City Council Regular Meeting Agenda
Monday, November 16, 2026, 7:00 PM
Council Chambers, 616 NE 4th AVE

NOTE: The City welcomes public meeting citizen participation. TTY Relay Service: 711. In compliance with the ADA, if you need special assistance to participate in a meeting, contact the City Clerk's office at (360) 834-6864, 72 hours prior to the meeting so reasonable accommodations can be made (28 CFR 35.102-35.104 ADA Title 1)

To observe the meeting (no public comment ability)
- go to https://vimeo.com/event/6352045

To participate in the meeting (able to public comment)
- go to https://cityofcamas-us.zoom.us/j/88951076096
(public comments may be submitted to publiccomments@cityofcamas.us)

CALL TO ORDER

PLEDGE OF ALLEGIANCE

ROLL CALL

PUBLIC COMMENTS

CONSENT AGENDA

NOTE: Consent Agenda items may be removed for general discussion or action.

1. November 2, 2026 Camas City Council Regular and Workshop Meeting Minutes
2. Automated Clearing House and Claim Checks Approved by Finance Committee
3. 2026 Pavement Preservation Grind and Inlay, Lakeside Industries, Change Order Authorization and Final Acceptance
(Submitted by Justin Monsrud, Engineering Project Manager)
4. Authorize Interlocal Agreement with Clark County related to The Village at Northshore Off-Site Transportation Improvements
(Submitted by James Carothers, Engineering Manager)

MAYOR

5. Mayor Announcements

MEETING ITEMS

6. Public Hearing – Ordinance 26-011 Fall Omnibus Amending the 2026 Readopted Budget

Presenter: Kayla McCauley, Interim Finance Director
Time Estimate: 5 minutes

7. Resolution No. 26-017 Revising the City of Camas Fee Schedule for 2027
Presenter: Kayla Mobley, Interim Finance Director
Time Estimate: 5 minutes

8. Public Hearing and Ordinance No. 26-012 for Criminal Justice Sales Tax
Presenters: Tina Jones, Police Chief and Jennifer Gorsuch, Administrative Services Director
Time Estimate: 15 minutes

9. Public Hearing - Ordinance No. 26-013 and Ordinance No. 26-014 2027 Property Tax Levies
Presenter: Kayla McCauley, Interim Finance Director
Time Estimate: 15 minutes

10. Public Hearing for 4% Utility Tax Increase and Ordinance No. 26-015
Presenter: Kayla McCauley, Interim Finance Director
Time Estimate: 10 minutes

11. Ordinance No. 26-008 Our Camas 2045 Comprehensive Plan
Presenter: Alan Peters, Community Development Director
Time Estimate: 5 minutes

12. Ordinance No. 26-009 Our Downtown Camas 2045 Subarea Plan
Presenter: Alan Peters, Community Development Director
Time Estimate: 5 minutes

13. Ordinance No. 26-010 Amendments to Titles 17 and 18 of the Camas Municipal Code, Downtown Design Manual, and Zoning Map
Presenter: Alan Peters, Community Development Director
Time Estimate: 5 minutes

PUBLIC COMMENTS

NON-AGENDA ITEMS

14. Staff

15. Council

CLOSE OF MEETING

City Council Workshop Minutes
Monday, November 2, 2026, 4:30 PM
Council Chambers, 616 NE 4th AVE

NOTE: Please see the published Agenda Packet for all item file attachments

CALL TO ORDER

Mayor Pro Tem Hein called the meeting to order at 4:30 p.m.

ROLL CALL

Present: Council Members Marilyn Boerke, Mahsa Eshghi, Tim Hein, John Nohr, Jennifer Senescu and John Svilarich

Remote: Council Member Martin Elzingre

Excused: Mayor Steve Hogan

Staff: Sydney Baker, Debra Brooks, James Carothers, Scott Collins, Carrie Davis, Cliff Free, Jennifer Gorsuch, Michelle Jackson, Tina Jones, Alan Peters, Doug Quinn, Bryan Rachal, Heidi Steffensen, Alicia Stevens, Connie Urquhart and Chris Witkowski

Press: No one from the press was present.

PUBLIC COMMENTS

Heidi Parker, Camas, commented about a proposed gas station.

Tom Small, Camas, commented about a proposed gas station.

Ken Cline, Clark County, commented about proposed budget.

Darcy Smith, Camas, commented about PFA's, proposed code changes and the budget.

Shannon Van Horn, Washougal, commented about the Farmer's Market.

WORKSHOP TOPICS

1. Intergovernmental Agreement with Clark County for the Village at North Shore
   Presenter: James Carothers, Engineering Manager

   This item will be placed on the November 16, 2026 City Council Regular Meeting for Council's consideration.

2. Evergreen School District and Washougal School District Capital Facilities Plan
   Presenter: Alan Peters, Community Development Director

A Public Hearing for this item will be on the December 7, 2026 City Council Regular Meeting.

3. City of Camas Third Quarter Financial Performance Presentation
   Presenter: Kayla McCauley, Interim Finance Director

   This item was for Council's Information Only.

4. 2027 – 2028 Mayor's Recommended Capital Budget Presentation
   Presenter: Kayla McCauley, Interim Finance Director

   A Public Hearing for this item will be on the December 7, 2026 City Council Regular Meeting.

5. 2026 Fall Omnibus Budget Amendment Presentation
   Presenter: Kayla McCauley, Interim Finance Director

   A Public Hearing for this item will open at the November 16, 2026 City Council Regular Meeting.

6. Staff Miscellaneous Updates
   Presenter: Doug Quinn, City Administrator

   Rachal commented about the Form of Government communication plan.

   Collins provided a PFA's settlement update and an update from the Regional Transportation Commission (RTC).

   Jones commented about a criminal justice grant and sales tax.

   Witkowski commented about the Parks and Recreation facility revenues and expenses.

PUBLIC COMMENTS

Darcy Smith, Camas, commented about security at the library and the Lake Road/Sierra Street roundabout.

Carrie Schulstad, Camas, commented about the Downtown Camas Association.

Emily Hubbard, Camas, commented about the proposed gas station and thanked the Camas Police Officers.

COUNCIL COMMENTS AND REPORTS

Due to time constraints, this item was moved to the November 2, 2026 City Council Regular Meeting.

CLOSE OF MEETING

The meeting closed at 6:39 p.m.

City Council Regular Meeting Minutes
Monday, November 2, 2026, 7:00 PM
Council Chambers, 616 NE 4th AVE

NOTE: Please see the published Agenda Packet for all item file attachments

CALL TO ORDER

Mayor Pro Tem Hein called the meeting to order at 7:00 p.m.

PLEDGE OF ALLEGIANCE

ROLL CALL

Present: Council Members Marilyn Boarke, Mahsa Eshghi, Tim Hein, Jennifer Senescu and John Svilarich

Remote: Council Member Martin Elzingre

Excused: Mayor Steve Hogan and Council Member John Nohr

Staff: Sydney Baker, James Carothers, Scott Collins, Jennifer Gorsuch, Tina Jones, Shawn MacPherson, Robert Maul, Kayla McCauley, Alan Peters, Doug Quinn, Bryan Rachal, Heidi Steffensen, Connie Urquhart and Chris Witkowski

Press: No one from the press was present.

PUBLIC COMMENTS

Elyse Hoover, Camas, commented about a wildlife bridge.

Randal Friedman, Camas, commented about Our Camas 2045.

Tyler Sanders, Camas, commented about the new crosswalk on Lake Road.

Karin Nosrati, Camas, commented about the proposed gas station on 13th Street.

Kim Vine, Camas, commented about a wildlife bridge.

Russell Wagner, Camas, commented about the proposed gas station on 13th Street.

Brad Richardson, Camas, provided updates from the Port of Camas-Washougal.

CONSENT AGENDA

1. October 19, 2026 Camas City Council Regular and Workshop Meeting Minutes

2. $946,095.45 Automated Clearing House 704339 – 704376, Claim Checks 164605 – 164706 and $119.11 Camas Assistance Program (CAP) Payment Approved by Finance Committee

3. NW 6th Place Sewer Repair, SLE Inc., Change Order #2 and Final Acceptance (Submitted by Justin Monsrud, Engineering Project Manager)

It was moved by Boerke, and seconded, to approve the Consent Agenda. The motion carried unanimously.

MAYOR

4. Mayor Announcements

There were no Mayor announcements.

5. Veterans Day Proclamation

Mayor Pro Tem Hein proclaimed November 11, 2026 as Veterans Day in the City of Camas.

MEETING ITEMS

6. 2027 – 2030 Collective Bargaining Agreement between the City of Camas and AFSCME, Local 307CC
Presenter: Jennifer Gorsuch, Administrative Services Director

It was moved by Svilarich, and seconded, to approve the 2027 – 2030 Collective Bargaining Agreement between the City of Camas and AFSCME, Local 307CC and authorize the Mayor and City Administer to sign the four-year agreement. The motion carried unanimously.

7. Our Camas 2045 Comprehensive Plan Periodic Update, Our Downtown Camas 2045 Subarea Plan, Downtown Design Manual, and associated amendments to Titles 17 and 18 of the Camas Municipal Code
Presenter: Alan Peters, Community Development Director

It was moved by Boerke, and seconded, to direct the City Attorney to draft Ordinances adopting the Our Camas 2045 Comprehensive Plan Periodic Update, Our Downtown Camas 2045 Subarea Plan, Downtown Design Manual, and associated amendments to Titles 17 and 18 of the Camas Municipal Code for Council's consideration on the November 16, 2026 City Council Regular Meeting. The motion carried unanimously.

PUBLIC COMMENTS

Jordan, Vancouver, commented about the comprehensive plan.

NON-AGENDA ITEMS

8. Staff

   There were no additional staff updates.

9. Council

   Senescu provided an update from the Washington State Energy Facility Site Evaluation Council (EFSEC) meeting and commented about the proposed operational budget.

   Elzingre provided an update from the Camas-Washougal Regional Fire Authority (RFA).

   Svilarich thanked citizens supporting the wildlife crossing.

   Boerke provided an update from the Camas-Washougal RFA and the City/Schools meeting. Boerke commented about security at the Camas Library.

   Eshghi commented about Boo Bash, the Association of Washington Cities (AWC) meeting, the Port of Camas-Washougal meeting, the City/Schools meeting and the upcoming Regional Transportation Commission (RTC) meeting.

   Hein thanked citizens for providing comments, attended many Finance Committee Meetings. Hein commented about Boo Bash, the Veterans of Foreign Wars (VFW) Post 4278 and reminded everyone to vote.

CLOSE OF MEETING

The meeting closed at 8:27 p.m.

Meeting minutes created by Sydney Baker.

Staff Report

November 16, 2026 Council Regular Meeting

2026 Pavement Preservation Grind and Inlay, Lakeside Industries, Change Order Authorization and Final Acceptance
Presenter: Justin Monsrud, Engineering Project Manager
Time Estimate: 0 minutes (consent agenda)

Phone	Email
360.817.7232	jmonsrud@cityofcamas.us

BACKGROUND: Lakeside Industries was awarded the 2026 Pavement Preservation Grind and Inlay contract at the June 1, 2026 Council meeting. The original contract awarded in amount of $1,038,334.74 and included removal and replacement of asphalt surfacing on roadway segments that had reached end of useful life. The contract included pavement rehabilitation on the following street segments:

- NW Fargo ST. From NW 18th AVE. to NW Hill ST
- NW 28th AVE. from NW Hill ST. to NW Utah ST.
- NW 38th AVE. from 800 LF West of NW Dahlia DR. to NW Astor ST.
- NW Astor ST. from NW 38th AVE. to terminus of NW 43rd AVE.

In addition to pavement rehabilitation, NW Fargo ST. and NW 28th AVE. street segments roadway restriping to provide 10-foot travel lanes providing traffic calming measures and incorporated bicycle facilities. These improvements support complete streets and active transportation and align with the City's Transportation System Plan priorities.

SUMMARY: This project reached substantial completion on September 9, 2026 and all contract work has been completed. The final revised contract amount is $1,169,138.90, representing a 12.6% increase to the original contract award requiring Council authorization.

The increase in contract value is primarily attributed to higher than estimated quantities for traffic control, flagging, striping, and pavement markings. Additionally, project coordination and scheduling required replacement of concrete curb and construction of a new concrete traffic island at the intersection of NW Fargo ST. and NW Hill ST. for a future Rectangular Rapid Flashing Beacon (RRFB) installation. These additional concrete improvements contributed to an overall increase in project costs.

It is important to distinguish the revised contract amount from the final amount paid to contractor. Although the revised contract amount is $1,169,138.9, the final contract payment will total $1,131,585.53 after accounting for underrun in other bid item quantities.


NW 28TH Avenue


NW Fargo Street



NW 38th Avenue



NW Astor Street

BENEFITS TO THE COMMUNITY: This project will benefit all roadway users by preserving roadway surfaces, increasing safety and enhancing driver comfort. Additionally, bike lane additions and travel lanes width reductions on NW Fargo Street and NW 28th Avenue improve safety and increase multimodal use of the corridor.

STRATEGIC PLAN: The project aligns with Strategic Plan Goal "Stewardship of City Assets" by preserving the cities roadway network.

POTENTIAL CHALLENGES: None, work has been completed.

BUDGET IMPACT: This project is funded by the street preservation fund. A summary of fund balance and project costs are provided below:

Budget:	
2026 Capital Budget Pavement Preservation Fund:	*$1,628,048.00*
2026 Pavement Preservation Grind and Inlays Project	
Original Contract (Construction bid)	*$1,038,334.74*
Change Order #1-RRFB STR26002	*$22,894.32*
Change Order #2- Bid item overages	*$75,520.62*
Change Order #3-Bid item overages	*$10,331.78*
Change Order #4- Bid Item overages and Striping Additions	*$22,057.44*
Net Bid Item Underruns	*($37,553.37)*
Total Contract Cost	*$1,131,585.53*
Construction Materials Testing (Columbia West)	*$7,049.00*
Total Project Cost	*$1,138,634.53*
Pavement Preservation Funds remaining (2027 rollover)	*$489,413.47*

RECOMMENDATION: Staff recommend authorizing contract increase for change order No.3 in amount of $10,331.78 and No.4 in amount of 22,057.44 to Lakeside Industries and accept project as complete.

Docusign Envelope ID: 26ABA66B-A631-825B-80EE-FAA9EE32E712

City of Camas
Contract Change Order

City Contract No.: **260139**
Change Order No.: **3**
Date:

Project: STR26001 2026 Pavement Preservation Grind Inlays

Contractor: Lakeside Industries

You are hereby requested to comply with the following changes from the contract plans and specifications:

Item	Description of Changes	QTY	Unit	Unit Cost	Decrease in Contract Price	Increase in Contract Price
	Tax Schedule A					
Segment 1	**NW 28th Ave and NW Fargo St from NW Utah St to NW 18th Ave**					
CO3-1A	Flagger (Sch. A - Segment 1 - Bid Item No. 4)	0.5	HR	$89.00		$44.50
CO3-1B	Painted White Edge Line - 8 inch (Sch. A - Segment	11920	LF	$0.72		$8,582.40
CO3-1C	Painted White Cross Hatch Diagonal - 8 Inch	508	LF	$1.72		$873.76
CO3-1D	Thermoplastic Stop Bar Line (Sch. A - Segment 1 -	30	LF	$30.00		$900.00
CO3-1E	Thermoplastic Bicycle Symbol including Directional	4	EA	$460.00		$1,840.00
Segment 2	**NW 38th Ave to NW Astor St to NW 43rd Ave**					
CO3-2A	Flagger (Sch. B - Segment 2 - Bid Item No. 3)	-50	HR	$89.00	($4,450.00)	
CO3-2B	Painted White Edge Line - 8 Inch (Sch. B - Segment	2647	LF	$0.96		$2,541.12
				Subtotal:		$10,331.78
				Sales Tax (8.8%):		EXEMPT
				Net Change in Contract Price:		**$10,331.78**

NOTES: Field-measured quantities, as verified by the Engineer, exceeded the original bid quantities. This change order adjusts the contract quantities and associated costs to reflect the actual quantities of work performed in accordance with the contract. Traffic Control Supervisor hours were previously paid in error under the “Flagger” hourly bid items in

Change Orders	Description	Date Approved	Approved Amount (including Tax)	% Contract Total Increase (Cumulative)
-	Original Contract Total	6/1/2026	$1,038,334.74	-
1	Change Order 1	9/4/2026	$22,894.32	2.20%
2	Change Order 2 - Overages	9/14/2026	$75,520.62	9.48%
3	Change Order 3 - Overages		$10,331.78	10.47%
		New Contract Total:	**$1,147,081.46**	

Contract Period

Previous contract end date: 10/11/2026 (or) Working Days:

The contract period provided for completion will be:

Extended to: **12/31/2026**
Extended by: Working Days New total:
Unchanged

Docusign Envelope ID: 26ABA66B-A631-825B-80EE-FAA9EE32E712

NOTES:

This document will become a supplement to the contract and all provisions will apply hereto.

Requested	Project Engineer	Date
Recommended	Project Manager	Date
Accepted	DocuSigned by: Johnny Escobedo 447CCFCD40354F4... Contractor	10/28/2026 Date
Approved	Public Works Director	Date

Docusign Envelope ID: 1A449B0B-5453-80F5-838D-1F3557330555

City of Camas
Contract Change Order

City Contract No.: **260139**
Change Order No.: **4**
Date:

Project: STR26001 2026 Pavement Preservation Grind Inlays

Contractor: Lakeside Industries

You are hereby requested to comply with the following changes from the contract plans and specifications:

Item	Description of Changes	QTY	Unit	Unit Cost	Decrease in Contract Price	Increase in Contract Price
	Tax Schedule A					
CO4-A	Mobilization	1	LS	$5,000.00		$5,000.00
CO4-B	Traffic Control	1	LS	$3,500.00		$3,500.00
CO4-C	Removing Paint Lines	219	LF	$8.50		$1,861.50
CO4-D	Thermoplastic Turn Arrows	2	EA	$500.00		$1,000.00
CO4-E	Raised Pavement Markers	3.88	100	$1,000.00		$3,880.00
Segment 1	**NW 28th Ave and NW Fargo St from NW Utah St to NW 18th Ave**					
CO4-1A	Flagger (Sch. A - Segment 1 - Bid Item No. 4)	13.5	HR	$89.00		$1,201.50
CO4-1B	Painted White Edge Line - 8 inch (Sch. A - Segment 1 - Bid Item No. 11)	2	LF	$0.72		$1.44
CO4-1C	Thermoplastic Crosswalk Line (Sch. A - Segment 1 - Bid Item No. 15)	234	SF	$17.50		$4,095.00
CO4-1D	Thermoplastic Stop Bar Line (Sch. A - Segment 1 - Bid Item No. 16)	15	LF	$30.00		$450.00
Segment 2	**NW 38th Ave to NW Astor St to NW 43rd Ave**					
CO4-2A	Flagger (Sch. B - Segment 2 - Bid Item No. 3)	12	HR	$89.00		$1,068.00
				Subtotal:		$22,057.44
				Sales Tax (8.8%):		EXEMPT
				Net Change in Contract Price:		**$22,057.44**

NOTES: Work was completed 10/7/2026

Change Orders	Description	Date Approved	Approved Amount (including Tax)	% Contract Total Increase (Cumulative)
-	Original Contract Total	6/1/2026	$1,038,334.74	-
1	Change Order 1	9/4/2026	$22,894.32	2.20%
2	Change Order 2 - Overages	9/11/2026	$75,520.62	9.48%
3	Change Order 3 - Overages		$10,331.78	10.47%
4	Change Order 4		$22,057.44	12.60%
		New Contract Total:	**$1,169,138.90**	

Contract Period

Previous contract end date: 12/31/2026 (or) Working Days:

The contract period provided for completion will be:

Extended to:

Extended by: Working Days New total:

Unchanged

Docusign Envelope ID: 1A449B0B-5453-80F5-838D-1F3557330555

NOTES:

This document will become a supplement to the contract and all provisions will apply hereto.

Requested	Project Engineer	Date
Recommended	Project Manager	Date
Accepted	DocuSigned by: Johnny Escobedo 447CCFCD40354F4... Contractor	10/28/2026 Date
Approved	Public Works Director	Date

CITY OF CAMAS
PROJECT NO. STR26001
2026 PAVEMENT PRESERVATION

PAY ESTIMATE: FOUR - FINAL
PAY PERIOD: 10/31/2026 Through 12/31/2026

ORIGINAL CONTRACT AMOUNT: $ 1,038,334.74

Lakeside Industries
8705 NE 117th Avenue
Vancouver, WA 98682
Johnny.Escobedo@lakesideindustries.com
360-709-0330

ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
Schedule A - Segment 1											
1	Mobilization	LS	1	$10,000.00	$10,000.00	1	$10,000.00	0	$0.00	1	$10,000.00
2	Construction Documentation (min. bid $7,500)	LS	1	$7,500.00	$7,500.00	1	$7,500.00	0	$0.00	1	$7,500.00
3	Project Temporary Traffic Control	LS	1	$32,600.00	$32,600.00	1	$32,600.00	0	$0.00	1	$32,600.00
4	Flagger	HR	600	$89.00	$53,400.00	1,009	$89,756.50	0	$0.00	1,008.5	$89,756.50
5	Portable Changeable Message Board (2 Each)	Day	18	$140.00	$2,520.00	0	$0.00	0	$0.00	0	$0.00
6	Removal and Replacement Unsuitable Material Incl. Haul	CY	100	$85.00	$8,500.00	0	$0.00	0	$0.00	0	$0.00
7	Project Temporary Traffic ControlHMA Class ½ Inch PG 64-22 With Fiber Reinforcement at 1LB per Ton HMA	TON	3,255	$127.00	$413,385.00	3,181	$403,927.31	0	$0.00	3,181	$403,927.31
8	Planing Bituminous Pavement	SY	19,160	$5.40	$103,464.00	20,414	$110,237.27	0	$0.00	20,414	$110,237.27
9	Manhole Adjustment Removal of Structures and Obstructions	EA	38	$225.00	$8,550.00	38	$8,550.00	0	$0.00	38	$8,550.00
10	Valve Can Adjustment	EA	45	$110.00	$4,950.00	45	$4,950.00	0	$0.00	45	$4,950.00
11	Painted White Edge Line - 8 inch	LF	7,630	$0.72	$5,493.60	19,552	$14,077.44	0	$0.00	19,552	$14,077.44
12	Painted Yellow Centerline - 4 inch	LF	5,674	$0.72	$4,085.28	4,690	$3,376.80	0	$0.00	4,690	$3,376.80
13	Painted White Cross Hatch Diagonal - 8 Inch	LF	913	$1.72	$1,570.36	1,421	$2,444.12	0	$0.00	1,421	$2,444.12
14	Painted White Chevron - 8 Inch	LF	815	$1.72	$1,401.80	0	$0.00	0	$0.00	0	$0.00
15	Thermoplastic Crosswalk Line	SF	130	$17.50	$2,275.00	364	$6,370.00	0	$0.00	364	$6,370.00
16	Thermoplastic Stop Bar Line	LF	18	$30.00	$540.00	63	$1,890.00	0	$0.00	63	$1,890.00
17	Thermoplastic Bicycle Symbol including Directional Arrow	EA	28	$460.00	$12,880.00	32	$14,720.00	0	$0.00	32	$14,720.00
18	Thermoplastic Bicycle Sharrow Symbol including Directional Chevron	EA	4	$460.00	$1,840.00	2	$920.00	0	$0.00	2	$920.00
19	Permanent Signage	LS	1	$33,000.00	$33,000.00	1	$33,000.00	0	$0.00	1	$33,000.00
	SUBTOTAL:				**$707,955.04**		**$744,319.44**		**$0.00**		**$744,319.44**
	Sales Tax (EXEMPT):				EXEMPT		EXEMPT		EXEMPT		EXEMPT
	Total:				$707,955.04		$744,319.44		$0.00		$744,319.44

ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
Schedule B - Segment 2											
1	Mobilization	LS	1	$14,700.00	$14,700.00	1	$14,700.00	0	$0.00	1	$14,700.00
2	Project Temporary Traffic Control	LS	1	$19,300.00	$19,300.00	1	$19,300.00	0	$0.00	1	$19,300.00
3	Flaggers	HR	280	$89.00	$24,920.00	431	$38,359.00	0	$0.00	431	$38,359.00
4	Portable Changeable Message Board (2 Each)	Day	10	$250.00	$2,500.00	0	$0.00	0	$0.00	0	$0.00
5	Removal and Replacement Unsuitable Material Incl. Haul	CY	50	$100.00	$5,000.00	0	$0.00	0	$0.00	0	$0.00
6	Project Temporary Traffic ControlHMA Class ½ Inch PG 64-22 With Fiber Reinforcement at 1LB per Ton HMA	Ton	1,490	$132.00	$196,680.00	1,449	$191,248.20	0	$0.00	1,449	$191,248.20
7	Planing Bituminous Pavement	SY	8,773	$5.70	$50,006.10	11,791	$67,207.45	0	$0.00	11,791	$67,207.45
8	Manhole Adjustment	EA	8	$300.00	$2,400.00	13	$3,900.00	0	$0.00	13	$3,900.00
9	Valve Can Adjustment	EA	15	$420.00	$6,300.00	21	$8,820.00	0	$0.00	21	$8,820.00
10	Thermoplastic Yield Symbol	EA	5	$100.00	$500.00	5	$500.00	0	$0.00	5	$500.00
11	Painted White Edge Line - 8 Inch	LF	3,200	$0.96	$3,072.00	5,847	$5,613.12	0	$0.00	5,847	$5,613.12
12	Painted White Edge Line - 4 Inch	LF	2,180	$0.48	$1,046.40	0	$0.00	0	$0.00	0	$0.00
13	Painted double Yellow Centerline - 4 Inch	LF	4,120	$0.96	$3,955.20	4,050	$3,888.00	0	$0.00	4,050	$3,888.00
	SUBTOTAL:				**$330,379.70**		**$353,535.77**		**$0.00**		**$353,535.77**
	Sales Tax (EXEMPT):				EXEMPT		EXEMPT		EXEMPT		EXEMPT
	Total:				$330,379.70		$353,535.77		$0.00		$353,535.77

CITY OF CAMAS
PROJECT NO. STR26001
2026 PAVEMENT PRESERVATION

PAY ESTIMATE: FOUR - FINAL
PAY PERIOD: 10/31/2026 Through 12/31/2026

ORIGINAL CONTRACT AMOUNT: $ 1,038,334.74

Lakeside Industries
8705 NE 117th Avenue
Vancouver, WA 98682
Johnny.Escobedo@lakesideindustries.com
360-709-0330

ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
Change Order No. 1											
1A	Mobilization	LS	1	$3,000.00	$3,000.00	1	$3,000.00	0	$0.00	1	$3,000.00
1B	Project Temporary Traffic Control Minor Change	LS	1	$9,000.00	$9,000.00	1	$9,000.00	0	$0.00	1	$9,000.00
1C	Asphalt Patching @ 3"	TON	0	$786.00	$0.00	0	$0.00	0	$0.00	0	$0.00
1D	Sidewalk Removal	SY	22.52	$16.00	$360.32	23	$360.32	0	$0.00	23	$360.32
1E	Curb Removal	LF	72	$16.00	$1,152.00	72	$1,152.00	0	$0.00	72	$1,152.00
1F	Curb and Gutter	LF	72	$40.00	$2,880.00	72	$2,880.00	0	$0.00	72	$2,880.00
1G	Rolled Curb and Gutter	LF	25	$40.00	$1,000.00	25	$1,000.00	0	$0.00	25	$1,000.00
1H	Temp Striping	EA	66	$35.00	$2,310.00	66	$2,310.00	0	$0.00	66	$2,310.00
1I	Survey	LS	1	$3,192.00	$3,192.00	1	$3,192.00	0	$0.00	1	$3,192.00
	SUBTOTAL:				**$22,894.32**		**$22,894.32**		**$0.00**		**$22,894.32**
	Sales Tax (EXEMPT):				EXEMPT		EXEMPT		EXEMPT		EXEMPT
	Total:				$22,894.32		$22,894.32		$0.00		$22,894.32

ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
Change Order No. 2 - Overages											
1A	Flagger (Sch. A - Segment 1 - Bid Item No. 4)	HR	395	$89.00	$35,155.00	0	$0.00	0	$0.00	0	$0.00
1B	Planing Bituminous Pavement (Sch. A - Segment 1 - Bid Item No. 8)	SY	1,254.31	$5.40	$6,773.27	0	$0.00	0	$0.00	0	$0.00
2A	Flagger (Sch. B - Segment 2 - Bid Item No. 3)	HR	139	$89.00	$12,371.00	0	$0.00	0	$0.00	0	$0.00
2B	Planing Bituminous Pavement (Sch. B - Segment 2 - Bid Item No. 7)	SY	3,017.78	$5.70	$17,201.35	0	$0.00	0	$0.00	0	$0.00
2C	Manhole Adjustment Removal of Structures and Obstructions (Sch. B - Segment 2 - Bid Item No. 8)	EA	5	$300.00	$1,500.00	0	$0.00	0	$0.00	0	$0.00
2D	Valve Can Adjustment (Sch. B - Segment 2 - Bid Item No. 9)	EA	6	$420.00	$2,520.00	0	$0.00	0	$0.00	0	$0.00
	SUBTOTAL:				**$75,520.62**		**$0.00**		**$0.00**		**$0.00**
	Sales Tax (EXEMPT):				EXEMPT		EXEMPT		EXEMPT		EXEMPT
	Total:				$75,520.62		$0.00		$0.00		$0.00

ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
Change Order No. 3 - Overages											
CO3 - 1A	Flagger (Sch. A - Segment 1 - Bid Item No. 4)	HR	0.5	$89.00	$44.50	1	$44.50	0	$0.00	0.5	$44.50
CO3 - 1B	Painted White Edge Line - 8 inch (Sch. A - Segment 1 - Bid Item No. 11)	LF	11,920	$0.72	$8,582.40	0	$0.00	0	$0.00	0	$0.00
CO3 - 1C	Painted White Cross Hatch Diagonal - 8 Inch (Sch. A - Segment 1 - Bid Item No. 13)	LF	508	$1.72	$873.76	0	$0.00	0	$0.00	0	$0.00
CO3 - 1D	Thermoplastic Stop Bar Line (Sch. A - Segment 1 - Bid Item No. 16)	LF	30	$30.00	$900.00	0	$0.00	0	$0.00	0	$0.00
CO3 - 1E	Thermoplastic Bicycle Symbol including Directional Arrow (Sch. A - Segment 1 - Bid Item No. 17)	EA	4	$460.00	$1,840.00	0	$0.00	0	$0.00	0	$0.00
CO3 - 2A	Flagger (Sch. B - Segment 2 - Bid Item No. 3)	HR	-50.0	$89.00	($4,450.00)	-50	($4,450.00)	0	$0.00	-50	($4,450.00)
CO3 - 2B	Painted White Edge Line - 8 Inch (Sch. B - Segment 2 - Bid Item No. 11)	LF	2,647	$0.96	$2,541.12	0	$0.00	0	$0.00	0	$0.00
	SUBTOTAL:				**$10,331.78**		**($4,405.50)**		**$0.00**		**($4,405.50)**
	Sales Tax (EXEMPT):				EXEMPT		EXEMPT		EXEMPT		EXEMPT
	Total:				$10,331.78		($4,405.50)		$0.00		($4,405.50)

CITY OF CAMAS
PROJECT NO. STR26001
2026 PAVEMENT PRESERVATION

PAY ESTIMATE: FOUR - FINAL
PAY PERIOD: 10/31/2026 Through 12/31/2026

ORIGINAL CONTRACT AMOUNT: $ 1,038,334.74

Lakeside Industries
8705 NE 117th Avenue
Vancouver, WA 98682
Johnny.Escobedo@lakesideindustries.com
360-709-0330

ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
Change Order No. 4											
CO4 - A	Mobilization	LS	1	$5,000.00	$5,000.00	0	$0.00	1	$5,000.00	1	$5,000.00
CO4 - B	Traffic Control	LS	1	$3,500.00	$3,500.00	0	$0.00	1	$3,500.00	1	$3,500.00
CO4 - C	Removing Paint Lines	LF	219	$8.50	$1,861.50	0	$0.00	219	$1,861.50	219	$1,861.50
CO4 - D	Thermoplastic Turn Arrows	EA	2	$500.00	$1,000.00	0	$0.00	2	$1,000.00	2	$1,000.00
CO4 - E	Raised Pavement Markers	100	3.88	$1,000.00	$3,880.00	0	$0.00	3.88	$3,880.00	3.88	$3,880.00
CO4 - 1A	Flagger (Sch. A - Segment 1 - Bid Item No. 4)	HR	13.5	$89.00	$1,201.50	0	$0.00	0	$0.00	0	$0.00
CO4 - 1B	Painted White Edge Line - 8 inch (Sch. A - Segment 1 - Bid Item No. 11)	LF	2	$0.72	$1.44	0	$0.00	0	$0.00	0	$0.00
CO4 - 1C	Thermoplastic Crosswalk Line (Sch. A - Segment 1 - Bid Item No. 15)	SF	234	$17.50	$4,095.00	0	$0.00	0	$0.00	0	$0.00
CO4 - 1D	Thermoplastic Stop Bar Line (Sch. A - Segment 1 - Bid Item No. 16)	LF	15	$30.00	$450.00	0	$0.00	0	$0.00	0	$0.00
CO4 - 2A	Flagger (Sch. B - Segment 2 - Bid Item No. 3)	HR	12	$89.00	$1,068.00	0	$0.00	0	$0.00	0	$0.00
	SUBTOTAL:				**$22,057.44**		**$0.00**		**$15,241.50**		**$15,241.50**
	Sales Tax (EXEMPT):				EXEMPT		EXEMPT		EXEMPT		EXEMPT
	Total:				$22,057.44		$0.00		$15,241.50		$15,241.50

	CONTRACT TOTAL	TOTAL PREVIOUS	**TOTAL THIS EST.**	TOTAL TO DATE
ORIGINAL CONTRACT SUBTOTAL	$1,038,334.74	$1,097,855.21	$0.00	$1,097,855.21
ADDITIONS / DELETIONS	$130,804.16	$18,488.82	$15,241.50	$33,730.32
SUBTOTAL	$1,169,138.90	$1,116,344.03	$15,241.50	$1,131,585.53
SALES TAX (EXEMPT):	EXEMPT	EXEMPT	EXEMPT	EXEMPT
TOTAL CONTRACT	$1,169,138.90	$1,116,344.03	$15,241.50	$1,131,585.53
TOTAL		**$1,116,344.03**	**$15,241.50**	**$1,131,585.53**

GL Code Pavement Preservation 1120.06.9120.000.5953000.563000
Retainage Bond on File

THIS PAY EST: **$15,241.50**

F.I.

Project Engineer Date

Contractor Date

Project Manager Date

Interlocal Cooperation Agreement Between The City of Camas (“City”) and Clark County (“County”) Under the Authority of Chapter 39.34, RCW

This is an interlocal agreement entered into on the date it is fully executed and pursuant to chapter 39.34 RCW for the design, permitting and construction of certain public facilities as set forth herein on public right of way adjacent to the City limits, but located outside the City limits.

RECITALS:

Whereas, "City" has been presented by HSR Dev - Mills, LLC certain improvement projects related to Village at North Shore off-site transportation improvements; and

Whereas, said project is within County right-of-way (“County ROW”), all as more particularly delineated on the attached Exhibit "A"; and

Whereas, HSR Dev - Mills, LLC has received preliminary site plan approval and/or conditional use approval from the City on the development proposals that require the projects to be completed; and

Whereas, the City and County both reviewed the engineering plans for the proposed improvement projects; and

Whereas, County presently has land use jurisdiction over portions of the proposed public transportation improvements by virtue of portions of said improvements being located within the County right-of-way and outside the City limits, said improvements being adjacent to City right of way; and

Whereas, the City and the County find that the public facility improvements as described herein provide benefits to the residents of both the City and the County; and

Whereas, the City and the County each have right-of-way and road standards that meet the multi-modal needs of the traveling public; and

Whereas, the City and the County each have professional planning, permitting, inspecting, and engineering personnel on their respective staffs.

AGREEMENT: NOW, THEREFORE, it is agreed by the City Council of Camas and the Clark County Council as follows:

1. The City and the County find it is in the public interest to enter into this Interlocal Agreement which will allow the right-of-way and roadway improvement projects to be processed through the City, including design and engineering plan review, permitting, construction oversight, operations, and maintenance of the new and existing public use facilities which are partially located within County right-of-way.
2. This Interlocal Agreement will terminate automatically upon the execution of item# 5 listed below.
3. This Interlocal Agreement does not require the creation of any separate legal or administrative entity. The City shall be responsible for review and approval of all elements of the proposed right-of-way improvements which will be constructed by HSR Dev - Mills, LLC through the City's land use development process. The City shall forward any modifications to the current plans depicted in Exhibit A to County for review and approval.
    a. The administrator in charge of this Project will be Doug Quinn, City Administrator of the City of Camas.
4. This Interlocal Agreement will pertain to the rights-of-ways on NE 3rd Street and NE 252nd Avenue as further shown and described in Exhibit "A".
    a. The City shall issue any regulatory or other permits needed to complete this project.
    b. The permitting of the development of the public facilities shall apply the County code. The County will provide the City with copies of applicable development codes and design standards.
    c. The City shall provide the County with a copy of the construction plans to perform a final review of the work within County ROW.
    d. The City will notify the County in writing, prior to issuance of final punch list, to provide input specific for work which is within County ROW addressing any concerns or discrepancies prior to final acceptance
    e. The City shall verify that a Warranty Bond is provided by HSR Dev - Mills, LLC prior to the recording of the plat to cover all public improvements within County ROW. The amount of the bond should be at least 10% of developers cost associated with those improvements.
    f. The City shall verify that an agreement has been established between the County and HSR Dev - Mills, LLC, providing for reimbursement by HSR Dev - Mills, LLC to the County to cover County costs for plan review, signing, striping, and inspection work within County ROW.

5. The City will notify the County in writing when the right-of-way improvements are accepted as complete.
6. The City shall respond to, defend, indemnify, and hold harmless the County for all claims of liability or damage resulting from the proposed right-of-way improvements.
7. Upon obtaining the final approved copy of this Agreement, the City will file the Interlocal Agreement with the County Auditor of Clark County, as required by RCW 39.34 040.
8. This Agreement shall be executed in three original counterparts, which shall be delivered to the Clerk of the City upon execution of the Agreement by the Clark County Council.

This Agreement shall be effective upon its adoption by the Clark County Council.

AGREED TO BY THE CITY COUNCIL OF THE CITY OF CAMAS, WASHINGTON THIS 16th DAY OF NOVEMBER, 2026.

CITY OF CAMAS

_____

John Nohr, Mayor Pro-Tem

Approved as to form:

_____

Attorney for City of Camas

AGREED TO BY THE CLARK COUNTY COUNCIL THIS_____DAY OF _____, 2026

Approved as to Form Only:
ANTHONY F. GOLIK
Prosecuting Attorney

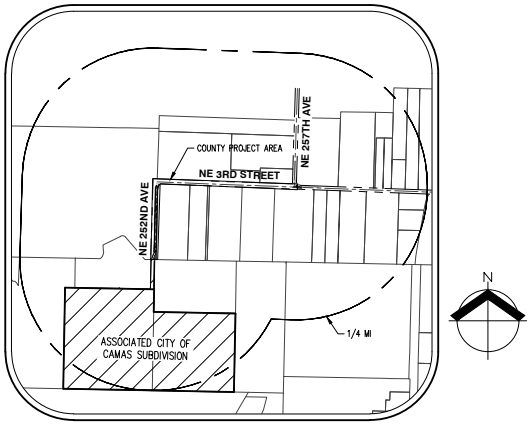
By:_____

CLARK COUNTY, WASHINGTON

By:_____
Kathleen Otto
County Manager

VANS OS TRANSPO IMPROVEMENTS

GRADING AND DRAINAGE PLANS



VICINITY MAP
N.T.S.



SITE MAP
N.T.S.

ENGINEERING CASE	GRD-2025-XXXX
HABITAT CASE	N/A
PLANNING LAND USE CASE	N/A
WETLAND CASE	N/A

DESIGN PROFESSIONAL SHALL COMPLETE ALL LINES:
PROJECT QUANTITIES
N/A = NOT APPLICABLE √ = APPLICABLE

GRADING:
- Onsite Excavation (Cut) Volume (Cubic Yards): 98 CY
- Fill From Off-Site Source (Cubic Yards): 94 CY

CONSTRUCTION INSPECTION DISTURBED AREA
- Disturbed Area (Acres): 0.50 AC

UIC - CLASS V INJECTION WELLS:
- Site Number: N/A
- Site Name: N/A
- Site Address: N/A
- EPA Well Type: N/A
- Well Count: N/A

PUBLIC IMPROVEMENTS	PRIVATE IMPROVEMENTS
☐ Transportation (Arterial & Collector) Sidewalk/Curb Lineal Feet 0 Street Lineal Feet 0	☐ Transportation Sidewalk/Curb Lineal Feet 0 Street Lineal Feet 0
☒ Transportation (Other) Sidewalk/Curb Lineal Feet 0 Street Lineal Feet 775 LF	
☒ Stormwater Facility Type CAVES BMP 17.40	☐ Stormwater Facility Type

SHEET INDEX

C000	COVER SHEET
C001	GENERAL NOTES & LEGEND
C002	EXISTING CONDITIONS
C003	EXISTING CONDITIONS
C050	GRADING, EROSION & SEDIMENT CONTROL PLAN
C100	STREET PLAN NE 252ND AVE
C101	STREET PLAN NE 252ND AVE
C102	STREET PLAN NE 3RD STREET
C500	DETAILS
C501	DETAILS
C502	DETAILS

811 Know what's below. Call before you dig.

APPLICANT
HSR DEV – MILLS, LLC
PARCEL #177885-000
CONTACT: ANDY SWANSON
19120 SE 34TH STREET, #103
VANCOUVER, WA 98683
PH: 503-936-8514
EMAIL: ANDY@HSR-CAPITAL.COM

OWNER
CLARK COUNTY
LACAMAS HERITAGE PROP LLC

GEOTECHNICAL ENGINEER
COLUMBIA WEST ENGINEERING, INC
CONTACT: DANIAL LEHTO, P.E., G.E.
11917 NE 95TH ST
VANCOUVER, WA 98682
PH: 360-823-2900

ENGINEERING/SURVEYING
AKS ENGINEERING & FORESTRY, LLC.
CONTACT: BRYCE HANSON, P.E.
9600 NE 126TH AVENUE, SUITE 2520
VANCOUVER, WA 98682
PH: 360-882-0419
FAX: 360-882-0426
E-MAIL: BRYCEH@AKS-ENG.COM

PROPERTY DESCRIPTION
LOCATED IN THE SW ¼ SEC 26 & SE ¼ SEC 27, TOWNSHIP 2 NORTH, RANGE 3 EAST, WILLAMETTE MERIDIAN, CLARK COUNTY, WASHINGTON.

EXISTING CLARK COUNTY ROW
PARCEL #175259-000

EXISTING LAND USE
COUNTY ROAD, ZONED: AG-20.

ARCHAEOLOGICAL NOTE
IF ANY CULTURAL RESOURCES AND/OR HUMAN REMAINS ARE DISCOVERED IN THE COURSE OF UNDERTAKING THE DEVELOPMENT ACTIVITY, THE DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION IN OLYMPIA AND CLARK COUNTY COMMUNITY DEVELOPMENT SHALL BE NOTIFIED. FAILURE TO COMPLY WITH THESE STATE REQUIREMENTS MAY CONSTITUTE A CLASS C FELONY, SUBJECT TO IMPRISONMENT AND/OR FINES.

PROJECT PURPOSE
CLARK COUNTY ROAD IMPROVEMENTS PER CCC 40.350.30(B)(6)(b) TO PROVIDE SITE ACCESS TO CITY OF CAMAS SUBDIVISION (VILLAGE AT NORTH SHORE: SUB25-1008).

SITE AREA
±2.358 AC (102,694 SF)

DATUM
VERTICAL DATUM: ELEVATIONS ARE BASED ON CLARK COUNTY BENCHMARK NO. 240, LOCATED AT THE NW CORNER OF HWY SR 500 & 23RD AVENUE. ELEVATION = 213.07 FEET (NGVD 29(47)).

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
360.882.0419
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

VANS OS TRANSPO IMPROVEMENTS
CLARK COUNTY WASHINGTON
NE 1/4, S34, T2N, R3E
#177885-000 #177884-000

COVER SHEET

DESIGNED BY: MAZ
DRAWN BY: MAZ
MANAGED BY: BDH
CHECKED BY: BDH
DATE: 6/13/2025

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 9095

SHEET C000

AKS DRAWING FILE: 9095 C000 COVERLINE | LAYOUT: C000

Exhibit A

Item 4.

GRADING NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING THE NECESSARY ARRANGEMENTS WITH THE GEOTECHNICAL ENGINEER FOR COMPACTION TESTING AND FOR SUPPLYING THE RESULTS TO THE PROJECT ENGINEER.
2. SITE PREPARATION MUST INCLUDE THE REMOVAL OF VEGETATION, NON-COMPLYING FILL, TOPSOIL, OR OTHER UNSUITABLE MATERIAL PRIOR TO PLACEMENT OF THE FILL.
3. NO CUT OR FILL SHALL EXCEED A GRADE OF 2 HORIZONTAL TO 1 VERTICAL UNLESS APPROVED BEFOREHAND BY THE PROJECT ENGINEER AND THE JURISDICTION.
4. APPROPRIATE BENCHING OF FILLS IS REQUIRED FOR FILLS OVER 5 FEET IN HEIGHT ON SLOPES IN EXCESS OF 5 HORIZONTAL TO 1 VERTICAL. BENCHING MUST BE DONE PER THE GEOTECHNICAL ENGINEERING REQUIREMENTS.
5. CUT AND FILL SLOPES SHALL BE PROTECTED FROM EROSION. SUCH CONTROL MAY CONSIST OF APPROPRIATE REVEGETATION OR OTHER ACCEPTABLE MEANS AND METHODS. EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EARTHWORK OR SITE STRIPPING.
6. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER AND THE PROJECT GEOTECHNICAL ENGINEER FOR REQUIRED INSPECTIONS AT THE FOLLOWING STAGES OF CONSTRUCTION:
   A. INSPECTION OF SITE STRIPPING, BUT PRIOR TO FILL PLACEMENT. EROSION CONTROL MEASURES SHALL BE IN PLACE AT THIS TIME.
   B. IN PREPARATION OF BENCH CONSTRUCTION PRIOR TO FILL PLACEMENT.
   C. AFTER PLACEMENT OF EACH 500 YARDS OF FILL.
   D. AFTER THE MAJORITY OF FILL HAS BEEN PLACED AND IS IN "ROUGH" GRADE BUT PRIOR TO FINAL GRADING.
   E. WHEN FINAL GRADING IS COMPLETED.
   F. DURING FINAL GRADING, BUT PRIOR TO BASE ROCK AND PAVEMENT CONSTRUCTION.
7. PROJECT GRADING LIMITS SHALL BE WITHIN THE PROJECT'S PROPERTY BOUNDARY AND/OR STREET RIGHT-OF-WAY, UNLESS OTHERWISE SHOWN ON PLANS. NO GRADING SHALL BE CONDUCTED IN WETLANDS OR OTHER ENVIRONMENTALLY SENSITIVE AREAS UNLESS SPECIFICALLY SHOWN ON THE APPROVED PLANS.
8. THE IDENTIFICATION OR REMOVAL OF UNSUITABLE MATERIAL SHALL BE DONE WITH CONSULTATION WITH THE PROJECT GEOTECHNICAL ENGINEER.
9. REMOVE AND DISPOSE OF ALL ORGANIC AND/OR UNSUITABLE MATERIALS, INCLUDING TREES, STUMPS, ROOTS, BRUSH, AND GRASS IN SUCH A MANNER TO MEET ALL APPLICABLE REGULATIONS. ON-SITE DISPOSAL SHALL BE AS DETERMINED BY THE PROJECT ENGINEER OR PROJECT GEOTECHNICAL ENGINEER.
10. THE CONTRACTOR SHALL PROTECT ALL TREES THAT ARE NOT SPECIFICALLY SHOWN TO BE REMOVED ON APPROVED PLANS. ALL TREES TO BE PRESERVED SHALL BE FENCED WITH STANDARD 4' ORANGE CONSTRUCTION FENCING AS SHOWN ON THE GRADING PLANS.
11. GRADE THE SITE TO THE ELEVATIONS SHOWN ON THE DRAWING WITH THE NECESSARY ADJUSTMENTS TO ACCOMMODATE THE FINISHED GRADES AS SPECIFIED. SHAPE FUTURE PAVED AREAS PER THE PLANS TO A SUBGRADE ELEVATION THAT WILL ACCOMMODATE FUTURE BASE ROCK AND PAVING.
12. STRAIGHT GRADES SHALL BE RUN BETWEEN FINISH GRADE AND/OR FINISH CONTOUR LINES SHOWN, UNLESS OTHERWISE NOTED. FINISH GRADES ARE TO DRAIN AS INDICATED ON THE PLANS. ROUGH GRADING SHALL BE FINISHED BY BLADING AND RAKING TO REASONABLE SMOOTH CONTOURS WITH GENTLE TRANSITIONS.
13. AREAS TO RECEIVE FILL MATERIALS SHALL BE PREPARED BY REMOVING ALL ORGANIC AND UNSUITABLE MATERIALS AND PROOF ROLLING. BENCHING IS REQUIRED ON FILLS WHERE THE EXISTING GROUND SLOPE EXCEEDS 5H:1V. BENCHING SHALL BE IN ACCORDANCE WITH PROJECT GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. MATERIAL IN SOFT SPOTS WITHIN FUTURE BUILDING, PAVED OR SIDEWALK AREAS SHALL BE REMOVED TO THE DEPTH REQUIRED (AS DIRECTED BY THE PROJECT ENGINEER OR THE PROJECT GEOTECHNICAL ENGINEER) TO PROVIDE A FIRM FOUNDATION AND SHALL BE REPLACED WITH SUITABLE BACKFILL. ALL FILLS SHALL BE CONSTRUCTED IN HORIZONTAL LIFTS NOT TO EXCEED 8 INCHES LOOSE MEASURE.
14. COMPACTION TESTS AND REPORTS SHALL BE CONDUCTED BY AN APPROVED TESTING LABORATORY. TEST FREQUENCY SHALL BE PER THE PROJECT GEOTECHNICAL ENGINEER. TESTING SHALL COMMENCE WITH FILL ACTIVITIES AND AS A MINIMUM, ONE TEST SHALL BE TAKEN FOR EVERY 500 CUBIC YARDS PLACED OR 2 VERTICAL FEET, WHICHEVER IS LESS. THE PROJECT ENGINEER AND PROJECT GEOTECHNICAL ENGINEER RESERVE THE RIGHT TO REQUEST ADDITIONAL TESTING AT THE CONTRACTOR'S EXPENSE.
15. FINISHED GRADE CONTOURS SHOWN ARE APPROXIMATE FINAL GRADE ELEVATIONS.
16. IF SPRINGS OR GROUNDWATER ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE PROJECT GEOTECHNICAL ENGINEER AND PROJECT ENGINEER OF THE CONDITIONS FOUND AND COORDINATE HIS ACTIVITIES IN A MANNER THAT WILL ALLOW TIME TO REVIEW THE SITUATION AND PREPARE A PLAN TO PROPERLY MITIGATE THE WATER ENCOUNTERED.
17. ALL CUT AND FILL AREAS SHALL BE STRIPPED OF SOD AND OTHER NON-STRUCTURAL MATERIAL (DEPTH TO BE DETERMINED BY PROJECT GEOTECHNICAL ENGINEER).
18. **CONTRACTOR SHALL COORDINATE WITH PROJECT ENGINEER/OWNER REGARDING CLEAN STRIPPING STOCKPILING AND SPREADING EVENLY OVER SURFACES NOT RECEIVING A HARD, DURABLE SURFACE (PAVEMENT, ETC.) UPON COMPLETION OF FINAL GRADING. THE STRIPPING REDISTRIBUTION SHALL NOT EXCEED 6-INCHES IN DEPTH, UNLESS OTHERWISE DIRECTED BY OWNER AND PROJECT ENGINEER. STRIPPINGS SHALL BE FREE OF VEGETATION, ROCKS, AND TREE ROOTS. NO STRIPPINGS SHALL BE PLACED ON AREAS STEEPER THAN 5H:1V. EXCESS STRIPPINGS SHALL BE DISPOSED OF OFF-SITE, AS APPROVED BY OWNER AND PROJECT ENGINEER.**
19. ALL GRADING SHALL BE IN CONFORMANCE WITH CHAPTER 33 OF THE CURRENT INTERNATIONAL BUILDING CODE (IBC).
20. ALL STRUCTURAL FILL SHALL MEET THE REQUIREMENTS OF THE PROJECT GEOTECHNICAL ENGINEER, GEOTECHNICAL REPORT, AND THE JURISDICTION. ENGINEERED FILL SHOULD BE COMPACTED IN HORIZONTAL LIFTS NOT EXCEEDING 8-INCHES USING STANDARD COMPACTION EQUIPMENT. THE MINIMUM COMPACTION SHALL BE 95% OF THE MAXIMUM DRY DENSITY DETERMINED BY ASTM D698 (STANDARD PROCTOR) OR EQUIVALENT. FIELD DENSITY TESTING SHALL CONFORM TO ASTM D2922 AND D3017, OR D1556.
21. **CONTOURS REPRESENT TOP OF PAVEMENT GRADES IN PAVED AREAS AND FINISHED GRADE (TOP OF CUT SURFACE/STRUCTURAL FILL SURFACE) IN ALL OTHER AREAS.**
22. **ALL GRADING ACTIVITIES SHALL BE COMPLETED PER THE GEOTECHNICAL ENGINEERING REPORT AND AS DIRECTED BY THE GEOTECHNICAL ENGINEER.**
23. CONTRACTOR SHALL DOCUMENT KEYWAY SUBDRAIN LOCATIONS AND PROVIDE TO THE PROJECT ENGINEER TO BE INCLUDED IN AS-BUILT PLANS.

NOTES REFERENCE

SEE ECN1 AND ENC2 ON PAGE C501 FOR CLARK COUNTY STANDARD NOTES ON EROSION CONTROL PLAN

GENERAL EROSION PREVENTION & SEDIMENT CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND IN WORKING CONDITION PRIOR TO ANY LAND DISTURBING ACTIVITY INCLUDING CLEARING OR GRADING. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE APPROVED BY THE CITY EROSION SPECIALIST PRIOR TO THE COMMENCEMENT OF WORK. AN ON-SITE INSPECTION SHALL BE REQUESTED WHEN EROSION AND SEDIMENT CONTROL MEASURES ARE IN PLACE AND PRIOR TO COMMENCEMENT OF WORK. ONCE APPROVED, THE SITE MUST BE MAINTAINED THROUGH THE LIFE OF THE PROJECT, AS SHOWN ON THE PLANS. ADDITIONAL MEASURES MAY BE REQUIRED TO MEET THE PROVISIONS OF CLARK COUNTY EROSION PREVENTION AND SEDIMENT CONTROL ORDINANCE CCC 40.386
2. EROSION AND SEDIMENT CONTROL BMPS SHALL BE SITED, DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS IN THE 2015 CLARK COUNTY STORMWATER MANUAL.
3. THE DEVELOPER AND/OR OWNER IS RESPONSIBLE FOR MAINTAINING EROSION PREVENTION AND SEDIMENT CONTROL BMPS DURING AND AFTER INSTALLATION OF ALL UTILITY WORK ASSOCIATED WITH UTILITY TRENCHES.
4. THE CONTRACTOR SHALL NOT ALLOW SEDIMENT OR DEBRIS TO ENTER NEW OR EXISTING PIPES OR INFILTRATION SYSTEMS. IF THIS OCCURS, THE CONTRACTOR SHALL REMOVE ALL ACCUMULATED SEDIMENT FROM THE STORM PIPES IMMEDIATELY. FINAL ACCEPTANCE WILL NOT BE ISSUED BY CLARK COUNTY UNTIL THIS OCCURS.
5. PRIOR TO LEAVING A CONSTRUCTION SITE OR PRIOR TO DISCHARGING INTO AN INFILTRATION SYSTEM, SEDIMENT-LADEN WATER SHALL PASS THROUGH A SEDIMENT POND, TRAP, OR OTHER APPROVED BMP SYSTEM.
6. ALL EXPOSED AND UNWORKED SOILS SHALL BE STABILIZED BY THE APPROPRIATE BEST MANAGEMENT PRACTICES (BMPS). FROM OCTOBER 1 TO APRIL 30, NO SOILS SHALL BE EXPOSED AND UNWORKED FOR MORE THAN TWO (2) DAYS. FROM MAY 1 TO SEPTEMBER 30, NO SOILS SHALL BE EXPOSED AND UNWORKED FOR MORE THAN SEVEN (7) DAYS.
7. SOIL STOCKPILES SHALL BE STABILIZED FROM EROSION, PROTECTED WITH SEDIMENT TRAPPING MEASURES, AND WHEN POSSIBLE, BE LOCATED AWAY FROM STORM DRAIN INLETS, WATER WAYS AND DRAINAGE CHANNELS.
8. CONSTRUCTION ROADS AND PARKING AREAS SHALL BE STABILIZED WHEREVER THEY ARE CONSTRUCTED, WHETHER PERMANENT OR TEMPORARY, FOR THE USE OF CONSTRUCTION TRAFFIC.
9. IF THE BMPS APPLIED TO A SITE ARE INSUFFICIENT TO PREVENT SEDIMENT FROM REACHING WATER BODIES, ADJACENT PROPERTIES, STORM FACILITIES OR PUBLIC RIGHT-OF-WAY, THEN THE COUNTY SHALL REQUIRE ADDITIONAL BMPS.
10. IF THE COUNTY INSPECTOR OR ENGINEER(S) HAS EVIDENCE OF POOR CONSTRUCTION PRACTICES OR IMPROPER EROSION PREVENTION BMPS, CITATIONS AND/OR A STOP WORK ORDER SHALL BE ISSUED UNTIL PROPER MEASURES HAVE BEEN TAKEN AND APPROVED BY CLARK COUNTY.

PROTECTION OF ADJACENT PROPERTIES, ROADS/STREETS AND PAVED SURFACES

11. IF SEDIMENT, MUD OR DEBRIS IS TRANSPORTED ONTO A PAVED SURFACE OR ROADWAY, THE PAVED SURFACE OR ROADWAY SHALL BE THOROUGHLY CLEANED WITH HIGH EFFICIENCY STREET SWEEPERS AT THE END OF EACH WORKDAY, OR MORE OFTEN IF NECESSARY. PUBLICLY TRAVELED PAVED SURFACES NEED TO BE CLEANED IMMEDIATELY. SIGNIFICANT SOIL DEPOSITS SHALL BE REMOVED FROM ROADS BY SHOVELING AND SWEEPING. STREET WASHING IS NOT ALLOWED UNLESS APPROVED BY THE DIRECTOR AND ONLY AFTER SEDIMENT IS REMOVED IN THE MANNER DESCRIBED ABOVE. MECHANICAL BROOM SWEEPERS ARE NOT ALLOWED.
12. SLURRY AND CUTTINGS SHALL BE VACUUMED DURING CUTTING AND SURFACING OPERATIONS. COLLECTED SLURRY AND CUTTINGS SHALL BE DISPOSED OF IN A MANNER THAT DOES NOT VIOLATE GROUNDWATER OR SURFACE WATER QUALITY STANDARDS.
13. A WHEEL WASH MAY BE REQUIRED IF CONSTRUCTION ENTRANCE IS NOT SUFFICIENT IN PREVENTING SEDIMENT FROM BEING TRACKED ONTO PAVEMENT. WHEEL WASH SHALL BE PER CLARK COUNTY DETAIL E1 AND THE STORMWATER MANUAL.

MAINTENANCE OF EROSION PREVENTION AND SEDIMENT CONTROL BMPS

14. ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS SHALL BE REGULARLY INSPECTED AND MAINTAINED TO ENSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION.
15. THE CONTRACTOR/CESCL SHALL MAINTAIN AND HAVE ON-SITE A WRITTEN LOG OF EROSION PREVENTION AND SEDIMENT CONTROL BMP MAINTENANCE.
16. ALL TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER SITE STABILIZATION IS ACHIEVED OR AFTER TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. DISTURBED SOIL AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED PER THE STORMWATER MANUAL.

DUST CONTROL

17. IN AREAS SUBJECT TO SURFACE AND AIR MOVEMENT OF DUST, REFER TO THE STORMWATER MANUAL FOR DUST CONTROL BMPS.

TEMPORARY SEEDING

18. EXPOSED SURFACES THAT WILL NOT BE BROUGHT TO FINAL GRADE OR GIVEN A PERMANENT COVER TREATMENT WITHIN 30 DAYS OF THE EXPOSURE SHALL HAVE SEED MIX AND MULCH PLACED TO STABILIZE THE SOIL AND REDUCE EROSION SEDIMENTATION. SEEDED AREAS SHALL BE CHECKED REGULARLY TO ASSURE A GOOD STAND OF GRASS IS BEING MAINTAINED. AREAS THAT FAIL TO ESTABLISH VEGETATION COVER ADEQUATE TO PREVENT EROSION WILL BE RESEEDED AS SOON AS SUCH AREAS ARE IDENTIFIED.
19. AN APPROVED TEMPORARY SEEDING MIXTURE SHALL BE APPLIED TO THE PREPARED SEED BED AT A RATE OF 120 LBS/ACRE. NOTE: "HYDROSEEDING" APPLICATIONS WITH APPROVED SEED-MULCH-FERTILIZER MIXTURES MAY ALSO BE USED.
20. PERMANENT STORM WATER FACILITIES SHALL BE ISOLATED AND PROTECTED FROM SEDIMENTATION WITH AN APPROVED BMP.

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CLARK COUNTY CODE (CCC), CLARK COUNTY STREET AND ROAD STANDARDS (CCSRS), CLARK COUNTY STANDARD DETAILS MANUAL (CCSDM). IT SHALL BE THE SOLE RESPONSIBILITY OF THE APPLICANT AND THE PROFESSIONAL CIVIL ENGINEER TO CORRECT ANY ERROR, OMISSION, OR VARIATION FROM THE ABOVE REQUIREMENTS FOUND IN THESE PLANS.
2. APPROVAL OF ROADWAYS, GRADING, EROSION CONTROL AND DRAINAGE PLAN BY CLARK COUNTY DOES NOT CONSTITUTE AN APPROVAL OF ANY OTHER CONSTRUCTION (E.G., DOMESTIC WATER CONVEYANCE, SEWER CONVEYANCE, GAS, ELECTRICAL, ETC.).
3. BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY, A PRE-CONSTRUCTION MEETING MUST BE HELD BETWEEN THE DEPARTMENT OF COMMUNITY DEVELOPMENT, ENGINEERING SERVICES (DCDES) CONSTRUCTION INSPECTION SECTION OF THE ENGINEERING SERVICES DIVISION, THE APPLICANT, AND THE APPLICANT'S CONSULTING ENGINEER AND CONSTRUCTION REPRESENTATIVES.
4. A COPY OF THESE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
5. CONSTRUCTION NOISE SHALL BE LIMITED IN ACCORDANCE WITH THE NUISANCE ORDINANCE CCC 9.14.010(3); NORMALLY, THIS IS 7A.M. TO 10 P.M. SEVEN DAYS A WEEK.
6. IT SHALL BE THE APPLICANT'S/CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL CONSTRUCTION EASEMENTS AND/OR RIGHT OF ENTRIES PRIOR TO CONSTRUCTION WORK.
7. ALL FRANCHISED UTILITIES (I.E. GAS, ELECTRIC, PHONE) OR OTHER INSTALLATIONS THAT ARE NOT SHOWN ON THESE APPROVED PLANS SHALL NOT BE CONSTRUCTED UNLESS AN APPROVED SET OF PLANS THAT MEETS ALL REQUIREMENTS OF CCSRS (CCC 40.350.030) IS SUBMITTED TO THE DCDES CONSTRUCTION INSPECTION SECTION THREE DAYS PRIOR TO CONSTRUCTION.
8. DATUM SHALL BE CLARK COUNTY DATUM NGVD 1929(47) UNLESS OTHERWISE APPROVED BY DCDES.
9. ALL UTILITY TRENCHES SHALL BE BACKFILLED AND COMPACTED TO 95 PERCENT MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99, WITHIN THE ROADWAY PRISM (CCC40.350.030(C)(4)(E)).
10. ALL ROADWAY SUBGRADE WITHIN THE ROADWAY PRISM SHALL BE BACKFILLED AND COMPACTED TO 95 PERCENT MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99 (WSDOT 2-06.3).
11. OPEN CUTTING OF EXISTING ROADWAYS IS NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY DCDES AND NOTED ON THESE APPROVED PLANS. ANY OPEN CUT SHALL BE RESTORED IN ACCORDANCE WITH CLARK COUNTY CODE (SEE STANDARD TRENCH RESTORATION NOTES OF STANDARD DETAILS MANUAL).
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACTOR. ANY WORK WITHIN THE TRAVELED RIGHT-OF-WAY THAT MAY INTERRUPT NORMAL TRAFFIC FLOW SHALL REQUIRE AT LEAST ONE FLAGGER FOR EACH LANE OF TRAFFIC AFFECTED. SECTION 1-07.23, "TRAFFIC CONTROL," OF THE WSDOT STANDARD SPECIFICATIONS SHALL APPLY IN ITS ENTIRETY.
13. STORM DRAIN, EROSION CONTROL, TRENCH RESTORATION, GRADING, AND SIGNING & STRIPING GENERAL NOTES PER STANDARD PLANS D1.0, ECN1 AND UGN RESPECTIVELY ARE MADE PART OF THESE NOTES, AND ARE TO BE INCLUDED IN THE CONSTRUCTION PLAN SET.
14. **IF ANY CULTURAL RESOURCES AND/OR HUMAN REMAINS ARE DISCOVERED IN THE COURSE OF UNDERTAKING THE DEVELOPMENT ACTIVITY, THE DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION IN OLYMPIA AND CLARK COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT SHALL BE NOTIFIED. FAILURE TO COMPLY WITH THESE STATE REQUIREMENTS MAY CONSTITUTE A CLASS C FELONY, SUBJECT TO IMPRISONMENT AND/OR FINES.**

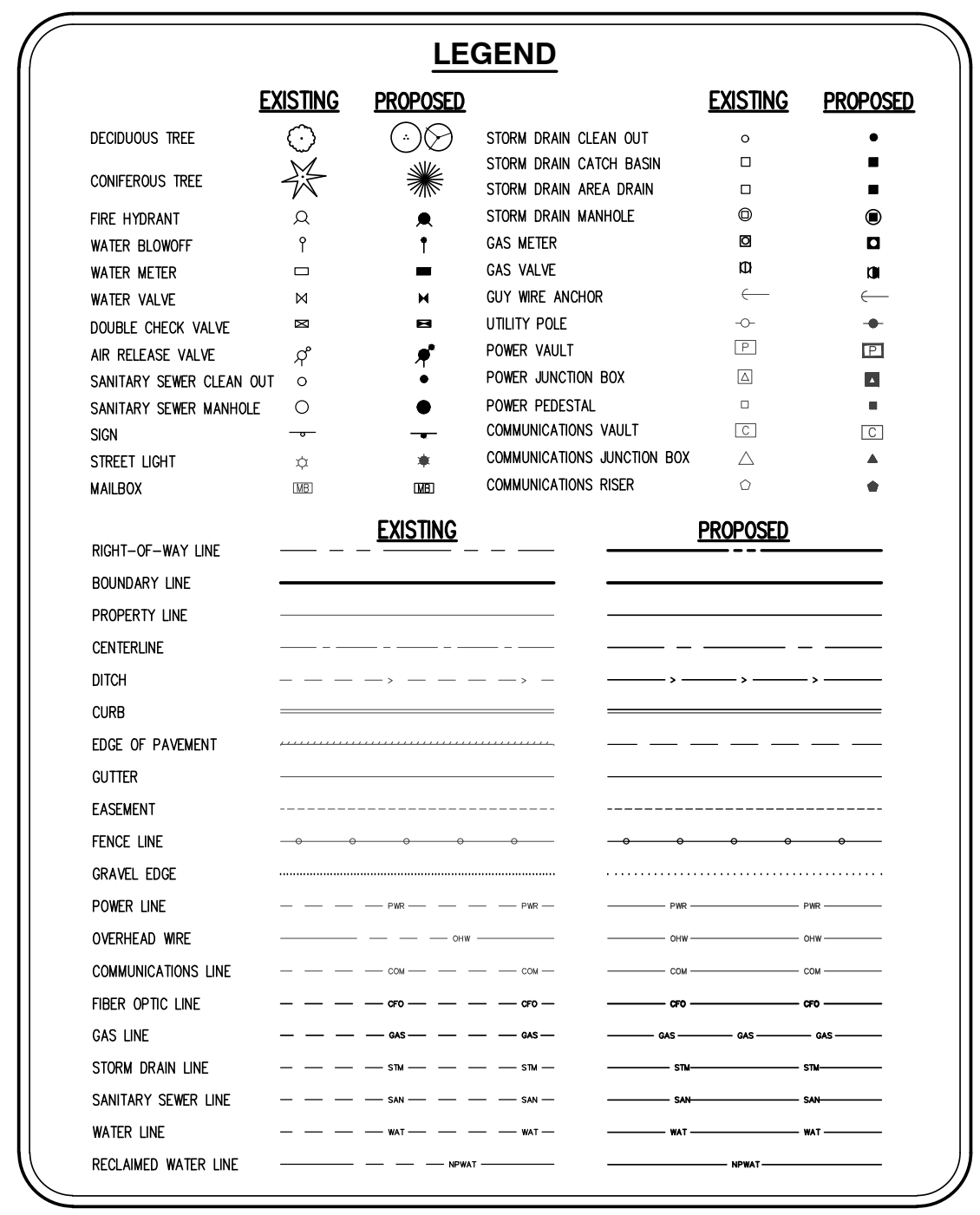
MISCELLANEOUS NOTES

1. THE LOCATIONS, DEPTH AND DESCRIPTION OF EXISTING UTILITIES SHOWN ARE COMPILED FROM AVAILABLE RECORDS AND/OR FIELD SURVEYS. THE ENGINEER OR UTILITY COMPANIES DO NOT GUARANTEE THE ACCURACY OR THE COMPLETENESS OF SUCH RECORDS. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA.
2. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND SHOWN FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL HAVE ALL UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST.
3. CONTRACTOR MUST VERIFY ALL EXISTING UTILITIES FOR BOTH VERTICAL ELEVATION AND HORIZONTAL LOCATION PRIOR TO START OF WORK (POTHOLE BEFORE DIGGING IF NECESSARY). IF THE CONTRACTOR PROCEEDS WITH UTILITY INSTALLATION WITHOUT FIRST VERIFYING EXISTING UTILITY LOCATIONS AND POTENTIAL CONFLICTS, ANY REDESIGN OR RELOCATION OF FACILITIES SHALL BE DONE AT THE CONTRACTOR'S EXPENSE. CHANGES MUST BE APPROVED BY THE PROJECT ENGINEER AND CITY IN ADVANCE OF WORK. CONTRACTOR SHALL COORDINATE THE WORK WITH UTILITY AGENCIES.
4. CONTRACTOR SHALL MAINTAIN BENCHMARKS, PROPERTY CORNERS, MONUMENTS, AND OTHER REFERENCE POINTS. IF SUCH POINTS ARE DISTURBED OR DESTROYED BY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AND PAY FOR THEIR REPLACEMENT BY EMPLOYING A PROFESSIONAL LAND SURVEYOR TO RESET PROPERTY CORNERS AND OTHER SUCH MONUMENTS.
5. PRIOR TO FINAL ACCEPTANCE AND PAYMENT, THE CONTRACTOR SHALL CLEAN THE WORK SITE AND ADJACENT AREAS OF ANY DEBRIS, DISCARDED ASPHALTIC CONCRETE MATERIAL, OR OTHER ITEMS DEPOSITED BY THE CONTRACTOR'S PERSONNEL DURING THE PERFORMANCE OF THIS CONTRACT.
6. TRAFFIC CONTROL DEVICES, FLAG PERSONS, ETC., SHALL BE IN PLACE PRIOR TO INITIATION OF CONSTRUCTION WORK AND SHALL BE EFFECTIVELY MAINTAINED.
7. PROJECT ENGINEER RESERVES THE RIGHT TO ADJUST GRADES OR ALIGNMENT TO ACCOMMODATE OTHER UTILITIES AS REQUIRED; SUCH ADJUSTMENTS OR REVISIONS SHALL BE REVIEWED BY CLARK COUNTY STAFF AND APPROVED PRIOR TO COMMENCEMENT OF WORK.
8. PIPE LENGTHS SHOWN ARE APPROXIMATE, FINAL LENGTHS TO BE DETERMINED BY FIELD CONDITIONS.
9. PROPERTY AND RIGHT-OF-WAY LINES SHOWN ARE APPROXIMATE. THESE PLANS ARE NOT MEANT TO SERVE BOUNDARY SURVEY PURPOSES.
10. ANY INSPECTION/OBSERVATION BY THE PROJECT ENGINEER OR PROJECT INSPECTORS SHALL NOT, IN ANY WAY RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM THE WORK IN COMPLIANCE WITH THE APPLICABLE CODES, REGULATIONS, CLARK COUNTY STANDARDS, ENGINEERING PLANS, AND PROJECT CONTRACT DOCUMENTS.
11. ALL CONSTRUCTION WITHIN CLARK COUNTY RIGHT-OF-WAY SHALL HAVE AN APPROVED TRAFFIC CONTROL PLAN AND RIGHT-OF-WAY PERMIT PRIOR TO ANY ON-SITE CONSTRUCTION ACTIVITY.
12. PAVING WILL NOT BE ALLOWED DURING WET OR COLD WEATHER, PER WSDOT SPECIFICATIONS.
13. ANY SIGNIFICANT DEVIATIONS FROM THE PLANS WILL REQUIRE A REQUEST FROM THE APPLICANT'S ENGINEER AND APPROVAL FROM THE COUNTY'S ENGINEER AND COUNTY INSPECTOR.
14. ALL PAVEMENT SHALL BE STRAIGHT CUT PRIOR TO PAVING. EXISTING PAVEMENT SHALL BE REMOVED AS NECESSARY TO PROVIDE A SMOOTH TRANSITION FOR BOTH RIDE AND DRAINAGE.
15. SUBGRADE PREPARATION DURING WET OR WINTER TIME CONSTRUCTION IS USUALLY/OFTEN NOT FEASIBLE. A WET OR WINTER TIME PLAN SHALL BE SUBMITTED TO CLARK COUNTY STAFF FOR REVIEW AND APPROVAL IF THE CONTRACTOR PLANS TO COMMENCE WITH CONSTRUCTION DURING WET WEATHER CONDITIONS. IF PAVING FROM OCTOBER 15TH TO MARCH 30TH, A WET WEATHER SUBGRADE PREPARATION PLAN IS REQUIRED. THE SUBGRADE MUST BE OVER EXCAVATED AND A GEOTEXTILE LINER USED. THE INSPECTOR SHALL APPROVE A COMPLETE PROOF ROLL TEST ON BOTH SIDES OF THE STREET.
16. CONTRACTOR SHALL REPORT ALL DAMAGES IMMEDIATELY TO THE COUNTY'S CONSTRUCTION SERVICES OFFICE AT (360) 487-7750 OR CONTACT THE INSPECTOR ON THE JOB.
17. THE PROJECT ENGINEER MUST BE NOTIFIED OF ALL CONSTRUCTION MODIFICATIONS. PRIOR APPROVAL MUST BE PROVIDED BY THE PROJECT ENGINEER BEFORE MODIFICATIONS TO THE APPROVED DESIGN ARE INITIATED.
18. THE CONTRACTOR SHALL TAKE NO ADVANTAGE OF ANY ERRORS, OMISSIONS, OR DISCREPANCIES IN THE PLANS. WHEN ERRORS, OMISSIONS, OR DISCREPANCIES ARE FOUND, THE ENGINEER SHALL BE NOTIFIED. WORK PERFORMED BY THE CONTRACTOR AS A RESULT OF AN ERROR, OMISSION, OR DISCREPANCY IN THE PLANS SHALL BE AT THE CONTRACTOR'S RISK AND EXPENSE WHEN SUCH ERROR, OMISSION, OR DISCREPANCY HAS NOT BEEN BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER.
19. THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO COMPLETE THIS PROJECT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS INCLUDING SUCH INCIDENTALS AS MAY BE NECESSARY TO MEET THE INTENT OF THE PROJECT CONTRACT DOCUMENTS, APPLICABLE AGENCY REQUIREMENTS, AND OTHER WORK AS NECESSARY TO PROVIDE A COMPLETE PROJECT.
20. THESE PLANS ASSUME THAT CONSTRUCTION STAKING WILL BE NECESSARY TO CONSTRUCT THE IMPROVEMENTS SHOWN. AKS ENGINEERING & FORESTRY LLC. DOES NOT ACCEPT ANY RESPONSIBILITY FOR ITEMS CONSTRUCTED INCORRECTLY BASED ON MISINTERPRETATIONS OF THESE PLANS.
21. UTILITIES SHOWN ARE DRAWN SCHEMATICALLY. UTILITY PLANS MAY NOT REFLECT THE ACTUAL SPACING AND HORIZONTAL/VERTICAL LOCATIONS OF NEW OR EXISTING UTILITIES. PLANS DO NOT SHOW ALL BENDS, REDUCERS, WYES, GASKETS, CLEANOUTS, FITTINGS, AND STRUCTURES. CONTRACTOR IS RESPONSIBLE FOR MATERIALS AND LABOR NECESSARY TO CONSTRUCT UTILITIES SHOWN AS INTENDED IN ACCORDANCE WITH APPLICABLE MANUFACTURER, LOCAL, STATE, AND FEDERAL REQUIREMENTS.
22. THE CONTRACTOR SHALL REPAIR ALL EXISTING IMPROVEMENTS DAMAGED BY CONSTRUCTION TO AS GOOD AS OR BETTER CONDITION.

STRUCTURAL NOTES

1. THESE PLANS ARE APPROVED FOR STANDARD ROAD AND DRAINAGE IMPROVEMENTS ONLY. PLANS FOR STRUCTURES SUCH AS BRIDGES, VAULTS, AND RETAINING WALLS REQUIRE A SEPARATE REVIEW AND APPROVAL BY CLARK COUNTY BUILDING DEPARTMENT AND/OR PUBLIC WORKS DEPARTMENT, AND WSDOT BRIDGE SECTION PRIOR TO CONSTRUCTION.

LEGEND



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VANS OS TRANSPO IMPROVEMENTS

CLARK COUNTY WASHINGTON

NE 1/4, S34, T2N, R3E

#177885-000 #177884-000

GENERAL NOTES & LEGEND

DESIGNED BY: MAZ
DRAWN BY: MAZ
MANAGED BY: BDH
CHECKED BY: BDH
DATE: 8/13/2025

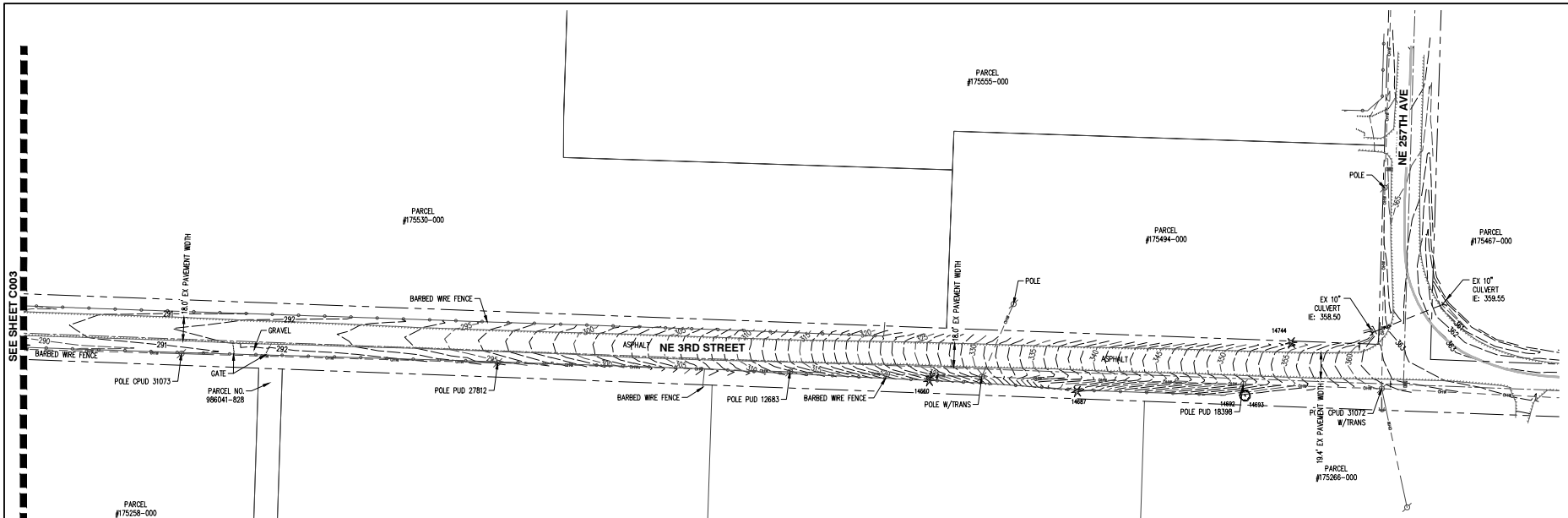
BRYCE D HANDY
STATE OF WASHINGTON
61079
REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
9095

SHEET
C001

AKS DRAWING FILE: 9095 C000 COVER.DWG | LAYOUT: C001



NOTES:

1. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. FIELD WORK WAS CONDUCTED IN FEBRUARY, 2025.
3. VERTICAL DATUM: ELEVATIONS ARE BASED ON CLARK COUNTY BENCHMARK NO. 240, LOCATED AT THE NW CORNER OF HWY SR 500 & 23RD AVENUE. ELEVATION = 213.07 FEET (NGVD 29(47)).
4. THIS IS NOT A BOUNDARY SURVEY TO BE RECORDED WITH THE COUNTY. BOUNDARIES MAY BE PRELIMINARY AND SHOULD BE CONFIRMED WITH THE STAMPING SURVEYOR PRIOR TO RELYING ON FOR DETAILED DESIGN OR CONSTRUCTION.
5. CONTOUR INTERVAL IS 1 FOOT. CONTOURS WITHIN THE PROJECT AREA, RIGHT-OF-WAY AND ADJACENT TO THE SITE WERE GENERATED FROM SURVEYED ELEVATIONS.
6. TREES SHOWN DO NOT REPRESENT THE ONLY TREES ON SITE. TREE DIAMETERS WERE DETERMINED BY VISUAL INSPECTION. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.
7. NE 252ND AVE & NE 3RD ST IS CLASSIFIED AS A RURAL LOCAL ACCESS ROAD PER CLARK COUNTY GIS.
8. PER CLARK COUNTY GIS, THERE ARE NO STEEP SLOPES ON SITE.
9. PER CLARK COUNTY GIS, THERE ARE CRITICAL AREAS WITHIN THE PROJECT LIMITS.
10. THE SITE IS NOT LOCATED WITHIN ANY CRITICAL AQUIFER DISCHARGE AREAS PER CLARK COUNTY GIS.

SCALE: 1"=40 FEET

40 0 8 20 40

N

811 Know what's below. Call before you dig.

LEGEND

EXISTING		EXISTING
DECIDUOUS TREE		STORM DRAIN CLEAN OUT
CONIFEROUS TREE		STORM DRAIN CATCH BASIN
FIRE HYDRANT		STORM DRAIN AREA DRAIN
WATER BLOWOFF		STORM DRAIN MANHOLE
WATER METER		GAS METER
WATER VALVE		GAS VALVE
DOUBLE CHECK VALVE		GUY WIRE ANCHOR
AIR RELEASE VALVE		UTILITY POLE
SANITARY SEWER CLEAN OUT		POWER VAULT
SANITARY SEWER MANHOLE		POWER JUNCTION BOX
SIGN		POWER PEDESTAL
STREET LIGHT		COMMUNICATIONS VAULT
MAILBOX		COMMUNICATIONS JUNCTION BOX
		COMMUNICATIONS RISER

EXISTING	
RIGHT-OF-WAY LINE	
BOUNDARY LINE	
PROPERTY LINE	
CENTERLINE	
DITCH	
CURB	
EDGE OF PAVEMENT	
EASEMENT	
FENCE LINE	
GRAVEL EDGE	
POWER LINE	PWR
OVERHEAD WIRE	OHW
COMMUNICATIONS LINE	COM
FIBER OPTIC LINE	CFO
GAS LINE	GAS
STORM DRAIN LINE	STM
SANITARY SEWER LINE	SAN
WATER LINE	WAT
RECLAIMED WATER LINE	NPWAT

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VANS OS TRANSPO IMPROVEMENTS

CLARK COUNTY WASHINGTON
NE 1/4, S34, T2N, R3E
#177885-000 #177884-000

EXISTING CONDITIONS

DESIGNED BY: MAZ
DRAWN BY: MAZ
MANAGED BY: BDH
CHECKED BY: BDH
DATE: 8/13/2025

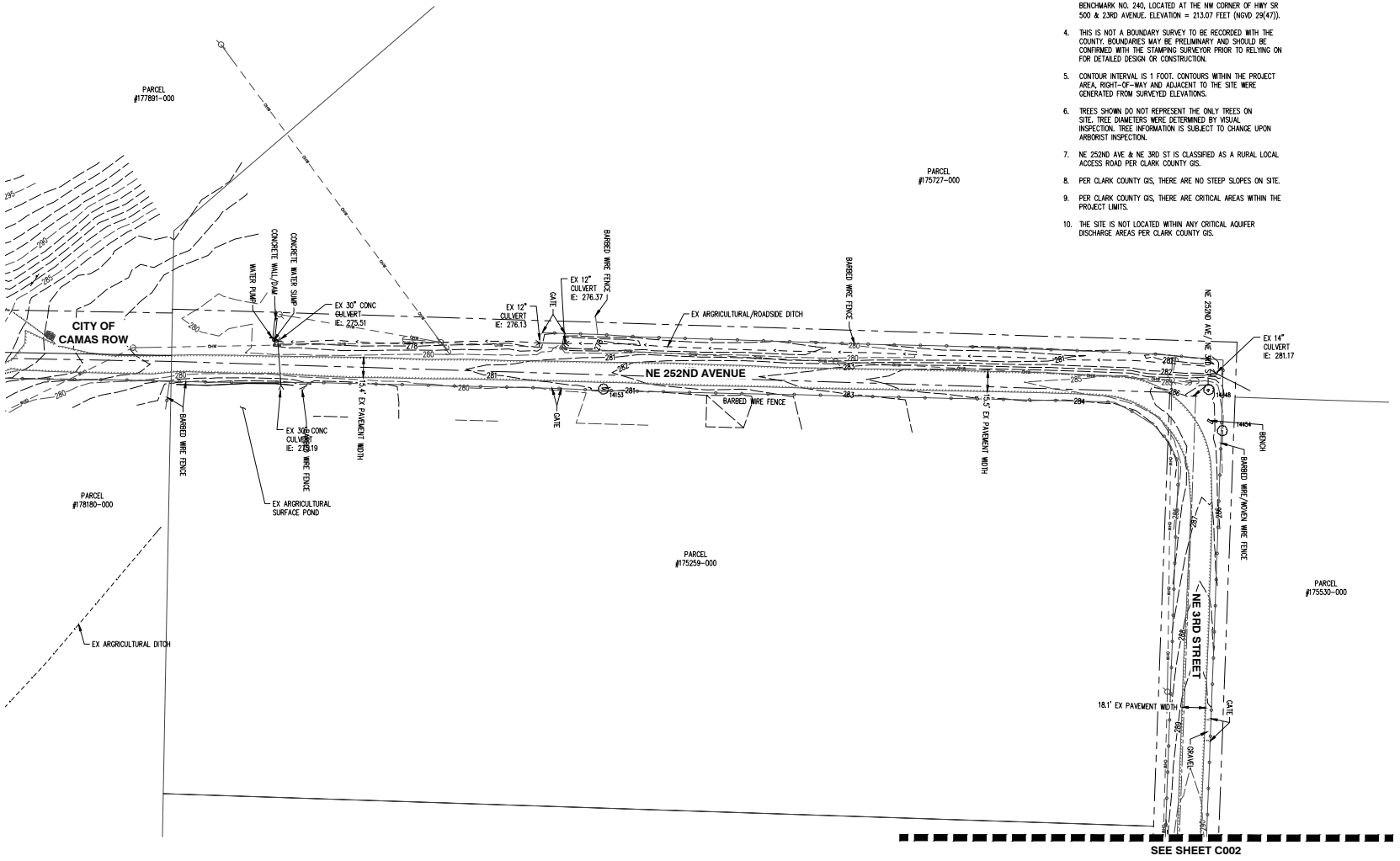
JAMES O. HANLEY — STATE OF WASHINGTON — 22400 — REGISTERED PROFESSIONAL LAND SURVEYOR
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING PURPOSES

REVISIONS

JOB NUMBER 9095

SHEET C002

AKS DRAWING FILE: 9095 C000 EXCAVLINE | LAYOUT: C002



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SCALE: 1"= 40 FEET

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VANS OS TRANSPO IMPROVEMENTS

CLARK COUNTY WASHINGTON
NE 1/4, S34, T2N, R3E
#177885-000 #177884-000

EXISTING CONDITIONS

DESIGNED BY:	MAZ
DRAWN BY:	MAZ
MANAGED BY:	BDH
CHECKED BY:	BDH

DATE: 8/13/2025

JAMES O. HARVEY — STATE OF WASHINGTON — 22000 — REGISTERED PROFESSIONAL LAND SURVEYOR — PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 9095

SHEET C003

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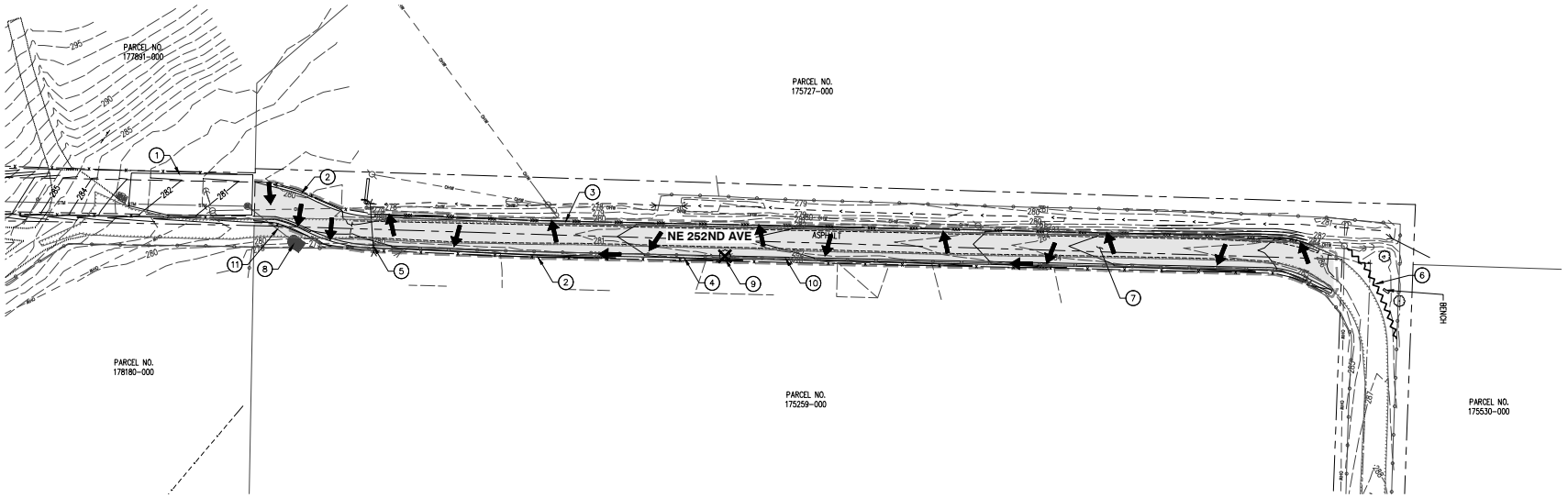

GENERAL NOTES

1. NE 252ND AVENUE IS CLASSIFIED AS A RURAL LOCAL ACCESS ROAD PER CLARK COUNTY GIS.
2. THE EXISTING PAVED ACCESS ON NE 3RD STREET WILL SERVE AS A CONSTRUCTION ENTRANCE FOR THIS PROJECT. IN THE EVENT SEDIMENT IS TRACKED ONTO NE 3RD STREET, THE STREET SHALL BE SWEPT CLEAN OF ALL SEDIMENT AND DEBRIS.
3. CONSTRUCTION OF CAVFS FACILITY SHALL NOT BEGIN UNTIL FINAL STABILIZATION IS ACHIEVED IN ALL CONTRIBUTING AREAS.
4. EXCAVATION OF CAVFS FACILITY, IS NOT ALLOWED DURING WET OR SATURATED CONDITIONS.
5. PROTECT EXISTING IMPROVEMENTS OUTSIDE OF DISTURBED LIMITS SHOWN. ANY DAMAGE SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.
6. SEE SHEET C500 FOR STORMWATER FACILITY SECTION.
7. PROTECT EXISTING UTILITIES TO THE MAXIMUM EXTENT PRACTICABLE.
8. SIGNIFICANT VARIATION AND DEGREE OF EROSION CONTROL EFFORT WILL BE DICTATED BY WEATHER CONDITIONS. THE DEVELOPER AND CONTRACTOR SHOULD BE PREPARED TO PROVIDE EXTRA EROSION CONTROL PROVISIONS AND EFFORT DURING WINTER AND WET WEATHER CONDITIONS BEYOND THAT NORMALLY REQUIRED DURING SUMMER AND DRY WEATHER CONDITIONS. FINE GRAINED AND UNCONSOLIDATED SOILS ON SLOPING SITES MAY BECOME UNSTABLE WHEN SUBJECT TO EXCESSIVE MOISTURE.
9. SEE SHEET C501 FOR ADDITIONAL GRADING AND EROSION CONTROL NOTES.
10. SEE SHEET C001 FOR GENERAL NOTES.
11. ALL CONSTRUCTION WITHIN CLARK COUNTY RIGHT-OF-WAY SHALL HAVE AN APPROVED TRAFFIC CONTROL PLAN AND RIGHT-OF-WAY PERMIT PRIOR TO ANY ON-SITE CONSTRUCTION ACTIVITY. CONTRACTOR TO PROVIDE AND COORDINATE.
12. THE APPLICANT MAY BE REQUIRED TO PROVIDE FLAGGING, SIGNS, AND OTHER TRAFFIC CONTROL DEVICES FOR SAFE TRUCK ACCESS ONTO PUBLIC STREETS. ALL SUCH DEVICES SHALL CONFORM TO THE STANDARDS ESTABLISHED IN THE LATEST ADOPTED EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION AND THE MODIFICATIONS TO THE MUTCD FOR STREETS AND HIGHWAYS FOR THE STATE OF WASHINGTON.
13. ANY PUBLIC, OR PRIVATE, ASPHALT DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO CLARK COUNTY STANDARDS FOR PUBLIC ROADS, OR SHALL BE REPAIRED TO PRIVATE STREET/DRIVEWAY STANDARDS, AS APPLICABLE.
14. IF ANY SEDIMENT IS TRACKED INTO THE PUBLIC RIGHT-OF-WAY A WHEEL WASH OR CONSTRUCTION ENTRANCE MAY BE REQUIRED AT THE INSPECTOR'S DISCRETION.
15. POST-CONSTRUCTION SOIL QUALITY AND DEPTH PER BMP T5.13 IS REQUIRED FOR ALL DISTURBED LANDSCAPED AREAS AFTER GRADING IS COMPLETE.
16. CONTRACTOR TO ENSURE BIORETENTION SOIL MEDIA IS PROTECTED FROM BEING COMPACTED. HEAVY CONSTRUCTION EQUIPMENT SHALL NOT BE USED ABOVE MEDIA SOIL, USE HAND TOOLS ONLY.
17. IF ANY CULTURAL RESOURCES AND/OR HUMAN REMAINS ARE DISCOVERED IN THE COURSE OF UNDERTAKING THE DEVELOPMENT ACTIVITY, THE DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION IN OLYMPIA AND CLARK COUNTY COMMUNITY DEVELOPMENT SHALL BE NOTIFIED. FAILURE TO COMPLY WITH THESE STATE REQUIREMENTS MAY CONSTITUTE A CLASS C FELONY, SUBJECT TO IMPRISONMENT AND/OR FINES.

KEYED NOTES

1. APPROXIMATE STOCKPILE/WASTE AREA LOCATION. SPREAD MATERIAL EVENLY AND STABILIZE WITH SEEDING PER BMP C120 OF THE 2015 CLARK COUNTY STORMWATER MANUAL. PROTECT WITH PLASTIC SHEETING PER CLARK COUNTY DETAIL E16, SHEET C501, IF DEEMED NECESSARY. HAUL OFF MATERIAL TO BE DISPOSED OF IN AN APPROVED LOCATION.
2. INSTALL SEDIMENT FENCE PER DETAIL E4 ON SHEET C500.
3. INSTALL WATTILES PER DETAIL E6 ON SHEET C501 (TYP).
4. CONSTRUCT ROADSIDE CONVEYANCE DITCH PER DETAIL 3/C500.
5. PROTECT EXISTING STORM PIPE AND OUTFALL.
6. PROTECT EXISTING TREES WITH TREE FENCE PER DETAIL ON SHEET C501.
7. MAINTAIN POSITIVE DRAINAGE AWAY FROM ROAD.
8. OUTLET PROTECTION TO BE INSTALLED WITH CITY PROJECT UNDER SEPARATE PERMIT.
9. REMOVE EXISTING TREE
10. RELOCATE EXISTING FENCE OUTSIDE OF GRADING LIMITS. CONTRACTOR TO COORDINATE WITH PROPERTY OWNER FOR EXACT LOCATION.
11. STORM PIPE INSTALLED UNDER SEPARATE CITY OF CAMAS PERMIT.

RECOMMENDED CONSTRUCTION SEQUENCE FOR EROSION CONTROL

1. PRE-CONSTRUCTION MEETING.
2. FLAG OR FENCE CLEARING LIMITS.
3. POST NOTICE OF CONSTRUCTION ACTIVITY SIGN WITH NAME AND PHONE NUMBER OF EROSION SEDIMENT CONTROL SUPERVISOR.
4. INSTALL CATCH BASIN PROTECTION, IF REQUIRED.
5. INSTALL PERIMETER PROTECTION (SILT FENCE, BRUSH BARRIER, ETC.).
6. GRADE AND INSTALL CONSTRUCTION ENTRANCE(S).
7. CONSTRUCT SEDIMENT PONDS AND TRAPS.
8. GRADE AND STABILIZE CONSTRUCTION ROADS.
9. CONSTRUCT SURFACE WATER CONTROLS (INTERCEPTOR DIKES, PIPE SLOPE DRAINS, ETC.) SIMULTANEOUSLY WITH CLEARING AND GRADING FOR PROJECT DEVELOPMENT.
10. MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON AND MANUFACTURER'S RECOMMENDATIONS.
11. RELOCATE SURFACE WATER CONTROLS AND EROSION CONTROL MEASURES OR INSTALL NEW MEASURES SO THAT AS SITE CONDITIONS CHANGE THE EROSION AND SEDIMENT CONTROL IS ALWAYS IN ACCORDANCE WITH THE CITY OF BATTLE GROUND EROSION AND SEDIMENT CONTROL STANDARDS.
12. COVER ALL AREAS THAT WILL BE UNWORKED FOR MORE THAN SEVEN DAYS DURING THE DRY SEASON OR TWO DAYS DURING THE WET SEASON WITH STRAW, WOOD FIBER MULCH, COMPOST, PLASTIC SHEETING OR EQUIVALENT.
13. STABILIZE ALL AREAS THAT REACH FINAL GRADE WITHIN SEVEN DAYS.
14. SEED OR SOD ANY AREAS TO REMAIN UNWORKED FOR MORE THAN 30 DAYS.
15. UPON COMPLETION OF THE PROJECT, ALL DISTURBED AREAS MUST BE STABILIZED AND BEST MANAGEMENT PRACTICES REMOVED IF APPROPRIATE.

GRADING QUANTITIES

CUT: 98 C.Y.
FILL: 114 C.Y.

STRIPPINGS: 20 CY (DISTURBED AREA: 21,600 SF)

NOTE: CONTRACTOR IS RESPONSIBLE FOR VERIFYING QUANTITIES FOR BID PURPOSES.

THESE EROSION AND SEDIMENT CONTROL PLANS ASSUME "DRY WEATHER" CONSTRUCTION. "WET WEATHER" CONSTRUCTION MEASURES NEED TO BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.

LEGEND

- EXISTING GROUND CONTOUR (1 FT)
- EXISTING GROUND CONTOUR (5 FT) — 350 —
- FINISHED GRADE CONTOUR (1 FT)
- FINISHED GRADE CONTOUR (5 FT) — 345 —
- SEDIMENT FENCE (TO BE INSTALLED PRIOR TO GRADING) — x — x —
- WATTLES (TO BE INSTALLED PRIOR TO GRADING) — xxx —
- DRAINAGE FLOW DIRECTION
- RIP RAP PAD, PIPE OUTLET PROTECTION
- GRADING LIMITS
- TREE PROTECTION FENCING

SCALE: 1"= 40 FEET
40 0 8 20 40

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VANS OS TRANSPO IMPROVEMENTS

CLARK COUNTY WASHINGTON
NE 1/4, S34, T2N, R3E
#177885-000 #177884-000

GRADING, EROSION & SEDIMENT CONTROL PLAN

DESIGNED BY:	MAZ
DRAWN BY:	MAZ
MANAGED BY:	BDH
CHECKED BY:	BDH

DATE: 8/13/2025

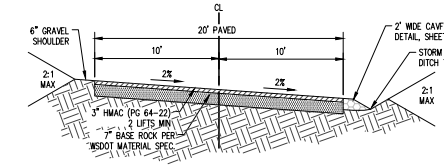
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 9095

SHEET C050

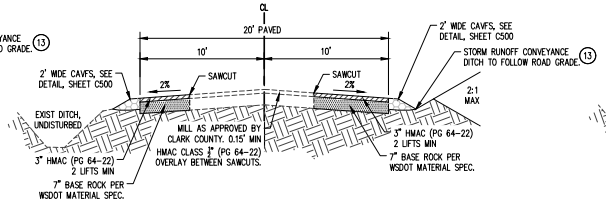
AKS DRAWING FILE: 9095 C050 GRADING.DWG | LAYOUT: C050



1 **20' LOCAL ACCESS ROAD - SHED RIGHT**

FROM STA: 14+03.20
TO STA: 14+45.16

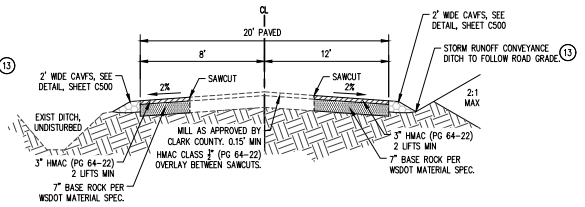
Scale: N.T.S.



2 **20' LOCAL ACCESS ROAD - CROWN**

FROM STA: 14+74.40
TO STA: 15+00

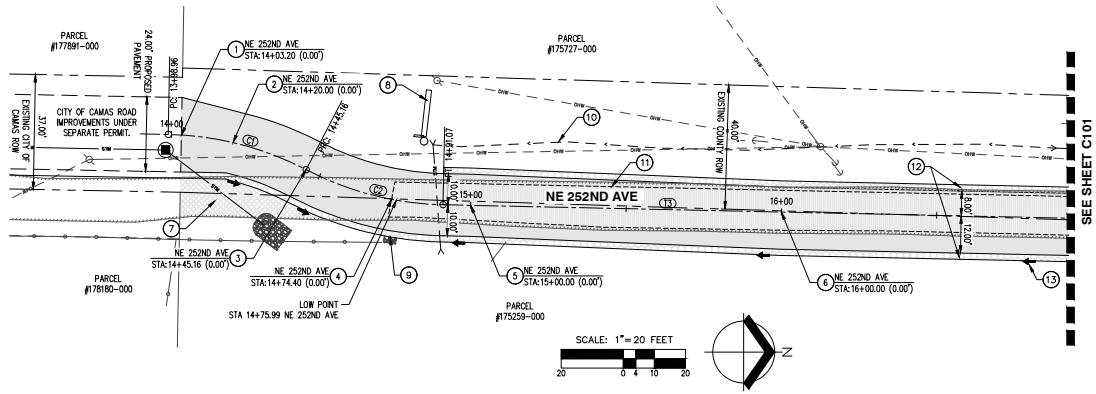
Scale: N.T.S.

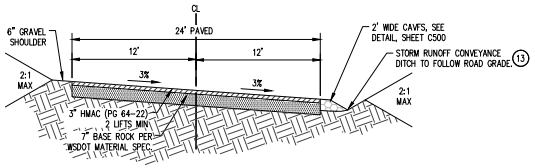


3 **20' LOCAL ACCESS ROAD - CROWN OFFSET**

FROM STA: 16+00
TO STA: 21+51.20

Scale: N.T.S.

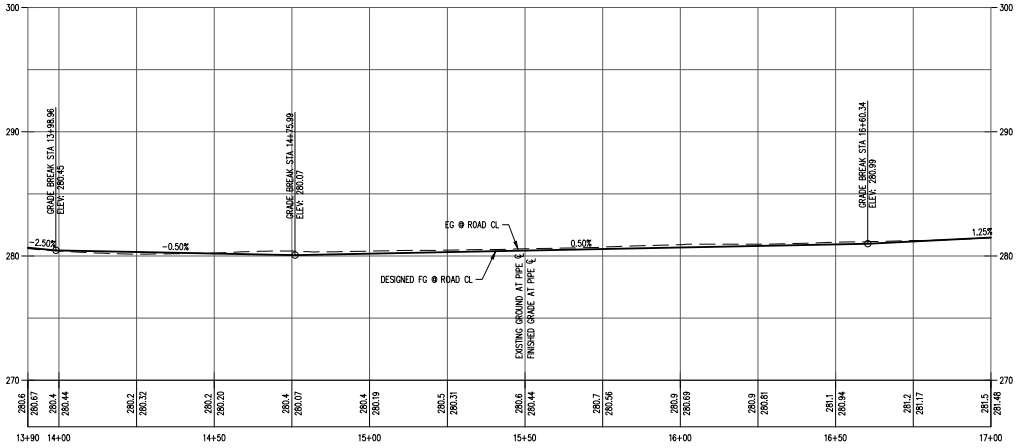




4 **24' LOCAL ACCESS ROAD - SHED RIGHT**

CITY OF CAMAS ROW UNDER SEPARATE PERMIT

Scale: N.T.S.



NE 252ND AVE
HORZ. SCALE: 1"=20
VERT SCALE: 1"=5
STATIONING IS BASED ON ROAD CL EXCEPT AS NOTED

KEYED NOTES

1. CITY/COUNTY ROW BOUNDARY. BEGIN COUNTY ROAD IMPROVEMENTS, END SECTION DETAIL 4, BEGIN TRANSITION TO SECTION DETAIL 1.
2. BEGIN SECTION DETAIL 1, THIS SHEET.
3. END ROAD SECTION PER DETAIL 1, THIS SHEET. BEGIN TRANSITION TO DETAIL 2, THIS SHEET. MAINTAIN 20' PAVEMENT WIDTH & CONSTRUCTION STANDARDS PER DETAILS.
4. END TRANSITION SECTION, BEGIN ROAD SECTION DETAIL 2, THIS SHEET.
5. END ROAD SECTION PER DETAIL 2, THIS SHEET. BEGIN TRANSITION TO DETAIL 3, THIS SHEET. MAINTAIN 20' PAVEMENT WIDTH & CONSTRUCTION STANDARDS PER DETAILS.
6. END TRANSITION SECTION, BEGIN ROAD SECTION DETAIL 3, THIS SHEET.
7. REMOVE EXISTING ROAD PAVEMENT. REPLACE WITH TOPSOIL TO ESTABLISH VEGETATION.
8. EXISTING CONCRETE HEAD WALL AND IRRIGATION EQUIPEMENT TO REMAIN.
9. DISCHARGE POINT FOR CONVEYANCE DITCH INTO THE EXISTING POND. INSTALL 4'x2' RIP RAP PAD PER DETAIL E7 ON SHEET C501.
10. EXISTING ROADSIDE DITCH TO REMAIN UNDISTURBED.
11. SAWCUT LINE, MINIMUM OF 1' INSIDE OF EXISTING PAVEMENT EDGE (TYP).
12. CAVFS PER DETAIL ON SHEET C500.
13. ROADSIDE DITCH PER DETAIL #3 SHEET C500.

NOTES:
1. SUBGRADE REINFORCEMENT GEOTEXTILES SHALL BE INSTALLED OVER ALL A-6, A-7 SOILS PRIOR TO CONSTRUCTING THE BASE AND SURFACING.
2. THE PAVEMENT STRUCTURE THICKNESSES IDENTIFIED FOR THESE SOIL TYPES ARE REQUIRED UNLESS A SITE SPECIFIC PAVEMENT DESIGN IS DONE. THE TOTAL PAVEMENT STRUCTURE SHALL NOT EXCEED 2.5 FEET.
3. ASPHALT CONCRETE FOR ALL RURAL ARTERIALS SHALL BE WSDOT HMA CL 3" PG 64-22 OR EQUIVALENT.
4. EITHER CONVENTIONAL OR THICK ASPHALT CONSTRUCTION IS ALLOWED.
5. ROADWAY SLOPE OUTSIDE LISTED RANGE ALLOWED WITH APPROVAL FOR FRONTAGE/MATCHING SITUATIONS.
6. THE SUBGRADE AND CRUSHED SURFACING MATERIALS SHALL BE COMPACTED PER WSDOT STANDARDS.
7. FEATURES WITHIN CORE ROAD AND FLEX ZONE ARE SUBJECT TO CCC 40.350.030(B)(3) AND TABLE CCC 40.350.030-2.
8. STORMWATER LOW IMPACT DEVELOPMENT (LID) FEATURES IN THE RIGHT-OF-WAY ARE SUBJECT TO CCC 40.350.030(B)(3) AND TABLE CCC 40.350.030-2.

CONVENTIONAL CONSTRUCTION

AASHTO SOIL TYPE	ASPHALT THICKNESS	BASE ROCK THICKNESS
A-1	0.25'	0.30'
A-2	0.25'	0.40'
A-3	0.25'	0.50'
A-4	0.25'	0.60'
A-5	0.25'	0.80'
A-6	0.25'	0.90'
A-7	0.25'	1.00'
OTHER	NO SECTION	ESTIMATED

GENERAL NOTES

1. ROAD PROFILE IS FOR REFERENCE ONLY FOR AREAS OF MILLING. GRADES ARE TO BE ESTABLISHED RELATIVE TO SAWCUT ELEVATION. GRIND & INLAY TO MATCH EXISTING. NEW PAVEMENT WIDENING SHALL SLOPE 2% ±0.5% FROM SAWCUT AWAY FROM CL CROWN AS SHOWN IN STREET SECTIONS.

LEGEND

- GRIND AND INLAY EXISTING PAVED SURFACE (±9,117 SF)
- NEW OR REPLACED PAVEMENT SECTION (±6,197 SF)
- EXISTING PAVEMENT TO BE REMOVED (±396 SF)
- CAVFS INCLUDING GRAVEL SHOULDER (±2,854 SF)
- SAWCUT LINE (1,388 LF)

PARCEL LINE AND CURVE TABLE

LINE #/CURVE #	LENGTH	BEARING/DELTA	RADIUS
C1	46.20	26.47	100.00
C2	45.92	26.31	100.00
T3	626.68	N01° 13' 49"E	

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VANS OS TRANSPO IMPROVEMENTS

CLARK COUNTY WASHINGTON
NE 1/4, S34, T2N, R3E
#177885-000 #177884-000

STREET PLAN NE 252ND AVE

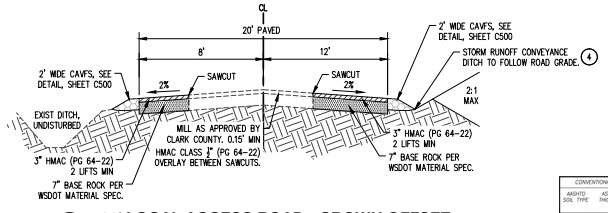
DESIGNED BY: MAZ
DRAWN BY: MAZ
MANAGED BY: BDH
CHECKED BY: BDH
DATE: 8/13/2025

REVISIONS

JOB NUMBER 9095

SHEET C100

AKS DRAWING FILE: X:\9095 C100 STRUCTURE\LAYOUT\ C100



3 20' LOCAL ACCESS ROAD - CROWN OFFSET

FROM STA: 16+00
TO STA: 21+51.13

Scale: N.T.S.

CONVENTIONAL CONSTRUCTION

AASHTO SOIL TYPE	ASPHALT THICKNESS	BASE ROCK THICKNESS
A-1	0.25'	0.30'
A-2	0.25'	0.45'
A-3	0.25'	0.60'
A-4	0.25'	0.80'
A-5	0.25'	0.90'
A-6	0.25'	1.00'
A-7	0.25'	1.00'
OTHER	NO SECTION	ESTIMATED

KEYED NOTES

1. EXISTING ROADSIDE DITCH TO REMAIN UNDISTURBED.
2. SAWCUT LINE, MINIMUM OF 1' INSIDE OF EXISTING PAVEMENT EDGE.
3. CAVFS PER DETAIL ON SHEET C500.
4. ROADSIDE DITCH PER DETAIL #3 SHEET C500.
5. END ROAD IMPROVEMENTS PER SECTION DETAIL 3, THIS SHEET.

GENERAL NOTES

1. ROAD PROFILE IS FOR REFERENCE ONLY FOR AREAS OF MILLING. GRADES ARE TO BE ESTABLISHED RELATIVE TO SAWCUT ELEVATION. GRIND & INLAY TO MATCH EXISTING. NEW PAVEMENT WIDENING SHALL SLOPE 2% ±0.5% FROM SAWCUT AWAY FROM CL CROWN AS SHOWN IN STREET SECTIONS.

NOTES:

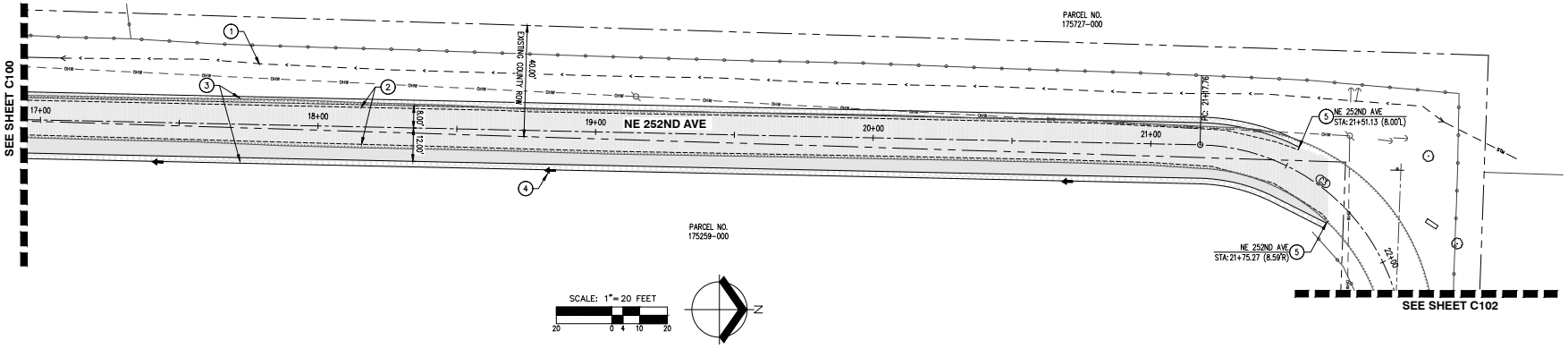
1. SUBGRADE REINFORCEMENT GEOTEXTILES SHALL BE INSTALLED OVER ALL A-6, A-7 SOILS PRIOR TO CONSTRUCTING THE BASE AND SURFACING.
2. THE PAVEMENT STRUCTURE THICKNESSES IDENTIFIED FOR THESE SOIL TYPES ARE REQUIRED UNLESS A SITE SPECIFIC PAVEMENT DESIGN IS DONE. THE TOTAL PAVEMENT STRUCTURE SHALL NOT EXCEED 2.5 FEET.
3. ASPHALT CONCRETE FOR ALL RURAL ARTERIALS SHALL BE WSDOT HMA CL ½" PG 64-22 OR EQUIVALENT.
4. EITHER CONVENTIONAL OR THICK ASPHALT CONSTRUCTION IS ALLOWED.
5. ROADWAY SLOPE OUTSIDE LISTED RANGE ALLOWED WITH APPROVAL FOR FRONTAGE/MATCHING SITUATIONS.
6. THE SUBGRADE AND CRUSHED SURFACING MATERIALS SHALL BE COMPACTED PER WSDOT STANDARDS.
7. FEATURES WITHIN CORE ROAD AND FLEX ZONE ARE SUBJECT TO CCC 40.350.030(B)(3) AND TABLE CCC 40.350.030-2.
8. STORMWATER LOW IMPACT DEVELOPMENT (LID) FEATURES IN THE RIGHT-OF-WAY ARE SUBJECT TO CCC 40.350.030(B)(3) AND TABLE CCC 40.350.030-2.

LEGEND

- GRIND AND INLAY EXISTING PAVED SURFACE (±9,117 SF)
- NEW OR REPLACED PAVEMENT SECTION (±6,197 SF)
- EXISTING PAVEMENT TO BE REMOVED (±396 SF)
- CAVFS INCLUDING GRAVEL SHOULDER (±2,854 SF)
- SAWCUT LINE (1,388 LF)

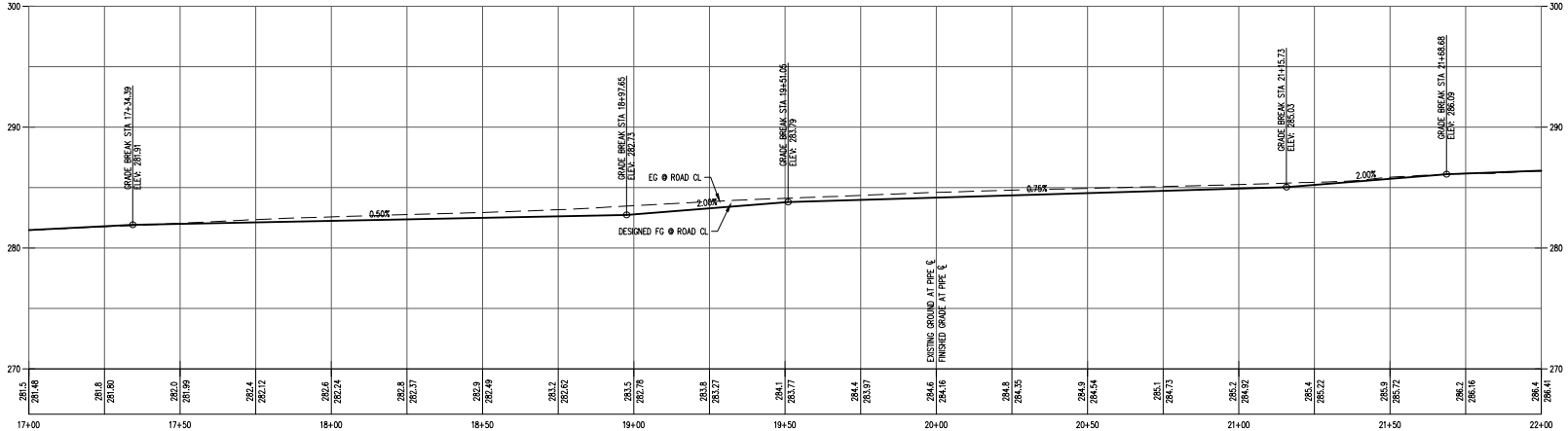
PARCEL LINE AND CURVE TABLE

LINE #/CURVE #	LENGTH	BEARING/DELTA	RADIUS
C3	118.48	90.51	75.00



SCALE: 1"= 20 FEET

20 0 4 10 20



NE 252ND AVE
HORZ. SCALE: 1"=20
VERT SCALE: 1"=5
STATIONING IS BASED ON ROAD CL EXCEPT AS NOTED

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STREET PLAN NE 252ND AVE

DESIGNED BY:	MAZ
DRAWN BY:	MAZ
MANAGED BY:	BDH
CHECKED BY:	BDH

DATE: 6/13/2025

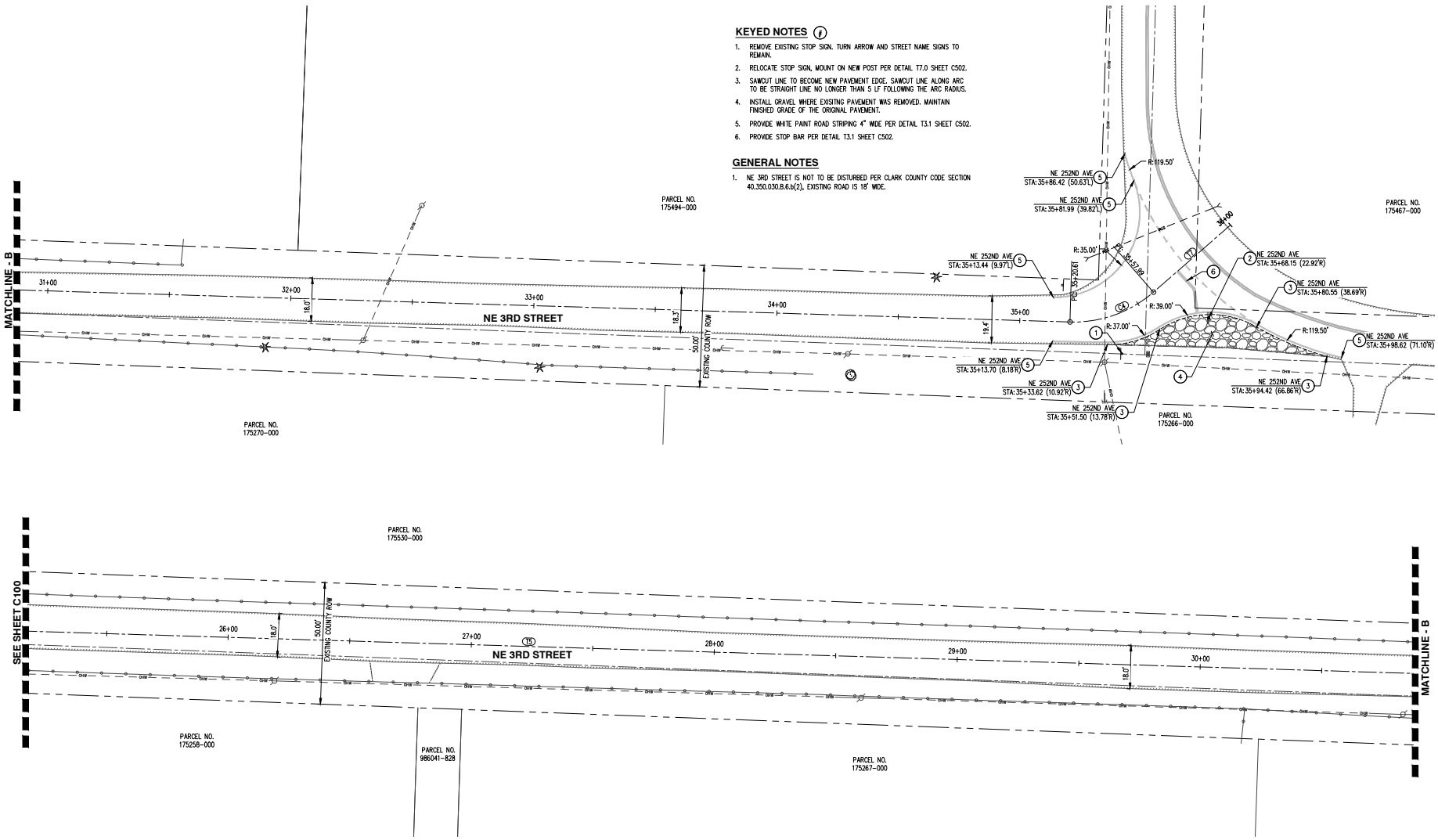
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 9095

SHEET C101

AKS DRAWING FILE: K:\DES C100 STRUCT\ LAYOUT\ C101



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STREET PLAN NE 3RD STREET

DESIGNED BY: MAZ
DRAWN BY: MAZ
MANAGED BY: BDH
CHECKED BY: BDH
DATE: 8/13/2025

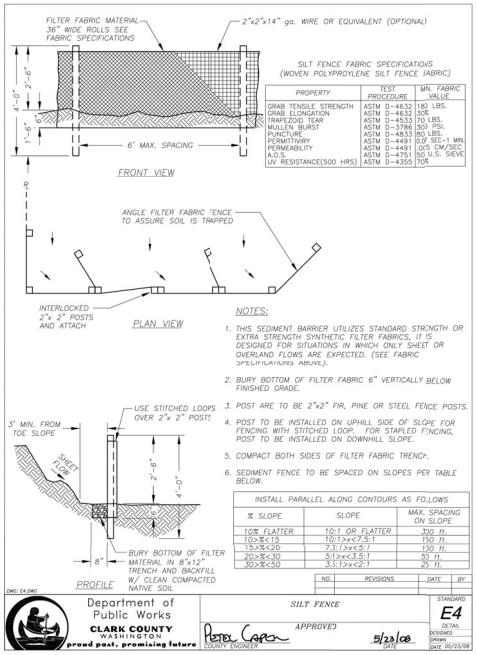
PRELIMINARY NOT FOR CONSTRUCTION

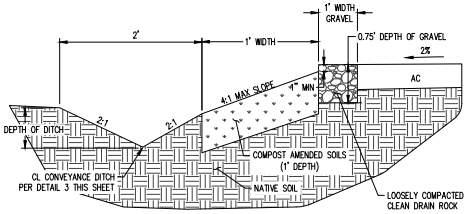
REVISIONS

JOB NUMBER 9095

SHEET C102

AKS_DRAWING FILE: X:\095 C100 STRUNK | LAYOUT: C102



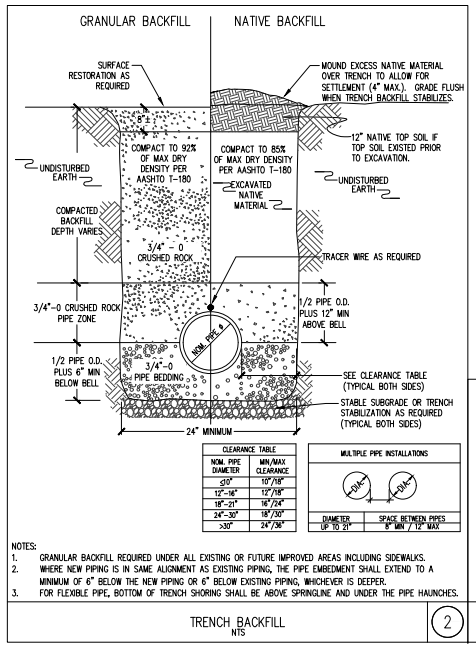


COMPOST AMENDED VEGETATED FILTER STRIPS (CAVFS)

N.T.S

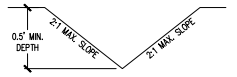
COMPOST AMENDED SOIL SPECIFICATIONS

1. MINIMUM ORGANIC CONTENT: 5% BY WEIGHT
2. PH: 5.5–7.0
3. 60% – 65% LOAMY SAND WITH 25% – 30% COMPOST
   –OR–
   30% SOIL MIX SHALL BE TESTED PRIOR TO INSTALLATION
4. FINAL SOIL MIX SHALL BE TESTED PRIOR TO INSTALLATION.
5. SEE BMP T7.40 FOR COMPLETE CAVFS SPECIFICATIONS AND BMP T5.14B FOR COMPLETE COMPOST SPECIFICATIONS.



NOTES:
1. GRANULAR BACKFILL REQUIRED UNDER ALL EXISTING OR FUTURE IMPROVED AREAS INCLUDING SIDEWALKS.
2. WHERE NEW PIPING IS IN SAME ALIGNMENT AS EXISTING PIPING, THE PIPE EMBEDMENT SHALL EXTEND TO A MINIMUM OF 6" BELOW THE NEW PIPING OR 6" BELOW EXISTING PIPING, WHICHEVER IS DEEPER.
3. FOR FLEXIBLE PIPE, BOTTOM OF TRENCH SHORING SHALL BE ABOVE SPRINGLINE AND UNDER THE PIPE HAUNCHES.

TRENCH BACKFILL
NTS
2



ROADSIDE CONVEYANCE DITCH
NTS
3

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VANS OS TRANSPO IMPROVEMENTS

CLARK COUNTY WASHINGTON
NE 1/4, S34, T2N, R3E
#177885-000 #177884-000

DETAILS

DESIGNED BY: MAZ
DRAWN BY: MAZ
MANAGED BY: BDH
CHECKED BY: BDH
DATE: 8/13/2025

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 9095

SHEET C500

AKS DRAWING FILE: K:\9095 C500 DETAILS.DWG | LAYOUT: C500

STANDARD NOTES FOR EROSION CONTROL PLAN

1. THE CONTRACTOR SHALL INSTALL AND MAINTAIN BMP'S AS SHOWN AND PERFORM ALL ACTIONS NECESSARY TO PREVENT EROSION, AND CONTROL SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. CONTRACTOR SHALL COMPLY WITH CLARK COUNTY CODE CHAPTER 40.386.
2. ALL EROSION CONTROL MEASURES SHALL BE IN-PLACE AND IN WORKING CONDITION PRIOR TO DISTURBING AND EXPOSING ANY SOIL SURFACES (I.E. SILT FENCE, CONSTRUCTION ENTRANCE, SEDIMENTATION BARRIERS, SEDIMENTATION TRAPS). REFER TO CCC 13.26A AND CLARK COUNTY STORMWATER MANUAL, BCDX 2 BMP'S.
3. ALL EROSION PREVENTION AND CONTROL BMP'S SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO INSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. NEEDED REPAIRS SHALL BE MADE AS SOON AS PRACTICABLE. THEY ARE TO REMAIN IN PLACE AND OPERATIONAL DURING ALL PHASES OF CONSTRUCTION. CONSTRUCTION ACTIVITIES SHALL NOT CONTINUE OR RESUME UNTIL REPAIRS TO EROSION CONTROL FACILITIES ARE MADE AND THE FACILITIES ARE FUNCTIONAL. ANY SEDIMENT LEAVING THE SITE OR DISCHARGING TO A SENSITIVE AREA SHALL BE STOPPED AND CONTROLLED IMMEDIATELY. CONTAMINATED AREAS SHALL BE CLEANED AND RESTORED.
4. CLEARING LIMITS AND WORK AREA LIMITS SHALL BE DELINEATED AND MARKED. DO NOT DISTURB MORE AREA THAN NEEDED FOR CONSTRUCTION REQUIREMENTS.
5. ALL SENSITIVE OR CRITICAL AREAS (WETLANDS, STEEP SLOPES, NATURAL WATERWAYS), AND BUFFERS SHALL ALL BE CLEARLY DELINEATED AND CLEARLY MARKED, AND PROTECTED FROM SEDIMENT DEPOSITION.
6. SEDIMENT LADEN RUNOFF SHALL BE PREVENTED FROM ENTERING ALL EXISTING STORM WATER CATCH BASINS, INLETS AND PERVIOUS DRAINAGE SYSTEMS AFFECTED BY CONSTRUCTION.
7. NO EXPOSED, BARE SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN **TWO** DAYS DURING THE PERIOD OCTOBER 1 THRU APRIL 30 OR FOR MORE THAN **SEVEN** DAYS DURING THE PERIOD OF MAY 1 THROUGH SEPTEMBER 30. ALL DISTURBED SOIL SURFACES SHALL BE STABILIZED BY A SUITABLE APPLICATON OF "BEST MANAGEMENT PRACTICES".
8. WHERE FEASIBLE, NO MORE THAN 500 FEET OF TRENCH SHALL BE OPEN AT ONE TIME. EXCAVATED MATERIAL SHALL BE PLACED ON THE UP-HILL SIDE OF TRENCHES PROVIDED IT DOES NOT CONFLICT WITH SAFETY REQUIREMENTS.
9. DEWATERING DEVICES SHALL DISCHARGE INTO A SEDIMENT TRAP OR SEDIMENT POND. NO DISCHARGE SHALL BE MADE TO A PAVED STREET OR STORMWATER COLLECTION SYSTEM WITHOUT APPROVAL AND REMOVING SEDIMENT.
10. CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. EROSION SHALL BE CONTROLLED AND PREVENTED BY SUCH MEASURES AS ROUGHENING THE SURFACE, INSTALLATION OF INTERCEPTOR DITCHES, TERRACING, COVERING WITH MATTING, MULCH OR PLASTIC SHEETING. RUNOFF SHALL BE PREVENTED FROM ENTERING A SLOPE AND FROM UNDERCUTTING THE BASE OF SLOPES.
11. ANY SOIL OR DEBRIS TRANSPORTED ONTO ROADWAYS AND SIDEWALKS SHALL BE REMOVED. DEPOSITS SHALL BE COMPLETELY REMOVED BY SHOVELING AND/OR SWEEPING. WASHING SHALL NOT BE UTILIZED UNLESS SPECIFICALLY APPROVED IN WRITING BY THE COUNTY.
12. ALL PERMANENT INFILTRATION SYSTEMS SHALL BE ISOLATED AND PROTECTED FROM SEDIMENT LADEN RUNOFF ENTERING TO AVOID RISK OF REDUCING THE ABILITY OF THE SYSTEMS TO INFILTRATE. ISOLATION AND PROTECTION SHALL NOT BE REMOVED UNTIL THE DRAINAGE AREA TRIBUTARY TO THE SYSTEM IS COMPLETELY STABILIZED.
13. ALL CONVEYANCE CHANNELS, BOTH TEMPORARY AND PERMANENT SHALL BE STABILIZED TO PREVENT EROSION OF THE CHANNEL. STABILIZATION SHALL EXTEND TO AREAS AT OUTLETS AND DOWNSTREAM REACHES VULNERABLE TO EROSION RESULTING FROM FLOW DISCHARGING FROM THE CHANNEL.
14. IF BMP'S SHOWN ARE UTILIZED BUT ARE INSUFFICIENT TO PREVENT SEDIMENT FROM REACHING WATER BODIES, ADJACENT PROPERTIES, OR PUBLIC RIGHTS-OF-WAY, ADDITIONAL BMP'S SHALL BE IMPLEMENTED IMMEDIATELY TO PREVENT FURTHER ENCROACHMENT OF SEDIMENT.

SHEET 1 OF 2

NO.	REVISIONS	DATE	BY

Department of Public Works
CLARK COUNTY WASHINGTON
proud past, promising future

STANDARD NOTES FOR EROSION CONTROL PLAN — STANDARD ECN1

APPROVED — COUNTY ENGINEER — DATE 01/30/15

STANDARD NOTES FOR EROSION CONTROL PLAN (CONTINUED)

15. STABILIZED AREAS SHALL BE PROVIDED FOR EMPLOYEE PARKING AND STORAGE OF CONSTRUCTION MATERIALS. ERODIBLE STOCKPILES OF EARTHEN MATERIALS, SUCH AS TOPSOIL, SILTY AND CLAYEY SOILS; AND LANDSCAPE MATERIALS, SHALL BE COVERED WHEN NOT BEING INCORPORATED IN THE WORK. EROSION CONTROL BMP'S SHALL BE UTILIZED AS NECESSARY TO PREVENT SEDIMENT LADEN RUNOFF FROM LEAVING OR SEDIMENT BEING TRANSPORTED FROM THESE AREAS FROM VEHICLE ACTIVITY.
16. ALL POLLUTANTS OTHER THAN SEDIMENT THAT OCCUR DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORM WATER.
17. THE CONTRACTOR SHALL KEEP AN INSPECTION LOG OF THE CONDITION OF THE EROSION CONTROL FACILITIES. EROSION CONTROL FACILITIES SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RAINFALL. THE INSPECTION LOG SHALL BE KEPT AT THE PROJECT SITE AT A DESIGNATED LOCATION AND SHALL BE AVAILABLE FOR REVIEW BY THE COUNTY. AN INDIVIDUAL THAT HAS SUCCESSFULLY COMPLETED THE COUNTY'S EROSION CONTROL CERTIFICATION COURSE SHALL PERFORM INSPECTIONS AND MAINTAIN THE LOG.
18. ALL TEMPORARY BMP'S SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED. TRAPPED SEDIMENT SHALL BE DEPOSITED AND STABILIZED ON SITE. AREAS DISTURBED RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.
19. CONSTRUCTION SHALL NOT BE CONSIDERED COMPLETE AND ACCEPTABLE UNTIL ALL DISTURBED SOIL SURFACES HAVE BEEN PROTECTED FROM EROSION WITH PERMANENT LANDSCAPING, COVERING WITH IMPERVIOUS SURFACES, RESTORED TO ORIGINAL UNDISTURBED CONDITION OR PERMANENTLY STABILIZED.
20. VEGETATED STABLIZATION AND LANDSCAPING SHALL BE "FERTILIZED, WATERED AND MAINTAINED TO INSURE THAT GROWTH OF VEGETATION IS ESTABLISHED AND SUSTAINED.
21. DURING DRY WEATHER CONSTRUCTION PERIODS THE CONTRACTOR SHALL PROVIDE PROJECT-SPECIFIC DUST CONTROL MEASURES THAT MAY INCLUDE: SEEDING, MULCHING, MATTING, WATER, TACKIFIER, OR CHEMICAL SOIL STABILIZERS. THE CONTRACTOR SHALL MAINTAIN THE DUST CONTROL MEASURES THROUGH DRY WEATHER PERIODS UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED. IMMEDIATELY RE-STABILIZE AREAS DISTURBED BY CONTRACTOR'S OPERATIONS OR OTHER ACTIVITIES (WIND, WATER, VANDALISM, ETC.).
22. ENTRY ONTO THE CONSTRUCTION SITE SHALL BE RESTRICTED TO A SINGLE APPROVED ENTRANCE AS SHOWN ON THE APPROVED PLAN.
23. MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES WHICH INVOLVE POTENTIAL CONTAMINANTS (OIL,SOLVENTS,HYDRAULIC FLUID, ETC.) MUST BE CONDUCTED IN A MANNER WHICH PREVENTS CONTAMINATION OF SOILS, SURFACE WATER AND GROUND WATER. TARPS, DRIP PANS, OR OTHER APPROPRIATE MEASURES SHALL BE USED AS NECESSARY.
24. STRIPPING, TOPSOIL, AND UNSUITABLE MATERIAL STOCKPILES SHALL BE HYDROSEEDED WITH "REGREEN WHEAT X WHEAT GRASS HYBRID" BY HOBBS AND HOBKINS (OR APPROVED EQUAL). MAINTENANCE OF STOCKPILE AREAS AND REAPPLICATION OF HYDROSEED COVERING SHALL BE REQUIRED IF BARE SOIL IS PRESENT. DURING WINTER AND WET WEATHER CONDITIONS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING PER DETAL E-16.
25. SIGNIFICANT VARIATION AND DEGREE OF EROSION CONTROL EFFORT WILL BE DICTATED BY WEATHER CONDITIONS. THE DEVELOPER AND CONTRACTOR SHOULD BE PREPARED TO PROVIDE EXTRA EROSION CONTROL PROVISIONS AND EFFORT DURING WINTER AND WET WEATHER CONDITIONS BEYOND THAT NORMALLY REQUIRED DURING SUMMER AND DRY WEATHER CONDITIONS. FINE GRAINED AND UNCONSOLIDATED SOILS ON SLOPING SITES MAY BECOME UNSTABLE WHEN SUBJECT TO EXCESSIVE MOISTURE.

SHEET 2 OF 2

NO.	REVISIONS	DATE	BY

Department of Public Works
CLARK COUNTY WASHINGTON
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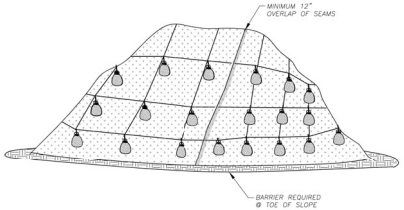
STANDARD NOTES FOR EROSION CONTROL PLAN (CONTINUED) — STANDARD ECN2

APPROVED — COUNTY ENGINEER — DATE 01/30/15



PLASTIC SHEETING

NOTES:

1. PLASTIC SHEETING IS USED TO PROVIDE IMMEDIATE PROTECTION TO SLOPES AND STOCKPILES.
2. DO NOT USE PLASTIC COVERING UPSLOPE OF AREAS SUCH AS STEEP AND/OR UNSTABLE SLOPES THAT MIGHT BE ADVERSELY AFFECTED BY CONCENTRATED RUNOFF.
3. WHEN POSSIBLE, INSTALL AN INTERCEPTER DIKE AT THE TOP OF THE PLASTIC TO DIVERT FLOWS AWAY FROM THE PLASTIC.
4. TOE-IN THE TOP OF THE SHEETING IN A 6"x6" TRENCH BACKFILLED WITH COMPACTED NATIVE MATERIAL.
5. INSTALL A GRAVEL BERM, RIPRAP, OR OTHER SUITABLE PROTECTION AT THE TOP OF THE SLOPE IN ORDER TO DISSIPATE RUNOFF VELOCITY.
6. ANCHOR THE PLASTIC USING SANDBAGS OR OTHER SUITABLE TETHERED ANCHOR SYSTEM SPACED ON A 10' CRO SPACING IN ALL DIRECTIONS.
7. OVERLAP SEAMS 1-2', TAPE, ROLL AND STAKE THE SIAMS AND THEN WEIGH DOWN THE ENTIRE LENGTH.
8. BARRIER IS REQUIRED @ TOE OF STOCK PILE.
9. REPLACE TORN SHEETS AND REPAIR OPEN SEAMS. COMPLETELY REMOVE AND REPLACE PLASTIC WHEN IT BEGINS TO DETERIORATE.

NO.	REVISIONS	DATE	BY

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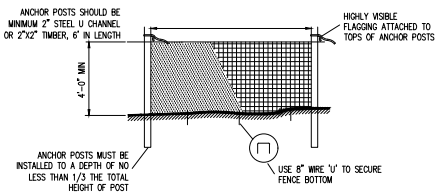
PLASTIC SHEETING — STANDARD E16

APPROVED — COUNTY ENGINEER — DATE 5/23/08

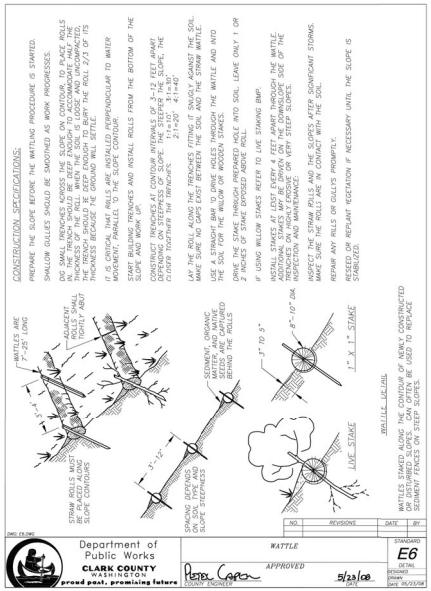


TREE PROTECTION NOTES:

1. BLAZE ORANGE OR BLUE PLASTIC MESH FENCE FOR TREE PROTECTION DEVICE, ONLY.
2. BOUNDARIES OF PROTECTION AREA WILL BE ESTABLISHED IN THE FIELD BY THE ARBORIST PRIOR TO CONSTRUCTION
3. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED BY THE ARBORIST, OR UNDER THE SUPERVISION OF THE ARBORIST, PRIOR TO INSTALLING DEVICES.
4. AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
5. TREE PROTECTION TO BE INSTALLED PRIOR TO CONSTRUCTION AND REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED.

PLASTIC MESH TREE PROTECTION FENCE

NOT TO SCALE



Department of Public Works
CLARK COUNTY WASHINGTON
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WATTLE — STANDARD E6

APPROVED — COUNTY ENGINEER — DATE 5/23/08

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
360.882.0419
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VANS OS TRANSPO IMPROVEMENTS

CLARK COUNTY WASHINGTON
NE 1/4, S34, T2N, R3E
#177885-000 #177884-000

DETAILS

DESIGNED BY: MAZ
DRAWN BY: MAZ
MANAGED BY: BDH
CHECKED BY: BDH
DATE: 8/13/2025

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 9095

SHEET C501

AKS DRAWING FILE: K:\9095 CSDD DETAILS.DWG | LAYOUT: C501

STANDARD NOTES FOR COUNTY INSTALLED SIGNING AND STRIPING

INSTAL. "X" STRIPING

MAINTAIN AND PROTECT EXISTING "X" STRIPING

REMOVE EXISTING "X" STRIPING

"X"	STRIPING NOTES
E	EDGE LINE
E-2	WIDE EDGE LINE
W	WIDE LINE
W-2	PLASTIC WHITE 4-IN LINE
W-3	PLASTIC WHITE 8-IN LINE
WB	LANE LINE
WD	WIDE DOTTED LINE
DE	DOTTED EXTENSION LINE
WDE	WIDE DOTTED EXTENSION LINE
DLL	DROP LANE LINE
Y	PAINT YELLOW 4-IN LINE
Y-2	PLASTIC YELLOW 4-IN LINE
YB	SKIP (CENTER)LINE
D	DOUBLE YELLOW CENTERLINE
D-2	NO-PASS LINE
TWL	TWO-WAY LEFT TURN LINE
BBL	BUFFERED BIKE LANE
CW	CROSSWALK
S	STOP LINE
LA	LEFT TURN ARROW
RA	RIGHT TURN ARROW
LSA	LEFT TURN STRAIGHT ARROW
RSA	RIGHT TURN STRAIGHT ARROW
RSLA	RIGHT TURN STRAIGHT LEFT ARROW
RALA	RIGHT TURN LEFT TURN ARROW
SA	STRAIGHT ARROW
LHM	LANE HOUSE/UM MARKER
WMA	WRONG WAY ARROW
BS	BICYCLE LANE SYMBOL
BR	BIKE RIDER SYMBOL
SH	SHARED LANE "SHARROW" SYMBOL
RR	RAILROAD CROSSING SYMBOL
YLD	YIELD LINE SYMBOL
YTM	YELLOW TUBULAR MARKER
WTM	WHITE TUBULAR MARKER
ON	"ONLY"
CH	CROSSHATCH MARKING

SIGNING NOTES

SIGN CODE N	NEW SIGN ASSEMBLY
SIGN CODE P	PROTECT EXISTING SIGN ASSEMBLY
SIGN CODE R	REMOVE EXISTING SIGN ASSEMBLY
SIGN CODE RS	REMOVE AND SAVE EXISTING SIGN ASSEMBLY
SIGN CODE RP	REMOVE EXISTING SIGN ASSEMBLY AND PROTECT EXISTING POST
SIGN CODE R	RELOCATE EXISTING SIGN ASSEMBLY (NEW LOCATION) (EXISTING LOCATION)

GENERAL NOTES:

1. THE SIGNING, STRIPING, PAVEMENT MARKINGS AND OTHER TRAFFIC CONTROL DEVICES SHALL BE CONTIGUOUS WITH THE EXISTING TRAFFIC CONTROL AND TRAFFIC OPERATIONS.
2. THE CONTRACTOR SHALL MAINTAIN EXISTING PERMANENT SIGNING, STRIPING, PAVEMENT MARKINGS AND TUBULAR MARKERS IN ACCORDANCE WITH SECTION 1-07.23(1) OF THE SPECIFICATIONS.
3. ANY LOOPS DAMAGED OR DESTROYED DURING WORK PERFORMED IN COUNTY RIGHT-OF-WAY SHALL BE REPLACED IN ACCORDANCE WITH CCC 12.20A. SPLICES WILL NOT BE ALLOWED.

FOR PRIVATE DEVELOPMENT:

1. FOR PRIVATE DEVELOPMENT PROJECTS, ITEM 3 AND 4 OF WSDOT STANDARD SPECIFICATIONS 1-07.23(1) SHALL BE MODIFIED TO REPLACE THE TERM "CONTRACTING AGENCY" WITH THE TERM "CONTRACTOR".
2. INSTALLATION OF NEW AND RELOCATED TRAFFIC CONTROL DEVICES, WITHIN THE PUBLIC RIGHT-OF-WAY, WILL BE PERFORMED BY CLARK COUNTY PUBLIC WORKS AFTER THE PRIVATE ROAD OWNERS HAVE REIMBURSED THE COUNTY FOR THE COST OF INSTALLING THE TRAFFIC CONTROL DEVICES.
3. INSTALLATION OF NEW AND RELOCATED TRAFFIC CONTROL DEVICES, OUTSIDE OF THE PUBLIC RIGHT-OF-WAY, WILL BE PERFORMED BY THE CONTRACTOR. THE TRAFFIC CONTROL DEVICES WILL BE MAINTAINED BY THE PRIVATE ROAD OWNERS.

STRIPING AND PAVEMENT MARKING NOTES:

1. ALL NEW STRIPING, PAVEMENT MARKINGS, TUBULAR MARKERS, SHALL BE PROVIDED AND INSTALLED BY THE COUNTY.
2. THE CONTRACTOR SHALL REMOVE STRIPING AND PAVEMENT MARKINGS AS SHOWN IN THE CONTRACT PLANS OR AS DIRECTED BY THE ENGINEER. THE STRIPING AND PAVEMENT MARKING REMOVAL PROCESS SHALL CONFORM TO SECTION 8-22.3(5) OF WSDOT STANDARD SPECIFICATIONS.
3. ALL PAVEMENT MARKINGS WILL BE LAID OUT IN THE FIELD BY THE ENGINEER.
4. PAVEMENT MARKING SYMBOLS MUST BE TYPE B PREFORMED FUSED THERMOPLASTIC PER 9-34.3(2) OF WSDOT STANDARD SPECIFICATIONS UNLESS OTHERWISE SPECIFIED. SEE CLARK COUNTY SPECIAL PROVISIONS FOR INSTALLATION DETAILS.
5. SEE CLARK COUNTY SPECIAL PROVISIONS FOR DETAILS REGARDING GREEN PAVEMENT MATERIAL, IF APPLICABLE.
6. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY PAVEMENT MARKINGS IN ACCORDANCE WITH SECTION 8-23 OF THE SPECIFICATIONS.

SIGNING NOTES:

1. ALL NEW SIGNING SHALL BE PROVIDED AND INSTALLED BY THE COUNTY.
2. THE CONTRACTOR SHALL REMOVE SIGNS AS SHOWN IN THE CONTRACT PLANS OR AS DIRECTED BY THE ENGINEER.
3. ALL SIGNS WILL BE FIELD STAKED BY THE ENGINEER.
4. R1-1 SIGNS SHALL BE TYPE XI SHEETING MATERIAL WITH PROTECTIVE OVERLAY FILM.
5. ALL SIGNS INSTALLED ON TRAFFIC SIGNAL POLES AND MASTARMS SHALL BE TYPE IX SHEETING MATERIAL.
6. FLUORESCENT YELLOW GREEN SIGNS SHALL BE TYPE IX SHEETING MATERIAL.
7. SIGNS INSTALLED ON TRAFFIC SIGNAL AND LIGHT STANDARDS SHALL BE INSTALLED PER WSDOT STANDARD PLAN D-30.10-04
8. THE CONTRACTOR SHALL SURPLUS ALL SIGNS (EXCEPT BARRICADES) AND POSTS TO CLARK COUNTY PUBLIC WORKS AT NO COST TO THE CONTRACT. THE SIGNS AND POSTS SHALL BE RETURNED TO THE COUNTY 149TH STREET MAINTENANCE STATION, LOCATED AT 17609-B NE 149TH STREET, BRUSH PRAIRIE, WA, 98606, AND CONTACTED AT (564) 397-2348.
9. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN CONSTRUCTION SIGNS IN ACCORDANCE WITH SECTION 1-10 OF THE SPECIFICATIONS.

REV. NO.	DATE	BY	APPR

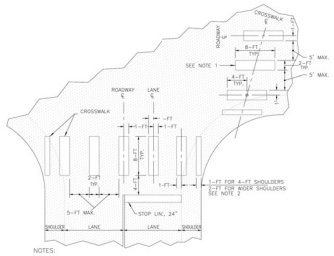
Department of Public Works
CLARK COUNTY WASHINGTON
proud past, promising future

STANDARD NOTES FOR COUNTY INSTALLED SIGNING AND STRIPING

APPROVED — COUNTY ENGINEER — 07/17/19 DATE

STANDARD T2.0 — DETAIL — DESIGNED — DRAWN — DATE

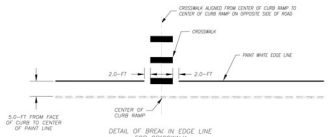
INTERSECTION MARKINGS



1-FT FOR 4-FT SHOULDERS
2-FT FOR WIDER SHOULDERS
SEE NOTE 3

NOTES:

1. FOR SKEWED CROSSWALKS, POSITION THE LINES PARALLEL TO THE TRAFFIC LANE.
2. INSTALL CROSSWALK LINE IN SHOULDER AREA ONLY WHEN ADJACENT TO SIDEWALK OR SEPARATE WALKWAY.
3. ALL STOP LINE APPLICATIONS SHALL BE 24 INCHES WIDE.
4. ALL CROSSWALKS AND STOP LINES MUST BE (OTHER TYPE A LIQUID HOT APPLIED THERMOPLASTIC OR TYPE B PRE-FORMED FUSED THERMOPLASTIC.
5. ALL CROSSWALKS AND STOP LINES SHALL BE WHITE.



DETAIL OF BREAK IN EDGE LINE FOR CROSSWALK

REV. NO.	DATE	BY	APPR

Department of Public Works
CLARK COUNTY WASHINGTON
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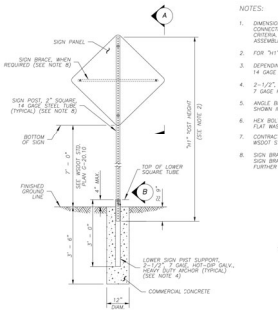
INTERSECTION MARKINGS

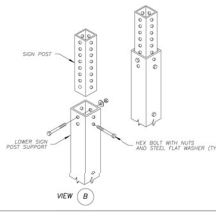
APPROVED — COUNTY ENGINEER — 07/17/19 DATE

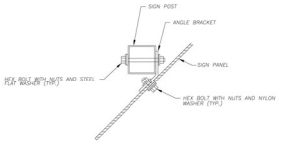
STANDARD T3.1 — DETAIL — DESIGNED — DRAWN — DATE

STEEL SIGN SUPPORT TYPE ST-4 AND SIGN INSTALLATION DETAILS



TYPE ST-4 SIGN SUPPORT





DETAIL 1

NOTES:

1. DIMENSIONS FOR THE PARTS USED TO ASSEMBLE THE BASE CONNECTIONS ARE INTENTIONALLY NOT SHOWN. BASE CONNECTIONS ARE PATENTED, MANUFACTURED PRODUCTS THAT ARE IN COMPLIANCE WITH NCHRP 350 CRASH TEST CRITERIA. THE BASE CONNECTION DETAILS ARE ONLY SHOWN ON THIS PLAN TO ILLUSTRATE HOW THE PARTS ARE ASSEMBLED.
2. FOR "H1" REFER TO THE SIGN SPECIFICATION TABLES IN THE CONTRACT.
3. DEPENDING UPON THE SIGN AREA, SIGN POST MAY BE A 2", 12 OR 14 GAGE POST OR 2-1/2", 12 OR 14 GAGE POST. SEE CONTRACT PLAN.
4. 2-1/2", 7 GAGE HEAVY DUTY ANCHOR IS REQUIRED WITH 2" POST. 3", 7 GAGE HEAVY DUTY ANCHOR IS REQUIRED WITH 2-1/2" POST. SEE CONTRACT PLAN.
5. ANGLE BRACKET SHALL BE USED FOR SIGN POST SQUARE TUBE GALVANIZED STEEL TUBE ATTACHMENT AT 45 DEGREES, SHOWN IN DETAIL 1.
6. HEX BOLT WITH NUTS AND NYLON WASHER SHALL BE USED FOR SIGN ATTACHMENT. HEX BOLT WITH NUTS AND STEEL FLAT WASHER SHALL BE USED FOR ANCHOR ATTACHMENT.
7. CONTRACT PLAN MAY ALLOW THE USE OF OTHER TYPES OF STEEL OR TIMBER SIGN SUPPORT SYSTEM, SPECIFIED IN THE WSDOT STANDARD PLAN, DEPENDING UPON SPECIFIC CONDITIONS AND SOIL TYPE, UPON APPROVAL BY THE ENGINEER.
8. SIGN BRACES ARE REQUIRED FOR SIGN WIDTHS OF 48" (IN) OR GREATER. FOR SIGN WIDTHS OF 36" (IN) OR LESS, SIGN BRACES ARE ONLY REQUIRED WHEN SPECIFIED IN THE CONTRACT. SEE WSDOT STANDARD PLAN C-50.10 FOR FURTHER DETAILS.

REV. NO.	DATE	BY	APPR

Department of Public Works
CLARK COUNTY WASHINGTON
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STEEL SIGN SUPPORT
TYPE ST-4 AND SIGN INSTALLATION DETAILS

APPROVED — COUNTY ENGINEER — 07/17/19 DATE

STANDARD T7.0 — DETAIL — DESIGNED — DRAWN — DATE

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9600 NE 126TH AVE, STE 2520
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CLARK COUNTY WASHINGTON
NE 1/4, S34, T2N, R3E
#177885-000 #177884-000

DETAILS

DESIGNED BY: MAZ
DRAWN BY: MAZ
MANAGED BY: BDH
CHECKED BY: BDH
DATE: 8/13/2025

PRELIMINARY NOT FOR CONSTRUCTION
BRYCE D. HANSEN
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

JOB NUMBER 9095

SHEET C502

AKS DRAWING FILE: 9095 C500 DETAILS.DWG | LAYOUT: C502

Staff Report

November 16, 2026 Council Workshop Meeting

Public Hearing – Ordinance 26-011 Fall Omnibus Amending the 2026 Readopted Budget
Presenter: Kayla McCauley, Interim Finance Director
Time Estimate: 5 minutes

Phone	Email
360.817.7021	kmccauley@cityofcamas.us

BACKGROUND: This public hearing is to consider comments on Ordinance 26-011, an ordinance amending the 2026 Readopted Budget. This ordinance contains sixteen budget items for appropriations totaling $8.55M, which were previously presented to Council in overview at the City Council Workshop on November 2, 2026.

SUMMARY: The 2026 Fall Omnibus consists of two carry-forward items from the 2025 budget, seven supplemental packages for previously unknown budget needs, and seven administrative items that are budget neutral or technical in nature.

BENEFITS TO THE COMMUNITY: The largest omnibus packages are utility-related, involving the stewardship of City assets. Maintaining and replacing assets helps the City proactively ensure the highest quality services to residents as affordably as possible.

STRATEGIC PLAN: This agenda item supports the following key components of the strategic plan.

- Stewardship of City Assets - **$7,654,357**
- Safe and Accessible Community **- $535,000**
- Vibrant Community Amenities - **$361,386**

BUDGET IMPACT: The budget impact is $7.06 million in unspent 2025 budget carried into 2026, $237k in administrative items that draw on dedicated revenues received in 2025 or delayed into 2027, and $1.25 million in new expenses. Overall, the 2026 Fall Omnibus Budget Amendment represents $8.55 million in net appropriations.

RECOMMENDATION: Staff recommends the Council open a public hearing to consider public comments on the 2026 Fall Omnibus Budget Amendment, to remain open until the Regular Council Meeting on December 7, 2026.

ORDINANCE NO. 26-011

AN ORDINANCE amending the City of Camas' 2025-2026 Budget Ordinance Nos. 24-020 and 25-024

WHEREAS, the City Council of the City of Camas approved Ordinance No. 24-020 and adopted a biennium budget for fiscal years 2025-2026; and

WHEREAS, the City Council of the City of Camas approved Ordinance No. 25-024 and readopted a budget for the fiscal year 2026; and

WHEREAS, the City Council of the City of Camas approved Ordinance No. 26-002 amending the Budget Ordinance 25-024 for the fiscal year 2026; and

WHEREAS, the City Council of the City of Camas desires to effectively utilize and manage the City's financial resources; and

WHEREAS, the City will receive additional revenues that were not anticipated at the time of adopting the budget for 2026; and

WHEREAS, funds received in excess of estimated revenues during the current fiscal year when authorized by an ordinance amending the original budget may be included in the expenditure limitation; and

WHEREAS, the City desires to undertake activities which were not foreseen at the time of adopting the 2026 budget; and

WHEREAS, the financial activities in the following funds could not have been reasonably foreseen at the time of adopting the 2026 budget.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CAMAS AS FOLLOWS:

Section I

Budget Amendment: The City of Camas' 2026 Budget as adopted in Ordinance No. 25-024 and amended by Ordinance 26-002 is amended as follows:

1. Modify the 2026 Budget for a delayed 2025 Lodging Tax Committee reimbursement award.
2. Modify the 2026 Budget for the on-going Wastewater Treatment Plant Upgrade project.
3. Adjust the 2026 Budget for furniture purchased for the Police Department interior remodel.
4. Adjust the 2026 Budget for the enhancement of security at the Skate Park.
5. Adjust the 2026 Budget for debt expenses and internal debt expense funding.
6. Adjust the 2026 Budget to consolidate and correct Water-Sewer projects and funding.

7. Adjust the 2026 Budget for the internal funding of the Facility Rental and Repair Fund.
8. Adjust the 2026 Budget for remediation and repair of Police Department flooding damage.
9. Adjust the 2026 Budget for correction and funding of pension expenses.
10. Supplement the 2026 Budget for increased fuel expenses.
11. Supplement the 2026 Budget for relocation of the Work Crew to the Municipal Court.
12. Supplement the 2026 Budget for the City Hall Planning Study.
13. Supplement the 2026 Budget for Fire and EMS overtime and leave cash-out expenses.
14. Supplement the 2026 Budget for the purchase of a parcel in the Northshore Legacy Lands.
15. Supplement the 2026 Budget for Lacamas Lake Algal Control and a related funding grant.
16. Supplement the 2026 Budget for the purchase of three vehicles for Water-Sewer operations.

Section II

Budget Amendment – Effect on Fund Revenues and Expenses: The foregoing increases affect the City funds as shown on Attachment A.

Section III

Effective Date. This ordinance shall take force and be in effect five days from and after its publication according to law.

PASSED BY the Council and APPROVED by the Mayor this _____ day of _____, 2026

SIGNED:_____
Mayor

SIGNED:_____
Clerk

APPROVED as to form:

_____
City Attorney

Attachment A

2026 Budget Amendment - Fund Summary

	Original Appropriation				Budget Amendment					
	Beginning Fund Balance [1]	Budget Revenues [1]	Budget Expenses [1]	Estimated End Fund Balance	Revenues	Expenses	Amended Fund Balance	Note: Omnibus Packages		
								Carry Forward	Administrative	Supplemental
Operating Funds										
General Fund	$ 14,047,385	$ 38,117,744	$ (41,984,678)	$ 10,180,451	$ -	$ (491,445)	$ 9,689,006		01,02,05,07	01,02,03
Street Fund	$ 1,670,091	$ 6,611,219	$ (6,676,012)	$ 1,605,298	$ -	$ 140,603	$ 1,745,901		03,05,07	
Transportation Benefit District	$ 1,442	$ 1,073,155	$ (1,070,000)	$ 4,597	$ -	$ -	$ 4,597			
Tree Fund	$ 49,537	$ 1,470	$ -	$ 51,007	$ -	$ -	$ 51,007			
Camas/Washougal Fire & EMS	$ 2,057,476	$ 18,371,476	$ (19,063,428)	$ 1,365,524	$ -	$ (624,144)	$ 741,380		03,05,07	01,04
Cemetery	$ 194,265	$ 301,497	$ (309,510)	$ 186,252	$ -	$ -	$ 186,252			
Capital/Enterprise Funds										
Unlimited GO Debt Service	$ 265,371	$ 2,057,370	$ (1,714,475)	$ 608,266	$ -	$ -	$ 608,266			
Limited GO Debt Service	$ -	$ 4,706,569	$ (4,706,569)	$ -	$ 3,666	$ (3,666)	$ -		03	
REET	$ 12,477,926	$ 2,991,778	$ (3,465,291)	$ 12,004,413	$ -	$ (136,278)	$ 11,868,135		03	
Park Impact Fee	$ 4,353,598	$ 2,351,846	$ (1,764,082)	$ 4,941,362	$ -	$ 148,041	$ 5,089,403		03	
Transportation Impact Fee	$ 5,538,859	$ 3,432,741	$ (1,624,008)	$ 7,347,592	$ -	$ (173,272)	$ 7,174,320		03	
Fire Impact Fee	$ 1,524,000	$ 859,683	$ -	$ 2,383,683	$ -	$ -	$ 2,383,683			
SR500/Everett St Improvements	$ -	$ 4,565,000	$ (1,200,000)	$ 3,365,000	$ -	$ -	$ 3,365,000			
NW 38th Ave Phase 3	$ 3,365,000	$ -	$ (3,365,000)	$ -	$ -	$ -	$ -			
Lake & Sierra Intersection Impvmt	$ 3,020,000	$ 50,000	$ (3,000,000)	$ 70,000	$ -	$ -	$ 70,000			
North Shore Arterial Fund	$ 3,020,000	$ 50,000	$ (3,000,000)	$ 70,000	$ -	$ -	$ 70,000			
Facitilies Capital Fund	$ -	$ 4,168,000	$ (4,168,000)	$ -	$ -	$ -	$ -			
Legacy Lands	$ 17,052,567	$ 295,237	$ (2,758,664)	$ 14,589,140	$ -	$ (375,970)	$ 14,213,170		05	
Fire Station 41 Constr Fund	$ 25,605,735	$ 750,000	$ (12,500,000)	$ 13,855,735	$ -	$ -	$ 13,855,735			
Storm Water	$ 4,317,260	$ 3,308,549	$ (5,402,374)	$ 2,223,435	$ 47,000	$ (78,798)	$ 2,191,637		03,05	01,06
Solid Waste	$ 4,078,026	$ 3,767,988	$ (3,680,404)	$ 4,165,610	$ -	$ (49,789)	$ 4,115,821		05	01
Water/Sewer	$ 16,883,519	$ 31,276,009	$ (27,735,335)	$ 20,424,193	$ (9,000,000)	$ (1,426,856)	$ 9,997,337	02	04,05,07	01,07
W/S Capital Projects	$ -	$ 6,494,000	$ (5,494,000)	$ 1,000,000	$ (245,000)	$ -	$ 755,000		04	
2019 Water Bond Projects	$ 1,372,963	$ 2,127,037	$ (3,500,000)	$ -	$ 245,000	$ -	$ 245,000		04	
2025 Water Sewer Bond Fund	$ 21,633,742	$ 642,668	$ (17,933,729)	$ 4,342,681	$ 10,283,800	$ (7,051,708)	$ 7,574,773	02	04	
Operations Center North - Constr	$ 1,100,000	$ 30,000	$ (1,000,000)	$ 130,000	$ -	$ -	$ 130,000			
WS Capital Reserve	$ 22,158,035	$ 6,122,815	$ (16,694,268)	$ 11,586,582	$ -	$ -	$ 11,586,582			
Reserve Funds										
Lodging Tax	$ 49,514	$ 39,900	$ (50,000)	$ 39,414	$ -	$ (9,991)	$ 29,423	01		
Equipment Rental and Replacement	$ 3,056,442	$ 2,574,966	$ (3,929,923)	$ 1,701,485	$ -	$ (13,030)	$ 1,688,455		05	
Facilities Rental and Repairs	$ 534,734	$ 1,723,397	$ (2,192,965)	$ 65,166	$ 330,000	$ (101,000)	$ 294,166		05,06	01
Technology Capital & Services	$ -	$ 175,000	$ (175,000)	$ -	$ -	$ -	$ -			
Firefighters' Pension	$ 907,359	$ 19,018	$ (99,793)	$ 826,584	$ -	$ (62,646)	$ 763,938		07	
Retiree Medical	$ 8,086	$ 174,913	$ (182,644)	$ 355	$ 94,662	$ (86,649)	$ 8,368		07	
LEOFF 1 Disability Board	$ 266,049	$ 193,044	$ (382,032)	$ 77,061	$ 35,989	$ 50,738	$ 163,788		07	
	$ 170,608,981	**$ 149,424,089**	**$ (200,822,184)**	**$ 119,210,886**	**$ 1,795,117**	**$ (10,345,860)**	**$ 110,660,143**			
						$ (8,550,743)				

(1) Beginning fund balance reflects the 2026 Readopted Budget values, while budgeted revenues and expenses reflect the revised budget from the 2026 Spring Omnibus Budget Amendment

			Carry Forward	$ -	$ (7,061,699)
Ord	Budget	$ 146,040,891	$ 195,858,519	*Administrative*	$ 1,748,117	$ (1,986,056)
	Spring 2026 Adj	$ 3,383,198	$ 4,963,665	*Supplemental*	$ 47,000	$ (1,298,105)
	Fall 2026 Adj	$ 1,795,117	$ 10,345,860			
	2026 Revised Bud	$ 151,219,206	$ 211,168,044		$ 1,795,117	$ (10,345,860)
						$ (8,550,743)

2026 Fall Omnibus Budget - Fund Balance Impacts

		General Fund	Street Fund	C/W Fire & EMS	Lodging Tax	LTGO	REET Projects	Park Imp Fee	Transp Imp Fee	Legacy Lands	Storm Water	Solid Waste	Water-Sewer	W-S Capital Projects	2019 Water Bond Projects	2025 W-S Bond Projects	Equipment Rental	Facilities Rental	FF Pension Fund	Retiree Medical	LEOFF I Disability Fund	Total
	Beginning Balance	$ 14,047,385	$ 1,670,091	$ 2,057,476	$ 49,514	$ -	$ 12,477,926	$ 4,353,598	$ 5,538,859	$ 17,052,567	$ 4,317,260	$ 4,078,026	$ 16,883,519	$ -	$ 1,372,963	$ 21,633,742	$ 3,056,442	$ 534,734	$ 907,359	$ 8,086	$ 266,049	$ 170,608,981
	Revenues	$ 38,117,744	$ 6,611,219	$ 18,371,476	$ 39,900	$ 4,706,569	$ 2,991,778	$ 2,351,846	$ 3,432,741	$ 295,237	$ 3,308,549	$ 3,767,988	$ 31,276,009	$ 6,494,000	$ 2,127,037	$ 642,668	$ 2,574,966	$ 1,723,397	$ 19,018	$ 174,913	$ 193,044	$ 149,424,089
	Expenditures	$ (41,984,678)	$ (6,676,012)	$ (19,063,428)	$ (50,000)	$ (4,706,569)	$ (3,465,291)	$ (1,764,082)	$ (1,624,008)	$ (2,758,664)	$ (5,402,374)	$ (3,680,404)	$ (27,735,335)	$ (5,494,000)	$ (3,500,000)	$ (17,933,729)	$ (3,929,923)	$ (2,192,965)	$ (99,793)	$ (182,644)	$ (382,032)	$ (200,822,184)
	Projected Ending Fund Bal 24.2%	**$ 10,180,451**	**$ 1,605,298**	**$ 1,365,524**	**$ 39,414**	**$ -**	**$ 12,004,413**	**$ 4,941,362**	**$ 7,347,592**	**$ 14,589,140**	**$ 2,223,435**	**$ 4,165,610**	**$ 20,424,193**	**$ 1,000,000**	**$ -**	**$ 4,342,681**	**$ 1,701,485**	**$ 65,166**	**$ 826,584**	**$ 355**	**$ 77,061**	**$ 119,210,886**
	Carry Forward Packages																					
CF-01	Carry forward partial 2025 budget				$ (9,991)																	$ (9,991)
CF-02	On-going WWTP Upgrades															$ (7,051,708)						$ (7,051,708)
	Total Carry Forward	$ -	$ -	$ -	$ (9,991)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (7,051,708)	$ -	$ -	$ -	$ -	$ -	$ (7,061,699)
	Subtotal Fund Balance	**$ 10,180,451**	**$ 1,605,298**	**$ 1,365,524**	**$ 29,423**	**$ -**	**$ 12,004,413**	**$ 4,941,362**	**$ 7,347,592**	**$ 14,589,140**	**$ 2,223,435**	**$ 4,165,610**	**$ 20,424,193**	**$ 1,000,000**	**$ -**	**$ (2,709,027)**	**$ 1,701,485**	**$ 65,166**	**$ 826,584**	**$ 355**	**$ 77,061**	**$ 112,149,187**
	Administrative Packages																					
A-01	Furniture for Police Remodel	$ (40,000)																				$ (40,000)
A-02	Skate Park Security Upgrades	$ (60,000)																				$ (60,000)
A-03	Debt Corrections		$ 131,536	$ 26,307		$ (3,666)	$ (136,278)	$ 148,041	$ (173,272)		$ (3,362)											$ (10,694)
	LTGO Funding Transfers In					$ 3,666																$ 3,666
A-04	Consolidating Capital Projects												$ (1,283,800)									$ (1,283,800)
	Funding Transfers In												$ (9,000,000)	$ (245,000)	$ 245,000	$ 10,283,800						$ 1,283,800
A-05	Facility R&R Funding Transfers	$ (214,816)	$ (12,321)	$ (43,832)						$ (24,575)	$ (5,436)	$ (7,789)	$ (8,201)				$ (13,030)					$ (330,000)
	Funding Transfers Into 5300																	$ 330,000				$ 330,000
A-06	Police Dept Flood Repairs																	$ (95,000)				$ (95,000)
A-07	Pension Expenses																			$ (86,649)		$ (86,649)
	Pension Expenses																				$ 50,738	$ 50,738
	Funding Transfers Out to 6020	$ (29,576)	$ 21,388	$ (106,619)									$ 20,145									$ (94,662)
	Funding Transfers Into 6020																			$ 94,662		$ 94,662
	Funding Transfers Out to 6030	$ 26,657																	$ (62,646)			$ (35,989)
	Funding Transfers Into 6030																				$ 35,989	$ 35,989
	Total Administrative	$ (317,735)	$ 140,603	$ (124,144)	$ -	$ -	$ (136,278)	$ 148,041	$ (173,272)	$ (24,575)	$ (8,798)	$ (7,789)	$ (10,271,856)	$ (245,000)	$ 245,000	$ 10,283,800	$ (13,030)	$ 235,000	$ (62,646)	$ 8,013	$ 86,727	$ (237,939)
	Subtotal Fund Balance	**$ 9,862,716**	**$ 1,745,901**	**$ 1,241,380**	**$ 29,423**	**$ -**	**$ 11,868,135**	**$ 5,089,403**	**$ 7,174,320**	**$ 14,564,565**	**$ 2,214,637**	**$ 4,157,821**	**$ 10,152,337**	**$ 755,000**	**$ 245,000**	**$ 7,574,773**	**$ 1,688,455**	**$ 300,166**	**$ 763,938**	**$ 8,368**	**$ 163,788**	**$ 111,911,248**
	Supplemental Packages																					
S-01	Fuel Overages	$ (10,000)		$ (25,000)							$ (15,000)	$ (42,000)	$ (20,000)					$ (6,000)				$ (118,000)
S-02	Relocate Work Crew Headquarters	$ (50,000)																				$ (50,000)
S-03	City Hall Planning Study	$ (113,710)																				$ (113,710)
S-04	Fire/EMS Overtime			$ (475,000)																		$ (475,000)
S-05	Purchase of Legacy Lands									$ (351,395)												$ (351,395)
S-06	Lake Algae Control and Grant										$ (55,000)											$ (55,000)
	WA Dept of Ecology Grant										$ 47,000											$ 47,000
S-07	Adding 3 Water-Sewer Vehicles												$ (135,000)									$ (135,000)
	Total Supplemental	$ (173,710)	$ -	$ (500,000)	$ -	$ -	$ -	$ -	$ -	$ (351,395)	$ (23,000)	$ (42,000)	$ (155,000)	$ -	$ -	$ -	$ -	$ (6,000)	$ -	$ -	$ -	$ (1,251,105)
	Net Budget Adjustment	$ (491,445)	$ 140,603	$ (624,144)	$ (9,991)	$ -	$ (136,278)	$ 148,041	$ (173,272)	$ (375,970)	$ (31,798)	$ (49,789)	$ (10,426,856)	$ (245,000)	$ 245,000	$ 3,232,092	$ (13,030)	$ 229,000	$ (62,646)	$ 8,013	$ 86,727	$ (8,550,743)
	Total Adjusted Fund Balance 23.1%	**$ 9,689,006**	**$ 1,745,901**	**$ 741,380**	**$ 29,423**	**$ -**	**$ 11,868,135**	**$ 5,089,403**	**$ 7,174,320**	**$ 14,213,170**	**$ 2,191,637**	**$ 4,115,821**	**$ 9,997,337**	**$ 755,000**	**$ 245,000**	**$ 7,574,773**	**$ 1,688,455**	**$ 294,166**	**$ 763,938**	**$ 8,368**	**$ 163,788**	**$ 110,660,143**

City of Camas 2026 Fall Omnibus Budget Packages

11/10/2026

Carry Forward List

Pkg #	Strategic Plan Priority	Department	Description	Amount	Reason
CF-01	Vibrant Community Amenities	Lodge Tax	Carry forward partial 2025 budget	$ 9,991	Roll budget for LTAC reimbursement processed too late to be included in 2025 expenses
CF-02	Stewardship of City Assets	WWTP	On-going WWTP Upgrades	$ 7,051,708	Carrying WWTP Upgrade budget forward - missed in Spring Omnibus
			Total	**$ 7,061,699**	

Administrative List

	Strategic Plan Priority	Department	Description	Amount	Reason
A-01	Stewardship of City Assets	Gen Fund	Furniture for Police Remodel	*$ 40,000*	Furniture for Police Admin area remodel, funded with accreditation grant received in 2025
A-02	Safe & Accessible Community	Gen Fund	Skate Park Security Upgrades	*$ 60,000*	Use of opioid settlement funds to add cameras and security to the skate park
A-03	Stewardship of City Assets	Multiple	Debt Corrections	$ 7,028	Correcting debt funding transfers and expenses across multiple funds
A-04	Stewardship of City Assets	W-S	Consolidating Capital Projects	$ -	Cleanup of water/sewer projects and funding transfers for clarity and accuracy to budget
A-05	Stewardship of City Assets	Facility R&R	Facility R&R Funding Transfers	$ -	Funding new internal service fund due to rates calculated from revenues not received
A-06	Stewardship of City Assets	Facility R&R	Police Dept Flood Repairs	*$ 95,000*	City anticipates receiving insurance recovery, but the amount is unknown at this time
A-07	Stewardship of City Assets	Pension Funds	Pension Expenses	$ 35,911	Funding for unexpected pension expenses
			Total	**$ 237,939**	

Supplemental List

	Strategic Plan Priority	Department	Description	Amount	Reason
S-01	Stewardship of City Assets	Multiple	Fuel Overages	$ 118,000	Park Maint: 10k, Trash: 42k, Fire/EMS: 25k, Storm: 15k, W/S: 20k, Facilities: 6k
S-02	Stewardship of City Assets	Gen Fund	Relocate Work Crew Headquarters	$ 50,000	Security, electrical for relocating Work Crew to dispatch from Muni Court instead of Ops Ctr
S-03	Stewardship of City Assets	Gen Fund	City Hall Planning Study	$ 113,710	Former siting analysis for City Hall relocation is now a space / options analysis
S-04	Safe & Accessible Community	CWFD	Fire/EMS Overtime	$ 475,000	Cushion to ensure funding for overtime and year-end cashouts
S-05	Vibrant Community Amenities	Park/Legacy	Purchase of Legacy Lands	$ 351,395	Purchase of a parcel of land in the Northshore Legacy Lands for future Parks
S-06	Stewardship of City Assets	Storm	Lake Algae Control and Grant	$ 8,000	Algae control at Lacamas Lake, majority covered by $47k WA Dept of Ecology grant
S-07	Stewardship of City Assets	W-S	Adding 3 Water-Sewer Vehicles	$ 135,000	New addition of vehicles in Water/Sewer: 2 for leads, 1 for meter reading
			Total	**$ 1,251,105**	

Total Omnibus Budget Packages $ 8,550,743

City of Camas 2026 Fall Omnibus Budget - Description of Packages

Package	Title	Description	Impacted Fund	Overall Appropriation
CF-01	Carry forward partial 2025 budget	Roll budget for LTAC reimbursement processed too late to be included in 2025 expenses	Lodging Tax	$ 9,991
CF-02	On-going WWTP Upgrades	Carrying WWTP Upgrade budget forward - missed in Spring Omnibus	2025 W-S Revenue Bond Fund	$ 7,051,708
A-01	Furniture for Police Remodel	Furniture for Police Admin area remodel, funded with accreditation grant received in 2025	General Fund	$ 40,000
A-02	Skate Park Security Upgrades	Use of opioid settlement funds to add cameras and security to the skate park	General Fund	$ 60,000
A-03	Debt Corrections	Correcting debt funding transfers and expenses across multiple funds	LTGO Debt, Streets, Fire, REET, PIF, TIF, Storm Water	$ 7,028
A-04	Consolidating Capital Projects	Cleanup of water/sewer projects and funding transfers for clarity and accuracy to budget	W-S Operating, W-S Capital, 2019 W-S Revenue Bond Fund, 2025 W-S Revenue Bond Fund, W-S Cap Reserve (SDC)	$ -
A-05	Facility R&R Funding Transfers	Funding new internal service fund due to rates calculated from revenues not received	General Fund, Streets, Fire, Utility Operating Funds, ER&R, FR&R	$ -
A-06	Police Dept Flood Repairs	City anticipates receiving insurance recovery, but the amount is unknown at this time	Facility R&R Fund	$ 95,000
A-07	Pension Expenses	Funding for unexpected pension expenses	Pension Funds	$ 35,911
S-01	Fuel Overages	Park Maint: 10k, Trash: 42k, Fire/EMS: 25k, Storm: 15k, W/S: 20k, Facilities: 6k	General Fund, Streets, Fire, Storm, W-S Oper, Fac R&R	$ 118,000
S-02	Relocate Work Crew Headquarters	Security, electrical for relocating Work Crew to dispatch from Muni Court instead of Ops Ctr	General Fund	$ 50,000
S-03	City Hall Planning Study	Former siting analysis for City Hall relocation is now a space / options analysis	General Fund	$ 113,710
S-04	Fire/EMS Overtime	Cushion to ensure funding for overtime and year-end cashouts	CWFD	$ 475,000
S-05	Purchase of Legacy Lands	Purchase of a parcel of land in the Northshore Legacy Lands for future Parks	Legacy Lands	$ 351,395
S-06	Lake Algae Control and Grant	Algae control at Lacamas Lake, majority covered by $47k WA Dept of Ecology grant	Storm Water	$ 8,000
S-07	Adding 3 Water-Sewer Vehicles	New addition of vehicles in Water/Sewer: 2 for leads, 1 for meter reading	W-S Operating	$ 135,000
			Total	**$ 8,550,743**

Attachment A - **City of Camas 2026 Fall Omnibus Budget Line Detail**

Package #	Description	Fund Description	Current Budget	Proposed Budget	GL Code	Rev Increase Exp Decrease	Rev Decrease Exp Increase	Impact to Budget
CF-01	Carry forward partial 2025 budget	Ads/Printing/Forms	$ 40,000	$ 49,991	1200.58.0000.000.5573000.549200.	$ -	$ (9,991)	$ (9,991)
CF-02	On-going WWTP Upgrades	WWTP Upgrade Project	$ 5,000,000	$ 12,051,708	4480.06.9450.000.5943500.563000.	$ -	$ (7,051,708)	$ (7,051,708)
A-01	Furniture for Police Remodel	Police Tools & Equipment	$ 100,639	$ 140,639	0001.20.0000.090.5212000.535000.	$ -	$ (40,000)	$ (40,000)
A-02	Skate Park Security Upgrades	Police Prof Svcs - Opioid Stmt	$ -	$ 60,000	0001.20.3694.090.5212000.540000.	$ -	$ (60,000)	$ (60,000)
A-03	Debt Corrections	Transfers Out to LTGO Bond	$ 131,536	$ -	1120.97.0000.000.5972400.500097.	$ 131,536	$ -	$ 131,536
A-03	Debt Corrections	Transfers Out to LTGO Bond	$ 26,307	$ -	1150.97.0000.500.5972400.500097.	$ 26,307	$ -	$ 26,307
A-03	Debt Corrections	Transfers In from Streets Fund	$ (131,536)	$ -	2400.97.0000.000.3971120.300097.	$ -	$ (131,536)	$ (131,536)
A-03	Debt Corrections	Transfers In from CWFD Fund	$ (26,307)	$ -	2400.97.0000.000.3971150.300097.	$ -	$ (26,307)	$ (26,307)
A-03	Debt Corrections	Transfers In from REET	$ (1,610,636)	$ (1,746,914)	2400.97.0000.000.3973000.300097.	$ 136,278	$ -	$ 136,278
A-03	Debt Corrections	Transfers In from PIF	$ (1,314,082)	$ (1,166,041)	2400.97.0000.000.3973010.300097.	$ -	$ (148,041)	$ (148,041)
A-03	Debt Corrections	Transfers In from TIF	$ (1,624,008)	$ (1,797,280)	2400.97.0000.000.3973020.300097.	$ 173,272	$ -	$ 173,272
A-03	Debt Corrections	GO Bond Interest	$ 2,079,861	$ 2,095,826	2400.80.0000.000.5927500.581000.	$ -	$ (15,965)	$ (15,965)
A-03	Debt Corrections	Loan Principal	$ 348,872	$ 352,415	2400.00.0000.000.5919500.578000.	$ -	$ (3,543)	$ (3,543)
A-03	Debt Corrections	GO Bond	$ 2,064,815	$ 2,064,692	2400.00.0000.000.5912100.571000.	$ 123	$ -	$ 123
A-03	Debt Corrections	Loan Interest	$ 68,021	$ 52,302	2400.80.0000.000.5929500.588000.	$ 15,719	$ -	$ 15,719
A-03	Debt Corrections	Transfers Out to LTGO Bond	$ 1,610,636	$ 1,746,914	3000.97.0000.000.5972400.500097.	$ -	$ (136,278)	$ (136,278)
A-03	Debt Corrections	Transfers Out to LTGO Bond	$ 1,314,082	$ 1,166,041	3010.97.0000.000.5972400.500097.	$ 148,041	$ -	$ 148,041
A-03	Debt Corrections	Transfers Out to LTGO Bond	$ 1,624,008	$ 1,797,280	3020.97.0000.000.5972400.500097.	$ -	$ (173,272)	$ (173,272)
A-03	Debt Corrections	Storm Admin GO Bond	$ 20,185	$ 20,038	4190.31.0000.600.5913100.571000.	$ 147	$ -	$ 147
A-03	Debt Corrections	Storm Admin Loan Principal	$ -	$ 3,543	4190.31.0000.600.5913100.578000.	$ -	$ (3,543)	$ (3,543)
A-03	Debt Corrections	Storm Admin GO Bond Interest	$ 19,276	$ 19,136	4190.31.0000.600.5923100.581000.	$ 140	$ -	$ 140
A-03	Debt Corrections	Storm Admin Loan Interest	$ -	$ 106	4190.31.0000.600.5923100.588000.	$ -	$ (106)	$ (106)
A-04	Consolidating Capital Projects	Transfers Out to 25 WS Rev Bnd	$ -	$ 1,283,800	4400.97.0000.000.5974480.500097.	$ -	$ (1,283,800)	$ (1,283,800)
A-04	Consolidating Capital Projects	Transfers In from WS	$ -	$ (1,283,800)	4480.97.0000.000.3974400.300097.	$ 1,283,800	$ -	$ 1,283,800
A-04	Consolidating Capital Projects	Transfers Out to W/S Fund	$ 11,000,000	$ 2,000,000	4600.97.0000.000.5974400.500097.	$ 9,000,000		$ 9,000,000
A-04	Consolidating Capital Projects	Transfers Out to W/S Cap Proj	$ 3,745,000	$ 3,500,000	4600.97.0000.000.5974420.500097.	$ 245,000	$ -	$ 245,000
A-04	Consolidating Capital Projects	Transfers Out to Water Bond	$ 1,949,268	$ 2,194,268	4600.97.0000.000.5974460.500097.	$ -	$ (245,000)	$ (245,000)
A-04	Consolidating Capital Projects	Transfers Out to 25 WS Rev Bnd	$ -	$ 9,000,000	4600.97.0000.000.5974480.500097.	$ -	$ (9,000,000)	$ (9,000,000)
A-04	Consolidating Capital Projects	Transfers In from WS Cap Res	$ -	$ (9,000,000)	4480.97.0000.000.3974600.300097.	$ 9,000,000	$ -	$ 9,000,000
A-04	Consolidating Capital Projects	Transfers In from W/S Cap Res	$ (11,000,000)	$ (2,000,000)	4400.97.0000.000.3974600.300097.	$ -	$ (9,000,000)	$ (9,000,000)
A-04	Consolidating Capital Projects	Transfers In from W/S Cap Res	$ (3,745,000)	$ (3,500,000)	4420.97.0000.000.3974600.300097.	$ -	$ (245,000)	$ (245,000)
A-04	Consolidating Capital Projects	Transfers In from W/S Cap Res	$ (1,949,268)	$ (2,194,268)	4460.97.0000.000.3974600.300097.	$ 245,000	$ -	$ 245,000
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ 214,816	0001.97.0000.000.5975300.500097.	$ -	$ (214,816)	$ (214,816)
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ 12,321	1120.97.0000.000.5975300.500097.	$ -	$ (12,321)	$ (12,321)
A-05	Facility R&R Funding Transfers	Transfers Out to Fac R&R	$ -	$ 43,832	1150.97.0000.000.5975300.500097.	$ -	$ (43,832)	$ (43,832)
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ 24,575	3200.97.0000.000.5975300.500097.	$ -	$ (24,575)	$ (24,575)
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ 5,436	4190.97.0000.000.5975300.500097.	$ -	$ (5,436)	$ (5,436)
A-05	Facility R&R Funding Transfers	Transfers Out to Fac R&R	$ -	$ 7,789	4220.97.0000.000.5975300.500097.	$ -	$ (7,789)	$ (7,789)
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ 8,201	4400.97.0000.000.5975300.500097.	$ -	$ (8,201)	$ (8,201)
A-05	Facility R&R Funding Transfers	Transfers Out to Fac R&R	$ -	$ 13,030	5200.97.0000.000.5975300.500097.	$ -	$ (13,030)	$ (13,030)
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ (214,816)	5300.97.0000.000.3970001.300097.	$ 214,816	$ -	$ 214,816
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ (12,321)	5300.97.0000.000.3971120.300097.	$ 12,321	$ -	$ 12,321
A-05	Facility R&R Funding Transfers	Transfers In from CWFD	$ -	$ (43,832)	5300.97.0000.000.3971150.300097.	$ 43,832	$ -	$ 43,832
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ (24,575)	5300.97.0000.000.3973200.300097.	$ 24,575	$ -	$ 24,575
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ (5,436)	5300.97.0000.000.3974190.300097.	$ 5,436	$ -	$ 5,436
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ (7,789)	5300.97.0000.000.3974220.300097.	$ 7,789	$ -	$ 7,789
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ (8,201)	5300.97.0000.000.3974400.300097.	$ 8,201	$ -	$ 8,201
A-05	Facility R&R Funding Transfers	*GL Account to be created*	$ -	$ (13,030)	5300.97.0000.000.3975200.300097.	$ 13,030	$ -	$ 13,030
A-06	Police Dept Flood Repairs	Police Station Repair & Maint	$ 14,327	$ 109,327	5300.20.5321.260.5212000.548000.	$ -	$ (95,000)	$ (95,000)
A-06	Police Dept Flood Repairs	*GL Account to be created*	$ -	$ -	5300.20.0000.000.3720000.300000.	$ -	$ -	$ -
A-07	Pension Expenses	Pension/Other Retiree Benefits	$ 182,644	$ 269,293	6020.00.0000.000.5172000.521000.	$ -	$ (86,649)	$ (86,649)
A-07	Pension Expenses	Police Benefits	$ 171,294	$ 71,294	6030.00.0000.000.5212000.521000.	$ 100,000		$ 100,000
A-07	Pension Expenses	EMS Admin Benefits	$ 134,266	$ 225,000	6030.00.0000.000.5221000.521000.	$ -	$ (90,734)	$ (90,734)
A-07	Pension Expenses	EMS Admin Pension	$ 76,472	$ 35,000	6030.00.0000.000.5221000.529000.	$ 41,472		$ 41,472
A-07	Pension Expenses	Transfers Out to Retiree Med	$ 111,310	$ 140,886	0001.97.0000.000.5976020.500097.	$ -	$ (29,576)	$ (29,576)
A-07	Pension Expenses	Transfers Out to LEOFF	$ 97,951	$ 71,294	0001.97.0000.000.5976030.500097.	$ 26,657	$ -	$ 26,657
A-07	Pension Expenses	Transfers In from GenFund	$ (111,310)	$ (140,886)	6020.97.0000.000.3970001.300097.	$ 29,576	$ -	$ 29,576
A-07	Pension Expenses	Transfers In from GenFund	$ (97,951)	$ (71,294)	6030.97.0000.000.3970001.300097.	$ -	$ (26,657)	$ (26,657)
A-07	Pension Expenses	Transfers Out to Retiree Med	$ 21,388	$ -	1120.97.0000.000.5976020.500097.	$ 21,388	$ -	$ 21,388
A-07	Pension Expenses	Transfers In from Streets Fund	$ (21,388)	$ -	6020.97.0000.000.3971120.300097.	$ -	$ (21,388)	$ (21,388)
A-07	Pension Expenses	Transfers Out to Retiree Med	$ 8,828	$ 115,447	1150.97.0000.500.5976020.500097.	$ -	$ (106,619)	$ (106,619)
A-07	Pension Expenses	Transfers In from CWFD Fund	$ (8,828)	$ (115,447)	6020.97.0000.000.3971150.300097.	$ 106,619	$ -	$ 106,619
A-07	Pension Expenses	Transfers Out to Retiree Med	$ 33,105	$ 12,960	4400.97.0000.000.5976020.500097.	$ 20,145	$ -	$ 20,145
A-07	Pension Expenses	Transfers In from W/S Fund	$ (33,105)	$ (12,960)	6020.97.0000.000.3974400.300097.	$ -	$ (20,145)	$ (20,145)
A-07	Pension Expenses	Transfers Out to LEOFF	$ 87,354	$ 150,000	6010.97.0000.000.5976030.500097.	$ -	$ (62,646)	$ (62,646)
A-07	Pension Expenses	Transfers In from FF Pension	$ (87,354)	$ (150,000)	6030.97.0000.000.3976010.300097.	$ 62,646		$ 62,646
S-01	Fuel Overages	Parks Fuel Consumed	$ 26,960	$ 36,960	0001.70.1800.180.5768000.532000.	$ -	$ (10,000)	$ (10,000)
S-01	Fuel Overages	EMS Fuel Consumed	$ 37,766	$ 49,484	1150.20.0000.500.5227000.532000.	$ -	$ (11,718)	$ (11,718)
S-01	Fuel Overages	Fire Fuel Consumed	$ 42,808	$ 56,090	1150.20.0000.540.5222000.532000.	$ -	$ (13,282)	$ (13,282)
S-01	Fuel Overages	Water Dist Fuel Consumed	$ 23,218	$ 31,388	4400.34.0000.730.5340000.532000.	$ -	$ (8,170)	$ (8,170)
S-01	Fuel Overages	Sewer Pressure Fuel Consumed	$ 21,892	$ 29,595	4400.34.0000.800.5350000.532000.	$ -	$ (7,703)	$ (7,703)
S-01	Fuel Overages	Sewer Pumping Fuel Consumed	$ 3,561	$ 4,814	4400.34.0000.810.5350000.532000.	$ -	$ (1,253)	$ (1,253)
S-01	Fuel Overages	WWTP Fuel Consumed	$ 8,169	$ 11,043	4400.34.0000.820.5350000.532000.	$ -	$ (2,874)	$ (2,874)
S-01	Fuel Overages	Storm O&M Fuel Consumed	$ 21,529	$ 36,529	4190.31.0000.610.5310000.532000.	$ -	$ (15,000)	$ (15,000)
S-01	Fuel Overages	Trash Collection Fuel Consumed	$ 83,721	$ 125,721	4220.37.0000.680.5370000.532000.	$ -	$ (42,000)	$ (42,000)
S-01	Fuel Overages	Facilities Admin Fuel Consumed	$ 3,261	$ 9,261	5300.10.0000.260.5183000.532000.	$ -	$ (6,000)	$ (6,000)
S-02	Relocate Work Crew Headquarters	Detention Miscellaneous	$ 915	$ 50,915	0001.20.0000.100.5233000.549900.	$ -	$ (50,000)	$ (50,000)
S-03	City Hall Planning Study	Engineering Professional Svcs	$ 89,133	$ 202,843	0001.10.0000.130.5189000.540000.	$ -	$ (113,710)	$ (113,710)
S-04	Fire/EMS Overtime	EMS Admin Salaries	$ 451,254	$ 472,544	1150.20.0000.500.5221000.511000.	$ -	$ (21,290)	$ (21,290)

Attachment A - **City of Camas 2026 Fall Omnibus Budget Line Detail**

Package #	Description	Fund Description	Current Budget	Proposed Budget	GL Code	Rev Increase Exp Decrease	Rev Decrease Exp Increase	Impact to Budget
S-04	Fire/EMS Overtime	EMS Overtime	$ 524,253	$ 678,010	1150.20.0000.500.5227000.512000.	$ -	$ (153,757)	$ (153,757)
S-04	Fire/EMS Overtime	Fire Overtime	$ 1,308,461	$ 1,580,693	1150.20.0000.540.5222000.512000.	$ -	$ (272,232)	$ (272,232)
S-04	Fire/EMS Overtime	Fire Marshal Office Overtime	$ 20,075	$ 47,796	1150.20.0000.540.5223000.512000.	$ -	$ (27,721)	$ (27,721)
S-05	Purchase of Legacy Lands	Capital Land/Land Imv	$ -	$ 351,395	3200.06.9320.000.5947600.561000.	$ -	$ (351,395)	$ (351,395)
S-06	Lake Algae Control and Grant	Storm Lake Mgmt Profess Svcs	$ 98,202	$ 153,202	4190.31.0000.635.5310000.540000.	$ -	$ (55,000)	$ (55,000)
S-06	Lake Algae Control and Grant	State Grant Dept of Ecology	$ -	$ (47,000)	4190.31.0000.000.3340310.300000.	$ 47,000	$ -	$ 47,000
S-07	Adding 3 Water-Sewer Vehicles	Water Vehicles	$ -	$ 90,000	4400.06.9440.000.5943400.566000.	$ -	$ (90,000)	$ (90,000)
S-07	Adding 3 Water-Sewer Vehicles	Sewer Vehicles	$ -	$ 45,000	4400.06.9450.000.5943500.566000.	$ -	$ (45,000)	$ (45,000)
						$ 21,190,866	$ (29,741,609)	$ (8,550,743)
					Net Total	$ 1,795,117	$ (10,345,860)	
							$ (8,550,743)	
							$ (8,550,743)	
							$ -	

Carry Forward		$ -	$ (7,061,699)	
	Net Balance		$ (7,061,699)	$ -
Administrative		$ 1,748,117	$ (1,986,056)	
	Net Balance		$ (237,939)	$ -
Supplemental		$ 47,000	$ (1,298,105)	
	Net Balance		$ (1,251,105)	$ -
				$ -

Budget Summary			
Total	$ 1,795,117	$ (10,345,860)	
		$ (8,550,743)	
		$ (8,550,743)	
		$ -	

Staff Report

November 16, 2026 Council Regular Meeting

Resolution No. 26-017 Revising the City of Camas Fee Schedule for 2027
Presenter: Kayla Mobley, Interim Finance Director
Time Estimate: 5 minutes

Phone	Email
360.817.7021	kmobley@cityofcamas.us

BACKGROUND: Staff are bringing forth Resolution 26-017, adopting the City of Camas Fee Schedule for 2027. The City indexed development fees against the ENR Construction Cost Index at 2.6% and all other fees by the West Coast Consumer Price Index July change of 3%. Notable amendments to the fees on the schedule were previously presented to City Council at the Oct 19, 2026 Workshop.

SUMMARY: The relevant indices were applied to 2026 fees, then staff reviewed the fee schedule for any necessary market adjustments, additions, or removals of obsolete fees.

BENEFITS TO THE COMMUNITY: Cost recovery ensures that the users of a service pay for the service rather than the service being funded from general government revenue, which would compete for resources with City services that have no dedicated revenue streams from rates and fees, such as Police or Library.

Annual CPI increases allow more manageable and predictable fee increases for service users, who could otherwise be burdened if cost recovery is deferred to large, infrequent increases. Further, smaller annual increases to pace inflation help stabilize City operations, avoiding any erosion or loss of services to the community.

STRATEGIC PLAN: The City's Strategic Plan Economic Prosperity priority has a goal to "Perform a fee analysis study on all fees and identify adequate cost recovery thresholds". It is in support of this goal that staff complete the annual fee update.

POTENTIAL CHALLENGES: The potential challenge with the Fee Schedule is finding the balance of cost recovery and market tolerance. Staff recognize that annual index increases may be insufficiently recovering costs given the interval since an in-depth review was last conducted, thus a thorough review of fees in 2027 is a top priority.

RECOMMENDATION: Staff recommend Council move to approve Resolution 26-017, adopting the proposed revisions to the 2027 Fee Schedule.

RESOLUTION NO. 26-017

A RESOLUTION revising the City of Camas fee schedule for 2027.

WHEREAS, the City of Camas has established a Fee Schedule pursuant to its authority to establish fees and charges for services provided by the City; and

WHEREAS, it is prudent business to review fees and charges imposed by the City; and

WHEREAS, it is necessary to establish such fees at rates that reasonably assure recovery of the full direct and indirect costs of the time and materials expended to provide the service for which the fee is charged; and

WHEREAS, it should be understood that these fees and charges are an important part of the resources for the operation of the City and in many cases do not cover the costs involved; and

WHEREAS, the fee schedule and administrative provisions set forth in this resolution are supported by the analysis performed by the City and adjusted by inflation; and

WHEREAS, it is desirable to improve the City's ability to communicate its fees and charges to its citizens and customers through the preparation of a consolidated fee schedule.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF CAMAS AS FOLLOWS:

Section I

The fees and charges as shown on Attachment A are adopted and made part of the City of Camas Fee Schedule effective January 1, 2027.

Section II

On January 1 of each year, the fees set forth in this Resolution may increase (if allowed by law) by the rate of increase, if any, of the Consumer Price Index for All Urban Consumers (CPI-U) Western Region, All Items, July to July Index, published by the Bureau of Labor Statistics in the year prior. Fees will be rounded to the nearest whole dollar.

Resolution No. 26-017

Section III

ADOPTED by the Council of the City of Camas and approved by the Mayor this this _____ day of _____, 2026.

SIGNED:_____
Mayor

ATTEST:_____
Clerk

APPROVED as to form:

_____
City Attorney

2027 City of Camas Fee Schedule

Attachment A

Fee Description	Notes	2026 Adopted	2027 Proposed
ADMINISTRATIVE FEES			
Public Records			
Photocopies of Public Records, printed copies of electronic when requested by the person requesting records, or for use of agency equipment to photocopy records	per page; RCW 42.56.120	$ 0.15	$ 0.15
Public Records scanned into an electronic format or for use of agency equipment to scan records	per page; RCW 42.56.120	$ 0.10	$ 0.10
Each four electronic files or attachments uploaded to email, cloud-based data storage service or other electronic means	per 4 electronic files; RCW 42.56.120	$ 0.05	$ 0.05
Transmission of Public Records in an electronic format or for the use of agency equipment to send the records electronically	per gigabyte; RCW 42.56.120	$ 0.10	$ 0.10
Maps Printed		$ 11.00	$ 11.00
Non-Sufficient Funds / Returned Payments Processed		$ 40.00	$ 41.00
Photos	actual cost		
Digital storage media/device, mail container, postage/delivery charge	actual cost		
Customized technology expertise to prepare data or provide customized electronic access	actual cost; RCW 42.56.120 (3)(a)(i)		
Work crew Sign-Up Fee		$ 32.00	$ 33.00
FINANCE FEES			
Ambulance			
Late Fee		$ 41.00	$ 42.00
Cemetery			
Lots – Full Burial			
Adult – Flat Marker		$ 1,397.00	$ 1,439.00
Adult – Upright Marker		$ 2,921.00	$ 3,009.00
Child under 5 years in Garden of Angels		$ 381.00	$ 393.00
Cremated Remains			
Single Niche Garden of Faith		$ 1,143.00	$ 1,178.00
Single Niche Premium		$ 1,397.00	$ 1,439.00
Single Niche Standard		$ 1,143.00	$ 1,178.00
Double Niche Premium		$ 2,153.00	$ 2,218.00
Double Niche Standard		$ 1,809.00	$ 1,864.00
4 x 4 Foot Ground Lot		$ 668.00	$ 688.00
Liners			
Cremated Remains: Urn Vault Liner (Single Urn Vaults)		$ 292.00	$ 301.00
Cremated Remains: Urn Vault Liner (Double Urn Vaults)		$ 489.00	$ 504.00
Niche Wall (Single Bronze Urns)		$ 210.00	$ 216.00
Urn Vault Liner (Wooden Urns)		$ 343.00	$ 353.00
Open & Close Fees			
Disinterment Charges	in addition to staking & inspection fee and deed transfer fee	$ 636.00	$ 655.00
Cremains – Added with a Full Burial Lot		$ 489.00	$ 504.00
Cremains – 4 x 4 Lot		$ 489.00	$ 504.00
Cremains – Niche Wall	does not include engraving	$ 444.00	$ 458.00
Saturday Services	in addition to any other applicable fees	$ 318.00	$ 327.00
Sunday/Holiday Services	in addition to any other applicable fees	$ 571.00	$ 588.00
Locating, Marker & Staking Fees			
Staking & Inspection (cremated remains & grave lots)		$ 158.00	$ 163.00
Marker Setting Fee		$ 158.00	$ 163.00
Miscellaneous Additional Charges			
Remembrance Wall – Inscription	City fee is in addition to pass-through fees from vendor	$ 29.00	$ 30.00
Engraving of Niche Wall/Columbarium	City fee is in addition to pass-through fees from vendor	$ 29.00	$ 30.00
Deed Transfers/Replacement Deeds		$ 45.00	$ 46.00
Maintenance Fund - Lot		$ 254.00	$ 262.00
Maintenance Fund - Niche		$ 318.00	$ 327.00
Second Rite of Burial	3 burials per lot: one full burial and two cremated remains OR three cremated remains	$ 444.00	$ 458.00
Tent Rental		$ -	$ 125.00
Other License & Permits			
Dog License – lifetime		$ 45.00	$ 46.00
Dog License – replacement		$ 8.00	$ 8.00
Guard Dog		$ 79.00	$ 81.00
Pawnbroker's/Second Hand Dealer – 2 yr. license		$ 158.00	$ 163.00
Solicitor's License Application/Background Check		$ 66.00	$ 68.00
Solicitor's License New or Renewal		$ 45.00	$ 46.00
Special Event Permit		$ 59.00	$ 60.00
Taxicab – annual license	issued after 7/1 - half of fee	$ 59.00	$ 60.00
Taxicab per vehicle		$ 18.00	$ 18.00
Taxi Driver's License		$ 9.00	$ 10.00
Taxi Driver's License Renewal		$ 9.00	$ 10.00
Vehicle Restoration Permit		$ 36.00	$ 37.00
Utilities			
Lien and Lien Release Filing Fees	fee is in addition to pass-through fees from vendor, both lien & release charged at lien recording	$ 29.00	$ 30.00
New Utility Account Set-Up Fee		$ 34.00	$ 35.00
Title Check Fee	in addition to pass-through fee from vendor	$ 19.00	$ 19.00
Utility Late Fee	5% of past due balance with a minimum charge equivalent to current fee	$ 19.00	$ 19.00
Utility Service Call Fee	no charge for initial service call, fee for each additional callout thereafter	$ 34.00	$ 35.00

Fee Description	Notes	2026 Adopted	2027 Proposed
Water – Sewer			
Backflow Testing	testing fee depending on vendor bids	$ 31.00	$ 32.00
Backflow Testing Administrative Fee		$ 6.00	$ 6.00
Backflow Testing Non-Compliance Fee		$ 68.00	$ 70.00
Portable Hydrant Meter Rental – Deposit	refundable - damage dependent	$ 1,563.00	$ 1,550.00
Portable Hydrant Meter Rental – Placement Fee		$ 133.00	$ 136.00
Portable Hydrant Meter Replacement Fee	full replacement cost must be paid and deposit repaid, if necessary, before meter reinstalled		$ 2,500.00
STEP/STEF Inspection		$ 225.00	$ 232.00
STEP/STEF Reinspection	per inspection	$ 102.00	$ 105.00
Temporary Water Service	to be determined based on meter size and use as approved by PW Director		
Water Connection Other Time and Materials	1" In-Fill parcels Service Tap Only	$ 1,700.00	$ 1,750.00
Water Meter Installation – 3/4" Meter		$ 510.00	$ 525.00
Water Meter Installation – 1" Meter		$ 569.00	$ 586.00
Water Meter Installation – 1.5" Meter		$ 1,259.00	$ 1,297.00
Water Meter Installation – 2" Meter		$ 2,433.00	$ 2,506.00
2" Service with 1.5" Meter	in addition to 1.5" Water Meter Installation fee	$ 646.00	$ 665.00
Water Meter Installation Reinspection		$ 102.00	$ 105.00
Water Disconnection at Owner's Request		$ 46.00	$ 50.00
Water Disconnection for Non-Payment		$ 59.00	$ 60.00
Water Reconnection After Hours		$ 119.00	$ 120.00
Padlocking Water Meter		$ 59.00	$ 60.00
Removal of Water Meter		$ 59.00	$ 60.00
Wrongfully or Illegally Reconnection		$ 322.00	$ 332.00
Water Meter Testing Deposit	deposit is returned if meter is not within the operating range set by CMC 13.40.010	$ 285.00	$ 294.00
Solid Waste			
Bi–weekly service on off–week		$ 9.00	$ 10.00
Bulky Item Removal			
Barbeque		$ 29.00	$ 30.00
Bicycle		$ 15.00	$ 16.00
Christmas Tree	no taller than five feet	$ 15.00	$ 25.00
Table		$ 32.00	$ 33.00
Change Can Size		$ 14.00	$ 15.00
Extra Bag		$ 5.00	$ 5.00
Extra Can 35 gallon		$ 9.00	$ 10.00
Extra Can 65 gallon		$ 19.00	$ 20.00
Extra Can 95 gallon		$ 29.00	$ 30.00
Extra Yard (not in rented container)		$ 45.00	$ 48.00
Overfilling Can		$ 5.00	$ 5.00
Recycling	pass-through from vendor		
Replacement of damaged can			
35 gallon can		$ 76.00	$ 75.00
65 gallon can		$ 100.00	$ 100.00
Return Trip For Missed Service		$ 8.00	$ 8.00
Unscheduled Pick Up Charge (day other than normal service day)		$ 26.00	$ 27.00
LIBRARY			
Community Rooms			
Single Room			
Maintenance Charge:			
Non-Profit	no charge		
Private Functions	per hour	$ 65.00	$ 67.00
Cleaning deposit, if serving food (refundable);	cost exceeding deposit will be billed	$ 77.00	$ 80.00
Combined Room			
Maintenance Charge:			
Non-Profit	no charge		
Private Functions	per hour	$ 127.00	$ 130.00
Cleaning deposit, if serving food (refundable);	cost exceeding deposit will be billed	$ 152.00	$ 157.00
Kitchen Use			
Non-Profit		$ 21.00	$ 22.00
Private Functions		$ 43.00	$ 44.00
Closed Hours Staffing Fee			
Non-Profit	per hour in addition to hourly charge	$ 77.00	$ 80.00
Private Functions	per hour in addition to hourly charge	$ 77.00	$ 80.00
Non–refundable application fee			
Non-Profit			
Private Functions		$ 21.00	$ 22.00
Non–Resident Annual Fees			
Household		$ 174.00	$ 180.00
Lost & Damaged Materials: Default prices if not noted in bib record			
Audiobooks		$ 54.00	$ 56.00
Board book		$ 13.00	$ 13.00
Book discussion kit		$ 155.00	$ 160.00
Devices		$ 323.00	$ 333.00
DVD/Blu-Ray		$ 45.00	$ 47.00
Hardcover & Paperback Books		$ 41.00	$ 43.00
Interlibrary loan	plus material replacement cost – assessed by lending library	$ 34.00	$ 35.00
Launchpads	replacement cost		$ 150.00
Library of Things		$ 57.00	$ 130.00
Magazines & Documents		$ 9.00	$ 9.00
Playaway		$ 70.00	$ 80.00
Reference book	replacement cost – pass-through from vendor		
WhaZoodles	replacement cost		$ 115.00
Photocopies & Printing			
Black & White Photocopy/Printing per side		$ 0.10	$ 0.10
Color Photocopy/Printing per side		$ 0.50	$ 0.52
Specialty Paper	determined by Library Director		
Library cardholders will receive a credit of $2.50 per day towards the cost of prints.			

Fee Description	Notes	2026 Adopted	2027 Proposed
PARKS & RECREATION FEES			
Miscellaenous Park Fees			
City Event - Vendor Space Rent	determined by Parks Director		
Facility Rentals			
Camas Community Center Rental			
Reception Room – Midweek	per day	$ 125.00	$ 140.00
Reception Room – Weekend	per day	$ 250.00	$ 280.00
Reception Room – Long Term Use	per hour	$ 30.00	$ 35.00
Conference Room – Midweek	per day	$ 100.00	$ 105.00
Conference Room – Weekend	per day	$ 200.00	$ 210.00
Conference Room – Long Term Use	per hour	$ 30.00	$ 35.00
Ball Room – Midweek	per day	$ 225.00	$ 240.00
Ball Room – Weekend	per day	$ 450.00	$ 480.00
Ball Room – Long Term Use	per hour	$ 30.00	$ 35.00
Kitchen – Midweek	per day	$ 50.00	$ 55.00
Kitchen – Weekend	per day	$ 100.00	$ 110.00
Deposit – refundable		$ 500.00	$ 500.00
Alcohol Use Fee		$ 150.00	$ 150.00
Key Call Back Fee		$ 175.00	$ 175.00
Long Term Users will be charged per hour	must pay for 6 months to be long term user	$ 30.00	$ 35.00
Midweek is Monday through Thursday and Friday until 2:00 p.m.			
Weekends are Fridays after 2:00 p.m. through Sunday			
No rental fee will be charged to non-profit groups who are community-based and IRS recognized, City of Camas sponsored events, school sponsored events or governmental agencies that reserve the facility Monday through Thursday, between the hours of 8:00 a.m. and 5:00 p.m. and Friday before 2:00 p.m.			
Mid-week daily rate will be charged for weekend reservations (Friday after 2:00 p.m. through Sunday).			
Camas residents will receive 20% discount			
Fallen Leaf Lake Park Rental			
Monday through Thursday	per day	$ 275.00	$ 300.00
Fridays, Saturdays, Sundays and Holidays	per day	$ 500.00	$ 525.00
Deposit – refundable		$ 500.00	$ 500.00
Alcohol Use Fee		$ 150.00	$ 150.00
Key Call Back Fee		$ 175.00	$ 175.00
Camas residents will receive 20% discount			
Non-profit groups renting on weekends will be charged mid-week rates			
Lacamas Lake Lodge Rental			
Main Hall	hourly; Saturday – 5 hr. minimum; all other days – 2 hr. minimum	$ 275.00	$ 300.00
Main Hall – public agencies	hourly; mid-week excluding Fridays during normal business hours	$ 100.00	$ 105.00
Deposit – refundable	per day	$ 500.00	$ 500.00
Room 1A	hourly; Saturday – 5 hr. minimum; all other days – 2 hr. minimum	$ 50.00	$ 50.00
Deposit – refundable	per day	$ 200.00	$ 200.00
Room 1B	hourly; Saturday – 5 hr. minimum; all other days – 2 hr. minimum	$ 50.00	$ 50.00
Deposit – refundable	per day	$ 200.00	$ 200.00
AV Equipment	per day	$ 100.00	$ 120.00
Alcohol Use Fee		$ 150.00	$ 150.00
Non-profit will receive a 20% discount off the hourly rate			
Cancellation must be received a minimum of 61 days prior to the event to receive a full refund. A 50% refund will be allowed if cancellation notices is received 30–60 days prior to the event.			
No refunds will be made with less than a 30 day notice.			
Camas residents will receive 20% discount			
POLICE DEPARTMENT			
Background/Clearance Letters		$ 15.00	$ 16.00
Body Worn Camera Recording Preparation	RCW 42.56.240 (14)(f)(i)	$ 1.39	
Full Screen Redaction	per minute of footage - screen fully blurred or blacked out		$ 0.63
Audio Redaction	per minute of footage - removal of exempt audio		$ 0.63
Targeted Video Redaction	per minute of footage - partial screen obscured, frame-by-frame redaction		$ 6.30
Body Worn Camera Recording Preparation - Deposit	10% of estimated Recording Preparation fee		
For requests of footage of less than 480 minutes	deposit may be required for complex requests, as determined by Police Chief		
For requests of footage of 480 minutes or more	Greater of $300 or 10% of estimated recording preparation fee		
Concealed Pistol Licenses	pass-through, with local distribution set by RCW 9.41.070		
Fingerprint Cards	per card	$ 23.00	$ 24.00
Lost/Unreturned Community Room Key		$ 34.00	$ 35.00
Police Case Reports (no charge to victim)	per page; RCW 42.56.120	$ 0.19	$ 0.15
Police Copies	per page; RCW 42.56.120	$ 0.19	$ 0.15
Record Checks/Non-Criminal Justice Agency inc. Military Services		$ 15.00	$ 16.00
Video Delivery Fee	per flash drive or DVD	$ 6.00	$ 6.00
COMMUNITY DEVELOPMENT, BUILDING, ENGINEERING & PLANNING FEES			
System Development Charges			
Water			
Accessory Dwelling Unit	no additional charge		
Residential/Commercial – 3/4" water meter		$ 9,449.00	$ 9,694.00
Residential/Commercial – 1" water meter		$ 15,747.00	$ 16,157.00
Residential/Commercial – 1.5" water meter		$ 31,492.00	$ 32,311.00
Residential/Commercial – 2" water meter		$ 50,341.00	$ 51,650.00
Residential/Commercial – 3" water meter		$ 100,776.00	$ 103,396.00
Residential/Commercial – 4" water meter		$ 157,463.00	$ 161,557.00
Residential/Commercial – 6" water meter		$ 314,924.00	$ 323,112.00
Residential/Commercial – 8" water meter		$ 503,879.00	$ 516,980.00
Industrial/Other	calculated by mandatory engineering study		
Sewer			
Residential		$ 7,496.00	$ 7,691.00
Commercial – 3/4" water meter		$ 7,496.00	$ 7,691.00
Commercial – 1" water meter		$ 12,492.00	$ 12,817.00
Commercial – 1.5" water meter		$ 24,984.00	$ 25,634.00
Commercial – 2" water meter		$ 39,974.00	$ 41,014.00
Commercial – 3" water meter		$ 74,951.00	$ 76,900.00
Commercial – 4" water meter		$ 124,920.00	$ 128,168.00
Commercial – 6" water meter	calculated by PW Director		
Commercial – 8" water meter	calculated by PW Director		
Commercial II / Industrial	calculated by PW Director		
Accessory dwelling unit (internal)	no additional charge		
Accessory dwelling unit (external)	no additional charge		

Fee Description	Notes	2026 Adopted	2027 Proposed
Impact Fees			
Park/Open Space			
Residential Scaled by Square Footage (SF)			
0 to 1,000 SF		$ 4,310.00	$ 4,422.00
1,001 to 2,000 SF		$ 7,896.00	$ 8,101.00
2,001 to 2,600 SF		$ 11,983.00	$ 12,295.00
2,601 SF and above		$ 13,712.00	$ 14,068.00
Accessory Dwelling Units by SF	thresholds set to ensure charges do not exceed 50% of the charge for the principal unit		
Principal Dwelling Unit sized 0 to 1,000 SF		$ 2,155.00	$ 2,211.00
Principal Dwelling Unit sized 1,001 to 2,000 SF		$ 3,948.00	$ 4,050.00
Principal Dwelling Unit sized 2,001 SF and above		$ 4,310.00	$ 4,422.00
Non-Residential Land Uses per SF	can be custom calculation when land use does not match one of the provided industries		
Industrial		$ 0.26	$ 0.27
Retail		$ 0.48	$ 0.49
Office		$ 0.49	$ 0.50
Healthcare		$ 0.64	$ 0.65
Transportation – North District			
Single Family (detached)		$ 11,047.00	$ 11,478.00
Apartment	per dwelling unit	$ 6,361.00	$ 6,609.00
Duplex/Townhome	per dwelling unit	$ 6,807.00	$ 7,072.00
Accessory dwelling unit (internal)		$ 2,762.00	$ 2,870.00
Accessory dwelling unit (external)		$ 3,867.00	$ 4,017.00
Commercial	calculated by PW Director		
Transportation – South District			
Single Family (detached)		$ 4,262.00	$ 4,428.00
Apartment	per dwelling unit	$ 2,454.00	$ 2,550.00
Duplex/Townhome	per dwelling unit	$ 2,626.00	$ 2,728.00
Accessory dwelling unit (internal)		$ 1,066.00	$ 1,107.00
Accessory dwelling unit (external)		$ 1,492.00	$ 1,550.00
Commercial	calculated by PW Director		
Fire			
Single Family (detached)	per square foot	$ 0.72	$ 0.73
Accessory dwelling unit (external)	per square foot	$ 0.72	$ 0.73
Apartment/Duplex/Townhome	per square foot	$ 0.39	$ 0.40
Commercial	per square foot	$ 0.93	$ 0.95
Administrative Fee		$ -	$ 40.00
School – Camas School District			
School Impact Fee – Single Family		$ 6,650.00	$ 6,650.00
School Impact Fee - Duplex/Townhome	per dwelling unit	$ 6,650.00	$ 6,650.00
School Impact Fee – Multi–Family		$ 6,650.00	$ 6,650.00
School Impact Fee – Accessory dwelling units (internal)	25% of single family rate		
School Impact Fee – Accessory dwelling units (external)	35% of single family rate		
Administrative Fee	CMC 3.88.100 (D)	$ -	$ 40.00
Other Impact Fees			
Impact Fee Deferral	City Fee	$ 629.00	$ 655.00
Lien/Release Filing Fees	Clark County pass-thru - lien and release fee per dwelling: clark.wa.gov/auditor/recording-guide		
Building Fees			
Building Permit Fees Total Valuation			
Building permit fees are based on the valuation of construction. *The valuation of work for new structures will be based off the total project valuation based on the ICC Building Valuation Table from August of the prior year or Applicants stated valuation, whichever is greater.* *The valuation of work for existing structures undergoing an alternation will be based on fair market labor and materials cost.*			
$1.00 to $500.00		$ 37.00	$ 39.00
$501.00 to $2,000.00			
for the first $500		$ 37.00	$ 39.00
for each additional $100, or fraction thereof, to and including $2,000		$ 5.00	$ 5.00
$2,001.00 to $25,000.00			
for the first $2,000		$ 115.00	$ 119.00
for each additional $1,000, or fraction thereof, to and including $25,000		$ 23.00	$ 24.00
$25,001.00 to $50,000.00			
for the first $25,000		$ 627.00	$ 652.00
for each additional $1,000, or fraction thereof, to and including $50,000		$ 16.00	$ 16.00
$50,001.00 to $100,000.00			
for the first $50,000		$ 1,018.00	$ 1,059.00
for each additional $1,000, or fraction thereof, to and including $100,000		$ 12.00	$ 12.00
$100,001.00 to $500,000.00			
for the first $100,000		$ 1,607.00	$ 1,671.00
for each additional $1,000, or fraction thereof, to and including $500,000		$ 10.00	$ 10.00
$500,001.00 to $1,000,000.00			
for the first $500,000		$ 5,268.00	$ 5,480.00
for each additional $1,000, or fraction thereof, to and including $1,000,000		$ 8.00	$ 9.00
$1,000,001.00 and up			
for the first $1,000,000		$ 9,191.00	$ 9,561.00
for each additional $1,000, or fraction thereof		$ 6.00	$ 6.00
New Residential Accessory Structures	If not in ICC Building Valuation Table, fee will be 50% of a U-Utility Occupants of VB Construction		
Washington State Surcharge Pass-Through Fee: Residential	Per RCW 19.27.085	$ 6.50	$ 6.50
Washington State Surcharge Pass-Through Fee: Commercial	Per RCW 19.27.085	$ 25.00	$ 25.00
Washington State Surcharge Pass-Through Fee: Multi-Family	Per RCW 19.27.085 - includes first unit	$ 25.00	$ 25.00
Each additional unit after one		$ 2.00	$ 2.00

Fee Description	Notes	2026 Adopted	2027 Proposed
Building Valuation Table			
Building Valuation Table – August prior year	100% of ICC Building Safety Journal Building Valuation Data		
Building Inspections & Fees			
Building Plan Review Fee	65% of the Building Permit Fee		
"Same As" Residential Plan Review Fee	32.5% of the Building Permit Fee		
Inspections During Non-Business Hours (minimum charge 2 hours)	per hour	$ 109.00	$ 113.00
Re-inspection Fees	per hour	$ 109.00	$ 113.00
Inspections for which No Fee is Specifically Indicated (minimum charge – one half	per hour	$ 109.00	$ 113.00
Inspection for work started without a permit	fee is double the fee that would have been charged if a permit was obtained prior to work initiated		
Additional Plan Review for Changes, Additions or Revisions to Plans (minimum charge – one half hour)	per hour	$ 109.00	$ 113.00
Use of Outside Consultants for Plan Checking and Inspections, or both	actual costs (include administrative and overhead costs)		
Reissue of Lost Permit		$ 53.00	$ 55.00
Reissue of Lost or Damaged Approved Construction Plans & Documents		$ 109.00	$ 113.00
Latecomer Pass-Through Fee / Transfer of Developer Credits		$ 75.00	$ 78.00
Mechanical Fees			
Mechanical Permit		$ 54.00	$ 57.00
Mechanical Plan Review	65% of the Mechanical Permit Fee		
For the installation or relocation of each forced-air or gravity-type furnace or burner, including ducts and vents attached to such appliance			
Up to and including 100,000 Btu/h (29.3kW)		$ 37.00	$ 39.00
Over 100,000 Btu/h (29.3kW)		$ 45.00	$ 47.00
For the installation or relocation of each floor furnace, including vent		$ 37.00	$ 39.00
For the installation or relocation of each mini split, heat pump, or A/C unit		$ 37.00	$ 39.00
For the installation or relocation of each suspended heater, recessed wall heater or floor-mounted heater		$ 37.00	$ 39.00
Repairs or Additions			
Repair or alteration or addition to heating appliance, refrigeration unit, cooking unit, absorption unit or heating, cooling, absorption or evaporative cooling system including installation of controls regulated by Mechanical Code		$ 32.00	$ 33.00
Boilers, Compressor and Absorption Systems			
For the installation or relocation of each boiler or compressor to and including 3 horsepower (10.6 kW), or each absorption system to and including 100,000 Btu/h (29.3kW)		$ 37.00	$ 39.00
For the installation or relocation of each boiler or compressor over 3 horsepower (10.6 kW), to and including 15 horsepower (52.7 kW) or each absorption system over 100,000 Btu/h (29.3 kW) to and including 500,000 Btu/h (146.6 kW)		$ 68.00	$ 70.00
For the installation or relocation of each boiler or compressor over 15 horsepower (52.7 kW), to or including 30 horsepower (105.5 kW), or each absorption system over 500,000 Btu/h (146.6 kW) to and including 1,000,000 Btu/h (293.1 kW)		$ 91.00	$ 94.00
For the installation or relocation of each boiler or compressor over 30 horsepower (105.5 kW), to or including 50 horsepower (176 kW), or each absorption system over 1,000,000 Btu/h (293.1 kW) to and including 1,750,000 Btu/h (512.9 kW)		$ 128.00	$ 133.00
For the installation or relocation of each boiler or compressor over 50 horsepower (176 kW), or each absorption system over 1,750,000 Btu/h (512.9 kW)		$ 211.00	$ 220.00
Air Handlers			
For each air-handling unit to and including 10,000 cubic feet per minute (cfm) (4719 L/s), including ducts attached thereto	This fee does not apply to an air-handling unit which is a portion of a factory-assembled appliance, cooling unit, evaporative cooler or absorption unit for which a permit is required elsewhere in the Mechanical Code	$ 27.00	$ 28.00
For each air-handling unit greater than 10,000 cubic feet per minute (cfm) (4719L/s)		$ 46.00	$ 48.00
Evaporative Coolers			
For each evaporative cooler, other than a portable type		$ 25.00	$ 26.00
Ventilation & Exhaust			
For each ventilation fan connected to a single duct		$ 18.00	$ 19.00
For each ventilation system which is not a portion of any heating or air-conditioning system authorized by a permit		$ 27.00	$ 28.00
For the installation of each hood which is served by a mechanical exhaust, including ducts for such hood		$ 27.00	$ 28.00
Incinerators			
For the installation or relocation of each domestic-type incinerator		$ 46.00	$ 48.00
For the installation or relocation of each commercial or industrial-type incinerator		$ 33.00	$ 35.00
Miscellaneous			
For each appliance or piece of equipment regulated by the Mechanical Code but not classed in other appliance categories, or for which no other fee is listed		$ 24.00	$ 25.00
Gas Piping System			
For each gas piping mechanical system of one to four outlets			
one to four outlets		$ 12.00	$ 13.00
more than 4	fee for each additional gas piping outlet	$ 4.00	$ 4.00
For each hazardous process piping system (HPP) of one to four outlets			
one to four outlets		$ 12.00	$ 13.00
more than 4	fee for each additional outlet	$ 4.00	$ 4.00
For each non-hazardous process piping system (NPP) of one to four outlets			
one to four outlets		$ 7.00	$ 7.00
more than 4	fee for each additional outlet	$ 4.00	$ 4.00
Plumbing Fees			
For issuance of each permit		$ 54.00	$ 57.00
Plumbing Plan Review	65% of the Plumbing Permit Fee		
For each plumbing fixture on one trap or a set of fixtures on one trap (including water, drainage piping and backflow protection thereof)		$ 18.00	$ 19.00
For each building sewer and each trailer park sewer		$ 37.00	$ 39.00
Rainwater systems – per drain (inside building)		$ 18.00	$ 19.00
For each water heater and/or vent		$ 18.00	$ 19.00
For each gas piping plumbing system of one to four outlets			
one to four outlets		$ 12.00	$ 13.00
more than 4	fee for each additional outlet	$ 4.00	$ 4.00
For each industrial waste pretreatment interceptor including its trap and vent, except kitchen-type grease interceptors functioning as fixture traps		$ 18.00	$ 19.00
For each installation, alteration or repair of water piping and/or water treating equipment	each	$ 18.00	$ 19.00
For each repair or alteration of drainage or vent piping, each fixture		$ 18.00	$ 19.00
For each backflow protective device			
two inch (51 mm) diameter and smaller		$ 18.00	$ 19.00
over two inch (51 mm) diameter		$ 37.00	$ 39.00
For each graywater system	plumbing plan review required	$ 91.00	$ 94.00
For each medical gas piping system for a specific gas			
one to four inlet(s)/outlet(s)		$ 112.00	$ 117.00
more than 4	fee for each additional medical gas inlet(s)/outlet(s)	$ 12.00	$ 13.00

Fee Description	Notes	2026 Adopted	2027 Proposed
Other Inspections & Fees			
Demolition Permit		$ 36.00	$ 38.00
Residential Re-Roofing		$ 187.00	$ 195.00
Residential Siding		$ 187.00	$ 195.00
Commercial Re-Reroofing		$ 413.00	$ 430.00
Commercial Siding		$ 413.00	$ 430.00
Administrative Fee – Residential Permits		$ 75.00	$ 78.00
Addressing Changes (minimum charge – one hour)	per hour	$ 109.00	$ 113.00
Engineering Fees			
Additional Plan Review for Changes, Additions or Revisions to Plans (minimum charge – one half hour)	per hour	$ 109.00	$ 113.00
Encroachment Permit			
first $1,500 construction value		$ 46.00	$ 48.00
over $1,500 construction value	fee plus 2.5% of construction value	$ 46.00	$ 48.00
Encroachment Permit extension		$ 39.00	$ 40.00
Engineering Plan Review	1% Plan Review		
Engineering Construction Inspection Fee	2% Construction Inspection		
Franchise Agreement Administrative Fee		$ 6,882.00	$ 7,159.00
Gates/Barrier on Private Street Review Fee		$ 1,376.00	$ 1,432.00
Grading Inspection Outside Normal Work Hours	per hour, 2 hour minimum	$ 109.00	$ 113.00
Inspection Outside Normal Work Hours	per hour	$ 109.00	$ 113.00
Inspections for Which No Fee is Specifically Indicated	per hour, minimum charge 1/2 hour	$ 109.00	$ 113.00
Modification to Approved Engineering Construction Plans		$ 555.00	$ 577.00
Re-inspection Fees	per hour, 2 hour minimum	$ 109.00	$ 113.00
Storm Water ***Only*** Review Fee – Single Family Residence	in-fill parcels only	$ 275.00	$ 287.00
Planning Fees			
Administrative Lot Split			$ 2,000.00
Annexation – 10% petition		$ 1,141.00	$ 1,500.00
Annexation – 60% petition		$ 4,848.00	$ 5,044.00
Appeal Fee		$ 1,560.00	$ 1,623.00
Archaeological Review		$ 181.00	$ 189.00
Binding Site Plan		$ 2,483.00	$ 2,583.00
plus fee per unit		$ 29.00	$ 30.00
Boundary Line Adjustment		$ 137.00	$ 142.00
Code Enforcement Appeal			$ 500.00
Comprehensive Plan Amendment		$ 7,700.00	$ 8,010.00
Conditional Use Permit – Residential		$ 4,516.00	$ 4,698.00
plus fee per unit		$ 127.00	$ 132.00
Conditional Use Permit – Non-Residential		$ 5,720.00	$ 5,950.00
Continuance of Public Hearing		$ 692.00	$ 720.00
Critical or Sensitive Areas	fee per type		
Critical Aquifer		$ 1,025.00	$ 1,066.00
Frequently Flooded		$ 1,025.00	$ 1,066.00
Geological Hazard		$ 1,025.00	$ 1,066.00
Habitat Conservation		$ 1,025.00	$ 1,066.00
Wetlands		$ 1,025.00	$ 1,066.00
Design Review – Minor		$ 573.00	$ 800.00
Design Review – Committee		$ 3,139.00	$ 3,265.00
Development Agreement	first hearing	$ 1,159.00	$ 1,205.00
Continuance or Additional Hearing		$ 713.00	$ 742.00
Director's Intrepretation		$ 423.00	$ 440.00
Home Occupation – Minor	notification		
Home Occupation – Major		$ 91.00	$ 94.00
LI/BP Development		$ 5,720.00	$ 5,950.00
plus fee per 1,000 sf of GFA		$ 50.00	$ 52.00
Minor Modification to Approved Development		$ 457.00	$ 475.00
Planned Residential Development	per unit plus subdivision fee	$ 46.00	$ 48.00
Plat, Preliminary – Short Plat	4 lots or less: per lot	$ 2,559.00	$ 2,662.00
Plat, Preliminary – Short Plat	5 lots or more	$ 9,482.00	$ 9,864.00
plus fee for each lot		$ 302.00	$ 314.00
Plat, Preliminary Subdivision		$ 9,482.00	$ 9,864.00
plus fee for each lot		$ 302.00	$ 314.00
Plat, Final – Short Plat		$ 265.00	$ 1,000.00
Plat, Final – Subdivision		$ 3,139.00	$ 3,265.00
Plat Modification/Alteration		$ 1,580.00	$ 1,644.00
Pre-Application Conference for Type III or IV	general	$ 468.00	$ 486.00
Pre-Application Conference for Type III or IV	subdivision	$ 1,203.00	$ 1,252.00
SEPA		$ 1,070.00	$ 1,114.00
Shoreline Conditional Use Permit			
Shoreline Exemption		$ 416.00	$ 433.00
Shoreline Permit		$ 1,580.00	$ 1,644.00
Shoreline Variance			
Sign Permit – General Sign	exempt if building permit is required	$ 54.00	$ 57.00
Sign Permit – Master Sign Permit		$ 167.00	$ 173.00
Site Plan Review – Residential		$ 1,521.00	$ 1,582.00
plus fee per lot		$ 41.00	$ 43.00
Site Plan Review – Non-Residential		$ 3,801.00	$ 3,954.00
plus fee per 1,000 sf of GFA		$ 82.00	$ 85.00
Site Plan Review – Mixed Use		$ 5,358.00	$ 5,574.00
plus fee per residential unit		$ 41.00	$ 43.00
plus fee per 1,000 sf of GFA		$ 82.00	$ 85.00
Temporary Use Permit		$ 106.00	$ 111.00
Unit Lot Subdivision		$ 2,000.00	$ 2,081.00
Variance – Minor		$ 918.00	$ 955.00
Variance – Major		$ 1,712.00	$ 1,781.00
Zone Change	single tract	$ 4,421.00	$ 4,599.00

Fee Description	Notes	2026 Adopted	2027 Proposed
Sexually Oriented Businesses			
Live Entertainment Application Fee		$ 1,128.00	$ 1,162.00
Live Entertainment License Fee	renewal Date 12/31	$ 378.00	$ 389.00
Live Entertainment Renewal Fee		$ 378.00	$ 389.00
Live Entertainment Renewal Fee – 1/2 Year	after 6/30	$ 197.00	$ 203.00
Other Sexually Oriented Business Application Fee		$ 754.00	$ 777.00
Other Sexually Oriented Business License Fee	renewal Date 12/31	$ 378.00	$ 389.00
Other Sexually Oriented Business Renewal Fee		$ 378.00	$ 389.00
Other Sexually Oriented Business Renewal Fee – 1/2 Year	after 6/30	$ 198.00	$ 204.00
Manager's License Application Fee		$ 158.00	$ 163.00
Manager's License Fee	renewal Date 12/31	$ 79.00	$ 81.00
Manager's License Renewal Fee		$ 79.00	$ 81.00
Manager's License Renewal Fee – 1/2 Year	after 6/30	$ 45.00	$ 46.00
Entertainer's License Application Fee		$ 158.00	$ 163.00
Entertainer's License Fee	renewal Date 12/31	$ 80.00	$ 82.00
Entertainer's License Renewal Fee		$ 80.00	$ 82.00
Entertainer's License Renewal Fee – 1/2 Year	after 6/30	$ 45.00	$ 46.00

2027 City of Camas Internal Service Rates

Attachment A

Department/User	General Ledger Account	Monthly	Annual
EQUIPMENT RENTAL RATES			
Admin Services (Motor Pool)	0001.10.0000.070.5189000.540520.	$ 1,688.11	$ 20,257.32
Engineering	0001.10.0000.130.5189000.540520.	$ 6,152.04	$ 73,824.48
Police	0001.20.0000.090.5212000.540520.	$ 46,260.12	$ 555,121.44
Work Crew	0001.20.0000.100.5233000.540520.	$ 1,974.19	$ 23,690.28
Building	0001.58.0000.160.5585000.540520.	$ 2,906.18	$ 34,874.16
Parks & Recreation	0001.70.0000.180.5710000.540520.	$ 1,770.55	$ 21,246.60
Parks Maintenance	0001.70.1800.180.5768000.540520.	$ 26,136.04	$ 313,632.48
Streets Maintenance	1120.40.0000.400.5423000.540520.	$ 24,288.29	$ 291,459.48
Streets Administration	1120.40.0000.400.5429000.540520.	$ 675.51	$ 8,106.12
Cemetery	1250.50.0000.490.5360000.540520.	$ 6,075.32	$ 72,903.84
Storm Water	4190.31.0000.610.5310000.540520.	$ 25,265.90	$ 303,190.80
Solid Waste Collection	4220.37.0000.680.5370000.540520.	$ 34,058.16	$ 408,697.92
Water/Sewer Administration	4400.34.0000.720.5340000.540520.	$ 1,343.92	$ 16,127.04
Water Distribution	4400.34.0000.730.5340000.540520.	$ 18,642.21	$ 223,706.52
Sewer Collection	4400.34.0000.800.5350000.540520.	$ 18,806.94	$ 225,683.28
Sewer Treatment	4400.34.0000.820.5350000.540520.	$ 7,301.26	$ 87,615.12
Facilities Maintenance	5300.10.0000.260.5183000.540520.	$ 3,777.04	$ 45,324.48
FACILITY RENTAL RATES			
Legislative	0001.10.0000.010.5116000.540530.	$ 476.33	$ 5,716.00
Municipal Court	0001.10.0000.020.5125000.540530.	$ 13,305.42	$ 159,665.00
Executive	0001.10.0000.030.5131000.540530.	$ 967.67	$ 11,612.00
Finance	0001.10.0000.040.5142000.540530.	$ 3,132.83	$ 37,594.00
Human Resources	0001.10.0000.060.5181000.540530.	$ 206.17	$ 2,474.00
Admin Services	0001.10.0000.070.5189000.540530.	$ 1,376.67	$ 16,520.00
Information Technology	0001.10.0000.080.5188000.540530.	$ 8,280.50	$ 99,366.00
Engineering	0001.10.0000.130.5189000.540530.	$ 2,180.92	$ 26,171.00
Police	0001.20.0000.090.5212000.540530.	$ 19,409.92	$ 232,919.00
Work Crew	0001.20.0000.100.5233000.540530.	$ 1,677.17	$ 20,126.00
Community Development	0001.58.0000.140.5593000.540530.	$ 530.17	$ 6,362.00
Planning	0001.58.0000.150.5586000.540530.	$ 1,110.25	$ 13,323.00
Building	0001.58.0000.160.5585000.540530.	$ 1,922.17	$ 23,066.00
Parks & Recreation	0001.70.0000.180.5751000.540530.	$ 9,217.67	$ 110,612.00
Library	0001.70.0000.200.5725000.540530.	$ 32,915.50	$ 394,986.00
Streets	1120.40.0000.400.5429000.540530.	$ 6,062.75	$ 72,753.00
Fire & EMS	*Invoice Regional Fire Authority: FMO & Stn 41*	$ 20,198.33	$ 242,380.00
Legacy Lands	3200.72.0000.000.5769000.540530.	$ 11,431.00	$ 137,172.00
Storm Water	4190.31.0000.610.5310000.540530.	$ 2,829.33	$ 33,952.00
Solid Waste	4220.37.0000.680.5370000.540530.	$ 3,837.92	$ 46,055.00
Water	4400.34.0000.720.5340000.540530.	$ 4,049.58	$ 48,595.00
Equipment Rental	5200.48.0000.900.5486000.540530.	$ 6,418.75	$ 77,025.00

Staff Report – Public Hearing and Ordinance for Criminal Justice Sales Tax

November 16, 2026 Council Meeting

Presenters: Camas Police Chief Tina Jones and Administrative Services Director Jennifer Gorsuch
Time Estimate: 15 minutes

Phone	Email
360.817.4151	tjones@cityofcamas.us

BACKGROUND: Council has an opportunity to consider community comments during a public hearing for the Criminal Justice Sales tax authorized by House Bill 2015. This House Bill authorized jurisdictions to establish a .1% sales tax with funds going towards criminal justice purposes. The sales tax, if approved, can provide an estimated $800,000 annually to the City of Camas to support police and municipal court expenses to improve safety in our community. Staff presented information on the House Bill and criminal justice sales tax during the August 17, 2026, City Council Workshop.

SUMMARY:

The sales tax considerations include:

- The tax is .1% which translates to 10 cents in tax for the consumer for every $100 in sales.
- The tax can be imposed by councilmanic action through June 30, 2028.
- The tax can be stacked with other sales taxes and is not shared with other jurisdictions.
- The sales tax usage is for "criminal justice purposes" which includes police and court expenses.

The revenue can help support the additional needs and stresses on our police department and municipal court. As our community grows, there is added strain to our police and court systems. The funding can help offset some of those costs by providing steady revenue to support staff, equipment, contract support, and other criminal justice needs. One area where there are identified future costs is for indigent defense. The increasing legislative restrictions on indigent defense caseloads are expected to increase over time.

The sales tax will impact the local taxpayer by adding a fraction of a percentage to the sales tax currently collected. This is the same amount increase other jurisdictions in the region have experienced with the adoption of this sales tax. For example, Clark County, Battleground, Ridgefield, Vancouver, and Washougal have all approved this sales tax within their jurisdictions. If approved, any tax revenue generated in Camas stays in Camas and goes directly to funding police and municipal court needs.

The Police Chief submitted a grant proposal to the Criminal Justice Training Commission related to House Bill 2015. The review committee determined the application met the numerous requirements to qualify and an award was granted. The qualifications for the grant and the criminal justice sales tax are the same.

STRATEGIC PLAN NEXUS: This topic is related to the Safe & Accessible priority of the Camas Strategic Plan.

BENEFITS TO THE COMMUNITY: Being able to continue to provide high level police and municipal court services in a growing city is important. Having a stable revenue source which supports this area where costs and demand on services continue to increase is important. This sales tax will help provide specific revenue to support safety as the city grows.

POTENTIAL CHALLENGES: Increasing sales tax could negatively impact some consumers in a time when costs for products and services have increased.

BUDGET IMPACT: If approved, the criminal justice sales tax may generate an estimated $800,000 annually to fund police and court services. If approved in November 2027, the sales tax collection would not start until April of 2028, which would mean an estimated $600,000 in revenue to support criminal justice expenses in 2027.

RECOMMENDATION: Staff recommends Council open a Public Hearing to consider public comments and upon closing the public hearing, consider adopting Ordinance 26-012.

Ordinance 26-012

AN ORDINANCE OF THE CITY OF CAMAS, WASHINGTON, ENACTING AN ADDITIONAL SALES AND USE TAX OF ONE-TENTH OF ONE PERCENT, AS AUTHORIZED IN SECTION 201, CHAPTER 350, LAWS OF WASHINGTON 2025, FOR CRIMINAL JUSTICE PURPOSES; ADDING A NEW SECTION TO CHAPTER 3.08 OF THE CAMAS MUNICIPAL CODE ENTITLED "PUBLIC SAFETY SALES AND USE TAX"; AND PROVIDING FOR SEVERABILITY AND ESTABILISHING AN EFFECTIVE DATE.

WHEREAS, the Legislature enacted House Bill 2015 in the 2025 legislative session to provide qualified cities, towns, or counties to authorize, by resolution or ordinance, a new local optional sales and use tax of one-tenth of one percent (0.1%) for criminal justice purposes; and

WHEREAS, the City Council seeks to enhance criminal justice funding; and

WHEREAS, the City Council finds that the city, through its law enforcement agency, the Camas Police Department, meets the requirements to receive a grant from the Local Law Enforcement Grant Program created in Section 101, Chapter 350, Laws of Washington 2025; and

WHEREAS, the city receives distributions from the sales and use tax authorized by RCW 82.14.340 for criminal justice purposes and receives distributions from the public safety sales and use tax authorized by RCW 82.14.450 for public safety; and

WHEREAS, the city voters have not repealed by referendum the criminal justice sales tax imposed pursuant to RCW 82.14.340 or rejected a ballot proposition to impose the public safety sales tax authorized by RCW 82.14.450 in the previous 12 months;

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF CAMAS, WASHINGTON, DO ORDAIN AS FOLLOWS:

A. **Section 1. Findings.** The City Council finds that the city, through its law enforcement agency, Camas Police Department, will meet the requirements to receive a grant from the Local Law Enforcement Grant Program created in Section 101, Chapter 350, Laws of Washington 2025, by the implementation of this tax, having:

1. Issued and implemented policies consistent with RCW 43.17.425 and 10.93.160, and the office of the Attorney General's Keep Washington Working Act guide, model policies, and training recommendations for state and local law enforcement agencies;
2. Participated in commission trainings as required by RCW 43.101.455 and 36.28A.445;
3. Issued and implemented policies and practices regarding use of force and de-escalation tactics consistent with RCW 10.120.030 and the Office of the Attorney General's model policies, and all other commission and Attorney General model policies regarding use of

force for law enforcement, including, but not limited to, duty to intervene and training and use of canine teams;

4. Implemented use of force data collection and reporting consistent with chapters 10.118 and 10.120 RCW when the program is operational, as confirmed by a notice from the Attorney General's office to all police chiefs and sheriffs;
5. Issued and implemented policies and practices consistent with chapters 7.105 and 9.41 RCW and the commission model policies and training addressing firearm relinquishment pursuant to court orders;
6. A 25 percent officer completion rate with the commission's 40-hour crisis intervention team training;
7. A 100 percent officer compliance rate for those officers required to complete trauma-informed, gender-based violence interviewing, investigation, response, and case review training developed or approved by the commission pursuant to RCW 43.101.272 and 43.101.276, and if requested by the commission, participated in agency case reviews;
8. Received funding from a sales and used tax authorized pursuant to RCW 82.14.340 or RCW 82.14.450;
9. A chief of police who is certified by the criminal justice training commission, and who has not been convicted of a felony anywhere in the United States or under foreign law, or been convicted of a gross misdemeanor involving moral turpitude, dishonesty, fraud, or corruption; and
10. Issued and implemented policies and practices that prohibit volunteers who assist with agency work from enforcing criminal laws, other than for assistance with special event traffic and parking, including engaging in pursuits, detention, arrests, the use of force, or the use of deadly force; carrying or the use of firearms or other weapons; or the use of dogs to track people or animals other than for purposes of search and rescue; and that set forth the required supervision of volunteers, including that they must be clearly identifiable by the public as distinguishable from peace officers and any identifying insignia must be officially issued by the agency and only used when on duty.

B. The city has provided the Criminal Justice Training Commission with a detailed staffing plan specifying the following:

1. The total number of commissioned officers currently employed by the agency;
2. The total number of specially commissioned officers currently employed by the agency;
3. The total number of co-response teams established within the agency and what staffing are included in each co-response team;
4. The total number of administrative staff currently employed by the agency;
5. The number of officers on flexible work schedules;
6. The average 911 response rate of the agency over the 12-month period immediately preceding the month in which the city is submitting documentation to the criminal justice training commission; and
7. The average case closure rate of the city over the 12-month period immediately preceding the month in which the city is submitting documentation to the criminal justice training commission.

C. The City Council directs the city to submit required documentation to the Criminal Justice Training Commission demonstrating that the city meets the requirements of Section 101, Chapter 350, Laws of Washington 2025.

Section 2. Tax Imposed.

There is hereby added to City of Camas municipal code chapter 3.08 a new section 3.08.045 to provide as follows:

3.08.045 Public Safety Sales and Use Tax

A. To provide funding for criminal justice purposes as authorized by Section 201, Chapter 350, Laws of Washington 2025, an additional one-tenth of one percent (0.1%) sales and use tax is hereby levied, fixed, and imposed on all taxable events within the city as defined in chapter 82.08, 82.12, or 82.14 RCW.

B. The tax shall be imposed upon and collected from those persons from whom sales tax or use tax is collected in accordance with chapter 82.08 or 82.12 RCW, and shall be collected at the rate of one-tenth of one percent of the selling price in the case of a sales tax, or value of the article used, in the case of a use tax.

C. The additional sales and use tax shall be in addition to all other existing sales and use taxes currently imposed by the city.

Section 3. Notice to Department of Revenue. The City Clerk is instructed to submit this Ordinance to the Washington Department of Revenue (DOR), and to direct DOR to take all steps necessary to immediately implement and collect the tax imposed by this Ordinance.

Section 4. Severability. Should any section, paragraph, sentence, clause or phrase of the Ordinance, or its application to any person or circumstance, be declared unconstitutional or otherwise invalid for any reason, or should any portion of this Ordinance be pre-empted by state or federal law or regulation, such decision or pre- emptions shall not affect the validity of the remaining portions of this Ordinance or its application to other persons or circumstances.

Section 5. Regulatory Conflicts. All other Ordinances and parts of other Ordinances inconsistent or conflicting with any part of this Ordinance are hereby repealed to the extent of the inconsistency or conflict.

Section 7. Effective Date. This Ordinance shall take effect and be in full force five (5) days after publication according to law provided that the additional sales and use

tax imposed by Section 2 shall apply only to taxable events occurring on and after April 1, 2027.

PASSED by the Council and APPROVED by the Mayor this 16th day of November, 2026.

SIGNED: _____
Mayor

ATTEST:_____
Clerk

Approved as to form:

_____
City Attorney

WASHINGTON STATE
CRIMINAL JUSTICE TRAINING COMMISSION
Jerrell C. Wills, Interim Executive Director
19010 1st Avenue South • Burien, WA 98148 • Phone: 206-835-7300 • www.cjtc.wa.gov

October 22, 2026

ELECTRONICALLY DELIVERED

Chief Tina Jones
Camas Police Department
2100 NE 3rd Avenue
Camas, WA 98607
TJones@cityofcamas.us

Dear Chief Jones:

Congratulations! The Washington State Criminal Justice Training Commission is pleased to inform you that your application for funding through the ESHB 2015 Public Safety Funding Program has been approved.

Your agency has been approved up to $424,597.88 to fund the salary, benefits, and Basic Law Enforcement Academy (BLEA) for your requested new officers. Attached is an overview of the Round 2 rubric decisions and eligible uses of program funds.

The ESHB 2015 project team will follow up with award documents and next steps. If you have any questions, please contact us at cjtchb2015@cjtc.wa.gov. We look forward to working with you.

Sincerely,

Jerrell C. Wills
Interim Executive Director

Attachment (1)
cc: Francesca Heard, Budget Manager, Budget Unit
Gail Stone, Project Manager, Budget Unit

Staff Report

November 16, 2026 Council Regular Meeting

Public Hearing - Ordinances No. 26-013 and 26-014 - 2027 Property Tax Levies
Presenter: Kayla McCauley, Interim Finance Director
Time Estimate: 15 minutes

Phone	Email
360.817.7021	kmccauley@cityofcamas.us

BACKGROUND: At the October 19, 2026 Council Workshop, staff presented the 2027 property tax levy options, including the statutory 1% limit under the Implicit Price Deflator (IPD) and proposed levy reductions to offset the newly formed Regional Fire Authority (RFA).

This agenda item opens the statutory Public Hearing required by RCW 84.55.120 prior to setting the annual tax levies, followed by Council consideration and action on Ordinances No. 26-013 and 26-014.

SUMMARY: Under RCW 84.55.010, the City's annual regular property tax levy increase is limited to the lesser of 1% or the percentage change in the Implicit Price Deflator (IPD). The official IPD rate published on September 25, 2026, for the 2027 tax year is 3.876%; therefore, the statutory lawful increase limit is 1.0%.

Consistent with Council direction and Resolution 25-012 (expressing intent to reduce City property taxes to offset the voter-approved RFA), Ordinance No. 26-013 sets the 2027 regular ad valorem levy reflecting the RFA reduction while protecting the City's statutory tax base by banking unused capacity under RCW 84.55.092.

Two ordinances are before Council for action tonight:

1. Ordinance No. 26-013: Adopting the 2027 General Fund regular property tax levy.
2. Ordinance No. 26-014: Adopting the 2027 excess property tax levy to fund annual debt service on the voter-approved Unlimited Tax General Obligation (UTGO) Fire Station 41 Bond.

BENEFITS TO THE COMMUNITY: Property taxes support essential General Fund core operations, including police protection, street maintenance, library services, and park operations. Enacting the RFA levy reduction delivers local tax relief that accounts for the independent fire authority while preserving City service delivery and maintaining fiscal stability.

STRATEGIC PLAN: Adopting the annual property tax levies directly supports the City of Camas Strategic Plan priorities:

- Safe and Accessible Community: Provides foundational funding for police patrol, investigations, and traffic safety, while sustaining street maintenance, lighting, and ADA pedestrian accessibility.
- Stewardship of City Assets: Supports the preservation and lifecycle maintenance of vital municipal infrastructure, civic facilities, and public rights-of-way, preventing costly deferred maintenance.
- Vibrant Community Amenities: Underwrites public access to the Camas Public Library, recreation programming, open space and trail upkeep, and community events such as Hometown Holidays.
- Economic Prosperity: Maintains high-quality public safety and community infrastructure that attract and retain businesses, while predictable levy administration protects the City's long-term financial stability and AAA credit rating.
- Engaged Workforce: Funds competitive compensation, professional training, and essential operational equipment for the municipal workforce delivering direct public services.

POTENTIAL CHALLENGES: Staff continues to connect qualifying property tax payers to the Clark County Assessor's Property Tax Relief Programs. These programs typically fall into either a reduction applied to their property taxes, or the ability to defer a part of their property taxes. Some programs require the participant to re-apply each year to continue to receive the reduction/deferral in property taxes.

BUDGET IMPACT:

The table below recaps the scenario evaluated at the October 19 workshop for a home assessed at $700,000. Ordinance No. 26-013 reflects the proposed RFA reduction, with unused capacity preserved under RCW 84.55.092.

General Fund Levy	Tax Levy	Tax Rate	Annual Impact on Homeowner *(ex: $700,000 home, Camas portion only)*
1% increase	$16,516,414	$1.80/$1,000	$1,261
RFA related release	($5,319,435)	($.58/$1000)	($406)
Total	$11,196,979	$1.22/$1,000	$855

Note: Ordinance No. 26-014 authorizes the separate, voter-approved UTGO bond levy required to service the 2027 debt payment for Fire Station 41.

RECOMMENDATION:

Staff recommends Council:

1. Open the Public Hearing to receive public testimony on the 2027 property tax levies and subsequently close the hearing.
2. Move to approve Ordinance No. 26-013, establishing the 2027 General Fund property tax levy.
3. Move to approve Ordinance No. 26-014, establishing the 2027 UTGO Fire Station 41 Bond Levy.

ORDINANCE NO. 26-013

AN ORDINANCE levying the ad valorem taxes for obligations of the General Fund for fiscal year ending December 31, 2027.

WHEREAS, the Council of the City of Camas has met and considered its budget for the calendar year 2027, and

WHEREAS, the Council of the City of Camas after hearing and after duly considering all relevant evidence and testimony presented, determined that the City of Camas requires a regular levy in the amount of $11,196,979 which excludes amounts resulting from the addition of new construction and improvements to property and any increase in the value of state-assessed property, and amounts authorized by law as a result of any annexations that have occurred and refunds made, in order to discharge the expected expenses and obligations of the City and in its best interest;

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF CAMAS as follows:

SECTION I

The dollar amount of the increase over the actual levy amount from the previous year shall be $0 which is a percentage increase of 0% from the previous year. This is exclusive of additional revenue resulting from the addition of new construction and improvements to property and any increase in the value of state assessed property, and any additional amounts resulting from any annexation that have occurred and refunds made.

SECTION II

A CERTIFIED BUDGET request or estimate shall be filed with the County Assessor's Office, separate from this ordinance. As required by RCW 84.52.020, that filing certifies the total

amount to be levied by the regular property tax levy. The form for this purpose is titled "Levy Certification" and is available through the Assessor's Office. Certification is made in a manner prescribed by the County Assessor's Office.

SECTION III

Any unused general property tax levy capacity for the 2027 tax year is reserved for future levy as provided by RCW 84.55.092.

SECTION IV

This Ordinance shall take force and be in effect five days from and after its publication according to law.

PASSED by the council and APPROVED by the Mayor this 16th day of November, 2026.

SIGNED:_____
Mayor

ATTEST:_____
Clerk

APPROVED as to form:

_____
City Attorney

ORDINANCE NO. 26-014

AN ORDINANCE levying the ad valorem taxes for the Unlimited Tax General Obligation Bonds for fiscal year ending December 31, 2027.

WHEREAS, the Council of the City of Camas has met and considered its budget for the calendar year 2027, and

WHEREAS, the Council of the City of Camas after hearing and after duly considering all relevant evidence and testimony presented, determined that the City of Camas requires a levy in the amount of $2,057,670, which is a levy on the assessed valuation for the purposes of raising funds for payment of bonds and interest for the 2025 Unlimited Tax General Obligation Bonds authorized by a vote of the electorate of the City of Camas to be paid without limit on the tax levy.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF CAMAS as follows:

SECTION I

The regular property tax levy is authorized by the vote of the electorate of the City of Camas on August 6, 2024.

SECTION II

A CERTIFIED BUDGET request or estimate shall be filed with the County Assessor's Office separate from this ordinance. As required by RCW 84.52.020, that filing certifies the total amount to be levied by the regular property tax levy. The form for this purpose is titled "Levy Certification" and is available through the Assessor's Office. Certification is made in a manner prescribed by the County Assessor's Office.

SECTION III

This Ordinance shall take force and be in effect five days from and after its publication according to law.

PASSED by the council and APPROVED by the Mayor this 16th day of November, 2026.

SIGNED:_____
Mayor

ATTEST:_____
Clerk

APPROVED as to form:

_____
City Attorney

EXHIBIT A

City of Camas

2027-2028 Mayor's Budget

Fund	Projected Beginning Fund Balance	2027 - 2028 Revenues	2027 - 2028 Appropriations	Projected Ending Fund Balance	Change in Fund Balance
General Fund	$ 8,052,898	$ 65,987,583	$ 74,321,375	$ (280,894)	$ (8,333,792)
Streets Fund	$ 223,948	$ 13,548,014	$ 13,833,963	$ (62,001)	$ (285,949)
Transportation Benefit District Fund	$ 686,316	$ 2,686,059	$ 2,952,511	$ 419,864	$ (266,452)
Tree Fund	$ 52,704	$ 3,209	$ -	$ 55,913	$ 3,209
Lodging Tax Fund	$ 111,794	$ 89,560	$ 100,000	$ 101,354	$ (10,440)
Cemetery Fund	$ 74,708	$ 582,791	$ 722,873	$ (65,374)	$ (140,082)
Unlimited GO Debt Service Fund	$ 629,583	$ 4,212,230	$ 3,433,450	$ 1,408,363	$ 778,780
Limited GO Debt Service Fund	$ -	$ 9,367,782	$ 9,367,782	$ -	$ -
Real Estate Excise Tax Fund	$ 9,650,064	$ 6,908,028	$ 6,110,454	$ 10,447,638	$ 797,574
Park Impact Fee Fund	$ 4,784,800	$ 5,111,767	$ 2,519,107	$ 7,377,460	$ 2,592,660
Transportation Impact Fee Fund	$ 4,102,466	$ 3,330,651	$ 3,567,467	$ 3,865,650	$ (236,816)
SR-500/Everett Corridor Capital Project Fund	$ 3,340,906	$ 232,364	$ 2,300,000	$ 1,273,270	$ (2,067,636)
Lake/Sierra Intersection Improvements Fund	$ 2,855,580	$ 591,396	$ 3,400,000	$ 46,976	$ (2,808,604)
Northshore Boulevard Capital Project Fund	$ 3,139,085	$ 274,760	$ 2,500,000	$ 913,845	$ (2,225,240)
Facilities Capital Improvement Fund	$ 4,978,311	$ 3,022,454	$ 4,217,533	$ 3,783,232	$ (1,195,079)
Legacy Lands Project Fund	$ 9,484,720	$ 690,995	$ 2,945,607	$ 7,230,108	$ (2,254,612)
Fire Station 41 Capital Project Fund	$ 14,054,556	$ 150,350	$ 10,939,930	$ 3,264,976	$ (10,789,580)
Storm Water Fund	$ 2,753,189	$ 8,798,318	$ 8,898,989	$ 2,652,518	$ (100,671)
Solid Waste Fund	$ 3,718,435	$ 8,120,040	$ 8,268,161	$ 3,570,314	$ (148,121)
Water/Sewer Fund	$ 18,386,959	$ 49,878,667	$ 59,884,399	$ 8,381,227	$ (10,005,732)
Water/Sewer Capital Projects Fund	$ 22,574	$ 6,364,451	$ 6,387,025	$ -	$ (22,574)
2025 Water/Sewer Bond Projects Fund	$ 16,272,982	$ 11,851,994	$ 18,166,844	$ 9,958,132	$ (6,314,850)
Operations Center North Construction Fund	$ 1,000,000	$ -	$ 1,000,000	$ -	$ (1,000,000)
Water/Sewer Capital Reserve Fund	$ 15,843,650	$ 8,139,472	$ 13,326,000	$ 10,657,122	$ (5,186,528)
Equipment Rental Internal Service Fund	$ 570,684	$ 5,558,701	$ 6,017,551	$ 111,834	$ (458,850)
Facilities Rental Internal Service Fund	$ 30,309	$ 4,249,392	$ 4,176,766	$ 102,935	$ 72,626
Firefighter's Pension Fund	$ 743,971	$ 56,283	$ 303,500	$ 496,754	$ (247,217)
Retiree Medical Benefits Fund	$ 2,202	$ 376,035	$ 375,085	$ 3,152	$ 950
LEOFF 1 Disability Board Fund	$ 141,577	$ 482,807	$ 606,320	$ 18,064	$ (123,513)
Total City Budget 2027-2028	**$ 125,708,971**	**$ 220,666,153**	**$ 270,642,692**	**$ 75,732,432**	**$ (50,755,319)**

City of Camas

2027-2028 Summary of Budgeted Revenues, Expenditures and Reserves

		Special Revenue			Internal Support			
	General Fund	Funds	Debt Funds	Capital Funds	Enterprise Funds	Funds	Reserve Funds	Total
Estimated Beginning Fund Balance 1/1/2027	$ 8,052,898	$ 1,149,470	$ 629,583	$ 56,390,488	$ 57,997,789	$ 600,993	$ 887,750	$ 125,708,971
Revenues								
Taxes	$ 41,056,526	$ 1,847,497	$ 4,212,230	$ 6,155,929	$ -	$ -	$ -	$ 53,272,182
Licenses and Permits	$ 5,304,484	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,304,484
Intergovernmental	$ 1,534,247	$ 2,184,101	$ -	$ 858,350	$ 407,243	$ -	$ -	$ 4,983,941
Charges for Services	$ 16,949,225	$ 1,056,506	$ -	$ 7,843,120	$ 66,967,767	$ 9,254,745	$ -	$ 102,071,363
Fines and Forfeitures	$ 245,312	$ -	$ -	$ -	$ 341,821	$ -	$ -	$ 587,133
Miscellaneous Revenue	$ 877,789	$ 121,200	$ -	$ 2,729,295	$ 4,129,081	$ 553,348	$ 69,865	$ 8,480,578
Transfers	$ 20,000	$ 11,700,329	$ 9,367,782	$ 2,726,071	$ 21,307,030	$ -	$ 845,260	$ 45,966,472
Total Revenue	$ 65,987,583	$ 16,909,633	$ 13,580,012	$ 20,312,765	$ 93,152,942	$ 9,808,093	$ 915,125	$ 220,666,153
Total Available Resources	$ 74,040,481	$ 18,059,103	$ 14,209,595	$ 76,703,253	$ 151,150,731	$ 10,409,086	$ 1,802,875	$ 346,375,124
Expenditures								
Salaries and Benefits	$ 43,237,925	$ 2,744,867	$ -	$ -	$ 13,784,300	$ 2,939,666	$ 981,405	$ 63,688,163
Supplies and Services	$ 20,308,165	$ 5,053,858	$ -	$ 449,918	$ 33,581,549	$ 4,450,575	$ 3,500	$ 63,847,565
Taxes	$ 234,102	$ -	$ -	$ -	$ 1,550,035	$ 49,076	$ -	$ 1,833,213
Capital	$ 383,733	$ 6,430,000	$ -	$ 26,832,398	$ 34,351,661	$ 2,755,000	$ -	$ 70,752,792
Debt Service	$ 57,733	$ 8,111	$ 12,801,232	$ -	$ 11,687,412	$ -	$ -	$ 24,554,488
Transfers	$ 10,099,717	$ 3,372,511	$ -	$ 11,217,782	$ 20,976,461	$ -	$ 300,000	$ 45,966,471
Total Expenditures	$ 74,321,375	$ 17,609,347	$ 12,801,232	$ 38,500,098	$ 115,931,418	$ 10,194,317	$ 1,284,905	$ 270,642,692
Estimated Ending Fund Balance	$ (280,894)	$ 449,756	$ 1,408,363	$ 38,203,155	$ 35,219,313	$ 214,769	$ 517,970	$ 75,732,432
Total Expenditures and Reserve Balance	$ 74,040,481	$ 18,059,103	$ 14,209,595	$ 76,703,253	$ 151,150,731	$ 10,409,086	$ 1,802,875	$ 346,375,124

EXHIBIT A

City of Camas

Revenue Budget Summary for 2027-2028

	2025 Actual	2026 Projected	Change	2027 Budget	Annual % Change	2027 Change	2028 Budget	Annual % Change	2028 Change	Notes for 2027-2028
General Fund										
Taxes	$ 24,472,903	$ 25,708,822	5.1%	$ 20,221,578	-21.3%	$ (5,487,244)	$ 20,834,948	3.0%	$ 613,370	RFA Shift: levy decrease (banked capacity)
Licenses and Permits	$ 2,754,408	$ 2,579,380	-6.4%	$ 2,973,542	15.3%	$ 394,162	$ 2,330,942	-21.6%	$ (642,600)	North Shore activity slows in second year
Intergovernmental	$ 1,185,245	$ 940,382	-20.7%	$ 838,705	-10.8%	$ (101,677)	$ 695,542	-17.1%	$ (143,163)	Declining State shared revenues
Charges for Services	$ 6,453,762	$ 6,220,308	-3.6%	$ 8,537,565	37.3%	$ 2,317,257	$ 8,411,660	-1.5%	$ (125,905)	Post-RFA service/cost reallocations
Fines and Forfeitures	$ 119,617	$ 120,366	0.6%	$ 121,386	0.8%	$ 1,020	$ 123,926	2.1%	$ 2,540	Expected to remain flat due to legislation
Miscellaneous Revenue	$ 542,670	$ 321,985	-40.7%	$ 429,903	33.5%	$ 107,918	$ 447,886	4.2%	$ 17,983	Opioid settlements taper, investment yield stable
Transfers from other funds	$ 36,575	$ 8,346	-77.2%	$ 10,000	19.8%	$ 1,654	$ 10,000	0.0%	$ -	Flat Lodging Tax for Parks Events
Total General Fund	**$35,565,180**	**$35,899,589**	**0.9%**	**$33,132,679**	**-7.7%**	**$(2,766,910)**	**$32,854,904**	**-0.8%**	**$ (277,775)**	
Special Revenue Funds										
Streets Fund										
Intergovernmental	$ 795,475	$ 1,224,721	54.0%	$ 1,604,931	31.0%	$ 380,210	$ 579,170	-63.9%	$ (1,025,761)	State/Fed grants for transportation projects
Charges for Service	$ -	$ 5,889		$ -	-100.0%	$ (5,889)	$ -		$ -	EV fees set to offset operating costs
Miscellaneous Revenue	$ 34,169	$ 41,939	22.7%	$ 31,477	-24.9%	$ (10,462)	$ 32,107	2.0%	$ 630	Fluctuates with large grant revenues and cap exp
Transfers from other funds	$ 5,761,702	$ 3,829,279	-33.5%	$ 5,812,398	51.8%	$ 1,983,119	$ 5,487,931	-5.6%	$ (324,467)	TBD & GF support preservation/operations + GF Subsidy
Total Street Fund	**$ 6,591,346**	**$ 5,101,828**	**-22.6%**	**$ 7,448,806**	**46.0%**	**$ 2,346,978**	**$ 6,099,208**	**-18.1%**	**$(1,349,598)**	
Transportation Benefit District Fund										
Taxes	$ 472,277	$ 850,950	80.2%	$ 872,224	2.5%	$ 21,274	$ 893,157	2.4%	$ 20,933	Increases based on estimated CPI
Charges for Service	$ 177,383	$ 433,365	144.3%	$ 437,699	1.0%	$ 4,334	$ 442,076	1.0%	$ 4,377	Increases driven by pop. growth, which is low
Miscellaneous Revenue	$ -	$ 19,852		$ 20,249	2.0%	$ 397	$ 20,654	2.0%	$ 405	Minimal due to annual sweep of funds into Streets
Total Transportation Benefit District Fund	**$ 649,660**	**$ 1,304,167**	**100.7%**	**$ 1,330,172**	**2.0%**	**$ 26,005**	**$ 1,355,887**	**1.9%**	**$ 25,715**	
Tree Fund										
Miscellaneous Revenue	$ 1,408	$ 1,557	10.6%	$ 1,589	2.1%	$ 32	$ 1,620	2.0%	$ 31	Investment interest remains stable
Total Tree Fund	**$ 1,408**	**$ 1,557**	**10.6%**	**$ 1,589**	**2.1%**	**$ 32**	**$ 1,620**	**2.0%**	**$ 31**	
Lodging Tax Fund										
Taxes	$ 36,532	$ 39,582	8.3%	$ 40,571	2.5%	$ 989	$ 41,545	2.4%	$ 974	Driven by hotel & vacation rental stays
Miscellaneous Revenue	$ 3,445	$ 3,613	4.9%	$ 3,685	2.0%	$ 72	$ 3,759	2.0%	$ 74	Stabilizing as fund growth slows post-COVID
Total Lodging Tax Fund	**$ 39,977**	**$ 43,195**	**8.0%**	**$ 44,256**	**2.5%**	**$ 1,061**	**$ 45,304**	**2.4%**	**$ 1,048**	
Cemetery Fund										
Charges for Services	$ 106,512	$ 62,404	-41.4%	$ 87,926	40.9%	$ 25,522	$ 88,805	1.0%	$ 879	Below index pace; fee study recommended
Miscellaneous Revenue	$ 3,653	$ 3,628	-0.7%	$ 3,000	-17.3%	$ (628)	$ 3,060	2.0%	$ 60	Interest remains relatively stable
Transfers from other funds	$ 200,000	$ 200,000	0.0%	$ 200,000	0.0%	$ -	$ 200,000	0.0%	$ -	Pressure on GF subsidy as costs rise
Total Cemetery Fund	**$ 310,165**	**$ 266,032**	**-14.2%**	**$ 290,926**	**9.4%**	**$ 24,894**	**$ 291,865**	**0.3%**	**$ 939**	
Debt Funds										
Unlimited GO Debt Service Fund										
Taxes	$ 1,784,183	$ 2,057,370	15.3%	$ 2,095,637	1.9%	$ 38,267	$ 2,116,593	1.0%	$ 20,956	Population Growth
Total Unlimited GO Debt Srv Fund	**$ 1,784,183**	**$ 2,057,370**	**15.3%**	**$ 2,095,637**	**1.9%**	**$ 38,267**	**$ 2,116,593**	**1.0%**	**$ 20,956**	
Limited GO Debt Service Fund										
Transfers from other funds	$ 8,645,605	$ 4,710,235	-45.5%	$ 4,686,907	-0.5%	$ (23,328)	$ 4,680,875	-0.1%	$ (6,032)	Based on debt service schedules
Total Debt Service Fund	**$ 8,645,605**	**$ 4,710,235**	**-45.5%**	**$ 4,686,907**	**-0.5%**	**$ (23,328)**	**$ 4,680,875**	**-0.1%**	**$ (6,032)**	
Capital Funds										
Real Estate Excise Tax Fund										
Taxes	$ 2,728,180	$ 3,032,328	11.1%	$ 3,062,651	1.0%	$ 30,323	$ 3,093,278	1.0%	$ 30,627	Anticipated stable real estate market activity
Intergovernmental	$ 680,900	$ 66,667	-90.2%	$ -	-100.0%	$ (66,667)	$ -		$ -	No grant-funded projects in biennium
Miscellaneous Revenue	$ 315,383	$ 345,904	9.7%	$ 352,822	2.0%	$ 6,918	$ 359,878	2.0%	$ 7,056	Stable as fund activity returns to core projects
Transfers from other funds	$ 2,475,927	$ 18,982	-99.2%	$ 19,456	2.5%	$ 474	$ 19,943	2.5%	$ 487	CPI only as activity returns to core projects
Total Real Estate Excise Tax Fund	**$ 6,200,390**	**$ 3,463,881**	**-44.1%**	**$ 3,434,929**	**-0.8%**	**$ (28,952)**	**$ 3,473,099**	**1.1%**	**$ 38,170**	
Park Impact Fee Fund										
Charges for Services	$ 1,774,731	$ 2,336,919	31.7%	$ 2,720,641	16.4%	$ 383,722	$ 2,088,364	-23.2%	$ (632,277)	Anticipated decline in construction in 2028
Miscellaneous Revenue	$ 136,653	$ 146,943	7.5%	$ 149,882	2.0%	$ 2,939	$ 152,880	2.0%	$ 2,998	Flattening with stabilizing fund balance
Transfers from other funds	$ 678	$ -	-100.0%	$ -		$ -	$ -		$ -	Lower spend; no transfers required
Total Park Impact Fee Fund	**$ 1,912,062**	**$ 2,483,862**	**29.9%**	**$ 2,870,523**	**15.6%**	**$ 386,661**	**$ 2,241,244**	**-21.9%**	**$ (629,279)**	
Transportation Impact Fee Fund										
Charges for Services	$ 1,923,734	$ 1,474,417	-23.4%	$ 1,716,517	16.4%	$ 242,100	$ 1,317,598	-23.2%	$ (398,919)	Anticipated decline in construction in 2028
Miscellaneous Revenue	$ 148,276	$ 143,922	-2.9%	$ 146,800	2.0%	$ 2,878	$ 149,736	2.0%	$ 2,936	Use of fund balance stabilized
Total Transportation Impact Fee Fund	**$ 2,072,010**	**$ 1,618,339**	**-21.9%**	**$ 1,863,317**	**15.1%**	**$ 244,978**	**$ 1,467,334**	**-21.3%**	**$ (395,983)**	
SR-500/Everett Corridor Capital Project Fund										
Intergovernmental	$ 461,994	$ 1,006,453	117.8%	$ -	-100.0%	$ (1,006,453)	$ -		$ -	State grant; future support unconfirmed
Miscellaneous Revenue	$ 158	$ 96,688	61094.9%	$ 98,622	2.0%	$ 1,934	$ 50,297	-49.0%	$ (48,325)	Interest to decline as grant/debt is spent down
Transfers from other funds	$ 177,839	$ 3,079,404	1631.6%	$ 41,515	-98.7%	$ (3,037,889)	$ 41,930	1.0%	$ 415	Unused funds from another project repurposed
Total SR500 and Everett Capital Fund	**$ 639,991**	**$ 4,182,545**	**553.5%**	**$ 140,137**	**-96.6%**	**$(4,042,408)**	**$ 92,227**	**-34.2%**	**$ (47,910)**	
Lake/Sierra Intersection Improvements Fund										
Miscellaneous Revenue	$ 47,796	$ 111,984	134.3%	$ 114,224	2.0%	$ 2,240	$ 50,000	-56.2%	$ (64,224)	Decline as bond proceeds are spent down
Debt Proceeds	$ 3,020,522	$ -	-100.0%	$ -		$ -	$ -		$ -	Single debt issuance to fund - 2025 LTGO Bond
Transfers from other funds	$ -	$ 13,091		$ 13,418	2.5%	$ 327	$ 413,754	2983.6%	$ 400,336	Increases with project, declines as completed
Total Lake and Sierra Capital Fund	**$ 3,068,318**	**$ 125,075**	**-95.9%**	**$ 127,642**	**2.1%**	**$ 2,567**	**$ 463,754**	**263.3%**	**$ 336,112**	
Northshore Boulevard Capital Project Fund										
Miscellaneous Revenue	$ 46,534	$ 114,706	146.5%	$ 117,000	2.0%	$ 2,294	$ 95,760	-18.2%	$ (21,240)	Decline as bond proceeds are spent down
Debt Proceeds	$ 3,020,522	$ -	-100.0%	$ -		$ -	$ -		$ -	Single debt issuance to fund - 2025 LTGO Bond
Transfers from other funds	$ -	$ 2,176		$ 12,000	451.5%	$ 9,824	$ 50,000	316.7%	$ 38,000	Increases with project, declines as completed
Total North Shore Blvd Capital Fund	**$ 3,067,056**	**$ 116,882**	**-96.2%**	**$ 129,000**	**10.4%**	**$ 12,118**	**$ 145,760**	**13.0%**	**$ 16,760**	
Facilities Capital Improvement Fund										
Intergovernmental	$ 15,959	$ -	-100.0%	$ 708,000		$ 708,000	$ -	-100.0%	$ (708,000)	Dept of Commerce for Library Exterior work
Miscellaneous Revenue	$ 42,145	$ 157,254	273.1%	$ 160,399	2.0%	$ 3,145	$ 40,000	-75.1%	$ (120,399)	Interest to decline as debt is spent down
Transfers from other funds	$ 5,442,751	$ 1,465,725	-73.1%	$ 2,027,766	38.3%	$ 562,041	$ 86,289	-95.7%	$ (1,941,477)	Transfer of 2020 LTGO, GF Library cap subsidy
Total Facilities Capital Fund	**$ 5,500,855**	**$ 1,622,979**	**-70.5%**	**$ 2,896,165**	**78.4%**	**$ 1,273,186**	**$ 126,289**	**-95.6%**	**$(2,769,876)**	
Legacy Lands Project Fund										
Miscellaneous Revenue	$ 636,205	$ 335,370	-47.3%	$ 342,077	2.0%	$ 6,707	$ 348,918	2.0%	$ 6,841	Declines as bond proceeds are spent down
Total Legacy Lands Project Fund	**$ 636,205**	**$ 335,370**	**-47.3%**	**$ 342,077**	**2.0%**	**$ 6,707**	**$ 348,918**	**2.0%**	**$ 6,841**	
Fire Station 41 Capital Project Fund										
Intergovernmental	$ -	$ -		$ 150,350		$ 150,350	$ -	-100.0%	$ (150,350)	Dept of Commerce grant
Miscellaneous Revenue	$ 163,907	$ 755,996	361.2%	$ -	-100.0%	$ (755,996)	$ -		$ -	Decline as bond funds fully spent down in 2027
Debt Proceeds	$ 26,471,108	$ -	-100.0%	$ -		$ -	$ -		$ -	2025 UTGO Bond for Public Safety Voted Levy
Total Fire Station 41/HQ Capital Fund	**$26,635,015**	**$ 755,996**	**-97.2%**	**$ 150,350**	**-80.1%**	**$ (605,646)**	**$ -**	**-100.0%**	**$ (150,350)**	

EXHIBIT A

	2025 Actual	2026 Projected	Change	2027 Budget	Annual % Change	2027 Change	2028 Budget	Annual % Change	2028 Change	Notes for 2027-2028
Enterprise Funds										
Storm Water Fund										
Intergovernmental	$ 518,605	$ 514,981	-0.7%	$ 407,243	-20.9%	$ (107,738)	$ -	-100.0%	$ (407,243)	Dept of Ecology grants for capital & operating
Charges for Services	$ 2,833,639	$ 3,289,778	16.1%	$ 3,771,237	14.6%	$ 481,459	$ 4,323,157	14.6%	$ 551,920	Follows adopted rate increases and pop. growth
Fines and Forfeitures	$ 13,321	$ 21,642	62.5%	$ 24,809	14.6%	$ 3,167	$ 28,440	14.6%	$ 3,631	Follows adopted rate increases and pop. growth
Miscellaneous Revenue	$ 41,774	$ 61,339	46.8%	$ 62,565	2.0%	$ 1,226	$ 63,817	2.0%	$ 1,252	Tracked improvement in fund balance
Transfer from other funds	$ -	$ 8,218		$ 108,424	1219.3%	$ 100,206	$ 8,626	-92.0%	$ (99,798)	Sewer support fluctuates with capital spend
Total Storm Drainage Fund	**$ 3,407,339**	**$ 3,895,958**	**14.3%**	**$ 4,374,278**	**12.3%**	**$ 478,320**	**$ 4,424,040**	**1.1%**	**$ 49,762**	
Solid Waste Fund										
Charges for Services	$ 3,585,709	$ 3,722,579	3.8%	$ 3,853,800	3.5%	$ 131,221	$ 3,989,647	3.5%	$ 135,847	Follows adopted rate increases and pop. growth
Fines and Forfeitures	$ 15,441	$ 22,833	47.9%	$ 23,638	3.5%	$ 805	$ 24,471	3.5%	$ 833	Follows adopted rate increases and pop. growth
Miscellaneous Revenue	$ 98,010	$ 110,893	13.1%	$ 113,111	2.0%	$ 2,218	$ 115,373	2.0%	$ 2,262	Increases alongside fund balance growth
Total Solid Waste Fund	**$ 3,699,160**	**$ 3,856,305**	**4.2%**	**$ 3,990,549**	**3.5%**	**$ 134,244**	**$ 4,129,491**	**3.5%**	**$ 138,942**	
Water/Sewer Fund										
Charges for Services	$ 18,467,362	$ 20,470,240	10.8%	$ 21,530,145	5.2%	$ 1,059,905	$ 22,645,698	5.2%	$ 1,115,553	Follows adopted rate increases and pop. growth
Fines and Forfeitures	$ 134,229	$ 110,370	-17.8%	$ 116,812	5.8%	$ 6,442	$ 123,651	5.9%	$ 6,839	Follows adopted rate increases and pop. growth
Miscellaneous Revenue	$ 1,800,429	$ 1,095,862	-39.1%	$ 644,480	-41.2%	$ (451,382)	$ 658,000	2.1%	$ 13,520	PFAS settlement distributions taper
Non-Revenues	$ 5,692	$ 1,149	-79.8%	$ -	-100.0%	$ (1,149)	$ -		$ -	Insurance recoveries
Transfer from other funds	$ 59,324	$ 2,426,194	3989.7%	$ 2,079,543	-14.3%	$ (346,651)	$ 2,080,338	0.0%	$ 795	Funding for R&R projects and debt payments
Total Water/Sewer Fund	**$20,467,036**	**$24,103,815**	**17.8%**	**$24,370,980**	**1.1%**	**$ 267,165**	**$25,507,687**	**4.7%**	**$ 1,136,707**	
Water/Sewer Capital Projects Fund										
Transfer from other funds	$ 4,913,853	$ 1,720,741	-65.0%	$ 3,127,090	81.7%	$ 1,406,349	$ 3,237,361	3.5%	$ 110,271	SDC & Utility rate funding for capital
Total W/S Capital Fund	**$ 4,913,853**	**$ 1,720,741**	**-65.0%**	**$ 3,127,090**	**81.7%**	**$ 1,406,349**	**$ 3,237,361**	**3.5%**	**$ 110,271**	
2025 Water/Sewer Bond Projects Fund										
Miscellaneous Revenue	$ 148,063	$ 575,785	288.9%	$ 587,300	2.0%	$ 11,515	$ 599,046	2.0%	$ 11,746	Fluctuates with capital revenues and outlays
Debt Proceeds	$ 23,202,202	$ -	-100.0%	$ -		$ -	$ -		$ -	Additional debt expected; amount pending
Transfer from other funds	$ 1,940,046	$ 10,328,687	432.4%	$ 7,585,849	-26.6%	$ (2,742,838)	$ 3,079,799	-59.4%	$ (4,506,050)	SDC & utility rate funding for capital
Total 2025 Water Proj Construction	**$25,290,311**	**$10,904,472**	**-56.9%**	**$ 8,173,149**	**-25.0%**	**$(2,731,323)**	**$ 3,678,845**	**-55.0%**	**$(4,494,304)**	
Operations Center North Construction Fund										
Debt Proceeds	$ 1,000,000	$ -	-100.0%	$ -		$ -	$ -		$ -	Addt'l revenue decisions await Ops Siting Analysis
Total Ops Center N Construction Fund	**$ 1,000,000**	**$ -**	**-100.0%**	**$ -**		**$ -**	**$ -**		**$ -**	
Water/Sewer Capital Reserve Fund										
Charges for Services	$ 4,301,807	$ 3,330,717	-22.6%	$ 3,877,621	16.4%	$ 546,904	$ 2,976,462	-23.2%	$ (901,159)	Anticipated decline in construction in 2028
Miscellaneous Revenue	$ 707,154	$ 834,559	18.0%	$ 851,251	2.0%	$ 16,692	$ 434,138	-49.0%	$ (417,113)	Declines with fund balance draw for capital
Total Water/Sewer Cap. Fund	**$ 5,008,961**	**$ 4,165,276**	**-16.8%**	**$ 4,728,872**	**13.5%**	**$ 563,596**	**$ 3,410,600**	**-27.9%**	**$(1,318,272)**	
Internal Support Funds										
Equipment Rental Internal Service Fund										
Charges for Services	$ 2,246,442	$ 2,228,902	-0.8%	$ 2,725,461	22.3%	$ 496,559	$ 2,752,716	1.0%	$ 27,255	Updated cost model post-RFA
Miscellaneous Revenue	$ 259,019	$ 94,363	-63.6%	$ 47,486	-49.7%	$ (46,877)	$ 33,038	-30.4%	$ (14,448)	Declines due to fund balance drawdown
Non-Revenue	$ 85,450	$ -	-100.0%	$ -		$ -	$ -		$ -	No known insurance recoveries at budget
Transfers from other funds	$ 519,317	$ -	-100.0%	$ -		$ -	$ -		$ -	One-time fund transfers at Facility R&R start
Total Equipment Rental Fund	**$ 3,110,228**	**$ 2,323,265**	**-25.3%**	**$ 2,772,947**	**19.4%**	**$ 449,682**	**$ 2,785,754**	**0.5%**	**$ 12,807**	
Facilities Rental Internal Service Fund										
Charges for Services	$ 1,898,972	$ 1,178,394	-37.9%	$ 1,828,641	55.2%	$ 650,247	$ 1,947,927	6.5%	$ 119,286	On-going adj to new internal cost model
Miscellaneous Revenue	$ 190,491	$ 213,901	12.3%	$ 235,228	10.0%	$ 21,327	$ 237,596	1.0%	$ 2,368	Fluctuates as new fund balance is established
Transfers from other funds	$ 20,000	$ 330,000	1550.0%	$ -	-100.0%	$ (330,000)	$ -		$ -	One-time funding for anticipated 2026 true-up issue
Total Facilities Rental Fund	**$ 2,109,463**	**$ 1,722,295**	**-18.4%**	**$ 2,063,869**	**19.8%**	**$ 341,574**	**$ 2,185,523**	**5.9%**	**$ 121,654**	
Reserve Funds										
Firefighter's Pension Fund										
Miscellaneous Revenue	$ 27,199	$ 27,316	0.4%	$ 27,863	2.0%	$ 547	$ 28,420	2.0%	$ 557	Stable; may decline as retirements increase
Total Firemen's Pension Fund	**$ 27,199**	**$ 27,316**	**0.4%**	**$ 27,863**	**2.0%**	**$ 547**	**$ 28,420**	**2.0%**	**$ 557**	
Retiree Medical Benefits Fund										
Miscellaneous Revenue	$ 445	$ 462	3.8%	$ 471	1.9%	$ 9	$ 480	1.9%	$ 9	Declines as funding covers liabilities only
Transfers from other funds	$ 169,943	$ 269,293	58.5%	$ 178,611	-33.7%	$ (90,682)	$ 196,473	10.0%	$ 17,862	Retiree cost growth; Fire removed post-RFA
Total Retiree Medical Fund	**$ 170,388**	**$ 269,755**	**58.3%**	**$ 179,082**	**-33.6%**	**$ (90,673)**	**$ 196,953**	**10.0%**	**$ 17,871**	
LEOFF 1 Disability Board Fund										
Miscellaneous Revenue	$ 9,095	$ 6,131	-32.6%	$ 6,253	2.0%	$ 122	$ 6,378	2.0%	$ 125	Declines as funding covers liabilities only
Transfer from other funds	$ 181,493	$ 221,294	21.9%	$ 232,285	5.0%	$ 10,991	$ 237,891	2.4%	$ 5,606	Growing retiree costs require higher funding
Total LEOFF 1 Disability Fund	**$ 190,588**	**$ 227,425**	**19.3%**	**$ 238,538**	**4.9%**	**$ 11,113**	**$ 244,269**	**2.4%**	**$ 5,731**	

EXHIBIT A

City of Camas

Budget Appropriation Summary for 2027-2028

	2025 Actual	2026 Projected	Change	2027 Budget	Annual % Change	2027 Change	2028 Budget	Annual % Change	2028 Change	Notes for 2027-2028
General Fund										
Salaries and Benefits	$ 17,899,890	$ 19,218,990	7.4%	$ 21,138,538	10.0%	$ 1,919,548	$ 22,099,387	4.5%	$ 960,849	Salary market and benefit increases
Supplies and Services	$ 8,261,010	$ 8,181,171	-1.0%	$ 10,276,276	25.6%	$ 2,095,105	$ 10,031,889	-2.4%	$ (244,387)	PROS plan update, Emerald Ash Borer mitigation
Taxes	$ 80,602	$ 112,842	40.0%	$ 115,663	2.5%	$ 2,821	$ 118,439	2.4%	$ 2,776	Tracks utility revenue growth
Debt	$ 26,913	$ 14,010	-47.9%	$ 28,524	103.6%	$ 14,514	$ 29,209	2.4%	$ 685	Line of credit borrowing costs
Capital	$ 238,013	$ 418,972	76.0%	$ 227,536	-45.7%	$ (191,436)	$ 156,197	-31.4%	$ (71,339)	Decreases after equipping new officers
Transfers to other funds	$ 10,272,592	$ 10,494,187	2.2%	$ 5,031,640	-52.1%	$ (5,462,547)	$ 5,068,077	0.7%	$ 36,437	Decreases post-RFA; no CWFD subsidy
Total General Fund	**$ 36,779,020**	**$ 38,440,172**	**4.5%**	**$ 36,818,177**	**-4.2%**	**$ (1,621,995)**	**$ 37,503,198**	**1.9%**	**$ 685,021**	
Special Revenue Funds										
Streets Fund										
Salaries and Benefits	$ 1,047,110	$ 1,094,299	4.5%	$ 1,167,650	6.7%	$ 73,351	$ 1,224,741	4.9%	$ 57,091	Salary market and benefit increases
Supplies and Services	$ 1,940,185	$ 1,957,210	0.9%	$ 2,284,667	16.7%	$ 327,457	$ 2,318,794	1.5%	$ 34,127	Internal cost model increases post-RFA
Debt	$ -	$ 3,910		$ 4,007	2.5%	$ 97	$ 4,104	2.4%	$ 97	Line of credit borrowing costs
Capital	$ 3,583,023	$ 2,167,885	-39.5%	$ 4,280,000	97.4%	$ 2,112,115	$ 2,150,000	-49.8%	$ (2,130,000)	Pavement Pres, fund by GF & TBD
Transfers to other funds	$ 383,746	$ 55,693	-85.5%	$ -	-100.0%	$ (55,693)	$ 400,000		$ 400,000	Backstops Lake/Sierra repave if no grant
Total Street Fund	**$ 6,954,064**	**$ 5,278,997**	**-24.1%**	**$ 7,736,324**	**46.5%**	**$ 2,457,327**	**$ 6,097,639**	**-21.2%**	**$ (1,638,685)**	
Transportation Benefit District Fund										
Transfer to other funds	$ 346,474	$ 1,070,000	208.8%	$ 1,661,448	55.3%	$ 591,448	$ 1,291,063	-22.3%	$ (370,385)	Pavement Pres funding increases w/ growth
Total Transportation Benefit District Fund	**$ 346,474**	**$ 1,070,000**	**208.8%**	**$ 1,661,448**	**55.3%**	**$ 591,448**	**$ 1,291,063**	**-22.3%**	**$ (370,385)**	
Tree Fund										
Supplies and Services						$ -			$ -	Program not yet developed, no expenses
Total Tree Fund	**$ -**	**$ -**		**$ -**		**$ -**	**$ -**		**$ -**	
Lodging Tax Fund										
Supplies and Services	$ 20,624	$ 51,501	149.7%	$ 40,000	-22.3%	$ (11,501)	$ 40,000	0.0%	$ -	Chamber's Camas Days, DCA events
Transfer to other funds	$ 10,000	$ 7,500	-25.0%	$ 10,000	33.3%	$ 2,500	$ 10,000	0.0%	$ -	Parks Springfest & Hometown Holidays
Total Lodging Tax Fund	**$ 30,624**	**$ 59,001**	**92.7%**	**$ 50,000**	**-15.3%**	**$ (9,001)**	**$ 50,000**	**0.0%**	**$ -**	
Cemetery Fund										
Salaries and Benefits	$ 151,452	$ 161,737	6.8%	$ 171,646	6.1%	$ 9,909	$ 180,830	5.4%	$ 9,184	Salary market and benefit increases
Supplies and Services	$ 148,795	$ 130,567	-12.3%	$ 182,681	39.9%	$ 52,114	$ 187,716	2.8%	$ 5,035	Internal cost model increases post-RFA
Capital	$ 15,415	$ -	-100.0%	$ -		$ -	$ -		$ -	No capital planned
Total Cemetery Fund	**$ 315,662**	**$ 292,304**	**-7.4%**	**$ 354,327**	**21.2%**	**$ 62,023**	**$ 368,546**	**4.0%**	**$ 14,219**	
Debt Fund										
Unlimited GO Debt Service Fund										
Principal	$ 1,165,000	$ 495,000	-57.5%	$ 520,000	5.1%	$ 25,000	$ 550,000	5.8%	$ 30,000	2025 UTGO Bond
Interest	$ 333,628	$ 1,219,475	265.5%	$ 1,194,725	-2.0%	$ (24,750)	$ 1,168,725	-2.2%	$ (26,000)	2025 UTGO Bond
Total Unlimited GO Debt Srv Fund	**$ 1,498,628**	**$ 1,714,475**	**14.4%**	**$ 1,714,725**	**0.0%**	**$ 250**	**$ 1,718,725**	**0.2%**	**$ 4,000**	
Limited GO Debt Service Fund										
Principal	$ 2,357,426	$ 2,562,107	8.7%	$ 2,646,583	3.3%	$ 84,476	$ 2,750,591	3.9%	$ 104,008	Set by debt service schedules
Interest	$ 1,999,455	$ 2,148,128	7.4%	$ 2,040,324	-5.0%	$ (107,804)	$ 1,930,284	-5.4%	$ (110,040)	Set by debt service schedules
Total Unlimited GO Debt Srv Fund	**$ 4,356,881**	**$ 4,710,235**	**8.1%**	**$ 4,686,907**	**-0.5%**	**$ (23,328)**	**$ 4,680,875**	**-0.1%**	**$ (6,032)**	
Capital Fund										
Real Estate Excise Tax Fund										
Supplies and Services	$ 295,781	$ 304,654	3.0%	$ 63,889	-79.0%	$ (240,765)	$ 65,422	2.4%	$ 1,533	Internal service costs
Capital	$ 4,990,342	$ 604,141	-87.9%	$ 1,350,000	123.5%	$ 745,859	$ 1,025,000	-24.1%	$ (325,000)	ADA, Parks revitalization focus
Transfers to other funds	$ 1,810,754	$ 1,746,914	-3.5%	$ 1,865,039	6.8%	$ 118,125	$ 1,741,104	-6.6%	$ (123,935)	Debt funding steady through biennium
Total Real Estate Excise Tax Fund	**$ 7,096,877**	**$ 2,655,709**	**-62.6%**	**$ 3,278,928**	**23.5%**	**$ 623,219**	**$ 2,831,526**	**-13.6%**	**$ (447,402)**	
Park Impact Fee Fund										
Capital	$ 1,281	$ 9,148	613.9%	$ 91,645	901.8%	$ 82,497	$ 108,290	18.2%	$ 16,645	Ongoing efforts for Eastlake Trail
Transfers to other funds	$ 2,061,779	$ 1,166,041	-43.4%	$ 1,159,976	-0.5%	$ (6,065)	$ 1,159,196	-0.1%	$ (780)	Debt funding remains steady through biennium
Total Park Impact Fee Fund	**$ 2,063,060**	**$ 1,175,189**	**-43.0%**	**$ 1,251,621**	**6.5%**	**$ 76,432**	**$ 1,267,486**	**1.3%**	**$ 15,865**	
Transportation Impact Fee Fund										
Transfers to other funds	$ 1,666,760	$ 1,797,280	7.8%	$ 1,786,892	-0.6%	$ (10,388)	$ 1,780,575	-0.4%	$ (6,317)	Debt funding remains steady through biennium
Total Transportation Impact Fee Fund	**$ 1,666,760**	**$ 1,797,280**	**7.8%**	**$ 1,786,892**	**-0.6%**	**$ (10,388)**	**$ 1,780,575**	**-0.4%**	**$ (6,317)**	
SR-500/Everett Corridor Capital Project Fund										
Capital	$ 548,997	$ 910,025	65.8%	$ 770,000	-15.4%	$ (140,025)	$ 1,530,000	98.7%	$ 760,000	Design nearing completion, construction begins
Total SR500 and Everett Cap Proj Fund	**$ 548,997**	**$ 910,025**	**65.8%**	**$ 770,000**	**-15.4%**	**$ (140,025)**	**$ 1,530,000**	**98.7%**	**$ 760,000**	
Lake/Sierra Intersection Improvements Fund										
Capital	$ -	$ 317,967		$ 2,720,000	755.4%	$ 2,402,033	$ 680,000	-75.0%	$ (2,040,000)	Construction expected in biennium
Total Lake and Sierra Cap Proj Fund	**$ -**	**$ 317,967**		**$ 2,720,000**	**755.4%**	**$ 2,402,033**	**$ 680,000**	**-75.0%**	**$ (2,040,000)**	
Northshore Boulevard Capital Project Fund										
Capital	$ -	$ 25,000		$ 1,500,000	5900.0%	$ 1,475,000	$ 1,000,000	-33.3%	$ (500,000)	Preliminary work expected in biennium
Debt	$ 19,853	$ -	-100.0%	$ -		$ -	$ -		$ -	
Total North Shore Blvd Cap Proj Fund	**$ 19,853**	**$ 25,000**	**25.9%**	**$ 1,500,000**	**5900.0%**	**$ 1,475,000**	**$ 1,000,000**	**-33.3%**	**$ (500,000)**	
Facilities Capital Improvement Fund										
Capital	$ 1,093,106	$ 1,159,254	6.1%	$ 2,342,185	102.0%	$ 1,182,931	$ 1,875,348	-19.9%	$ (466,837)	Library, Bldg Maint delayed by City Hall siting
Debt	$ 12,337		-100.0%			$ -			$ -	
Total Facilities Capital Project Fund	**$ 1,105,443**	**$ 1,159,254**	**4.9%**	**$ 2,342,185**	**102.0%**	**$ 1,182,931**	**$ 1,875,348**	**-19.9%**	**$ (466,837)**	
Legacy Lands Project Fund										
Supplies and Services	$ 58,224	$ 124,890	114.5%	$ 178,621	43.0%	$ 53,731	$ 141,986	-20.5%	$ (36,635)	Facility repairs and maintenance
Capital	$ 248,620	$ 386,464	55.4%	$ 650,000	68.2%	$ 263,536	$ 250,000	-61.5%	$ (400,000)	Boat launch (partial), trail development
Transfers to other funds	$ 9,561,540	$ 798,089	-91.7%	$ 1,725,000	116.1%	$ 926,911	$ -	-100.0%	$ (1,725,000)	Transfer final facility bonds to Cap Facilities Fund
Total Legacy Lands Project Fund	**$ 9,868,384**	**$ 1,309,443**	**-86.7%**	**$ 2,553,621**	**95.0%**	**$ 1,244,178**	**$ 391,986**	**-84.6%**	**$ (2,161,635)**	
Fire Station 41 Capital Project Fund										
Capital	$ 1,094,003	$ 12,224,362	1017.4%	$ 10,939,930	-10.5%	$ (1,284,432)	$ -	-100.0%	$ (10,939,930)	Construction scheduled to complete in 2027
Debt	$ 171,108	$ -	-100.0%	$ -		$ -	$ -		$ -	
Total Fire Station 41 Capital Proj Fund	**$ 1,265,111**	**$ 12,224,362**	**866.3%**	**$ 10,939,930**	**-10.5%**	**$ (1,284,432)**	**$ -**	**-100.0%**	**$ (10,939,930)**	

EXHIBIT A

Enterprise Funds	2025 Actual	2026 Projected	Change	2027 Budget	Annual % Change	2027 Change	2028 Budget	Annual % Change	2028 Change	Notes for 2027-2028
Storm Water Fund										
Salaries and Benefits	$ 845,436	$ 979,069	15.8%	$ 1,112,456	13.6%	$ 133,387	$ 1,166,637	4.9%	$ 54,181	Salary market and benefit increases
Supplies and Services	$ 1,763,970	$ 1,532,912	-13.1%	$ 2,805,642	83.0%	$ 1,272,730	$ 2,331,332	-16.9%	$ (474,310)	Master plan, rate study, lake dam consultant
Capital	$ 436,361	$ 477,584	9.4%	$ 897,792	88.0%	$ 420,208	$ 500,000	-44.3%	$ (397,792)	Dams, storm treatment, Storm R&R addition
Debt Service Payments	$ 33,135	$ 42,824	29.2%	$ 42,599	-0.5%	$ (225)	$ 42,531	-0.2%	$ (68)	Debt funding steady through biennium
Transfers to other funds	$ 83,091	$ 8,329	-90.0%	$ -	-100.0%	$ (8,329)	$ -		$ -	
Total Storm Water Fund	**$ 3,161,993**	**$ 3,040,718**	**-3.8%**	**$ 4,858,489**	**59.8%**	**$ 1,817,771**	**$ 4,040,500**	**-16.8%**	**$ (817,989)**	
Solid Waste Fund										
Salaries and Benefits	$ 665,499	$ 728,914	9.5%	$ 757,417	3.9%	$ 28,503	$ 794,217	4.9%	$ 36,800	Salary market and benefit increases
Supplies and Services	$ 2,886,133	$ 2,901,026	0.5%	$ 3,267,441	12.6%	$ 366,415	$ 3,449,086	5.6%	$ 181,645	Salary market and benefit increases
Capital	$ -	$ -		$ -		$ -	$ -		$ -	
Transfers to other funds	$ 83,091	$ 10,764	-87.0%	$ -	-100.0%	$ (10,764)	$ -		$ -	
Total Solid Waste Fund	**$ 3,634,723**	**$ 3,640,704**	**0.2%**	**$ 4,024,858**	**10.6%**	**$ 384,154**	**$ 4,243,303**	**5.4%**	**$ 218,445**	
Water/Sewer Fund										
Salaries and Benefits	$ 3,857,192	$ 4,184,428	8.5%	$ 4,858,369	16.1%	$ 673,941	$ 5,095,204	4.9%	$ 236,835	Salary market and benefit increases
Supplies and Services	$ 8,373,218	$ 8,071,361	-3.6%	$ 10,720,005	32.8%	$ 2,648,644	$ 11,008,043	2.7%	$ 288,038	Rate studies; internal rate growth post-RFA
Taxes	$ 882,742	$ 717,149	-18.8%	$ 765,828	6.8%	$ 48,679	$ 784,207	2.4%	$ 18,379	Excise tax fluctuates with revenue
Capital	$ 2,664,682	$ 3,580,915	34.4%	$ 3,750,000	4.7%	$ 169,085	$ 3,650,000	-2.7%	$ (100,000)	Repair & Replacement projects remain steady
Debt Service Payments	$ 3,365,929	$ 5,658,879	68.1%	$ 5,825,241	2.9%	$ 166,362	$ 5,777,041	-0.8%	$ (48,200)	More debt-funded projects driving up costs
Transfers to other funds	$ 2,636,987	$ 2,808,125	6.5%	$ 1,419,267	-49.5%	$ (1,388,858)	$ 6,231,194	339.0%	$ 4,811,927	Funds portions of PFAS, waterlines, pumps
Total Water/Sewer Fund	**$ 21,780,750**	**$ 25,020,857**	**14.9%**	**$ 27,338,710**	**9.3%**	**$ 2,317,853**	**$ 32,545,689**	**19.0%**	**$ 5,206,979**	
Water/Sewer Capital Projects Fund										
Capital	$ 9,450,476	$ 1,410,449	-85.1%	$ 3,137,025	122.4%	$ 1,726,576	$ 3,250,000	3.6%	$ 112,975	Reallocated project funding; Zone 343 Constr
Total W/S Capital Projects	**$ 9,450,476**	**$ 1,410,449**	**-85.1%**	**$ 3,137,025**	**122.4%**	**$ 1,726,576**	**$ 3,250,000**	**3.6%**	**$ 112,975**	
2025 Water/Sewer Bond Projects Fund										
Capital	$ 2,493,274	$ 15,290,844	513.3%	$ 15,066,844	-1.5%	$ (224,000)	$ 3,100,000	-79.4%	$ (11,966,844)	PFAS mitigation on-going, 2028 funding pending
Debt Service Payments	$ 197,637	$ -		$ -			$ -			New debt required; amount pending
Transfers to other funds	$ -	$ -		$ -		$ -	$ -		$ -	
Total 2025 W/S Bond Projects	**$ 2,690,911**	**$ 15,290,844**	**468.2%**	**$ 15,066,844**	**-1.5%**	**$ (224,000)**	**$ 3,100,000**	**-79.4%**	**$ (11,966,844)**	
Operations Center North Construction Fund										
Capital	$ -	$ -		$ 600,000		$ 600,000	$ 400,000	-33.3%	$ (200,000)	Activity paused pending siting analysis
Total Ops North Construction Fund	**$ -**	**$ -**		**$ 600,000**		**$ 600,000**	**$ 400,000**	**-33.3%**	**$ (200,000)**	
Water/Sewer Capital Reserve Fund										
Transfers to other funds	$ 2,421,912	$ 13,361,985	451.7%	$ 11,326,000	-15.2%	$ (2,035,985)	$ 2,000,000	-82.3%	$ (9,326,000)	Debt, Zone 343, Lake Rd Booster, North Shore WL
Total WS Cap Reserve Fund	**$ 2,421,912**	**$ 13,361,985**	**451.7%**	**$ 11,326,000**	**-15.2%**	**$ (2,035,985)**	**$ 2,000,000**	**-82.3%**	**$ (9,326,000)**	
Internal Support Funds										
Equipment Rental Internal Service Fund										
Salaries and Benefits	$ 704,980	$ 791,179	12.2%	$ 816,348	3.2%	$ 25,169	$ 856,494	4.9%	$ 40,146	Salary market and benefit increases
Supplies and Services	$ 678,365	$ 519,457	-23.4%	$ 761,182	46.5%	$ 241,725	$ 779,451	2.4%	$ 18,269	Internal cost model increases post-RFA
Taxes	$ 19,269	$ 23,656	22.8%	$ 24,247	2.5%	$ 591	$ 24,829	2.4%	$ 582	Driven by vehicle registration fees
Capital	$ 2,520,885	$ 2,486,279	-1.4%	$ 1,350,000	-45.7%	$ (1,136,279)	$ 1,405,000	4.1%	$ 55,000	Replacements stabilize as supply chain normalizes
Transfers to other funds	$ -	$ 15,220		$ -			$ -			
Total Equipment Rental Fund	**$ 3,923,499**	**$ 3,835,791**	**-2.2%**	**$ 2,951,777**	**-23.0%**	**$ (884,014)**	**$ 3,065,774**	**3.9%**	**$ 113,997**	
Facilities Rental Internal Service Fund										
Salaries and Benefits	$ 271,842	$ 413,541	52.1%	$ 619,039	49.7%	$ 205,498	$ 647,785	4.6%	$ 28,746	Salary market and benefit increases
Supplies and Services	$ 1,450,782	$ 1,198,877	-17.4%	$ 1,445,561	20.6%	$ 246,684	$ 1,464,381	1.3%	$ 18,820	Internal cost model increases post-RFA
Capital	$ -	$ 150,826		$ -	-100.0%	$ (150,826)	$ -		$ -	
Transfers to other funds	$ -	$ 398,316		$ -			$ -			
Total Facilities Rental Fund	**$ 1,722,624**	**$ 2,161,560**	**25.5%**	**$ 2,064,600**	**-4.5%**	**$ (96,960)**	**$ 2,112,166**	**2.3%**	**$ 47,566**	
Reserve Funds										
Firefighter's Pension Fund										
Professional Services	$ -	$ 3,500		$ -	-100.0%	$ (3,500)	$ 3,500		$ 3,500	Actuarial consultant for annual reporting
Transfers to other funds	$ 94,312	$ 158,939	68.5%	$ 150,000	-5.6%	$ (8,939)	$ 150,000	0.0%	$ -	Growing retiree costs require higher funding
Total Firefighters's Pension Fund	**$ 94,312**	**$ 162,439**	**72.2%**	**$ 150,000**	**-7.7%**	**$ (12,439)**	**$ 153,500**	**2.3%**	**$ 3,500**	
Retiree Medical Benefits Fund										
Salary and Benefits	$ 165,790	$ 269,292	62.4%	$ 178,612	-33.7%	$ (90,680)	$ 196,473	10.0%	$ 17,861	Fire retirees removed post-RFA; rate growth
Total Retiree Medical Fund	**$ 165,790**	**$ 269,292**	**62.4%**	**$ 178,612**	**-33.7%**	**$ (90,680)**	**$ 196,473**	**10.0%**	**$ 17,861**	
LEOFF 1 Disability Board Fund										
Salary and Benefits	$ 325,456	$ 330,133	1.4%	$ 348,211	5.5%	$ 18,078	$ 258,109	-25.9%	$ (90,102)	Higher retiree medical costs and premium rates
Total LEOFF 1 Disability Fund	**$ 325,456**	**$ 330,133**	**1.4%**	**$ 348,211**	**5.5%**	**$ 18,078**	**$ 258,109**	**-25.9%**	**$ (90,102)**	

EXHIBIT A

City of Camas

General Fund Expenditure Budget Summary for 2027-2028

	2025 Actual	2026 Projected	Change	2027 Budget	Annual % Change	2027 Change	2028 Budget	Annual % Change	2028 Change	Notes for 2027-2028
Legislative										
Salaries and Benefits	$ 283,758	$ 292,574	3.1%	$ 291,754	-0.3%	$ (820)	$ 303,744	4.1%	$ 11,990	COLA, benefits increases
Supplies and Services	$ 19,913	$ 39,837	100.1%	$ 47,707	19.8%	$ 7,870	$ 48,851	2.4%	$ 1,144	WCIA insurance increase
Total Legislative	**$ 303,671**	**$ 332,411**	**9.5%**	**$ 339,461**	**2.1%**	**$ 7,050**	**$ 352,595**	**3.9%**	**$ 13,134**	
Judicial										
Salaries and Benefits	$ 272,164	$ 291,261	7.0%	$ 316,271	8.6%	$ 25,010	$ 331,035	4.7%	$ 14,764	Salary market increase, benefit increases
Supplies and Services	$ 367,684	$ 370,338	0.7%	$ 443,429	19.7%	$ 73,091	$ 454,072	2.4%	$ 10,643	Increase in bldg lease and Court contract
Total Judicial	**$ 639,848**	**$ 661,599**	**3.4%**	**$ 759,700**	**14.8%**	**$ 98,101**	**$ 785,107**	**3.3%**	**$ 25,407**	
Executive										
Salaries and Benefits	$ 732,607	$ 783,492	6.9%	$ 818,712	4.5%	$ 35,220	$ 856,113	4.6%	$ 37,401	Salary market increase, benefit increases
Supplies and Services	$ 383,983	$ 310,635	-19.1%	$ 245,639	-20.9%	$ (64,996)	$ 248,535	1.2%	$ 2,896	Decrease following finalization of strategic plan
Total Executive	**$ 1,116,590**	**$ 1,094,127**	**-2.0%**	**$ 1,064,351**	**-2.7%**	**$ (29,776)**	**$ 1,104,648**	**3.8%**	**$ 40,297**	
Finance										
Salaries and Benefits	$ 1,662,922	$ 1,788,404	7.5%	$ 1,987,927	11.2%	$ 199,523	$ 2,076,011	4.4%	$ 88,084	Salary market increase, benefit increases, fully staffed
Supplies and Services	$ 723,553	$ 629,084	-13.1%	$ 687,964	9.4%	$ 58,880	$ 708,332	3.0%	$ 20,368	reduction in temp staffing costs once fully staffed
Taxes and Assessments	$ 80,602	$ 112,842	40.0%	$ 115,663	2.5%	$ 2,821	$ 118,439	2.4%	$ 2,776	Increase due to anticipated utility rate revenue increases
Total Finance	**$ 2,467,077**	**$ 2,530,330**	**2.6%**	**$ 2,791,554**	**10.3%**	**$ 261,224**	**$ 2,902,782**	**4.0%**	**$ 111,228**	
Legal										
Supplies and Services	$ 225,514	$ 237,691	5.4%	$ 243,634	2.5%	$ 5,943	$ 249,481	2.4%	$ 5,847	Holding stable with only CPI for contract
Total Legal	**$ 225,514**	**$ 237,691**	**5.4%**	**$ 243,634**	**2.5%**	**$ 5,943**	**$ 249,481**	**2.4%**	**$ 5,847**	
Human Resources										
Salaries and Benefits	$ 401,032	$ 407,773	1.7%	$ 664,854	63.0%	$ 257,081	$ 691,205	4.0%	$ 26,351	Retirement liability funding
Supplies and Services	$ 60,210	$ 56,475	-6.2%	$ 92,351	63.5%	$ 35,876	$ 84,567	-8.4%	$ (7,784)	negotiation assistance
Total Human Resources	**$ 461,242**	**$ 464,248**	**0.7%**	**$ 757,205**	**63.1%**	**$ 292,957**	**$ 775,772**	**2.5%**	**$ 18,567**	
Administrative Services										
Salaries and Benefits	$ 209,660	$ 166,053	-20.8%	$ 303,622	82.8%	$ 137,569	$ 317,415	4.5%	$ 13,793	Correcting payroll allocation of Admin Svc Dir
Supplies and Services	$ 353,258	$ 288,312	-18.4%	$ 370,126	28.4%	$ 81,814	$ 322,689	-12.8%	$ (47,437)	form of govt election in 2027, facility rent adj
Total Administrative Services	**$ 562,918**	**$ 454,365**	**-19.3%**	**$ 673,748**	**48.3%**	**$ 219,383**	**$ 640,104**	**-5.0%**	**$ (33,644)**	
Information Services										
Salaries and Benefits	$ 1,179,562	$ 1,322,418	12.1%	$ 1,346,258	1.8%	$ 23,840	$ 1,407,801	4.6%	$ 61,543	Salary market increase, benefit increases
Supplies and Services	$ 596,959	$ 795,443	33.2%	$ 902,284	13.4%	$ 106,841	$ 917,483	1.7%	$ 15,199	Tech tools and services far exceed general CPI
Total Information Services	**$ 1,776,521**	**$ 2,117,861**	**19.2%**	**$ 2,248,542**	**6.2%**	**$ 130,681**	**$ 2,325,284**	**3.4%**	**$ 76,742**	
Law Enforcement										
Salaries and Benefits	$ 6,238,725	$ 6,615,299	6.0%	$ 7,246,919	9.5%	$ 631,620	$ 7,567,284	4.4%	$ 320,365	3 FTE from 2026 backfilled from internal promote
Supplies and Services	$ 1,870,407	$ 2,120,721	13.4%	$ 2,410,427	13.7%	$ 289,706	$ 2,468,277	2.4%	$ 57,850	Increasing software costs, Internal costs higher post-RFA
Capital	$ 129,176	$ 270,156	109.1%	$ -	-100.0%	$ (270,156)			$ -	No anticipated capital needs
Total Law Enforcement	**$ 8,238,308**	**$ 9,006,176**	**9.3%**	**$ 9,657,346**	**7.2%**	**$ 651,170**	**$10,035,561**	**3.9%**	**$ 378,215**	
Work Crew										
Salaries and Benefits	$ 101,692	$ 121,037	19.0%	$ 121,122	0.1%	$ 85	$ 126,498	4.4%	$ 5,376	Salary market increase, benefit increases
Supplies and Services	$ 63,908	$ 117,320	83.6%	$ 76,007	-35.2%	$ (41,313)	$ 77,832	2.4%	$ 1,825	decrease after move to Court, internal costs higher
Total Detention and Correction	**$ 165,600**	**$ 238,357**	**43.9%**	**$ 197,129**	**-17.3%**	**$ (41,228)**	**$ 204,330**	**3.7%**	**$ 7,201**	
Animal Control										
Supplies and Services	$ 192,005	$ 152,116	-20.8%	$ 193,361	27.1%	$ 41,245	$ 198,002	2.4%	$ 4,641	Increase in Service Contracts
Total Animal Control	**$ 192,005**	**$ 152,116**	**-20.8%**	**$ 193,361**	**27.1%**	**$ 41,245**	**$ 198,002**	**2.4%**	**$ 4,641**	
Engineering										
Salaries and Benefits	$ 1,982,064	$ 2,110,214	6.5%	$ 2,291,707	8.6%	$ 181,493	$ 2,400,597	4.8%	$ 108,890	Salary market increase, benefit increases
Supplies and Services	$ 264,379	$ 246,649	-6.7%	$ 628,087	154.6%	$ 381,438	$ 313,668	-50.1%	$ (314,419)	ADA Compliance Plan, Dev review, internal services
Total Engineering	**$ 2,246,443**	**$ 2,356,863**	**4.9%**	**$ 2,919,794**	**23.9%**	**$ 562,931**	**$ 2,714,265**	**-7.0%**	**$(205,529)**	
Community Development										
Salaries and Benefits	$ 313,354	$ 343,755	9.7%	$ 374,540	9.0%	$ 30,785	$ 391,624	4.6%	$ 17,084	Salary market increase, benefit increases
Supplies and Services	$ 176,797	$ 173,425	-1.9%	$ 204,209	17.8%	$ 30,784	$ 209,110	2.4%	$ 4,901	CPI
Total Community Development	**$ 490,151**	**$ 517,180**	**5.5%**	**$ 578,749**	**11.9%**	**$ 61,569**	**$ 600,734**	**3.8%**	**$ 21,985**	
Planning										
Salaries and Benefits	$ 781,640	$ 861,466	10.2%	$ 893,311	3.7%	$ 31,845	$ 934,361	4.6%	$ 41,050	Salary market increase, benefit increases
Supplies and Services	$ 574,666	$ 274,287	-52.3%	$ 278,014	1.4%	$ 3,727	$ 180,452	-35.1%	$ (97,562)	Reduced costs after Comp Plan wrap-up
Total Planning	**$ 1,356,306**	**$ 1,135,753**	**-16.3%**	**$ 1,171,325**	**3.1%**	**$ 35,572**	**$ 1,114,813**	**-4.8%**	**$ (56,512)**	
Building										
Salaries and Benefits	$ 867,190	$ 891,119	2.8%	$ 1,081,918	21.4%	$ 190,799	$ 1,134,999	4.9%	$ 53,081	Salary market increase, benefit increases
Supplies and Services	$ 356,183	$ 290,772	-18.4%	$ 328,673	13.0%	$ 37,901	$ 336,552	2.4%	$ 7,879	increase in fees for permits paid on EPL online
Total Building	**$ 1,223,373**	**$ 1,181,891**	**-3.4%**	**$ 1,410,591**	**19.4%**	**$ 228,700**	**$ 1,471,551**	**4.3%**	**$ 60,960**	
Parks and Recreation										
Salaries and Benefits	$ 341,060	$ 561,403	64.6%	$ 580,997	3.5%	$ 19,594	$ 607,068	4.5%	$ 26,071	Salary market increase, benefit increases
Supplies and Services	$ 348,739	$ 307,590	-11.8%	$ 1,024,206	233.0%	$ 716,616	$ 1,048,786	2.4%	$ 24,580	PROS plan update, Emerald Ash Borer mitigation plan
Total Parks and Recreation	**$ 689,799**	**$ 868,993**	**26.0%**	**$ 1,605,203**	**84.7%**	**$ 736,210**	**$ 1,655,854**	**3.2%**	**$ 50,651**	
Parks Maintenance										
Salaries and Benefits	$ 1,019,537	$ 1,056,015	3.6%	$ 1,145,101	8.4%	$ 89,086	$ 1,202,970	5.1%	$ 57,869	Salary market increase, benefit increases
Supplies and Services	$ 1,007,660	$ 1,052,720	4.5%	$ 1,266,594	20.3%	$ 213,874	$ 1,305,262	3.1%	$ 38,668	Seasonals, noxious weed control, pest control
Capital	$ -	$ -		$ 75,000		$ 75,000	$ -	-100.0%	$ (75,000)	Field drainage, restroom and dugout rehab
Total Parks Maintenance	**$ 2,027,197**	**$ 2,108,735**	**4.0%**	**$ 2,486,695**	**17.9%**	**$ 377,960**	**$ 2,508,232**	**0.9%**	**$ 21,537**	
Library										
Salaries and Benefits	$ 1,512,925	$ 1,606,706	6.2%	$ 1,673,524	4.2%	$ 66,818	$ 1,750,669	4.6%	$ 77,145	COLA, benefit increases
Supplies and Services	$ 702,104	$ 731,766	4.2%	$ 862,088	17.8%	$ 130,322	$ 889,145	3.1%	$ 27,057	Catalogue and e-book service fee increases
Capital	$ 108,837	$ 148,816	36.7%	$ 152,536	2.5%	$ 3,720	$ 156,197	2.4%	$ 3,661	Increase in collection acquisitions
Total Library	**$ 2,323,866**	**$ 2,487,288**	**7.0%**	**$ 2,688,148**	**8.1%**	**$ 200,860**	**$ 2,796,011**	**4.0%**	**$ 107,863**	
Support to Other Funds										
Transfers to Other Funds	$ 10,272,592	$ 10,494,187	2.2%	$ 5,031,640	-52.1%	$ (5,462,547)	$ 5,143,077	2.2%	$ 111,437	Street, Cemetery, & pension funding, CWFD drops off
Total Support to Other Funds	**$10,272,592**	**$10,494,187**	**2.2%**	**$ 5,031,640**	**-52.1%**	**$(5,462,547)**	**$ 5,143,077**	**2.2%**	**$ 111,437**	
TOTAL GENERAL FUND	**$36,779,021**	**$38,440,171**	**4.5%**	**$36,818,176**	**-4.2%**	**$(1,621,995)**	**$37,578,203**	**2.1%**	**$ 760,027**	

City of Camas 2027-2028 Revenue Budget

Fund	Taxes	Licenses & Permits	Inter-governmental Revenue	Charges For Services	Fines & Forfeits	Misc. Revenue	Interfund Transfers	Beginning Fund Balance	Total
General Government									
General Fund	$ 41,056,526	$ 5,304,484	$ 1,534,247	$ 16,949,225	$ 245,312	$ 877,789	$ 20,000	$ 8,052,898	$ 74,040,481
Special Revenue									
Streets Fund			2,184,101			63,584	11,300,329	223,948	13,771,962
Transportation Benefit District Fund	1,765,381			879,775		40,903		686,316	3,372,375
Tree Fund						3,209		52,704	55,913
Lodging Tax Fund	82,116					7,444		111,794	201,354
Cemetery Fund				176,731		6,060	400,000	74,708	657,499
Sub Total	$ 1,847,497	$ -	$ 2,184,101	$ 1,056,506	$ -	$ 121,200	$ 11,700,329	$ 1,149,470	$ 18,059,103
Debt Service									
Unlimited GO Debt Service Fund	4,212,230							629,583	4,841,813
Limited GO Debt Service Fund							9,367,782	-	9,367,782
Sub Total	$ 4,212,230	$ -	$ -	$ -	$ -	$ -	$ 9,367,782	$ 629,583	$ 14,209,595
Capital Projects									
Real Estate Excise Tax Fund	6,155,929					712,700	39,399	9,650,064	16,558,092
Park Impact Fee Fund				4,809,005		302,762		4,784,800	9,896,567
Transportation Impact Fee Fund				3,034,115		296,536		4,102,466	7,433,117
SR-500/Everett Corridor Capital Project Fund						148,919	83,445	3,340,906	3,573,270
Lake/Sierra Intersection Improvements Fund						164,224	427,172	2,855,580	3,446,976
Northshore Boulevard Capital Project Fund						212,760	62,000	3,139,085	3,413,845
Facilities Capital Improvement Fund			708,000			200,399	2,114,055	4,978,311	8,000,765
Legacy Lands Project Fund						690,995		9,484,720	10,175,715
Fire Station 41 Capital Project Fund			150,350					14,054,556	14,204,906
Sub Total	$ 6,155,929	$ -	$ 858,350	$ 7,843,120	$ -	$ 2,729,295	$ 2,726,071	$ 56,390,488	$ 76,703,253
Enterprise									
Storm Water Fund			407,243	8,094,394	53,249	126,382	117,050	2,753,189	11,551,507
Solid Waste Fund				7,843,447	48,109	228,484		3,718,435	11,838,475
Water/Sewer Fund				44,175,843	240,463	1,302,480	4,159,881	18,386,959	68,265,626
Water/Sewer Capital Projects Fund							6,364,451	22,574	6,387,025
2025 Water/Sewer Bond Projects Fund						1,186,346	10,665,648	16,272,982	28,124,976
Operations Center North Construction Fund								1,000,000	1,000,000
Water/Sewer Capital Reserve Fund				6,854,083		1,285,389		15,843,650	23,983,122
Sub Total	$ -	$ -	$ 407,243	$ 66,967,767	$ 341,821	$ 4,129,081	$ 21,307,030	$ 57,997,789	$ 151,150,731
Internal Support									
Equipment Rental Internal Service Fund				5,478,177		80,524		570,684	6,129,385
Facilities Rental Internal Service Fund				3,776,568		472,824		30,309	4,279,701
Sub Total	$ -	$ -	$ -	$ 9,254,745	$ -	$ 553,348	$ -	$ 600,993	$ 10,409,086
Reserves									
Firefighter's Pension Fund						56,283		743,971	800,254
Retiree Medical Benefits Fund						951	375,084	2,202	378,237
LEOFF I Disability Board Fund						12,631	470,176	141,577	624,384
Sub Total	$ -	$ -	$ -	$ -	$ -	$ 69,865	$ 845,260	$ 887,750	$ 1,802,875
Total	$ 53,272,182	$ 5,304,484	$ 4,983,941	$ 102,071,363	$ 587,133	$ 8,480,578	$ 45,966,472	$ 125,708,971	$ 346,375,124

City of Camas 2027-2028 Expenditure Budget

Fund	Salaries & Wages	Personnel Benefits	Supplies	Other Services & Charges	Taxes	Interfund Transfers	Debt Service	Capital Outlay	Total	Ending Fund Balance
General Government										
General Fund	$ 31,916,416	$ 11,321,509	$ 1,550,701	$ 18,757,464	$ 234,102	$ 10,174,717	$ 57,733	$ 383,733	$ 74,396,375	$ (280,894)
Special Revenue										
Streets Fund	1,727,848	664,543	473,686	4,129,775		400,000	8,111	6,430,000	13,833,963	(62,001)
Transportation Benefit District Fund						2,952,511			2,952,511	419,864
Tree Fund				-					-	55,913
Lodging Tax Fund				80,000		20,000			100,000	101,354
Cemetery Fund	230,596	121,880	30,857	339,540				-	722,873	(65,374)
Sub Total	$ 1,958,444	$ 786,423	$ 504,543	$ 4,549,315	$ -	$ 3,372,511	$ 8,111	$ 6,430,000	$ 17,609,347	$ 449,756
Debt Service										
Unlimited GO Debt Service Fund							3,433,450		3,433,450	1,408,363
Limited GO Debt Service Fund							9,367,782		9,367,782	-
Sub Total	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,801,232	$ -	$ 12,801,232	$ 1,408,363
Capital Projects										
Real Estate Excise Tax Fund				129,311		3,481,143		2,375,000	5,985,454	10,447,638
Park Impact Fee Fund						2,319,172		199,935	2,519,107	7,377,460
Transportation Impact Fee Fund						3,567,467			3,567,467	3,865,650
SR-500/Everett Corridor Capital Project Fund								2,300,000	2,300,000	1,273,270
Lake/Sierra Intersection Improvements Fund								3,400,000	3,400,000	46,976
Northshore Boulevard Capital Project Fund								2,500,000	2,500,000	913,845
Facilities Capital Improvement Fund								4,217,533	4,217,533	3,783,232
Legacy Lands Project Fund				320,607		1,725,000		900,000	2,945,607	7,230,108
Fire Station 41 Capital Project Fund								10,939,930	10,939,930	3,264,976
Sub Total	$ -	$ -	$ -	$ 449,918	$ -	$ 11,092,782	$ -	$ 26,832,398	$ 38,375,098	$ 38,203,155
Enterprise										
Storm Water Fund	1,651,136	627,957	197,632	4,939,342			85,130	1,397,792	8,898,989	2,652,518
Solid Waste Fund	1,123,541	428,093	327,900	6,388,627					8,268,161	3,570,314
Water/Sewer Fund	7,202,911	2,750,662	3,687,355	18,040,693	1,550,035	7,650,461	11,602,282	7,400,000	59,884,399	8,381,227
Water/Sewer Capital Projects Fund								6,387,025	6,387,025	-
2025 Water/Sewer Bond Projects Fund								18,166,844	18,166,844	9,958,132
Operations Center North Construction Fund								1,000,000	1,000,000	-
Water/Sewer Capital Reserve Fund						13,326,000			13,326,000	10,657,122
Sub Total	$ 9,977,588	$ 3,806,712	$ 4,212,887	$ 29,368,662	$ 1,550,035	$ 20,976,461	$ 11,687,412	$ 34,351,661	$ 115,931,418	$ 35,219,313
Internal Support										
Equipment Rental Internal Service Fund	1,202,291	470,551	253,265	1,287,368	49,076			2,755,000	6,017,551	111,834
Facilities Rental Internal Service Fund	961,329	305,495	161,728	2,748,214					4,176,766	102,935
IT Rental	$ 2,163,620	$ 776,046	$ 414,993	$ 4,035,582	$ 49,076	$ -	$ -	$ 2,755,000	$ 10,194,317	$ 214,769
Sub Total										
Reserves										
Firefighter's Pension Fund				3,500		300,000			303,500	496,754
Retiree Medical Benefits Fund		375,085							375,085	3,152
LEOFF 1 Disability Board Fund		606,320							606,320	18,064
Sub Total	$ -	$ 981,405	$ -	$ 3,500	$ -	$ 300,000	$ -	$ -	$ 1,284,905	$ 517,970
Total	$ 46,016,068	$ 17,672,095	$ 6,683,124	$ 57,164,441	$ 1,833,213	$ 45,916,471	$ 24,554,488	$ 70,752,792	$ 270,592,692	$ 75,732,432

Staff Report – Public Hearing for 4% Utility Tax Increase

November 16, 2026 Regular Meeting

Public Hearing for 4% Utility Tax Increase
Presenter: Kayla McCauley, Interim Finance Director
Time Estimate: 10 minutes

Phone	Email
360.817.7021	kmccauley@cityofcamas.us

BACKGROUND: In January 2023, the City implemented a 2% utility tax on municipal water, sewer, stormwater, and solid waste utilities. Staff estimates that through December 2026, the tax will have generated approximately $1.7M.

During the 2027-2028 Biennial Budget workshops, staff presented revenue options to address ongoing structural deficits in the General Fund. Tonight's agenda item opens the required Public Hearing and presents Ordinance No. 26-015 for Council consideration, which increases the utility tax rate by 4%, establishing a total rate of 6%.

SUMMARY: Utility taxes represent one part of the traditional "three-legged stool" of municipal revenue to fund general operations of a city in Washington State. Cities are permitted to levy the utility tax upon the income of public and private utilities providing services within the boundaries of that city. In addition, cities may also levy taxes on revenues generated by the city's own utility both inside and outside the city limits.

The City currently levies a 2% rate on City-operated water, sewer, stormwater, and solid waste services. To bridge the General Fund operating deficit and diversify revenues, Ordinance No. 26-015 increases this rate by 4.0%, establishing an ongoing 6.0% rate effective January 1, 2027.

BENEFITS FOR THE COMMUNITY: Revenue diversification stabilizes General Fund operations against economic volatility and statutory limitations placed on property taxes (1% annual cap). The additional revenues will directly support essential, non-fee-supported municipal core services, including police operations, street preservation, emergency response, library services, and parks maintenance.

STRATEGIC PLAN:

This action directly supports the following City of Camas Strategic Plan priorities:

- Safe and Accessible Community: Utility tax revenues flow into the General Fund to preserve an sustain non-fee-supported emergency services, bridging the operational deficit prevents critical public safety staffing reductions and ensures reliable emergency response across the city.
- Stewardship of City Assets: General Fund revenues support the ongoing maintenance and preservation of non-enterprise public infrastructure, including city streets, pedestrian right-of-way, municipal buildings, and parks. Securing sustainable ongoing revenue prevents deferred maintenance and protects capital assets from premature degradation.
- Economic Prosperity: Establishing a reliable, diversified revenue stream protects the City's long-term fiscal health and structural balance. Maintaining fiscal resilience helps safeguard Camas's AAA rating, minimizes future borrowing costs for capital investments, and ensures the continued delivery of high-quality services that attract and retain businesses and residents.

POTENTIAL CHALLENGES: An increase in the utility tax rate increases the monthly financial burden on residents and commercial accounts. For an average single-family residential customer with typical municipal utility consumption across all four services (water, sewer, stormwater, and garbage), a 4% increase equates to an estimated impact of approximately $3.00 to $10.00 per month (varying with seasonal water use).

(Base) Bill Pre Tax	Current Tax (2%)	Current Bill	Proposed Tax (6%)	Proposed New Bill	Monthly Impact	Annual Impact
75.00	1.50	76.50	4.50	79.50	3.00	36.00
100.00	2.00	102.00	6.00	106.00	4.00	48.00
125.00	2.50	127.50	7.50	132.50	5.00	60.00
150.00	3.00	153.00	9.00	159.00	6.00	72.00
175.00	3.50	178.50	10.50	185.50	7.00	84.00
200.00	4.00	204.00	12.00	212.00	8.00	96.00
250.00	5.00	255.00	15.00	265.00	10.00	120.00

To mitigate impacts on vulnerable households, qualifying residents may apply for the City's Camas Assistance Program (CAP). Donations to the CAP fund are also accepted for those wishing to contribute to the fund.

BUDGET IMPACT: An additional 4% tax generates approximately $1,000,000 in new annual General Fund revenue ($2,000,000 across the 2027–2028 biennium). Maintaining the current 2% rate would require corresponding expenditure reductions or service level drawdowns in the 2027–2028 operating budget.

RECOMMENDATION:

Staff recommends Council:

1. Open the Public Hearing to receive community testimony regarding the proposed utility tax increase, and subsequently close the hearing.
2. Move to approve Ordinance No. 26-015, amending Camas Municipal Code Chapter 3.88 to adjust the municipal utility excise tax rate to 6%.

ORDINANCE NO. 26-015

AN ORDINANCE amending Section 3.10.040 of the Camas Municipal Code to increase the utility business and occupation tax rate from two-percent (2%) to six-percent (6%) effective as to the tax year commencing January 1, 2027.

WHEREAS, the City of Camas has authority as a municipal corporation of the State of Washington to impose a utility business and occupation tax pursuant to RCW 35A.82.020; and

WHEREAS, the City has heretofore adopted Chapter 3.10-Utility Tax of the Camas Municipal Code which included in Section 3.10.040 thereto a 2% utility tax to be levied upon water, sewer, solid waste, and stormwater utilities; and

WHEREAS, being mindful of the potential impact of any utility tax the City further adopted a process within Chapter 3.10 to allow for the waiver or decrease in such utility tax should be provided for low-income families; and

WHEREAS, pursuant to RCW 35.92.460 a City imposing a utility tax must disclose the tax rate on all billing statements and the City Finance Department shall continue to be directed to abide by such provision; and

WHEREAS, Camas Municipal Code Section 3.10.010B requires the City Council to review the need for utility tax rate or other changes as part of the biennial budget process; and

WHEREAS, the Council of the City of Camas has determined, after considering during the 2026 biennial budget review cycle all relevant evidence and testimony, that the public interest is best served by increasing the utility tax from two-percent (2%) to six-percent (6%) as set forth in Camas Municipal Code Section 3.10.040 effective as to the tax year commencing January 1, 2027; and

WHEREAS, upon adoption of any increase in the utility tax state law allows for such ordinance to be subject to referendum allowing for the repeal thereof; and

NOW THEREFORE, the Council of the City of Camas do ordain as follows:

Section I

Section 3.10.040- Tax Rate of the Camas Municipal Code shall be amended to provide as follows:

3.10.040- Tax Rate

There is levied upon water, sewer, solid waste, and stormwater utilities, taxes in the amount to be determined by the application of rates given gross earnings as follows:

Activity	Tax Rate
Water Operations	6%
Sewer Operations	6%
Solid Waste	6%
Stormwater	6%

Section II

Referendum Procedure

The provisions of this Ordinance are subject to the referendum procedure as follows:

A. A referendum petition seeking to repeal this Ordinance shall be filed with the City Clerk, who shall be designated the person to receive petitions of all types, within seven days of the passage by the City Council of this Ordinance or publication thereof, whichever is later.

B. Within ten days, the City Clerk shall confer with the petitioner concerning the form and style of the petition, issue an identification number for the petition, and cause to be written a ballot title for the measure.

C. The ballot title shall be posed as a question, so that an affirmative answer to the question and affirmative vote on the measure results in the tax rate increase being imposed, and a negative answer to the question and a negative vote on the measure results in the tax rate increase not being imposed. The petitioner shall be notified of the identification number and ballot title within this ten-day period.

D. After notification of the identification number and ballot title, the petitioner shall have

thirty days in which to secure on petition forms the signatures of not less than fifteen percent of the registered voters of the City and to file the signed petitions with the City Clerk.

E. Each petition form shall contain the ballot title and the full text of the measure to be referred. The City Clerk shall verify the sufficiency of the signatures on the petitions. If sufficient valid signatures are properly submitted, the City Clerk shall cause the referendum measure to be submitted to the City voters at the next election within the City or at a special election as provided pursuant to RCW 35.17.260(2).

Section III

Exclusive Procedure

Pursuant to RCW 35.21.706, the referendum procedure set forth in Section II above, shall be the exclusive referendum procedure for the increase in the utility tax imposed herein, and shall supersede the procedures, to the extent applicable, under chapters 35.17 and 35A.11 and all other statutory provisions for initiative or referendum which might otherwise apply.

Section IV

Severability

Should any section, paragraph, sentence, clause or phrase of this Ordinance, or its application to any person, entity, or circumstance, be declared unconstitutional or otherwise invalid for any reason, or should any portion of this Ordinance be pre-empted by state or federal law or regulation, such decision or pre-emption shall not affect the validity of the remaining portions of this Ordinance or its application to other persons or circumstances.

Section V

Effective Date

This Ordinance shall take force and be in effect five (5) days from and after its passage,

approval, and publication according to law, provided that the increase in tax imposed by Section I shall apply effective for the tax year commencing January 1, 2027.

PASSED BY the Council and APPROVED by the Mayor this _____ day of _____, 2026.

SIGNED:_____
____
Mayor

ATTEST:_____
___
Clerk

APPROVED as to form:

_____
City Attorney

Staff Report – Ordinance

November 16, 2026 Council Regular Meeting

Ordinance No. 26-008 Our Camas 2045 Comprehensive Plan
Presenter: Alan Peters, Community Development Director
Time Estimate: 5 minutes

Phone	Email
360.817.7254	apeters@cityofcamas.us

BACKGROUND: The Our Camas 2045 Comprehensive Plan is a periodic update to the City of Camas Comprehensive Plan required by the Washington Growth Management Act. Developed over more than three and a half years of planning, coordination, and community engagement, the plan establishes a long-range vision for how Camas will grow and evolve through 2045 while preserving the qualities that make the community distinctive. The proposed plan responds to changes in community conditions and state requirements and establishes goals, policies, and strategies addressing housing, employment, transportation, public services, infrastructure, environmental protection, and community character.

The Planning Commission held a public hearing on September 15, 2026, and voted unanimously on September 29, 2026, to forward a recommendation to Council to adopt the Our Camas 2045 Comprehensive Plan. Council held a public hearing on October 19, 2026, and on November 2, 2026, moved to direct the City Attorney to prepare an ordinance for adoption of the Our Camas 2045 Comprehensive Plan.

SUMMARY: Ordinance No. 26-008 adopts the Our Camas 2045 Comprehensive Plan and completes the City's periodic update process. The Our Downtown Camas 2045 Subarea Plan, Downtown Design Manual, and Municipal Code amendments that have been prepared in conjunction with the Our Camas 2045 plan are proposed for adoption in separate ordinances.

BENEFITS TO THE COMMUNITY: The proposed Comprehensive Plan establishes an updated framework for accommodating growth through 2045. The proposal establishes a new vision statement, expands housing choices, supports economic development and employment opportunities, strengthens environmental and climate resiliency policies, promotes safe and connected multimodal transportation, and coordinates growth with public facilities and infrastructure.

STRATEGIC PLAN: This item advances multiple City strategic priorities, including Economic Prosperity, Safe and Accessible Community, and Vibrant Community Amenities. The updated plans and regulations support a diverse and resilient local economy, expand housing and development opportunities, protect community character and environmental resources, and provide a clearer and more predictable regulatory

framework. The proposal also strengthens long-range coordination between land use, transportation, infrastructure, public services, environmental stewardship, and future City investments.

POTENTIAL CHALLENGES: Implementation of the updated plans and regulations will require adjustment by City staff, applicants, property owners, and the development community. Increased growth will also require continued coordination of transportation, water, sewer, public safety, parks, and other infrastructure investments. Staff will need to monitor implementation and recommend further code amendments as needed.

BUDGET IMPACT: Preparation of the Comprehensive Plan update has been completed using existing City staff and previously authorized consultant resources, funded in part by grants. The amendments will facilitate future development activity, resulting in corresponding City revenues and costs.

RECOMMENDATION: Staff recommends Council adopt Ordinance No. 26-008 and it be published accordingly to law.

ORDINANCE NO. 26-008

An Ordinance adopting the Our Camas 2045 Comprehensive Plan, in accordance with the goals and requirements of the Washington Growth Management Act.

WHEREAS, Chapter 36.70A RCW, the Washington Growth Management Act (GMA), requires the City of Camas (City) to periodically review and, as necessary, revise its comprehensive plan and development regulations to comply with state law and plan for anticipated growth; and

WHEREAS, the City's current Camas 2035 Comprehensive Plan was adopted in 2016 and the City undertook the Our Camas 2045 periodic update to establish a coordinated policy framework for growth through 2045; and

WHEREAS, beginning in December 2023, the City conducted a public visioning and planning process involving surveys, community meetings and summits, stakeholder engagement, advisory committees, and continuing review by the Planning Commission and City Council; and

WHEREAS, City Council approved the Our Camas 2045 Vision Statement in July 2024 in Resolution No. 24-012; and

WHEREAS, the City coordinated with Clark County regarding countywide planning policies, population and employment allocations, land capacity, and urban growth areas, and Clark County adopted its updated comprehensive plan on October 13, 2026; and

WHEREAS, the City prepared the Our Camas 2045 Comprehensive Plan, including updates to goals, policies, maps, and the Community Character, Land Use, Housing, Natural Environment, Climate Change and Resiliency, Transportation, Public Facilities and Services, and Economic Development elements; and

WHEREAS, the City conducted environmental review pursuant to Chapter 43.21C RCW and issued a Determination of Nonsignificance for the proposed update and related actions on September 10, 2026, under file no. SEPA26-1006; and

WHEREAS, the City provided notice to the Washington State Department of Commerce pursuant to RCW 36.70A.106 on August 14, 2026; and

WHEREAS, following public notice, the Planning Commission conducted a public hearing on September 15, 2026, and on September 29, 2026, unanimously recommended adoption of the Comprehensive Plan; and

WHEREAS, following a duly noticed public hearing on October 19, 2026, and consideration of the Planning Commission recommendation, staff analysis, public testimony, and written comments, the City Council reviewed the proposed Comprehensive Plan and on November 2, 2026, moved to direct the City Attorney to prepare an ordinance for adoption of the Our Camas 2045 Comprehensive Plan;

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF CAMAS AS FOLLOWS:

I

The Council incorporates by reference the Recitals as set forth herein as findings of fact. The Council concludes that the City has completed its periodic review pursuant to RCW 36.70A.130. The Our Camas 2045 Comprehensive Plan contains eight named elements: Community Character, Land Use, Housing, Natural Environment, Climate Change and Resiliency, Transportation, Public Facilities and Services, and Economic Development. These

elements, together with the maps, appendices, and supporting plans, address the mandatory elements of RCW 36.70A.070.

Land Use. The Land Use Element establishes the distribution and location of residential, commercial, industrial, mixed-use, and parks and open space uses, informed by population and employment allocations, the Vacant Buildable Lands Model, environmental considerations, and infrastructure needs.

Housing. The Housing Element identifies existing and projected housing needs, including housing needs for moderate, low, very low, and extremely low-income households; and emergency housing, emergency shelters, and permanent supportive housing. The housing element demonstrates that the City has adequate capacity for its housing needs based on the City's population and housing allocation.

Capital Facilities. The Public Facilities and Services Element identifies public facility needs and policies for coordinating the timing, capacity, and financing of facilities with planned growth, including water, wastewater, stormwater, public safety, and other municipal facilities.

Utilities. The Public Facilities and Services Element addresses existing and planned utility systems and coordination with utility providers, including City water, sewer, and stormwater services and franchise utilities.

Transportation. The Transportation Element assesses travel demand and the transportation network and establishes policies, performance measures, and planned improvements for streets, transit, walking, bicycling, and other modes of travel.

Economic Development. The Economic Development Element establishes policies to retain and attract businesses, support employment opportunities and a diverse local economy, and preserve and expand employment lands.

Parks and Recreation. Parks, recreation, open space, trails, and urban tree canopy are addressed through the Land Use, Community Character, Natural Environment, and Public Facilities and Services elements, together with the City's adopted Parks, Recreation, and Open Space Comprehensive Plan.

Climate Change and Resiliency. The new Climate Change and Resiliency Element establishes goals and policies to reduce greenhouse gas emissions and per capita vehicle miles traveled. The element also addresses climate resilience by establishing policies to protect vulnerable populations, strengthen infrastructure and emergency preparedness, safeguard natural resources, and reduce risks to people, property, and ecological systems.

II

The Our Camas 2045 Comprehensive Plan meets the requirements of the GMA through consistency with planning goals identified in RCW 36.70A.020. The following fifteen goals guided the development of the Our Camas 2045 plan: Urban Growth, Reduce Sprawl, Transportation, Housing, Economic Development, Property Rights, Permits, Natural Resource Industries, Open Space and Recreation, Environment, Citizen Participation and Coordination, Public Facilities and Services, Historic Preservation, Climate Change and Resiliency, and Shorelines of the State.

III

The City conducted a public participation program in accordance with RCW 36.70A.130(2). The City established a Public Participation Plan in February 2024 that included engagement objectives, key messages, community demographics, underserved populations, stakeholders and partners, engagement activities, communication tools, risks and mitigation strategies for low attendance or response rates, and an evaluation process for meeting the engagement objectives.

The City utilized a variety of methods to reach a broad audience of community members, including in-person events, online surveys, a project website, and attendance at City Council and Planning Commission meetings. The City used various communication tools, such as social media, public notices in the Camas-Washougal Post Record, updates to the project website, flyers posted around the city, and distribution through partner agency communication channels, to advertise community events and engagement activities.

During the vision phase of the project, a citywide outreach process established the community's vision and priorities related to Camas's future via community conversations, in-person community events, online surveys, online mapping tools, and through the project website.

During the development of land use alternatives, the community was asked to provide their feedback on the proposed land use alternatives and early stages of the plans. The feedback was used to inform development of the preferred land use alternative and the goals and policies that were developed in the draft plan.

During the plan development phase, the City sought feedback on the draft plan elements. Community Summit #3 was a multi-month series with a new focus element every two weeks. Feedback from this summit was used to revise the goals and policies of each element.

During the final adoption phase, public hearings were held by the Planning Commission and City Council. Feedback from the Planning Commission and City Council was incorporated into the final draft plans.

IV

Based on the findings of fact, the Council finds and declares that the review and needed revisions have been prepared in conformance with applicable law, including Chapter 36.70A RCW, Chapter 43.21C RCW, and Camas Municipal Code, Chapter 18.51 Comprehensive Plan Amendments. That document entitled "Our Camas 2045 Comprehensive Plan", a copy of which is on file with the office of the City Clerk for public inspection, is hereby adopted as the Comprehensive Plan for the City.

The existing City of Camas Comprehensive Plan adopted in Ordinance No. 16-010 is hereby repealed.

V

This ordinance shall take force and be in effect five (5) days from and after its publication according to law.

PASSED by the Council and APPROVED by the Mayor this 16th day of November, 2026.

SIGNED:_____
Mayor

ATTEST:_____
Clerk

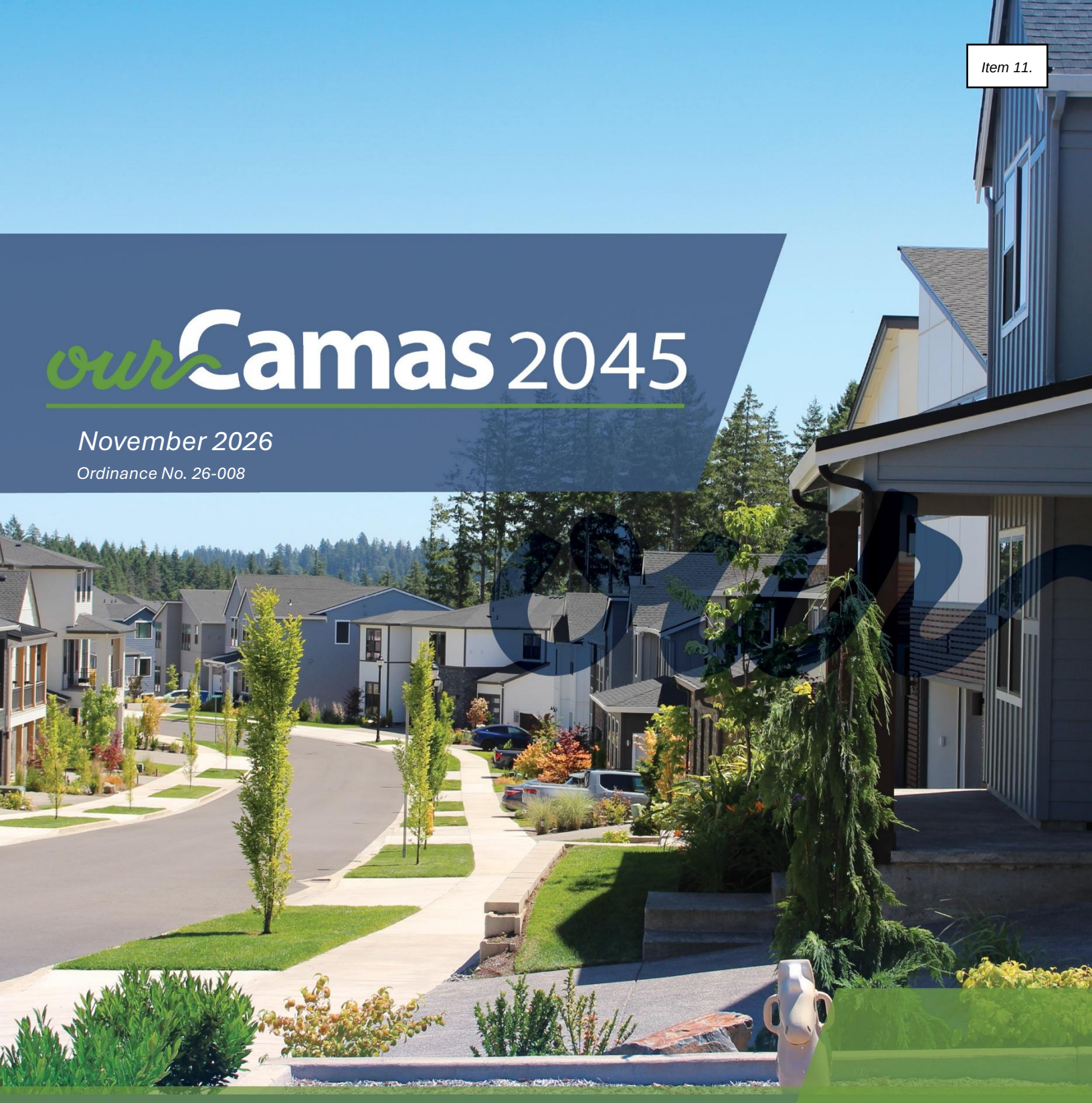
APPROVED as to form:

_____
City Attorney

ourCamas 2045

November 2026

Ordinance No. 26-008



Comprehensive Plan

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Acknowledgements

Thank you to the members of the Camas community for sharing your time and insights in the development of Our Camas 2045.

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ourCamas 2045

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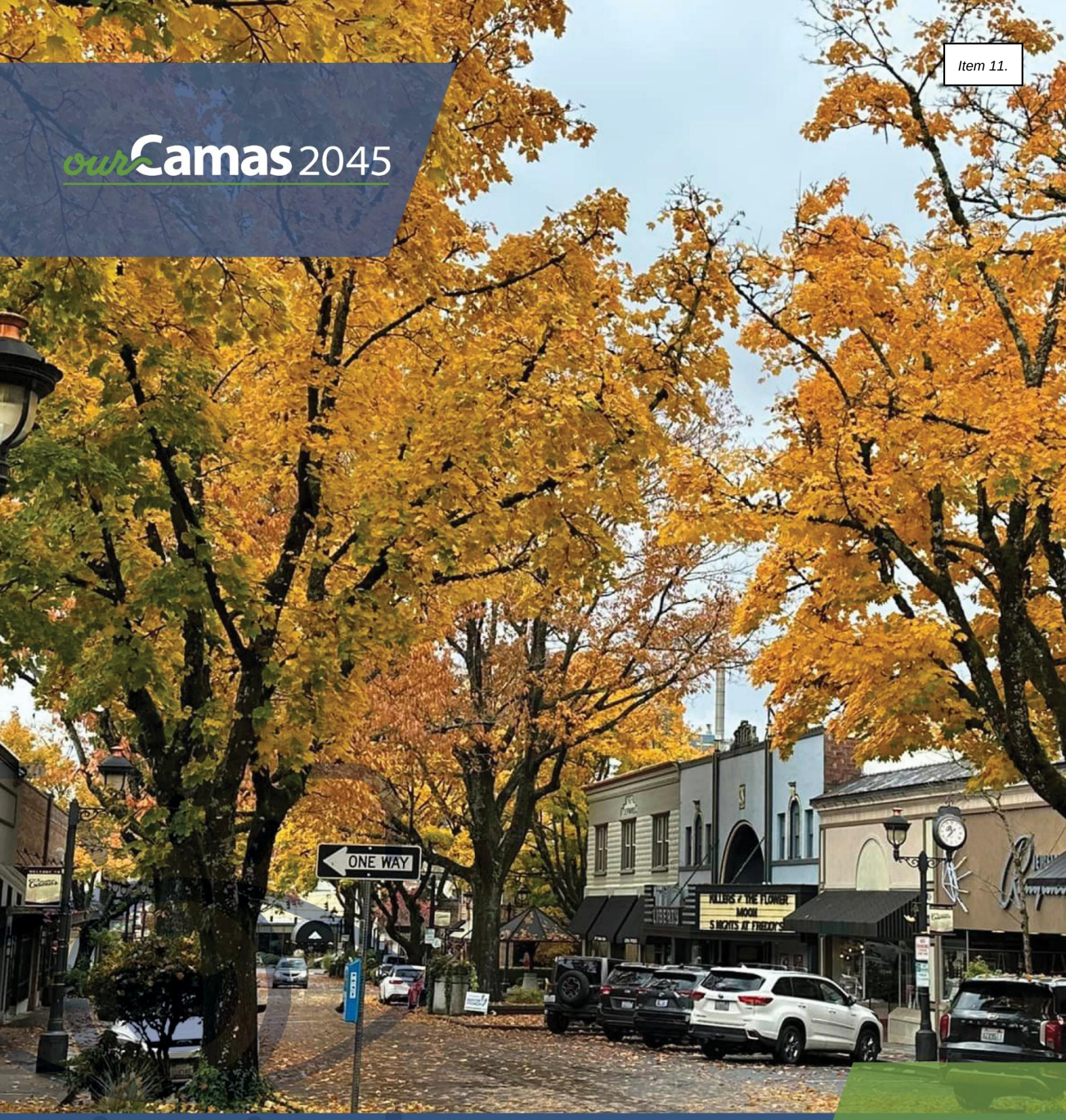


Vision

01

01. Vision

Our Camas 2045 Vision Statement

This vision is written in the present tense, as if describing the city as it exists in 2045. Some aspects of the vision can be found in Camas today, while others represent aspirations. The vision provides a framework for the goals and policies of every element of Our Camas 2045.



Our Community

Camas is an inclusive community where residents experience a sense of belonging and connection. Community-wide events foster civic pride, strong bonds among neighbors and a welcoming atmosphere for new residents. Community amenities and recreation facilities throughout Camas promote active lifestyles and social interaction. Camas is recognized for excellent schools and its commitment to lifelong learning. The City promotes a strong culture of public safety, transparent communication, and good governance, allowing residents to thrive in their neighborhoods and engage in decision-making that shapes their community.



Our Environment

Camas embraces its connection to nature and enjoys a wealth of outdoor recreational opportunities. Access to forests, clean water, parks, and trails is foundational to Camas' quality of life. The community shares a deep reverence for Camas' beauty, scenery, and tranquility, and is committed to preserving and enhancing its natural resources and tree canopy. Through proactive planning, the City mitigates the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come.



Our Neighborhoods

Camas embraces its small-town feel while responsibly managing growth, ensuring a prosperous and livable future for all. Camas provides a variety of housing options that meet the needs of all residents, while ensuring the town's charm and livability are sustained. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities and access to high wage jobs. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity.



Our Downtown

Charming, vibrant, and walkable, Downtown Camas is the city's living room. Downtown's history is complemented by new businesses and inclusive housing options. Expansion, resiliency and a dynamic economic landscape are critical to its success. Downtown Camas anchors the community while fostering a culture of pride, support, and connection.

ourCamas 2045



Introduction

02

02. Introduction

Our Camas 2045

Our Camas 2045 is a roadmap for the future of the city and guides land use development and public facility investment decisions between now and 2045.

Camas has a long and rich history. More than 10,000 years ago, Native Americans occupied the Columbia River Valley. The Lewis and Clark Corps of Discovery camped by the river in 1806. In the late 1800s, the La Camas Colony Company of Portland purchased 2,600 acres and began planning the construction of a paper mill to supply newsprint for The Oregonian. The construction of the mill brought the platting of the town and the City of Camas was incorporated in 1906. Today, Camas is a vibrant and diverse community that occupies approximately 16 square miles and is home to over 28,000 people.

Our Camas 2045 is an update to the prior City of Camas comprehensive plan, Camas 2035. This update incorporates new state legislation to support additional housing and climate planning and establishes a new vision for the community's future.

The history of Camas comprehensive planning dates back to 1963 when the first plan was prepared. In 1990, the state adopted the Growth Management Act (GMA) with the goal of managing the growth of cities that had previously grown in an uncoordinated fashion. GMA requires municipalities to update their comprehensive plans every 10 years to ensure future growth can be accommodated with housing and jobs, and public services and facilities are available to serve new residential, commercial, and employment areas.

The last major update to the City's comprehensive plan was in 2016. Since that time, the city has grown by over 6,500 people, added new residential areas in Grass Valley and Green Mountain, and completed the North Shore Subarea Plan, which established a new vision and zoning for the North Shore of Lacamas Lake and sets the stage for future residential, mixed use, and employment development. In conjunction with Our Camas 2045, the city prepared a downtown subarea plan. Our Downtown Camas 2045 establishes a detailed vision and action plan to catalyze public and private investment in the historic downtown. Both plans work together to guide future development and ensure Camas' future remains as vibrant as its past.

What is a Comprehensive Plan?

Our Camas 2045 guides land use development and public facility investment decisions between now and 2045. Our Camas 2045 has eight elements that work together to achieve the community's vision and ensure long-term economic vitality:



Each element sets goals that will implement the vision and expresses policies that will guide land use and infrastructure decisions for the 20-year planning horizon. The elements are supported by the comprehensive plan map, which identifies land use designations throughout the City and within its urban growth area.

Why Plan?

Planning is choosing what to do and how and when to do it. Planning is part of our everyday lives. We plan our vacations, our budgets, and even our trips to the grocery store. The detailed planning of our daily lives derives from a set of goals that we want to accomplish – in a day, in the next six months, or the next two years.

In the same way and for the same purpose, the City's plan is the basis of coordinated action – it enables public and private interests to undertake projects with a clear understanding of community goals and policies.

Our Camas 2045 helps the City identify deficiencies and take steps to remedy them. Planning can find desirable and reasonable solutions before the problem is beyond the community's economic capabilities. The plan is crucial to avoiding uncoordinated activities as the City adapts to changing conditions and experiences the population growth that is anticipated.

The plan is not intended as a rigid system of goals and development policies; rather, it is:

- **Long range** – looks ahead 20 years to anticipate growth and resulting community needs.
- **Comprehensive** – relates and integrates all types of uses and necessary public facilities.

- **General** – establishes general locations and areas for the elements and indicates their relationships to each other and the population they serve.
- **Responsive** – through regular updates, adjusts to changing conditions, unforeseen circumstances, and local and regional trends.

How is a Comprehensive Plan Related to Other Plans?

Our Camas 2045 is part of a family of state, regional, and local plans. Some, like statewide GMA and Clark County's Comprehensive Growth Management Plan, set the overall planning framework and guide the content of the Camas comprehensive plan.

Others, like plans that are specific to particular subareas, supply more detailed information about individual topics or smaller parts of the City.

Growth Management Act

The GMA establishes state goals, sets deadlines for compliance, and offers direction on how to prepare comprehensive plans and development regulations. GMA also establishes requirements for early and continuous public participation. GMA requires state and local governments to manage growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, and preparing comprehensive plans and implementing them through capital investments and development regulations.

The GMA legislation, which is Chapter 36.70A of the Revised Code of Washington (RCW), contains 15 goals.

For a community's plan to be valid, it must meet the requirements of the GMA through consistency with state statutory goals, countywide policies, and the plans of adjacent jurisdictions.

The fifteen statutory goals identified in the GMA (RCW 36.70A) are:

1. **Urban growth**. Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner.
2. **Reduce sprawl.** Reduce the inappropriate conversion of undeveloped land into sprawling, low-density development.
3. **Transportation.** Encourage efficient multimodal transportation systems that will reduce greenhouse gas emissions and per capita vehicle miles traveled, and are based on regional priorities and coordinated with county and city comprehensive plans.
4. **Housing.** Plan for and accommodate housing affordable to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage preservation of existing housing stock.
5. **Economic development.** Encourage economic development throughout the state that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons, promote the retention and expansion of existing businesses and recruitment of new businesses, recognize regional differences impacting economic development opportunities, and encourage growth in areas experiencing insufficient economic growth, all within the capacities of the state's natural resources, public services, and public facilities.
6. **Property rights.** Private property shall not be taken for public use without just compensation having been made. The property rights of landowners shall be protected from arbitrary and discriminatory actions.
7. **Permits.** Applications for both state and local government permits should be processed in a timely and fair manner to ensure predictability.

8. **Natural resource industries.** Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forestlands and productive agricultural lands, and discourage incompatible uses.
9. **Open space and recreation.** Retain open space and green space, enhance recreational opportunities, enhance fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities.
10. **Environment.** Protect and enhance the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
11. **Citizen participation and coordination.** Encourage the involvement of citizens in the planning process, including the participation of vulnerable populations and overburdened communities, and ensure coordination between communities and jurisdictions to reconcile conflicts.
12. **Public facilities and services.** Ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.
13. **Historic preservation.** Identify and encourage the preservation of lands, sites, and structures, that have historical or archaeological significance.
14. **Climate change and resiliency.** Ensure that comprehensive plans, development regulations, and regional policies, plans, and strategies under RCW 36.70A.210 and chapter 47.80 RCW adapt to and mitigate the effects of a changing climate; support reductions in greenhouse gas emissions and per capita vehicle miles traveled; prepare for climate impact scenarios; foster resiliency to climate impacts and natural hazards; protect and enhance environmental, economic, and human health and safety; and advance environmental justice.
15. **Shorelines of the state.** For shorelines of the state, the goals and policies of the shoreline management act as set forth in RCW 90.58.020 shall be considered an element of the county's or city's comprehensive plan.

Urban Growth Areas

An urban growth area is a defined area of land adjacent to city limits within which urban growth is encouraged and beyond which growth can occur only if it is not urban in nature.

Each county that adopts a comprehensive plan under the GMA must designate urban growth areas. The City of Camas has 11,848 acres of land within the urban growth areas. This land, combined with the vacant land available within the City limits, must accommodate the City's population and employment projections as established by the state's Office of Financial Management. The population and employment projections for the City for the year 2045 are 37,080 people and 13,658 jobs. The City is proposing urban growth area expansion to accommodate increased job capacity (see the Land Use Element for additional details).

County Planning Goals and Policies

The Comprehensive Growth Management Plan, adopted by Clark County and its cities and last updated in 2016, guides local jurisdictions as they work to decide questions of regional land use and services.

Clark County is in the final stages of fully updating this plan for 2026 through 2045. As County and city plans were developed, representatives of the City of Camas met on a regular basis over the span of two years with officials of the County and its cities to coordinate efforts. This level of communication helps ensure that the plans and capital projects of these jurisdictions are consistent when adopted. Our Camas 2045 is consistent with the concepts put forward in the County's Comprehensive Growth Management Plan, and the initial drafts of its pending comprehensive plan, and the countywide planning policies as required by RCW 36.70A.100 and 210, WAC 365-196-305; 400(2)(c); 510 and 520.

Local Plans

The goals and policies included in Our Camas 2045 are implemented through development regulations established in the Camas Zoning Code (Title 18 of the Camas Municipal Codes) as well as the standards set forth in existing plans and policy documents.

Our Camas 2045 has been developed to ensure consistency with all other relevant local plans as listed below:

- Strategic Plan 2025-2030 (2025)
- Legacy Lands Master Plan (2026)
- Lake Management Plan (2024)
- North Shore Subarea Plan (October 2022)
- Camas Water System Plan (October 2019, to be updated with Our Camas 2045)
- Camas General Sewer Plan (June 2022, to be updated with Our Camas 2045)
- Camas General Sewer/Wastewater Facility Plan (November 2011)
- City of Camas Parks, Recreation, and Open Space Comprehensive Plan (March 2022)
- Camas Design Standards Manual–Engineering (adopted October 20, 2014, Res. 1308, updated annually)
- Camas Design Review Manual (May 2, 2016)
- Camas Shoreline Master Program (2021)
- Downtown Design Manual (revision in process, to be adopted with Our Downtown Camas 2045, the Downtown Subarea Plan)
- Camas Stormwater Design Standards Manual (June 2022)
- Six-Year Street Plan (Updated annually)
- 2025–2030 Capital Improvement Plan Project List (to be updated with Our Camas 2045)
- Transportation Impact Fee Update (May 2012)

Amending a Comprehensive Plan

The City is required to review its comprehensive plan at least every ten years. However, the City's comprehensive plan and development regulations are reviewed and evaluated regularly.

Our Camas 2045 is based on the best available information. As years go by, new information or changing circumstances – for instance, a revised sewer or water plan – may prompt changes to this plan. By state law, amending a comprehensive plan can occur only once a year and must follow the procedures that are set forth in RCW 36.70A.130.

Amendments to a comprehensive plan require legislative action, which entails the adoption of a resolution or ordinance following notice and public hearing indicating, at a minimum, a finding that a review and evaluation has occurred and identifying the revisions made, or that a revision was not needed and the reasons.

The review and evaluation must include the consideration of critical area ordinances, population projections, and other plans and policies in effect.

Under certain circumstances, amendments can occur more frequently:

- The initial adoption of a subarea plan. Subareas must clarify, supplement, or implement jurisdiction-wide comprehensive plan policies, and may only be adopted if the cumulative impacts of the proposed plan are addressed by appropriate environmental review under chapter 43.21C RCW.
- The development of an initial subarea plan for economic development located outside of the 100 year floodplain in a county that has completed a state-funded pilot project that is based on watershed characterization and local habitat assessment
- The adoption or amendment of a shoreline master program under the procedures set forth in Chapter 90.58 RCW.
- The amendment of the capital facilities element of a comprehensive plan that occurs concurrently with the adoption or amendment of a county or city budget.
- The adoption of comprehensive plan amendments necessary to enact a planned action under RCW 43.21C.440, provided that amendments are considered in accordance with the public participation program established by the county or city under this subsection (2)(a) and all persons who have requested notice of a comprehensive plan update are given notice of the amendments and an opportunity to comment.

Developing Our Camas 2045

Our Camas 2045 began with a citywide outreach process to better understand the community's vision and priorities related to Camas' future. The Our Camas Visioning process reached over 1,000 community members through community conversations, community events, an online survey, online mapping tools, and the project website.

The City hosted three Community Summits. The first, held in June 2024, was an open house event where members of the public could provide feedback on the draft vision statement and goals, as well as provide ideas to achieve the vision and goals. The second Community Summit was held in October 2024 and provided a forum for community members to provide feedback on the draft land use alternatives, development scales, review development concepts for downtown, and learn about the County's climate planning efforts and greenhouse gas inventory. The third Community Summit was a three-month effort in fall 2025 to share the draft comprehensive plan and Downtown subarea plan. The summit was a mix of online engagement and in-person activities to provide community members with opportunities to review, ask questions and provide feedback on each chapter of the draft comprehensive plan and the Downtown subarea plan. Every two weeks, a new plan element was highlighted with background information, an online survey to gauge opinion on various plan policies and an opportunity to chat with a planner, where community members could speak directly with City staff.





There were several advisory committees that participated in the development of the plan.

- Project Advisory Committee (PAC) – technical stakeholders, agency partners, service providers
- Community Advisory Community (CAC) – broad cross-section of community interests
- Climate Policy Advisory Team (CPAT) – community members advising on climate goals and policies
- Downtown Advisory Committee (DAC) – representatives from the CAC and the Downtown Camas Association (DCA)
- The Planning Commission and City Council were also consulted during the development of the vision, goals, policies, and plan

COMMUNITY FEEDBACK HIGHLIGHTS

Feedback from the community is highlighted throughout the plan chapters, indicating where the community's input was incorporated into vision, goals, policies and plan.

Following preparation of the draft plan, the City hosted pop-up events throughout the summer and fall of 2025 to seek input on the preferred alternative map and draft goals and policies.

In addition to the outreach efforts described above, the City maintained a public engagement website throughout the visioning process and the development of Our Camas 2045. During spring 2024, a community survey and interactive map gathered feedback from the community on things they like about Camas, things they would change in the future, important topics to address in the plan, and areas of opportunity or concern both downtown and in the wider Camas community. A second online survey accompanied the second community summit to seek input on the draft land use alternatives and development concepts for downtown. The City prepared an online Story Map in Spring 2025 to present and obtain feedback on the preferred land use alternative and proposed zoning and comprehensive plan land use designation changes.

The City of Camas values residents' opinions and is committed to being responsive. The final comprehensive plan incorporates the contributions and comments from those who participated in the project engagement. Summaries of all engagement activities are included in Appendix A.

ourCamas 2045



03 Community Character

03. Community Character

Community Character

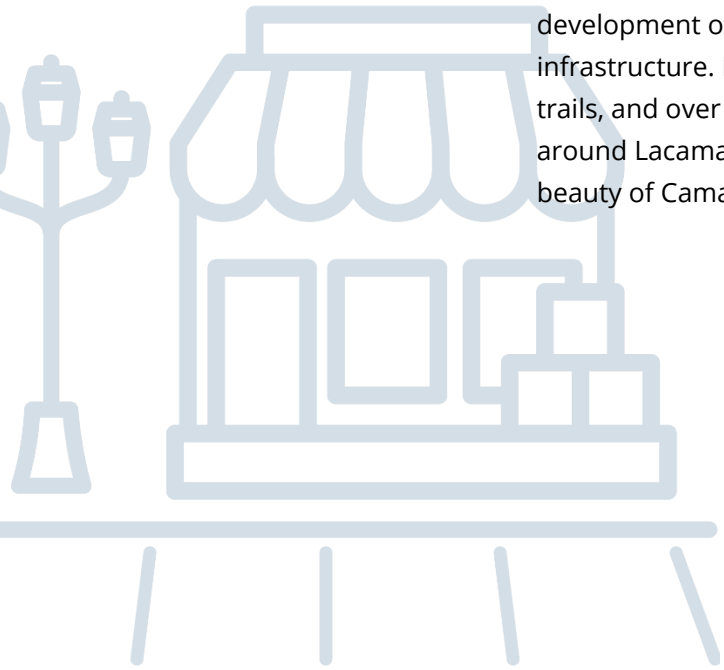
This element integrates art, culture, growth and identity into the comprehensive plan, while ensuring community engagement is inclusive and open.

Vision

In 2045, Camas is an inclusive community where residents experience a sense of belonging and connection. The city's unique identity is defined by its small-town feel and the incorporation of the natural landscape into walkable neighborhoods and high-quality development. Camas maintains its distinct sense of place through inclusive community engagement, sustainable development practices, and intentional placemaking that reinforces Camas' beauty, livability, and lasting connection to nature.

Introduction

The community character element establishes a framework for preserving and enhancing the physical, cultural, and social characteristics that make Camas feel like Camas. Community character is shaped not only by the built environment, but also by the natural landscape, cultural identity, historic context, and the ways in which people engage with their surroundings. As Camas plans for continued growth through the 2045 horizon, this element ensures that the qualities residents value—such as the City's small-town atmosphere, its connection to nature, and its strong civic identity—are maintained and reinforced through thoughtful development, design standards, public investment, and public engagement. Camas' natural and built environment is defined by its integration of the natural features of the land with the development of housing, commercial buildings and its connecting infrastructure. In 2026, the City of Camas is home to 16 parks, 12 miles of scenic trails, and over 1,060 acres of parks and open space. From the forested paths around Lacamas Lake to the many playgrounds throughout the city, the natural beauty of Camas is a defining part of community life.









Camas' diversifying community is comprised of approximately 28,500 people and expected to grow to over 37,000 by 2045. While most people who live in Camas commute to nearby cities for employment, in 2026, there are approximately 9,550 jobs within the city with the largest employment sectors being education and healthcare, followed by professional services. The Georgia Pacific Mill remains a significant part of the city's economic history and a symbol of Camas' working roots.

The majority of housing in Camas is low density detached homes. Most residents own their home, with renters making up 20% of residents. There are approximately 10,000 housing units in Camas in 2026. By 2045, the city needs to add 4,226 new units to support the growing population. Camas also needs a greater variety of housing types at a range of price points to meet residents' diverse needs. By 2045, new multifamily and mixed-use buildings near transit, in Downtown, North Shore, and along NW Parker Street and Pacific Rim Boulevard will expand options for existing and new residents. These future developments will complement the strong sense of place already present in Camas' established neighborhoods like Prune Hill, Crown Park, and Evergreen Terrace.

Access to public art and community events is an important priority to define and enhance the identity of Camas. Beloved local traditions like Camas Days, the Camas Farmers Market, sporting events, and seasonal festivals foster a deep sense of connection and pride. New development will include and support inclusive public gathering spaces to host events, ensuring that the community spirit thrives as the city grows.

Key community resources to preserve and enhance include the existing built infrastructure, high quality schools, access to living wage jobs, parks, open space and recreational amenities, and the distinctive Downtown area, where historic storefronts, local restaurants, and venues like the Liberty Theatre draw residents and visitors alike.

The community will connect with city government and processes through accessible engagement and neighborhood leadership. Ongoing collaboration will help ensure that Camas remains a place where people feel heard, welcomed, and at home.

COMMUNITY FEEDBACK

- **Provide amenities for children and teenagers**
- **Focus on reuniting the community and fostering diversity through inclusive initiatives**
- **Prioritize community engagement and accountability in city planning and policy implementation**
- **Preserve and expand upon Camas' cultural heritage through arts and community events**
- **Provide development incentives for projects to protect natural topographic, geologic, vegetative, and hydrologic features and provide features such as tree-lined streets, rain gardens and use of native landscaping.**
- **Develop a City education program to share information and educate the community on local government, city functions and ways to engage with staff**



Community Character Goals and Policies

Goal CC-1 Art, Culture, and Heritage

Camas is a city where history, art, and culture are celebrated and accessible to all. Camas events and activities will instill a sense of belonging among residents of all ages, making Camas an ideal place to live and work.

Policy CC-1.1 Encourage and promote a wide range of artistic and cultural activities by reducing barriers and increasing access to hosting and attending community events that define and enhance Camas' community identity.

Policy CC-1.2 Incentivize development sites to create spaces conducive to the provision of art and other cultural activities and amenities. Encourage murals, sculptures, interactive art installations, and interpretive displays that celebrate the history, culture, and creativity of Camas.

Policy CC-1.3 Develop a process to memorialize historic sites and create and maintain an official inventory of Camas' historic and cultural resources.

Policy CC-1.4 Support the formation of a local arts commission that provides funding and support for local artists and artistic events in Camas.

Policy CC-1.5 Require a percentage of capital project budgets to be allocated for public art and design enhancements.

Policy CC-1.6 Prioritize naming streets, parks, and public facilities after historically significant people, events, geographic features, or native flora and fauna. Consider allowing naming rights in recognition of significant donations.

Goal CC-2 Sustainable Growth and Distinct Identity

Camas' unique identity is enhanced by high-quality urban design that respects the natural landscape, fosters a connection to nature, and integrates sustainable development.

Policy CC-2.1 Establish and enforce clear and objective design standards to ensure that new development respects and enhances Camas' architectural, historical, and natural character.

Policy CC-2.2 Regulate land use and development to protect natural topographic, geologic, vegetative, and hydrologic features, and natural contours of undeveloped properties.

Policy CC-2.3 Promote and provide educational resources for tree-lined streets, rain gardens, and preservation and use of native landscaping to reinforce Camas' connection to nature.

Policy CC-2.4 Align development regulations and design guidelines with dark sky standards to encourage the preservation of the night sky.

Policy CC-2.5 Establish distinctive gateway features at major points of entry into Camas, including attractive signage, landscaping, and public art that reflect Camas' distinct identity.

Policy CC-2.6 Ensure that street signage, lighting, landscaping, and street furniture are designed and maintained with a cohesive aesthetic that enhances community identity.

Policy CC-2.7 Revise the City's sign standards to ensure that all permanent and temporary signage is attractive and well-maintained, with clear regulations and enforcement mechanisms.

Policy CC-2.8 Provide educational and volunteer programs related to climate science, the connections between habitat conditions and native species, and effective ways to mitigate the impacts of climate change.

Goal CC-3 Community Engagement

Camas will have a strong sense of community through open communication, inclusive and meaningful outreach efforts, and enduring partnerships throughout the community.

Policy CC-3.1 Increase access to public engagement by ensuring materials and procedures are accessible for all community members, especially vulnerable groups such as low-income, Limited English Proficiency (LEP) individuals, youth, elderly, and differently abled.

Policy CC-3.2 Utilize outreach strategies such as focus groups and listening posts that accommodate the needs of everyone and account for the broad spectrum of community members.

Policy CC-3.3 Develop and implement strategies to support neighborhood leadership and associations to increase community involvement and provide opportunities to participate in the development processes.

Policy CC-3.4 Regularly inform the community of activities and events through a range of outreach methods including traditional and social media, partnerships with schools, and information at fairs and events.

Policy CC-3.5 Develop a City education program to inform the community on the inner workings of their local government, city functions, and an opportunity to engage with staff.

ourCamas 2045



Land Use

04

04. Land Use

Land Use Element

The land use element is designed to support development that adheres to the City's vision to ensure Camas' future is as bright as its past.

Vision

Camas embraces its small-town feel while responsibly managing growth, ensuring a prosperous and livable future for all. Camas provides a variety of housing options that meet the needs of all residents, while ensuring the town's charm and livability are sustained. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities and access to high wage jobs. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity.

Land Use Overview

The City of Camas is home to great schools, family-wage jobs, high quality neighborhoods, and an abundance of open space and recreational amenities. Camas has grown into a dynamic, vibrant city with diversified employment opportunities and services that cater to its residents' various needs. In 2026, Camas maintains its small town charm and character, and downtown remains the heart of the City with a mix of restaurants, shops, professional offices, and residential development. The Grass Valley area is home to several national and international technology and manufacturing firms. Newer residential development has occurred recently in the Green Mountain area, and planned transportation improvements in the North Shore area will improve connectivity and provide better transportation options throughout the City.

The land use element is designed to support development that adheres to the City's vision to ensure Camas' future is as bright as its past. The GMA identifies the land use element as the foundation of the comprehensive plan. GMA outlines the framework by which the plan will be implemented and establishes land use designations to accommodate the City's population and employment projections. The development of land in accordance with the goals and policies included in the land use element will ensure the achievement of an appropriate balance of public facilities, housing, employment, services, and recreational uses throughout the City.

Population Projections

GMA requires that each jurisdiction accommodate its share of the region's growth. The City of Camas is expected to have a population of 37,080 by 2045 (based on the County adopted growth rate of 1.2 percent per year), a 8,590-person increase from the 2026 population of 28,490. During the same period, Camas is expected to have 13,658 jobs in the city by 2045.

Land Use Designations

In order to ensure the City's vision and land use goals are achieved, land use designations are used to assign a variety of development uses and building densities to land throughout the City. The plan identifies areas for residential, commercial, mixed use, mixed employment and industrial development. The plan also identifies areas for parks and open space to support recreation and enhance natural areas, including habitat and wildlife corridors. Public facilities, such as stormwater, sewer and water facilities are allowed uses within these designations. See the Public Facilities & Services chapter for additional information and maps of these facilities.

Table 1 Land Use Designations

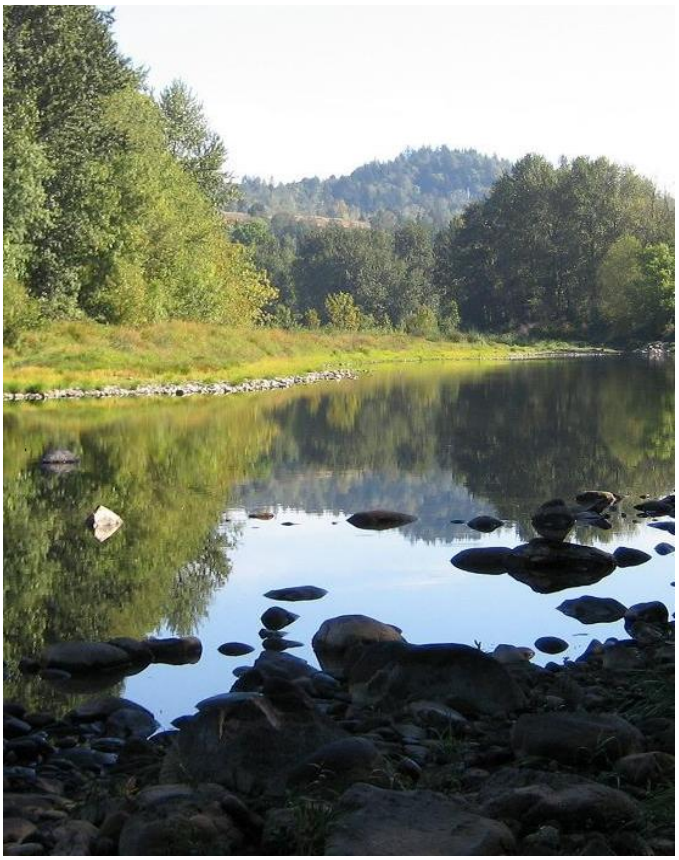
Comprehensive Plan Designation	Corresponding Zones	Total (Acres)[1]	Net residential capacity (units)	Jobs Capacity
Residential Low	Residential 15 (R-15)	442	39	0
	Residential 12 (R-12)	27	30	0
	Residential 10 (R-10)	272	363	0
	Residential 7.5 (R-7.5)	202	310	0
	Residential 6 (R-6)	108	269	0
	North Shore Lower Density (LD-NS)	122	203	0
	Downtown Residential (DT-R)	1	39	11
Residential Medium	Multi-Family 10 (MF-10)	93	503	0
Residential High	Multi-Family 18 (MF-18)	23	0	0
	Multi-Family 24 (MF-24)	33	282	0
	North Shore Higher Density (HD-NS)	139	848	0
Mixed Use	Mixed Use (MX)	133	1,509	1,001
	North Shore Mixed-Use (MX-NS)	93	790	598
	Downtown Mixed-Use Low Rise (DT-MXL)	1	23	9

Comprehensive Plan Designation	Corresponding Zones	Total (Acres)[1]	Net residential capacity (units)	Jobs Capacity
	Downtown Mixed-Use Mid Rise (DT-MXM)	16	566	127
Mixed Employment 	Mixed Employment (ME)	361	0	2,201
	North Shore Mixed Employment (ME-NS)	99	0	590
Commercial 	Neighborhood Commercial (NC)	2	0	20
	Community Commercial (CC)	91	0	1,197
	North Shore Commercial (C-NS)	66	0	894
	Regional Commercial (RC)	298	0	3,826
	Historic Main Street Core (DT-HMSC)	1	24	1
Industrial 	Heavy Industrial (HI)	545	0	1,948
Parks and Open Space 	Parks and Open Space (POS)	1,343	0	0

[1]Total acres within each zoning designation are gross acres and inclusive of rights-of-way and infrastructure.

COMMUNITY FEEDBACK

- **Manage growth to allow for infrastructure adjustments and maintain the small-town feel**
- **Support neighborhood hubs, residential scale businesses, and encourage community building**
- **Encourage multifamily units to support walking or taking transit to employment areas**
- **Need clear transitions between low density and higher density developments**
- **Support for design standards that are sustainable and low climate impact (native landscaping, energy and water efficiency standards, site optimization to preserve green space)**
- **Align land use plans with transportation improvements**



Overlays

In addition to the land use designations listed in Table 1, land use overlays further define appropriate uses and development standards for particular areas within the City. Overlays in Camas include an Airport Overlay, Cottage Overlay, and a Design Overlay. Development within all overlay areas must comply with the goals and policies of the underlying land use designation and the specific standards included in the overlay.

The Airport Overlay area applies to land adjacent to Grove Field, an airport owned and operated by the Port of Camas-Washougal and located northeast of Lacamas Lake. Grove Field is included in the UGA with this update. The Airport Overlay is designated to ensure land uses adjacent to the airport are compatible with air traffic and do not interfere with safe air navigation. For example, the comprehensive plan designation of lands adjacent to the airport is generally Mixed Employment, rather than residential, and the Airport Overlay area restricts uses tending to have higher concentrations of people, such as schools or hospitals.

The Cottage Overlay may be utilized within multi-family zones only and is intended to increase housing choice and supply by allowing flexibility in the development of smaller detached cottage-style dwellings.

The Gateway Design Overlay is a new overlay with the 2026 update and replaces the Gateways and Corridors Overlay included in the prior plan. The Design Overlay generally applies to the following locations. The specific extents of the overlay are included on the Camas Zoning Map.

- NW 6th Avenue
- NE 3rd Avenue
- NE Everett Street
- NW 38th Avenue
- NW Lake Road
- Green Mountain – NW Goodwin Road
- NW Brady Road
- SE Union Street
- NW Parker Street

The Design Overlay is intended to enhance the walkability, pedestrian experience, and design of the corridors it covers. Development/redevelopment within a designated Design Overlay must adhere to the Design Overlay goals and policies included in this element. See Goal LU-6 and Policies LU-6.1 – 6.7.



Figure 1 Comprehensive Plan Map

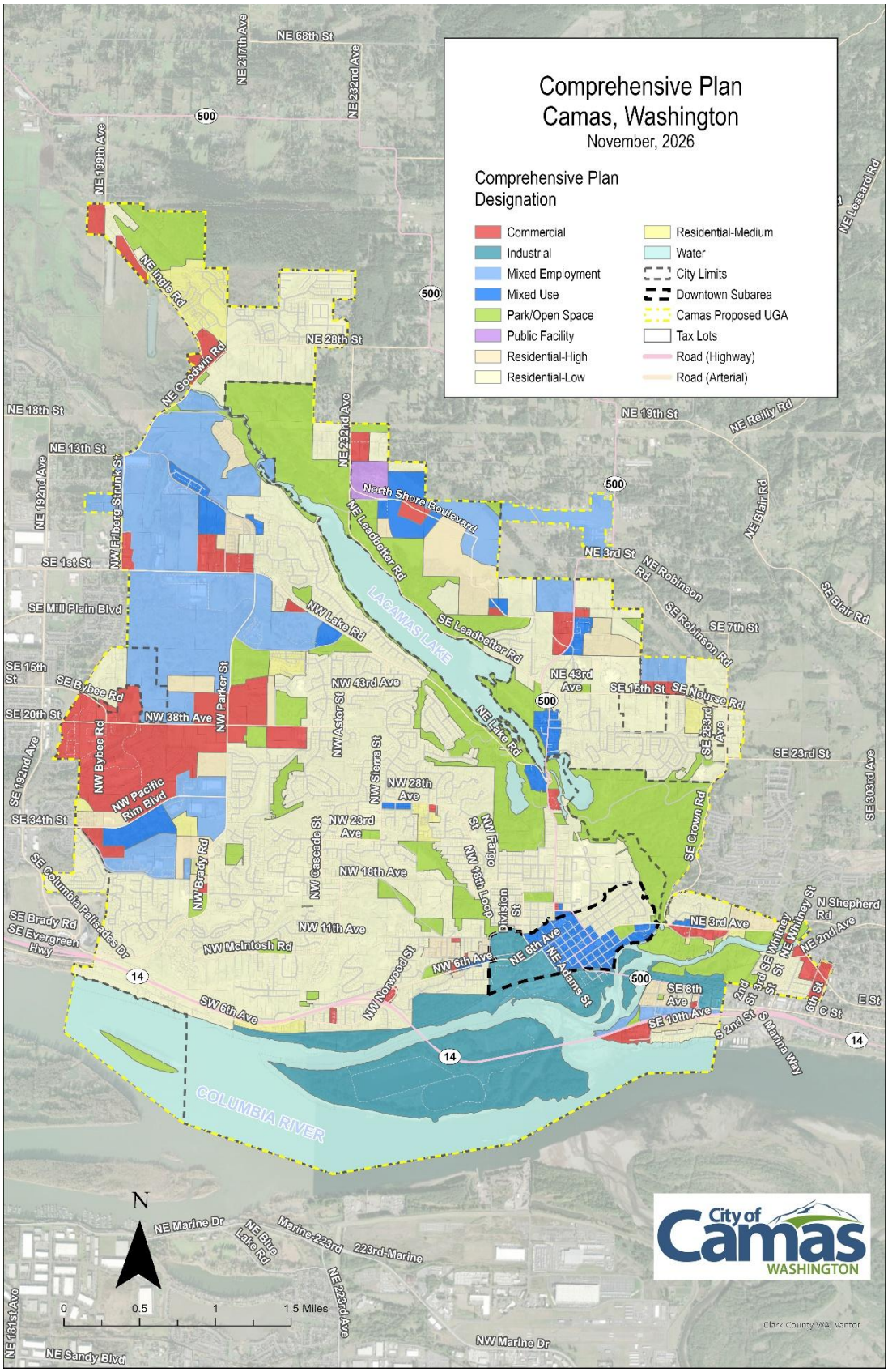
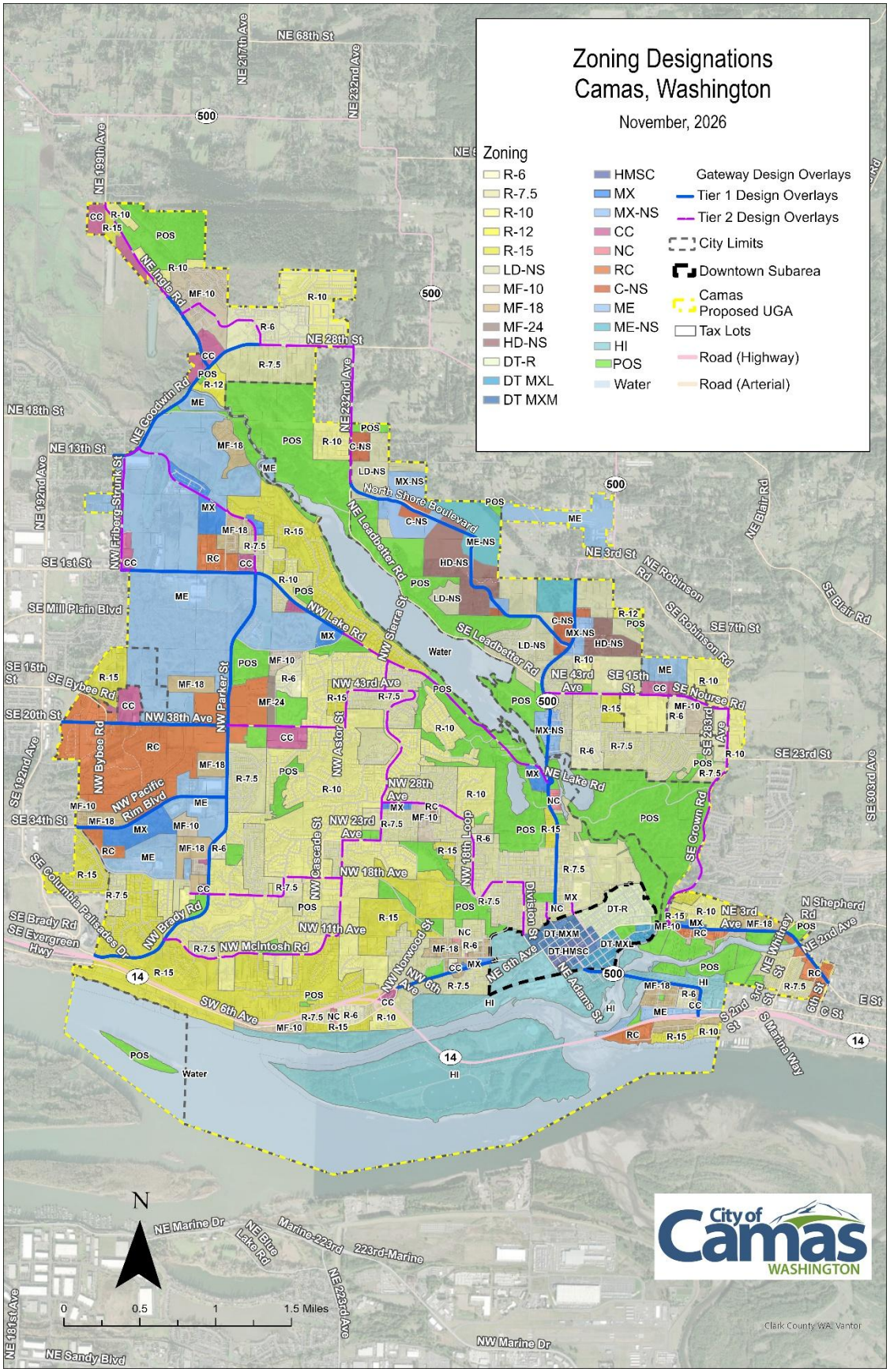


Figure 2 Zoning Map



Land Use Goals and Policies

Goal LU-1 Citywide Land Use

Maintain a land use pattern that respects the natural environment and existing uses while accommodating a mix of housing and employment opportunities to meet the City's growth projections in coordination with the capital improvement plan.

Policy LU-1.1 Ensure the appropriate mix of commercial, residential, and industrial zoned land accommodates the City's share of the regional population and employment projections for the 20-year planning horizon.

Policy LU-1.2 Coordinate with Clark County, the state, and special districts to identify future needs and site planning for essential public facilities such as airports, state education facilities, state and regional transportation facilities, state and local correctional facilities, solid waste handling facilities, regional parks and others as identified in RCW 36.70A.200. (See policies ED-3.1, 3.2, and 3.3 regarding Grove Field airport, policy TR-2.1 regarding transportation, and policy PFS-4.27 regarding solid waste.)

Policy LU-1.3 Implement design standards for new development, redevelopment, and infill that consider the surrounding built and natural environments and support a natural transition between uses.

Policy LU-1.4 Ensure that park and recreation land is distributed equitably throughout the City and work to achieve park and continuous trail corridors from Green Mountain to the Columbia River. (See policies PFS-2.1 and 2.4 regarding increasing connectivity to natural areas and continuous trail around Lacamas Lake.)

Policy LU-1.5 Ensure adequate public facilities, including roads, emergency services, utilities, and schools, exist to serve new development, and mitigate potential impacts to current residents. Establish and maintain policies for impact fees for new development.

Policy LU-1.6 Ensure consistency with County-wide planning policies.

Policy LU-1.7 Evaluate and improve design and building standards for new and redeveloped sites in high-risk natural hazard areas.

Policy LU-1.8 Incorporate sustainable and low climate impact design into development codes and standards. [1]

[1] The leaf symbol is used throughout the plan to indicate policies that tangentially support the goals in the climate chapter that aim to reduce greenhouse gas emissions and plan for climate resiliency.

Policy LU-1.9 Encourage high density concentrations of housing, commercial, and other uses needed in daily life along major transportation corridors to support the reduction in vehicle miles traveled, increase opportunities for physical activity and limit development in areas vulnerable to wildfire, flood, and landslides.

Policy LU-1.10 Protect the viability of the airport as a significant economic resource to the community by encouraging compatible land uses and densities, and reducing hazards that may endanger the lives and property of the public and aviation users consistent with state laws RCW 36.701A.510 and RCW 36.70547.

Goal LU-2 Employment Land

Create a diversified economy and serve Camas residents, businesses, and tourists by providing sufficient land throughout the City to support a variety of business types and employment opportunities.



Policy LU-2.1 Protect employment land to ensure an adequate supply of commercial and industrial land to meet 20-year employment projections. Encourage a balance of new and existing commercial, light industrial, knowledge-based business, medical, and high-tech uses.

Policy LU-2.2 Encourage mixed-use developments (residential and commercial) that support adjacent uses, reduce vehicle miles traveled, and balance job creation.

Policy LU-2.3 Implement development and landscaping standards to ensure industrial development and other employment lands integrate with the surrounding neighborhoods.

Policy LU-2.4 Support the transition of industrial brownfield sites to mixed-use development. Ensure that residential components are designed and located to not interfere with continuing industrial operations.

Goal LU-3 Neighborhoods

Create vibrant, stable, and livable neighborhoods with a variety of housing choices that meet all stages in the life cycle and the range of affordability.



Policy LU-3.1 Encourage connectivity between neighborhoods and adjoining natural areas and trails to increase access to recreation amenities. (See policies PFS-2.1 and 2.2)

Policy LU-3.2 Discourage exclusive neighborhoods, privacy walls, and gated communities.

Policy LU-3.3 Provide commercial zoning within a half mile of residential areas for the development of food retailers (grocery stores and farmers' markets) to improve food access.

Goal LU-4 Natural Environment

Develop an interconnected network of parks, trails, and open space to enhance the quality of life for Camas residents and visitors and support and preserve wildlife corridors and natural resources.

Policy LU-4.1 Maintain development regulations that encourage the preservation of trees and natural areas, including the use of density bonuses and other tools to protect sensitive areas and encourage tree replacement. (See policy NE-4.1)

Policy LU-4.2 Support the purchase and preservation of open space by the City and private owners. Encourage careful consideration and integration of the natural environment in planning activities to maintain the park-like setting of Camas.

Policy LU-4.3 Encourage connectivity and increase access to regional trails throughout the City to support multi-modal transportation and physical activity. (See policies PFS-2.1)

Policy LU-4.4 Protect the quality and quantity of groundwater used for public water supplies through conservation of water usage and treatment of runoff.

Goal LU-5 Mixed-Use Areas

Foster economically and socially diverse mixed-use neighborhoods that meet the multi-modal transportation, housing, employment, education, recreation, and health needs of the community.

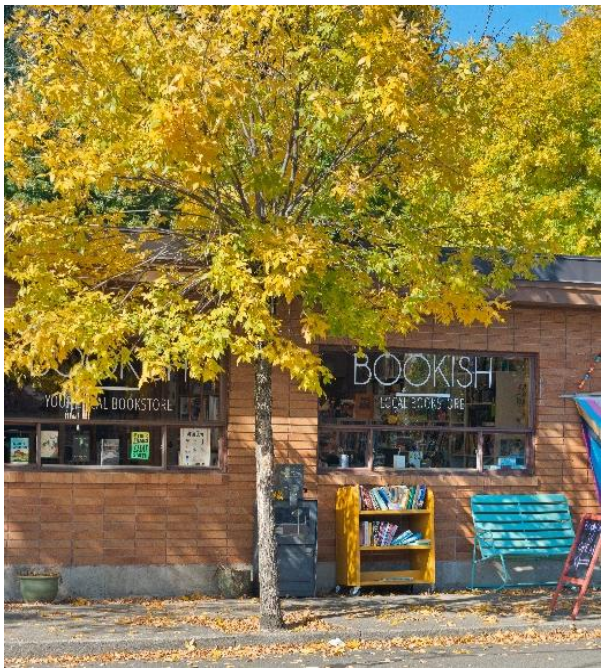
Policy LU-5.1 Mixed-use developments should be unique to the area in which they are located, encourage small business development, provide a mix of housing types to ensure affordability, increase pedestrian and transit connections, and include design that is sensitive to the natural environment.

Policy LU-5.2 Develop mixed-use areas that are oriented to the public street and scaled and designed to integrate with surrounding land uses.

Policy LU-5.3 Create a mixed-use zone that requires developments to include a minimum percentage of commercial space in both vertical and horizontal mixed-use settings.

Goal LU-6 Design Overlay Areas

Create attractive and welcoming areas in the City and distinguish Camas from adjacent jurisdictions through the development of design overlays.



Policy LU-6.1 Encourage development and redevelopment along the design overlay corridors that respects the historic character of the areas, improves pedestrian mobility/safety, and supports small-scale retail and commercial services.

Policy LU-6.2 Encourage development of commercial uses and multi-family residential within the NE 6th Avenue and NE 3rd Avenue design overlay corridors to support downtown businesses (such as through the Downtown subarea plan). Consider rezoning low-density residential land to support the downtown area.

Policy LU-6.3 Orient building entrances toward the street and provide pedestrian connections from building entrances to the sidewalk. Encourage landscaping, rather than parking, between the building and the street to create a welcoming streetscape.

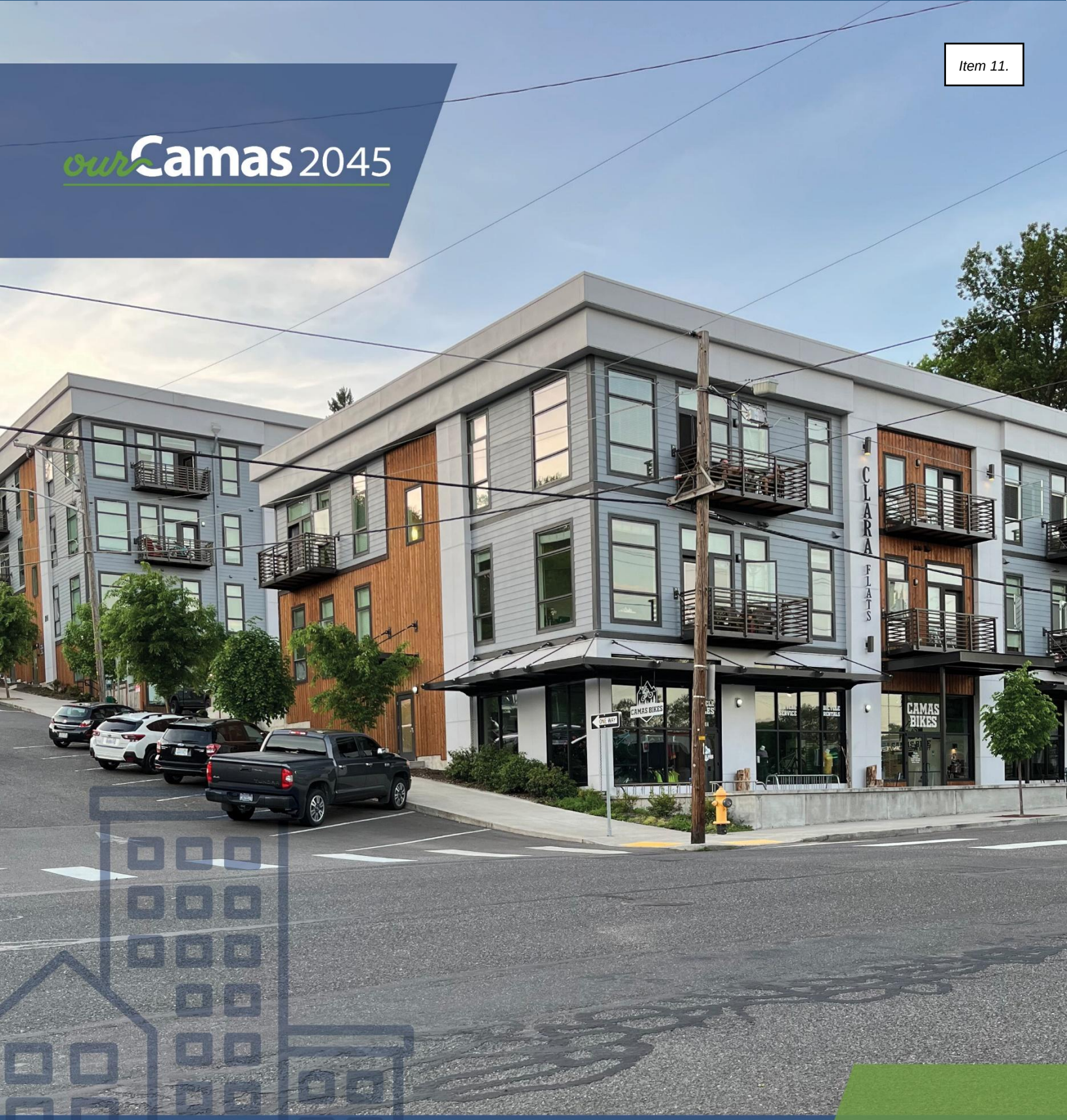
Policy LU-6.4 Collaborate with partners to support community events, public art, and infrastructure investments that celebrate cultural heritage, provide community amenities, and strengthen community branding. Develop area identities through events, festivals, signage, and other improvements that help establish or enhance existing character within the overlay areas.

Policy LU-6.5 Encourage the designation and development of design overlay features in strategic areas to create a distinct pedestrian scale identity and attract visitors.

Policy LU-6.6 Identify streets in the design overlay areas as public places to encourage pedestrian and bicycle mobility and to reinforce the connection between the corridors and the surrounding neighborhoods.

Policy LU-6.7 Improve and increase wayfinding signage in design overlay areas to nearby recreational and other amenities.

ourCamas 2045



Housing

05

05. Housing

Housing Challenges

Camas is facing housing challenges that could benefit from improved access to more housing options including more housing for seniors and young adults, smaller housing, more rental units, and affordable homeownership opportunities, all of which the City can have a role in supporting.

Vision

In the year 2045, residents of Camas continue to appreciate their safe, diverse, and welcoming community. Those raised in Camas will return for living-wage jobs and to ultimately retire here. Camas is a well-planned and connected city where residents enjoy pedestrian and bicycle paths between neighborhoods and to downtown. Camas provides a wide variety of housing options that meets the needs of all residents and provides a range of housing for all ages, abilities, needs, preferences, and income levels.

Background

This element of the comprehensive plan sets out the vision, goals, and policies to address current and projected housing needs for the next 20 years (to 2045), inclusive of the diverse needs of the whole community across the income spectrum. Camas is facing housing challenges that could benefit from improved access to more housing options including more housing for seniors and young adults, smaller housing, more rental units, and affordable homeownership opportunities, all of which the City can have a role in supporting.

The housing element is supported by a housing needs assessment (provided below) that quantifies existing housing stock and projected housing needed to accommodate projected growth. Housing analysis is an important exercise as the housing needs in Camas tend to continually evolve based on changes in the broader economy, local demographics, and the regulatory environment. In addition to an assessment of housing needs based on the best available existing data, the housing element goals and policies reflect community input, state legislative requirements, and City of Camas' priorities.

The following section provides background on the planning framework and highlights the analytical findings associated with current and projected housing including details on Camas' community demographics, housing stock, housing market dynamics, expected housing demand, and special housing needs. The insights from this analysis help to build a factual basis for the housing policy updates.

Planning Framework

In Clark County, RCW 36.70A.040 requires all cities to "fully plan" for the Elements of a Comprehensive Plan, including land use, housing, capital facilities, utilities, transportation, and climate change.[2] The current update process is part of a periodic update also required by the Growth Management Act (GMA), as part of an established schedule by the County.

At the state level, the GMA requires local jurisdictions to adopt Housing Elements that are consistent with statewide goals and objectives. The Housing Element must include an inventory and analysis of existing and projected housing needs that identifies the number of housing units by income level necessary to manage projected growth including permanent supportive and emergency housing.

Recent state legislation calls for cities to expand middle housing allowances in single family residential zones (HB 1110) and support Accessory Dwelling Unit development (HB 1337). These changes require cities to allow up to two Accessory Dwelling Units (ADUs) on all lots zoned to allow single-family homes. In addition, via HB 1220, the Washington State Department of Commerce instructed local governments to "plan for and accommodate" housing affordable to all income levels. Additionally, HB 1220 requires cities to examine racially disparate impacts, displacement, exclusion and displacement risk in housing policies and regulations as well as adopt policies that will begin to undo those impacts.

Middle housing policy in WA

'Middle housing' refers to moderate-density housing types between single-family detached homes and larger multifamily housing. HB 1110 became effective in July 2023 and requires that designated Growth Management Act (GMA) planning cities in Washington must allow certain minimum densities for middle housing within 6 months after their periodic update due date.

Camas is counted as a Tier 2 city under this policy, which must allow for 2 dwelling units per lot or higher in predominantly residential zones, as well as 4 dwelling units per lot within a quarter mile of major transit stops and for affordable housing (ESHB 1110, Sec. 3(1)(c)).

The Housing Accountability Act (HAA, also referred to as HB 2266, passed in 2025) promotes accountability in local housing planning by creating an approval process for local government Housing Elements and housing regulations. In 2026, HB 2266 clarified local regulation governing emergency shelters, transitional housing, emergency housing, and permanent supportive housing (or STEP housing). The new state law specifies that jurisdictions may not impose conditions on STEP uses that are more restrictive than those applied to comparable residential development or lodging uses. These changes reinforce the state's expectation that local governments support a full range of housing opportunities.

HB1998 requires cities to allow co-living housing as a permitted use on any lot located within an urban growth area that allows at least six multifamily residential units, including on a lot zoned for mixed-use development. In 2026, HB1859 updated the density bonus law for religious properties. Cities must allow an increased density bonus

[2] The GMA includes other optional Elements for economic development, parks and recreation, conservation, energy, sub areas, and ports.

consistent with local needs for any affordable housing development of any single-family or multifamily residence located on property owned or controlled by a religious organization.

The Parking Reform and Modernization Act (SB5184) established conditions to maximum parking caps as well as elimination of parking minimums in specific circumstances.

The Clark County Countywide Planning Policies provide helpful guidance on the Comprehensive Plan update. Clark County updated its Comprehensive Plan and Countywide Planning Policies in 2026. See Clark County's Comprehensive Growth Management Plan website for the draft Clark County Countywide Planning Policies.

Lastly, the City of Camas completed its Housing Action Plan (HAP) in 2021 (Appendix B), including a housing needs assessment and a thorough community engagement process focused on learning about housing experiences and identifying ways to meet housing needs and overcome core challenges. The engagement included two virtual public meetings, seven focus groups and interviews, a housing survey with over 300 responses, a project website, and written public comments. Key findings helped to shape the updates to the Camas Housing Element.



Community Engagement

The project team held interactive open houses and interviewed stakeholders to learn about housing challenges, opportunities, and actions. Engagement activities identified the following themes that could contribute to future decision-making related to housing in Camas.

Housing Action Plan

The City of Camas completed its Housing Action Plan (HAP) in 2021 (Appendix B), including a housing needs assessment and a thorough community engagement process focused on learning about housing experiences and identifying ways to meet housing needs and overcome core challenges. The engagement included two virtual public meetings, seven focus groups and interviews, a housing survey with over 300 responses, a project website, and written public comments. Key findings about community priorities and HAP goals and strategies are summarized below.



HAP Goals

- **Develop Housing to Accommodate Growth.** Thoughtful changes to Camas' zoning and development regulations can allow the City to better accommodate projected growth.
- **Diversify the Mix.** A greater variety of housing types can better serve young families, small households, seniors, people with disabilities, and people with diverse incomes.
- **Increase Housing Affordability.** Young families, seniors, and people who work in Camas may have difficulty finding affordable housing in Camas.
- **Preserve Existing Affordable Housing.** Camas should adopt strategies to preserve its existing affordable housing and prevent the displacement of residents. Community members noted concern for preserving existing affordable housing, particularly smaller single-family properties, in older neighborhoods near Downtown.

COMMUNITY FEEDBACK

- **Need diverse residential options that cater to different life stages.**
- **Maintain Camas' character by integrating small-town charm in mixed use developments.**
- **Ensure workforce housing is available for current and future workers.**
- **Incentivize housing development through zoning, taxes and fees, and partnerships.**
- **Partner with affordable housing developers to build affordable housing.**
- **Desire for more dense housing options, especially Downtown.**
- **Require large developments to dedicate a portion of lots or units for middle housing or ADUs as part of subdivision approval.**
- **Offer financial assistance or programs to rehabilitate and repair existing housing stock.**
- **Invest in existing neighborhoods to improve safety, accessibility, and livability while preserving neighborhood character.**



Table 2 Housing Action Plan Goals and Strategies

	Develop Housing	Diversify Housing Mix	Increase Housing Affordability	Preserve Affordable Housing
Strategy 1: Expand housing opportunities in mixed use and downtown commercial districts.	X	X		
Strategy 2: Consider making targeted rezones during Comprehensive Plan updates.	X			
Strategy 3: Diversity allowed housing types and update related lot and dimensional standards.	X	X	X	
Strategy 4: Focus on key areas with residential development or redevelopment potential. Expand more mixed-use areas throughout the city.	X	X		
Strategy 5: Continue community conversations around housing and housing for all.	X	X	X	X
Strategy 6: Communicate available affordable housing resources.			X	
Strategy 7: Build partnership to develop and preserve affordable housing for individuals, families and seniors. Explore expansion of the MFTE program.			X	X
Strategy 8: Explore funding source and cost reduction options for affordable housing.	X	X	X	X

Housing Targets

Planning for future housing demand is critical to ensure that the City can meet demand driven by population growth. This section summarizes projected future housing demand for Camas to provide context for the City's housing policies.

Population and Housing Allocations

Table 3 below demonstrates the City of Camas and Clark County's anticipated population forecast between 2023 and 2045. Since 2000, Camas has grown at a faster rate than the County overall with an Average Annual Growth Rate (AAGR) of 5.2% in the City (including annexations), compared to the County's AAGR of 2.4% (Appendix C, Housing Analysis). However, the County's estimates assume a slower growth scenario for the City in the next 22 years. With this assumption, new population growth in Camas is estimated to comprise 4.05% of growth in Clark County overall.

The population growth forecast indicates that the City of Camas will make up 4.05 percent of new growth population in Clark County between 2023 and 2045 with an AAGR of 1.2% in the City. The County's methodology also acknowledges Washington State Department of Commerce's HAPT estimates for current housing supply in Camas and allocates a number of net new units for the Urban Growth Area(s).

Table 3 Population Growth Forecast, Camas and Clark County, 2023 to 2045

Source: Clark County Interim Population Allocations and Clark County Comprehensive Plan 2025 Update, 2025 Population, Housing, and Employment Allocation – Issue Paper 5.

Jurisdiction	2023 Est. Population	Vacant Buildable Land Model Percent Capacity	2023-2045 Growth	2045 Estimate	Change (percent)	AAGR
City of Camas	**29,352**	**4.26%**	**7,729** ***(4.05% of total growth)***	**37,080**	**26%**	**1.2%**
Clark County	527,400	100%	190,754 *(100% of total growth)*	718,154	36%	1.6%

Housing Allocations

In 2021, HB 1220 created a new way that communities in the state are required to plan for housing needs. This legislation requires that jurisdictions plan for sufficient land capacity for housing needs, including all economic segments of the population (moderate, low, very low and extremely low income, as well as emergency housing and permanent supportive housing).

- Since 2000, the City of Camas had an average annual growth rate of 221 new housing units per year.
- Comparatively, the City will need to add an average of 195 new housing units per year between 2024 and 2045 to reach its allocation of net new units.

In May 2024, Clark County adopted housing allocations for jurisdictions located within county boundaries. In total, this shows an estimated 4,226 housing units needed by 2045 in the City of Camas and UGA(s).[3] The City would add about 311 new units to meet the new permanent supportive housing target and 1,766 units affordable to low-income households below 80% of AMI by 2045. Camas currently has 143 units of housing affordable for households at or below 30% of AMI that are not Permanently Supportive Housing (PSH)[4] and 14 emergency units[5] according to

[3] The Washington State Department of Commerce Housing for All Planning Tool (HAPT) provides two allocation methods for determining the share of a County's housing supply to be met by jurisdictions. Method A assumes all housing needs will be accommodated through new housing production. Method B assumes all jurisdictions will accommodate equivalent shares of the total countywide housing need at each income level, proportional to their size, in the projection year. Clark County elected to use a hybrid method of 75/25 for Camas.

[4] Permanent Supportive Housing is defined as: "subsidized, leased housing with no limit on length of stay that prioritizes people who need comprehensive support services to retain tenancy and utilizes admissions practices designed to use lower barriers to entry than would be typical for other subsidized or unsubsidized rental housing, especially related to rental history, criminal history, and personal behaviors" Washington RCW 36.70A.030(31).

[5] Temporary emergency housing is defined as: "temporary indoor accommodations for individuals or families who are homeless or at imminent risk of becoming homeless that is intended to address the basic health, food, clothing,

the HAPT estimate. With this allocation, the City will need to accommodate 172 new units of temporary emergency housing by 2045.[6]

Figure 3 Housing Unit Allocations by Income, Camas and its UGA, 2024-2045

Source: Washington State Department of Commerce HAPT, Clark County Interim Housing Allocations, City of Camas
Note: Current supply includes both the estimate from the HAPT with the addition of 599 additional units since its calibration in 2020.



4,226 new homes will be needed over the next 20 years in the City of Camas

In addition, there will also need to be:
172 Emergency housing beds (temporary housing)

and personal hygiene needs of individuals or families. Emergency housing may or may not require occupants to enter into a lease or an occupancy agreement." – Washington RCW 36.70A.030(14).

[6] Clark County's interim allocations do not include designated temporary emergency housing units at the City level. Estimates in this section for the City of Camas are derived directly from the Department of Commerce HAPT tool.

Table 4 Housing Units Needed

	0-30% AMI		>30-50% AMI	>50-80% AMI	>80-100% AMI	>100-120% AMI	>120% AMI	Total	Emergency housing beds
	Non-PSH	PSH							
2024: Current Housing Supply Estimate	143	0	458	1,874	1,182	1,965	4,201	**9,832**	14
2024-2045: New Housing Unit Needed for the Allocation	**564**	**331**	**811**	**955**	**516**	**249**	**799**	**4,226**	172
2045: Total Target Supply	707	331	1,269	2,829	1,698	2,214	5,000	**14,058**	186

Housing Choice and Affordability

Housing affordability and a diversity of housing options were a consistent theme in community engagement. There are a variety of barriers to meeting the housing needs of the whole community. These barriers include:

- Lack of variety of housing types to serve young families, small households, seniors, people with disabilities, and people with diverse incomes. Since 2015, 70% of housing permits were for single detached housing.
- Rising housing costs. The median home sale price in 2023 was $704,000, an increase of 119% since 2013.
- Lack of strategies to preserve existing affordable housing and prevent displacement of residents.
- Strict, inflexible code provisions can prevent the development of affordable housing. Building height restrictions and fees prevent economic feasibility of apartment buildings.
- Lack of incentives through zoning, taxes, and fees to build affordable housing and mixed use buildings.
- Permitting of affordable housing can involve long and uncertain timelines that add risk and costly delays.
- Lack of funding to help build low income housing.



In order to develop housing that is affordable to a wider range of incomes, the City will pursue several pathways to meet this goal. One way to develop more housing that is affordable to households earning 50-100% AMI is to increase the density of housing in neighborhoods with access to schools, jobs and other amenities. The updated land use map and zoning map incorporate more medium and high density residential and mixed uses throughout the city to address this issue. Despite these changes to the land use map, single-family zoning largely dominates most residential areas throughout the City and can contribute to housing unaffordability by limiting most residential land to detached homes on individual lots and prohibiting more space-efficient housing types such as duplexes, triplexes, townhomes, and apartment buildings. By restricting the number of homes that can be built in desirable neighborhoods, these regulations constrain housing supply even as population and demand grow. The limited supply of homes increases competition for available housing, driving up land values, home prices, and rents. Single-family zoning can also encourage larger lot sizes and lower-density development, which increases infrastructure and land costs per household. As a result, many households, including first-time homebuyers, renters, and lower- and middle-income residents face fewer affordable housing options and may be priced out of neighborhoods with access to jobs, schools, and services. By allowing medium and higher density residential development in Camas, more lower cost housing options may be available.

Approximately 40% of new housing units needed will need to be affordable to households at or below 50% AMI. This type of housing typically requires public subsidy in order to make development feasible. The State has not allocated funding to cities to support development of units affordable at this level. This plan includes policies to facilitate the permitting process for developing housing that is affordable to a wider range of incomes as well as to pursue funding that directly supports development of affordable housing. Potential sources of funding include Federal grants from the Department of Housing and Urban Development, state funding opportunities through tax exemption programs like the Multifamily Tax Exemption incentive, and local options such as waiving impact fees and deferral of construction sales tax.

The Comprehensive Plan includes policies to facilitate the permitting process for developing housing that is affordable to a wider range of incomes as well as to pursue funding that directly supports development of affordable housing.

Analysis of housing price data and land capacity below demonstrates the availability of land to meet housing needs. Table 5 lists the level of affordability anticipated to be achieved within each zone based on an analysis of housing prices.

Table 5 Affordability Level and Housing Type by Zoning Designation

Zoning Designation	Typical Housing Types Allowed	Assumed Affordability Level of Capacity Analysis
North Shore Higher Density (HD-NS)	Duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts, small-scale apartments (wood frame), garden-style apartments, and apartments (podium)	High income (100% AMI - >120% AMI)
North Shore Lower Density (LD-NS)	Single-family (attached/detached), duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts	High income (100% AMI - >120% AMI)
Residential 6 (R-6)	Single-family (attached/detached), duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts	High income (100% AMI - >120% AMI)
Residential 7.5 (R-7.5)	Single-family (attached/detached), duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts	High income (100% AMI - >120% AMI)
Residential 10 (R-10)	Duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts	High income (100% AMI - >120% AMI)
Residential 12 (R-12)	Duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts and small-scale apartments (wood frame)	High income (100% AMI - >120% AMI)
Residential 15 (R-15)	Duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts and small-scale apartments (wood frame)	High income (100% AMI - >120% AMI)
Downtown Residential (DT-R)	Duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts and small-scale apartments (wood frame)	Moderate income (>80% AMI - 120% AMI)
Multi-Family 10 (MF-10)	Duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts and small-scale apartments (wood frame), garden-style apartments	Low to moderate income (>50% AMI – 80% AMI)
Multi-Family 18 (MF-18)	Duplexes, triplexes, quadplexes, 5-6 unit buildings, townhouses and cottage courts and small-scale apartments (wood frame), garden-style apartments	Low to moderate income (>50% AMI – 80% AMI)

Zoning Designation	Typical Housing Types Allowed	Assumed Affordability Level of Capacity Analysis
Multi-Family 24 (MF-24)	Garden-style apartments and apartments (podium)	Low to moderate income (>50% AMI – 80% AMI)
ADUs (All zone categories)	Accessory dwelling units (ADUs) on developed residential lots	Low to moderate income (>50% AMI – 80% AMI)
Downtown Mixed-Use Low Rise (DT-MXL)	Mixed-use (wood frame)	Moderate income (>80% AMI - 120% AMI)
Downtown Mixed-Use Mid Rise (DT-MXM)	Mixed-use (podium)	Moderate income (>80% AMI - 120% AMI)
Downtown Historic Main Street Core (DT-HMSC)	Mixed-use (podium)	Moderate income (>80% AMI - 120% AMI)
Mixed Use (MX)	Mixed-use (wood frame), mixed-use (podium)	Moderate income (>80% AMI - 120% AMI)
North Shore Mixed-Use (MX-NS)	Mixed-use (podium)	High income (100% AMI - >120% AMI)

While the land use and zoning updates meet the City's need for housing, financial subsidies will be necessary to meet housing needs for 0-80% AMI levels. In order to build below market rate housing, annual subsidies from various sources are necessary. The goals and policies in this chapter look to pursue partnerships and funding to support development of more affordable housing in a coordinated way in Camas.

Emergency housing, emergency shelters, and transitional housing are allowed uses by right in all zones across the city that allow residential and lodging uses. There is a need for an additional 172 emergency shelter beds by 2045. The goals and policies of this chapter support coordinated efforts and development of an affordable housing strategy to build these housing types in Camas. Table 6 summarizes the total unit capacity by zoning designation where emergency housing, emergency shelters, and transitional housing are allowed. The City currently has no permanently supportive housing (PSH) and a goal to add 331 PSH units by 2045. PSH should be in central areas with access to community and transit services. Addressing this gap should be a key priority for the affordable housing strategy.

Table 6 Zoned Capacity for Emergency Housing and Shelters by Zoning Designation

Zoning Designation	Unit Capacity
North Shore Higher Density (HD-NS)	848
North Shore Lower Density (LD-NS)	203
Residential 6 (R-6)	269
Residential 7.5 (R-7.5)	310
Residential 10 (R-10)	363
Residential 12 (R-12)	30
Residential 15 (R-15)	39
Downtown Residential (R-DT)	39
Multi-Family 10 (MF-10)	503
Multi-Family 18 (MF-18)	0
Multi-Family 24 (MF-24)	282
Downtown Mixed-Use Low Rise (MX-LR)	23
Downtown Mixed-Use Mid Rise (MX-MR)	566
Historic Main Street Core (HMSC)	24
Mixed Use (MX)	1,509
North Shore Mixed-Use (MX-NS)	790
Total Housing Unit Capacity	**5,798**

Disproportional Impacts and Displacement

Past housing policies were analyzed to consider potential disproportionate impacts that limited the development of housing affordable to lower- and middle-income families. The goals and policies of this plan aim to provide a greater diversity of housing choices throughout Camas. Additional analysis of previous housing programs and policies that had racially disparate impacts, impacted displacement and resulted in exclusion in housing access is provided in Appendix D, Racially Disparate Impacts Memo. The goals and policies of this chapter and throughout this plan aim to remove barriers to accessing housing as well as mitigate the risk of displacement.

Camas has an overall relatively low risk for residential displacement, as demonstrated in the Displacement Risk Map developed by the Department of Commerce. One area at high risk for displacement is downtown and the neighborhoods directly south and east of downtown. Additionally, a section on the west side of the City is at moderate risk for displacement. Goals and policies within this plan aim to reduce the risk of displacement citywide.

Residential Capacity

Residential capacity is generally defined as the amount of existing housing units plus new housing a city can accommodate based on city zoning regulations (e.g., residential density requirements in the zoning code) and land available for new development. Residential capacity relates to residential growth allocations in a number of ways. Evaluating residential growth capacity is necessary to determine whether the housing growth allocation

(determined by the county) can be accommodated within the City of Camas and its UGA. Sufficient capacity is available if residential growth capacity is equal to or greater than the City's allocation. If sufficient capacity is not available, the shortfall must be addressed by rezoning, or revising allowable density, or by modifying or creating a new UGA or annexed area to provide additional area for residential growth capacity. The Vacant Buildable Lands Model (VBLM) for Clark County provided a basis for the available housing capacity in the City of Camas based on available buildable land (including both vacant and underutilized land) and current zoning. The existing zoning and UGA showed insufficient housing capacity.

The City of Camas is proposing zoning modifications that would allow for more residential capacity. According to the housing capacity estimates as detailed in Appendix E, Housing Needs and Land Capacity Analysis, Camas would have capacity for 5,795 housing units. This would result in a surplus over the 2045 housing target of 4,226 housing units (1,570 capacity surplus). Results (summarized below and in Table 7) from the updated capacity analysis show sufficient residential growth capacity to meet the 2045 housing target.

Table 7 Housing Capacity by Income Level

Income Level (% AMI)	Allocated Housing Need	Comp Plan Designation Serving These Needs	Aggregated Housing Need	Total Capacity	Capacity Surplus
0-30% AMI (PSH)	331	MF-10, MF-18 and MF-24, and MX	2,661	2,717	56
0-30% AMI (Other)	564				
>30-50% AMI	811				
>50-80% AMI	955				
>80-100% AMI	516	HD-NS, R-6, R-DT, DTMU-L, DTMU-Mid, HMSC, and MX	765	2,134	1,369
>100-120% AMI	249				
>120% AMI	799	HD-NS, LD-NS, R-6, R-7.5, R-10, R-12, R-15, and MX-NS	799	944	145
Total	**4,226**		**4,226**	**5,795**	**1,570**



Summary of Housing Analysis Findings

A summary of key findings from the housing data analysis is provided below to help describe key insights to inform Comprehensive Plan policy updates (Appendix C provides the full findings).

Community Demographic Trends

- Since 2000, Camas has grown at a faster rate than Clark County or Washington State overall, more than doubling in size by 2023 from 12,462 to 27,420 persons. As population increases, the demand for housing also rises and affects planning.
- In terms of land, Camas has expanded incrementally over time through annexations. In the 2000's and early 2010's, the City added large new areas on the north side of Lacamas Lake, with a large portion of this area zoned for multifamily housing alongside employment and commercial areas.
- Camas is becoming a more diverse community. The share of people of color increased from 13% in 2012 to 24% in 2022 and is slightly more diverse than the county (21% were people of color in 2022). This may indicate that displacement in Camas is at a lower risk.
- Camas is seeing a larger share of couples and families with children (39%) and has a higher share of both groups than the County or State (24%, 22%, respectively). The City also had a larger median household size (almost 3 persons) compared to the county (2.65 persons).

- Median household income in Camas is higher than both Clark County and the state at $133,000 in 2022. Adjusting for inflation, median income in the City still increased by 31 percentage points since 2012 which is primarily due to growth in high-income households earning over $100,000 per year.[7]
- Four out of five households in Camas owned their homes in 2018-2022, at a higher rate than either Clark County or Washington. The share of renter households stayed the same in Camas since 2012, showing less than a 1% increase over this time period.

County-level trends indicate that homeownership disparities exist for some groups by race and ethnicity in Clark County, with households who are Black or African American, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Hispanic or Latino, or mixed/other races having lower rates of homeownership. This may be indicative of past policies that had a racially disparate impact on homeownership.

- At the County level, income levels also vary by race and ethnicity. Households who were Black or African American, Native Hawaiian or Pacific Islander, Hispanic or Latino, two or more races, or another race had lower median household incomes than the overall average.

Overall levels of housing cost burden are decreasing, but more renters and low-income households experience higher rates. Around 24% of all Camas households experienced cost burden (2022) with a higher share of renter households experienced cost burden compared to homeowners and with 100% of households earning less than $20,000 experienced severe cost burden (paying at least half of their monthly income towards housing). Although cost burden is generally lower for homeowners, more people of color in Camas who own their homes experience cost burden compared to white, non-Hispanic homeowners, another indicator or potential racially disparate impacts from prior policies.

[7] The median income in Camas is above the area median income (AMI) for 2023. HUD determined the AMI to be $114,400 for a family of four in the Portland-Vancouver-Hillsboro, OR-WA MSA (including Camas). This is lower than median income in Camas itself which was $133,000 in 2022 (Exhibit 14) and has been consistently lower than the City over time.

Existing Housing Inventory

- Camas has seen growth in their number of housing units in the past two decades, with a 108% change between 2000 and 2023 (annually this equates with an average of 221 new homes). The City of Camas' growth in housing units was lower than its population change (120%), indicating that the City has not been keeping pace by adding to its supply to meet the rising demand.
- Camas has steadily low vacancy rates for all housing units in total (4% in 2022 with little change over the last decade). This level of vacancy is indicative of a healthy housing market with natural rates of turnover; however, the slight decrease could begin to indicate constrained supply of housing.
- For two-bedroom multifamily units, Camas has seen spikes in vacancy, but these align with new construction trends which can temporarily raise vacancy rates for newly delivered units but do not indicate long-term vacancy. In 2023, the City saw over 200 new housing units delivered, likely accounting for the fluctuation in vacancies, as well as deliveries in 2017 and 2020.
- Since 2015, the City has permitted 2,763 new housing units. Single detached homes have accounted for the largest share (70%) of new permits in the City of Camas, and another 8 percent were made up of attached townhomes. While apartments, condos, and units in mixed-use buildings made up 20 percent of new permits between 2015-2024, middle housing types like duplexes, triplexes, quadplexes, and accessory dwelling units (ADUs) were only 2 percent of all permits.
- Median home sale prices in Camas has increased over the last ten years, with Camas' average prices generally remaining higher than the County. In 2023, the average home sale price in the City was $704,000, increasing by 119% since 2013 which is more expensive than the average home in the City of Portland (by $196,000) or Clark County (by $173,000).
- Prices are also increasing quickly in Camas and Clark County for the average 2-bedroom multifamily rental. The average 2-bedroom apartment rent was over $1,800 in the City and over $1,700 in Clark County (2024 year-to-date), indicating a 35% increase since 2010. Average 2-bedroom multifamily rents in Portland tracked closely with Camas in the 2010's, while rents in Vancouver remained lower (generally following countywide trends).
- Compared with home sale price and rent increases in Camas, only households earning over 150% or more of AMI would be able to afford the average home in the City as of 2023. However, the average 2-bedroom apartment is still affordable to households between 50 and 80% AMI in Camas.
- The City of Camas had 98 units of regulated affordable housing in 6 buildings according to data from Oregon Metro and the City. Approximately half of these units are affordable respectively for residents between 30-50% of AMI and 50-80% of AMI. The City also has several long-term care residential facilities for older adults providing 135 units.

Future Housing Demand

- Since 2000, Camas has grown at a faster rate than Clark County overall but is expected to slow based on County estimates for 2045. The County's projections assume that new population growth in Camas is estimated to grow at an annual rate of 1.2% to account for 4.05% of county growth.

- County allocations show the need for 4,226 new housing units in Camas by 2045, adding around 211 new housing units per year.
- The City would add about 331 new units to meet the new permanent supportive housing target and 1,766 units affordable to low-income households below 80% of AMI by 2045.
- Camas residents with disabilities may require additional housing features for accessibility. Around 8% of residents in Camas had at least one disability (2022), with the most common being cognitive difficulties, followed by ambulatory and vision difficulties. These disabilities can require housing accommodations such as zero-step entryways, ramps, lifts, or other accessibility features.

Housing Goals and Policies

Goal H-1 Citywide Housing

Promote safe, attractive, and vibrant neighborhoods with access to housing, jobs, services, schools, amenities, and healthy active living that meet the needs of all members of the community.

Policy H-1.1 Provide a range of housing choices and options to support all ages and income levels. Provide an adequate supply of land to accommodate the City's housing growth target.

Policy H-1.2 Support low impact development (LID) in residential development that minimizes both impervious areas and site grading to retain the natural contours of the land. LID strategies include conserving native vegetation, narrower streets, stormwater gardens, and other landscape practices that store and filter runoff.

Policy H-1.3 Promote the use of flexible development options (e.g., planned residential developments and development agreements) to create a variety of accessible housing types within new developments.

Policy H-1.4 Require new residential developments to demonstrate how proposed lot, street, and utility layouts can accommodate development of single-story dwellings, duplexes, and attached or detached accessory dwelling units.

Policy H-1.5 Ensure housing in mixed-use buildings (or developments) will complement the commercial and retail portion of the development and increase local living-wage jobs. Amend the municipal code to support mixed-use and middle housing development in the Downtown Subarea and nearby Heavy Industrial areas and near other community hubs.

Policy H-1.6 Support in-fill housing development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services.

Policy H-1.7 Require all new housing developments to provide a range of housing types and sizes that are evaluated through the land use approval process and stipulated on the final plat.

Policy H-1.8 Support the maintenance, repair, and rehabilitation of Camas' existing housing stock by promoting resources that provide financial and other assistance to community members to maintain or repair health and safety features of their home and avoid displacement.

Policy H-1.9 Develop partnerships with housing agencies such as the Vancouver Housing Authority to establish a home repair program targeted to low and moderate income households and those with disabilities.

Policy H-1.10 Support investment in existing neighborhoods to enhance livability, safety, and accessibility in a way that preserves unique physical character while mitigating displacement.

Policy H-1.11 Develop objective design standards to ensure new development is compatible in scale, architectural style, and landscape composition with existing and planned neighborhoods.

Policy H-1.12 Provide ongoing education and community engagement regarding Camas' housing needs, including available programs and incentives. Provide permit process support to affordable housing developers.

Policy H-1.13 Achieve and sustain the housing targets by income group allocation for Camas as adopted by the Clark County Council. Monitor and assess the City's progress in meeting housing needs at least every five years.

Policy H-1.14 Support and encourage housing legislation at the county, state, and federal levels that promotes and supports the City's housing goals and policies.

Goal H-2 Housing Choice and Affordability

Create a diversified housing stock that meets the needs of all lifestyles and economic segments of the community through new developments, preservation, and collaborative partnerships.

Policy H-2.1 Support and encourage a wide variety of housing types throughout the City to provide choice, diversity, affordability, promote homeownership and mitigate displacement.

Policy H-2.2 Allow emergency shelters, transitional housing, emergency housing, and permanent supportive housing (STEP housing) where comparable residential development or lodging uses are allowed.

Policy H-2.3 Develop an affordable housing strategy to work with partners to secure grants and loans by agencies, private developers, and nonprofit organizations that are tied to the provision of permanent supportive housing, emergency shelter beds, transitional housing, and other housing serving at-risk populations.

Policy H-2.4 Develop partnership with organizations such as Clark County Ending Community Homelessness, Camas-Washougal Community Chest, and St. Vincent de Paul to expand access to transitional housing and shelters.

Policy H-2.5 Promote the preservation and rehabilitation of the City's existing affordable housing stock of all types, including low-cost rentals and affordable owner-occupied single-family homes, and protection of existing households. Support measures that preserve affordable housing, such as home repair programs with partners to rehabilitate existing housing that serve low to moderate-income households.

Policy H-2.6	Create opportunities for ownership housing in a variety of settings, styles, sizes, and affordability levels throughout Camas.
Policy H-2.7	Establish programs that support access to affordable housing such as down-payment assistance, home buyer education, a community land trust pilot for low to moderate income units and partnership efforts to create smaller affordable units.
Policy H-2.8	Provide incentives and bonuses for the development of affordable housing, middle housing, and accessory dwelling units. Ensure that any affordable housing built with the support of city incentives or bonuses (including, but not limited to, public funds, through development agreements, incentives, or by regulation) remains affordable for the longest possible term.
Policy H-2.9	Develop pre-approved building plans for middle housing and ADUs in Camas.
Policy H-2.10	Establish a regional housing committee to improve affordable housing planning coordination and acquire funding to provide affordable housing. Develop collaborative partnerships with organizations such as the Vancouver Housing Authority, Evergreen Habitat for Humanity, Columbia Non-Profit Housing, and faith-based organizations to ensure that affordable housing and supportive services are provided throughout the City.
Policy H-2.11	Encourage and support collaborations between for-profit and non-profit developers to expand affordable housing options.
Policy H-2.12	Evaluate the existing Multifamily Tax Exemption (MFTE) program provisions and participation. Consider changes and expansions to program options and associated costs and benefits that support housing production and affordable housing targets.
Policy H-2.13	Review and update the Camas Municipal Code to be consistent with State guidelines for housing, residential use, co-living, density bonuses, and parking.
Policy H-2.14	Examine opportunities to reduce or eliminate minimum requirements for off-street automobile parking spaces for residential uses and mixed-use development particularly in areas with regular public transit service, consistent with state law and considering the implementation of a local transportation demand management programs, while maintaining accessibility and temporary and loading zone parking for businesses.
Policy H-2.15	Plan for and accommodate Camas' allocated share of countywide future housing needs for moderate-, low-, very low-, and extremely low-income households as well as manufactured housing, multifamily housing, group homes, foster care facilities, emergency housing, emergency shelters, and permanent supportive housing.
Policy H-2.16	Protect tenant homeowners living in a manufactured community, including but not limited to, implementing specific requirements if a community ownership is transferred or if a community is closed, including early noticing, options to purchase, and relocation assistance consistent with Washington State law.
Policy H-2.17	Implement anti-displacement strategies in areas with higher risk of displacement of low-to-moderate income housing (such as the areas near Downtown Camas), including but not limited

to, acquisition and financing of existing affordable housing and multi-unit housing, landlord education and resource hub for renters, fair access policies, supporting community land trusts (or other alternative ownership models), notice of intent to sell ordinance, tenant relocation assistance, tenant opportunity to purchase, and right to return policies for promoting home ownership.

Policy H-2.18 Evaluate potential surplus public property that could be transferred, leased, or disposed of for affordable housing, transitional housing, or emergency housing consistent with state law. Survey public land holdings to identify potential affordable housing development opportunities and monitor regulated and naturally occurring affordable housing units that could be at risk of redevelopment and displacing low to moderate income households.

Goal H-3 Housing Accessibility and Livability

Encourage and support a variety of housing opportunities for those with special needs, particularly those with challenges relating to age, health, or disability.

Policy H-3.1 Encourage and incentivize special needs and senior housing to be dispersed throughout the community and close to public transportation, shopping, medical clinics, and other essential services.

Policy H-3.2 Encourage, support, and work with partners, such as the Clark County Health District, that support social and health service organizations and offer programs and facilities to help persons with special needs remain in the community.

Policy H-3.3 Treat residential structures occupied by persons with disabilities the same as residential structures occupied by a family or by non-disabled unrelated individuals.

Policy H-3.4 Encourage the creation and retrofitting of senior housing and accessible housing types that allow residents to "age in place" to support aging populations and allow residents to continue living in Camas.

Policy H-3.5 Work with other jurisdictions and health and social service organizations to develop a coordinated, regional approach to address the impacts of displacement and people at risk of becoming homeless.

Policy H-3.6 Promote the design of accessible accommodations for those with disabilities such as through universal design[8], visitability and home retrofitting for new development or redevelopment housing projects to ensure housing is designed for all people and abilities.

[8] Universal design is the principle that people of all ages and ability levels can use buildings, products, and the built environment without adaptation. Examples of universal design in housing include wide doorways, adequate maneuvering space in kitchens and bathrooms, switches and handles that are easy to reach and operate, and slide-out shelves. These and other relatively simple features enable people to remain in their homes even as their needs change over time. Visitability features are a subset of universal design that addresses access to the main part of the house to ensure that visitors with mobility limitations are able to go to the homes of friends and relatives.

Goal H-4 Streamlining Permitting for Housing

Support the development of quality and sustainable housing in Camas with streamlined regulations and permitting processes.

Policy H-4.1 Periodically review and update the City's residential zoning regulations, design standards, and permitting procedures to promote quality development with timely and predictable outcomes and consistency with state law. Consider input from permitting stakeholders during the periodic review and update.

Policy H-4.2 Create regulations and procedures that balance clarity and objectivity with flexibility for design innovation.

Policy H-4.3 Study the impacts of land use policy decisions and zoning code amendments and minimize the negative impacts to housing supply and affordability.

Policy H-4.4 Classify the development of middle housing and accessory dwelling units as permitted uses in lower density residential zones, consistent with the state law requirements associated with housing planning.[9]

Policy H-4.5 Review and update policies, codes, and ordinances to allow for a mix of housing types and variable lot and unit sizes in new subdivisions and development projects to promote housing choice diversity and affordability.

Policy H-4.6 Annually review the number and type of housing units built in Camas and permit timelines associated with new housing developments to inform additional changes to permitting, incentives, and housing programs.

Being able to do this supports important, life-enriching interactions. Visitability features include wide doorways, a zero-step entrance, and no-stair access to a toilet facility with adequate space for maneuverability. (AARP, https://www.aarp.org/livable-communities/housing/info-2020/homefit-guide.html).

[9] The City of Camas has amended code to be consistent with middle housing requirements in RCW 36.70A.635–638 and ADU requirements in RCW 36.70A.680-682 and RCW 36.70A.696-69. Camas will continue to monitor possible code and fee structure amendments consistent with state law and in support of meeting housing targets.

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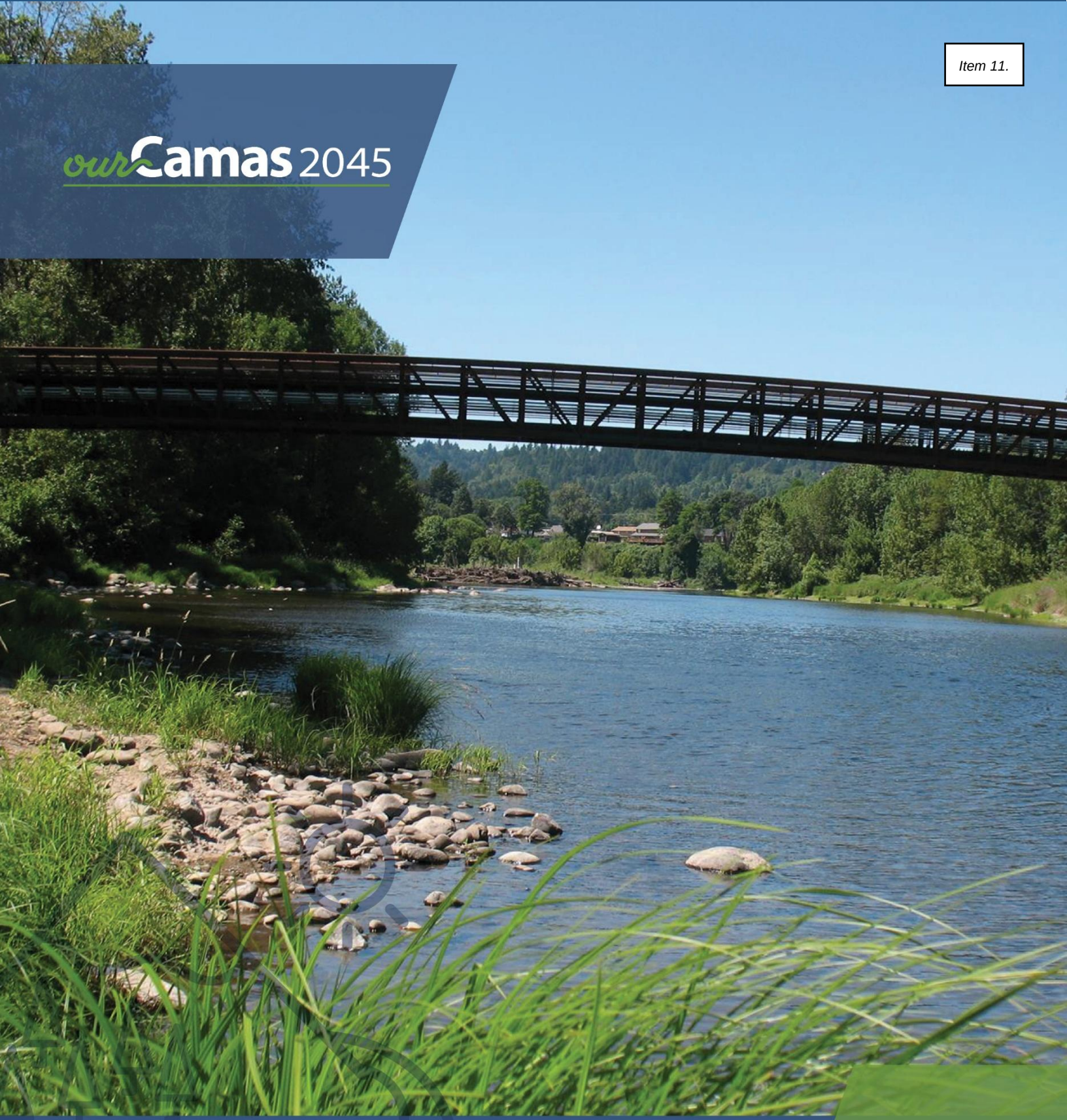


Natural Environment

06

06. Natural Environment

Nature in Camas

Camas has an abundance of natural areas that make it an ideal place to live. This element balances Camas' natural environment with the demands of a growing city.

Vision

Camas embraces its connection to nature and enjoys a wealth of outdoor recreational opportunities. Access to forests, clean water, parks, and trails is foundational to Camas' quality of life. The community shares a deep reverence for Camas' beauty, scenery, and tranquility, and is committed to preserving and enhancing its natural resources and tree canopy. Through proactive planning, the City mitigates the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come.

Natural Setting

Camas is blessed with an abundance of natural areas and physical features, making it a highly attractive place for people to call home. Residents and businesses who seek an exceptional quality of life are buoyed by the natural surroundings of Camas and enjoy such amenities as Lacamas, Round and Fallen Leaf Lakes, Lacamas Creek, and the Washougal River greenway. Residents also enjoy the beauty and quiet of the open space and greenbelt network throughout the community, stitched together by the City through many decades of planning and implementation.

As envisioned decades ago and to be held in perpetuity as natural, legacy lands along Lacamas Lake, Fallen Leaf Lake, and near Green Mountain are treasured for their mature stands of evergreen and deciduous trees and offer a respite for many in the community. When people think of Camas, they think of a place that values the natural environment on par with other facets of the community. Camas is a place where stewardship of greenbelts, natural areas, and open space is an essential fiber in the fabric of the community.

Overview

The natural environment element of the comprehensive plan provides a policy framework for the identification, protection, and improvement of Camas' natural environment. Goals and policies include those for environmental stewardship, the protection of environmentally sensitive lands (critical areas), natural areas and open space, shorelines, and landscaping and tree enhancement.

Stewardship has three prongs for the benefit of all community members. The first prong relates to compliance with the Growth Management Act (GMA) and the identification, designation, and protection of certain environmentally sensitive lands, which, in GMA, are known as critical areas. The second prong relates to the community and its steadfast approach to keeping Camas a place that balances growth with preservation of natural areas and open space networks. Camas has long placed a premium on its open space network of environmentally sensitive lands, with or without GMA requirements. The third prong is an ethic of volunteerism and stewardship from the community's citizenry, which manifests in many ways including active volunteer groups, active boards and committees, and public involvement on issues related to the environment.

Environmental stewardship refers to the City's role as chief steward of the environment for the Camas community. A chief steward in this context means how the City, on behalf of the residents, establishes a responsible relationship between the people and the land they inhabit.

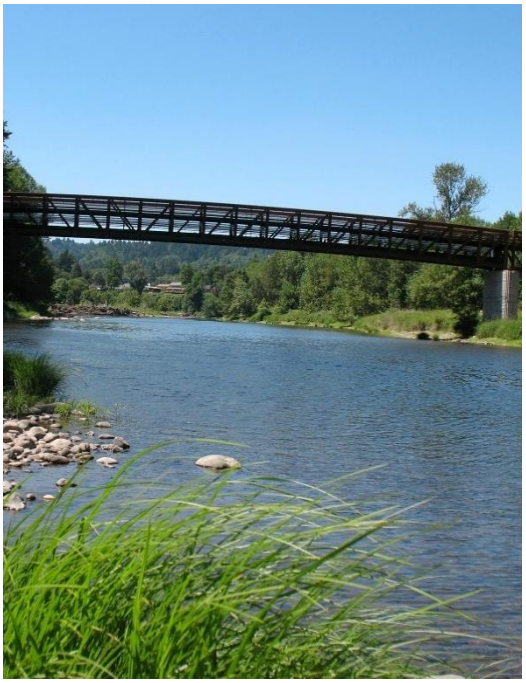
The City of Camas has preserved over 700 acres of open space across 31 sites, including forests, wetlands, riparian corridors, and steep slopes, with nearly half of this land concentrated around Lacamas Lake. These natural areas, distinct from developed parks, are managed to protect ecosystem functions, water quality, native vegetation, and wildlife habitats, while allowing for limited public access through trails and modest amenities. The City prioritizes conservation and restoration of high-value landscapes such as waterfronts, forested hillsides, and sensitive wetlands, balancing environmental stewardship with recreational use. Key efforts include protecting watercourses within three major watersheds, regulating development on steep slopes and wetlands, and maintaining resilient forest lands to support biodiversity and ecological health.



COMMUNITY FEEDBACK

- **Preserve land for wildlife and promote denser development in already developed areas to conserve green spaces**
- **Preserve mature landscaping and save parks and green space**
- **Support cleanup efforts at the Camas Mill and other contaminated sites to protect natural resources and local water supply**
- **Implement targeted lake management actions to protect water quality and reduce harmful algae blooms in local waterways**

Environmental Stewardship



One of the most demanding roles the City of Camas must fulfill is that of chief steward of the community's environment while also accommodating growth. The City has the duty to implement land use policies via development regulations and the responsibility to comply with federal and state statutes related to the environment.

Facing federal and state mandates, the City strives to ensure that its environment is managed in compliance with applicable laws and does so in a wise manner. While simultaneously accommodating growth, the City encourages the preservation, restoration, and improvement of the natural environment in all development.

Goal NE-1 Environmental Stewardship

Preserve Camas' natural environment citywide by developing a sustainable urban environment and protecting natural areas and open space, including critical areas.

Policy NE-1.1 Support a cleanup of the Camas Mill and other contaminated sites to protect natural resources and the city's water supply.

Policy NE-1.2 Support programs and regulations that monitor, maintain, conserve and protect water quality in Camas, including watersheds, Lacamas Lake Basin, Columbia River Basin, and Washougal River Basin.

Policy NE-1.3 Encourage restoration and protection of natural areas through the removal of invasive species.

Policy NE-1.4 Support and implement actions identified in adopted plans, including adaptive management of natural resources that is consistent with best available science and climate guidance to improve climate resiliency.

Policy NE-1.5	Protect and restore natural resources, valuable historic and cultural areas, climate refugia, habitat areas and corridors to provide biological and hydrological connectivity that fosters resilience to climate impacts.
Policy NE-1.6	Create and support natural resource management plans that consider climate change impacts and guide adaptive management.
Policy NE-1.7	Include immediate and long-term environmental impacts in the policy and regulatory decision-making process. Identify and quantify the ecosystem services benefits of natural systems and include these natural capital assets in cost-benefit assessments for community and development planning.
Policy NE-1.8	Promote and incentivize public and private landowners to restore and create local habitats and corridors to increase the availability throughout the city.
Policy NE-1.9	Regulate land use and development to protect natural topographic, geologic, vegetative, and hydrologic features of undeveloped properties.
Policy NE-1.10	Promote soil stability and minimize and control soil erosion using best management practices, best available science, ecologically sustainable site design, natural drainage systems and protection of existing native vegetation.

Critical Areas

The natural environment includes specific environmentally sensitive areas that the GMA requires the City to identify, designate, and protect. Referred to in statute (RCW 36.70A) as *critical areas.* Under GMA, critical areas include wetlands, critical aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas. Each of these critical areas is present in the City. The law further requires that the City use best available science (BAS) when developing policies and regulations to designate and protect critical areas. GMA also recognizes that salmonids (salmon and trout) play an important role in the ecosystem and are vital cultural and economic resources, which require jurisdictions to give 'special consideration to conservation and protection measures necessary to preserve or enhance anadromous fisheries'.

Functions of Critical Areas

Critical areas perform key functions that enhance the environment and protect us from natural hazards. The beneficial functions and values that critical areas provide include, but are not limited to, water quality protection and enhancement; fish and wildlife habitat; food chain support; flood storage, conveyance, and attenuation of flood waters; groundwater recharge and discharge; drinking water quality and quantity; erosion control; protection from natural hazards; historical, cultural, archaeological, and aesthetic value; and recreation. Identifying the functions and values of local critical areas is essential to defining the purpose of a critical areas protection program.

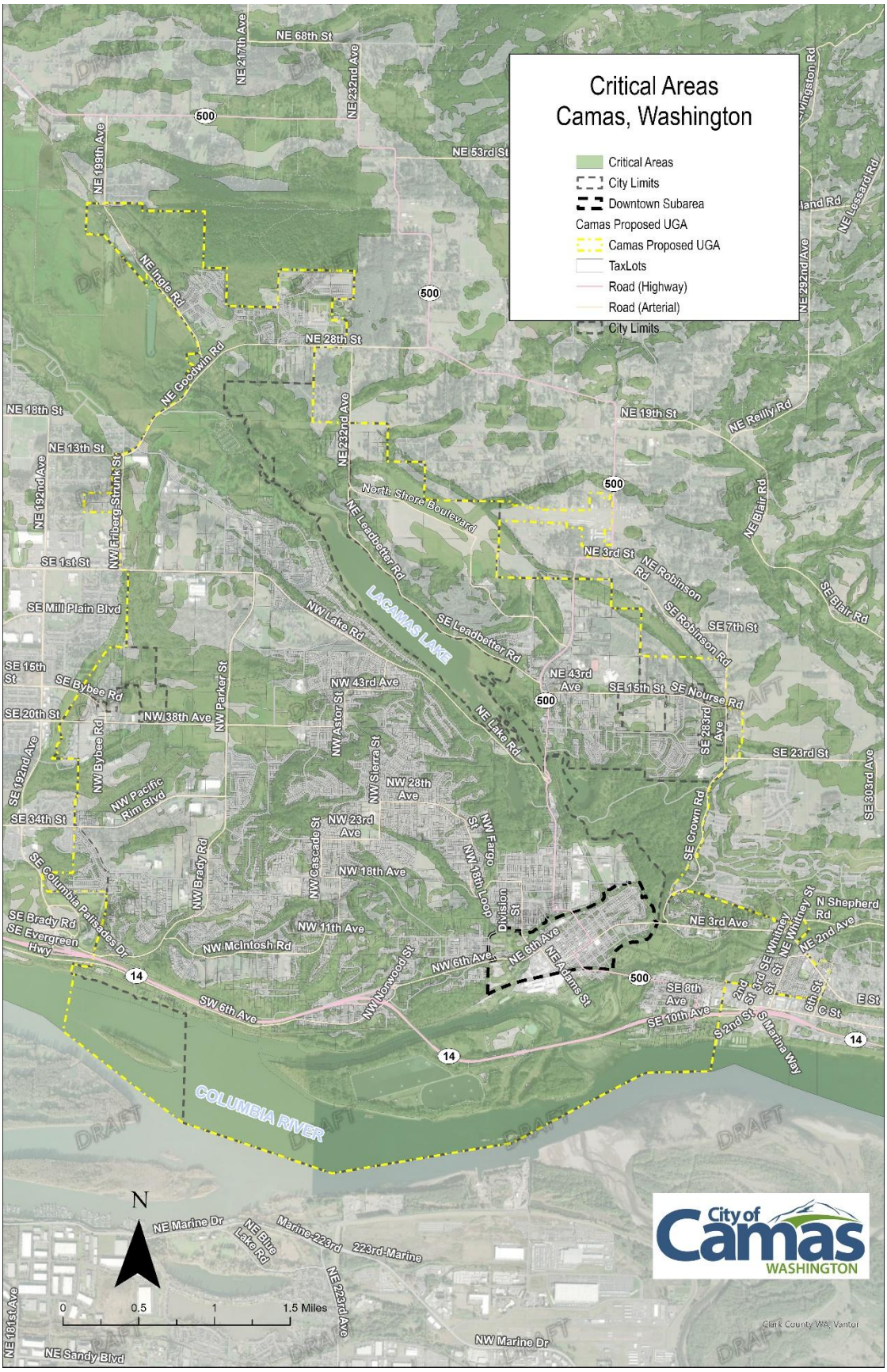
Each type of critical area performs different functions and each community assesses the values of the critical areas in its environment differently. Therefore, the purpose of protecting critical areas is unique for each community. Critical areas protection is necessary to protect the public's health and safety and is essential to comply with state laws in Washington. It may also provide compliance with federal laws for such things as water quality and

endangered species. There are also economic reasons to protect critical areas. For example, protection of drinking water quality and quantity supports sustainable growth, and critical areas support resource industries, such as salmon and other fisheries.

Critical areas are environmentally sensitive and hazardous areas that the State and City have identified for certain development considerations or restrictions to protect their functions and values, while allowing for reasonable use of property. Critical areas protection is regulated through the Camas Municipal Code (CMC) Title 16, which identifies five types of critical areas: wetlands, fish and wildlife habitat conservation areas, geologically hazardous areas (steep slopes, erosion hazard areas, and seismic hazard areas), critical aquifer recharge areas (CARAs), and frequently flooded areas.



Figure 4 Critical Areas



Wetlands

Wetlands are defined as those areas, designated in accordance with the approved federal wetland delineation manual and applicable regional supplements, which are inundated or saturated by surface or ground water at a frequency and duration, and under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands in the community are generally located in and around the Grass Valley area in west Camas, Lacamas Lake, Lacamas Creek, and the Washougal River greenway. The largest mapped wetland is located around the south end of Lacamas Lake, identified as lake habitat. The National Wetlands Inventory (NWI) does not identify mapped wetlands in downtown Camas.

Critical Aquifer Recharge Areas

Critical aquifer recharge areas (CARAs) are those areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge. The quality and quantity of groundwater in an aquifer is inextricably linked to its recharge area. To determine the threat to groundwater quality, existing land use activities and their potential to lead to contamination should be evaluated.

The goal of establishing CARAs is to protect the functions and values of the community's drinking water supply by preventing pollution and/or contamination of the supply directly or recharge areas indirectly.

Frequently Flooded Areas

Floodplains and other areas subject to flooding perform important hydrologic functions and may present a risk to persons and property. Classifications of frequently flooded areas should include, at a minimum, the 100-year floodplain designations of the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP), known as the 'special flood hazard area', which is defined further as having a special flood, mudflow, or flood-related erosion hazards and shown on Flood Insurance Rate Maps (FIRM), which also includes the regulatory floodway.

Geologically Hazardous Areas

In the physical context of Camas, geologically hazardous areas include areas susceptible to erosion hazard, seismic hazard, mine hazard, and other geological events. Geologically hazardous areas in Camas include severe erosion hazard areas adjacent to Lacamas Lake, north of the Columbia River, and to the east along the Washougal River.

Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas (FWHCAs) are critical ecological zones that support essential habitats and species necessary for maintaining ecosystem integrity and biodiversity. These areas may include rare ecosystems, high-density wildlife zones, breeding and migration corridors, and habitats for endangered or sensitive species. Their designation plays a key role in guiding land use planning, urban growth boundaries, and conservation strategies. FWHCAs must be identified using the best available science, considering factors such as habitat connectivity, human activity levels, riparian and salmonid protection, and the impact of surrounding land uses. Buffer zones are also recommended to minimize conflicts between development and habitat preservation.

Aquatic and Riparian Habitat

Fish and wildlife habitat conservation areas in Camas include habitats for state or federally listed endangered, threatened, or sensitive species, as well as areas associated with state priority species identified by the Washington Department of Fish and Wildlife. These areas encompass naturally occurring ponds under twenty acres, classified state waters, and water bodies stocked with game fish by governmental or tribal entities. Key aquatic habitats in Camas include the Columbia and Washougal Rivers, Lacamas Creek, Camas Slough, Lacamas Lake, and various streams, ponds, and wetlands, all often bordered by riparian zones. Lacamas Lake is the largest aquatic habitat in the city aside from the Columbia River system.

Terrestrial Habitat

Terrestrial habitats in Camas, like aquatic ones, include areas supporting state or federally listed endangered, threatened, or sensitive species, as well as state priority species identified by the Washington Department of Fish and Wildlife (WDFW), State Natural Area Preserves, and locally important habitats. Locally designated habitats include Oregon white oak trees and stands, and Camas lily fields of specific sizes. While much of the city is mapped as "cave rich" by WDFW, actual cave presence is limited, though caves are considered a priority habitat feature. The Camas biodiversity corridor, which includes mature timber and sightings of Vaux swifts, runs through parts of the city. Oak woodland habitat is primarily found near Lacamas Lake, and the northern part of Camas including the Lacamas Prairie Natural Area Preserve, which protects rare Willamette Valley wet prairie habitat and several endangered plant species, including Bradshaw's lomatium.

Critical Areas Goals & Policies

Preserve, maintain, and restore the City's critical areas to protect their function and value.

Policy NE-2.1	Use best management practices and best available science to preserve, protect, and restore the biological health and diversity of Camas' critical areas.
Policy NE-2.2	Preserve and restore aquatic and riparian habitats consistent with applicable regulations.
Policy NE-2.3	Preserve and avoid development of areas with endangered, threatened, and sensitive species and species of local importance as required by local, state, and federal laws.
Policy NE-2.4	Ensure that development throughout the City meets or exceeds standards and practices for long-term wetland protection and mitigation.

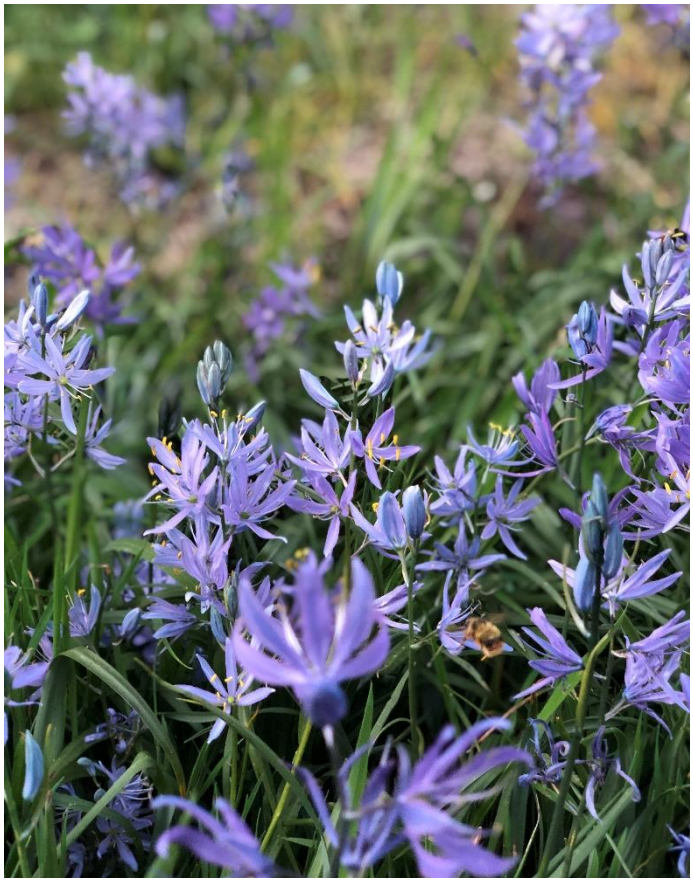
Shorelines

Overview

The Shoreline Management Act, enacted in 1972, created a collaborative framework between Washington State and local governments to manage and protect shorelines. Under this law, local jurisdictions are required to develop Shoreline Master Programs (SMPs) tailored to their specific needs.

Camas encompasses 946 acres of shoreline across 26 miles, including areas along Lacamas Creek, several lakes, and the Columbia and Washougal Rivers. The SMP outlines strategies to minimize flood risks, enhance recreational opportunities, and ensure sustainable shoreline use through voluntary programs and regulatory measures.

To guide development and conservation, Camas assigns specific shoreline designations based on land use, ecological characteristics, and community vision. These designations—Aquatic, Natural, Urban Conservancy, Medium Intensity, and High Intensity—are aligned with state guidelines and the city's comprehensive plan. Each designation comes with tailored policies and development regulations, such as height and setback limits. For example, High Intensity areas support industrial use, while Natural areas prioritize ecological preservation. These designations help ensure that shoreline development aligns with environmental protection and long-term community goals.



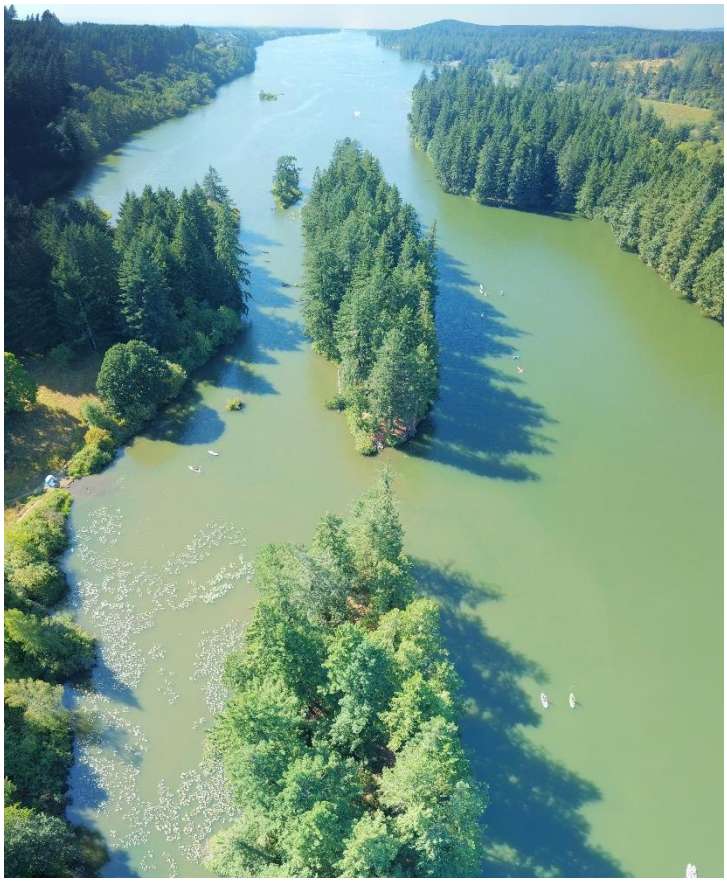
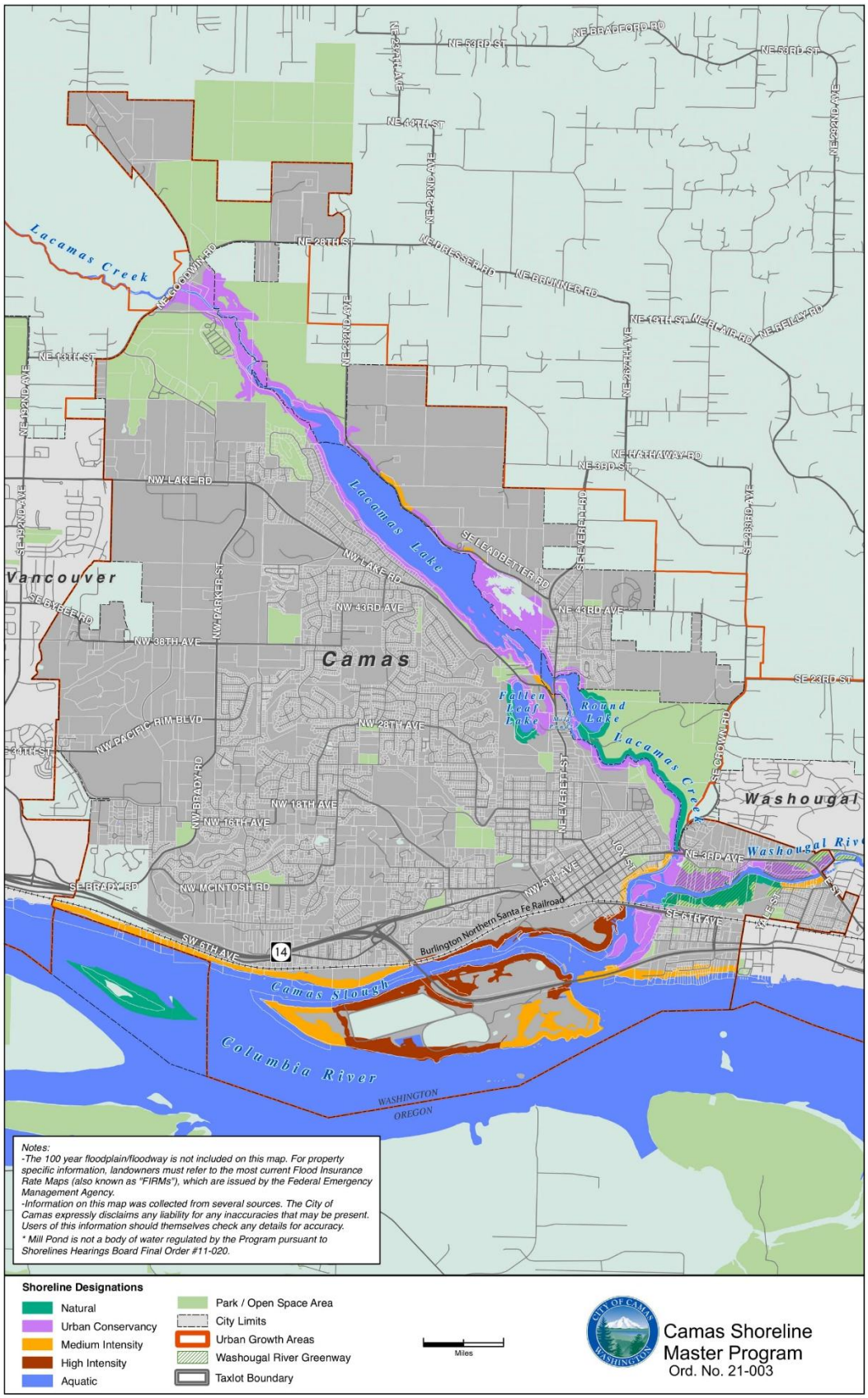


Figure 5 Shoreline Map



Shoreline Goals and Policies

Goal NE-3 Shorelines

Use the full potential of shoreline in accordance with the opportunities presented by their relationship to the surrounding area, their natural resource values, and their unique aesthetic qualities offered by water, topography, and views. Develop a physical environment that is both ordered and diversified, and which integrates water and shoreline uses while achieving a net gain of ecological function.

Policy NE-3.1 Adopt the goals and policies as outlined in the current Camas Shoreline Master Program.

Landscape Enhancement and Tree Preservation

The natural landscape and existing tree cover are important aspects of Camas' natural environment. Native, mature landscaping and trees contribute to the City's ecological health, supply valuable animal habitat, and enhance the community's natural beauty.

Goal NE-4 Landscape Enhancement and Tree Preservation

Preserve existing natural landscapes and tree canopy. Support opportunities for increasing native and climate resilient landscaping and tree canopy.

Policy NE-4.1 Develop and implement a program to prioritize retention of existing trees and planting of new trees within development sites to maximize cooling and energy savings. Encourage planting of hardy and climate resilient native trees.

Policy NE-4.2 Develop an urban forestry program that articulates a long-term strategy for future-proofing the City's tree canopy, including actions for tree protection, management, education, and collecting and maintaining data on citywide tree canopy.

Policy NE-4.3 Require the use of native and climate resilient plants in residential, commercial, and industrial landscapes to support the implementation of low impact development.

Policy NE-4.4 Develop and implement a program to mitigate and compensate for tree canopy loss when retention of mature trees within development sites is impractical.

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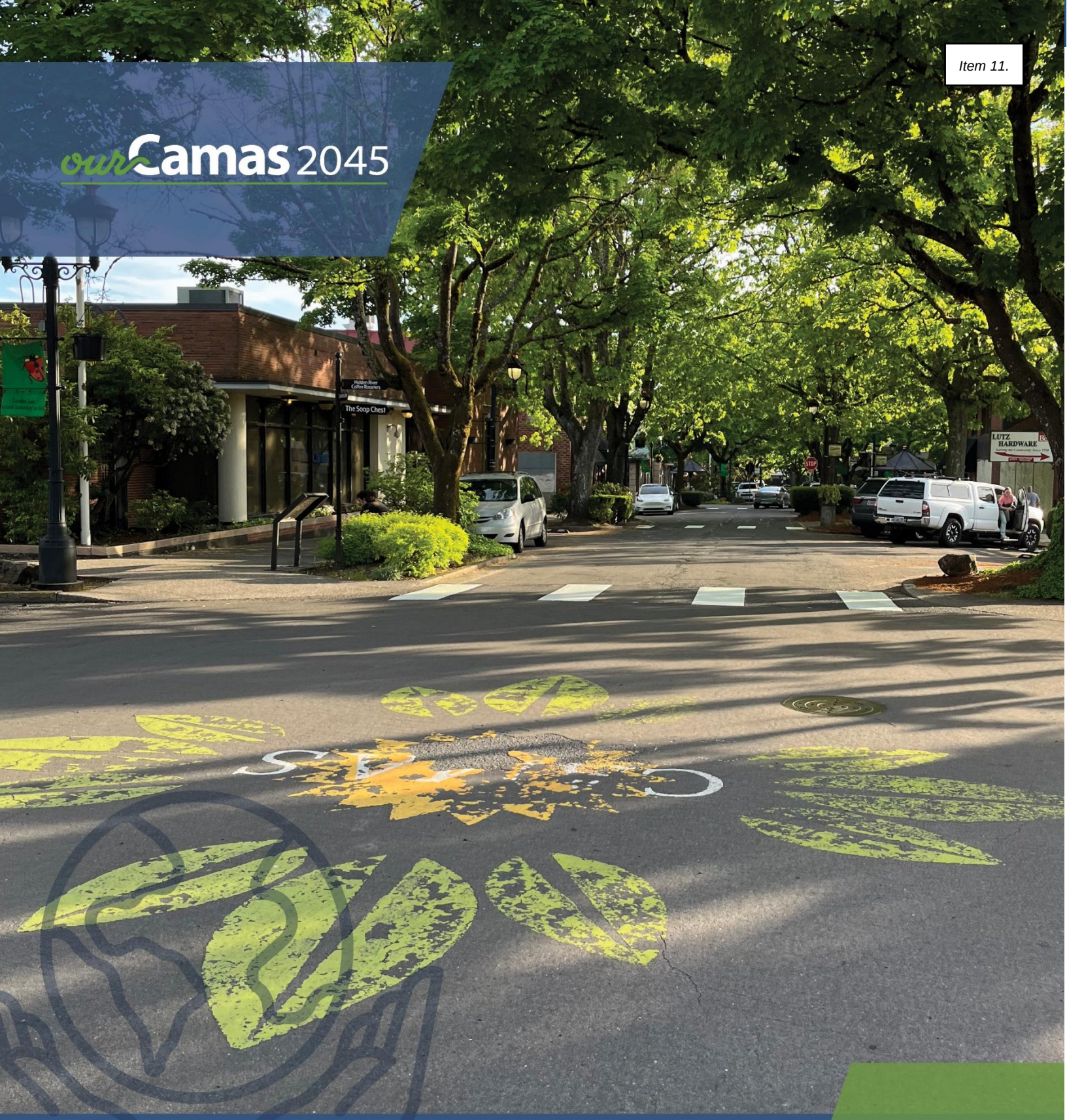


Climate Change & Resliency

07

07. Climate Change & Resiliency

Community Impacts from Climate Change

Climate hazards (i.e., natural hazards exacerbated by climate change) of the highest concern and priority are extreme heat and precipitation. Camas can address anticipated impacts by reducing GHG emissions and building community resiliency.

Vision

In 2045, Camas has proactive plans to reduce greenhouse gas (GHG) emissions and mitigate the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come. The most vulnerable communities are protected, and climate planning contributes to improvements in community health and well-being.

Introduction

The City developed this climate change and resiliency element consistent with House Bill 1181, signed into law in 2023. This new state law integrates climate planning into Washington's GMA and requires cities and counties to include a climate element in their comprehensive plans.

Climate change refers to long-term shifts in temperatures and weather patterns. The burning of fossil fuels and other human activities are increasing emissions of greenhouse gases (GHGs) that trap heat in the atmosphere and contribute to global and local climate change. Negative effects include impacts on the community caused by natural hazards that are exacerbated by climate change (e.g., the increased frequency and severity of drought conditions). Natural hazards are also referred to as "climate hazards" in this element as climate change is anticipated to affect the frequency and intensity of natural hazards.

The purpose of this climate element is twofold: to reduce contributions to climate change (i.e., GHG emissions) and to build community resilience to climate change.

To support these two overarching goals, the City formed a Climate Policy Advisory Team (CPAT) to advise on the creation of this new element. The 17 CPAT members included community members, City staff, City Council and Planning Commission liaisons, and representatives from the Port of Camas-Washougal, Clark Public Utilities, NW Natural, and the Camas School District. CPAT members held five meetings between early 2024 and early 2025.

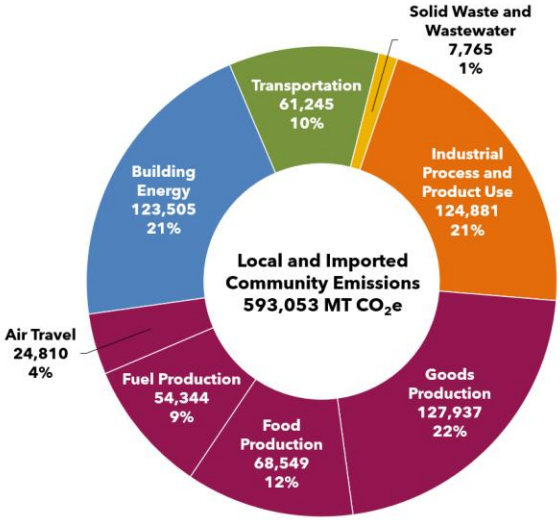
The CPAT was instrumental in the identification and development of climate goals and policies.

Climate Overview

Greenhouse Gas Emissions

The GHG reduction subelement identifies actions to reduce GHG emissions and decrease per capita vehicle miles traveled (VMT). One of the requirements of the GHG reduction subelement is to meet the GHG reduction requirements in RCW 36.70a.070(9)(d), including reducing per capita VMT within Camas but without increasing GHG emissions elsewhere in the state. To identify actions for VMT reduction, Clark County worked with local cities to prepare a VMT study and travel market assessment to understand baseline travel patterns and strategies for VMT reduction. According to the VMT study, data from the Highway Performance Monitoring System shows that the city's estimated per capita VMT, which represents the average weekday VMT within Camas divided by the city's population, is 11.1. The travel market assessment identified key travel destinations in the city for short trips (i.e., trips 3 miles or less), showing that areas near Lacamas Lake, Camas high school, and Downtown Camas are popular destinations. Both assessments will help inform a regional target for VMT, which will be established outside the climate element/comprehensive plan framework. In addition to VMT reduction, Clark County's Countywide Planning Policies establish requirements for cities to reach net-zero emissions by 2050 (14.1.2) in alignment with statewide GHG emission reductions (RCW 70A.45.020(1)) and set interim (5-year) objectives or targets (14.1.4). A GHG inventory for Camas was also prepared to inform GHG reduction strategies. The inventory provides an estimate of the city's carbon footprint from local emissions (building energy, transportation, solid waste and wastewater, and industrial process and product use) and imported emissions (consumption of goods). Figure 6 Camas Emissions, 2022 shows the combined and per capita emissions for the city.

Figure 6 Camas Emissions, 2022



With a population of 27,250, all 2022 GHG emissions combined (local and imported) for City of Camas totaled

593,035 MT CO_2e

21.8
MT CO_2e
Per Capita

Local emissions include sector-based emissions that are generated within Camas. Imported emissions are generated outside of Camas to produce and provide the goods, food, services, air travel, and production of transport of fuels consumed by households. Additionally, wildfires have become one of the largest sources of carbon emissions in Washington state. From 2014 to 2018, wildfires in the state generated 39,200,000 MT CO_2e.

Figure 7 Local and Imported Emissions in Camas

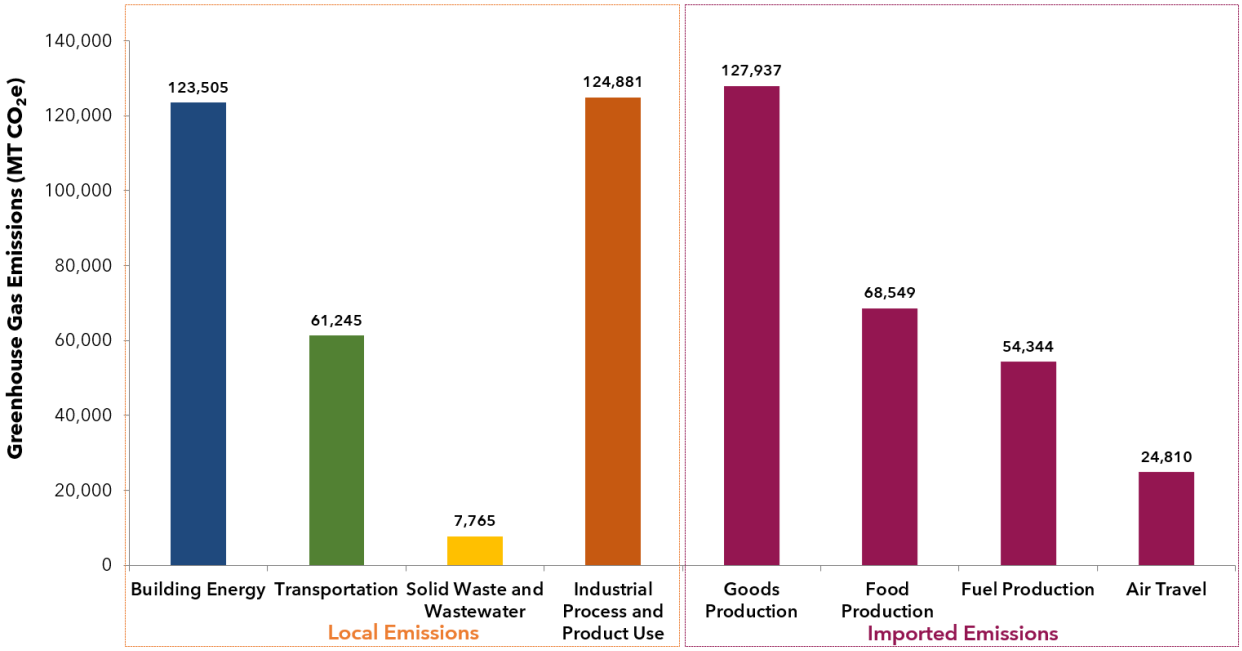


Figure 7 shows a breakdown of the sources of local and imported emissions in Camas. Most sources of local emissions include **industrial process and product use** and **building energy**, which accounts for **78%** of local emissions. Emissions from the industrial process and product use sector generally involve facilities with silicon semiconductor manufacturing. While emissions from these facilities contribute to a large share of local emissions, demand for these goods is global and not specific to Camas. Therefore, goals and policies target reducing local emissions and support existing GHG reduction strategies or targets that are being implemented by businesses and industries in Camas.

Climate Resiliency

Community resiliency is the ongoing process of preparing for, anticipating, and responding to natural hazards created or aggravated by climate change.

Natural hazards relevant to Camas are identified in the 2023 Clark County Natural Hazard Mitigation Plan (NHMP) (CRESA 2023). Table 8 Natural Hazards in Camas lists hazards of concern in order of ranking and their priority, which were evaluated as part of the risk assessment in the NHMP. The risk rating reflects the probability of a hazard weighted against its potential impact on people, property, and the economy. The table also shows the projected climate impacts for each hazard and how hazards have affected the community in the past.

Table 8 Natural Hazards in Camas

Natural Hazard (NHMP Rating[10])	Projected Changes by 2050[11]	Effects on the Community[12]
Extreme Heat (High)	40+ days per year that feel hotter than 90 degrees.	Increased demand for air conditioning, higher utility bills, heat-related illness for sensitive populations and youth at school playgrounds and sports fields, disruption of outdoor activities.
Extreme Precipitation (High)	12% increase in total annual precipitation	Overflowing of streams or rivers, unsafe driving and walking conditions.
Landslide (Medium)	13% increase in heavy rain events	Physical damage to residential and commercial property, energy infrastructure, communication infrastructure, and transportation infrastructure.
Flood (Medium)	17% increase in peak streamflow in Washougal River	Property damage, particularly for older buildings and low-income housing near the floodplain, and temporary or permanent displacement. Temporary closures of businesses and other services.
Wildfire (Medium)	9+ days per year that have high fire danger	Wildfire smoke can impact human health, particularly people with respiratory illnesses or diseases. Increased health risks and property damage for communities near the wildland-urban interface[13].
Drought (Low)	14% decrease in summer rains	Impacts to water quality and quantity, decrease in habitat quality and quantity for salmon and other aquatic species.

[10] 2023 CRESA Regional Natural Hazard Mitigation Plan Volume 2 – Planning Partner Annexes
[11] University of Washington's Climate Mapping for a Resilient Washington webtool. Projections are based on a "business as usual" emissions scenario.
[12] Includes effects identified by the Camas community in a 2025 survey.
[13] Clark County Code (15.13.030) defines the wildland-urban interface as areas with elevation in excess of 500 feet and one or more of the following conditions: (a) slope equal to or greater than 25%, (b) forest type vegetation, and (c) outside of an organized fire protection district.

Vulnerability

Vulnerable Communities

Climate change can impact certain groups of people (vulnerable populations) and areas of the city (overburdened communities) differently. Vulnerable populations are groups of people who are more vulnerable to environmental harms due to socioeconomic factors and other health risk factors (RCW 70A.02.010(14)). Overburdened communities are areas where vulnerable populations experience environmental harms and health impacts (RCW 70A.02.010(11)). Together, vulnerable and overburdened communities are disproportionately impacted by climate change due to the concentration of environmental harms (e.g., air pollution near major roadways) and socioeconomic characteristics (e.g., low income, youth and children). People and communities in Camas who are vulnerable to climate hazards are generally described in the *Our Camas 2045* Equity Framework (see Appendix F). Additional information regarding identification of overburdened communities and efforts to engage these communities during the update of the plan is available in the Overburdened Communities and Vulnerable Populations Memo (Appendix G).

In addition to communities described in the Equity Framework, CPAT members identified additional communities that could be more vulnerable to climate hazards. These communities include areas that are located near floodplains (such as Lacamas Lake and the Columbia River), near mobile sources of air pollution (such as major roadways), near steep slopes and steep road grades, and/or near the wildland urban interface (e.g., homes adjacent to forested areas).

Vulnerable Assets

In Camas, the impact of climate hazards can depend on the proximity of people and buildings to each hazard. The approximate location of these hazards is shown in Figure 8 Wildfire Hazard Areas and Figure 9 Flood and Landslide Hazard Areas. Climate hazard locations are based on data from publicly available sources such as Clark County's Open Data Hub and include approximate areas of increased risk. While this information provides a visualization of higher risk areas, data may not include all potential risks and data gaps may exist depending on when data was published. Therefore, these figures provide a conceptual understanding of the location of climate hazards and potential effects on the community.







Figure 8 Wildfire Hazard Areas

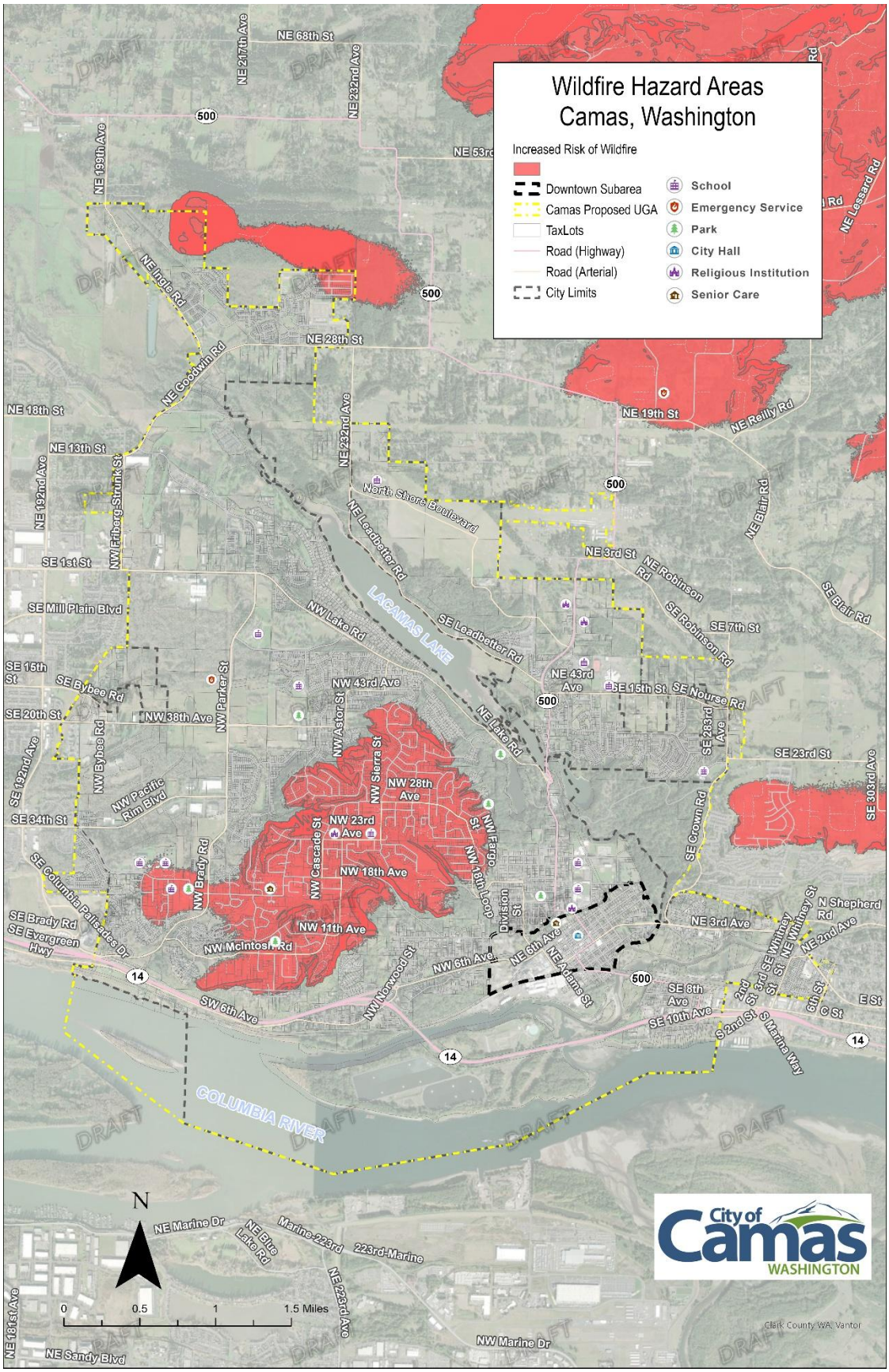
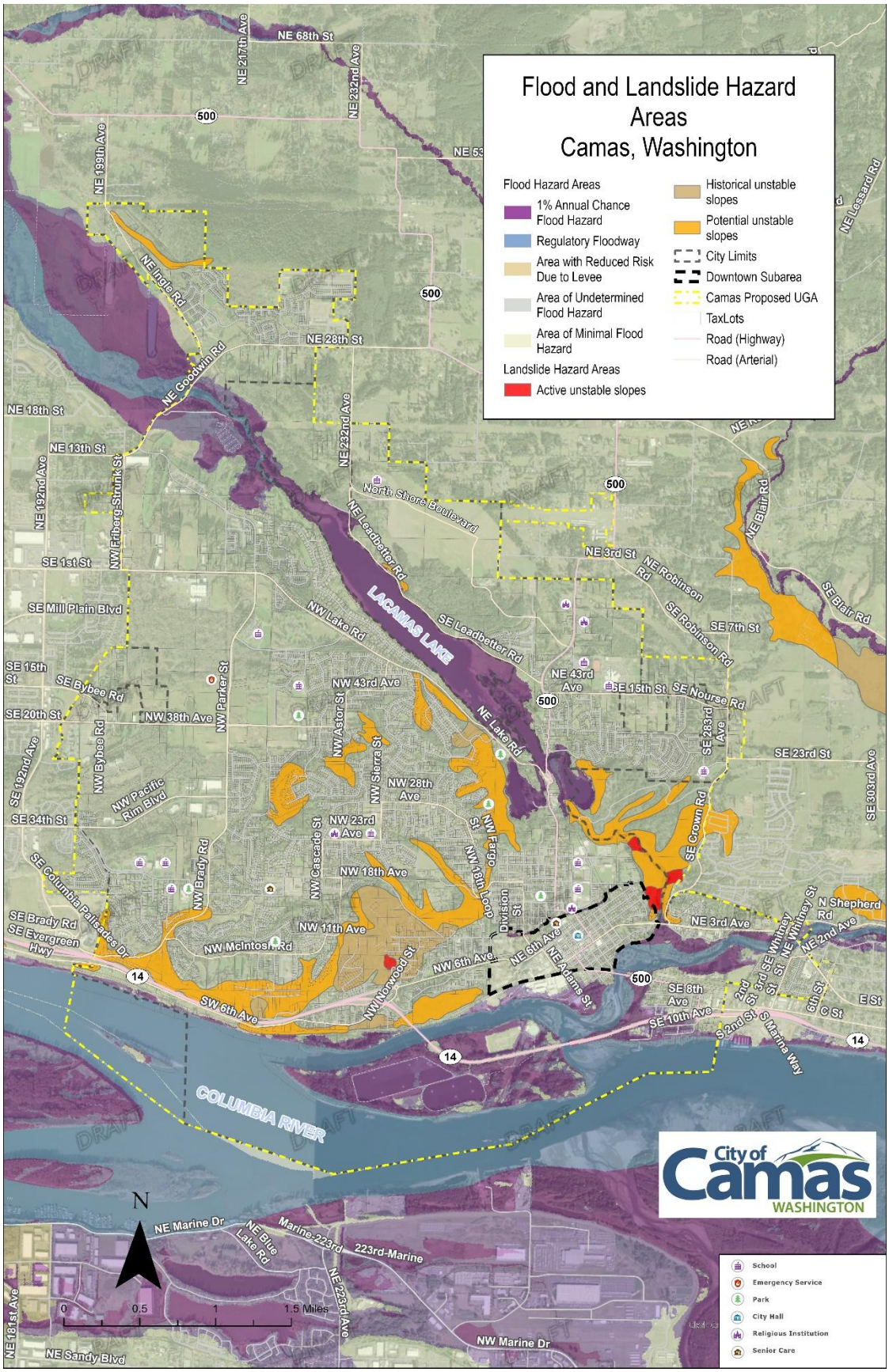


Figure 9 Flood and Landslide Hazard Areas





In Camas, buildings and infrastructure that could be vulnerable to climate hazards include aging water and sewer lines, buildings constructed before adopted seismic codes (e.g., city hall, public works operations center), and high-pressure natural gas lines. High tension power lines may also be vulnerable to severe storms (i.e., wind and ice), homes along the Washougal and Columbia Rivers, including the Georgia Pacific paper mill, may be susceptible to flooding, and the dam at Lacamas Lake could be impacted by an earthquake or flooding.

Extreme heat is one of the highest rated hazards for Camas. Buildings and impervious surfaces such as streets are factors in the urban heat island effect, where urban areas are warmer than surrounding rural or less developed areas. The County's department of public health collected heat data on one day in July 2024 and prepared a heat watch summary report describing how urban heat varies across neighborhoods in the county and how landscape features affect temperature and humidity. Across the county, areas with more buildings and paved surfaces tend to be hotter during the afternoon and evening. In Camas, the hottest areas of the city during the afternoon and evening are near Downtown Camas while cooler areas with more vegetation and shade are in west Camas, northeast of downtown, and near Lacamas Lake.

Vulnerability Assessment

A vulnerability and risk assessment prepared for Camas evaluated the risk of extreme heat on outdoor recreation sites, including (1) Lakes, (2) Parks & Trails, (3) School Playgrounds & Sport Fields, and (4) Downtown Camas. Both vulnerability (sensitivity and adaptive capacity) and risk (probability and magnitude) were evaluated.

The assessment produced composite scores for vulnerability and risk. For the lakes, Lacamas Lake and Round Lake scored high and Fallen Leaf Lake scored low. Under parks and trails, seven scored low, two scored medium, and 11 scored high. School playgrounds and sports fields scored medium (6) and high (6). Lastly, Downtown Camas scored high as it features the hottest area of the city. To reduce vulnerability and risk, this element includes policies to mitigate the impacts of extreme heat.

COMMUNITY FEEDBACK

- **Prepare a community wildfire protection plan that addresses wildfire prevention and requirements for fire resilient landscaping**
- **Hold community listening sessions on evacuation routes and develop policies based on community input**
- **Reform storm water modeling under climate scenarios to assess infrastructure capacity and service levels**
- **Retrofit older buildings to meet current codes**
- **Install electric vehicle charging stations**
- **Improve active transportation options to reduce dependence on vehicle travel, particularly for shorter trips around Camas and into Vancouver**
- **Incorporate solar power into local energy strategies**



Climate Change and Resiliency Goals and Policies

Climate goals and policies are established to meet the State's vision to reduce greenhouse gas emissions, plan for resilience, and support environmental justice. While these goals and policies directly focus on emissions and resiliency, additional policies in other elements of the plan tangentially support these goals. Those policies are noted with a leaf symbol.

Goal CL-1 Energy

Ensure that development and redevelopment projects, including buildings and energy infrastructure (generation, storage, and transmission) are designed to accommodate and use renewable energy, conservation, and efficiency technologies and practices to reduce GHG emissions and increase resiliency to natural hazards.

Policy CL-1.1 Support residents' efforts to improve energy efficiency and resiliency in existing and new residences through education and resources.

Policy CL-1.2 Encourage renewable energy sources for new and existing buildings and explore incentive programs for those that use renewable energy.

Policy CL-1.3 Provide commercial buildings, particularly restaurants and food services, with incentives to retrofit buildings for energy efficiency (e.g., grant programs, reduce permit fees, etc.).

Policy CL-1.4 Incentivize and streamline the review process for renewable resource projects.

Goal CL-2 Transportation

Improve the efficiency and resiliency of the transportation system to achieve GHG reduction goals and better withstand natural hazards.

Policy CL-2.1 Promote and complement state and utility incentives to provide electric vehicle charging infrastructure throughout the city, particularly at existing and new multi-family buildings and large employers.



Policy CL-2.2 Provide homeowners and renters information on state and federal tax credits/rebates for electric vehicles, renewable resources and energy efficiency.

Policy CL-2.3 Incorporate projected hydrologic climate impacts into the design and maintenance of water-crossing structures (e.g., climate-smart culverts and bridges).

Policy CL-2.4 Promote land use patterns and multimodal transportation systems that reduce vehicle miles traveled, traffic congestion, and associated greenhouse gas emissions per capita to support sustainability and climate resiliency.

Goal CL-3 Local Agency Sustainability and Preparedness

Support agencies, districts, and businesses in establishing and achieving their own sustainability goals, initiatives, and programs.

Policy CL-3.1 Support the sustainability initiatives of local agencies, districts, and businesses.

Policy CL-3.2 Support local businesses efforts to bolster climate preparedness and continuity of operations (e.g., develop on-site electricity storage to reduce energy demand during peak hours, incentives to install backup power, building retrofits).

Policy CL-3.3 Support the local economy's resilience to climate disruptions by providing information and resources on how to prepare for extreme heat, flooding, and wildfire.

Policy CL-3.4 Support economic opportunities for green jobs in Camas, including businesses that produce goods or services that benefit the environment and jobs that support business production processes to be more environmentally friendly or use fewer natural resources.

Policy CL-3.5 Develop a sustainable purchasing policy and sustainable construction standards for the City of Camas.

Goal CL-4 Community Health

Protect community health and well-being from the impacts of climate-exacerbated hazards and ensure that the most vulnerable residents do not bear disproportionate health impacts.

Policy CL-4.1 Promote the use of health impact assessments and other tools to identify and address the impacts on health and equity from climate change.

Policy CL-4.2 Develop and implement an urban heat resilience strategy that addresses land use, urban design, urban greening, and waste heat reduction actions.

Policy CL-4.3 Establish development regulations that include best practices for reducing risk of climate-exacerbated hazards such as wildfire, extreme heat, extreme precipitation and flooding.

Policy CL-4.4 Develop and implement mitigation measures related to the impacts from air, water, heat, noise and light pollution, with a focus on areas with high environmental health disparities (see WA Department of Health map).

Goal CL-5 Emergency Preparedness

Enhance emergency preparedness, response, and recovery efforts to mitigate risks and impacts associated with natural hazards.

Policy CL-5.1 Create accessible evacuation plans and outreach materials to help residents plan and practice actions that make evacuation and reunification quicker and safer during a natural hazard event (e.g., notification alerts).

Policy CL-5.2 Develop a comprehensive, communitywide wildfire resilience strategy to support development in compliance with the International Wildland-Urban Interface Code, implement Firewise actions, improve emergency response capabilities, create fire-resilient landscapes, promote fire-adapted communities, and support the development of community wildfire protection plans.

Policy CL-5.3 Support enhanced data collection for hazard events of all magnitudes to provide a fuller understanding of the community's hazard characteristics.

Policy CL-5.4 Develop resiliency hubs, such as community-serving facilities that support residents, coordinate communication, distribute resources, and enhance quality of life.

Policy CL-5.5 Prepare, plan, and provide ongoing training for those responding to adverse environmental events.

Goal CL-6 Water Resources

Protect and preserve the long-term quality and quantity of Camas' water, and natural and cultural resources from climate change hazards such as drought and extreme participation.

Policy CL-6.1 Develop and implement a comprehensive drought resilience strategy that factors in projected climate impacts and sets action levels for different drought stages.

Policy CL-6.2 Evaluate the long-term adequacy of water delivery and storage infrastructure to ensure projected changes in hydrological conditions can be anticipated and managed effectively.

Policy CL-6.3 Implement actions recommended by the Lacamas, Round, and Fallen Leaf Lakes Management Plan to reduce the frequency of harmful algae blooms in lakes due to water pollution and projected changes in climate conditions, including higher temperatures.

Policy CL-6.4 Identify funding mechanisms for mitigation measures recommended by the Lake Management Plan to address the impacts of climate hazards on Lacamas, Round, and Fallen Leaf Lakes.

Policy CL-6.5 Introduce adaptive cooling features such as water and shade structures at local parks and school playgrounds and sports fields to help mitigate the effects of extreme heat on vulnerable park users and young children.



ourCamas 2045



Transportation

08

08. Transportation

GMA Planning Goal

Encourage efficient multimodal transportation systems that will reduce greenhouse gas emissions and per capita vehicle miles traveled, and are based on regional priorities and coordinated with county and city comprehensive plans.

Vision

In 2045, residents of Camas continue to appreciate their safe transportation infrastructure that equitably serves all users.

Introduction

As part of the comprehensive plan periodic update, the City of Camas reviewed and updated its Transportation System Plan (TSP). The TSP is adopted by reference and included as Appendix H. The TSP is a long-range plan to guide transportation investments for Camas and its UGA for the planning horizon to 2045. The TSP provides the following:

- Inventory of the current transportation system for all modes of travel
- Summary of land use assumptions used for estimating travel demands
- Summary of level of service (LOS) standards
- List of actions to address deficiencies
- Forecast of traffic demand for twenty years
- System needs to meet the current and forecasted demand
- Six-year Transportation Improvement Plan (TIP)

These items are foundational to a comprehensive plan and integral to implementing the Land Use plan.

The transportation element is one of the main parts of the comprehensive plan and is an effective tool for shaping the city's future development patterns. Growth and development patterns have a major influence on the fiscal health of local governments and on the economic performance of the community. The nature of public streets can shape the level of traffic congestion, the use of multiple modes, and the character of neighborhoods. Related requirements, such as parking and loading, will influence the cost to develop in a community and can present both opportunities and barriers to how people can access homes, schools, recreational opportunities, and businesses within the community and in the region.

Ownership, control, development, and the operation and maintenance of streets and public rights-of-way are primary functions of local governments. A transportation system is one of the most expensive facilities a community will construct, operate and maintain. Each new facility adds an asset to the city's

portfolio, but it also must be managed, resulting in an incremental increase in operating costs and a new set of maintenance, preservation, and rehabilitation obligations.

Decisions about transportation facilities greatly influence the safety and security of the community. How the streets, roads and other transportation facilities are designed, built and maintained will influence safety in multiple ways for all users.

Federal, state, county and city transportation systems are interrelated, so coordination with other units of government is essential. Responsibility for transportation systems spans all levels of government. The Camas transportation network connects to state highways, neighboring city streets and adjacent county roads and indirectly to federal and interstate highways. It also interacts with transportation facilities operated by other special purpose districts like C-TRAN and for-profit businesses. Moreover, the public does not experience the transportation system as a series of separate systems, but as a single, unified system, and it expects all the parts to function in an integrated fashion. The transportation model used to plan future transportation projects in the TSP is consistent with growth assumptions for Camas as well as the region. The City coordinates closely with neighboring jurisdictions, regional bodies, Clark County and the state in transportation and land use planning.

The GMA requires the transportation element to implement and be consistent with the land use element. Counties and cities should use consistent land use assumptions, population forecasts, and planning periods for both elements. Coordination of the land use and transportation elements must be dynamic and iterative with an ongoing feedback loop coordinating land use and transportation in the plan development and in local implementation. The transportation element is also required to be consistent with state and regional plans. The transportation element is certified by the regional transportation organization, which is the Southwest Washington Regional Transportation Council (RTC), to ensure consistency with the regional transportation plan (RTP). This chapter was analyzed and revised to be consistent with the RTP, including consistency with project lists, LOS, land use assumptions, goals and policies.

Performance Standards

Level of Service (LOS)

The TSP includes level of service as a measure of performance standards for motor vehicles. A LOS “D” and a vehicle to capacity (v/c) ratio not higher than 0.85 is the minimum performance standard during the highest one-hour period of the day for signalized, all-way stop and roundabout controlled intersections under City jurisdiction. These standards shall be applied to the intersection as a whole.

A LOS “E” and a v/c ratio not higher than 0.90 is the minimum performance standard during the highest one-hour period of the day for two-way stop and yield controlled intersections under City jurisdiction. These standards shall be applied to all intersection approaches serving more than 20 vehicles. Mobility standards do not apply to approaches at intersections serving 20 vehicles or fewer during the highest one-hour period of the day. This mobility standard allows more flexibility in the tension between larger intersection and street designs that are sometimes needed to accommodate peak vehicle demands, and the desire to maintain smaller designs that encourage slower vehicle speeds and tend to be more accommodating to pedestrian and bicycle users.

Table 9 Transportation Level of Service

Level of Service	A/B	C	D	E
Intersections	N/A	Local Access	Collectors and Arterials	State Highways of Non-Significance
Roundabouts	N/A	Local Access	Collectors and Arterials	State Highways of Non-Significance

Table 10 Volume to Capacity Ratio

Volume to Capacity Ratio	0.85	0.9
Roundabouts	Local Access and Collectors	Arterials and State Highways of Non-Significance
Roadways Based on Average Speed	Collectors and Arterials	State Highways of Non-Significance

Level of Service for Highways of Statewide Significance is set by the State. In Clark County, the standard is set as LOS "D" for urban areas, including SR 14. Level of Service for regional state highway facilities (not part of the HSS), including SR 500 in Camas, is set through the Southwest Washington RTC. The Southwest Washington RTC Board adopted LOS 'E' or better for non-HSS urban state highway facilities.

The City adopts C-TRAN's MMLOS standard for the local and regional system. For the local system, routes have a service frequency LOS B (30 min headway) or better and transit stops have accessible path with LTS 1 or 2 and stop completeness (assess existing facilities against C-TRAN Amenity Standards). For the regional system, routes have a reliability LOS B or better and transit stops have accessible path with LTS 1 or 2 and stop completeness (assess existing facilities against C-TRAN Amenity Standards). Route 92 serves Camas and Washougal.

As part of the City's TSP update, forecasted 2045 motor vehicle volumes for peak hour conditions were utilized to determine areas on the baseline roadway network that will be congested and may require future investments to accommodate forecasted growth. The corridors recommended to prioritize for improvements include:

- SR 500-NE Everett Street between NE 23rd Avenue and SE Leadbetter Road
- NW 6th Avenue between Norwood Street and Adams Street
- NE 3rd Avenue between NE Dallas Street and SE Lechner Street

The City will pursue implementation of the programs, policies and projects listed in the TSP in order to bring transportation facilities and services to the established LOS.

Level of Traffic Stress (LTS)



The City is adopting Level of Traffic Stress (LTS) as the multimodal level of service (MMLOS) standard. LTS is used to measure the comfort of those who are walking, biking or rolling on streets shared with vehicles. The best way to make these facilities comfortable to use while walking, biking and rolling is with space, separation, and visibility. The specific application depends on the conditions of each street. LTS is measured on a scale of one to four. A road with an LTS of 1 is best and is suitable for all users. A road with an LTS of 4 has the highest level of stress for a user and is typically used by those with a high level of confidence or those who don't have an alternative option. LTS 2 is the standard, meaning streets should be comfortable for most adults, including most adults experiencing disabilities. There may be some separation between pedestrians and vehicles, though no physical barrier.

Travel Demands and Characteristics

The number of people who choose to walk, bike, ride transit, or drive alone with the distances they travel is important for assessing how well existing transportation facilities serve the needs of users. Available data on travel demand, travel mode choice, and trip length are used to better understand travel behavior in the community and inform the needs analysis for the transportation system. This data is largely derived from the US Census Bureau on employment-based trips; however, no other travel data is available from this source. The following sections provide a summary of travel demands and characteristics in the City's planning area.

Commuter Trips

Much of the traffic in the Camas planning area, especially during the more congested weekday peak periods, is related to employment. In other words, how do people get to and from work from their place of residence. People who live in Camas and who are employed overwhelmingly commute to work outside of the planning area (87 percent), while jobs in the planning area are overwhelmingly filled by people who live outside of the planning area (83 percent).[14]

In terms of the predominant travel mode, on average, almost 75 percent of employed residents in the Camas planning area commute to work using single-occupant motor vehicles. About 8 percent of residents carpool to work and the remaining 17 percent work from home, walk, bike, take transit, or use some other means of travel[15].

About 11 percent of employed residents in the Camas planning area worked from home pre-COVID, and that figure likely increased due to COVID-19. It seems likely that a higher percentage of workers will continue a hybrid work schedule that includes teleworking, at least part time. Any increase in the hybrid work week (e.g. 2-3 days in an office with the balance at home or some other remote location) will change the demand on the transportation network, including when and how people travel.

[14] US Census Bureau, OnTheMap. Home/Work Distance/Direction Analysis, 2015.
[15] US Census Bureau, 2012-2016 American Community Survey

Transportation Demand by Mode

Pedestrian, bicycle, and motor vehicle traffic counts were conducted at key intersections throughout Camas on typical weekdays[16]. This information indicates where and when travel demand is highest for each mode of travel. It also provides a basis for assessing how well existing transportation facilities are able to meet the needs of users during peak demand periods.

- Pedestrian volumes during the PM peak hour are generally highest near downtown Camas, including along NE 3rd Avenue and NE Adams Street (the traffic count summary is included in Appendix I). The highest hourly pedestrian activity during the evening peak occurred at the NW Sierra Drive intersection with NW 28th Avenue, near Dorothy Fox Elementary school, with 30 pedestrian crossings in the one-hour period. Other study intersections with more than 15 pedestrian crossings during the one-hour period included many downtown locations such as NE 6th Avenue at NE Adams Street, NE 3rd Avenue at NE Dallas Street, NE 3rd Avenue at NE 4th Street, and Weir Road at NE 3rd Avenue, near the border of Camas and Washougal.
- Bicycle volumes indicate limited biking, with the highest volumes along NW Lake Road, and NW Sierra Street (the traffic count summary is included in Appendix I). During the evening peak hour, 20 of the 50 study intersections had no observed bicyclists during the one-hour period. The NE Lake Road at SR 500, NW Lake Road at NW Sierra Street, NW Lake Road at NW Leadbetter Drive, NW Sierra Street at NW 45th Avenue, and NE 6th Avenue at NE Garfield Street intersections had the highest observed bicycle volumes, with 4 or more bicyclists counted during the single hour at each of the intersections.
- Motor vehicle volumes on the roadways in Camas (the traffic count summary is included in Appendix I) most commonly peak during weekday evenings between 4:50 and 5:50 p.m. The highest hourly motor vehicle volumes during the evening peak occurred along the NW 6th Avenue corridor between the SR 14 ramps and NE Adams Street, with more than 1,300 trips during the one-hour period. This corridor is the primary entrance into Camas from eastbound travel. The NE Lake Road at NE Everett Street, and NW 6th Avenue at SR 14 Ramps intersections had the highest observed volumes, with more than 1,800 entering vehicle trips during the single hour at each of the intersections.

Active Transportation Networks

Camas is a community with an active population and, therefore, requires a fairly robust active transportation system that includes pedestrian and biking facilities. The TSP inventoried the pedestrian and biking facilities, listed gaps in the systems, and assessed the facilities for how a pedestrian and bicyclist experiences them.

Multimodal Network Design

The design of the streets in the City's planning area is based on the network classifications and area designation. All streets in the planning area are multimodal and include travel lanes and on-street parking for vehicles, sidewalks for pedestrians, and on-street or separated facilities for bicyclists. Accommodating these modes varies by the functional classification and area designations. For a typical street cross-section, the functional classification determines the minimum design requirements for the number of vehicle travel way lanes and on-street parking, and the minimum acceptable bike facility, and the area designation is used to determine the minimum acceptable

[16] Based on counts conducted in April of 2018.

design for pedestrian facilities, and the minimum travel lane and median/turn lane width. Together, these cross-section standards identify the design characteristics needed to meet the function and demand for each facility type for streets in the City's planning area. Since the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, this system allows standardization of key characteristics to provide consistency. An example of a collector street cross section is shown in **Error! Reference source not found.**.

Figure 10 Collector Street Cross Section



The typical designs are intended to be implemented in newly developing or redeveloping areas of the City's planning area, where constrained conditions do not limit the ability to construct the typical cross-section. A variety of physical and natural constraints may prevent adherence to the multimodal network design requirements. A deviation to the street standards may be requested from the City Engineer or City Engineer's designee with justification of constraints to consider a constrained cross-section or other adjustments.

Pedestrian Network

Walking supports healthy lifestyles, is an easy and economical way to travel, and is well-suited for people of all ages and abilities. In this plan, "walking" and "pedestrian" are terms that include people who walk independently or use canes, wheelchairs, or other walking aids, or strollers. Approximately two percent of commuters in the city walk to work, with three percent utilizing public transportation, which often includes walking at the beginning or end of the trip.[17] In addition to the work commute trips, walking trips are made to and from recreational areas, shopping areas, schools, and other key destinations in the community. Continuous and direct sidewalk connections to all key

[17] US Census Bureau, 2012-2016 American Community Survey

destinations and along all streets, in addition to safe crossing opportunities along major roadways, are essential to encourage walking and transit use.

A pedestrian network assessment of streets, showing the extent to which the walking network on collector and arterial streets provides a level of comfort and safety for users, was completed throughout the city. About 30 percent of the collector and arterial street miles in Camas were rated "good (i.e., level of traffic stress (LTS) 2)" or "excellent (i.e., LTS 1)" for pedestrians. However, over 35 percent of the collector and arterial street miles rate poorly (i.e., LTS 4). Most of the street miles rated "poor" are located in high growth areas, be that housing or business growth. The pedestrian network in these areas is largely unimproved due to the once rural nature of the surrounding land use. As future urban development occurs, pedestrian facilities will improve in those areas. Overall, the pedestrian network rates relatively high near downtown, and generally poorer towards the edges of the city. See Figure 12 for an inventory of the pedestrian network.

Bicycle Network

Cycling is important for both transportation and recreation in the Camas planning area. This includes people who bike to work and school, bike for recreation or running errands. Approximately one percent of commuters in the city bicycle to work[18]. Riding bicycles also plays a key role in the transportation system's ability to support healthy and active lifestyles and provide a viable alternative to the automobile. Continuous bicycle connections between all activity generators and arterial/collector roadways are desirable to allow for safe and attractive non-motorized travel options.

The bicycle network in the City's planning area, shown in

Figure 11, is composed of bike lanes, roadway shoulders, shared roadways, and shared-use paths.

- Bike lanes are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. Bike lanes are most appropriate for arterials and collectors, where high traffic volumes and speeds warrant greater separation of the travel modes. Significant segments of continuous bicycle lanes exist along portions of NW Lake Road, NW 38th Avenue, NW Parker Street, NW Friberg-Strunk Street, and SR 500.
- Shoulder bikeways are paved with striped shoulders wide enough for bicycle travel. A six-foot paved shoulder is desired to adequately provide for bicyclists, with a four-foot minimum width in constrained areas. Roadways with shoulders less than four feet are considered shared roadways. Some shoulder bikeways are signed to alert motorists to expect bicycle travel along the roadway
- Shared roadways include those on which bicyclists and motorists share the same travel lane. The most suitable roadways for shared bicycle use are those with low speeds (25 mph or less) and low traffic volumes (3,000 vehicles or fewer per day). Shared roadways, often signed as bicycle routes, serve to provide continuity to other bicycle facilities (e.g., bicycle lanes) or can be designated as a preferred route through the community. Shared roadways can have signs that highlight a special route or provide directional information in bicycling minutes or distance. Most local roadways in the city are considered shared

[18] US Census Bureau, 2012-2016 American Community Survey

roadways, but do not have signs or pavement markings, although some are planned to be improved in the TSP.

- Shared-use paths provide off-street travel for bicyclists and pedestrians, and are wider than an average sidewalk (e.g., 10 – 14 feet). Shared-use paths are typically paved (asphalt or concrete) but may also consist of an unpaved smooth surface, such as compacted gravel, as long as it meets Americans with Disabilities Act (ADA) standards. Paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout the residential neighborhoods.

A bicycle network assessment of streets in Camas shows the extent to which the bicycle network on collector and arterial streets provides a level of comfort and safety for users. About 20 percent of the collector and arterial street miles' in Camas rate "good (i.e., LTS 2)" or "excellent (i.e., LTS1)" for bicyclists. However, about 65 percent of the collector and arterial street miles' rate poorly (i.e., LTS 4) for bicyclists.

Overall, the bicycle network rates relatively high on the northwest side of the city and poor on the south and east side. The streets with the lowest ratings are the streets important for local and regional through travel (e.g. portions of NW 6th Avenue, NE 3rd Avenue, and SR 500), where many businesses and services are located. These streets rate low due to the relatively high motor vehicle traffic volumes and speeds and lack of separated bicycle facilities.

COMMUNITY FEEDBACK

- **Improve walking and biking infrastructure for better accessibility**
- **Connect neighborhoods and parks to Downtown Camas with sidewalks and trails**
- **Prioritize protected bike lanes**
- **Prioritize pedestrian-focused, multimodal streets with bike lanes, protected sidewalks, and transit stops that connect neighborhoods**
- **Develop a Safe Routes to School program with the Camas School District**



Transition Plan for Transportation

Title II of the Americans with Disabilities Act requires cities to establish a transition plan for transportation. The plan shall, at a minimum:

1. Identify physical obstacles in Camas' facilities that limit the accessibility of its programs or activities to individuals with disabilities;
2. Describe in detail the methods that will be used to make the facilities accessible;
3. Specify the schedule for taking the steps necessary to achieve compliance and, if the time period of the transition plan is longer than one year, identify steps that will be taken during each year of the transition period; and
4. Indicate the official responsible for implementation of the plan.

Camas has a relatively well-developed pedestrian network that is also potentially suitable for those who use mobility devices. The network is composed of sidewalks, shared-use paths and pedestrian trails, and other accessways. A large part of downtown Camas was developed prior to 1950, a time in which sidewalks were incorporated into the design of neighborhoods and streets. Although most areas incorporated into Camas over the following decades have sidewalk coverage, a few areas have noticeable gaps that do not make for a complete sidewalk network. These gaps are most significant in southwest, southeast, and northeast Camas, and on roadway segments outside city limits. Paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout residential neighborhoods. Unpaved pedestrian only trails are scattered throughout the city.

Many intersections in older parts of the city lack ADA-compliant ramps, which provide important connections between sidewalks, making it easier to cross streets and handle the vertical drop at curbs. Knowing these conditions, the city has been recently installing new curb ramps in many of these locations. The presence of curb ramps is fairly consistent along streets in downtown Camas, and in the newer neighborhoods in the city. Additional work is required by the City to ensure all existing and future sidewalks have curb ramps.

About 38 percent of street miles (including City arterial, collector and local streets) lack sidewalk coverage along one or both sides (see Figure 12). These gaps are more common along arterial streets than collector streets, at 40 and 23 percent, respectively, of the street miles with no sidewalk on either side. These numbers do not incorporate off-street shared-use paths that may run alongside some roadways. Any future streets constructed in association with development projects will be required to construct sidewalks with curb ramps, increasing the overall sidewalk supply.

Transportation Projects and Priorities

This section describes the transportation system improvement projects – multimodal street improvement, intersection improvement, pedestrian/bike improvement, transit enhancement, and demand/system management – to address the system needs identified in earlier text in order to bring transportation facilities and services to the established level of service.

The list of projects was developed through three main sources including stakeholders, relying on previous plans (such as the North Shore Subarea Plan), and independent project team evaluation. The Camas project list is consistent with the RTP 6-year project list.

The full list of projects is identified to improve the transportation network along major streets in the City's planning area, regardless of their priority or their likelihood of being funded. The TSP focuses on streets in the planning area with a functional classification of Collector or higher. Additional improvements will occur with private development in the planning area, including the build-out of the local street network consistent with the applicable standards.

The planning process from the TSP screens candidate projects to set aside those that may not be feasible due to environmental or existing development limitations. The remaining projects are a combination of new and previous ideas for the transportation system that seek to address the gaps and deficiencies in the city.

The full project list, included in Appendix H, includes 99 projects totaling over $180 million in total investments. For the purposes of cost estimates, project design elements are identified, however, the actual design elements for any

project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City, WSDOT, Clark County, and/or other partner agency approval. The projects were assigned to one of several categories:

- Multimodal Street Improvement - these projects will improve or construct new multimodal streets throughout the planning area, each with facilities for motorists, pedestrians, and bicyclists. A total of 29 projects have been identified that, as of 2024, will cost an estimated $72 million to complete.
- Intersection Improvement – these projects will improve safety and mobility at intersections throughout the planning area. A total of 19 projects were identified to construct new or improve existing intersections that, as of 2024, will cost an estimated $64 million to complete.
- Pedestrian/Bike Improvement – these projects include stand-alone sidewalk, path and roadway crossing improvements, and an integrated network of bicycle lanes, marked on-street routes and shared-use paths to facilitate safe and convenient travel citywide. A total of 39 pedestrian and bicycle projects were identified that, as of 2024, will cost an estimated $38 million to complete.
- Transit Enhancement – these projects will enhance the quality and convenience for transit passengers. One transit project was identified that, as of 2024, will cost an estimated $1 million.
- Demand/System Management – this will encourage more efficient usage of the transportation system. Two projects were identified that, as of 2024, will cost an estimated $450,000.







Transportation Facility Maps

Figure 11 Bicycle Facilities

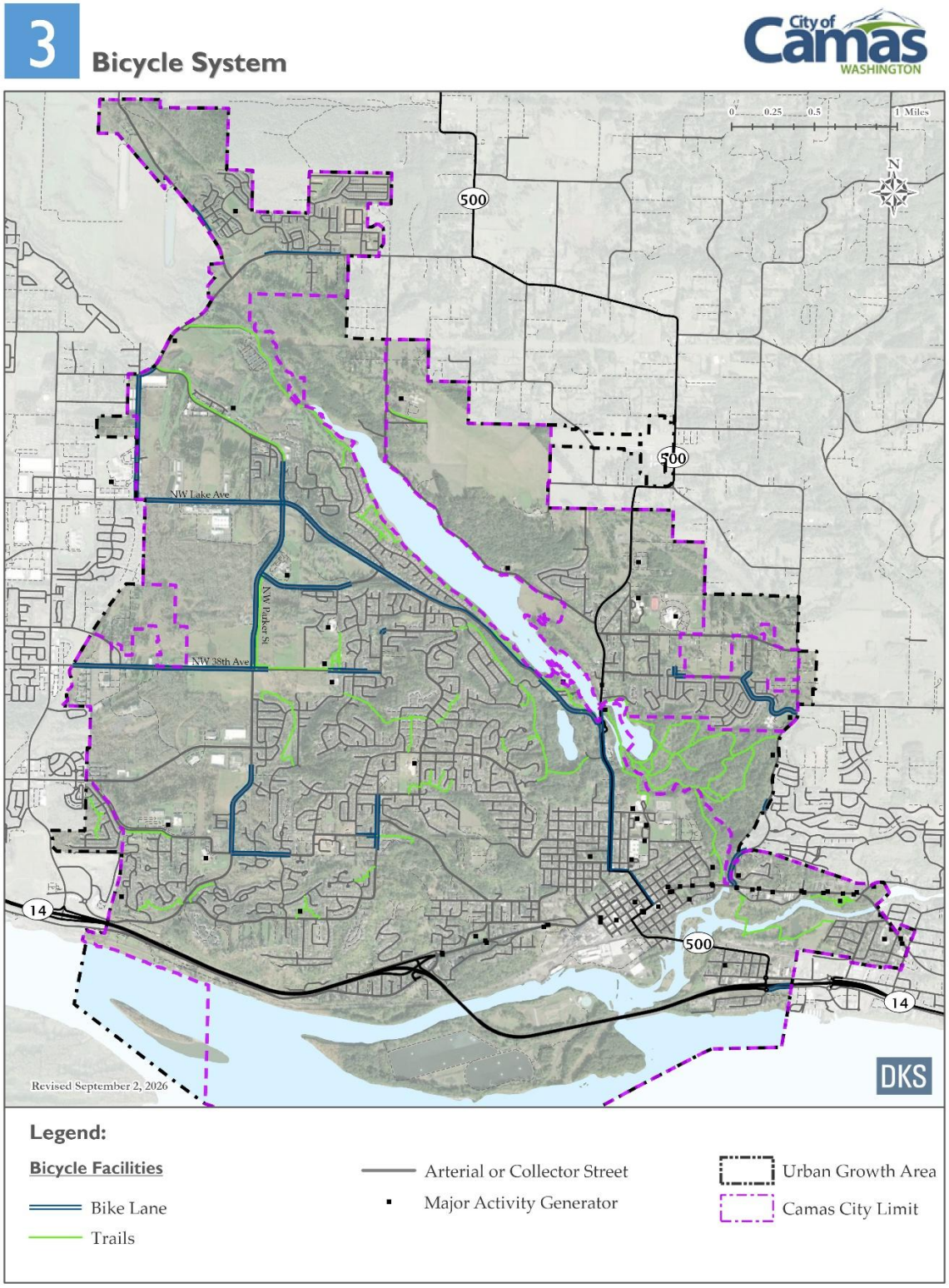


Figure 12 Pedestrian Facilities

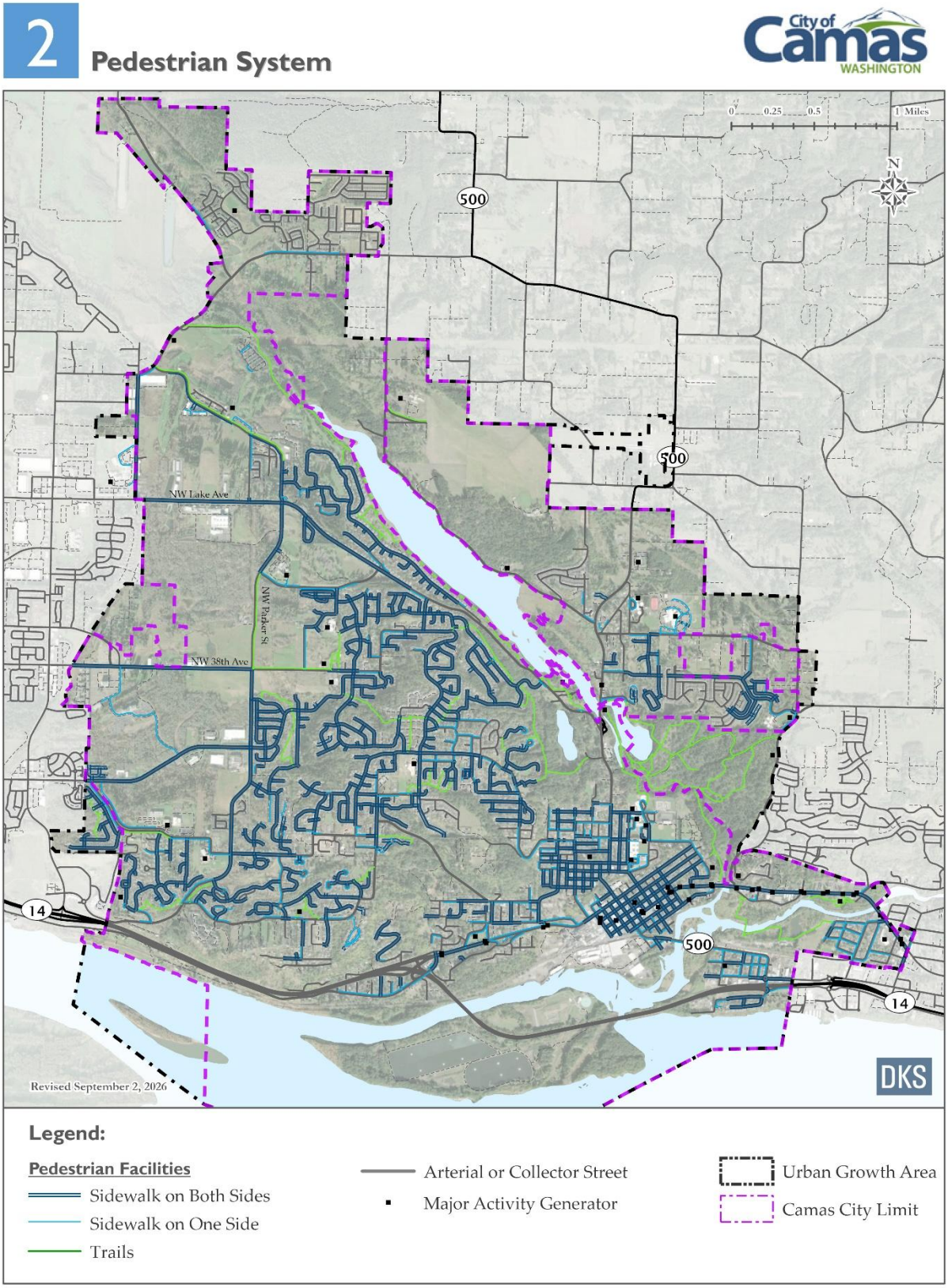


Figure 13 Street Network

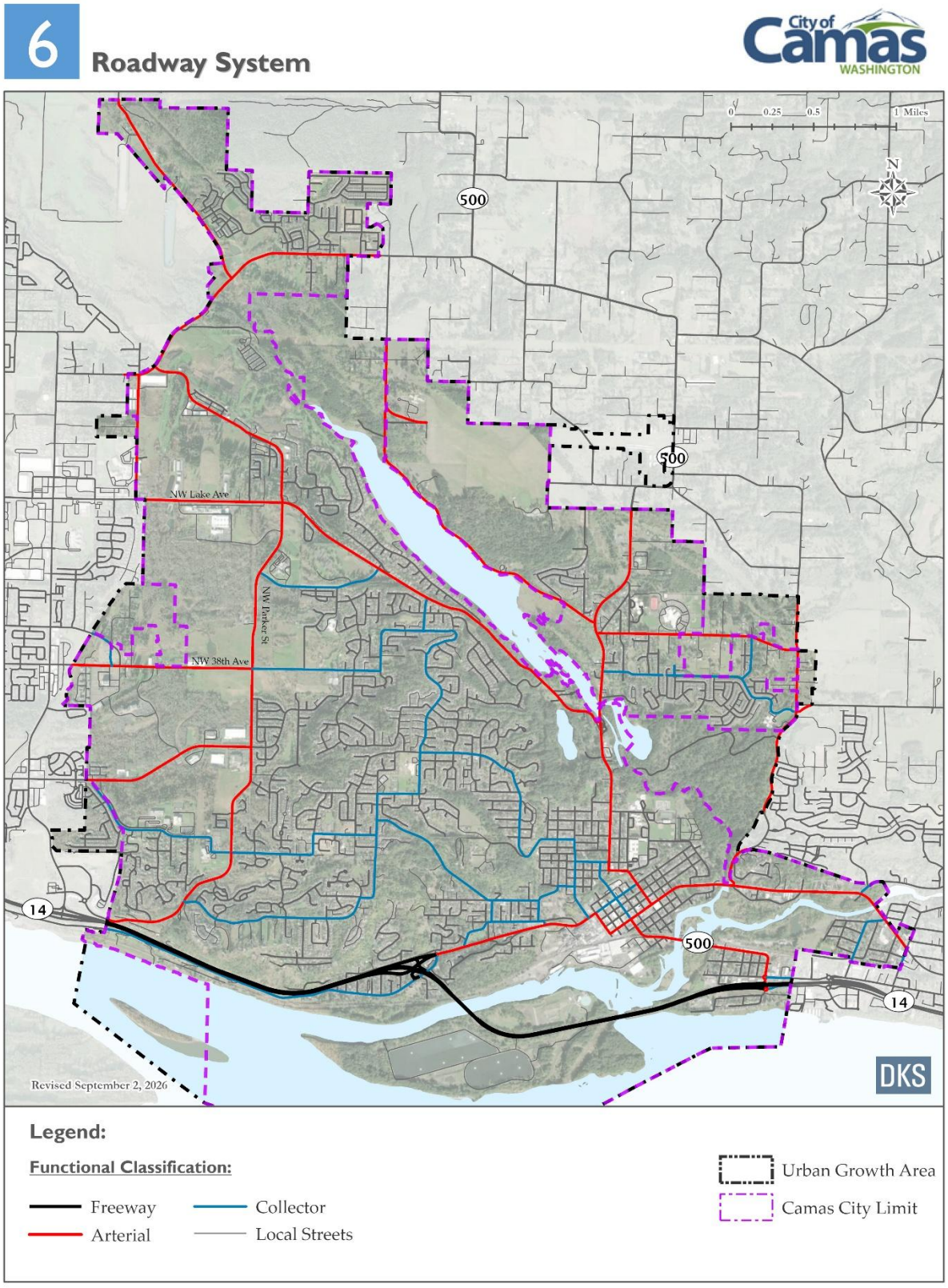
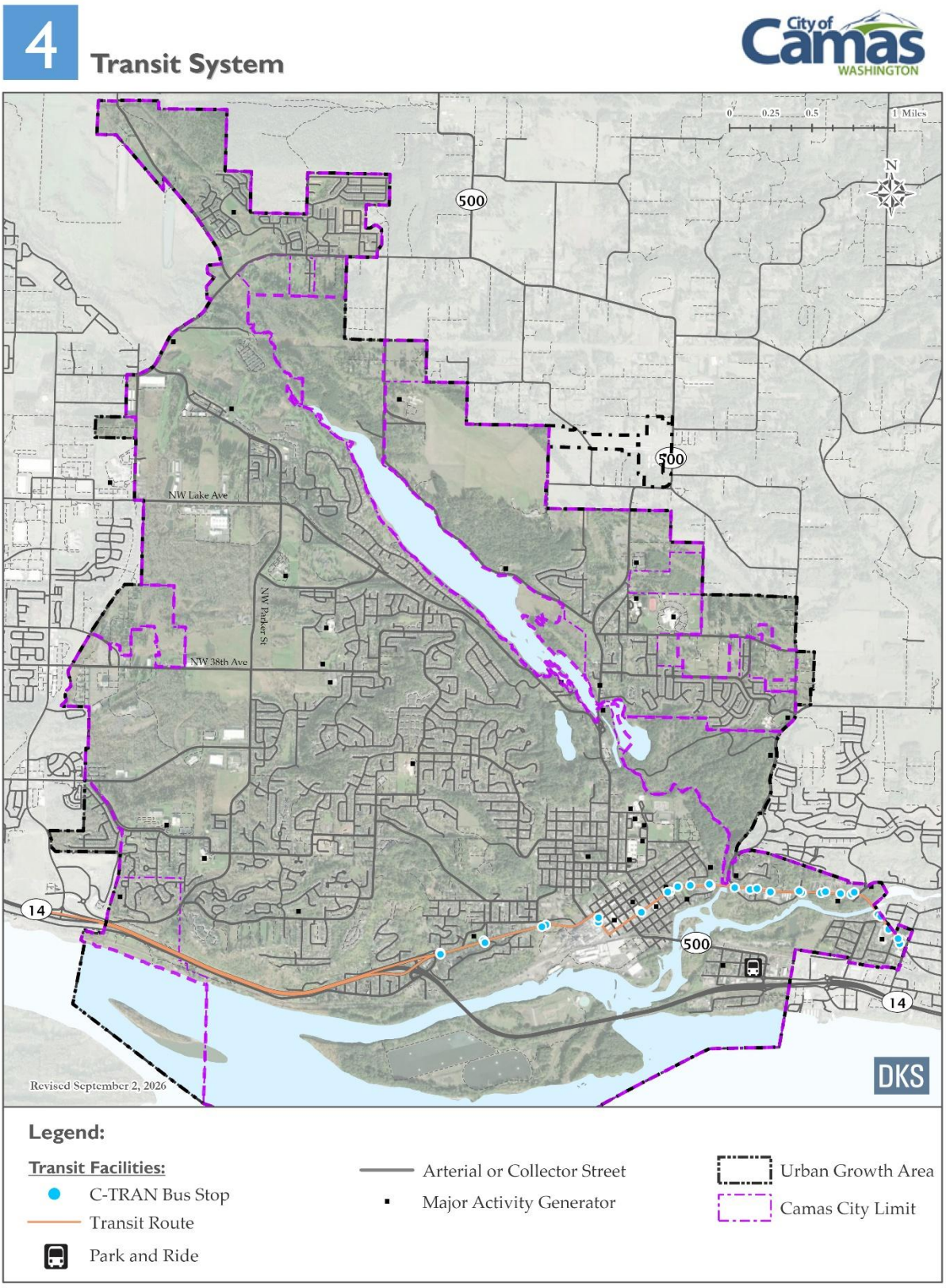


Figure 14 Transit Facilities



Transportation Goals and Policies

Goal TR-1 Complete Streets

Streets will function for all users of all abilities including bicyclists, pedestrians, transit users, and motorists.

Policy TR-1.1 Implement the Transportation System Plan (TSP) to maintain the livability of Camas and guide decision-making for transportation-related projects, policies, and design. Ensure consistency between the TSP, the Parks, Recreation and Open Space Plan and the 6-year street plan.

Policy TR-1.2 Maintain the transportation system to enhance safety and efficiency for all users, facility aesthetics, access management measures and the overall integrity of the system.

Policy TR-1.3 Construct streets that are interconnected and avoid long cul-de-sacs or dead ends. Block lengths should be less than 1,000 feet. Include pedestrian and bicycle linkages in the construction of cul-de-sacs and other forms of dead-end streets. Existing dead-end streets should be retrofitted to provide bicycle and pedestrian linkages as practicable.

Policy TR-1.4 Develop and implement design standards that provide attractive streetscapes, encourage appropriate traffic volumes and speeds, and support multi-modal safety. Include enhanced roadway features such as roundabouts, decorative lighting, and landscaping in gateways and design overlay areas.

Policy TR-1.5 Minimize access to new development and redevelopment along City arterials and consolidate access points when spacing is insufficient.

Policy TR-1.6 Provide routes designed for active transportation to encourage mode shift for short trips. Route planning should seek shortcuts and other opportunities that provide advantages to active transportation users. Public investments should support active transportation routes such as street lighting, safe crosswalks, and protected bike lanes.

Policy TR-1.7 Coordinate with Camas School District to implement a safe routes to school program to encourage the use of alternative and active transportation.

Policy TR-1.8 Develop and implement Complete Streets design in all new and retrofit street projects to support the use of alternative travel modes. Adopt engineering design standards consistent with Complete Streets goals.

Policy TR-1.9 Increase wayfinding signage for outdoor destinations throughout the City.

Policy TR-1.10 Inventory current bicycle and pedestrian networks to identify gaps in route coverage. Support filling in network gaps as new development and redevelopment occurs to create a bicycle and pedestrian network that is safe, comfortable, and accessible to people of all ages and abilities.

Policy TR-1.11 Minimize cut and fill roadway design and, where feasible, minimize restructuring the natural contours of the land.

Policy TR-1.12 Encourage the inclusion of low impact development (LID) design features (e.g. rain gardens, grass pavers, pervious pavement) in the design of road surfaces.

Policy TR-1.13 Require LED lights in new development and replace existing inventory that lack LED features.







Goal TR-2 Local and Regional Transit

Regional transit will provide safe, efficient, and dependable service to the Camas community for a variety of trips within and outside of the city.

Policy TR-2.1 Coordinate with local municipalities, Washington Department of Transportation, adjacent counties, and C-TRAN to ensure that minimum roadway and multi-modal design standards are consistent.

Policy TR-2.2 Partner with C-Tran to advocate for and develop transit options that are safe, convenient, frequent, and accessible for Camas residents.

Goal TR-3 Traffic Safety

Design and construct safe transportation facilities that meet applicable requirements.

Policy TR-3.1 Encourage traffic safety through education, enforcement, and engineering. Use traffic calming, traffic diversion, and other available tools such as landscaping, trees, and art to ensure a comfortable and safe environment for all users.

Policy TR-3.2 Provide adequate access for emergency vehicles throughout the city.

Policy TR-3.3 Develop safe pedestrian and bicycle routes between residential areas, schools, and public facilities.

Policy TR-3.4 Require new development to implement designs standards using the Neighborhood Traffic Management Plan.

Policy TR-3.5 Identify high accident areas and implement specific measures to reduce accident occurrences.

Goal TR-4 Transportation Demand Management

Transportation planning will achieve the efficient use of transportation infrastructure, increase its person carrying capacity, and accommodate and facilitate future growth consistent with land use objectives.

Policy TR-4.1 Require large employers to implement a commute trip reduction program for employees, as mandated by state law.

Policy TR-4.2 Support intergovernmental development review.

Policy TR-4.3 Support the Regional Transportation Council (RTC) with funding and staff participation to the extent possible.

Goal TR-5 Concurrency and Level of Service

The City will maintain the adopted LOS standards for all arterial streets and transit routes.

Policy TR-5.1 Encourage growth in areas with existing or planned infrastructure capacity.

Policy TR-5.2 Pursue the programs and policies listed in the TSP in order to bring transportation facilities and services to the established LOS.

Policy TR-5.3 Require new development to demonstrate that adequate person trips are available, or that multi-modal improvements to the transportation system will be made to accommodate the impacts concurrent with the development.

Policy TR-5.4 Utilize traffic impact fee studies, development traffic impact analyses, and corridor studies to identify deficiencies and plan improvements to maintain or improve LOS standards.

Policy TR-5.5 Take the following actions (in no priority order) if the probable funding falls short of meeting identified needs: 1) delay development until programs, facilities, or services can be funded; 2) obtain the revenue needed or revise the transportation plan to reflect known financial resources; 3) reassess the land use element, including land use designations and proposed densities. As a last resort measure, change the transportation LOS standard.

Goal TR-6 Transportation Revenue

Maximize the use of state and federal funds for transportation capital, operating, service, and demand improvements.

Policy TR-6.1 Maintain a capital improvement plan (CIP) that identifies construction and improvement priorities and funding.

Policy TR-6.2 Ensure that the transportation impact fee program responds to land use changes, supports connectivity, and requires new development to pay its proportionate share of needed capacity.

Policy TR-6.3 Support the Pavement Asset Management System and other maintenance programs to ensure cost-effective maintenance of transportation facilities and efficient use of public funds.

Policy TR-6.4 Develop equitable transportation impact fees to assess developers a fair-share contributions for any transportation improvements.

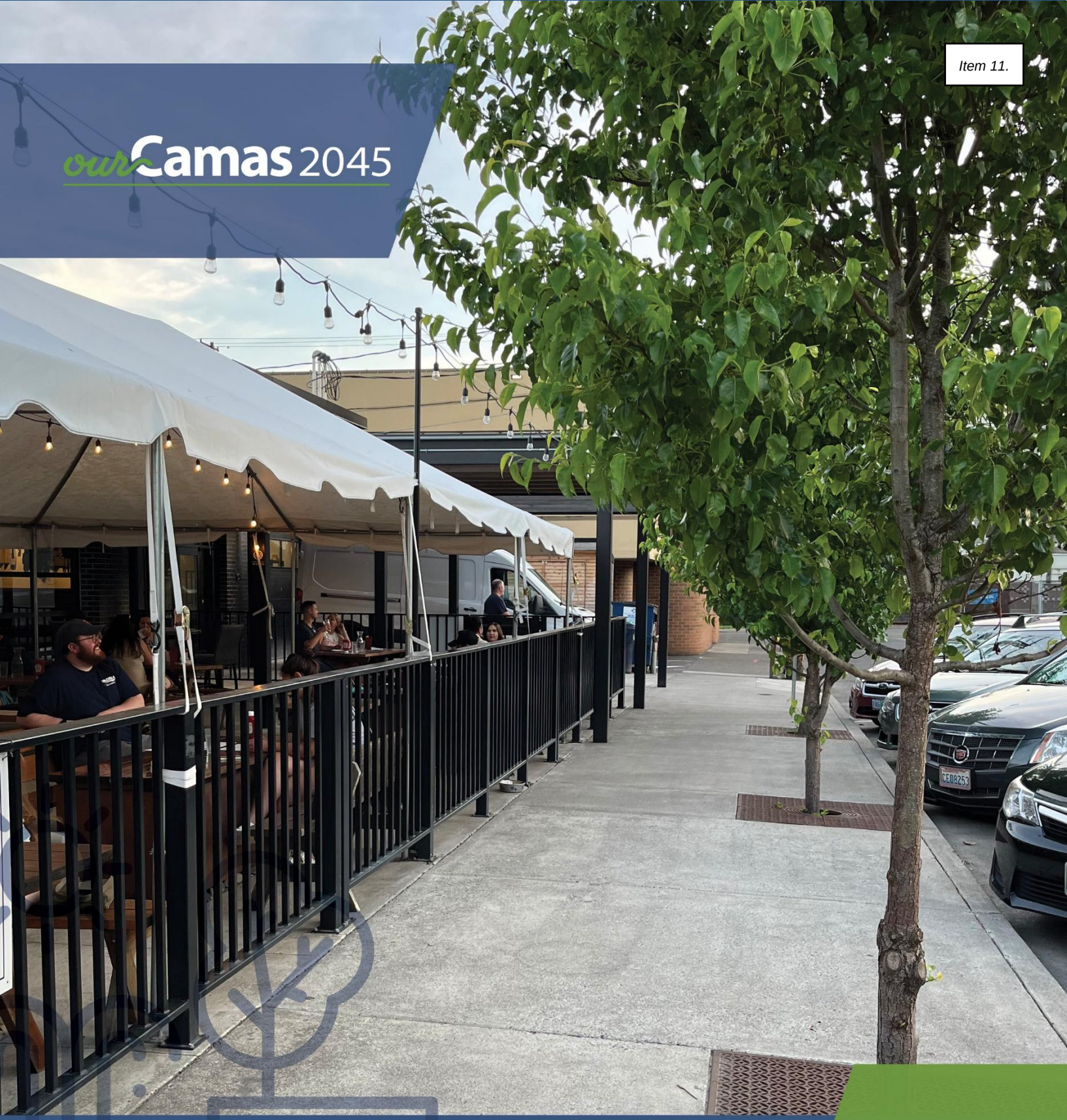
Policy TR-6.5 Prioritize transportation funding for multi-modal improvements that will enhance safety and access between infill areas, schools, and employment centers.

Policy TR-6.6 Focus transportation projects in economic development areas to act as catalysts for job growth.





ourCamas 2045



Public Facilities & Services

09

09. Public Facilities & Services

Purpose

Plan for adequate facilities that are consistent with the other elements, goals and policies of Our Camas 2045, can accommodate the projected population and employment growth and land use plan, and based on sound fiscal policies for the City.

Vision

In 2045, Camas residents enjoy the city's parks, trails, community centers, and other recreational opportunities. The school district draws families to the community and the library continues its vital role as a place of learning. Residents value accessible police, fire, and emergency response services. Proficient government agencies maintain existing City assets and coordinate future development.

Introduction

The City of Camas is a full-service community that offers a breadth of public facilities, services, and utilities. Public facilities include such things as City Hall, the Camas Public Library, the Public Works Operation Center, Lacamas Lodge, the Community Center, the Camas Police Department headquarters, and Fire Stations 41 and 42. The majority of the City's functions and services are carried out from these facilities.

General government services include such departments as Administration and Human Resources, Community Development, Finance, Information Technology, and the Camas Public Library. General services include but are not limited to utility billing, human resources, city clerk functions, building and engineering permits and inspection, and activities of the City Council and city boards and commissions.

Other city services include Fire and Emergency Medical Services (EMS), Police, and Parks and Recreation. Fire and EMS services are provided in Camas and, via intergovernmental agreements, beyond Camas city limits. The Camas Police Station dispatches law enforcement services throughout the community. Parks and Recreation services are housed in several facilities including Lacamas Lodge, the Community Center, and through a myriad of parks, trails, open spaces, and special use buildings.

Public utilities, administered by the Public Works Department, includes the city's sewer system, water system, and municipal stormwater system. These systems have a variety of assets that support them and are scattered throughout the city.

Public Works also operates solid waste service. Garbage trucks are dispatched from the Operations Center, the hub of Public Works' activities, and the solid waste is transported to an off-site transfer station and then to a landfill in

eastern Washington. The City budgets money for capital equipment, however, the solid waste system does not require the same kinds of investments that the sewer, water, and stormwater systems require.

The public facilities and services element is divided into four sections:

- Public Facilities and Services including fire, emergency medical and police services, parks and open space, and City owned facilities
- Public and Franchise Utilities including water, sewer, stormwater, solid waste, electricity, natural gas, and telecommunications
- Capital Improvement Plan
- School Districts

Related to this element is the City's Water System Plan (Appendix N), General Sewer Plan (Appendix O), Stormwater Management Program (Appendix P), and Capital Improvement Plan (CIP) (Appendix Q), which provide comprehensive project lists and schedules guiding the investment of city resources in facilities and infrastructure. These resources are made up of local revenues as well as State, Federal and other sources. The plans listed above identify projects which have secured funding as well as a list of projects which have not yet been funded.

Level of Service (LOS) Standards

Under the GMA, adequate provisions for urban governmental services must be provided in the UGA. The goals and policies in this element are provided to address anticipated growth and maintain adopted LOS standards.

COMMUNITY FEEDBACK

- **Enhance community facilities including parks and libraries**
- **Develop multipurpose green spaces for sports and other recreation that support active lifestyles**
- **Improve the Mill Ditch trail with lighting, well-maintained pathway to connect community spaces**
- **Incorporate sustainable design features (such as daylighting, solar, and green roofs) in existing and new public buildings**
- **Update the City's Stormwater Design Standards Manual to include requirements for low-impact development or green infrastructure to reduce the amount of impervious areas in new development or redevelopment projects**
- **Protect groundwater recharge areas**



Public Facilities and Services

Many of the public facilities and services listed in this element have strategic plans and actions that guide maintenance and service improvements. The identified goals and policies were given consideration based on a framework of budgetary and operational guidelines as well as these strategic plans.

Fire Protection, Emergency Medical Services, and Police Protection

The city is served by the Camas-Washougal Fire Department (CWFD), which covers 20 square miles and 33,000 residents for fire protection and 80 square miles and 65,000 residents for emergency medical services. The Camas and Washougal fire departments consolidated in 2011 through a joint contract for service to improve efficiency and lower costs. CWFD averages approximately 5,000 fire and medical calls annually. The CWFD is the only fire department in Clark County to provide ambulance transport services, which requires additional training for the firefighters in addition to fire suppression techniques.

Camas Fire and EMS operates out of two stations – Station 41 located in City Hall on NE 4th Avenue and Station 42 located off NW Parker Street. Station 42 opened in 2001, while Station 41 was constructed in 1967 as part of City Hall.

Voters approved a capital construction bond in August of 2024 for a new downtown station and headquarters to replace Station 41. It will be located on the property occupied by the City Hall Annex building just west of City Hall on NE Fourth Avenue. When construction of the new Station 41 is completed in 2027, there will be vacated space in the City Hall building. Future uses for the vacated space have not been determined.

A Facility Conditions Assessment (FCA) (Appendices F and G) was completed in 2021 and lists some deficiencies in Station 42 in the form of HVAC, plumbing, electrical, and interior finishes that will be addressed with funding from a general obligation bond.

Beginning January 1, 2027, the Camas-Washougal Fire Department will become a regional fire authority operating independent of the City of Camas. The boundaries of this new agency will cover the municipal boundaries of the cities of Camas and Washougal.

The Camas Police Department operates a full-service police department from one location near the downtown core on NE 3rd Avenue. This 15,000 square-foot facility was built in 1998 and includes a 1,500 square-foot community/training room. Services include police response, community engagement, school resource officers, investigative follow-up, parking enforcement, code enforcement, and records services.

The City is currently investing over $400,000 in upgrades to the Camas Police Station by replacing end-of-life mechanical equipment. This investment will make it more cost-effective and environmentally resilient.

Parks, Trails, and Open Space



Camas' Comprehensive Parks, Recreation, and Open Space (PROS) plan outlines a community vision for Camas that includes a high-quality park and recreation system, with a comprehensive open space and trail system linking all recreational sites to the regional trail network. The PROS plan is adopted by reference and included as Appendix L.

Parks and recreational opportunities in Camas include neighborhood parks that serve individual neighborhoods, natural open space areas that preserve resources throughout the community, and special use areas for specific recreation needs. Supplementing these are public and private sites and facilities, such as school sites, regional parks, and privately-owned recreation facilities.

In response to the community's feedback on the PROS plan, the City completed a Parks and Open Space Management Plan (POSMP), included as Appendix M. The purpose of the POSMP is to maintain the existing facilities, fill gaps and improve trail connections, and develop and improve existing parks. The POSMP outlines a strategic vision for the thoughtful management of parks and open spaces within the city, ensuring that they continue to serve as resources for all users. The City will need to coordinate the POSMP with the comprehensive plan to ensure consistency.

During the City's review of land use designations, the PROS plan was reviewed to ensure that sufficient land is designated as Parks and Open Space.

Camas receives impact fees paid by new development for park, trail, and open space improvements that increase the capacity of the system. The expenditure of the collected fees will be applied to the total costs of implementing projects that are identified in the PROS Plan project list, and as further refined by the City's Capital Improvements Plan.

City Facilities

The comprehensive FCA reviewed 17 publicly owned buildings located at 11 different sites. The total square footage of the surveyed buildings is just under 276,000 square feet.

The FCA report notes the total replacement value of all facilities at $61 million in 2022 dollars. The reported deficiencies for the years 2022-2027 total $17 million with the priority needs (life safety and code issue deficiencies) at $6.3 million. Long-term needs would require $18 million for major maintenance projects.

Recently, the City appropriated funding, through limited general obligation bonds, to pay for many of the items listed as priority needs in the FCA. This approximately $7 million has allowed the City to attend to some of the high priority deficiencies.

Noteworthy on the list is Station 41 and the City Hall Annex. With passage of a voter approved bond in 2024 specifically to replace Station 41, the City Hall Annex building will be demolished, and the site will house the new Station 41, which will also serve as the headquarters of the new regional fire authority.

The Camas Public Library, located across the street from City Hall on NE 4th Avenue, provides library services to the community at-large. According to the FCA, the library is in need of priority improvements to address immediate deficiencies. Since the date of the report, the City is funding a number of deficiencies through a general obligation bond.

City and Franchise Utilities

Water

The City owns and operates a multi-source municipal water system which includes supply, treatment, storage, and distribution of potable water to residential and commercial customers. The City currently obtains its water from ten groundwater wells and two surface water sources that are treated to provide high quality water to customers. The City owns over 143 miles of pipelines in its water transmission and distribution system. Service is provided to customers across five major pressure zones and 18 subzones. Eight booster pumping stations are used to move water between pressure zones. Seven storage facilities, with a combined total of 8.45 million gallons (MG), provide storage for normal and emergency conditions, such as fire suppression. Additionally, distribution system includes numerous meters, isolation valves, and hydrants. Additional information regarding Camas Water Service, including existing and future capacity analysis, is available in Appendix N, Water System Plan.



Figure 15 Water System Map

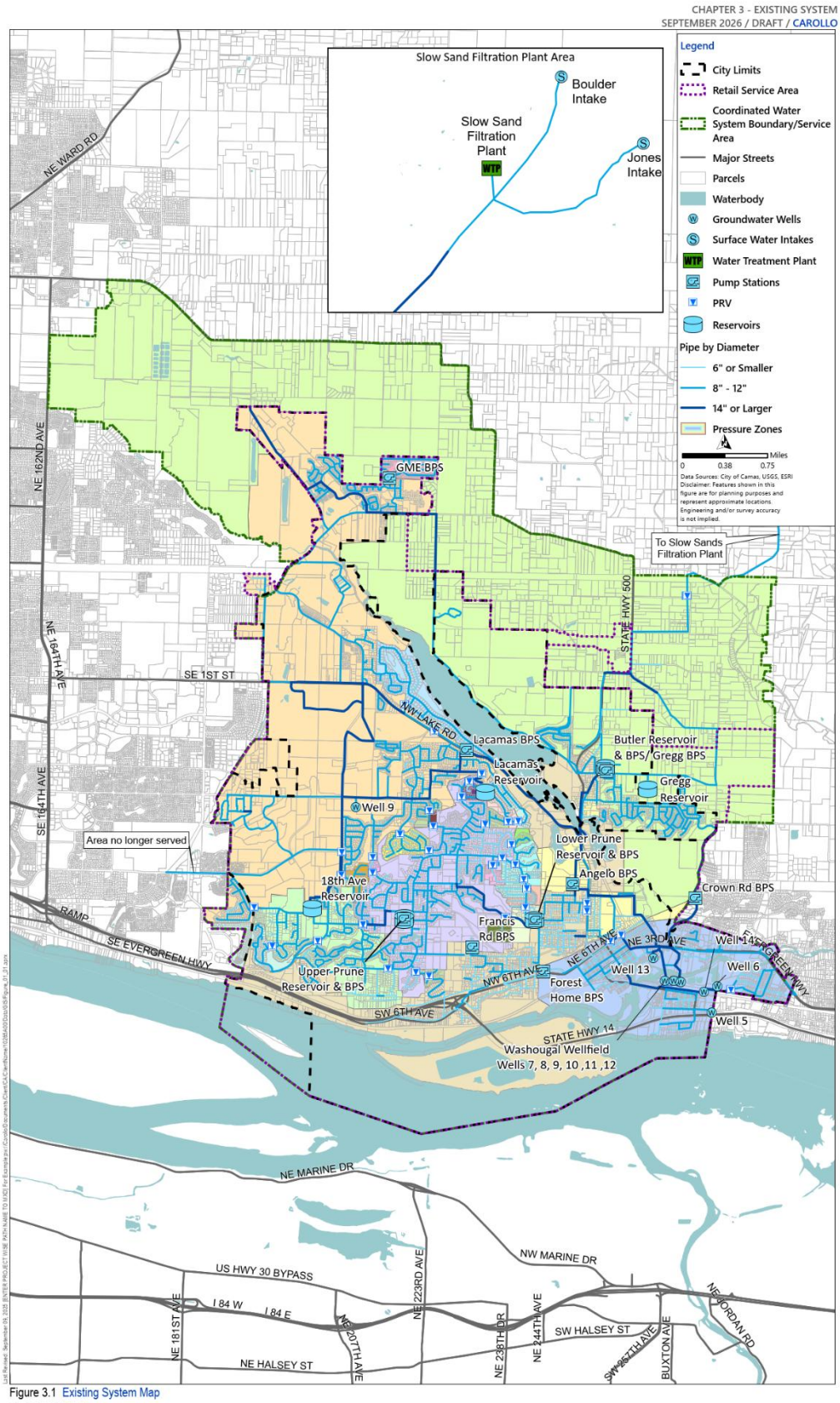


Figure 3.1 Existing System Map
CITY OF CAMAS
WATER SYSTEM PLAN UPDATE

Sewer

The majority of the 7,700-acre UGA and the sewage collecting infrastructure inside the city limits is owned and operated by the City of Camas. The collecting system consists of traditional gravity sewers, pump stations, force mains, and septic tank effluent systems. The system includes 38,260 linear feet of force main, 29 lift stations, and 236,200 linear feet of gravity mains. Approximately half of the city is served by septic tank effluent systems and the other half by a traditional collection system. The City gathers, treats, and discharges wastewater into the Columbia River at the Camas Wastewater Treatment Plant (WWTP). See Figure 16 for a map of the existing system.

The City of Camas Sewer Division serves residences and commercial buildings, with approximately 8,500 customers, comprised of industrial, commercial, and residential users.

A collection system flow metering and projection of future need was conducted in 2018/2019 to evaluate the collection system using the City's hydraulic model. The results of this analysis are available in Appendix O, General Sewer Plan, which develops a management plan for the system over the next 20 years.



Figure 16 Existing Wastewater Collection System

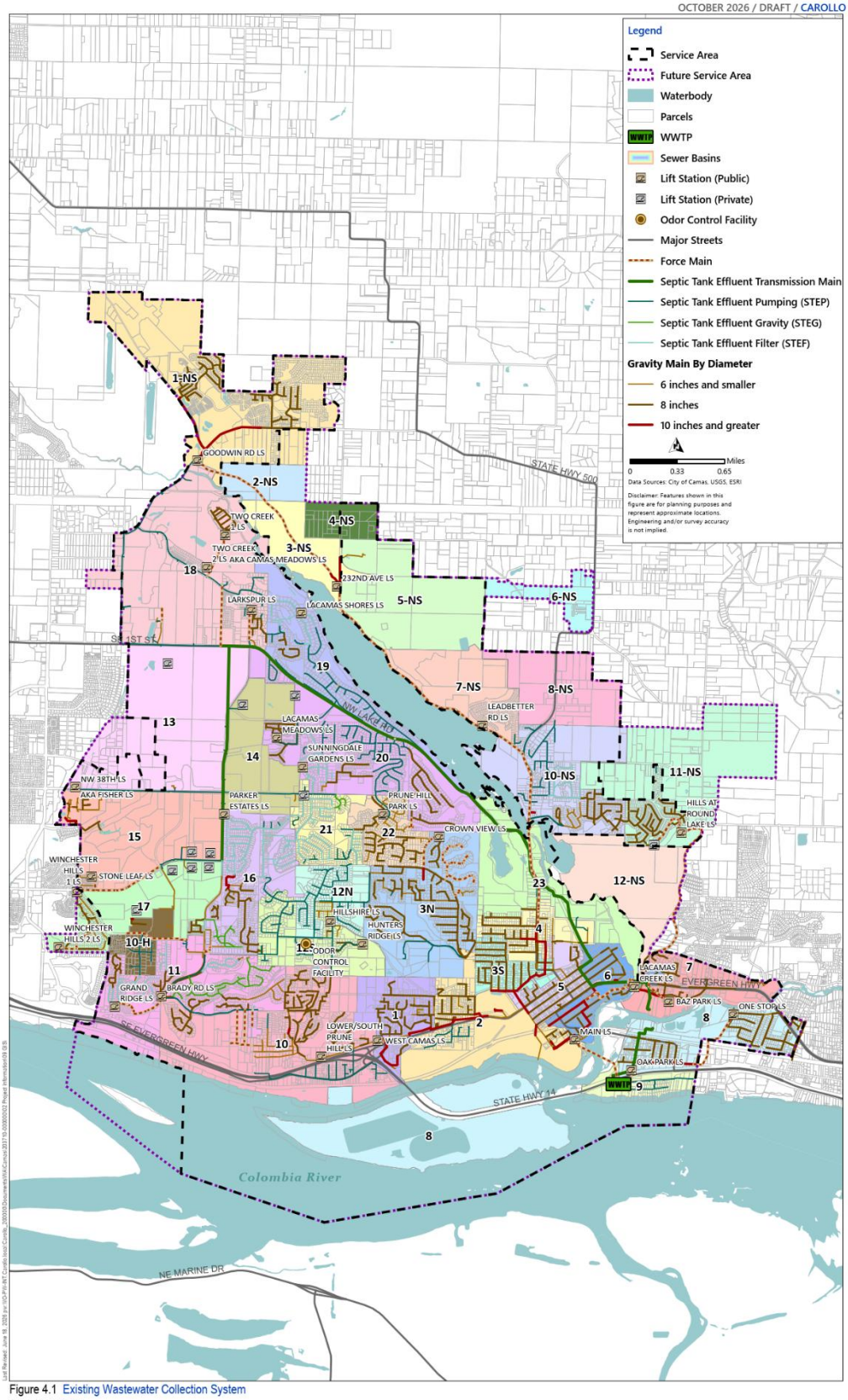


Figure 4.1 Existing Wastewater Collection System
CITY OF CAMAS
GENERAL SEWER PLAN

Stormwater

The stormwater runoff generated from approximately 7,500 acres across the city of Camas is managed through 75 miles of stormwater conveyance pipe and 1,800 stormwater inlets and catch basins. The stormwater conveyance system is owned and maintained by the City. The City also owns and maintains stormwater facilities, including underground treatment vaults, detention ponds, biofiltration swales, wet ponds, drainage ditches, and culverts. These have been geolocated on the City's Stormwater Management Action Plan (SMAP) Public Input Map. The SMAP identifies actions to protect and improve receiving waters' water quality. Commercial and residential stormwater facilities are privately owned and maintained per stormwater code CMC 14.02.200 Ownership and Maintenance. These privately owned facilities within the city are geolocated on the SMAP Public Input Map. Additional details on stormwater management in Camas can be found in Appendix P, Stormwater Management Program, which is reviewed and updated annually. A map of city owned and private stormwater facilities is available online: Camas Stormwater Facilities.

Solid Waste

The City owns and operates its own solid waste utility which provides for the collection and transfer of solid waste refuse to the Clark County-owned Washougal Transfer Station. The City is responsible for managing garbage collection within the Camas boundaries. The City has established universal compulsory solid waste collection, requiring all residents and businesses to maintain solid waste service. The City contracts with Waste Connections of Washington to provide recycling and yard debris management, collection, and disposal. The City also contracts with Waste Connections to provide large container service (larger than 2 cubic yards) to those with greater solid waste handling needs.

All cities and towns in Clark County have delegated responsibility for solid waste transfer and disposal planning to the County, including Camas. The currently adopted Clark County Comprehensive Solid Waste Management Plan (CSWMP) was adopted in October 2025. Agreements between Clark County and its cities commit each to the plan and to the plan's waste disposal system.

Franchise Utilities

There are several other utilities, some of which are provided by public entities and others by private entities, that contribute to the functionality and prosperity of the community. The main utilities include electricity, natural gas, and telecommunications. Electricity is provided by Clark Public Utilities (CPU), a customer-owned public utility; natural gas is provided by Northwest Natural; and telecommunications, including high-speed internet, are provided by a variety of companies (e.g. Comcast, Verizon, Frontier, etc.). No detailed inventory regarding the capacity of these utilities is available.

Electrical

Clark Public Utilities (CPU) (https://www.clarkpublicutilities.com/) provides electricity to Camas and throughout Clark County. CPU balances strategic planning for the future with present rate and service stability in compliance with changing requirements at the local, state, and federal levels. CPU is led by an elected board to plan for integration of new technologies and has indicated there is ample capacity to meet existing demand for areas within both the incorporated City limits and the UGA. Power supplies are provided through a combination of power supply contracts and purchases from the generating system.

Natural Gas

Delivery of natural gas to Camas and its UGA is provided by Northwest Natural (https://www.nwnatural.com/). The delivery of natural gas is governed by the Federal Energy Regulatory Commission, the National Office of Pipeline Safety, and the Washington Utilities and Transportation Commission (WUTC). The City's regulations include safety and emergency provisions, LOS standards, and rate limitations. Northwest Natural provides natural gas service to all of Clark County. The alignment of the main pipeline crosses the Columbia River at the area of the Port of Camas-Washougal. Additionally, Northwest Natural is improving its backbone through the City with the installation of a large-diameter high-pressure gas main connecting Lake Road and Pacific Rim Boulevard.

Telecommunications

Verizon provides local telephone service to the City and its UGA. Many of the telecommunication facilities, including aerial and underground, are co-located with those of the electrical power provider. Frontier Communications also provides telecommunications to a large number of customers in the Camas area. Contact information for telecommunication utility providers is available on the City of Camas website (https://www.cityofcamas.us/utilities/page/new-resident-information).

Capital Improvement Plan

The 6-year Capital Improvement Plan (CIP) is a significant component of the financing plan and is adopted as part of the biennial budget. It includes a list of projects, project start dates, estimated cost, and funding. The CIP is a shorter term funding plan that directs available resources to specific projects including street preservation and improvements, fire and EMS, parks and recreation, stormwater, water, and sewer projects. The 2025-2026 CIP is included as Appendix Q.

The first two years of the CIP are typically consistent with the adopted City budget. However, since capital expenditures often impact multiple years after funding has been committed, it is prudent to plan ahead for the expenditure of funds for at least four years or longer. Additionally, some of the City's adopted plans include longer term expenditure plans in which resources are actively being pursued when opportunities arise.

School Districts

Public schools are recognized as one of the largest public services within the community. Education serves one of the most important roles in community health as the quality of education today impacts the skill levels, employment rates, labor supply, and wages of tomorrow.

The Camas School District has the most, and some of largest, public facilities in the Camas Urban Growth Area. The UGA spans two school districts. Camas and Evergreen School Districts are responsible for facility planning and service levels of the districts and coordination with the city's overall development. Both school districts are currently evaluating school facilities and overall needs to serve the community.

The Camas School District has prepared a 2022 Capital Facilities Plan (CFP) (Appendix T) to provide the County and the Cities with a schedule and financing program for capital improvement needs over a six year period (2022-2028) to ensure that adequate facilities are available to serve new growth and development.

The collection of school impact fees generates partial funding for construction of public facilities needed to accommodate new development. School impact fees are collected by the cities and County on behalf of the District at the time plats are approved or building permits are issued. Impact fees are calculated based on a formula, which includes the portion of District construction resulting in increased capacity in schools. The districts submit their capital facilities plans every other year, accompanied by impact fee calculations. The plans describe the existing and planned school facilities and services.

Anticipated property acquisition and new construction is based on the enrollment forecast, capacity, the District's educational standards and the community's support of finance tools to fund improvements.



Public Facilities and Services Goals and Policies

Goal PFS-1 Fire Protection, Emergency Medical Services, Police Protection

Provide fire protection, emergency medical services, and police protection to Camas and accommodate growth in the community.

Policy PFS-1.1 Plan for fire and emergency medical services to include adequate land, building, and equipment to effectively serve the geographic area of the city north of Lacamas Lake (North Shore).

Policy PFS-1.2 Assess the level of service needs and provide fire, advanced life support emergency medical, and police services that meet the community demand. Maintain service levels as growth occurs.

Policy PFS-1.3 Ensure the installation of commercial fire sprinklers where required by code and strongly encourage their use when installation is optional.

Policy PFS-1.4 Pursue funding to maintain fire facilities, including all fire apparatus at levels that best serve the community. Fire apparatus includes fire suppression equipment such as engine, water tenders, brush trucks and command officer vehicles.

Policy PFS-1.5 Require all new residences to install fire sprinkler systems.

Policy PFS-1.6 Plan police annex facilities at strategic locations throughout the City.

Goal PFS-2 Parks, Trails and Open Space



A network of parks, trails, and open space will connect neighborhoods, wildlife corridors, and natural resources and enhance the quality of life for residents and visitors. Refer to the Camas PROS plan for additional goals and policies.

Policy PFS-2.1 Provide and maintain an active transportation network to increase connectivity to natural areas, wildlife corridors, and other natural resources in Camas.

Policy PFS-2.2 Ensure every neighborhood has access to a park within a 15-minute walk or roll.

Policy PFS-2.3 Provide safe and maintained parks, natural areas, and other recreational spaces that are accessible for all ages and abilities.

Policy PFS-2.4 Provide a continuous trail network around Lacamas Lake with ample access points, prioritizing active transportation users. Consider new public access points through dedications, easements, and acquisitions. Partner with transit agencies to plan and implement transit service to Lacamas and Round Lake.

Policy PFS-2.5 Explore the development of dog parks within special use park areas to balance the needs of pet owners and other park users.

Policy PFS-2.6 Encourage the development of parks and playgrounds that have ample facilities for all users.

Policy PFS-2.7 Work with the Camas Parks & Recreation Department to acquire land for parks, trails, recreational uses, and habitat conservation.

Policy PFS-2.8 Enhance water conservation methods and technologies in development of irrigation infrastructure within parks and recreation areas.

Goal PFS-3 City Facilities and Services

Provide facilities and services to support the functions of City government and the community, including cemetery, animal control, and the public library.

Policy PFS-3.1 Develop an expansion plan (e.g., new municipal facility, meeting space) to accommodate additional personnel.



Policy PFS-3.2 Maintain a strong civic presence in Downtown Camas, while exploring opportunities to expand and distribute municipal facilities and services throughout the City. Incorporate sustainable and low climate impact design into city buildings. Consider LEED certification or other sustainable design strategies and best practices when developing or renovating publicly owned facilities.

Policy PFS-3.3 Utilize the City's capital improvement program to develop alternative transportation facilities and electric vehicle charging infrastructure for public facilities.

Policy PFS-3.4 Maximize the developed and undeveloped property for cemetery use to meet future burial needs and trends and meet residents' service expectations.

Policy PFS-3.5 Provide economic stability to the cemetery fund by reducing dependency on the general fund.

Policy PFS-3.6 Develop a strong volunteer and donation program for the cemetery.

Policy PFS-3.7 Continue animal control partnership with the City of Washougal.

Policy PFS-3.8 Maintain funding and support for library services that meet the demands of current and future residents.

Policy PFS-3.9 Assess need and solutions for additional library services throughout the growing City.

Goal PFS-4 City and Franchise Utilities

Provide utility services, including energy and communication facilities and their services, to all businesses, residents, and properties in the City limits.

General Utilities Policy

Policy PFS-4.1 Maintain and improve City utility systems through preventative maintenance and regular assessments and improvements to meet regulatory standards.

Policy PFS-4.2 Where service is available, require connection to public water for domestic and irrigation needs and connection to sewer systems. Promote connection to sewer and water before system failure of private well or septic.

Policy PFS-4.3 The City should be the sole provider of urban services, including water and sewer, within the UGA for sewer service and the Water Service Area for water. Require all new construction connect to city systems. Prohibit construction of new private wells and subsurface sewage disposal systems in new developments.

Policy PFS-4.4 Do not extend utilities without annexation or commitments for annexation. Exceptions may be made in cases where human health is threatened. In areas where utilities presently extend beyond City limits, but are within UGAs, plan development jointly with the County. A joint development must be consistent with City standards.

Policy PFS-4.5 Coordinate plans for providing public utility services in UGAs and rural areas with plans for transitioning undeveloped land to urban uses.

Policy PFS-4.6 Plan public utility services so that service provision maximizes efficiency, cost effectiveness, is equitably distributed and ensures concurrency. Coordinate with other entities to provide services within the urban area.

Policy PFS-4.7 Update capital facility plans on a regular cycle that aligns with the Comprehensive Plan's projection year to ensure public facilities meet the needs of the community.

Policy PFS-4.8 Take the following actions (in no priority order) if the probable funding falls short of meeting identified needs to maintain or expand facilities: 1) delay development until programs, facilities, or services can be funded; 2) obtain the revenue needed or revise the Capital Facilities Plan to reflect known financial resources; 3) reassess the land use element, including land use designations and proposed densities; or 4) change the LOS standard.

Water Service Policy

Policy PFS-4.9 Extend adequate public water service throughout the City's urban areas that meets state requirements and provides minimum fire flow as required by the Fire Marshal.

Policy PFS-4.10 Conserve and protect groundwater resources to provide safe, clean, high quality drinking water to residents.

Policy PFS-4.11 Ensure water infrastructure is designed to City standards and is in place prior to land development.

Policy PFS-4.12 Coordinate with Clark County and other purveyors to eliminate private systems in accordance with the Clark County Coordinated Water System Plan.

Policy PFS-4.13 Coordinate with the County and the cities of Vancouver and Washougal to protect groundwater from contamination.

Policy PFS-4.14 Expand municipal reclaimed water systems and allow onsite non-potable water systems to reduce water demand in private-sector commercial and residential buildings.

Policy PFS-4.15 Eliminate the introduction of groundwater and surface water into the sewer system.

Sewer Services Policy

Policy PFS-4.16 Extend public sanitary sewer service, as required, throughout urban areas. Service may be provided outside urban areas to serve areas where imminent health hazards exist.

Policy PFS-4.17 Use traditional gravity sewer systems (in lieu of STEP systems) to serve future customers and reduce maintenance and power costs.

Policy PFS-4.18 Coordinate with Clark County to eliminate septic systems.

Stormwater Policy

Policy PFS-4.19 Provide a stable funding source to meet National Pollutant Discharge Elimination Systems (NPDES) Phase II requirements to manage and control stormwater runoff.

Policy PFS-4.20 Inspect homeowner association and other private facilities and provide directions and standards for repair.

Policy PFS-4.21 Meet water quality standards by providing best management practices for development activities.

Policy PFS-4.22 Establish baseline flows on each drainage basin or sub-basin for the analysis of deficiencies.

Policy PFS-4.23 Consider stormwater impacts during land use review processes and develop standards that would reduce the amount of impervious surface on existing and new development, including the creation and adoption of low-impact development standards and the use of green infrastructure, to address increased storm intensities and stormwater runoff.

Policy PFS-4.24 Require new development or redevelopment to comply with the Camas Stormwater Design Standards Manual and design criteria.

Policy PFS-4.25 Manage stormwater to safely pass surface water and maintain water quality of lakes, streams, and rivers.

Solid Waste Policy

Policy PFS-4.26 Provide for solid waste service throughout the City through continuance of self-collection of solid waste and contracting with private waste management companies to provide recycling and yard debris collection options.

Policy PFS-4.27 Continue a system of universal compulsory solid waste collection.

Policy PFS-4.28 Coordinate with the County to implement the Clark County Solid Waste Management Plan (CSWMP). Reduce the total production of waste, increase the recycling rate of waste that is produced, and properly manage and dispose of waste that is not recycled. Provide education and outreach to businesses and the public on benefits and opportunities for waste reduction and recycling. Focus on residential recycling rates to improve participation rates similar to the rest of the County.

Policy PFS-4.29 Work with solid waste utility companies to determine if household food waste/compost can be accommodated in yard waste bins.

Franchise Utility Policy

Policy PFS-4.30 Minimize the effects on adjacent properties, the environment, and the visual quality of the community of siting, developing, operating, and maintaining facilities.

Policy PFS-4.31 Coordinate to provide reliable service through partnerships and agreements with utility companies.

Policy PFS-4.32 Promote the conservation of energy resources through the adoption of appropriate energy codes and efficient land use and transportation systems.

Policy PFS-4.33 Work with energy utilities to improve the safety and reliability of infrastructure vulnerable to climate change (e.g., undergrounding transmission lines).

Goal PFS-5 Capital Improvement Plan

Maintain and implement the Capital Improvement Plan in coordination with the biennial budget.

Policy PFS-5.1 Update the capital improvement plan biannually and include a statement of projected costs and sources of revenue.

Policy PFS-5.2 Ensure capital improvements enhance the community and add physical value to the City.

Policy PFS-5.3 Apply earnings from bond proceeds toward the debt service fund reserved for the future repayment of debt directly for enhancement of the project.

Policy PFS-5.4 Dedicate all or a portion of the first year of property taxes generated from newly incorporated areas to the Capital Fund.

Policy PFS-5.5 Dedicated funds and bonds may be used to fund essential capital improvement projects such as police, fire, and general municipal structures.

Policy PFS-5.6 Use voted, general obligation debt for discretionary projects such as recreation and library facilities.

Policy PFS-5.7 Prioritize projects that support the core services provided by the City.

Policy PFS-5.8 Ensure consistency of capital improvement plans with the adopted comprehensive plan map and evaluate if funding is adequate to provide necessary public facilities and services to implement the plan.

Goal PFS-6 School Districts

Support access to quality education and public schools through partnerships and investments.

Policy PFS-6.1 Encourage the Camas School District, Clark County, and the City of Camas to invest in mutual use facilities that support intergenerational and intercultural use.

Policy PFS-6.2 Coordinate planning between the Camas School District and the City of Camas to reflect school facility needs in response to growth forecasts.

Policy PFS-6.3 Ensure equitable access to schools and educational programs, specifically considering those in underserved areas, where needs and abilities may differ.

ourCamas 2045



Economic Development

10

10. Economic Development

Boosting the Local Economy

The economic health and well-being of the City of Camas is supported by providing a wide range of employment opportunities throughout the community and a setting and quality of life that is attractive to businesses and residents.

Vision

In 2045, Camas has cultivated a diverse and thriving economy with stable employment opportunities and living-wage jobs across various sectors, including technology, healthcare, manufacturing, retail, recreation, and professional services. Camas residents have access to a wide range of services and amenities in their community, while benefiting from excellent regional connectivity and the city's proximity to Portland International Airport. Camas is a gateway to nature and recreational opportunities, supporting regional tourism in the area. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity. Professional office, medical, and industrial uses typify western Camas, with retail businesses supporting these firms and nearby residents. The North Shore area will fulfill the employment and retail needs of the growing population on the northeast side, and reduce trips outside the city. Downtown Camas anchors the community with a dynamic economic landscape and retains its historic atmosphere as a walkable, attractive place to shop, dine, and gather. Inclusive housing options within the city's core contributes to a town center that supports local businesses.

Approach for Updating this Element

The approach for updating the economic development element for the 2026 to 2045 planning horizon was informed by community input (outlined below), state legislation requirements, priorities, and a comprehensive economic profile. This profile integrated the best available information from public and private data sources to assess the city's economic trajectory, opportunities, challenges, and economic conditions and competitiveness. These insights help build a factual basis for the updates.

Community Engagement Insights

Interactive open houses and interviews with stakeholders provided information about economic development strengths, challenges, opportunities, and actions in Downtown Camas and other areas in the City. Engagement activities identified the following themes that could contribute to future decision-making related to economic development in Camas.

COMMUNITY FEEDBACK

- **Support for infill development in North Shore**
- **Maintain land for commercial and manufacturing jobs**
- **Maintain Downtown's quaint, small-town character and support the mix of older and newer businesses**
- **Increasing housing density near Downtown will support more amenities in the area**
- **Need for more indoor and outdoor gathering spaces**
- **Explore opportunities for ground floor activation**
- **Partner with groups such as the Chamber of Commerce, Port of Camas-Washougal and CREDC to proactively recruit new businesses and industries and ensure that tools and incentives are in place to attract and retain living-wage employment**
- **Support local businesses and provide incentives for new businesses and industries with a grant program**



City of Camas Competitive Position

The city's competitive position can be summarized in terms of strengths, weaknesses, opportunities, and threats. These represent internal and external factors that can have positive or negative impacts on economic outcomes in Camas. Several ideas added to the summary below are based on feedback received through community engagement activities. Table 11 below outlines key findings associated with economic growth and development.

Table 11 Strengths, Weaknesses, Opportunities, and Threats Summary Analysis

STRENGTHS

- High quality of life amenities like parks and recreation opportunities including new City investments in capital projects.
- Downtown experiencing high visitation and high demand for retail spaces (increasing rents, low vacancy).
- Responsive permitting, ongoing maintenance of the public realm.
- No Washington State income tax.
- Proximity to Portland International Airport.
- Well regarded public schools.
- The Downtown Camas Association is completing a comprehensive Downtown lighting plan with a state grant to support safety.

WEAKNESSES

- Rising housing costs, purchasing a home is unaffordable for those under 120% AMI.
- High industrial rents and very low industrial real estate vacancies.
- Development standards related to height was cited as a barrier by stakeholders.
- Need Downtown development to be feasible to build (pencil).
- Highly constrained lands may be difficult to develop for commercial or industrial land uses (such as in Washougal).

OPPORTUNITIES

- Attract highly skilled workers with locational flexibility.
- Develop pathways for youth to gain skills and seek jobs in Camas.
- Identify target industries for managing land capacity and expected growth.
- Incentives for existing business owners, wishing to expand their operations.
- Opportunities for Downtown redevelopment and partnerships with Downtown businesses and nonprofits (such as Downtown Camas Association, the Port, Chamber, Farmers Market, and more).
- Develop mill ditch into a compelling, easy, and beautiful trail system that is clear to connect with from Downtown and improve the trails to encourage local resident activity and to attract visitors.
- Need more hotels and conference space.
- City should partner more with the Downtown Camas Association on incentive programs.
- Improve pedestrian safety throughout downtown.

THREATS

- Unequal rates of homeownership by race and ethnicity indicating unequal economic opportunities.
- Disparities between remote and non-remote workers.
- Anchor employer changes.
- Safety threats that could be supported by better lighting, street tree improvements, safer crossings for pedestrians in the Downtown.
- Need to balance preserving historic features with new development in Downtown.

Broad Planning Context

Comprehensive planning in Washington is guided by the Growth Management Act (GMA), a series of statutes first adopted in 1990 which requires cities and towns within the state's most populous counties to fully plan for future growth (RCW 36.70A) and develop mandatory comprehensive plan elements. State provisions set limits on what actions cities and counties can take to support economic development. Article 8, Section 7 of the state constitution specifies that "No county, city, town or other municipal corporation shall hereafter give any money, property, or loan its money, or credit to or in aid of any individual, association, company or corporation, except for the necessary support of the poor and infirm."[19] Given this limitation, cities generally cannot directly use public funds to attract private development and instead target policies that facilitate economic growth through land use, infrastructure, tourism, marketing, and partnerships with nonprofit community-based organizations.

Cities in Washington also coordinate with county-level Associate Development Organizations (ADOs) that represent each of Washington's counties, funded in part by the state Department of Commerce. The Columbia River Economic Development Council (CREDC) represents Clark County and presents a baseline of goals and objectives for the region. Their former 2018-2023 Comprehensive Economic Development Plan outlined goals and actions based on a vision and set of values and guiding principles identified through extensive engagement with local partners, which have carried through and expanded with the more recent 2024 Comprehensive Economic Development Plan with new supplemental actions to encourage economic development for communities within Clark County.

New objectives in CREDC's regional economic development plan expand on support for entrepreneurship, placemaking investments, fostering development and redevelopment projects, and expanding equitable employment opportunities. The Plan also recognizes the growing role of smaller cities like Camas outside of Vancouver which are seeing fast population growth and opportunities to develop their own employment bases.







[19] RCW 35.21.703 does allow cities to contract with nonprofit corporations to advance economic development.

Table 12 Goals and Objectives from 2018-2023 CREDC Comprehensive Economic Development Plan

Source: CREDC

	2018 Plan Objectives	2024 Update Objectives
Expand the Existing Base	• Become Industry Experts • Strategically Market Industry Clusters • Build a Start-Up Ecosystem	• Reduce Site Infrastructure Hurdles • Grow Start-Up Ecosystem • Support Permitting Consistency • Explore Commercial Code Flexibility • Foster Small Business Networking
Support People	• Foster Skills Development • Prepare Youth for Economic Opportunity • Launch a Brain Gain Initiative	• Align Workforce with Employer Needs • Enhance Access to Career Pathways • Support Talent Retention
Create Place	• Each Community Creates a Placemaking Strategy • Embrace Economic Opportunity in Urban Center • CREDC Tells the Story of Place • Make Areas Desired by Industry Clusters Shovel-Ready • Determine All Transportation Needs on a Regional Level	• Leverage Placemaking Investments • Encourage Infrastructure Investments That Cross Municipal Boundaries

The Clark Countywide Planning Policies provide guidance on economic development across incorporated and unincorporated areas of the County (the County also distinguishes policies specifically for unincorporated areas, but not for jurisdictions and their UGAs). These policies were updated in 2026.

Buildable Land Capacity and Employment Capacity

Cities fully planning for adequate land capacity to meet the needs of the community must understand their current employment base, development trends, workforce housing availability, income segments of the population, and future projections. To fully plan for growth and meet community needs in compliance with state provisions, more suburban cities like Camas that are growing in terms of employment must understand the dynamics of the local and regional economy, consider where employment is concentrated and how residents and workers access

employment opportunities, what industries are growing or declining, and whether there is sufficient space to fulfill anticipated employment land needs alongside other uses.

Washington's Review and Evaluation Program (the Buildable Lands Program, RCW 36.70A.215) requires certain counties, including Clark County, to establish their own buildable lands programs and review past development and density patterns to see if local policies are effective and prepare to plan for the next 20 years of growth, through a "Buildable Lands Report" released before a Comprehensive Plan update.

Clark County has updated its Vacant Buildable Lands Model (VBLM) as a part of their 2026 periodic update of their Comprehensive Plan. This VBLM provides a basis for the available employment capacity in the City of Camas based on available buildable land (including both vacant and underutilized land), current zoning, and market and employment density assumptions. Table 13 below shows the County's current allocation of jobs for the City of Camas and the Camas Urban Growth Area (UGA) and the 2023 Vacant Buildable Lands Model (VBLM) capacity and yield calculations.[20]

This analysis shows that the City of Camas has an overall job target of 13,658 jobs; however, not all of those jobs create demand for commercial or industrial land. The County estimates that 2,043 of the allocated jobs will consist of work-from-home employment, field-based construction employment, or government employment accommodated on public land or existing facilities. Accordingly, the employment land capacity target for Camas is 11,615 jobs as documented in Clark County's 2025 Population, Housing and Employment Allocation memorandum.[21]

Evaluating employment capacity is necessary to determine whether the job growth allocation (determined by the county) can be accommodated within the City of Camas and Camas UGA(s). Sufficient capacity is available if employment growth capacity is equal to or greater than the City's allocation. If sufficient capacity is not available, the shortfall must be addressed by rezoning, or revising allowable density, or by modifying or creating a new UGA or annexed area to provide additional area for employment growth capacity. To help provide geographic context for this analysis, see Figure 1, a map of the City of Camas and its existing and proposed Urban Growth Areas.

[20] This has been modified since the County's 2020 Buildable Lands Report, which identified 963 net buildable acres (296 on commercial land, 667 on industrial land) in the Camas UGA (Clark County Buildable Lands Report, 2023).
[21] Clark County Community Planning, 'Clark County Comprehensive Plan 2025 Update 2025 Population, Housing and Employment Allocation – Issue Paper 5,' April 2024, https://clark.wa.gov/sites/default/files/media/document/2024-04/issue_paper_5_pop-emp_alloc_4_17_24.pdf.

Table 13 Employment Capacity and Allocation by UGA, Clark County

Source: VBLM 2023, Capacity and Yield by Jurisdiction. Note: The County total estimate is 88,100 jobs accounting for government, construction, rural, and work from home jobs.

Jurisdiction	2023-2045 Employment Allocation	2023 VBLM Capacity	Assumptions		
			Work from Home	Construction	Government
City of Camas and Camas UGA	**13,658 jobs**	**12,423 jobs**	615 jobs	879 jobs	549 jobs
Total Clark County UGAs and Cities	**83,695 jobs**	68,406 jobs	3,524 jobs	5,038 jobs	8,600 jobs

Additional analysis refining the employment capacity is underway that is based on key City of Camas zoning and UGA modifications. The City of Camas is adopting zoning modifications and expanded the UGA to allow for additional employment capacity. According to these refined employment capacity estimates, Camas has capacity for 12,423 jobs which exceeds the 2045 employment target of 11,615 jobs.

Clark County's Buildable Lands Report, 2023, Key Findings

Clark County's Buildable Lands Report was adopted in June 2022 to update the methodology and Vacant Buildable Lands Model (VBLM) and updated with 2023 data.

- The Clark County Buildable Lands Report and employment allocations and City of Camas estimates indicate that there is sufficient employment capacity for employment growth in the county through 2045.
- Camas has the second largest share of total projected jobs in Clark County (17.5%) after the City of Vancouver and the Vancouver Unincorporated Urban Area (U). The City of Camas is expected to have capacity to accommodate 11,363 jobs, with about half (55%) of new employment on commercial land and half on industrial (45%).

City of Camas Profile

The early economy in Camas was at first dominated by manufacturing but has shifted and diversified over time. In 2018, the mill now owned by Georgia-Pacific, shut down several facilities and all but one of its paper machines and downsized its workforce to roughly 150 workers. In 2026, the mill began a multi-year revitalization project which includes removing buildings and equipment no longer needed for papermaking as well as new investments to upgrade equipment and infrastructure. The City's past economic health was closely tied to the paper mill but has shifted to become more diversified supporting many technology and manufacturing firms, as well as a growing school system and professional offices. In the last four decades, the family-friendly city with close ties to the Portland Metropolitan Region has continued to attract more residents, especially from 1990 to 2000 by almost doubling in size to almost 13,000 people, increasing to a little over 19,000 people in 2010, and then reaching 27,420 people by 2023. Similar to the City of Vancouver, Camas has experienced high population growth over the last two decades, with an average annual growth rate of 5.2% which is double the rate in Clark County and Washington State.

Today, the City of Camas is a highly desirable place to live, offering a prime location nearby the growing cities and employment centers of Vancouver and Portland, and the smaller cities of Washougal and Battle Ground in south Clark County. The City of Camas is sandwiched between the City of Vancouver (sharing a border on the west side of Camas) to the west and the City of Washougal to the east. At a regional level, the City is interconnected to the Portland Metropolitan region, located northeast of Portland (see map below).

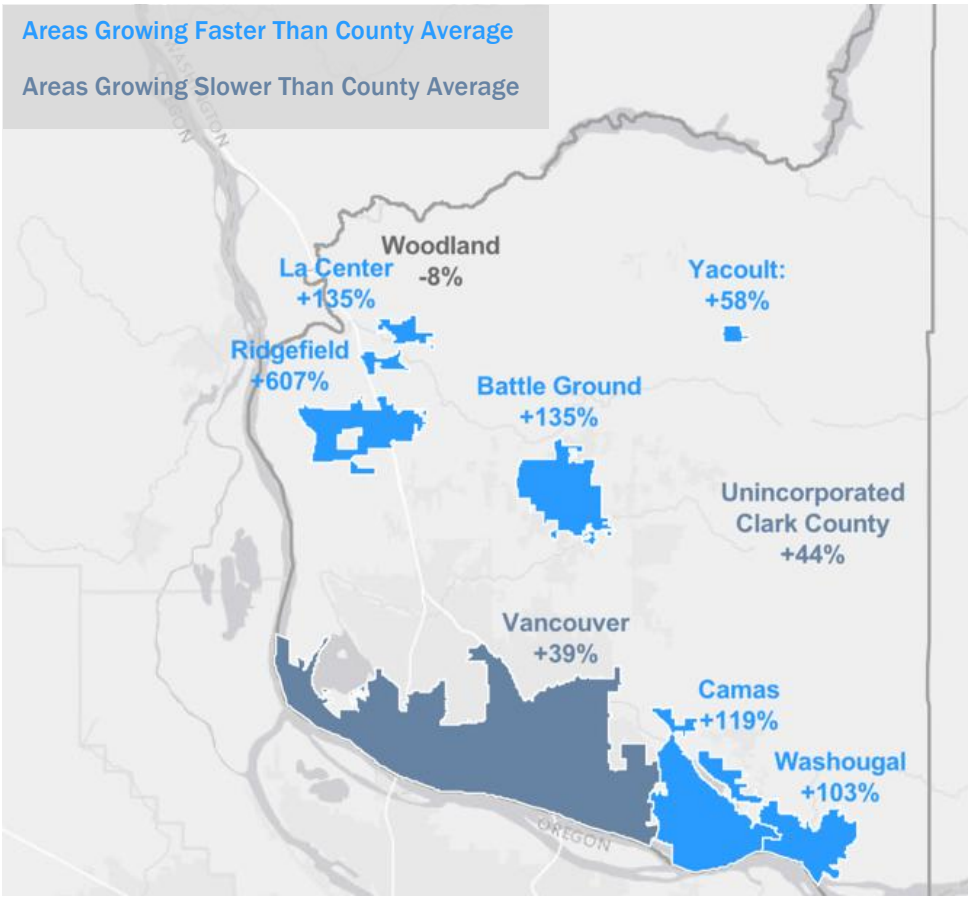






Camas has been working to advance its economic development goals in recent years while investing in quality-of-life amenities that make it a competitive location for attracting workers and residents. Recently, the City adopted a North Shore subarea plan (2022) to support community vibrancy and economic development strategies and the City is working to adopt a new Downtown subarea plan as part of the 2026 Comprehensive Plan periodic update. The City has also been expanding its inventory of parks space by leveraging the County's Legacy Lands program to expand its offerings of natural areas and recreation facilities. As larger economic trends increase locational flexibility (especially for professional services and traditionally office-based jobs), these types of investments will be critical for cities in the region to continue drawing in and retaining a residential base and workforce. The Port of Camas-Washougal manages an airport that is outside City limits, but most of the developable land in the North Shore area is within the airport influence area.

Figure 17 Camas Compared to Clark County Cities



Source: Office of Financial Management Population Estimates

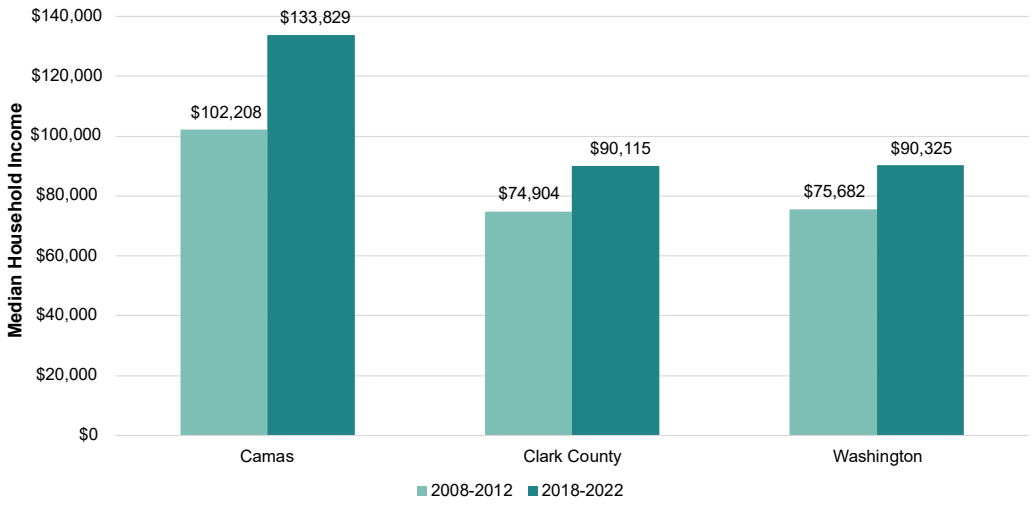
Economic Development Overview

Economic development for the City of Camas is the creation and sustenance of a diverse array of employment opportunities, ensuring the tax base currently enjoyed by the City endures and is strengthened. The economic health and well-being of the City are tied to commitments to promote a wide range of employment opportunities for the community and to provide a setting and quality of life that attract businesses and residents.

Planning a diverse and vibrant economy must start by understanding current economic conditions in the City and Clark County. While the City's past economic health was closely tied to the paper mill, in more recent years, the City's economy has diversified and now supports many technology and manufacturing firms, as well as a growing school system and professional offices. The figures below compare the median household income for Camas, Clark County, and Washington as well as employment and related trends over time.

As illustrated in Figure 18 when compared with Clark County, wages in Camas are higher and have grown over the last decade. Higher wages can have positive impacts on other aspects of the economy, and community members have expressed their desire to support living-wage jobs, particularly in healthcare and high technology.

Figure 18 Median Household Income, Camas, Clark County, and Washington



Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates
Note: 2008-2012 values are adjusted for inflation. Median household incomes are shown in 2022 $.

Growth in employment, population, and housing are interconnected. In general, communities with a high ratio of population to jobs can be characterized as "bedroom" or commuter communities, where there are fewer jobs than residents in the city. In Camas, there are roughly three residents for every one employee, indicating a continued trend from the past decade.

The ratio of jobs to housing has slightly increased from 0.9 to 1.0, indicating a healthy balance of housing units in comparison with employment and meeting the jobs-to-housing ratio of 1:1 adopted by Clark County (Resolution 2016-03-01). As the City grows, maintaining this trend can help to ensure there is adequate housing for those who work in Camas.

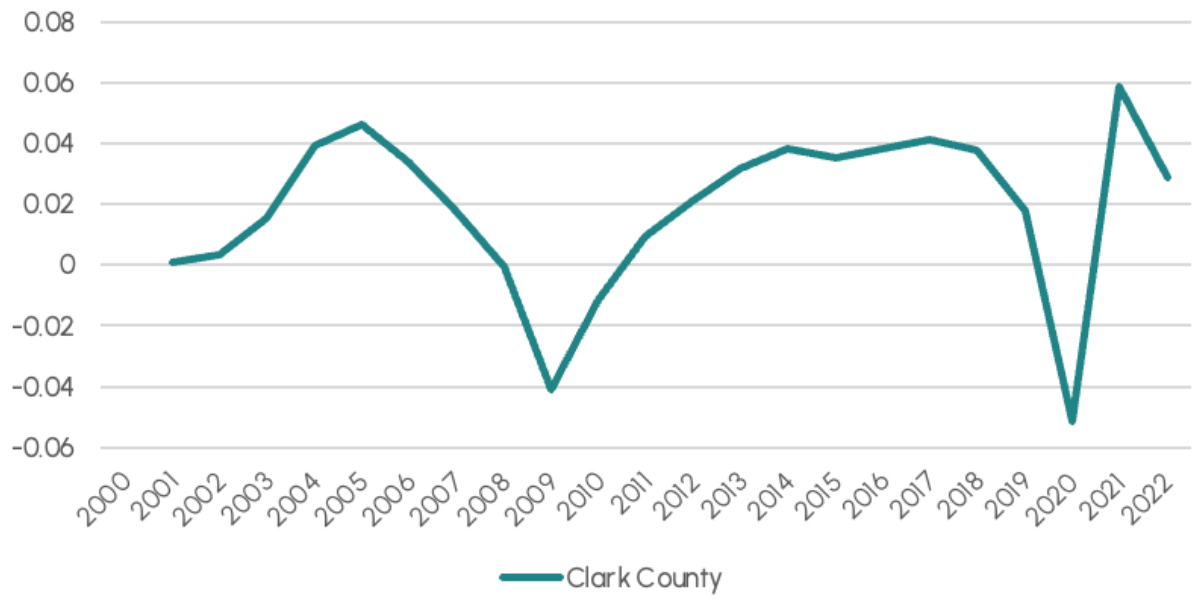
Table 14 Population, Employment, and Jobs Comparison Ratios, Camas, 2010-2021

	Trends			Ratios	
	Population	Employment	Housing Units	Population : Jobs	Jobs : Housing
2010	19,355	6,508	7,072	3.0	0.9
2021	26,870	9,558	9,586	2.8	**1.0**

Source: OFM, LEHD-LODES. Note: Employment data is currently only available at the City level through 2021.

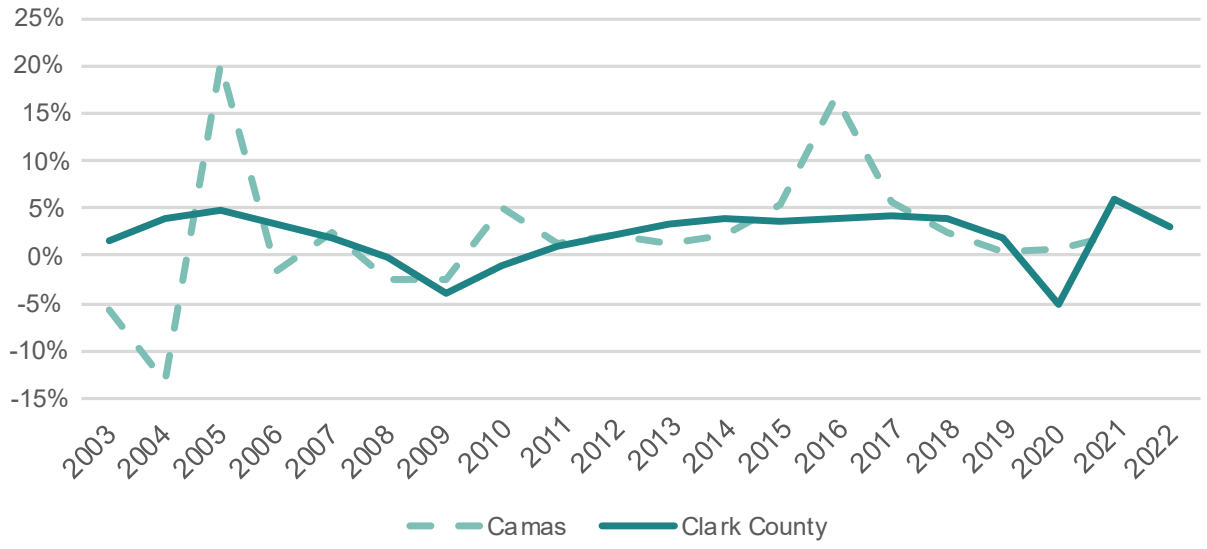
Overall, Clark County has seen fluctuations in employment since 2000, with the most notable decline in employment in the wake of the 2008 recession and at the onset of the COVID-19 in 2020. However, the County has also seen a rapid rebound from pandemic trends, with sharp employment growth after 2020. The City has generally seen positive growth in employment over the last two decades. The City saw less of a decrease during 2020 compared to Clark County overall, which may reflect Camas' growth in remote workers during this period (Figure 19).

Figure 19 Total Covered Employment Change YOY, Clark County (2001-2022)



Source: Washington Employment Security Department

Figure 20 Total Employment Change YOY (Primary Jobs), Camas and Clark County

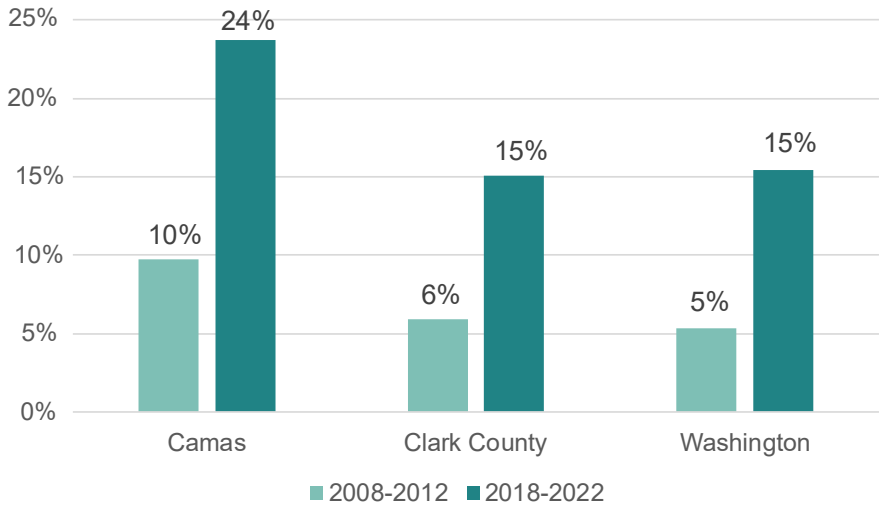


Source: Washington Employment Security Department, LEHD-LODES. Note: LEHD-LODES data for the City of Camas only available through 2021

The Economic Development Element establishes goals and policies that seek to maintain the diversification of employment opportunities and support the continued growth of the Camas economy and attainment of the jobs target by 2045.

The City is targeting businesses that provide a greater proportion of living-wage jobs. Increasing retail services in support of residential, industrial, and professional business growth is highly desirable. Camas is also seeing an increasing share of remote workers at a higher rate than the County or State, with nearly a quarter of workers falling into this category in 2022.

Figure 21 Share of Remote Workers, Camas, Clark County, and Washington, 2012-2022



Source: ACS, 2008-2012, 2018-2022

Summary of Demographic and Economic Trends

A summary of key findings from this Economic Development Element analysis is provided below to help describe key insights regarding the economic context, economic opportunities and challenges informing plan updates (Appendix R, Economic Conditions and Opportunities Analysis provides the full findings).

- **Camas has an aging population with a median age of 40 years in 2022 and a growing share of residents aged 60 years and over.** This group typically represents late-career workers or retirees. Median age in Camas is higher than Clark County overall and quickly growing since 2012, likely indicating a combination of natural growth and in-migration of older adults.
- **Camas has a higher share of residents 25 or older with at least a college level bachelor degree compared to Clark County or Washington State**, with 79% of residents holding these degrees in 2022. This share of residents rose quickly from only 37% in 2012.
- **Median household income for all households in Camas was nearly $134,000 in 2022, higher than Clark County or Washington State.** Since 2012, median income for residents of Camas increased by about 30% (in nominal dollars, not adjusted for inflation), more than either the County or State.
- **The City of Camas has seen generally positive trends in employment growth over the last two decades,** with notable increases in the number of workers in 2005, 2010, and 2016. The City of Camas employment grew from approximately 6,584 to 9,558 between 2011 and 2021.

- **The current employment to housing ratio in Camas was 1.0 in 2021, meaning that there is about one employee working in the City for every housing unit.** This ratio indicates that Camas has a well-balanced housing stock to accommodate workers in the City.
- **In 2021, the top five industries by employment in Camas were Finance and Insurance; Manufacturing; Educational Services; Professional, Scientific, and Technical Services; and Wholesale Trade.** Four of these five top industries paid above average wages (all except Educational Services paid below average wages). Finance and Insurance was the City's fastest growing industry (with an average annual growth rate of about 33%).
- **Top employers also reflect many of the County's largest industries, including professional services like finance and insurance, technology, manufacturing, and health care. Four of the City's top ten employers were in the manufacturing industry as of 2020.** Within Camas, employment has concentrated at two nodes, including the Downtown area to the southeast and corporate campuses in the Grass Valley near the border with the City of Vancouver.
- **Camas is part of an interconnected region, with more residents commuting out of Camas for work (8,159) than employees commuting in (6,982) as of 2021. Approximately 9,102 people are employed in Camas and among this total nearly 90% live in Camas (8,159) but work outside of the city and the remaining 10% live and work in Camas (943 people).** Top commuting destinations for Camas residents are primarily nearby, larger cities with employment hubs like Vancouver and Portland, while only 10% remained in the City. Nearly 59% commute less than 10 miles. The fourth most common destination for residents was Seattle, likely indicating remote workers at companies based in the Puget Sound area. Workers commuting to Camas originated from similar destinations, with one quarter coming from Vancouver.
- **Washington State Employment Security Department projections for future employment growth estimated that the Southwest Washington region will grow by about 19% overall by 2031.** The sectors expected to see the greatest increase in their share of employment are Professional/ Business Services, Leisure/ Hospitality, Education/ Health Services, Information, and Other Services.
- **Camas has a larger share of remote workers compared with Clark County and Washington State.** In 2022 one in four workers in Camas was a remote employee, compared to 15% in both the County and State overall. The share of remote workers in Camas has grown since 2012.
- **Since 2020, the City has issued 8,652 new business permits, with the largest volume of new permits in 2020 and a decreasing amount annually after 2020.** General business establishments accounted for the largest portion of these permits (74%), followed by home occupations (25%), and nonprofits (1%).
- **Camas' taxable retail sales were higher than those in most comparable jurisdictions in Clark County over the past decade**, competing primarily with the City of Battle Ground for the highest annual sales. In 2022, total taxable retail sales reached an all-time high of over $600 million.
- **Retail rents in Camas had slight upward growth since 2014 while vacancies trended downward, indicating increasing demand for retail. Industrial real estate in the City of Camas is also performing well compared to Clark County in 2024.** The City is home to only about 3.9% of Clark County's industrial real estate in square footage but saw a sharp increase of industrial rents PSF in 2022, growing by over 200% year-over-year (YOY) to $23. Vacancy rates for industrial real estate were also extremely low in Camas in 2024 YTD at 1.7%, indicating high demand in the industrial market.

Implementation Tools and Strategies

Realizing the City of Camas economic development goals requires building on the City's potential while overcoming existing constraints. The following implementation strategies will generate positive momentum toward creating a more balanced and healthy economy.

Programmatic Strategies

- **Economic Development Committee:** Establish a mayor-appointed committee to help refine and implement Camas' economic development goals and strategies. The committee will:
    - Convene government, private sector, and nonprofit partners to leverage resources or secure financial support for economic development initiatives that benefit Camas and the broader region. In addition, this committee would help provide input on the Economic Development Strategy.
- **Economic Development Strategy**: Create an Economic Development Strategic Plan involving the Economic Development Committee, local businesses, community groups, school districts, and city leadership that further identifies priorities for job creation in targeted industries, infrastructure needs, reducing regulatory barriers, and incentives to attract needed and desired businesses.
    - Promote the development of an economic development strategy that will capitalize on the creation and retention of industries that provide living-wage jobs.
    - Future economic development strategy planning should capitalize on existing facilities and infrastructure and include a mix of uses that are trail- and transit-oriented and designed with high-quality streetscape appeal.
    - Lead an economic development strategy update every 1 to 3 years.

Financial Strategies

- **Leverage Grant Dollars**: Utilize federal, state, and county grants to support the establishment and expansion of small local businesses and infrastructure improvements benefiting economic development areas.
- **Incentives**: Explore incentives to encourage mixed-use development and provide affordable housing options (such as TIF, LID, MFTE changes).
- **Partnership**: Coordinate with the Columbia River Economic Development Council (CREDC) or other relevant organizations, to explore collaborative opportunities in promoting regional workforce development.
- **Opportunity Site Inventory**: Identify sites where the city can participate in cost-sharing mechanisms for infrastructure development.
    - Establish a policy that prioritizes capital investments to or on opportunities sites or other capital projects that better connect commercial nodes. This could include sidewalks, trails, bike paths, etc.

Regulatory Strategies

- **Code Audit**: Ensure the zoning code supports/incentivizes a broad range of needed and desired businesses in various zones.
    - **Study Allowed Uses:** Ensure needed and desired businesses are allowed in certain zones, including accessory uses which can support home-based businesses.

- **Design standards**: Consider revisiting existing design standards to ensure they adequately support efforts to maintain and enhance existing character without compromising development feasibility.
- **Flexible parking standards:** Develop flexible parking standards that can respond to site conditions.
- **Revised Gateway Corridor Design Standards:** Update the design standards and allowed uses for gateway corridors to enhance its natural beauty but deemphasize its auto-oriented environment.

Procedural Strategies

- **Capacity Building**: Leverage increased tax revenue from population growth to support Camas' economic development strategy.
- **Clear and Objective Development Standards**: Establish clear and objective development standards for all development types, reducing the need for conditional use processes or other discretionary review processes.
- **Monitoring**: Monitor the performance of economic development such as with business retention and attrition, changes in tax revenues, and permitting of employment facilities. Monitor the financial impact of new programs, policies, and regulatory requirements on development feasibility by providing a report update every 1-3 years describing key metrics such as development changes and infrastructure projects.

Economic Development Goals and Policies

Goal ED-1 Citywide Economic Development

Maintain a diverse range of employment opportunities to support all residents, provide sufficient land supporting employment needs, and provide a setting and quality of life that attract and retain living-wage jobs[22] throughout the community.

Policy ED-1.1 Work with partners to identify strategies to proactively recruit businesses and ensure that tools and incentives are in place to attract sustainable and innovative industries to expand and provide stable living-wage employment.

Policy ED-1.2 Work with partners (such as the Chamber of Commerce, education programs, Workforce SW WA, CREDC) to provide apprenticeships, internships, vocational training schools, entrepreneurship programs, equitable opportunities, and on-the-job training in targeted industry sectors.

Policy ED-1.3 Encourage appropriate reuse, environmental cleanup, and redevelopment of older and deteriorating commercial areas and industrial brownfield sites. Identify opportunities to support place-based economic development, provide connections to the waterfront, diversify the economy, and support mixed-use development.

[22] A living-wage job is one that pays an income sufficient to cover basic living expenses without financial hardship, allowing an individual or family to afford essential needs such as housing, food, healthcare, transportation, childcare, and other necessities without relying on public assistance. MIT Living wage calculation (2024): https://livingwage.mit.edu/counties/53053.

Policy ED-1.4 Foster and expand year-round recreational services, lodging, conference spaces, dining, and retail options to support tourism, benefit residents and employers, leverage Camas' strong parks and open space assets, and connect to the waterfront.

Policy ED-1.5 Participate in regional recruitment organizations to ensure the availability of an adequate supply of commercial and industrial employment land to support the City's economic development goals. Evaluate city resources to support economic development planning and implementation by designating a point-of-contact for economic development programs and serving as a liaison to the business community.

Policy ED-1.6 Support and encourage employees to use the Commute Trip Reduction Program. Encourage businesses to support remote work to reduce trips and implement a trip reduction program with incentives for carpooling, transit ridership, and other options beyond single-occupancy vehicles.

Policy ED-1.7 Encourage mixed-use development and complementary businesses throughout the City to support industry clusters and leverage resources.

Policy ED-1.8 Review regulatory design standards and planning procedures for industrial and commercial facilities and provide economic incentives to promote private investment in start-ups, incubator businesses, and businesses relocating to Camas.

Policy ED-1.9 Explore ways to support remote workers such as community hubs and third places and code revisions for co-working spaces.

Policy ED-1.10 Implement the Downtown Camas subarea plan and the associated goals and actions (see downtown subarea element).

Policy ED-1.11 Promote the growth of residential development in the North Shore as described in the Camas North Shore Subarea Plan.

Goal ED-2 Local Business Development

Promote business creation, expansion, retention, and diversification throughout the community to create a consistent and reliable tax base and a healthy, diversified local economy.

Policy ED-2.1 Identify and plan for infrastructure to nurture and incubate new businesses. Explore financing tools such as tax increment financing to fund infrastructure to support development and investment in targeted areas.

Policy ED-2.2 Support retention, expansion, and recruitment of local businesses in Camas.

Policy ED-2.3 Support development standards that promote high-quality building and site design, encourage businesses to operate in a sustainable and environmentally responsible manner and integrate energy efficient design features.

Policy ED-2.4 Collaborate with partners and agencies (such as CREDC and the Port of Camas Washougal) to develop economic strategies that promote diversification of business and industry in the city and facilitate opportunities for entrepreneurship.

Policy ED-2.5 Work with partners to proactively recruit and promote the growth of businesses and industries that provide, at a minimum, cost-of-living wages and economic diversity in alignment with the CREDC regional economic development plan.

Policy ED-2.6 Explore the creation of an economic development grant program for local businesses in connection with local partners.

Policy ED-2.7 Facilitate an environment for the success and growth of small businesses to maintain a strong, diverse, and resilient local economy.

Policy ED-2.8 Encourage investments and programs that provide resources and support to minority-owned and woman-owned businesses.

Policy ED-2.9 Increase the number of neighborhood business districts to expand local access to goods and services. Consider expanding mixed-use zoning options with ground floor commercial uses that allow residents to walk or roll from home.

Policy ED-2.10 Encourage shopping local to support Camas businesses.

Goal ED-3 Mixed Use and Commercial Areas

Encourage efficient and innovative development that thoughtfully mixes commercial and residential land uses that are pedestrian-friendly and consider the context of the surrounding area.

Policy ED-3.1 Develop commercial and mixed-use areas that are safe, comfortable, and attractive to pedestrians.

Policy ED-3.2 Encourage efficient land use in the mixed-use land use designation by facilitating compact, high-density development and minimizing the amount of land that is needed for surface parking.

Policy ED-3.3 Promote the growth of businesses such as grocery stores, medical offices, and restaurants that meet the retail and service needs of the community.

Policy ED-3.4 Encourage new developments to provide neighborhood parks and shared use paths to encourage greater physical activity and connect residential areas to commercial centers, public transit, and community facilities.

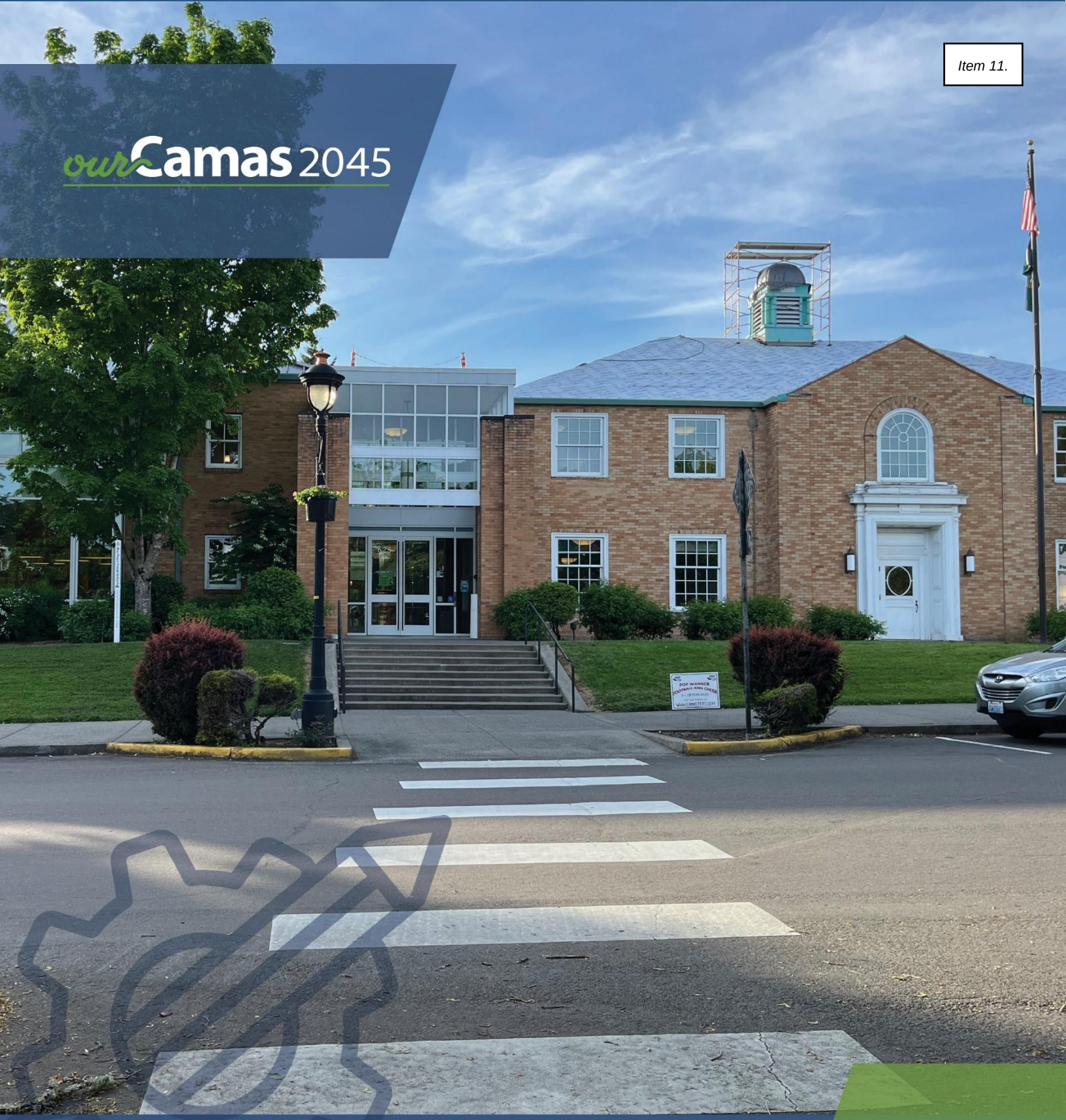
Goal ED-4 Mixed Employment and Industrial Areas

Providing a mix of traditional industrial and non-industrial land uses to maximize opportunities and partnerships and facilitate employers to remain, expand, or locate in Camas.

Policy ED-4.1 Evaluate the costs and benefits associated with adding the Grove Field Urban Growth Area to the North Shore Subarea Plan.

Policy ED-4.2	Preserve large tracts of land for large industry and master-planned commercial development within mixed employment land use areas.
Policy ED-4.3	Support a mix of light industrial, research and development, manufacturing, and office spaces through flexible zoning that allows for evolving business needs.
Policy ED-4.4	Support the development of business parks, incubators, and innovation hubs that integrate industrial and high-tech employment uses.
Policy ED-4.5	Ensure zoning and development regulations support both large-scale employers and small businesses, including start-ups and maker spaces.
Policy ED-4.6	Support continued operation of the Camas Mill while recognizing the long-term potential for mixed-use redevelopment, including residential. Support environmental cleanup to standards protective of unrestricted land uses.

ourCamas 2045



Technical Appendices

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11. Technical Appendices

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Appendix H: Transportation System Plan, Volume 1

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Appendix A: Engagement Summaries

Engagement Summaries

City of Camas
Comprehensive Plan Update (Our Camas 2045)

October 2026

Our Camas Engagement Summary Memo
October 2026

Introduction

Engagement with the community was a top priority during the Comprehensive Plan update. The City utilized a variety of methods to reach a broad audience of community members, including in-person events, online surveys, a project website, and attendance at City Council and Planning Commission meetings. The City used various communication tools, such as social media, public notices in the Camas-Washougal Post Record, updates to the project website, flyers posted around the city, and distribution through partner agency communication channels, to advertise community events and engagement activities.

RCW 36.70A.140 directs cities to "establish and broadly disseminate to the public a public participation program identifying procedures providing for early and continuous public participation in the development and amendment of comprehensive land use plans and development regulations implementing such plans. The procedures shall provide for broad dissemination of proposals and alternatives, opportunity for written comments, public meetings after effective notice, provision for open discussion, communication programs, information services, and consideration of and response to public comments." Camas established a Public Participation Plan in February 2024 that included engagement objectives, key messages, community demographics, underserved populations, stakeholders and partners, engagement activities, communication tools, risk and mitigation for low attendance/response, and an evaluation process for meeting the engagement objectives. The Public Participation Plan was reviewed with the Community Advisory Committee and then implemented through an engagement schedule posted and updated on the project website (https://engagecamas.com/ourcamas2045). This memorandum and attachments include a summary of engagement activities, comments received, and how those comments were responded to and addressed throughout the planning process.

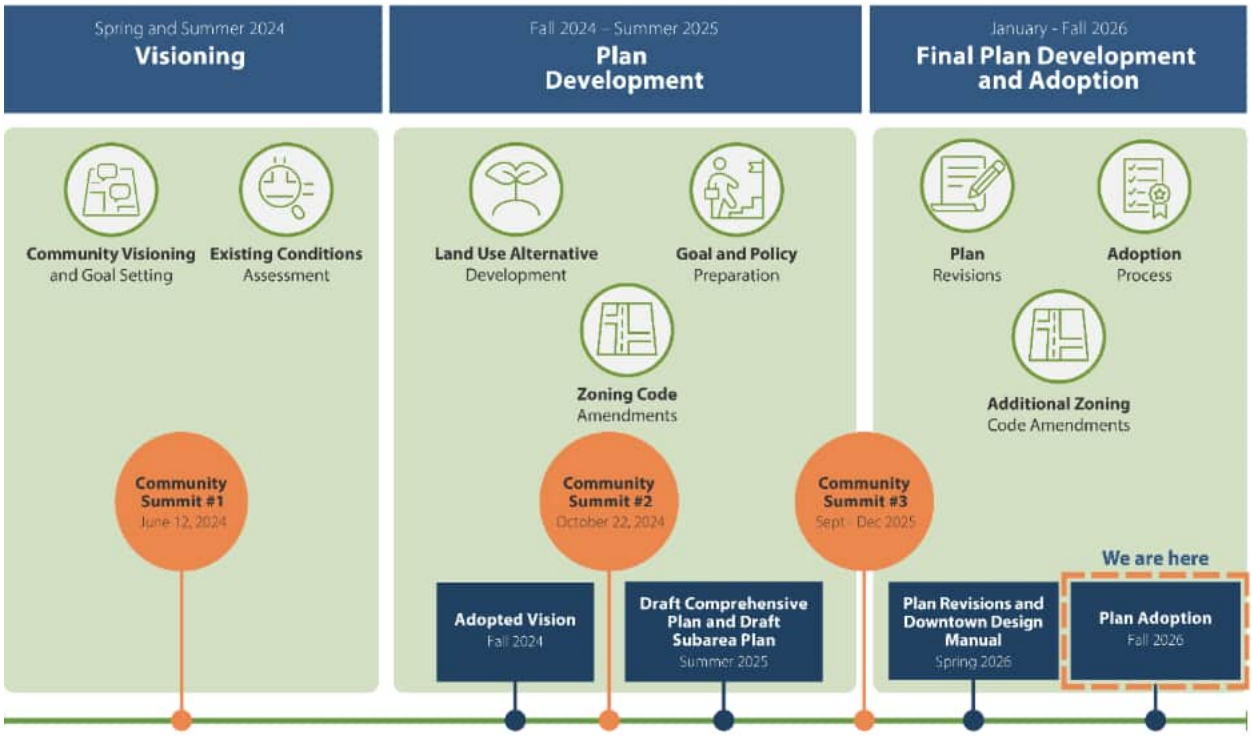
Types of Engagement

The City utilized a broad spectrum of methods to engage with the community during the comprehensive plan update, including the following:

- Tabling at in person community events;
- Maintaining a project website throughout the duration of the project that hosted information and documents related to the project, surveys to collect feedback related to land uses and community priorities;
- Community Summits with topic focused presentations that included in-person and virtual elements (see Community Summit summaries for additional details);
- Community Conversations facilitated with local groups, clubs, committees, and organizations in Camas (see Visioning Outreach Summary and Appendix for additional details); and

- Advisory Committees that provided topic specific feedback on the vision, goals, policies and code (see meeting summaries for additional details).
    - Project Advisory Committee (PAC): technical stakeholders, agency partners, service providers
    - Community Advisory Committee (CAC): broad cross-section of community interests
    - Downtown Advisory Committee (DAC): representatives from the CAC and the Downtown Camas Association (DCA)
    - Climate Policy Advisory Team (CPAT): community members advising on climate goals and policies
    - City Council
    - Planning Commission
        - City Council and Planning Commission agendas, presentations, staff reports and minutes available at https://www.cityofcamas.us/meetings

Project Phases



Engagement Phase Summary

Visioning

A citywide outreach process established the community's vision and priorities related to Camas' future via community conversations, in-person community events, online surveys, online mapping tools, and through the project website. A community survey and interactive map gathered feedback from the community on things they like about Camas, things they would change in the future, important topics to address in the plan, and areas of opportunity or concern both downtown and in the wider Camas community.

During the visioning phase, the community shared the things they value about Camas, what the plan should strive to preserve or enhance, changes they would like to see, and the most important topics for the

Comprehensive Plan update. This information resulted in development of the Our Camas 2045 Vision Statement and the four primary themes: Our Community, Our Environment, Our Neighborhoods, and Our Downtown. These themes and the vision provided guidance for the remainder of the project, influencing the draft land use alternatives, the draft plan, the draft Downtown Subarea Plan, and the final versions that were adopted at the conclusion of the project.

Date	Event	Topic
December 18, 2023	City Council Workshop	Middle Housing and ADUs
February 6, 2024	Community Advisory Committee Meeting	Project Overview
February 6, 2024	Downtown Advisory Committee	Project Overview, Urban Design, Site Assessment
February 21, 2024	Planning Commission	Middle Housing and ADUs, Our Camas 2045 Update
February 2024	Citywide Mailer	Visioning for Our Camas, Project Awareness
February 2024	Online Survey and Interactive Map	Visioning for Our Camas, Project Awareness
March 14, 2024	Climate Policy Advisory Team	Project Overview, Climate Planning, Equity Framework
March 18, 2024	City Council Workshop	Population and Jobs Allocations
March 20, 2024	Downtown Advisory Committee	Existing Conditions, Opportunities and Constraints
March 26, 2024	Community Advisory Committee Meeting	Visioning, Existing Conditions, Equity Framework
April 15, 2024	City Council Workshop	Community Conversation
Spring 2024	Community Conversations	Visioning for Our Camas
Spring 2024	Tabling at Downtown Camas First Fridays and at Camas Days	Visioning for Our Camas, Project Awareness
May 16, 2024	Downtown Advisory Committee	Downtown Vision and Goals
May 21, 2024	Planning Commission	Population and Jobs Allocations, Vision Outreach Summary
June 4, 2024	Community Advisory Committee Meeting	Draft Vision and Goals Statements
June 12, 2024	Community Summit #1	Vision Statement and Goals
June 18, 2024	Planning Commission	Vision Statement
July 1, 2024	City Council	Vision Statement
July 15, 2024	City Council	Vision Statement Resolution

Plan Development – Land Use Alternatives

This phase of the project asked the community to provide their feedback on the proposed land use alternatives and early stages of the plans. The Community Summit and online StoryMap provided forums to weigh in on the land use alternatives, proposed zoning and comprehensive plan, land use designation changes, development scale, the Downtown Subarea Plan, and climate planning. Top priorities included community building, walkability, preserving the small town feel of Camas, economic diversity, inclusive and diverse housing design, moderate increases in density, and safe transportation infrastructure. A common topic discussed at multiple forums is the need for more diverse housing types in Camas as well as more

housing that is affordable to a broad range of incomes. The feedback was used to inform development of the preferred land use alternative and the goals and policies that were developed in the draft plan.

Date	Event	Topic
June 26, 2024	Community Advisory Committee Meeting	Housing Needs Assessment, Economic Analysis, Land Use Alternatives
August 12, 2024	Community Advisory Committee Meeting	Land Use Alternatives
August 20, 2024	Planning Commission	Land Use Alternatives
September 19, 2024	Downtown Advisory Committee	Land Use Concepts, Development Opportunity, Open Space and Transportation Studies
September 24, 2024	Climate Policy Advisory Team	Greenhouse Gas Inventory, Vulnerability and Risk
October 15, 2024	Planning Commission	Climate and Resiliency Element
October 22, 2024	Community Summit #2	Draft Land Use Alternatives
Fall 2024	Online Map Survey	Draft Land Use Alternatives
November 12, 2024	Climate Policy Advisory Team	Climate Resilience, Greenhouse Gas Reduction Goals, Climate Policy, Overburdened Communities
December 9, 2024	Community Advisory Committee Meeting	Preferred Alternative, Draft Goals and Policies
December 9, 2024	Downtown Advisory Committee	Draft Plan Outline, Policies
December 17, 2024	Planning Commission	Preferred Alternative
January 23, 2025	Climate Policy Advisory Team	Climate Resilience and Greenhouse Gas Reduction Policies
February 18, 2025	City Council Workshop	Preferred Land Use Alternative

Draft Plan and Final Plan Development

During the penultimate phase of the project, the City sought feedback on the draft plan elements. Community Summit #3 was a multi-month series with a new focus element every two weeks. During the two weeks, the project website hosted the draft element for review and a survey asking for feedback. Additionally, during each two-week section, a "Chat with a Planner" was scheduled to allow members of the public to speak directly with planning staff, ask questions, and provide feedback on the draft plan. Feedback from this summit was used to revise the goals and policies of each element.

Date	Event	Topic
March 24, 2025	Downtown Advisory Committee	Downtown Design Guidelines Manual, Policies
March 27, 2025	Climate Policy Advisory Team	Goals and Policies
April 14, 2024	Community Advisory Committee Meeting	Comprehensive Plan Elements
April 15, 2025	Planning Commission	Housing and Economic Development Elements

Date	Event	Topic
April 21, 2025	City Council Workshop	Housing and Economic Development Elements
September – December 2025	Community Summit #3	Review and Comment on Draft Comprehensive Plan Elements
September 8, 2024	Community Advisory Committee Meeting	Zoning Code, Downtown Subarea Plan
September 15, 2025	City Council Workshop	Project Update
November 17, 2025	City Council Workshop	Land Use Element
December 15, 2025	City Council Workshop	Draft Downtown Subarea Plan Review
December 16, 2025	Planning Commission	Draft Downtown Subarea Plan Review
January 5, 2026	City Council Workshop	Preferred Land Use Alternative

Plan Adoption

Planning staff presented at the Planning Commission and City Council numerous times during the adoption phase to share the draft zoning code and final drafts of the Comprehensive Plan, Downtown Subarea Plan and Downtown Design Manual. Feedback from the Planning Commission and City Council were incorporated into the versions that were adopted at the end of the project. The City submitted the draft Comprehensive Plan, Downtown Subarea Plan and Zoning Code to the Department of Commerce, Washington Department of Transportation and the Regional Transportation Council for review and comments. Based on the comments received at the Planning Commission and City Council meetings, as well as from the Department of Commerce, WSDOT, and the RTC, the Plans and Code were modified to align with partner and community feedback and the requirements of the Growth Management Act. In addition to updates to the Comprehensive Plan, Downtown Subarea Plan and Zoning Code, staff presented updates to the Planning Commission and City Council regarding the Capital Facilities Plans (water, sewer and transportation). This is a key implementation step post adoption of the plans and zoning code.

Date	Event	Topic
March 17, 2026	Planning Commission	Code Updates
April 21, 2026	Planning Commission	Code Updates
May 19, 2026	Planning Commission	Code Updates
June 16, 2026	Planning Commission	Code Updates
July 21, 2026	Planning Commission	Code Updates
August 3, 2026	City Council Workshop	Code Updates
August 17, 2026	City Council Workshop	Code Updates
August 18, 2026	Planning Commission	Code Updates
September 8, 2026	City Council Workshop	Code Updates
September 15, 2026	Planning Commission	Our Camas 2045 Planning Commission Hearing
September 21, 2026	City Council Workshop	Code Updates
September 29, 2026	Planning Commission	Our Camas 2045 Planning Commission Recommendation
October 5, 2026	City Council Workshop	Our Camas 2045 Planning Commission Recommendation

Date	Event	Topic
October 19, 2026	City Council Regular Meeting	Public Hearing - Our Camas 2045 Comprehensive Plan Periodic Update
October 20, 2026	Planning Commission	Our Camas 2045 - Capital Facilities Plans

Attachments

The following attachments provide additional details on engagement related materials and summaries.

- Camas 2045 Public Participation Plan
- Visioning Outreach Summary
- Visioning Outreach Summary Appendix
- Community Summit 1 Summary
- Community Summit 2 Summary
- Community Summit 3 Summary
- Community Advisory Committee Meeting 1 Agenda and Summary
- Community Advisory Committee Meeting 2 Agenda and Summary
- Community Advisory Committee Meeting 3 Agenda and Summary
- Community Advisory Committee Meeting 4 Agenda and Summary
- Community Advisory Committee Meeting 5 Agenda and Summary
- Community Advisory Committee Meeting 6 Agenda and Summary
- Community Advisory Committee Meeting 7 Agenda and Summary
- Community Advisory Committee Meeting 8 Agenda and Summary
- Climate Policy Advisory Team Meeting 1 Agenda and Summary
- Climate Policy Advisory Team Meeting 2 Agenda and Summary
- Climate Policy Advisory Team Meeting 3 Agenda and Summary
- Climate Policy Advisory Team Meeting 4 Agenda and Summary
- Climate Policy Advisory Team Meeting 5 Agenda and Summary
- Downtown Advisory Committee Meeting 1 Agenda and Summary
- Downtown Advisory Committee Meeting 2 Agenda and Summary
- Downtown Advisory Committee Meeting 3 Agenda and Summary
- Downtown Advisory Committee Meeting 4 Agenda and Summary
- Downtown Advisory Committee Meeting 5 Agenda and Summary
- Downtown Advisory Committee Meeting 6 Agenda and Summary

Camas Comprehensive Plan Update and Downtown Subarea Plan

Public Participation Plan

February 9, 2024

Project Overview

The City of Camas seeks to update its Comprehensive Plan and to account for 20 years of growth and remain consistent with the requirements of the Growth Management Act (GMA). Per the GMA, comprehensive plans are required to contain certain elements including land use, housing, capital facilities, utilities, transportation, economic development, and parks. New considerations stemming from recent state mandates in the GMA include housing, critical areas, and the recently released guidance on climate change. The City of Camas also seeks to create a Downtown Subarea Plan that will coincide with the Comprehensive Plan update. This plan will consider the direction for sub-districts, land use and density, connectivity and mobility systems, potential redevelopment sites, gateways, and activity centers.

To ensure the Comprehensive Plan and Downtown Subarea Plan reflect the needs of community members, a robust public involvement process that reaches a large segment of Camas's population is essential. The purpose of this document is to outline an array of tools that will be employed to reach a diverse set of Camas stakeholders who will help guide the development of the Comprehensive Plan Update and Downtown Subarea Plan.

Community Engagement Objectives

The public involvement process aims to meet the following objectives:

- Inform the community with timely, transparent, and accurate information.
- Educate community members about planning, the Growth Management Act, and decision-making processes.
- Consult and involve the community in the identification, refinement and prioritization of policy updates needed to guide growth and development in Camas over the next 20 years as well as for the Downtown Subarea Plan. Ensure community members understand how decisions are made, their concerns are heard, and they know how their feedback influenced decisions.
- Partner with city and agency representatives to ensure officials are engaged in the planning process and key decisions.
- Reach a diversity of stakeholders who reflect Camas's greater community.

Key Messages

- The City of Camas is launching *Our Camas 2045*, a citywide effort to develop a new, community-wide vision for the future and update the Camas Comprehensive Plan to reflect that vision.
- Washington requires that all cities and counties plan for managing growth over a 20-year horizon, including changes in population, demographics, housing and employment trends.
- The Comprehensive Plan is Camas's primary planning document. It articulates the city's vision for future land use, housing, capital facilities, utilities, transportation, economic development, and parks.
- The City of Camas is also launching *Our Downtown Camas 2045*, a concurrent planning process to establish a more detailed vision and action plan to preserve and enhance our historic downtown's unique sense of place.
- The City of Camas is committed to an inclusive and transparent planning process. Community engagement is crucial to understanding the community's core values and developing an equitable, representative plan.
- There will be many opportunities for community members to engage throughout the planning process, with a focus on accessible opportunities to provide feedback.
- Community members can stay engaged by visiting the project website: https://engagecamas.com/

Community Demographics

The following demographic profile helps identify priority populations and tailor outreach methods to reach the full spectrum of Camas residents and property owners. Demographic data is derived primarily from the U.S. Census American Community Survey 5-Year Data 2017-2021 Data Profile. According to Census Bureau Population Estimates, Camas's population reached 27,371 as of July 1, 2022.

Race and Ethnicity

According to 2017-2021 American Community Survey data, 78 percent of Camas residents identify as White. The remainder of residents identify as African American (1.6%), American Indian/Alaska Native (1.0%), and Asian (10.6%). 8.0 percent identify with two or more races. 3.8 percent of Camas residents identify as Hispanic or Latino.

Race/Ethnicity	City of Camas	Washington
White	78.0%	71.7%
African American	1.6%	3.9%
Asian	10.6%	9.0%
Native Hawaiian and other Pacific Islander	0.1%	0.7%
American Indian or Alaskan Native	1.0%	1.2%
Two or more races	8.0%	8.6%
Hispanic or Latino (any race)	3.8%	13.2%

Languages Spoken at Home

86.7 percent of Camas residents are English speakers. The language spoken most commonly other than English are Indo European languages (5.9%) as well as Asian and Pacific Islander languages (5.5%). Smaller portions of the population speak Spanish (1.4%).

Age

The City of Camas has a larger share of residents 19 and under (29.0%) than the State of Washington (24.4%). There is also a significant portion of those who are between 35 and 54 years old (32.0%). Consequently, there are smaller shares of residents who are between the ages of 20-34 (12.7%) and those who are 75 years and older (4.0%) than Washington (21.4% and 5.8%). Camas's other age group sizes are roughly on par with State averages.

Age	City of Camas	Washington
19 years and under	29.0%	24.4%
20 – 34 years	12.7%	21.4%
35 – 54 years	32.0%	26.0%
55 – 64 years	12.9%	12.7%
65 – 74 years	9.3%	9.6%
75 years +	4.0%	5.8%

Income

From 2017-2021, the median household income in Camas was $121,094, which is higher than the state median ($82,400). More than half of Camas households earn more than $100,000 annually, compared to the State average of 40.9%.

Income	City of Camas	Washington
<$15,000	4.9%	7.1%
$15,000-$25,000	3.8%	5.9%
$25,000-$50,000	9.3%	16.5%
$50,000-$75,000	15.0%	16.3%
$75,000-$100,000	8.9%	13.4%
$100,000+	58.1%	40.9%

People with Disabilities

Census data indicates that 17.3 percent of Camas residents live with a disability. This is lower than the Washington state average of 25.4 percent. The highest percentages of those with disabilities have a hearing (3.9%) or cognitive (3.8%) disability.

Housing

Census data indicates that more than 83 percent of Camas residents live in a single-family detached home, which is greater than the State of Washington (63.0%). Around 9.7 percent of Camas residents live in middle housing (1 to 4 attached units), 5.3 percent occupy multi-family homes (5 or more attached units), and about 1.2 percent live in a mobile home. 79.9 percent of Camas residents are

homeowners and 20.1 percent are renters. ACS 2017-2021 shows that median gross rent in Camas was $1,504.

Housing Type	City of Camas	Washington
Single-family home	83.8%	63.0%
Middle housing	9.7%	10.0%
Multi-family home	5.3%	20.9%
Mobile home	1.2%	5.9%
Homeowners	79.9%	63.6%
Renters	20.1%	36.4%

Underserved Populations

The City of Camas is committed to facilitating extensive and equitable community engagement for the Comprehensive Plan Update and Downtown Subarea Plan. To ensure full and fair participation by all potentially affected community members in the decision-making process, engagement activities and tools will focus on meeting underserved groups where they are. The following describes priority populations for this process.

Census demographic information indicates that second most spoken language besides English are Indo-European Languages (5.9) and Asian and Pacific Islander Languages (5.5%) in Camas. About 10.6 percent of the community also identified as Asian. The City may consider translation of materials in relevant languages, and hosting public activities in non-governmental, community spaces that are comfortable and welcoming to those who speak limited English.

The City of Camas is also shown to have significantly higher proportions of youth (19 and under). To reach the youth of Camas, engagement activities should be centered around youth-oriented events and activities. Local schools, after school programs, and youth groups may be considered for community conversations and surveys or notified of engagement opportunities.

While the City of Camas does have a lower proportion (17.3%) of those with disabilities than Washington (25.4%), engagement activities should be made accessible and include accommodations for people of all abilities. Among identified groups in the census, those with hearing impairments are the higher than others (3.9%). Engagement events should consider the accessibility of community spaces and venues, including provision of hearing impairment accommodations, as well as access to transportation options.

Although Camas's median household income is higher than Washington, approximately 18 percent of Camas households still earn less than $50,000 a year. Access to technology to participate in engagement activities, as well as access to transportation and childcare during engagement activities should be considered when taking an equitable approach. While the City of Camas has a lower percentage of renters and people living in multifamily housing, citywide mailings could ensure all residents regardless of housing type and tenure are informed and engaged.

Stakeholders and Partners

Community members and stakeholders will have multiple opportunities to participate in the Comprehensive Plan Update and Downtown Subarea Plan processes. This section identifies the spectrum of stakeholders and the variety of ways in which the City will engage community members in the process.

Interests	Specific Organizations
Schools/Youth	Camas School District- Citizen Advisory Committee Dorothy Fox Elementary PTA Grass Valley Elementary PTA Helen Baller Elementary PTA Lacamas Lake Elementary PALS Prune Hill Elementary PTA Woodburn Elementary PTA Middle School and High School student groups Clark College Camas Montessori C-W Parent Co-Op Preschool Tree Hill Learning Center Boys and Girls Club 4-H Programs Camas Little Leage Camas Educational Foundation (CEF)
Parks and Nature	Camas Parks & Rec Department Clark County Parks Department Lacamas Trails Advocacy Group Parks and Recreation Commission Parks Foundation Clark County Camas Parks Foundation
Industry and Businesses	Downtown Camas Association (Economic Vitality Committee; Downtown Merchants Committee) Chamber of Commerce Port of Camas-Washougal Columbia River Economic Development Council (CREDC) Franchise utility companies
Public Safety	Camas Police Department Camas-Washougal Fire Department Station 42 East County Fire and Rescue Station 91
Utilities	Waste Connection NW Natural Gas Clark Public Utilities

Interests	Specific Organizations
Developers/Property Owners	Property Owners Port of Camas-Washougal Homeowners Associations Habitat for Humanity Clark County Housing Authority Vancouver Housing Authority Building Industry Association (BIA)
Health	Legacy Medical Group-Camas Camas Center Clinic (Kalispel Tribe of Indians)
Transportation	C-Tran Clark County Transportation Alliance SW WA Regional Transportation Commission Bike Clark County
Service Non-profits	The Columbia Future Forge Camas Community Education Camas-Washougal Community Chest Camas-Washougal Wildlife League Camas Lions Club Rotary Club of C-W Inter-faith Treasure House Meals on Wheels Booster Club Vancouver NAACP
Non-native English Speakers	APANO Latino Community Resource Group (LCORG)
Arts and Culture	Clark County Arts Commission DCA Design Committee Camas Artisans Guild Camas Library Camas Library Book Clubs 411 Art Collective
State Agencies	WSDOT Clark County
Faith Based Organizations	NorthLake Church Journey Church Zion Lutheran Church Elca Northwest Gospel Church Camas United Methodist Church Camas Friends Quaker

Interests	Specific Organizations
	St. Thomas Aquinas Catholic Church Activate Church
Elected and Appointed Officials	City Council Planning Commission Boards and Commissions
Accessibility	Council for the Homeless Camas View Senior Care Forest Home Elder Care Adult Family Home Lacamas Heights Memory Care PEACE NW Stephen's Place Washington State School for the Blind (WSSB)
Environmental	Camas Washougal Community Chest Columbia Springs Columbia Land Trust

Engagement Activities

The following table summarizes primary community engagement activities, their intended audience, and partners needed to carry out the activities while using the IAP2 engagement spectrum.

The IAP2 Spectrum is an internationally recognized model developed to help clarify the role of the public in planning and decision making, and how much influence the community has over planning or decision-making processes. The model identifies 5 levels of community engagement, ordered as follows by increasing impact on decision-making: (1) inform; (2) consult; (3) involve; (4) collaborate; and (5) empower.

Engagement Tool/Activity	IAP2 Spectrum	Description	Audience
Project Advisory Committee (PAC)	Inform Consult Involve	The PAC will meet up to eight (8) times to advise on the Comprehensive Plan Update and Downtown Subarea Plan process. The PAC will consist of technical stakeholders, agency partners and service providers to work alongside the CAC. They will review project materials and advise on technical issues.	Interest Groups Technical Groups
Community Advisory Community (CAC)	Inform Consult Involve	The Community Advisory Committee (CAC) will meet up to eight (8) times. The committee will represent a broad cross-section of community interests. The CAC will review and comment on work products, guide public outreach and engagement efforts, act as liaisons to specific constituencies or interest groups, help host public events, encourage community members to participate in the	Public Interest Groups

Engagement Tool/Activity	IAP2 Spectrum	Description	Audience
		process, and act as champions of the ultimate Camas Vision, Comprehensive Plan, and Downtown Plan that emerge from this process.	
Downtown Camas Association (DCA) Meetings	Inform Consult Involve	The Consultant Team will attend up to eight (8) meetings with the Downtown Camas Association (DCA) at key project milestones. Meetings will be held with the DCA board or subcommittees.	Public Interest Groups
Interested Party Interviews	Inform Consult Involve	Up to (6) interviews with interested parties will be conducted. Interviews will help build relationships with trusted community leaders and identify important issues, challenges, and assets at the outset of the project.	Stakeholders Public
Community Conversations & Events	Inform Consult	Up to ten (10) Community Conversations will be conducted by the project team, City staff and CAC members. Community Conversations will provide community members with information about the project and engage them in discussion about what they value about Camas today and what could make it a better place to live in the future. Up to five (5) community events will involve visioning activities through an informational table/booth or intercept surveys. Visioning activities will be designed to create awareness of the project and engage youth and adults in identifying what they love about Camas today and what they would change to make Camas an even better place to live, work and play in the future. Events could include: • Little Art Camas • Camas Farmer's Market • Camas Days • First Fridays • Plant and Garden Fair	Public
Surveys & Online Engagement	Inform Consult	Four (4) online community forums or surveys to gather the general interests and positions of the public will be created. Digital surveys will be provided through Engage Camas, and paper surveys will be distributed or conducted as intercept surveys at strategic locations around the city. Surveys will coincide with each of the (4) rounds of public involvement and provide an alternative opportunity to comment for those who may not come to a meeting or	Public

Engagement Tool/Activity	IAP2 Spectrum	Description	Audience
		event or feel comfortable voicing their opinions among others.	
Community Summits	Inform Consult Involve	Four (4) Community Summits throughout the course of the project will be held. These fun and engaging community events are the main opportunities for Camas community members to engage and share ideas with their neighbors face-to-face regarding the Vision, Comprehensive Plan, and Downtown Plan. To encourage participation, snacks/beverages and activities for children will be provided.	Public

Communication Tools

In addition to the above activities, the following communication tools will provide information about events, activities, and opportunities to be involved in developing the Comprehensive Plan Update and Downtown Subarea Plan.

Communication Tools	Description
Project Website	The website page will utilize the Engage Camas platform and will function as an information and engagement hub for the project. It will be used for outreach activities such as online surveys and virtual meetings as well. A project overview, timeline, important contacts, schedules for public events, surveys, and other engagement activities, updates on the project's status, and the ability to view or download documents will be available on this webpage.
Social Media	Content will be prepared for social media platforms, such as Facebook and Instagram accounts to increase project awareness and provide multiple avenues for community input.
Media Contacts	Media releases to the Camas-Washougal Post Record and other local media outlets will be prepared for the City to distribute.
Public Information Materials	Flyers, newsletters, facts sheets and other materials to educate and inform the public will be prepared.
Electronic Mailing List	The City will maintain a database of e-mail addresses of people who express interest in the planning process. E-blasts for the City to distribute to help notify people about events and activities will be prepared. Interested parties will have several opportunities to join the mailing list, such as on the project website and at public meetings and events.

Risks and Mitigation Engagement Activities

The following table summarizes potential risks and suggested mitigations.

Risks	Mitigation	Stakeholder(s) Affected
Low attendance at public forums	Community event notices are shared through e-blasts, social media, website, at public events and in print materials, and distributed by CAC members.	General public
Low response rate for surveys	Surveys are shared through e-blasts, social media, website, at public evets and in print materials, and distributed by CAC members.	General public
Limited communication and buy-in from agency and city partners	Advisory Committee meeting summaries are shared in a timely manner with city and agency partners. Planning Commission and City Council updates occur throughout the project.	Agency partners, City, general public
Inadequate or poor media coverage	Press release published prior to each community event; Press invited to attend committee meetings and public events; Detailed and up to date information on the website.	Agency partners, City, general public
Lack of variety in stakeholders engaged	Committee meetings and public events held at a variety of venues that meet stakeholder needs. Direct outreach to stakeholder and community organizations that represent a broad cross section of the Camas community.	General public

Evaluation

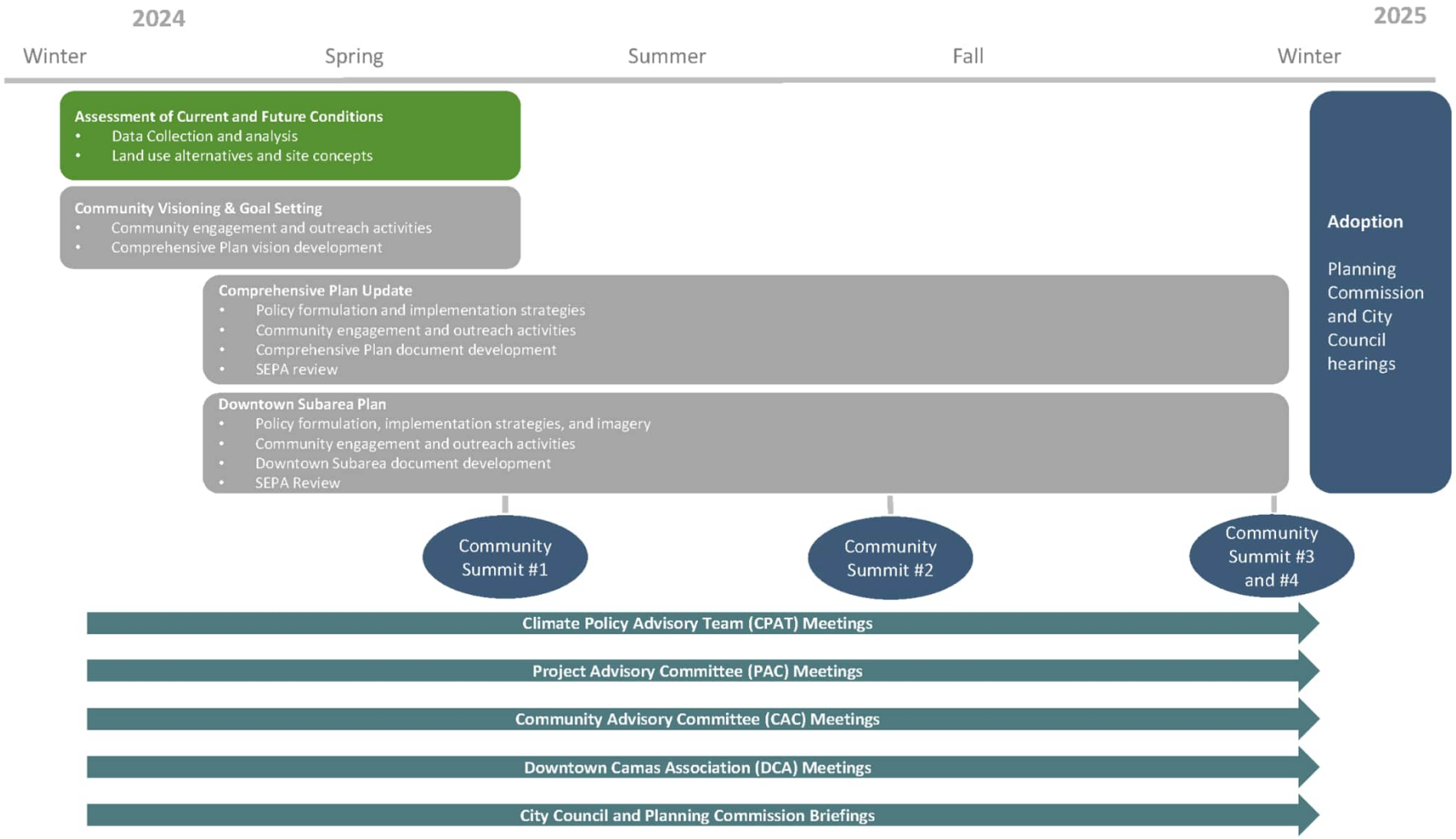
The following table describes the key metrics and processes for evaluating progress on meeting the goals set out in this public engagement plan. The project team will evaluate progress made toward meeting these goals throughout the duration of the project.

Goal	Objective	Metric	Tool
Inform: inform the community with timely, transparent and accurate information.	• Community event attendees report high satisfaction with information shared at forums • Web traffic increases throughout the process • Social media engagements increase throughout the process	• >75% attendees are satisfied with information shared • >75% attendees are satisfied with transparency of process • Increase in web traffic throughout process • Increase in social media engagement throughout process	• Online survey • Web analytics • Social media analytics • Event questionnaires and comment forms
Consult: consult and involve the community in the identification, refinement and prioritization of plan updates. Ensure community members understand how decisions are made, have their concerns heard and learn how their feedback influenced project decisions.	• Community event attendees report high satisfaction with opportunities to engage in sharing feedback • Stakeholder feedback is plentiful • Stakeholder feedback and decisions are published within a timely manner • Information is shared back with stakeholders about how their feedback influenced the plan	• >75% attendees are satisfied with opportunities to share feedback • 200+ residents respond to surveys • 50+ residents attend public events • Website includes information on feedback and how it influenced policy • CAC meeting summaries are uploaded to website within 20 days	• Online survey • Online survey analytics • Community event sign-in sheet • Web content (Project library) • Event questionnaires and comment forms

Partner: partner with city and agency representatives to ensure officials are engaged in the planning process and key decisions.	• City Council and Planning Commission are satisfied with frequency and quantity of information shared	• City Council and Planning Commission receive a planning update either in writing or through regular briefings	• City Council and Planning Commission engagement at briefings and attendance at key community events
Reach: reach a diversity of stakeholders that reflect Camas' community.	• Each stakeholder interest is represented • Community events are hosted at accessible and representative venues • Specific outreach methods are used to reach minority populations including people of color people experiencing low income, renters, and seniors.	• Community members from all interests identified in the stakeholder interest matrix are engaged at some point throughout the process • 100% of venues are ADA accessible • Venue reflects diverse interests	• Community events sign in sheets • Venue list • Mailers • Print materials

Project Schedule

This schedule outlines engagement activities and key milestones throughout the project.



OurCamas2045 Visioning Outreach
Summary of Engagement Results
October 2024

Project Overview

The City of Camas is undertaking a multi-year initiative to update the City's Comprehensive Plan. The Our Camas 2045 Comprehensive Plan will establish a vision for growth and development and will articulate goals, objectives, policies, and actions to guide our future through 2045. The plan will also address recent changes to Washington's Growth Management Act related to housing and climate change. In conjunction with Our Camas 2045, the City of Camas is developing a downtown subarea plan to establish a more detailed vision and action plan to catalyze public and private investment in our historic downtown that preserves and enhances its unique sense of place. Our Downtown Camas 2045 will be a visionary roadmap that honors our rich heritage and maintains our hometown feel while setting the stage for a thriving future.

Beginning in December 2023, City staff and the consultant teams led outreach efforts to better understand the community's vision and priorities related to Camas' future. As of October 2024, the *Our Camas Visioning* process has reached over 1,000 community members through Community Conversations, Community Events, online surveys, online mapping tools, and the project website. The main purpose of the initial outreach effort was to ask the following questions:

- *What makes Camas, including our historic downtown, special today? What should we strive to preserve or enhance?*
- *What about Camas, including our historic downtown, would you like to change in the future? What can improve?*

While there was variation in how these broad questions were posed across different activities, they were designed to identify common themes around the aspirations and concerns of Camas residents and business owners, which is a key piece to the development of the vision statement for both downtown and the broader community. After each engagement activity, all information received was reviewed and stored within the online survey database, either through individual survey responses or manual input (which is noted within the survey system) of notes from events and activities.

This summary provides a review of the various outreach efforts and summarizes the key themes that emerged from these activities through tagging of community

conversations, event notes, and survey responses. The raw survey data, which includes the notes and feedback from community conversations and events, is included in the Appendix to this document. Note that this is not a statistically valid survey and is only meant to qualitatively explore the future of Camas.

Engagement Activities

Community Conversations

To reach a wide spectrum of Camas community members, project staff and members of the Community Advisory Committee (CAC) facilitated community conversations with local groups, clubs, committees, and organizations in Camas.

While most community conversations were facilitated by City staff, project staff and CAC members, a "Community Conversation Kit" was available on the project website for anyone to download and conduct among their own networks.

Fourteen community conversations were conducted with the following groups, engaging approximately 558 community members in Camas:

- City Council
- Camas Library Board of Directors
- Columbia Ridge Assisted Living
- Chamber of Commerce
- Downtown Camas Association
- Skyridge Middle School
- Prune Hill Residents
- Camas Planning Commission
- Holly Hills Residents
- Camas City Directors
- Downtown Merchants
- Camas Parks and Recreation Commission
- Camas Lions Club
- Camas High School



Camas High School Community Conversation

Community conversations were held in-person, and the discussion questions followed the same questions posed through the online questionnaire. These discussions helped extend the reach of the online questionnaire. Notes from discussion leaders were manually inputted to the questionnaire and marked as a community conversation.

Community Events

Starting in April, the project team kicked off the beginning of presence at community events. Tabling at community events provides a unique opportunity to reach many people in one place. Materials for tabling were designed to receive community feedback, build project awareness, drive people to the project website, and promote opportunities to get involved.



Downtown Camas First Friday Event

- Downtown Camas First Fridays
- Camas Days

On June 12th, the City of Camas hosted Our Camas 2045 Community Summit #1. The purpose of this event was to report back on the outreach and engagement activities that took place over Spring 2024, reveal the draft and ask for feedback on the Our Camas 2045 Vision Statement and Goals, and to identify the community's big ideas for achieving the vision and goals. More than 40 community members participated in the event at the Lacamas Lake Lodge, where kids activities and refreshments were provided.

A wide range of participants included residents, business owners, families with children, and elected officials. A compilation of the raw notes from the comment forms and poster boards are included in Appendix.



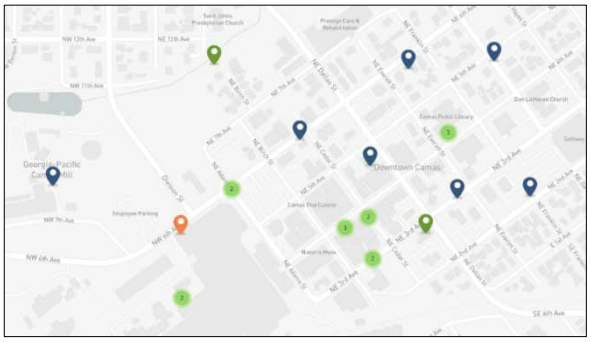
Our Camas 2045 Community Summit #1

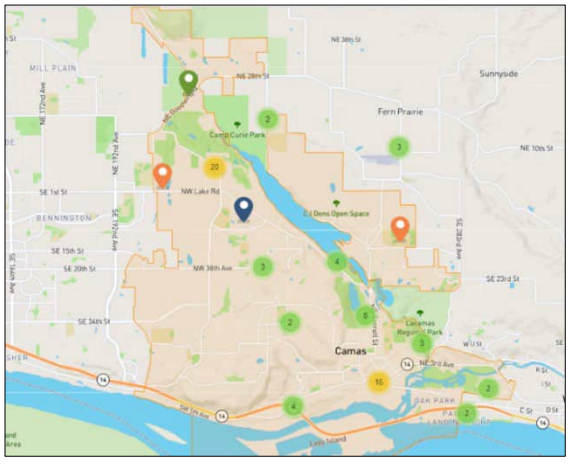
Online Engagement

Running concurrently with outreach through Community Conversations and community events, an initial online questionnaire and interactive map were launched in early February 2024. A citywide mailer was sent to all Camas residents to announce the launch of the project and promote the project website and online engagement activities.

The initial questionnaire received 367 responses, accessed through the City's *Engage Camas* online platform, which has received over 2,000 visitors to the site.

In addition to the first questionnaire, an interactive online map provided the opportunity for participants to identify and describe areas of opportunity or concern both in the downtown and in the wider Camas community. Overall, the interactive map received 146 pins.





Following Summit #1, an online survey complimentary to the summit was launched as an opportunity for community members to participate who were unable to attend the event.

Topics and Key Themes

The following is a list of topics that emerged from the outreach conducted through the initial visioning process. These topics are a synthesis of the comments shared by Camas residents and business owners when they describe what they love about their community today, and what they want to see in the future. The word clouds provide a visual representation of the most repeated phrases.

What makes Camas, including our historic downtown, special today? What should we strive to preserve or enhance?

City-wide

- Family-friendly
- Outdoor Access
- Trails
- Small-town feel
- Safety
- Community
- Cleanliness
- Art
- Parks
- Beauty
- Community Events
- Natural Resources

Downtown

- Walkability
- Charm
- Trees
- Historic



What about Camas, including our historic downtown, would you like to change in the future? What can improve?

City-wide

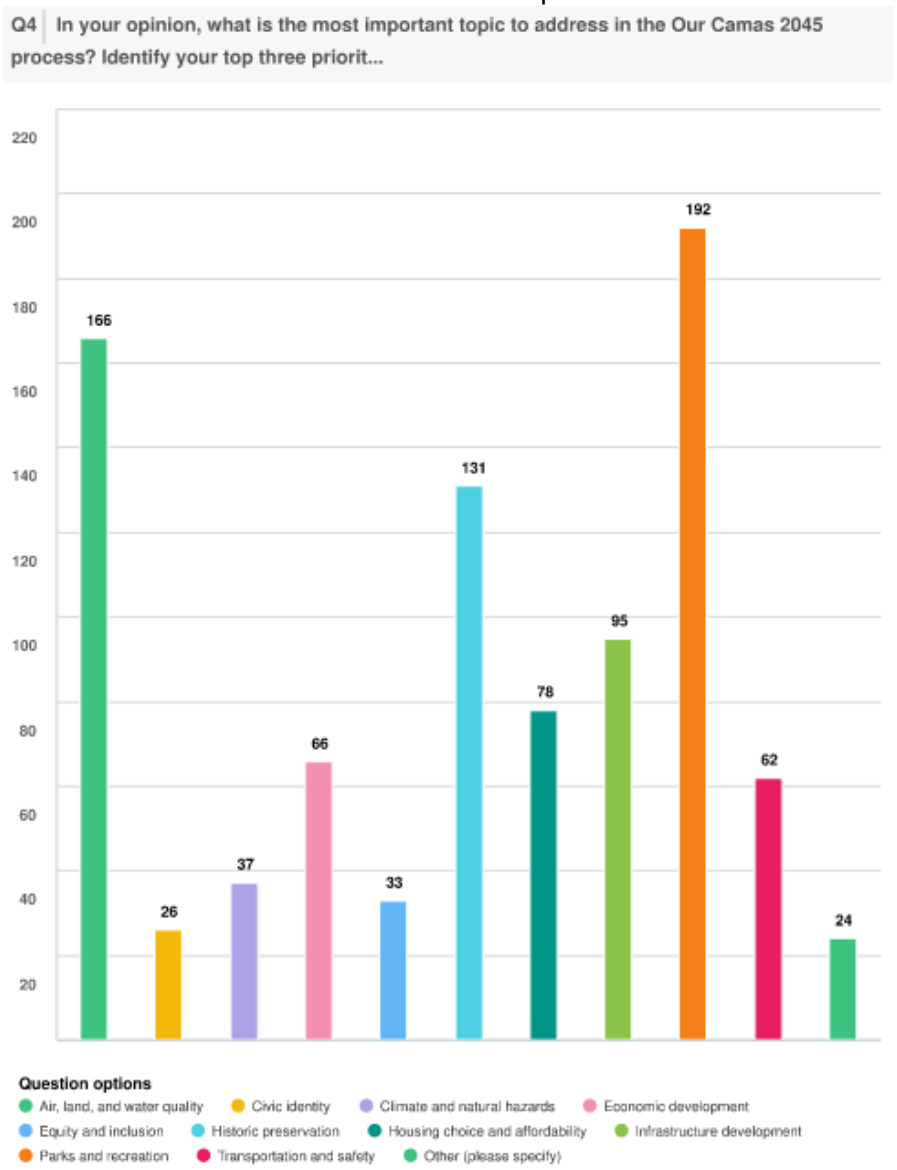
- Equity
- Support diversity
- Celebrate history
- Community pool
- Prioritize infrastructure
- Gathering space
- Lake quality
- Improve walkability
- Enhance parks
- Increase green space

Downtown

- Better parking
- More restaurants
- Less Church property
- More businesses
- Redevelop Paper Mill
- Expand downtown
- More hotels
- Maintain landscaping
- More entertainment
- Develop waterfront

- Dog park
- Smart growth
- Encourage employment
- Youth activities
- Better communication
- Building facade
- Trees
- Improve bike facilities
- Traffic
- More housing
- Affordability
- Support Emergency Services
- Maintain/increase safety
- Maintain cleanliness
- Add High School
- Increase trail connectivity
- Preserve open space
- Plan for Natural Hazards
- Support education
- Improve environment
- Reduce temporary camping
- More community events
- Public transit
- Neighborhood centers
- Recreational opportunities
- Reduce speeding
- Facility maintenance
- Accessibility
- More parks

In addition to these two broad visioning questions, the online questionnaire also asked respondents to identify the most important topics to address through the *Our Camas 2045* Comprehensive Plan and Downtown Subarea Plan process. Parks and Recreation, Air, Land, and Water Quality, and Historic Preservation were the top three topics that respondents chose as seen below in a snapshot of the results.



Based on the topics that were uncovered through the visioning process, four key themes emerged that captured the sentiment and aspirations of Camas residents and businesses owners about the future of their community. An assessment of the outreach feedback is organized around these four key themes, which serve as the foundation of the *Our Camas 2045 Vision Statement*.

Our Community:
The questionnaire's results show support for more community events and activities to add to existing programming. There were requests for better communication with residents, more involvement in decision-making processes and the welcoming of new families moving into the area through informational welcome packets. Respondents share concerns about taxation, zoning, and development decisions. Many respondents also call for more community facilities like a swimming pool, youth center, and more recreational activities such as parks, trails, and sports facilities. Lastly, some suggestions call for improving access to education, including the need for more schools and support for innovative education models.

Positive feedback was offered on the community feel and connection, shown in in sentiments like "it's a great mix of people, a safe place for families, and has a small-town community feel" and "I think the city still offers a feel of community that is lost in some places." Many point to the downtown as the center of the Camas community, noted in responses like "the downtown corridor is the foundation of Camas" and "the DCA (Downtown Camas Association) is critical in creating a welcoming atmosphere." There is strong support for locally owned businesses, seen through responses like "small family-owned businesses" and "local businesses, walkability." Emphasis was seen on preserving the small-town feel through responses like "preserve the small-town feel" and "don't turn it into a crowded, noisy place!"

Our Environment:
The questionnaire's results highlight care and passion for the many opportunities for access to nature and the outdoor recreation opportunities offered by the regional outdoor access, lakes, the waterfront, and hiking trails. Concerns were voiced about water quality in lakes seen through responses like "water quality in lakes" and "clean up the lake." Respondents noted the need for clean-up and maintenance to preserve the natural beauty and green spaces.

Many respondents spoke positively about the City's access to nature through statements like "access to nature on a daily basis is very important to me" and "nature, calmness/peace are what I think of with Camas." Emphasis was placed on the beauty, greenery, and trails, seen through responses like "I love our beautiful eclectic town" and "trails, green space and parks."

Our Neighborhoods:
The questionnaire's results ask for better management of growth, specifying the need for infrastructure considerations prior to additional housing development, shown in

responses like "developers are building housing developments faster than our infrastructure and the schools can handle them" and "growth needs to be better managed." Concerns were voiced about parking availability and infrastructure improvements such as improved streets, sidewalks, and central gathering places like parks or a town square. Emphasis was placed on improving walkability with better sidewalks, bike lanes, pedestrian-only areas, and safer pedestrian crossings, as well as reducing car traffic in downtown areas. Specific responses seen were "Strive for more large sidewalks" and "Walkability and food; shopping options downtown."

Positive feedback was given on the current state of the City's safety, cleanliness, quietness, and quality of schools. Responses indicated "it's a safe and clean community" and Camas is a "small, quiet, clean town." Emphasis was placed on slowing down development and preserving existing buildings, with comments that expressed " many things have changed over the past 15 years" and "it's sad to see buildings destroyed for what some feel is 'improvement'."

Our Downtown:
Respondents call for maintaining and preserving the historical significance of Camas, including educating youth about the town's founding and heritage. There is considerable appreciation for the quaint, historic downtown area, noted in responses like "it is a tight knit community," "the small-town feel" and "I love the older buildings downtown with the lighted trees."

There is a strong desire to preserve downtown's charm and ambiance, expressed in comments such as "preserve the small-town vibe" and "preserve the heritage and hardworking culture of the past." Emphasis was placed on the feel and the draw offered by downtown and its local businesses, noted in responses like "our quaint historic downtown area, wonderful shops and restaurants" and "love the 'community' feel, the downtown area is quaint and enjoyable."

Every key theme has ties to the downtown core, with specific suggestions for downtown development including building a parking garage, revitalizing existing parks through the addition of new play structures, restrooms, and water fountains, preserving the historic look and feel of the area, and attracting more diverse businesses, shown in responses like "continue to encourage businesses to develop in the downtown area" and "continue investment in the downtown core."

Respondents express a strong desire for downtown to be more pedestrian-friendly, with respondents saying, "make the downtown core walkable (vehicle free), with ample parking around it" and "make the entire downtown core a pedestrian zone." There is a

strong interest in more dining and restaurant options, with nearly 40 mentions of the word "restaurant" in the survey analysis. This is supported by sentiments like "add more restaurants, cafes, wine bars" and "[I] would like to see more shops/restaurants and other business that make it fun to spend an afternoon shopping and eating."

Lastly, there are some differing opinions on increasing housing downtown, but more often, respondents note the need for more downtown housing options in addition to hotels and places for visitors to stay. Specifically, people mentioned supporting "downtown businesses by including more housing" and "more housing downtown and throughout town for all income levels."

Conclusion

The raw survey data, which includes the notes and feedback from community conversations and events, is included in the Appendix. All comments received through community conversations and community events were inputted into the questionnaire to build an online database of feedback. Information from this summary was used to craft the *Our Camas 2045 Vision Statement for* the Comprehensive Plan update and Downtown Subarea Plan process.

Our Camas 2045: Vision Survey

SURVEY RESPONSE REPORT
01 December 2023 - 15 May 2024

PROJECT NAME:
Our Camas 2045

SURVEY QUESTIONS

Q1 Why do you choose to live and/or work in Camas?

Screen Name Redacted 2/09/2024 07:21 PM	When I originally purchased property here in Camas it presented as a small town that valued exactly that- a small town culture of safe protection. Boy was I wrong!
Screen Name Redacted 2/09/2024 09:12 PM	I moved to Camas specifically because of the downtown area. I have lived by Crown Park and now live by Doc Harris, and specifically live close to the center of downtown because it is what makes our city special.
Screen Name Redacted 2/10/2024 07:55 AM	I was born and raised in Washougal and I love our beautiful eclectic town.
Screen Name Redacted 2/10/2024 09:40 AM	Schools, nature, small town feel
Screen Name Redacted 2/10/2024 11:47 AM	I moved to Camas because I liked the simple small town feel. I loved how kind and inviting people were and how safe it was.
Screen Name Redacted 2/10/2024 11:14 PM	Community and culture
Screen Name Redacted 2/11/2024 10:27 AM	It is safe for raising a family. It is close to parks and nature with a strong community feel rather than an unplanned urban sprawl.
Screen Name Redacted 2/12/2024 10:02 AM	nature, calmness/peace are what I think of with Camas. Camas is ideal in its environmental setting--- with the lakes & rivers providing so many areas to walk and hike. I love how green it is here, and keeping access to recreation in nature is very important to me.
Screen Name Redacted 2/12/2024 02:44 PM	Small town feel, family environment, unique shops, lots of open spaces, amazing schools.
Screen Name Redacted 2/12/2024 02:59 PM	Safety, good schools, small town feel, cleanliness.
Screen Name Redacted	Great schools. Proximity to job.

2/12/2024 04:48 PM	
Screen Name Redacted 2/13/2024 08:43 AM	I live in the Green Mountain neighborhood off of Ingle. I live here because of safety, access to the lakes and hiking trails and the good schools.
Screen Name Redacted 2/13/2024 08:52 AM	The excellent school district, green spaces, rivers & "small town" feel.
Screen Name Redacted 2/13/2024 09:11 AM	Community focus on families, quality schools, and a safe, welcoming environment.
Screen Name Redacted 2/13/2024 09:37 AM	Great schools and wonderful community
Screen Name Redacted 2/13/2024 09:42 AM	Because my wife lives here.
Screen Name Redacted 2/13/2024 09:42 AM	Schools and community feeling.
Screen Name Redacted 2/13/2024 10:00 AM	The safety and small town feel! If it changes to much more I may have to choose elsewhere.
Screen Name Redacted 2/13/2024 10:42 AM	Parks and trails. Quiet and not overdeveloped.
Screen Name Redacted 2/13/2024 10:52 AM	I am a lifelong Camas resident. I stay because of the beautiful area and because the town has been developed thoughtfully and in a way that has retained and enhanced its unique small town feeling.
Screen Name Redacted 2/13/2024 10:55 AM	Schools and public outdoor recreation/beauty (lake, park, gorge)
Screen Name Redacted 2/13/2024 12:18 PM	Small and historic town is why we moved here 20 years ago.
Screen Name Redacted 2/13/2024 12:47 PM	School, Community, Parks and Trails

Screen Name Redacted 2/13/2024 12:49 PM	It's a great small-town feel with modern amenities. Convenient location and spectacular views.
Screen Name Redacted 2/13/2024 01:27 PM	Parks/Trails, Schools, Location to PDX, Taxes, and the hope of a more diverse downtown.
Screen Name Redacted 2/13/2024 02:09 PM	The natural beauty and small town charm.
Screen Name Redacted 2/13/2024 02:59 PM	From Washougal. I love what used to be the small feel like Washougal. I work in Camas. I enjoy supporting the local businesses in town and the trails and parks.
Screen Name Redacted 2/13/2024 06:00 PM	Schools and location
Screen Name Redacted 2/13/2024 07:02 PM	Small feel
Screen Name Redacted 2/13/2024 07:34 PM	Great small community vibe, lots of green space and dedicated parks and trails.
Screen Name Redacted 2/13/2024 07:53 PM	safety and schools
Screen Name Redacted 2/13/2024 09:21 PM	Lots of open green spaces, and a useful, vibrant downtown.
Screen Name Redacted 2/13/2024 09:29 PM	I enjoy the small town feel, plentiful outdoor activities and trail system
Screen Name Redacted 2/13/2024 11:33 PM	Small town feel. Time moves slower. Know people I went to school with.
Screen Name Redacted 2/14/2024 05:29 AM	I live by downtown and like being able to walk to get many basic everyday needs met, while also being able to walk to a trail system from my house. Access to nature on a daily basis is very important to me. And also the great schools for my kids!

Screen Name Redacted 2/14/2024 08:06 AM	Good schools. Small town feel. Both of these aspects are dwindling FAST. Developers are building housing developments faster than our infrastructure and the schools can handle them. Camas high school is over crowded and serves only the top echelon of students. A second high school is needed. New road projects are literally pushing small businesses out - people that have spent time and money and invested in our community. What the EverettStreet corridor project is doing to these businesses is outrageous- all because the city didn't have a plan for infrastructure after allowing developers to build hundreds (maybe thousands?) of homes east of the lakes.
Screen Name Redacted 2/14/2024 09:39 AM	Safety and quality schools
Screen Name Redacted 2/14/2024 12:05 PM	Raised our children in Camas Schools while working in the metro Portland-Vancouver job market. Have remained here now that we are empty-nesters and retired because of the availability of services, health-care, relatively low taxes, and excellent parks & trails
Screen Name Redacted 2/14/2024 05:16 PM	Safety, small town community, conservative values
Screen Name Redacted 2/15/2024 08:30 AM	We've built a family, home and community here.
Screen Name Redacted 2/15/2024 09:16 AM	We live in Camas because we have lived here for 50 years now and don't want to sell our home and start over even though we don't like the direction that our town is going.
Screen Name Redacted 2/15/2024 09:16 AM	Safe, good schools, beautiful scenery, modern suburbs and development
Screen Name Redacted 2/15/2024 09:26 AM	Our quaint historic downtown area, wonderful shops and restaurants.
Screen Name Redacted 2/15/2024 09:33 AM	We picked Camas first for the schools. Second we picked it based on it's proximity to PDX and Portland. Third we picked it based on it's charming downtown and walking trails.
Screen Name Redacted 2/15/2024 09:39 AM	Now that the city doesn't give a crap about the beauty of trees, all access to the lake or anything nature/wildlife related, not sure why. I

	will be moving out of here in the next 2 to 3 years. Camas used to be a gem - now it's just as ugly as strip-mall Vancouver. Well done Camas, you've ruined the beauty that brought me here. Shame on you.
Screen Name Redacted 2/15/2024 09:46 AM	Safety. No homeless camps and drugs on streets. There's no gang activity and violence.
Screen Name Redacted 2/15/2024 09:44 AM	The schools, small town community but close to airport and PDX. Parks and neighborhoods with trees
Screen Name Redacted 2/15/2024 09:44 AM	Nice, friendly small town with great schools.
Screen Name Redacted 2/15/2024 09:52 AM	Small Community values, school excellence, safety, quiet neighborhoods.
Screen Name Redacted 2/15/2024 09:58 AM	I live in Washougal, but worked at the paper mill for 40 years. I moved here for works but enjoy the small town feel of Camas and Washougal.
Screen Name Redacted 2/15/2024 10:02 AM	I like the small town feel and abundance of trees and trails.
Screen Name Redacted 2/15/2024 10:06 AM	Small community support, outdoor access to hikes, lakes, feeling of safety
Screen Name Redacted 2/15/2024 10:08 AM	New Housing.
Screen Name Redacted 2/15/2024 10:18 AM	We chose to live here because of the small town feel, specifically downtown's charm. We live a few blocks from downtown and the walkability is a huge positive for my partner and me. We also love how close we are to the hiking trail and river walk. It feels like we have everything we need here and it is lovely not having to leave town unless there is a special need.
Screen Name Redacted 2/15/2024 10:18 AM	I moved here to live with my daughters family. I enjoy the area and 'home' town feel.

Screen Name Redacted 2/15/2024 10:29 AM	I live it Camas because it is a friendly, safe community. We love the large lots of land that houses are on. We love how adorable yet functional downtown Camas. We love that getting into Portland and PDX isn't a hassle, traffic is good.
Screen Name Redacted 2/15/2024 10:28 AM	Large lot homes, small town feel.
Screen Name Redacted 2/15/2024 10:36 AM	away from the bigger cities, yet near enough to PDX and Downtown Vancouver if need some city life. Feel fairly safe - but this is starting to change....
Screen Name Redacted 2/15/2024 10:41 AM	The low crime rates, people it draws to the community and abundance of outdoor recreational access/opportunity (primarily biking lanes, trails and open space).
Screen Name Redacted 2/15/2024 10:43 AM	It's where the business I work at is located.
Screen Name Redacted 2/15/2024 10:48 AM	The charming downtown and friendly people drew us to Camas. Our home is within walking distance to downtown. We also like its proximity in the Portland metro area.
Screen Name Redacted 2/15/2024 10:50 AM	I work and hangout in camas because it is a great town with awesome small town feel. Being able to hangout downtown and walk to round lake park and feel like you are in the middle of nowhere is so cool. So many great places to eat and drink
Screen Name Redacted 2/15/2024 10:52 AM	It is a cute, vibrant and at the same time quiet town that is really enjoyable to stroll around regularly. There are also lots of events and opportunities available.
Screen Name Redacted 2/15/2024 10:59 AM	I love the small town feel, it's very beautiful.
Screen Name Redacted 2/15/2024 10:58 AM	Beautiful area, love down town, and friends already here
Screen Name Redacted	It is beautiful and safe

2/15/2024 10:56 AM

Screen Name Redacted
2/15/2024 10:59 AM

Community culture, downtown

Screen Name Redacted
2/15/2024 11:17 AM

Public green spaces with water access for hiking, biking and dog walking, proximity to airport and Portland, quality schools,

Screen Name Redacted
2/15/2024 11:30 AM

Our jobs were here (in the late 70's). Now we could work anywhere but we love the downtown core and the fact that we live within walking distance, n "old Camas."

Screen Name Redacted
2/15/2024 11:45 AM

Nice surroundings

Screen Name Redacted
2/15/2024 11:49 AM

Amazing small town and community feel. Lots of access to great parks and recreation.

Screen Name Redacted
2/15/2024 12:41 PM

It’s beautiful

Screen Name Redacted
2/15/2024 12:44 PM

Well, technically I'm in Washougal, but only just -- however our family did live in Camas for about 10 years. The biggest draw -- besides good schools -- was and is the downtown core, with shops, restaurants, galleries and regular community activities. The places I visit most often are Caffe Piccolo, Camas Antiques and the library.

Screen Name Redacted
2/15/2024 12:53 PM

Small town feel but close to bigger cities. Originally the school district but feeling lied to regarding it being top notch.

Screen Name Redacted
2/15/2024 12:56 PM

Great school districts, small town feel with proximity to Portland/Vancouver.

Screen Name Redacted
2/15/2024 01:07 PM

Love the small town feel the town

Screen Name Redacted
2/15/2024 01:10 PM

Its reputation for being a clean and safe place to live. A place that cares about the families that live there

Screen Name Redacted 2/15/2024 02:08 PM	We live in an older neighborhood walking distance to downtown. Love the downtown but disturbing to see all the development swallowing up the outskirts of camas.
Screen Name Redacted 2/15/2024 02:16 PM	Small town and great schools
Screen Name Redacted 2/15/2024 02:16 PM	I love the community! The shops and nice restaurants. I also love the trails for biking and walking. I really really love camas.
Screen Name Redacted 2/15/2024 03:14 PM	Love the small town feel(I live close to Downtown, I'm in Washougal, but camas school district.
Screen Name Redacted 2/15/2024 03:56 PM	Great schools
Screen Name Redacted 2/15/2024 04:23 PM	Location, schools, amenities, and recreational opportunities.
Screen Name Redacted 2/15/2024 04:40 PM	I both work and live in Camas. I wanted a small town feel, but close to the city of Portland. I like the parks, especially Round Lake, Fallen Leafe Lake and Lacamas Lake parks.
Screen Name Redacted 2/15/2024 05:20 PM	Schools, trails, beautiful and quaint downtown.
Screen Name Redacted 2/15/2024 05:39 PM	It is a nice little city
Screen Name Redacted 2/15/2024 06:46 PM	Because it's home for over 29 years.
Screen Name Redacted 2/15/2024 07:46 PM	Fairly small town setting.
Screen Name Redacted 2/15/2024 11:23 PM	I love the strong sense of community reflected in the pride shining in our downtown and parks, the strong support of our schools and public services, and the joyous neighborhood feeling of First Fridays, Camas Days and Farmers Market.

Screen Name Redacted 2/16/2024 12:20 AM	You are close to nature and the beauty of the trees and lakes, yet not too far from civilization either.
Screen Name Redacted 2/16/2024 05:07 AM	I like the community and small town atmosphere.
Screen Name Redacted 2/16/2024 08:08 AM	I have lived in Camas for 62 of my 64 years. I love our town, but our growth needs to be better managed.
Screen Name Redacted 2/16/2024 08:40 AM	I chose to live in Camas because of the quality of schools and because of the mix of rural and small-town urban community. I value open space and trails and I love that Camas has so much open space and rural community in combination with a lively small-town feel downtown.
Screen Name Redacted 2/16/2024 09:47 AM	Small town feel, love the beauty of the downtown as well as the nature around us.
Screen Name Redacted 2/16/2024 11:53 AM	nice people, pleasant, clean, safe, pretty.
Screen Name Redacted 2/16/2024 12:34 PM	We moved for the schools and will stay because of the natural beauty, dedication to preserving quality public spaces and the small town ethos that drives development.
Screen Name Redacted 2/16/2024 01:44 PM	Love the 'community' feel, the downtown area is quaint and enjoyable, the work of the Small Business Association is vibrant, there are art galleries, and the vintage Liberty Theater is great!
Screen Name Redacted 2/16/2024 04:54 PM	Live near Camas, Vancouver!!😊
Screen Name Redacted 2/16/2024 05:18 PM	Safety, clean, parks/trails, small town feel.
Screen Name Redacted 2/16/2024 06:17 PM	Camas has done a great job balancing community, businesses, jobs, and schools. The historic downtown. We are far enough away from the big cities, but close enough to go there if we chose.

Screen Name Redacted 2/17/2024 08:19 AM	Found an affordable view property in an established neighborhood 34 years ago.
Screen Name Redacted 2/17/2024 09:23 PM	It is a safe, family friendly small town where one can actually know others who also work and live here.
Screen Name Redacted 2/18/2024 09:07 AM	Natural elements: the forest, trails, lake, river
Screen Name Redacted 2/18/2024 09:38 AM	I relish living close enough to Lacamas Park, and ready access to all the trails, while also within easy walking distance to downtown Camas.
Screen Name Redacted 2/18/2024 04:15 PM	Schools and neighborhoods
Screen Name Redacted 2/19/2024 08:42 AM	I love the small-town vibe, interesting houses, walkable streets, and community events (even if I don't partake in very many).
Screen Name Redacted 2/19/2024 11:53 AM	Outdoor recreation (hiking, mountain biking, lakes, etc.), good schools, safe.
Screen Name Redacted 2/19/2024 02:23 PM	Family (I'm a 3rd generation Camasonian), friends, community.
Screen Name Redacted 2/20/2024 09:33 PM	Highly rated schools. Safety. Quiet, small town life-style.
Screen Name Redacted 2/21/2024 10:35 AM	Small town, small school district, nice people, cute downtown area, beautiful nature
Screen Name Redacted 2/21/2024 05:11 PM	I live in Camas because I enjoy quick access to trails and LaCamas Lake. I also enjoy. Downtown Camas.
Screen Name Redacted 2/22/2024 01:22 PM	Beautiful suburb and location next to Columbia River is gorgeous. Great schools and safe for kids
Screen Name Redacted	Moved here for schools in 2001. Staying because we like the

2/23/2024 09:58 AM	downtown & parks.
Screen Name Redacted 2/24/2024 08:28 PM	We moved here from out of state, we heard from a lot of people this is the best town to live in for kids, and low crime.
Screen Name Redacted 2/26/2024 08:36 AM	We wanted to move to camas for the quiet, unique, far-away feel from the big city; for the schools; for the serene beauty of the trees, the quiet neighborhoods, the less populated roads. Sadly, many of those things have changed over the past 15 years. The streets are failing - our road is crumbling apart and looks like it could be a sinkhole one day soon. Our street is like a main highway, our house is being targeted nearly every weekend by kids trying to beat down our door - causing health issues for my husband. We can't sit in our backyard without hearing industrial decibel leaf blowers all day and street racers at night. The front of our house has become a parking spot for folks that are up to no good - no plates or temp tags, smoking, yelling, trash, etc. Yet the city keeps asking for more of our money while our quality of living in this city is taking a nosedive.
Screen Name Redacted 2/27/2024 09:54 AM	I love the small town feel. Not a lot of Portland and Vancouvers messy homeless politics.
Screen Name Redacted 2/27/2024 10:39 AM	We moved here for work. We chose Camas for the Lakes, trails, small community, and we heard so much about the great schools. We LOVE the Library!
Screen Name Redacted 2/27/2024 11:58 AM	For the neighborhoods, open spaces/farms, and schools.
Screen Name Redacted 2/27/2024 02:25 PM	Access to nature and schools
Screen Name Redacted 2/27/2024 04:18 PM	Good schools Beautiful community The lake (which I didn't know was filthy until I moved here)
Screen Name Redacted 2/27/2024 04:31 PM	It's got small town charm without the right wing politics
Screen Name Redacted 2/27/2024 04:57 PM	Schools, safety

Screen Name Redacted 2/27/2024 06:28 PM	School district
Screen Name Redacted 2/27/2024 07:09 PM	We moved to Camas for the high performing schools and fantastic outdoor hiking. Protect the parks!
Screen Name Redacted 2/28/2024 08:59 AM	Two biggest factors that brought my family to Camas from San Diego. 1) My family is nearby in Washougal 2) The schools have a reputation for being top notch.
Screen Name Redacted 2/28/2024 06:52 PM	Outdoors
Screen Name Redacted 2/28/2024 09:06 PM	I have lived in Camas for almost 30 Years because it was a great small town.
Screen Name Redacted 2/29/2024 08:38 PM	Proximity to Lacamas Park, Columbia River, and Portland.
Screen Name Redacted 2/29/2024 09:00 PM	Proximity to Lacamas park - our family hikes, mountain bikes and trail runs through the park multiple times a week. We love access to the lakes in the summer (we wish they were safe to swim in). We love that there's almost no traffic in camas and there's a vibrant downtown thats fun to walk in and attend community events.
Screen Name Redacted 2/29/2024 09:46 PM	My kids and grandkids live here and I really love the small town life. Hope it’s not over built.
Screen Name Redacted 3/01/2024 07:51 PM	great environment, green space, parks, hiking trails, library
Screen Name Redacted 3/01/2024 09:44 PM	It’s a safe and clean community
Screen Name Redacted 3/02/2024 07:37 PM	Schools; Lacamas Lake Park and Heritage Park; quality and consistency of neighborhoods; small-town feel; moved for work then fell in love with it and stayed; better than the other nearby choice, Washougal; clients recommended it, so we moved to Camas from the Bay Area; outdoors and access to nature; moved from another mill town, Aberdeen, WA; reduced the commute to my job at PDX Airport; all of the choices, Camas was the best; my husband's work colleague

	lived in Camas and told us to check it out.
Screen Name Redacted 3/04/2024 02:05 AM	It was a small community with a sense of pride.
Screen Name Redacted 3/06/2024 05:58 PM	Small town, recreation, schools
Screen Name Redacted 3/06/2024 06:24 PM	Access to outdoor activities and Lacamas lake. Beautiful downtown area.
Screen Name Redacted 3/06/2024 06:36 PM	1:Love the trail network and views. 2: Higher-end homes. 3: Favorable WA state tax structures 4: Charming downtown.
Screen Name Redacted 3/06/2024 07:49 PM	Beautiful scenery, parks and recreation, safety, sense of community, high quality of life
Screen Name Redacted 3/06/2024 08:09 PM	Schools, outdoor parks and recreation, the ability to participate in local government and make a difference, the community we've built, schools, schools, schools, community, being connected and feeling involved.
Screen Name Redacted 3/06/2024 08:05 PM	great schools, opportunity to participate in government and the environment, parks and outdoor space
Screen Name Redacted 3/07/2024 01:11 AM	Quiet and slower paced, feels safe, doesn’t have a lot of the issues facing Vancouver, emphasis on nature
Screen Name Redacted 3/07/2024 09:17 AM	Great schools, friendly community, safe and beautiful environment.
Screen Name Redacted 3/07/2024 09:33 AM	The school system (we moved from California)
Screen Name Redacted 3/07/2024 09:38 AM	Good schools, grew up here, safe.
Screen Name Redacted 3/07/2024 10:04 AM	Mostly because of the downtown -- the shops, galleries and small businesses feel like a community. When you walk into a store, as

	often as not they greet you by name. It's also just beautiful in every season, with all those mature trees.
Screen Name Redacted 3/07/2024 10:11 AM	It is so nice to not have to get on the freeway to get involved in community. I appreciate the family events in the Hometown field. The tree line streets and the lit up nights are enchanting.
Screen Name Redacted 3/07/2024 10:29 AM	Odyssey middle school is the singular reason we chose camas. It's an extraordinary program
Screen Name Redacted 3/07/2024 11:41 AM	It’s a family oriented town and it’s pretty. We also fell in love with a church here before we moved to Camas.
Screen Name Redacted 3/07/2024 12:51 PM	Safe, good schools, beautiful area
Screen Name Redacted 3/07/2024 01:27 PM	Love downtown
Screen Name Redacted 3/07/2024 01:44 PM	The quality of life- we have an incredible balance of “small town”, natural amenities, proximity to larger city options and great small businesses.
Screen Name Redacted 3/07/2024 04:01 PM	School district & safe feeling community
Screen Name Redacted 3/07/2024 07:09 PM	Schools and cleanliness
Screen Name Redacted 3/07/2024 07:16 PM	Small town community feel, great schools and trails, safety
Screen Name Redacted 3/07/2024 09:16 PM	I chose to live in Camas for the beautiful natural areas and quality public schools.
Screen Name Redacted 3/08/2024 09:15 AM	school district, community feel like DCA events, beautiful nature like Lacamas and Round lake trails

Screen Name Redacted 3/08/2024 12:32 PM	Good schools, Lacamas Park, beautiful views, Lacamas Lake
Screen Name Redacted 3/08/2024 12:49 PM	The schools, the location close to pdx airport and portland.
Screen Name Redacted 3/10/2024 08:13 PM	I moved here for the small-town feel, abundance of trees and trails, and low amount of traffic.
Screen Name Redacted 3/11/2024 03:15 PM	Family nearby, PDX metro is convenient for working remotely but traveling when needed, love PNW
Screen Name Redacted 3/11/2024 08:30 PM	To raise kids in a safe community, with good schools
Screen Name Redacted 3/11/2024 10:21 PM	I grew up in Camas, my family is here and I love living and working in the downtown.
Screen Name Redacted 3/12/2024 12:45 PM	I've lived in the community for approximatly 52 of my 56 years. The proximity to PDX while not being in the big city is perfect.
Screen Name Redacted 3/12/2024 02:43 PM	Good schools, great community feel, love our downtown shops and restaurants
Screen Name Redacted 3/14/2024 09:17 AM	Safe community, lots of community events, hiking trails and parks, great schools, lake activities
Screen Name Redacted 3/14/2024 10:58 AM	School district and overall safety
Screen Name Redacted 3/15/2024 08:13 PM	Originally, because it was close to work, and we liked the location. Now its because we still like the location, and our backyard permaculture "food forest" produces tons of food for us.
Screen Name Redacted 3/16/2024 06:19 PM	We moved to the area due to work, but chose Camas because it was a small, safe town with an old-style downtown.
Screen Name Redacted	Family here and the good public schools

3/16/2024 06:30 PM

Screen Name Redacted
3/16/2024 06:51 PM

I love both the small town feel as well as the proximity to a big city. I love the parks, the ease of being in nature. It feels like a mostly safe, close community.

Screen Name Redacted
3/16/2024 08:19 PM

Close to ocean,mountains and airport

Screen Name Redacted
3/16/2024 08:36 PM

It is a great town. I live and work in Camas.

Screen Name Redacted
3/16/2024 09:32 PM

School district

Screen Name Redacted
3/16/2024 11:41 PM

Moved here for the SCHOOLS - staying for the beautiful trails, amazing downtown community, and deepening social connections.

Screen Name Redacted
3/17/2024 01:24 AM

Love the location and small town feeling.

Screen Name Redacted
3/17/2024 07:22 AM

Small town feel

Screen Name Redacted
3/17/2024 08:14 AM

Safety, cleanliness, nature access

Screen Name Redacted
3/17/2024 08:39 AM

We chose to live her for the schools, proximity to a larger city with a small town feel.

Screen Name Redacted
3/17/2024 08:49 AM

When we moved here, it was a small, pretty town with a few restaurants and shops, close to major cities. The schools also had a good review for our growing family. That's what brought us here.

Screen Name Redacted
3/17/2024 09:01 AM

Schools, excellent police, location.

Screen Name Redacted
3/17/2024 10:29 AM

We love the small town feel, the great school system, and the support of small businesses.

Screen Name Redacted 3/17/2024 10:29 AM	I like how it’s a small town with beautiful nature and events like Wheels and Wings and First Friday, but it’s next to the medium town of Vancouver and the large town of Portland.
Screen Name Redacted 3/17/2024 10:40 AM	School system and the darling downtown area
Screen Name Redacted 3/17/2024 01:45 PM	Small town with character.
Screen Name Redacted 3/17/2024 05:10 PM	Good schools. Close to parks and trails.
Screen Name Redacted 3/17/2024 05:27 PM	It's a small town, great place to raise a family, feels safe but also close to metropolitan area.
Screen Name Redacted 3/17/2024 05:43 PM	Since of community. Businesses in town owned by fellow Camas citizens. Quality of life, small town feel.
Screen Name Redacted 3/17/2024 08:22 PM	Trails... and the shrinking historical downtown core and shrinking landscape.
Screen Name Redacted 3/18/2024 02:54 AM	I’ve lived here off and on for 30 years. I love it
Screen Name Redacted 3/18/2024 09:51 AM	Small safe community with great schools
Screen Name Redacted 3/18/2024 11:49 AM	It was for the schools
Screen Name Redacted 3/18/2024 11:54 AM	Quieter than the surrounding areas. I feel safer here. I found the best house (privacy)
Screen Name Redacted 3/18/2024 01:45 PM	Camas has the best schools in PDX metro area. Camas is safe and we love the small-town community feeling.
Screen Name Redacted 3/19/2024 10:13 AM	Great school, lots of green spaces, cute downtown

Screen Name Redacted 3/20/2024 05:25 AM	Nature, affordability, school districts, parks, community.
Screen Name Redacted 3/20/2024 03:19 PM	Love to mountain bike at Lacamas Park
Screen Name Redacted 3/20/2024 03:29 PM	Charm sense of community Wanting to work where you live
Screen Name Redacted 3/20/2024 07:26 PM	Family friendly community, good schools, close to Portland, airport and extended family.
Screen Name Redacted 3/22/2024 07:12 AM	I moved to Camas in the 90s.Within that time,Camas has turned into a city,that is now nothing that it was.Honestly if we did not have our home specifically where it is,as well as what it is, we would not own a home in this town.
Screen Name Redacted 3/22/2024 09:01 AM	nice, clean, town, close to shops (costco walmart) but also lots nature
Screen Name Redacted 3/25/2024 10:09 PM	We moved to Camas to raise our kids in a smaller city.
Screen Name Redacted 3/26/2024 09:46 AM	10 - 15 minute commute to work Quality schools Trails, green space and parks Real downtown, not just strip malls
Screen Name Redacted 3/26/2024 11:07 AM	Safety, schools, cleanliness
Screen Name Redacted 3/26/2024 04:18 PM	Good schools, affordable housing, close to Portland, natural beauty.
Screen Name Redacted 3/27/2024 03:45 PM	§ People knowing/supporting each other § Close-knit downtown business community § Great schools § Family Friendly § Close to nature (paths, lake, parks) § Clean and Safe § Don't see a homeless problem (new residents) § Downtown acts as living room – expands social fabric § Events bring people downtown, and they come back for the businesses § Compact, walkable, accessible (balanced with proximity to nature, but access to 205/14/PDX airport) § Authentic historic charm (architecture, mill town history, "Hallmark movie") §

	Library programing, Youth Sports programming § "We pass all our bonds"
Screen Name Redacted 4/03/2024 08:44 AM	Because it’s a nice small town
Screen Name Redacted 4/03/2024 09:08 AM	Camas has been special to me. I grew up in Camas 1947 to 1969, lived on Prune Hill 1976 to 1991; in Fern Prairie 1991 to 2002. My Grandpa had a Business College in Camas from 1939 to 1964; my parents had a clothing store from 1947 to 1972; Dad was involved in the business community, and held advisory positions for the school and city. Great activities growing up in Camas, first Little league teams; Babe Ruth teams; fun at Crown Park; swimming at the Camas Pool, saldy now gone!! It’s sad to see buildings destroyed, for what some feel is “improvement"?? The old Church that was recently destroyed was a historic building that should never have been destroyed. Camas is unique for it’s visual atmosphere includes old buildings to be treasured and maintained!! The downtown Post Office is one of those treasures!! My vision of Camas, is the Camas I grew up in, and I shudder at the thought of the growth of Camas that seems to be happening. S Slow the growth, before Camas totally loses it’s identity!!
Screen Name Redacted 4/03/2024 10:07 AM	I grew up in Camas & Washougal. It was a beautiful and peaceful area with an abundance of open, green space providing a healthy habitat for people and wildlife. Then the money-hungry developers arrived.
Screen Name Redacted 4/03/2024 10:24 AM	I love the little city feel. I love the tails, parks, and the school district.
Screen Name Redacted 4/03/2024 10:43 AM	Schools
Screen Name Redacted 4/03/2024 11:02 AM	I grew up here and liked the small town and associated close knit community.
Screen Name Redacted 4/03/2024 12:34 PM	I grew up here. My parents grew up here. My grand parents moved here when they were very young. For me it's just home! I lived for a while in the Seattle area, and in the mountains of Montana, and on Oahu. But this is home.

Screen Name Redacted 4/03/2024 04:45 PM	I chose to live here because I was looking for property in the camas washougal property. I grew up in washougal in the gorge. I loved our smaller towns back then and it feels safer here.
Screen Name Redacted 4/03/2024 05:13 PM	Born here
Screen Name Redacted 4/03/2024 06:10 PM	I don't live in Camas, but in western North Carolina. However, I lived in Camas for the first 23 years of my life and off and on after that until 1981 when I moved away permanently, only visiting now and then.
Screen Name Redacted 4/03/2024 10:03 PM	Great small town feel. Caring community.
Screen Name Redacted 4/03/2024 11:32 PM	I'm 4th generation Camas!!! My roots are here!
Screen Name Redacted 4/04/2024 02:26 AM	I have lived in Camas for over 55 years. The small town was calm, safe, and friendly. Housing was affordable, schools were great, and the land was beautiful.
Screen Name Redacted 4/04/2024 07:30 AM	It is my hometown. My family has been here for years! However...you all seem to be in favor of pushing locals out
Screen Name Redacted 4/04/2024 08:05 AM	Camas schools, being near family, lots of parks and outdoor spaces.
Screen Name Redacted 4/04/2024 08:11 AM	Schools
Screen Name Redacted 4/04/2024 08:23 AM	Small community that is great for families
Screen Name Redacted 4/04/2024 08:34 AM	I grew up in Camas and it's where I raised my family. I know maintaining a small town mindset is difficult as the city grows but the feeling of close community is why we stay.
Screen Name Redacted 4/04/2024 08:58 AM	Cuz it's a beautiful old town feel, LOVE the older CLASSIC buildings with our towns history so vibrant.

Screen Name Redacted 4/04/2024 09:54 AM	Originally, because of the schools for our children and because there was a separation from Vancouver. Now, because it feels like home and has maintained it's "small town" appeal.
Screen Name Redacted 4/04/2024 11:51 AM	Camas is a fantastic place to live ! Small town appeal but still has plenty of things to see and do ! We found an affordable house in a beautiful country atmosphere, and have been here for over 20 years. Hate to see things changing but it's inevitable. That's what progress is. Does Camas need progress ? My opinion.....to a certain degree. But not if it's going to destroy everything of historic value in this wonderful community. That's a big part of the charm and appeal of Camas....it's not BIG CITY !!!
Screen Name Redacted 4/04/2024 01:01 PM	We chose to live in Camas because it was near my husband's work and it was supposed to have the best schools (2006). I would not choose Camas for the schools today.
Screen Name Redacted 4/04/2024 01:15 PM	I live and work in Camas because of the kind community filled with people who appreciated common sense approach to problems. Moved here in 2008 and it has changed and NOT for the better.
Screen Name Redacted 4/04/2024 01:39 PM	It’s always been a unique town with outstanding charm and appeal.
Screen Name Redacted 4/04/2024 01:44 PM	The small town feel
Screen Name Redacted 4/04/2024 03:32 PM	Rural small town feel
Screen Name Redacted 4/04/2024 06:13 PM	Small, quaint town.
Screen Name Redacted 4/04/2024 06:58 PM	3rd generation resident. We built this town, but now our presence and opinions are neither desired nor required.
Screen Name Redacted 4/04/2024 07:26 PM	I liked the small-town feel and the tree canopy downtown. I loved the lakes and rivers. I like the quaint old Mill houses. I liked that I could do shopping, medical visits, yoga, groceries all right downtown.

Screen Name Redacted 4/04/2024 07:36 PM	Walkability, schools, beautiful downtown, library, lgbtqia+ safe
Screen Name Redacted 4/04/2024 11:03 PM	Because it is safe, I want my children to grow up in a lovely community, and the school district is of the highest quality.
Screen Name Redacted 4/05/2024 10:37 AM	The schools and safe neighborhoods
Screen Name Redacted 4/05/2024 11:41 AM	Small town with no over development.
Screen Name Redacted 4/06/2024 07:48 AM	The small town atmosphere, with so many small businesses. We are a community deliberately striving to avoid being incorporated into a huge, faceless metro.
Screen Name Redacted 4/06/2024 02:58 PM	My husband grew up hear.
Screen Name Redacted 4/06/2024 11:45 PM	Small town, friendly community that is not far from a Metropolitan city
Screen Name Redacted 4/08/2024 09:20 AM	A wonderful, thriving small town with access to some of the best nature in the world. And fairly low density living, which needs to be preserved in future planning.
Screen Name Redacted 4/12/2024 10:29 AM	I grew up here, my family and friends live here. I love the area and my job here.
Screen Name Redacted 4/12/2024 01:45 PM	The charm of the community, great schools, small town and community centric events.
Screen Name Redacted 4/12/2024 03:40 PM	We've retired here which allows us to live comfortably in Washington State (our home state for 30+ years) while also being close to our daughter, son-in-law, and granddaughter who live in Portland. This is a beautiful town that is so nicely walkable. We regularly (daily almost) use the walking trails of the large Lacamas Creek Park; so great! Downtown is also walkable for us (a short 4 blocks or so) from our wonderful neighborhood in our remodeled 1937 house. Finally, so close to the airport!!

Screen Name Redacted 4/12/2024 05:02 PM	good schools, access to outdoors, safe, relatively affordable
Screen Name Redacted 4/12/2024 05:38 PM	Close to Portland and the airport but far enough away it feels safe, clean, and family friendly.
Screen Name Redacted 4/12/2024 08:46 PM	Love the small-town feel and approachability of the downtown core and nature trails.
Screen Name Redacted 4/12/2024 09:08 PM	Nice and homey without too much suburban sprawl
Screen Name Redacted 4/13/2024 04:49 AM	Small town feel, quaint shops in town, the lakes and surrounding beautiful parks and trails, crown park. Close to airport. Nice genuine people.
Screen Name Redacted 4/13/2024 06:19 AM	Small town community pride, availability of easy access parks and trails, school system quality, safe neighborhoods.
Screen Name Redacted 4/13/2024 07:03 AM	Parks, lots of family centered events, schools, convenient to everything.
Screen Name Redacted 4/13/2024 03:33 PM	Small town feel, but has so much and close to bigger cities and airports. I like the downtown area, very friendly, every thing close and lots of small businesses.
Screen Name Redacted 4/13/2024 04:36 PM	I bought a home here when prices were cheap and nobody wanted to live here.
Screen Name Redacted 4/13/2024 05:05 PM	We have young kids; appreciate the commitment to quality education from the city and community. We enjoy the quiet clean local feel that Camas provides.
Screen Name Redacted 4/13/2024 08:05 PM	Small town close to river and large city
Screen Name Redacted 4/14/2024 11:03 AM	Camas is a quiet, clean community with an abundance of open space parks for outdoor activities.

Screen Name Redacted 4/14/2024 11:11 AM	Walkability! Camas is one of the few places in Clark County that a person can navigate almost entirely on foot. We have great trails and need more! Walking and biking contribute to public safety (basically citizen patrols) and keeps our residents healthier and more connected.
Screen Name Redacted 4/14/2024 05:39 PM	Grew up here and came back after working in Oregon. Sad to see what has happened to this historic city and the changes leadership is making without thought to the citizens or qualities in this town we love. Unfortunately I realize filling out a survey will not have an impact on leaders who have heard concerns with deaf ears. As long as money and progress is dangled in front of their faces, they will continue to ruin the aspects of this city we appreciate and come back home to.
Screen Name Redacted 4/14/2024 07:17 PM	The schools.
Screen Name Redacted 4/15/2024 06:40 AM	Born and raised here since 1961. Many Many friends and family friends. small town community. Love the closeness of Hiking, the mountains. Lose to city and medical and high speed internet.
Screen Name Redacted 4/15/2024 10:39 AM	Love the small town! This feels so much safer than a larger city (Portland).
Screen Name Redacted 4/15/2024 10:53 AM	WA state personal income tax structure. The charm of downtown. Safety of community. Proximity to Portland. Green space.
Screen Name Redacted 4/15/2024 02:26 PM	quaint small downtown; schools/parks/etc increase the resale value of my home
Screen Name Redacted 4/15/2024 02:56 PM	Small and nice downtown
Screen Name Redacted 4/15/2024 04:36 PM	I choose to live in Camas because it has a small town feel and largely lacks the urbanized strip mall business sections. It is quiet at night and low traffic. I love hiking the trails and visiting the parks. People are friendly and do not seem to be in a hurry. The schools are great and I love the library. Downtown by the mill is a perfect place to stroll

	and not feel overwhelmed by a big city feel. We moved here last year from eastern Washington and I wanted to be in Camas because it is outside the city and I hope it stays that way.
Screen Name Redacted 4/15/2024 05:23 PM	Schools and green space
Screen Name Redacted 4/15/2024 06:59 PM	Grew up here and love the town. Because of the great schools, moved back so my kids could get a great education and everyone is friendly.
Screen Name Redacted 4/16/2024 09:10 AM	Quality of life! A family-friendly environment with good schools, safe neighborhoods, parks and trails, quiet (little air traffic and limited vehicle thoroughfare). Proximity to the river, access to freeways for commuting, as well as getting to the airport, or into Portland. We don't want to live in Portland, so we do not want Camas to become anything like Portland!
Screen Name Redacted 4/16/2024 09:34 AM	Parks and trails, lake, close to undeveloped land-we like being close to rural areas.
Screen Name Redacted 4/16/2024 03:59 PM	It used to be a small town, safe community. Now the city allows homeless people to live downtown, i.e. Carmen, and they don't do anything about it!
Screen Name Redacted 4/16/2024 06:51 PM	I enjoy the access to nature, the community feel, and the events that our put forward for families.
Screen Name Redacted 4/16/2024 08:21 PM	Initially I moved to the area because of my job, which was in Vancouver. Because of tax reasons, I wanted to live on the WA side. I chose Camas because of the short commute, schools had a good reputation, and I liked the livability of the area.
Screen Name Redacted 4/17/2024 08:06 AM	Small community, nature, less traffic
Screen Name Redacted 4/17/2024 12:10 PM	We have chosen Camas for the quality of life it provides (Close to a large city - Portland - , close to the airport, quaint downtown, close to the Columbia Gorge)

Screen Name Redacted 4/17/2024 02:49 PM	A walkable vibrant downtown with a lot going on, and easy access to the countryside.
Screen Name Redacted 4/17/2024 05:10 PM	Love the access to recreation. The probability that you may run into someone you know at the store. The pride in the town activities and name.
Screen Name Redacted 4/17/2024 05:48 PM	It’s safe and beautiful!
Screen Name Redacted 4/17/2024 05:58 PM	Great schools! All of the green areas, with beautiful trees and plenty of walking/hiking/bike riding paths, interspersed throughout our growing city.
Screen Name Redacted 4/17/2024 09:07 PM	Quiet, small town feel, good schools
Screen Name Redacted 4/18/2024 07:28 AM	Community. The hiking trails. Nature at our back door is amazing.
Screen Name Redacted 4/18/2024 09:31 AM	Good schools and easy access to nature
Screen Name Redacted 4/18/2024 09:52 AM	We wanted a safe, family friendly, town.
Screen Name Redacted 4/18/2024 02:06 PM	Beautiful history, beautiful preserved natural areas, beautiful people
Screen Name Redacted 4/18/2024 03:33 PM	Views, privacy, quiet community
Screen Name Redacted 4/19/2024 05:56 PM	Smaller town with services, trails are wonderful, nice downtown, nice library.
Screen Name Redacted 4/19/2024 07:24 PM	Quiet area.
Screen Name Redacted 4/20/2024 10:55 AM	I grew up here, and decided to move back here to raise my kids because of the excellent schools, safe community, beauty, and

	hometown pride. I love that it's close to bigger cities but retains its small town feel.
Screen Name Redacted 4/20/2024 06:40 PM	Central location, close to highways, good views of Columbia river, good weather, good people, safe
Screen Name Redacted 4/20/2024 07:25 PM	my sister lives in Portland. I never thought I could afford to live here, but had some good luck - then did a crazy thing - bought a house I saw on the net for nearly 900 grand. Had never been to Camas. I love it.
Screen Name Redacted 4/20/2024 08:25 PM	Nice community. Not crowded outdoors. Downtown
Screen Name Redacted 4/22/2024 09:05 AM	The Camas area is a great location. Close to all the amenities you could ever need if you go West. Close to all the outdoor activities you could ever want if you go East.
Screen Name Redacted 4/22/2024 12:10 PM	Walkability, good schools, quiet town, good weather, trail system, lakes, awesome library, shopping district downtown, community events.
Screen Name Redacted 4/23/2024 05:00 PM	Character -- the surroundings, the people, the history. It is reminiscent of some of the smaller coastal towns where I grew up (as they existed then).
Screen Name Redacted 4/23/2024 09:08 PM	Small town vibe, open spaces, proximity to nature and hiking.
Screen Name Redacted 4/23/2024 09:20 PM	I live here because of how walkable and bikeable camas is. Camas is a rare example of a city that relatively held on to its urban fabric.
Screen Name Redacted 4/26/2024 07:36 AM	library, access to natural and less populated hiking and walking areas, rivers & lakes, green!
Screen Name Redacted 4/27/2024 12:34 PM	Good schools and access to hiking
Screen Name Redacted	Family has been here since the 1800s

4/27/2024 05:02 PM	
Screen Name Redacted 4/29/2024 10:59 AM	I can own a nice home here, the nature is beautiful, the schools are great.
Screen Name Redacted 4/29/2024 12:38 PM	Beautiful location. Wonderful people. Hiking trails. A concern for the public's input.
Screen Name Redacted 5/02/2024 03:06 PM	good schools, good community, lakes, close to PDX airport, not too crowded
Screen Name Redacted 5/02/2024 03:30 PM	It's quiet, safe and schools are great
Screen Name Redacted 5/02/2024 09:31 PM	There is a nice balance of green space, well paying jobs, and lots of potential to grow into a model, well-connected community.
Screen Name Redacted 5/02/2024 10:20 PM	Schools
Screen Name Redacted 5/03/2024 08:07 AM	Parks and trails, library
Screen Name Redacted 5/03/2024 08:23 AM	Schools and public safety
Screen Name Redacted 5/03/2024 08:42 AM	Proximity to the Gorge, mountains, and outdoor recreation; access to the trails on the Columbia and Washougal rivers, and Lacamas/Round/Fallen Leaf Lake; affordability of housing; proximity to PDX and Portland; good schools
Screen Name Redacted 5/03/2024 03:27 PM	Community, parks and trails
Screen Name Redacted 5/03/2024 03:28 PM	Quality of life, small community
Screen Name Redacted 5/03/2024 04:05 PM	retiree, gladly left congestion of Portland, OR 5 yr. ago for contented living in the Camas/Washougal corridor. Grew weary of paying 10% income tax to Oregon! Camas is nicely sized and Very Clean.

Screen Name Redacted 5/03/2024 04:05 PM	I bought a house in 2015 when it was more affordable than Vancouver. Now it’s not affordable to live here.
Screen Name Redacted 5/03/2024 04:05 PM	It is where our daughter lives. We love the downtown area.
Screen Name Redacted 5/03/2024 04:07 PM	Because it’s a wonderful place
Screen Name Redacted 5/03/2024 04:37 PM	Cost of living, quality of schools, natural beauty, a lake (bummed to learn it was contaminated after moving)
Screen Name Redacted 5/03/2024 05:41 PM	Schools Parks Small town feel Great food and stores
Screen Name Redacted 5/03/2024 06:03 PM	1. I was able to buy a solidly built home, old and in need of repair, but so solidly built I can play my piano in the middle of the night yet the neighbors don't hear me! 2. Walkability. Nature trails are within 3 blocks of my house, and go on for over 12 miles; sidewalks (and many bike lanes) make exercise safe and enjoyable. 3. Great community spirit: meaningful volunteer activities, shared pride in our hometown, the Farmer's Market, a vibrant independent library, friendly small businesses.
Screen Name Redacted 5/03/2024 06:01 PM	The school district at the time (2019) and the small town atmosphere with the natural beauty surroundings.
Screen Name Redacted 5/03/2024 09:16 PM	Small town vibe, beautiful surroundings, convenient to Portland and downtown Vancouver, great schools, recreational opportunities
Screen Name Redacted 5/03/2024 09:55 PM	Beautiful downtown, proximity to Portland and the Columbia Gorge, safety
Screen Name Redacted 5/04/2024 09:19 AM	We moved here in 1992 when we found an affordable home. We love the area and also can’t afford to move anywhere else if we want to downsize in our retirement.
Screen Name Redacted	Schools, Fisher Investments job, hiking trails, downtown restraints

5/04/2024 09:47 AM	and shops
Screen Name Redacted 5/04/2024 04:41 PM	Quality of Life -- walkability, trails, schools, downtown and other local services & amenities, proximity to major metro areas (Vancouver and Portland), green spaces and tree canopy, PNW climate, access to lakes & rivers, mountain views....
Screen Name Redacted 5/04/2024 05:28 PM	Access to parks and trails, access to downtown
Screen Name Redacted 5/04/2024 05:30 PM	The trail networks is number one Schools
Screen Name Redacted 5/05/2024 08:40 AM	Location close to Gorge/Mt Hood, good schools
Screen Name Redacted 5/05/2024 09:13 AM	The school district and access to outdoor recreation.
Screen Name Redacted 5/05/2024 12:39 PM	Family. I use to love the small town feel and the endless view of untouched land.
Screen Name Redacted 5/05/2024 03:21 PM	I love the green areas, the wildlife and fields close to downtown, the small town atmosphere
Screen Name Redacted 5/05/2024 04:34 PM	Safe and quaint town!
Screen Name Redacted 5/05/2024 06:11 PM	Raised kids here… love the area
Screen Name Redacted 5/05/2024 09:37 PM	My partner is a 5 generation Camas resident. We choose to live here because his family is close.
Screen Name Redacted 5/06/2024 02:01 PM	I Love the small town feel and sense of safety we enjoy.
Screen Name Redacted 5/06/2024 03:27 PM	I’ve lived here all my life.

Screen Name Redacted
5/07/2024 08:24 PM

It’s a safe community with good schools.

Screen Name Redacted
5/10/2024 01:55 PM

It has been our home for 25 years and we love the dedicated space to nature and trails. Please continue to protect and expand our green spaces as we move forward.

Screen Name Redacted
5/11/2024 02:20 PM

Camas and the surrounding areas provide a place to live that is both beautiful and ideally situated (ie close to the airport, Portland, the Gorge, Mt. Hood, etc).

Screen Name Redacted
5/12/2024 07:25 AM

Schools, close to nature , close to PDX

Screen Name Redacted
5/12/2024 06:47 PM

We have been here a pretty long time and watched Camas grow. It's a really good place to be for so many reasons including the outdoors, the accessibility and the overall quality of life.

Screen Name Redacted
5/13/2024 04:33 PM

My wife's best from from grade school lived here and we visited. We decided this would be a great place to retire.

Screen Name Redacted
5/13/2024 09:22 PM

Safe attractive residential neighborhoods.

Optional question (341 response(s), 26 skipped)
Question type: Essay Question

Q2 What makes Camas, including our historic downtown, special today? What should we strive to preserve or enhance?

Screen Name Redacted
2/20/2024 02:02 PM

Small town feel; the architecture, small businesses, and green space paths. High amount of tech employment base. Access to airport. Access to nature. School system excellence.

Screen Name Redacted
2/09/2024 07:21 PM

City council absolutely needs to govern better with consideration of ALL residents and peoples who pay property tax to the city of Camas. This is not currently represented.

Screen Name Redacted 2/09/2024 09:12 PM	Downtown Camas is a jewel among gems. Every time I have friends or family come from out of town we routinely visit the shops and restaurants in downtown Camas and don't really go to Vancouver or Portland. We need to continue to build on downtown and it's infrastructure, so that this type of hospitality attraction can continue for years to come.
Screen Name Redacted 2/10/2024 07:55 AM	The wide variety of shops and dining, the trees and lights and all the fun activities.
Screen Name Redacted 2/10/2024 09:40 AM	Downtown with it's small businesses, lakes with hiking trails
Screen Name Redacted 2/10/2024 11:47 AM	I love the older buildings in downtown with the lighted trees. It is a great area to come and walk and shop.
Screen Name Redacted 2/10/2024 11:14 PM	The Antique Shop, old theater, and Lacamas Lake.
Screen Name Redacted 2/11/2024 10:27 AM	We should strive to preserve the safe and walkability of the community along with a high density of a community lifestyle enhancing businesses. Also the access to nature and trails and lakes.
Screen Name Redacted 2/12/2024 10:02 AM	The downtown corridor is the foundation of Camas, rooted in the history of the mill. Honoring the history of Camas as a mill town and all the business that started from that is important. I think DCA did a great job with the walking tour/signs which tell key historical businesses/people. I think the key in the long term future is in the clean up and eventual transition of the existing mill. Someday this mill will go and with it is an opportunity to still tell the historic Camas legacy, while bringing modern development and opportunity in a prime location of downtown
Screen Name Redacted 2/12/2024 02:44 PM	Character. Old but well maintained buildings, nice landscaping, unique shops, good food.
Screen Name Redacted 2/12/2024 02:59 PM	Downtown is well maintained from a beauty/cleanliness stand point and I enjoy the retail options. Parks are safe and clean, but could use a refresh. Roads are pretty well maintained and fixed when there are issues. The Brady corridor road improvements turned out great. I would like to see more maintenance to clear roads quicker during

	winter weather and more road enhancements to improve walkability on older country roads (i.e. McIntosh and the southern end of Brady).
Screen Name Redacted 2/13/2024 08:43 AM	It's special because of the focus on keeping the original facades of the buildings.
Screen Name Redacted 2/13/2024 08:52 AM	All of the things listed in #1 above. But I'll ad ... keep giant apartment buildings & big box, national chain stores, out of the downtown core. Don't let the urban/suburban sprawl, industrial development & traffic nightmare become Camas/Washougal, as it has in the once iconic small towns of Gresham & Troutdale, directly across the river.
Screen Name Redacted 2/13/2024 09:11 AM	Local businesses, walkability, the many community events (first Friday, farmer's market, etc).
Screen Name Redacted 2/13/2024 09:37 AM	The 1st Fridays and the liberty theater.
Screen Name Redacted 2/13/2024 09:42 AM	Proximity to the river and the mountains. Open (undeveloped) land.
Screen Name Redacted 2/13/2024 09:42 AM	Preserving small businesses.
Screen Name Redacted 2/13/2024 10:00 AM	Everything that is already there!! The design of the buildings to the beautiful feel it gives. There is not allot to enhance other then making sure the maintenance is kept up.
Screen Name Redacted 2/13/2024 10:42 AM	Small town feel, traffic is not bad, downtown is fun, all the forested areas within the city limits. These should all be preserved .
Screen Name Redacted 2/13/2024 10:52 AM	My favorite things about Camas are the trails and parks around the lake and the thriving downtown. The Northshore plans to create a larger trail system and connect all the trails will make the lake area even better. Maintaining the charm of downtown while expending the core out onto adjacent streets will make the downtown better too.
Screen Name Redacted 2/13/2024 10:55 AM	small, walkable downtown

Screen Name Redacted 2/13/2024 12:18 PM	It’s less special since the “elected” officials ignore our wants.
Screen Name Redacted 2/13/2024 12:47 PM	Small Town Feel, Great Library, Unique Small businesses
Screen Name Redacted 2/13/2024 12:49 PM	Preserve the heritage and hardworking culture of the past. It's a small town that doesn't give up!! Let's strive for a cleaner and more appealing town for visitors and locals. Clean up the streets and continue to make it a desirable place to be in.
Screen Name Redacted 2/13/2024 01:27 PM	The potential. It has everything to be something truly special.
Screen Name Redacted 2/13/2024 02:09 PM	I would strive to preserve the natural beauty of the town in addition to downtown.
Screen Name Redacted 2/13/2024 02:59 PM	Old growth forests. Trails and parks. Small family owned businesses. Areas for youth to gather and be active. Create a local music venue for youth and adults.
Screen Name Redacted 2/13/2024 06:00 PM	Small businesses
Screen Name Redacted 2/13/2024 07:02 PM	Diversity celebrations
Screen Name Redacted 2/13/2024 07:34 PM	Don’t over develop. Don’t allow commercial companies in, stay local and preserve the history and natural beauty.
Screen Name Redacted 2/13/2024 07:53 PM	Beautiful tree-lined streets and historic buildings with unique local businesses.
Screen Name Redacted 2/13/2024 09:21 PM	Useful stores (Lutz, Bookish, Periwinkle) that help me get my tasks accomplished (housework, gifts) without having to drive to Vancouver.
Screen Name Redacted 2/13/2024 09:29 PM	The small town feel

Screen Name Redacted 2/13/2024 11:33 PM	Community events Mill Mixed income residential Youth sports
Screen Name Redacted 2/14/2024 05:29 AM	I do think having so many trails basically right in town is very unique, please continue to preserve / expand the trail system and connect different trail areas. The downtown is adorable, it just needs to keep doing what it's doing.
Screen Name Redacted 2/14/2024 08:06 AM	The community still feels quaint and approachable, but it is quickly growing to a size where community involvement and hometown pride will feel meaningless. Vancouver has already turned into this.
Screen Name Redacted 2/14/2024 09:39 AM	Old fashion values.
Screen Name Redacted 2/14/2024 12:05 PM	Parks, trails, and open spaces, with a dynamic library as a part of fabric of the community.
Screen Name Redacted 2/14/2024 05:16 PM	The buildings are historic and quaint. There are no homeless people. A variety of businesses. However you need 2 more coffee shops and some more cafes. To enhance it, I'd recommend requiring businesses to be open for a portion of Sunday.
Screen Name Redacted 2/15/2024 08:30 AM	Preserve the small town vibe. All the restaurants, shops and avenue of old trees add a unique charm to Camas. Preserve small town vibe- limit excessive growth, that our infrastructure can’t maintain. Our roads are overloaded and downtown Camas events, like Boo Bash, Christmas tree lighting are almost impossible to access. There’s not enough parking, so we need to arrive hours early to attend. Preserve our trees. They add such value to the city. Preserve the look of the old buildings. Revamp the mill into a shopping / lifestyle center like the Bend Mill District. Preserve our trails. Clean up the lakes, and stop motorized boats/ jet skis, that make so much noise and prevent non-motorized boats and swimmers from being safe.
Screen Name Redacted 2/15/2024 09:16 AM	We enjoy the history of the buildings from the Antique store to the old post office.
Screen Name Redacted 2/15/2024 09:16 AM	We need to enhance the downtown with more modern developments such as take down the paper mill and build a new Camas waterfront

	with contemporary shops and dining. We can still preserve the old downtown just have the new downtown Camas at the waterfront connect to the old historic downtown Camas. Many cities do this such as Dublin, Ohio with their new downtown Dublin connected to the old history downtown Dublin.
Screen Name Redacted 2/15/2024 09:26 AM	The people and shops. You need to somehow get control of the 'church' property back. It's a shame that so much of that amazing street is now empty or a church. I am a Christian but this isn't the best use for historic buildings and losing prime real estate and good restaurants is so disappointing.
Screen Name Redacted 2/15/2024 09:33 AM	The downtown is very charming and a highlight of the area. The tree lined streets and hanging baskets in the spring make the downtown beautiful. The retail stores are varied and offer a lot of options for residents and visitors. However, when you peel back the layers, there aren't a whole lot of places to keep you downtown. For instance, we only have a handful of restaurants families and friends can gather. The church has bought up valuable storefront space and took a pizza restaurant with it. If we can't get more restaurants, what about a food truck park? Restaurants can make Camas more of a destination.
Screen Name Redacted 2/15/2024 09:39 AM	Quitting being greedy SOBs and preserve! Ridiculous that this is even a question.
Screen Name Redacted 2/15/2024 09:46 AM	The small local businesses are special and add character. Preserve the Family oriented community.
Screen Name Redacted 2/15/2024 09:44 AM	The small town feel. You can go anywhere and run into someone you know. The members of the town really care about each other. This has been truly shown in how the town has thrived even through COVID. The parks and trails are amazing. Continuing to work to preserve and improve these is very important. All of the activities throughout town through out the year.
Screen Name Redacted 2/15/2024 09:44 AM	Locally owned businesses. Downtown Camas Association events.
Screen Name Redacted 2/15/2024 09:52 AM	Walk-ability, diversity of shops, restaurants, and entertainment. I hope that more spaces are available/affordable for small shops, restaurants and entertainment venues. I love the community events hosted/supported by the DCA. I would like more parking options, or

	more communication regarding transportation/shuttle options for community events, i.e. First Friday, October-fest, Car Show, Christmas tree lighting, etc.
Screen Name Redacted 2/15/2024 09:58 AM	The downtown development has made shopping downtown very inviting. I would like to preserve the small town atmosphere
Screen Name Redacted 2/15/2024 10:02 AM	Please preserve the historic buildings, small town charm, trees, and nature trails.
Screen Name Redacted 2/15/2024 10:06 AM	Not many small towns left and it feels good ti be part of the community. preserving historical buildings and culture is important for the future generations
Screen Name Redacted 2/15/2024 10:08 AM	Keep the great downtown association that is driving business.
Screen Name Redacted 2/15/2024 10:18 AM	I love that downtown has local companies. I think this is the future of malls and strip malls across the country. People want to support local and it's such a good thing. I also love how walkable downtown is, and that it is pedestrian centric, not car centric. America's roads (stroads) are designed for cars, not people, and it is so unfortunate and dangerous. Having a pedestrian centric downtown is so much safer and provides a much better experience.
Screen Name Redacted 2/15/2024 10:18 AM	the small shops are part of the feel. I like the events and parade in the summer. the general area is nice with parks and walking trails. Parking is always the big problem downtown.
Screen Name Redacted 2/15/2024 10:29 AM	Preservation on the friendly and safe community is so important. The look and feel of our historic downtown is essential.
Screen Name Redacted 2/15/2024 10:36 AM	Its fun to have a local theater, and small locally owned shops. Parking spaces are too small for modern day large vehicles. More places to eat, less salons..
Screen Name Redacted 2/15/2024 10:41 AM	What makes it special is its juxtaposition to water - to Lacamas Lake and the Columbia/Washougal rivers. We should strive to enhance the downtown, especially by reclaiming the land destroyed by the Mill over the years and hold GP accountable for remediating ALL

	properties and the underlaying soil/sediment/groundwater owned by GP to the highest land use classification, residential.
Screen Name Redacted 2/15/2024 10:43 AM	The brickwork and tree-lined lane - main street is gorgeous anytime of year and I'd love to see that continue. The art throughout the downtown area is also lovely and greatly enhances the feel of it. The theater is especially wonderful to have, and I frequent many of the local businesses including the hardware store, truly scrumptuous, mesa, kop chai and others.
Screen Name Redacted 2/15/2024 10:48 AM	We enjoy the trails and access to nature on walks or on bicycles.
Screen Name Redacted 2/15/2024 10:50 AM	Its ease to get to, great places to eat and drink and proximity of one place to the next is very nice Should strive to keep the small town feel. No big buildings, no big corporate block take overs (ex, the new church taking up a whole block)
Screen Name Redacted 2/15/2024 10:52 AM	The history is still seen throughout our town while we continue to grow and have more modern amenities. I would love to continue preserving the history while growing to meet our community's needs.
Screen Name Redacted 2/15/2024 10:59 AM	I like the shops and restaurants, the farmers markets. I like the trees, flower baskets, and statues.
Screen Name Redacted 2/15/2024 10:58 AM	Downtown. A vision for the mill is critical, and should be mixed use with housing
Screen Name Redacted 2/15/2024 10:56 AM	It is cute and charming
Screen Name Redacted 2/15/2024 10:59 AM	continuing preservation of historic downtown preserving walkability safety, parking ease.
Screen Name Redacted 2/15/2024 11:17 AM	small town feel with great shops, movie theater, live music and restaurants, community events and unique themed gatherings
Screen Name Redacted 2/15/2024 11:30 AM	The vintage buildings with their upgraded, locally owned shops and restaurants. The trees and plantings help immensely but the narrow

	street makes it particularly inviting to walk along 4th. Please try to add landscaping to the side streets, 3rd, 5th and 6th.
Screen Name Redacted 2/15/2024 11:45 AM	Don’t change to much
Screen Name Redacted 2/15/2024 11:49 AM	The small town feel. Shops are owned and operated by locals. It has a unique vibe. Doesn't feel like every other place.
Screen Name Redacted 2/15/2024 12:41 PM	It’s unique history and charm and beautiful natural beauty of the area.
Screen Name Redacted 2/15/2024 12:44 PM	What's special are all those independently owned businesses along Fourth Ave. The downtown core is so very pleasant because of all those tall, leafy trees and the well-maintained plantings and flower baskets. There's also just a good mix of different things, which means you can easily spend half a day or even a day shopping interspersed with restaurant-hopping. It's wonderfully walkable.
Screen Name Redacted 2/15/2024 12:53 PM	Embrace the new cultures moving into the community.
Screen Name Redacted 2/15/2024 12:56 PM	Small town feeling and locally-owned businesses.
Screen Name Redacted 2/15/2024 01:07 PM	Preserve the small town feel
Screen Name Redacted 2/15/2024 01:10 PM	A balance of cute small businesses, nice places to eat and clean and safe parks and recreation area. Strive to preserve the cleanliness and safety.
Screen Name Redacted 2/15/2024 02:08 PM	Beautiful Crown Park is so underutilized and lacking updates. A bathroom would be nice. The parks here are lovely. They need to be upkept better. We were promised a splash pool when they arbitrarily tore out the pool. That’s been several years ago and nothing.
Screen Name Redacted 2/15/2024 02:16 PM	All downtown activities , Small town feel, great shops, great schools, lots of hiking and park land.

Screen Name Redacted 2/15/2024 02:16 PM	Community things! Like first friday, farmers markets, etc. So fun!
Screen Name Redacted 2/15/2024 03:14 PM	Charming
Screen Name Redacted 2/15/2024 03:56 PM	I like the downtown feel with the shops
Screen Name Redacted 2/15/2024 04:23 PM	The warm welcoming family feel. People still say hello and our downtown business are friendly and inviting.
Screen Name Redacted 2/15/2024 04:40 PM	Small family owned businesses, historic buildings, and honoring the history of how camas came to be. Lets preserve the nature we have here. Round Lake, Fallen Leafe Lake and Lacamas Lake parks, Washougal River. Please prevent any further development on these natural sites. Preserving nature is key to making it livable here.
Screen Name Redacted 2/15/2024 05:20 PM	Special because it's a great mix of people, a safe place for families, and has a small town community feel.
Screen Name Redacted 2/15/2024 05:39 PM	It is a tight knit community Let’s keep it that way
Screen Name Redacted 2/15/2024 06:46 PM	The originality of Camas art, businesses and streets. Please preserve some of the original charm. Not just brew pubs and burger joints. Keep flowering baskets, first Friday’s, Girls night out, add 5k, events, art walks. Add Sassy Saturdays and other fun activities.
Screen Name Redacted 2/15/2024 07:46 PM	Balanced city with parks, library, retail, theater, restaurants, and residential. Preserve the downtown area but improve the entrance on 6th into downtown.
Screen Name Redacted 2/15/2024 11:23 PM	There seems to be a shared feeling of enjoyment and belonging when I'm downtown and cross paths with others, even if we don't know one another. I invite friends and family from out of the area to join in one of the special downtown events, and they feel like they've been welcomed to our block party
Screen Name Redacted	It's quaint...lets keep it clean and the crime low.

2/16/2024 12:20 AM

Screen Name Redacted
2/16/2024 05:07 AM

Small town, preserve the restaurants and shops.

Screen Name Redacted
2/16/2024 08:08 AM

The people whe have been here the longest seem to want to keep our Camas hometown feel. I am not a fan of out of towners moving in and wanting to change everything. Our school district is awesome, 4th Avenue should be walkable with stations that are permane from early spring through the end of Farmer's market or Boo Bash. Then all events could take place there with not do many spardic Street closures.

Screen Name Redacted
2/16/2024 08:40 AM

The small-town feel of Camas and the mix of small neighborhoods and rural community is one of my favorite parts of Camas. I think the town needs to preserve some of the rural areas and not just convert it all to subdivisions. Camas also needs to preserve and invest more in expanding open space and green areas, primarily natural areas and natural walking paths. With the growth we expect in the coming decades, we need to expand access to open space and natural areas.

Screen Name Redacted
2/16/2024 09:47 AM

Something for everyone. Preserve the history of the town.

Screen Name Redacted
2/16/2024 11:53 AM

nice people, pleasant, clean, safe, pretty. downtown is charming. Lacamas Lake is a treasure. Christmas festival is enjoyable.

Screen Name Redacted
2/16/2024 12:34 PM

Downtown should be enhanced by encouraging tax paying enterprises to set up in an environment that encourages community, growth and diversity of commerce. Real access to the entire community via trails, roads and public transit should be encouraged.

Screen Name Redacted
2/16/2024 01:44 PM

(see above for 1st question) Communities need to grow of course but Camas needs to do this while keeping the small town feeling. The cohesion in downtown is a real draw for not only locals but people outside the area as well.

Screen Name Redacted
2/16/2024 04:54 PM

The buildings, shops and restaurants

Screen Name Redacted

Nice walkable downtown, trails, usually pass school levies, festivities

2/16/2024 05:18 PM	downtown. Preserve downtown especially the movie theater, preserve park and open space.
Screen Name Redacted 2/16/2024 06:17 PM	Thanks to the city leaders, the downtown has been maintained as its historic self, camas should preserve that and not let it turn into a bunch of multilevel high rise apartment buildings to pack population into that area.
Screen Name Redacted 2/17/2024 08:19 AM	Great ambiance and flowers. Keep flowers and greenery.
Screen Name Redacted 2/17/2024 09:23 PM	Preserving the liberty theatre, library, the look of downtown Camas: lights, landscaping, sidewalks, monthly first Friday’s and other events throughout the year. The parks and trails are phenomenal. Great school support.
Screen Name Redacted 2/18/2024 09:07 AM	My favorite parts of downtown are the library and the theater. They signify the history of the town and community. Lutz’s is fantastic too—very hometown.
Screen Name Redacted 2/18/2024 09:38 AM	Signage that shares the history of our city with newcomers. I also enjoy places to mingle with a cup of tea, coffee, wine, and not just door to door spas.
Screen Name Redacted 2/18/2024 04:15 PM	Downtown
Screen Name Redacted 2/19/2024 08:42 AM	The mill history, murals/plaques, and a very dedicated and active library (with bees!) are special. I would love to enhance our knowledge about the history of the downtown-adjacent neighborhoods.
Screen Name Redacted 2/19/2024 11:53 AM	Outdoor recreation (parks, lakes, etc)
Screen Name Redacted 2/19/2024 02:23 PM	Preserve and protect our small businesses! Ensure development and growth doesn't adversely impact this vital part of what makes our community "us".

Screen Name Redacted 2/20/2024 02:25 PM	• Strong sense of community • Camas Farmer's Market • Many family friendly events, unique and inclusive • Iconic Main Street charm and beauty • Tree canopy, downtown and throughout town • Award winning library and programming • Downtown is cozy and inviting • Downtown is walkable—so much contained within a few blocks • Safety downtown and throughout Camas • Liberty Theatre—quality of programming and experience • Live music in multiple locations in downtown on the weekends; other events throughout the week in the bars/restaurants (tastings, bunco, karaoke, trivia, murder mysteries, etc) • Undertone of friendliness in downtown and throughout town • All of Camas is cleaner than average city • Quality stores, restaurants and services downtown—great mix for our size • Merchants collaborate with each other • Our community supports our downtown and wants to engage with our businesses • Surprising art scene: organic, authentic, variety of media styles, engaged artists • Many art focused events • Public art in downtown—engaging and fits within our aesthetic and scale • Downtown amenities—benches and seating areas, art, bike racks, signage • Our public schools • Our trail systems/parks; recreation areas • There is a Main Street Program that has and continues to intentionally revitalize downtown
Screen Name Redacted 2/20/2024 09:33 PM	Community events. Well maintained landscaping and store fronts. Locally owned businesses that service all age groups.
Screen Name Redacted 2/21/2024 10:35 AM	Our historic downtown is so cute! Fun activitites, small businesses, nice people. The library is amazing! Please keep it small and local.
Screen Name Redacted 2/21/2024 05:11 PM	I love the small town feel of Camas. I hope we can improve what we have without becoming too big or commercial.
Screen Name Redacted 2/22/2024 01:22 PM	Business friendly and very walkable historic downtown. I wish it was just more pedestrian friendly from downtown camas to Crown Rd. Many people walking on Crown Rd to Lacamas Creek Trail to downtown camas and that area does not feel very safe for all the pedestrians. I would like to see more large sidewalks and walking paths as a pedestrian who walks on crown rd to downtown camas often.
Screen Name Redacted 2/23/2024 09:58 AM	Walkability and food & shopping options downtown
Screen Name Redacted 2/24/2024 08:28 PM	Downtown camas is straight out of a hallmark movie! All the stores and walking the streets makes you feel like you're the main character

	in a small town movie. I'd love for there to be more restaurants and other unique stores added in the downtown strip, and possibly adding on to make it longer! Definitely preserve the library and post office, and keep all the older buildings as long as possible! It adds to the charm. I think the city could enhance the landscaping around the town, and adding lighting around camas.
Screen Name Redacted 2/26/2024 08:36 AM	Please stop adding more housing development before building the appropriate infrastructure. Fix the roads first. Putting the cart before the horse will never end well. And for some reason this trend continues to happen. Maybe revamp the planning commission .
Screen Name Redacted 2/27/2024 09:54 AM	Keep it small. Keep it walking friendly, but put it back to two lanes by safeway. Have the police actually give speeding tickets on 6th by the ball fields. Alot of people do 50 to 60 so they can be first to the stupid roundabout. Keep the homeless away. The mess they bring is disgusting.
Screen Name Redacted 2/27/2024 10:39 AM	We moved from Bend and feel that even though Bend is much larger it has really figured out how to have a small town community vibe. It puts a large portion of its' budget into parks and rec and and the schools (teachers, admin & especially the counselors) really show they care and put the kids and community first. Everyone lives in and contributes to the community. We haven't really felt that here. We feel Camas has such a unique opportunity with Lakes, Trails and historic downtown , however it's really not maintaining or utilizing them well. Clean lakes should be top priority. If we eliminate motorized vehicles on the lake it would make it less stressful on the ecosystem and more enjoyable for people to enjoy. We love paddling and kayaking on the lake with the kids and their friends but many times my kids have been knocked off by wave runners and speed boats circling us like sharks. Needless to say it makes it much less enjoyable and more difficult for kids, beginners and older adults to enjoy. We are fortunate to border the Columbia which is perfect for those vehicles so it wouldn't really be a loss for people who would like to participate in motorized activities .Also seems that since some people were interested in a community pool we could work on cleaning the lakes and maybe even have swimming areas & install inflatable features like slides, etc in the summer. We are so happy to see that work is being done to improve the trailhead on 3rd street. Thank you.
Screen Name Redacted 2/27/2024 11:58 AM	The character of the neighborhoods and the fact that there are still farms and open spaces. It's old AND new; not cookie cutter.

Screen Name Redacted 2/27/2024 02:25 PM	Quaint family friendly outdoor shopping and eating and events.
Screen Name Redacted 2/27/2024 04:18 PM	Local businesses and events
Screen Name Redacted 2/27/2024 04:31 PM	Don’t turn it into a crowded, noisy place! Keep the old charm
Screen Name Redacted 2/27/2024 04:57 PM	Cute old buildings. Stop taking down cute older ones and instead focus on getting rid of the 80s ones like the old Rivermark bank building if something needs to be taken down.
Screen Name Redacted 2/27/2024 06:28 PM	Preserve the small town feel
Screen Name Redacted 2/27/2024 07:09 PM	Unique shops & good food! Camas city pride.
Screen Name Redacted 2/28/2024 08:59 AM	I enjoy the cute downtown feel.
Screen Name Redacted 2/28/2024 06:52 PM	Open space
Screen Name Redacted 2/28/2024 09:06 PM	Actual homes, used to have little traffic.Strive to stop turning us into Vancouver
Screen Name Redacted 2/29/2024 08:38 PM	Lacamas Park. Historic downtown. Building/maintaining more trails to get citizens healthy and happy in nature.
Screen Name Redacted 2/29/2024 09:00 PM	Lacamas park is a pure gem and we love the lakes. Please preserve these wonderful areas and continue to work on the algae bloom issues in the lakes. Historic downtown is special because of it's focus on pedestrians over cars which facilitates enriching community events.
Screen Name Redacted 2/29/2024 09:46 PM	The cute town town area. Crown park is beautiful and should have attention.

Screen Name Redacted 3/01/2024 07:51 PM	charming downtown, We like the events in the summertime, Camas days, antique shows etc.
Screen Name Redacted 3/01/2024 09:44 PM	To have more options for cultural event. Theater, live music, musical, festival.
Screen Name Redacted 3/02/2024 07:37 PM	People talk to one another, unlike Salmon Creek where we used to live; connectedness; play park (run out of a local church, where a lot of moms and kids got to know one another; sociableness of our neighborhood, Lake Pointe; mom connections; convenience of downtown Camas; Heritage Trail and Round Lake trail network; green spaces; you recognize a lot of people when you're out; Downtown Camas merchants and staff; beauty; it's the total package: schools, downtown--you don't have to sacrifice anything; safety; community steps up to help each others; connections; cute, quaint, has trees; driving down Lake Road; most people own their homes; neighborliness; people have your back
Screen Name Redacted 3/04/2024 02:05 AM	We have a quaint historic downtown. The shortage of parking for events keeps us away from enjoying it. Parking is needed!
Screen Name Redacted 3/06/2024 05:58 PM	Natural spaces, good well-staffed schools, charming downtown
Screen Name Redacted 3/06/2024 06:24 PM	Great schools, good parks near Lacamas lake, nice downtown area. Please don't let Journey church take over the whole downtown area. Downtown is quaint but it's in need of more restaurants and specialty stores. We need to draw more foot traffic.
Screen Name Redacted 3/06/2024 06:36 PM	1:Privately owned business vs big chains and franchises everywhere, especially downtown. 2:Love the beautiful trees downtown and some buildings have character.
Screen Name Redacted 3/06/2024 07:49 PM	Charming atmosphere, independently owned businesses, convenient location. Strive for more diverse, higher caliber restaurants and bars/lounges.
Screen Name Redacted 3/06/2024 08:09 PM	Downtown: Strong community pride, shops, well-cared for. Bringing visitors downtown--it has a great feel; the big, mature trees make it

	feel really nice. Variety of businesses, including restaurants, movie theater; feels very family-friendly; feels safe.
Screen Name Redacted 3/06/2024 08:05 PM	park space, city adding green space, tree canopy
Screen Name Redacted 3/07/2024 01:11 AM	Love the old buildings and that everything doesn't look “cookie cutter” downtown. Please preserve and enhance nature and wildlife.
Screen Name Redacted 3/07/2024 09:17 AM	Small town feel with unique small businesses
Screen Name Redacted 3/07/2024 09:33 AM	We really do like the downtown area and the lakes/walking trails
Screen Name Redacted 3/07/2024 09:38 AM	downtown is charming Camas is hanging on to the small town feel that I loved growing up.
Screen Name Redacted 3/07/2024 10:04 AM	The library is incredibly special. Small businesses like Lutz Hardware are hard to find -- they're always friendly, and they always go the extra mile to find what you need. I LOVE Camas Antiques. It is definitely my happy place. Most times I visit, I buy things, but even when I don't, I leave feeling uplifted. Camas street fairs are unbeatable.
Screen Name Redacted 3/07/2024 10:11 AM	The Historical placards, and old buildings really add to the flavor of the town. The little statues of animals are a bit of whimsy and greatly appreciated.
Screen Name Redacted 3/07/2024 11:41 AM	Downtown Camas has unique old buildings and several nice shops/ restaurants. It has a quaint and charming feel, should be maintained.
Screen Name Redacted 3/07/2024 12:51 PM	Tear down the papermill and build a waterfront. It’ll bring in more businesses to the area and help our local economy. Build more modern buildings like a new library, contemporary downtown shopping.
Screen Name Redacted 3/07/2024 01:27 PM	all the people

Screen Name Redacted 3/07/2024 01:44 PM	The charm of downtown to me lies in the historic appearance, the trees, and our amazing small businesses.
Screen Name Redacted 3/07/2024 04:01 PM	the DCA is critical in creating a welcoming atmosphere which invites participation, but does not create artificial pressure. The regular newsletters, First Friday activities, and community events show how passionate and engaged the DCA members are, and encourage others to get involved as well. I value connection with my neighbors and knowing that all parents are aware of activity and will communicate in order to keep our kids safe so they can feel like they are playing on their own and gaining independence. I would love to see proactive planning to address the drug and houseless crisis that are stretching toward our town and could impact that sense of safety.
Screen Name Redacted 3/07/2024 07:09 PM	More promotion of small business. Additional community centered spaces and parks.
Screen Name Redacted 3/07/2024 07:16 PM	Small town feel, good community/schools, clean parks and trails, local businesses
Screen Name Redacted 3/07/2024 09:16 PM	I enjoy the events downtown, but they do get sort of redundant. I love the seasonal decor.
Screen Name Redacted 3/08/2024 09:15 AM	school district, community feel like DCA events, beautiful nature like Lacamas and Round lake trails, small independent businesses, lots of little eateries, local theater, library, etc. small town feel.
Screen Name Redacted 3/08/2024 12:32 PM	The downtown is charming. The trees and other plantings must be preserved to retain this charm.
Screen Name Redacted 3/08/2024 12:49 PM	Its a great city with small town charm and pride, don’t take all the open space and build on it. Takes away from the charm
Screen Name Redacted 3/10/2024 08:13 PM	Please preserve the old buildings that give our town the character that keeps it from looking like “any other town.” Please maintain our trees, trails, and pedestrian-friendly traffic levels
Screen Name Redacted 3/11/2024 03:15 PM	walkability, small town vibe, green trees, the sense of community, Natalia's cafe, bookstore, library, kid's stores and the movie theater all

	create an awesome homey vibe
Screen Name Redacted 3/11/2024 08:30 PM	For downtown specifically, I love the events for families and it's great to see small businesses downtown. We could use more options for food/drinks. Downtown is cute, clean, walkable, safe.
Screen Name Redacted 3/11/2024 10:21 PM	Our stores and merchants are so friendly and there is always something fun going on.
Screen Name Redacted 3/12/2024 12:45 PM	Keep from making it like California 2.0.
Screen Name Redacted 3/12/2024 02:43 PM	The lovely parks, downtown shops and restaurants, library and schools
Screen Name Redacted 3/14/2024 09:17 AM	Local stores and community activities. Less church owned buildings would be great...
Screen Name Redacted 3/14/2024 10:58 AM	Safety, great school and absence of homeless people
Screen Name Redacted 3/15/2024 11:29 AM	Small Town feel, *Small businesses, *Green space paths, *Access to nature,*School system excellence
Screen Name Redacted 3/15/2024 08:13 PM	Events downtown, and downtown itself. Decent (though incomplete) trail network. Camas lily fields, though they are getting degraded from invasives, development, and "bad instagrammers" who trample the plants. Pretty good community feel.
Screen Name Redacted 3/16/2024 06:19 PM	The movie theater, the antique store, the trees, the library, and the farmer's market. We also like the variety of restaurants downtown, places to get a hair cut. We don't go to the most expensive restaurants or the wineries. Places for people to sit and visit (benches, and I think there used to be a gazebo? in the downtown area are nice. We also liked the outdoor seating for restaurants allowed on the sidewalks or parking spaces during covid. Camas Days with the parade and the annual car show are also our favorite annual events.

Screen Name Redacted 3/16/2024 06:30 PM	Nice downtown, small town feel, easy and free parking. Save the downtown post office and other older buildings and trees. Sorry to see that church go and too much development
Screen Name Redacted 3/16/2024 06:51 PM	I like that there are t really any corporate entities. It’s walkable, easy to park. I love unique stores like Poppy & Hawk. I wish there were more like it.
Screen Name Redacted 3/16/2024 08:19 PM	Green trees,local business, quality food and drinks. No big shopping plazas please,not too many tourists too.
Screen Name Redacted 3/16/2024 08:36 PM	There are great restaurants and nice stores. Preserve a safe water system. Don't turn a contaminated pump on.
Screen Name Redacted 3/16/2024 09:32 PM	Schools
Screen Name Redacted 3/16/2024 11:41 PM	First Fridays are amazing, don't change a thing. Would love to see consistent source of information for everything going on around town - seems like I'm always the last to know when there's a special event coming to town.
Screen Name Redacted 3/17/2024 01:24 AM	The little few blocks of our old town and the business located there.
Screen Name Redacted 3/17/2024 07:22 AM	The commitment to building a vibrant business community that draws citizens of Camas as well as tourists to our downtown.
Screen Name Redacted 3/17/2024 08:14 AM	The trees and design of historic downtown are so charming and having shops and restaurants down there continue is crucial. We should preserve the downtown and continue to expand the specialty shops and restaurants. We also need to preserve the walking trails near the lakes as it makes camas so special!
Screen Name Redacted 3/17/2024 08:39 AM	We are proud to bring visitors. Feels safe, charming.
Screen Name Redacted 3/17/2024 08:49 AM	The downtown area is beautifully landscaped and maintained, it has a good variety of restaurants and shops and an affordable theater, a lovely library. Preserve the diversity of stores, the theater, the small

	town feel. It's sad that we have not preserved the small town. There are far too many people and the roads are crowded.
Screen Name Redacted 3/17/2024 09:01 AM	A small town environment is important for our youth.
Screen Name Redacted 3/17/2024 10:29 AM	The small and family-owned businesses, good restaraunts and shops. We were drawn to the town not being over-developed, which has been changing unfortunately.
Screen Name Redacted 3/17/2024 10:29 AM	The Main Street including its trees and foliage. The shops owned by local, small-town owners rather than a bunch of chains.
Screen Name Redacted 3/17/2024 10:40 AM	I love the community events. There's always something going on. The DCA has done a fabulous job making the town welcoming and beautiful.
Screen Name Redacted 3/17/2024 01:45 PM	The mix of businesses including a theater.
Screen Name Redacted 3/17/2024 05:10 PM	Love all the restaurants and beer places.
Screen Name Redacted 3/17/2024 05:27 PM	Downtown Camas needs to remain historic. It does not need more housing, it needs parking, walkable paths, places to sit and enjoy.
Screen Name Redacted 3/17/2024 05:43 PM	Our downtown expand streets beyond 4th with trees love the feel of 4th
Screen Name Redacted 3/17/2024 08:22 PM	Taking the charm out of Camas isn't good for anyone. There's literally no point having a DCA if the purpose is to strip away the things that make Camas unique. This includes historical buildings, like the octagon church. Putting up a high rise apartment with little character and no parking spaces will make it more difficult for people to want to stay downtown.
Screen Name Redacted 3/18/2024 02:54 AM	Preserve

Screen Name Redacted 3/18/2024 09:51 AM	Safe walkable downtown
Screen Name Redacted 3/18/2024 11:49 AM	Love the mill. Don't lose the feel of a mill town!
Screen Name Redacted 3/18/2024 11:54 AM	Like everyone I've met - the "small town feel" and TREES! Camas needs to hang on to open spaces, views, RESIST ALL DEVELOPMENT - the roads are becoming too busy, and most of all protect the TREES! People love to visit Camas because it "feels" like a hip, 1950's town - if you put sky scrapers around the main street it will not attract visitors or inhabitants. Right now Lacamas lakes are at risk and the rest of the hiking areas - which are being overused.
Screen Name Redacted 3/18/2024 01:45 PM	Camas is very walkable with wonderful trails and safe streets and sidewalks. Downtown Camas and Crown Park neighborhoods are very walkable and community oriented. We love First Fridays, farmer's market, Crown Park movies/concerts, egg hunt and summer kid's activities. We miss the Crown Park pool and look forward to the water feature/splash pad being installed soon.
Screen Name Redacted 3/19/2024 10:13 AM	Great school, the walkable downtown area, the hiking trails
Screen Name Redacted 3/20/2024 05:25 AM	Stop allowing churches on Main St., we fell in love with down town, but Journey is destroying it by trying to take up more space. Fully support them anywhere but the Main Street down there. Protect the trails.
Screen Name Redacted 3/20/2024 03:24 PM	Open space and trails. public safety. Tree canopy. Quiet. proximity to gorge Public ambulance model. Quality and accessibility of schools. Clean, well-kept. Accessibility to PDX, and airport. WA tax, amenities of big metro. Charming downtown, walkable. Small businesses. Library programming. Job opportunities. Historical mill town- jobs and investment. Work ethic, Community pride. Volunteer culture. Focus on youth and opportunities. Responsive and approachable city staff. City size and culture. Municipal service providers. High tech buy-in, finance, educated community. Community events. Family-oriented. Small-town feel. Proximity identity.
Screen Name Redacted 3/20/2024 03:29 PM	Old fashioned charm of Downtown can’t be replicated, beautiful historic architecture Ridgeline lighting and trees The relationships, and the connections we make The limited height of the buildings Lots

	of fun events! Public safety, people feel safe and secure, clean Family focused, excellent schools Good support for small business owners Nice parks and trail systems Many artists, lovely public art, art that fits our scale Walkability Flower baskets Cohesiveness, planned and intentional Liberty Theatre, Camas Hotel, Farrell building (Camas Antiques building)—all buildings to preserve, matter to our town Good restaurants Small and subtle features like public art, gazebos and benches
Screen Name Redacted 3/20/2024 07:26 PM	It's charming, the historical buildings, restaurants, coffee shops, library, cinema, post office, boutiques.
Screen Name Redacted 3/22/2024 07:12 AM	Camas is quickly turning from special to pathetic. The masses of homes,Now apartments especially apartments in downtown without having builders pay for road improvements,impact for utilities , schools,services.
Screen Name Redacted 3/22/2024 09:01 AM	Want to see my vibrant shops and restaurants while preserving historic small downtown feel. Love the quirky activities, first fridays, themed festivals, garden festivals, camas days etc. Love how clean it is. Keep residential and commercial areas separate. Don't put large commercial buildings right next to residential areas.
Screen Name Redacted 3/25/2024 10:09 PM	I think the city still offers a feel of community that is lost in some places. I like that there are trees and green spaces.
Screen Name Redacted 3/26/2024 09:46 AM	Downtown - quality and uniqueness of shops and restaurants, street trees and flowers, walkability Trails , green space and parks including large trees
Screen Name Redacted 3/26/2024 11:07 AM	Love the food options, cute shops like Poppy and Hawk. Safe atmosphere. Strive to preserve the safety and cleanliness. Continue to keep homeless off the streets of Camas. Enhance dining options, family friendly shops and events.
Screen Name Redacted 3/26/2024 04:18 PM	It's a Cute downtown. We need to preserve our great public schools.
Screen Name Redacted 3/27/2024 11:46 AM	What makes Camas Special? Parks Nature Open Spaces Community Pride Walkability Friendly people Schools Tree-lined streets Special Events History of good planning Downtown Library Lakes Good

	football team Great location/transportation corridors What should we strive to preserve? Tree canopy High-quality education Lakes Community center Nature/trails Sense of community Arts Sports Safe/Quiet Historic look and feel of Downtown Small business friendliness Inclusiveness
Screen Name Redacted 4/01/2024 11:31 AM	· Schools XXXXX · Location · Reasonable commute to jobs · Open spaces XXX · Proximity to international airport XXX · Liberty Theater (downtown entertainment hub) · Connected community & neighborhoods “you can’t leave your house without running into a neighbor” · Natural beauty/trails/lakes XX · Many opportunities to get involved in community · Comfortable/quiet · Affordability
Screen Name Redacted 4/03/2024 08:44 AM	It’s small and nice.
Screen Name Redacted 4/03/2024 09:08 AM	Downtown Camas needs to be preserved for it's historic feel!! Be careful to stop destroying historic buildings without a great deal of community input!! Stop the growth around and near LaCamas Lake. The Lake is a mess, and needs much attention, new homes should not be added to the problem. I would hope part of the paper mill could be maintained since there would be no Camas history without the presence of the mill in Camas. Stop small lots, and keep open areas, and keep areas that could be used for farming. Limit any annexation.
Screen Name Redacted 4/03/2024 10:07 AM	Please preserve what little green space and wildlife habitat still remains. We don't need more concrete, blacktop, apartments, etc. The planned Everett St. "improvements" are an example of the poor decisions being made ... putting small businesses out of business. The small businesses downtown are a significant reason for the charm and ambience of the area. "Pave paradise, put up a parking lot"... it's a shame.
Screen Name Redacted 4/03/2024 10:24 AM	Just the whole look of downtown should be preserved. Camas Days where they close off the roads and have a big city party.
Screen Name Redacted 4/03/2024 10:43 AM	Local businesses like bookish
Screen Name Redacted 4/03/2024 11:02 AM	The down town area is nice. Reduce traffic and congestion.

Screen Name Redacted 4/03/2024 12:34 PM	It's special when things are preserved as much as possible. I think with the exceptional push for growth caused by an exceptional demand, then we should be asking for more than usual in return. 1) Do everything possible to SLOW the process down, giving extra time for preservation of natural spaces. 2) make sure the infrastructure is in place BEFORE anything else happens. 3) Demand and get a quid pro quo. For everything given up for growth, something else is preserved that might otherwise be lost.
Screen Name Redacted 4/03/2024 04:45 PM	I love historic camas. I think less new buildings and keeping camas smaller is better. I also do not think we should extend the city boundaries by the airport. More country less highly populated neighborhoods. More trials and walking biking areas, more parks. Stop developing in camas. I want smaller town not city.
Screen Name Redacted 4/03/2024 05:13 PM	Everything
Screen Name Redacted 4/03/2024 06:10 PM	The memories of places I loved that are lost and gone forever. Don't turn all the remaining open space into massive houses on tiny lots.
Screen Name Redacted 4/03/2024 10:03 PM	The preservation of small town history. New buildings should fit the history style if small town. Not modernized monstrosities.
Screen Name Redacted 4/03/2024 11:32 PM	The beauty of Camas needs to be preserved. Quit building developments with houses on top of each other. Save our trees and hurry up and fix crown park (I took the survey years ago)!
Screen Name Redacted 4/04/2024 02:26 AM	I am having a hard time finding a response to the first question. We should strive on protecting our land, our natural resources, and STOP building large developments on every open field. Our community needs safe places for teenagers And family’s to go to, such as, skating rinks, bowling alleys, or game rooms.
Screen Name Redacted 4/04/2024 07:30 AM	Camas is a small mill town...even though the mill is nothing like it used to be...it is where are roots are as a town...no need to go and make it something new. Preserve the history, preserve our trees, forest, space and small town feel
Screen Name Redacted 4/04/2024 08:05 AM	The many local shops in downtown make it very special. When we first moved here there were a lot of outdoor dinning spaces that used

	parking spaces in downtown. I miss that. In the summer the outdoor space was beautiful and gave even more charm to downtown.
Screen Name Redacted 4/04/2024 08:11 AM	Businesses
Screen Name Redacted 4/04/2024 08:23 AM	Small town feel
Screen Name Redacted 4/04/2024 08:34 AM	The improvements to the downtown core have been such a joy to watch and participate in! Let’s continue to be mindful of our history as we grow and change. Not everything old needs to be torn down and replaced with shiny new buildings.
Screen Name Redacted 4/04/2024 08:58 AM	Preserve the history of our fun town, the classic small town feel. The people, community, nature, trails, green spaces all need to be saved.
Screen Name Redacted 4/04/2024 09:54 AM	Camas is special because it has maintained the small town vibe. When I drive through the narrow downtown streets it me how little it has changed over the years I have lived here. I don't think that should ever be allowed to change.
Screen Name Redacted 4/04/2024 11:51 AM	It's closeness to the Columbia River Gorge Scenic Area. Our historic Downtown should be preserved AT ALL COSTS !! It is part of what makes Camas so special. The events downtown are so enjoyable. Being able to see other Camas residents enjoying Downtown together....as a community should. Enhance the small town appeal of this city ! Don't destroy it !
Screen Name Redacted 4/04/2024 01:01 PM	The old buildings with nice architecture. Green spaces to walk and play. The lake, although it's a mess right now and needs to be fixed.
Screen Name Redacted 4/04/2024 01:15 PM	The DCA is a mean girl clique. Top to bottom it lacks ‘community’. Benefits those that are deemed worthy, won’t even implement suggestions from people that cost little no money if it isn’t from people who are in the circle.
Screen Name Redacted 4/04/2024 01:39 PM	The lake, hiking trails, downtown and classic feel of the mill.

Screen Name Redacted 4/04/2024 01:44 PM	Camas needs to preserve it's small town character and NOT build high density apartments on top of retail buildings. KEEP HIGH DENSITY HOUSING OUT OF DOWNTOWN CAMAS !!
Screen Name Redacted 4/04/2024 06:13 PM	Don’t build any more apartment/condos. Re purpose historic buildings. Explore using 5th avenue for more shops and events. Maybe planting more trees on 5th avenue would bring more shade for this.
Screen Name Redacted 4/04/2024 06:58 PM	Good local events like farmers' market and mothers' day plant sale
Screen Name Redacted 4/04/2024 07:26 PM	Plant trees that will grow tall on 5th street. Enhance areas for small shops and businesses.
Screen Name Redacted 4/04/2024 07:36 PM	Strive to preserve commerce in downtown, encourage climate-resistant solutions in future development, maintain roads, improve pedestrian safety, improve water runoff/flooding in old neighborhoods
Screen Name Redacted 4/04/2024 11:03 PM	The small town feel. Camas has such an adorable downtown, I love the shops, restaurants, and coffee options.
Screen Name Redacted 4/05/2024 10:37 AM	More affordability and diversity would be great
Screen Name Redacted 4/05/2024 11:41 AM	Historic downtown should be left alone . No high density housing. Improve the infrastructure downtown. You need to stop over developing every open space to make more tax money. Quit annexing more area, you cannot even effectively service the area you already have!
Screen Name Redacted 4/06/2024 07:48 AM	The small town feel is important. People know their neighbors and support the local businesses. Perhaps most importantly, Camas feels safe. You aren't constantly watching your back here, like in Portland.
Screen Name Redacted 4/06/2024 02:58 PM	DO NOT TEAR DOWN ANY MORE HISTORIC BUILDINGS!!!!!!! EVER!!!! Every old building is special and needs to be saved and protected for future generations.

Screen Name Redacted 4/06/2024 11:45 PM	The most special thing is that it's far enough from Portland
Screen Name Redacted 4/08/2024 09:20 AM	the Downtown vibe, access to parking. LaCamas Lake and park. Also, driving on the north side of the LaCamas Lake is a special experience, and one that cannot be duplicated. Its special and needs to be preserved.
Screen Name Redacted 4/08/2024 09:52 AM	Walking trails and parks. Small town feel. Proximity to city and culture. Walkable downtown, the character, no empty stores, people are invested. Welcoming environment for all ages. Monthly events, something for everyone, including kids. Grocery stores and library are in accessible locations. First responders and police are the best, and their partnership with schools is appreciated. Access to hiking trails. The people. Safety. The beer. Consistently pleasant. People care about their property. Downtown is really important. People are very friendly. The dog park is very social and offers social opportunities. Tight knit business community, everyone is very supportive of each other.
Screen Name Redacted 4/08/2024 12:48 PM	• People knowing/supporting each other • Close-knit downtown business community • Great schools • Family Friendly • Close to nature (paths, lake, parks) • Clean and Safe • Don't see a homeless problem (new residents) • Downtown acts as living room – expands social fabric • Events bring people downtown, and they come back for the businesses • Compact, walkable, accessible (balanced with proximity to nature, but access to 205/14/PDX airport) • Authentic historic charm (architecture, mill town history, "Hallmark movie") • Library programing, Youth Sports programming • "We pass all our bonds"
Screen Name Redacted 4/12/2024 10:29 AM	Small businesses with community desired products/services, walkable trails that feel safe, limited large apartment complexes in favor of beautiful individual family homes, walkable downtown areas that's safe.
Screen Name Redacted 4/12/2024 01:45 PM	The frequency of community events and available events to attend. The older buildings certainly provide charm that would be missing if they were removed. Even the historic and older houses in the area contribute greatly to the community's feel.
Screen Name Redacted 4/12/2024 03:40 PM	Slow traffic in lovely tree-lined street. Great restaurants and shops but these should be added to even more. By remodeling and

	restoring, keep the old buildings and, thus, the historic feel.
Screen Name Redacted 4/12/2024 05:02 PM	Charm in historic downtown. I would like to see the character preserved. Our parks and outdoor spaces are also quite impressive.
Screen Name Redacted 4/12/2024 05:38 PM	We love the historic buildings, hanging flowers and big trees that line the downtown.
Screen Name Redacted 4/12/2024 08:46 PM	Walkability, small local businesses, and the events that draw people to participate.
Screen Name Redacted 4/12/2024 09:08 PM	The greenery and small business shops, lack of large corporations
Screen Name Redacted 4/13/2024 04:49 AM	The down area consists of old historic buildings. The 2 shops on 4 th, Camas Antique store and the Camas Hotel, remind us of the past that goes back well over 100 years, and I think showcasing that is vital. Even the mill has a history of its own. Oh I forgot, the liberty theatre and library are historic too.
Screen Name Redacted 4/13/2024 06:19 AM	Simple, accessible, vibrant but not too busy with people, parking is fairly easily regardless of event. Strive to enhance grocery shopping experience.
Screen Name Redacted 4/13/2024 07:03 AM	It has a unique collection of shops, great restaurants, and is very walkable. I do feel like churches taking over downtown space might change the vibe though.
Screen Name Redacted 4/13/2024 03:33 PM	Small town feel, small businesses, community events, park district is great, wonderful friendly feel.
Screen Name Redacted 4/13/2024 04:36 PM	The mill. This town would be NOWHERE without the mill at the epicenter. Everything Camas has /is can be traced to the mill. We do our forefathers a disservice to bad mouth the mill and its history. It’s disgusting to hear the high school now call themselves the Makers instead of the Papermakers. To come from another state and want to change this towns history is extremely narcissistic.
Screen Name Redacted	small, local shops/restaurants, and the local theatre is fantastic. The

4/13/2024 05:05 PM

downtown looks very clean and friendly and has a wonderful family feel. There's a large variety of parks and playgrounds that are all close and clean and wondeful for our family to hang out at.

Screen Name Redacted
4/13/2024 08:05 PM

The downtown is distinctively unique and should stay that way

Screen Name Redacted
4/14/2024 11:03 AM

Clean, quite with an abundance of preserved outdoor space. The downtown area is very pretty and quaint.

Screen Name Redacted
4/14/2024 11:11 AM

Camas lucked into a classic walkable core downtown before exclusionary zoning took over. Please don't ruin our downtown with more traffic. We must keep vehicle traffic at low speeds and increase access to downtown by walking, biking, or rolling. 2 of my adult family members don't drive and two more with they could reduce their driving if access was safer.

Screen Name Redacted
4/14/2024 05:39 PM

What makes it special is the hard working men and women who made this town what it is. Green spaces. Limit urban growth. Please please stop growing the city boundary. We have space within city limits to grow if needed but the more we sprawl and entice folks from elsewhere to push bigger streets, more traffic lights, etc. The more we become the suburb of LA these people are trying to move away from.

Screen Name Redacted
4/14/2024 07:17 PM

Camas is nice because of the good schools, greenery/parks/playgrounds/trails, cute downtown. There are no big box stores and it’s not cookie cutter which is a good thing. Keep it small and improve sidewalks and add crosswalks for all the kids here trying to enjoy what it has to offer.

Screen Name Redacted
4/15/2024 06:40 AM

preservation of main street buildings, the mill. that look and feel .

Screen Name Redacted
4/15/2024 10:39 AM

Small businesses are the heart of camas. It is important to continue to support our local small box stores. The post office and library are especially important landmarks. While the Mill isn't nearly as large and productive as it once was, this is a big part of Camas history and at least the interpretive lobby should be maintained.

Screen Name Redacted
4/15/2024 10:53 AM

The downtown is adorable! Keep investing in it with local businesses and expand the tree-lined streets. It could use more diverse

	businesses. It is heavy on galleries, churches, and stores catering to 'parents.' More businesses to attract the youth would be good. The addition of churches in the downtown is not helping to make it feel diverse and attractive to tourism.
Screen Name Redacted 4/15/2024 02:26 PM	quaint, small, friendly
Screen Name Redacted 4/15/2024 02:56 PM	Keeping the downtown clean and keeping the town small
Screen Name Redacted 4/15/2024 04:36 PM	You should strive to preserve the small town community feel where people feel safe, friendly and unique. Keep it small please, it doesn't need to be like the Vancouver waterfront. We don't need more cookie cutter strip mall buildings. The historic downtown is perfect the way it is, even with the mill. This is a special place that is quiet and out of the way, focused on recreation and families. We can go to Vancouver for everything else.
Screen Name Redacted 4/15/2024 05:23 PM	Local businesses and tree-lined charm.
Screen Name Redacted 4/15/2024 06:59 PM	The brick buildings, the shops, it's very quaint. Strive to keep it that way and preserve it by making the entire city a national historic site.
Screen Name Redacted 4/16/2024 09:10 AM	The family-friendly environment NEEDS to be preserved. Preserve the quality of schools, as well as parks, lakes, and greenspaces as much as possible. Limited high density - we do not want to see large, multistory apartments or office towers. Keep the small town feel - single family homes, vibrant downtown - with restaurants, shops, and small businesses. Cleanliness and safety are important - we want Camas to feel safe for families.
Screen Name Redacted 4/16/2024 09:34 AM	Small town feel of downtown, lots of activities (outdoor, Liberty theater, downtown shops, close to gorge), history with mill.
Screen Name Redacted 4/16/2024 06:51 PM	I like the small town feel, family friendly and walkability nature of it. I'm disappointed that the city chose to allow an entire block to be purchased by a church to decide what to do with a prime location. I don't mind them having a presence but to take probably the most important section of all of downtown to then decide what is available to to our community shouldn't be allowed by just one entity. I like the

	diversity that the town has and this takes away from it.
Screen Name Redacted 4/16/2024 08:21 PM	I found that Vancouver never felt like it had a feeling of community; Camas does. It has that small town feel that happened to grow a bit bigger. We should preserve that as Camas continues to grow.
Screen Name Redacted 4/17/2024 08:06 AM	Preserve as much historical character as possible while keeping buildings safe and comfortable. Keep downtown open, not packed in or it becomes uncomfortable to visit
Screen Name Redacted 4/17/2024 12:10 PM	What makes Camas special: It is a stable environment: Families who have moved here stay here. What should be preserved/enhanced: Quality of education provided by Middle and High-Schools
Screen Name Redacted 4/17/2024 02:49 PM	Old bulidings and trees, lack of strip malls, small independent businesses, great parks and green spaces with good hiking/walking
Screen Name Redacted 4/17/2024 03:57 PM	Quality of schools. Parks and green space; heritage trail, lake access, crown park, trail connectivity, and river access. Community events. Pride. Downtown flower baskets. Climate. Access to services and healthcare. Great EMS response times. Strong law enforcement. Safety. DCA. Chamber of commerce. Collaborative leadership. Care for where they live. Library programming. Small town charm.
Screen Name Redacted 4/17/2024 05:10 PM	Love that it's always had a small town feel and hope that as we continue to grow we don't stray too far from that.
Screen Name Redacted 4/17/2024 05:48 PM	It’s clean and beautiful and people clearly care about kids.
Screen Name Redacted 4/17/2024 05:58 PM	Everything I listed in #1, plus our beautiful library, the downtown area (with exceptions I’ll list later), Lacamas Lake (with exceptions I will also list later).
Screen Name Redacted 4/17/2024 09:07 PM	Small town feel. Clean look. Green and flowers
Screen Name Redacted 4/18/2024 07:28 AM	The small town feel. Don’t let big box stores kill small businesses. Keep the old look and feel of downtown.

Screen Name Redacted 4/18/2024 09:31 AM	Strong sense of community, downtown Camas is a place we enjoy going to
Screen Name Redacted 4/18/2024 09:52 AM	We enjoy that the historic downtown is clean. We'd like to see small and local business prioritized and giving them affordable rent. Rather than large businesses or churches. The friendly residents and family focus, with city events geared towards families are the best.
Screen Name Redacted 4/18/2024 02:06 PM	Sense of community.
Screen Name Redacted 4/18/2024 03:33 PM	I like the library. The rest of the building are outdated and need to be replaced.
Screen Name Redacted 4/19/2024 05:56 PM	Preserve the culture of the downtown, preserve the theater, the library.
Screen Name Redacted 4/19/2024 07:24 PM	I like the parks and downtown area.
Screen Name Redacted 4/20/2024 10:55 AM	Downtown Camas is so cute. It also always has a bit of a magical feel to me. The older buildings are certainly a critical part of that vibe. I love its walkability. I also think that the library is particularly important. I always stop in when I’m downtown.
Screen Name Redacted 4/20/2024 06:40 PM	Preserve and enhance walkability to everywhere, shops, neighbors, parks. Downtown has European town feel with all things within walking distance, focused on pedestrians and interaction with neighbors.
Screen Name Redacted 4/20/2024 07:25 PM	downtown is delightful. keep it that way it is - looks like you're going back in time. the flowers, trees, wonderful.
Screen Name Redacted 4/20/2024 08:25 PM	Keep the charm
Screen Name Redacted 4/22/2024 09:05 AM	It is not special right now. It has the potential to be special though.

Screen Name Redacted 4/22/2024 09:35 AM	The library - independent ownership. Green spaces and parks. Walkable and bikeable downtown. Strong school system. DCA. Library and parks and rec programs. Safety. Urban and rural. Mountains. Small businesses - Grains of Wrath and Natalia's Liberty theatre. Downtown.
Screen Name Redacted 4/22/2024 12:10 PM	Love the downtown charm and public library, farmer's market, first Fridays. Please preserve these. Love the neighborhood feel and the number of pedestrians and cyclists. My bipoc and lgbtqia children feel safer here than most smaller cities/towns.
Screen Name Redacted 4/23/2024 05:00 PM	I would love to see the many community events that bring people together (First Fridays, Farmers Market, etc.) continue. Growth is inevitable, but maintaining the friendly, relaxed, small-town character is critical. I would prefer to have a limited number of those multi-level complexes we're starting to see on 6th St. In the areas I grew up in, they've built too many and irreversibly changed the character of those communities. Love the idea of expanding the downtown out to include surrounding streets.
Screen Name Redacted 4/23/2024 09:08 PM	Downtown has a quaint small town feel, which is very charming.
Screen Name Redacted 4/23/2024 09:20 PM	I think the walkability is the greatest strength. I would try to enhance the city’s density by allowing for more mixed use zoning, especially in the crown park neighborhood.
Screen Name Redacted 4/26/2024 07:36 AM	the history of Camas is centered on downtown. The town was formed around the mill industry which is why roads built oriented to mill and such. At some point the mill needs to go, but the history is important & should be used as educational opportunities. The older & repurposed buildings help preserve the character and new DCA educational signs help hint into the past. Would love to see more
Screen Name Redacted 4/27/2024 12:34 PM	The forest and hiking trails within city limits is one of Camas's most valuable features, the city should strive to expand and enhance them. And the schools.
Screen Name Redacted 4/27/2024 05:02 PM	Small town feel, great old post office, library, trees. Safe to walk the streets, lots of Greenspan for quality of life

Screen Name Redacted 4/29/2024 10:59 AM	Bustling businesses, shops and restaurants! We need more high rises with shops and stores underneath apartment/condo type living. Also, needs to be more pedestrian and cyclist friendly. The sidewalks are really old and narrow. We need to add larger walkways and bike lanes all the way down to the Lacamas Creek Trail and up SE Crown Rd as well.
Screen Name Redacted 4/29/2024 12:38 PM	Keep the streets narrow and the businesses small. Maintain the hanging flower baskets.. they're stunning! The town remains small and friendly with many activities.
Screen Name Redacted 5/02/2024 09:40 AM	Cutest downtown, little town atmosphere. Public space and parks. Historical element - preserve the core. Prepare for growth. People come for the feeling and small-town vibe. Unique shops. Cleanliness, well-maintained, well-planned. Strong history of growth projections, which has preserved the home feel. PPL. Access to nature and lakes. Great place to raise kids. Uniqueness of Mill.
Screen Name Redacted 5/02/2024 09:43 AM	walkability, greenery, local businesses
Screen Name Redacted 5/02/2024 03:06 PM	quiet residential community with lots of nature
Screen Name Redacted 5/02/2024 03:30 PM	There’s not much bringing me to downtown
Screen Name Redacted 5/02/2024 09:31 PM	The walkable, small town feel is great, and the city seems to want to maintain lots of green space for citizens.
Screen Name Redacted 5/02/2024 10:20 PM	Diverse family friendly food and entertainment options plus shopping.
Screen Name Redacted 5/03/2024 08:07 AM	Historical buildings, walkable space, small retail and dining spaces are what make downtown Camas a fun place to hang out.
Screen Name Redacted 5/03/2024 08:23 AM	Cohesive feel to the community. Camas should continue to enhance areas of largest citizen agreement.

Screen Name Redacted 5/03/2024 08:42 AM	It's cute, historic, and walkable. More restaurants and dining would mean more reasons to go downtown or meet others out.
Screen Name Redacted 5/03/2024 03:27 PM	It’s picturesque. Lots of cute shops. Could enhance food options
Screen Name Redacted 5/03/2024 03:28 PM	Character - cute, non-chain shops, well maintained buildings, walkable streets
Screen Name Redacted 5/03/2024 04:05 PM	This area has an ABUNDANCE of parks and walking paths! Yrs. gone by, the Mill made Camas-town smell, undesirably. By the time I moved here: Camas no longer "smelled." YAY Camas library is a stand-out!
Screen Name Redacted 5/03/2024 04:05 PM	Much is made of the historical aspect but the city continues to let the historical infrastructure degrade. Spend the money bringing it up to code before it becomes a greater issue / emergency.
Screen Name Redacted 5/03/2024 04:05 PM	The community is very active and plans a lot of fun events. Definitely preserve the small town feeling.
Screen Name Redacted 5/03/2024 04:07 PM	The waters and trails, aswell as downtown and the wooded areas with no homes on them
Screen Name Redacted 5/03/2024 04:37 PM	Downtown is great. Preserve restraunts and bar diversity (acorn and oak!) Worried about church owning a whole block.
Screen Name Redacted 5/03/2024 05:41 PM	Parks and trails
Screen Name Redacted 5/03/2024 06:03 PM	See above.
Screen Name Redacted 5/03/2024 06:01 PM	The natural beauty, open spaces, parks, outdoor recreation. It would be amazing to turn the mill into a a cool shopping area once it isn’t running anymore.
Screen Name Redacted 5/03/2024 06:31 PM	walkability, connectivity to trails

Screen Name Redacted 5/03/2024 09:16 PM	Investments and priority placed on small business success, parks
Screen Name Redacted 5/03/2024 09:55 PM	Maintaining a clean and safe downtown, incorporating the historic charm and displaying signage about the towns history. Events are great. Events like First Fridays aren't unique to cities and towns, but Camas takes so much pride in the community, it just feels like home when attending one.
Screen Name Redacted 5/04/2024 09:19 AM	The architecture and the trees:
Screen Name Redacted 5/04/2024 09:47 AM	Shops and restaurants, hiking trails, schools. Should strive to enhance these, as well as more outdoor and indoor recreation
Screen Name Redacted 5/04/2024 04:41 PM	Walkable, human-scaled development downtown. Street trees. Please preserve and enhance pedestrian and bike access, limiting influence of automobiles. Camas parks and trails are wonderful -- please protect and improve ped/bike access to parks and trailheads.
Screen Name Redacted 5/04/2024 05:28 PM	Building and vibe, community feel
Screen Name Redacted 5/04/2024 05:30 PM	Enhance walkability and connection to the river. Camas could also get rid of the mill so that we can get back our views and connection to the riverfront.
Screen Name Redacted 5/05/2024 08:40 AM	Walkable downtown. Need more connected pathways for walking and bikes.
Screen Name Redacted 5/05/2024 09:13 AM	Good variety of community events throughout the year, as well as community ed and parks and recreation opportunities. Enhance quality of parks (e.g. consistently having bathroom facilities, public parking, pedestrian access). Preserve small businesses downtown and preferably extend operating hours so it's easier to shop small businesses.
Screen Name Redacted 5/05/2024 12:39 PM	Our natural resources must be protected. Keep our water clean for drinking and recreation. Preserve all the old buildings and homes. The

	downtown post office needs to be preserved. It's a beautiful building.
Screen Name Redacted 5/05/2024 03:21 PM	4th Street with its numerous small shops, galleries and eateries, beautiful trees and cozy sidewalks. Some of the side streets could be enhanced in the manner of 4th St.
Screen Name Redacted 5/05/2024 04:34 PM	Small-town feel. No chain stores. Everyone very friendly.
Screen Name Redacted 5/05/2024 06:11 PM	We need to focus on roads and development of the northshore area with a variety of live work areas. So many great options. Check out Northwest Crossing area in Bend, Oregon
Screen Name Redacted 5/05/2024 09:37 PM	The small town feel is something to be valued. I love that I can walk downtown and run into familiar faces. Business seem to be involved in the community and I believe that it is important that they continue to contribute to the community in a positive manner. I believe it is imperative to preserve our natural spaces. The lake, the trails, and the parks.
Screen Name Redacted 5/06/2024 02:01 PM	The streetscape is a beautiful, colorful and trendy setting with streetside dining opportunities. I believe the street and curbs have been cut lifted or repaired for so many years that a thorough repair and finish needs to be done on all concrete curb sidewalk, and asphalt surfaces.
Screen Name Redacted 5/06/2024 03:27 PM	Make it so you don't have to be a millionaire to live her.
Screen Name Redacted 5/07/2024 08:24 PM	It has a small town feel with modern amenities.
Screen Name Redacted 5/10/2024 01:55 PM	Camas is special as it has largely kept out the large box stores and restaurants from downtown. Small business is the way to go.
Screen Name Redacted 5/11/2024 02:20 PM	Camas provides a wonderful variety of green spaces, including forested areas as well as parks and trails. The natural beauty should be preserved and not decimated to make way for development. Preserve the "quaintness" and the small town feel that Camas currently exudes.

Screen Name Redacted 5/12/2024 07:25 AM	Unique shops , great library, small town
Screen Name Redacted 5/12/2024 06:47 PM	We seem to focus only on the downtown. While it's quaint it is well beyond being the focus of a city of our size. Many people live far away from the downtown. Some of the businesses are in constant turnover. We should strive to enhance the downtown but we also need to set a vision on the next generation of special and historic parts of Camas, which means we start to build them today.
Screen Name Redacted 5/13/2024 04:33 PM	A livable scale, a walkable downtown, natural resources. All of these need to be balanced against growth.
Screen Name Redacted 5/13/2024 09:22 PM	Local businesses, no corporate franchises. More focus on arts
Screen Name Redacted 5/15/2024 12:24 PM	Trails and mountain biking. Connectivity to PDX and surrounding areas.+ Greenspace.+ Not heavily built out/ very chill and peaceful. Not a lot of crime. Unique downtown/historic look. Water/rain. Hills. Clean. Community events. Lakes and parks+ Low crime/safety. Trails. Churches. Friendly people. Great schools. Public safety/1st responders. Food trucks in neighborhoods. Ecosystem in back yard/ lots of wildlife. Camas pride. School athletics. Topography/geographic location. Views/the gorge. Don pedros and other restaurants. Cold winter/warm summer. School funding. Trees and wide roads. Community education programs and services.

Optional question (348 response(s), 19 skipped)
Question type: Essay Question

Q3 What about Camas, including our historic downtown, would you like to change in the future? What can improve?

Screen Name Redacted 2/20/2024 02:02 PM	Housing diversity; increase medium and high-density housing. Connecting/expanding walking path system. Re-energizing high tech employment in town (reverse job losses from Sharp, HP, UL Labs, etc.) Improve telework infrastructure via high-speed internet/public data access. Improve access to regional transportation to better support business travel (commuter bus to airport and train stations) More secondary neighborhood small retail centers with groceries, coffee, and small shops in Grass Valley, but NOT sprawling minimart areas. Create walkable/architecturally nice areas. Dedicated food

	truck park with covered eating areas especially adjacent to other infrastructure like parks.
Screen Name Redacted 2/09/2024 07:21 PM	Create a better parking plan at the rate growth is being allowed. I had to find a different church due to lack of parking and no longer patron restaurants in Camas. Reasonable parking is no longer available. Preserve the history of Camas and why it was even founded. The young people need to know and be able to experience some of why Camas exists.
Screen Name Redacted 2/09/2024 09:12 PM	We need better infrastructure downtown. We need better streets sidewalks. We really need a central gathering. Place like a town Square or town Park that ties third, fourth, and fifth together. And eventually sixth, especially as more development happens.
Screen Name Redacted 2/10/2024 07:55 AM	We need a big parking garage. I vote for buying the lot that belongs to the mill across from Grains of Wrath. Allow the mill employees free parking and charge everyone else. It would pay for itself in no time and then it would be a source of revenue for the town.
Screen Name Redacted 2/10/2024 09:40 AM	I would like to see more sidewalks outside the downtown area, and maybe a park on the North shore of the Lacamas lake.
Screen Name Redacted 2/10/2024 11:47 AM	Downtown should not be changed at all!!! The improvements that were suppose to be made to Crown Park should happen already. Lacamas lake needs to be cleaned up and properly maintained to stop the toxic algae that grows every year.
Screen Name Redacted 2/10/2024 11:14 PM	Water quality in lakes
Screen Name Redacted 2/11/2024 10:27 AM	We need expand safe walkable areas and higher density areas for community gatherings and lifestyle enhancement. Create separate zoning for industrial or “strip mall” like development away from residential areas. Keep as much of chain stores and restaurants outside of camas.
Screen Name Redacted 2/12/2024 10:02 AM	walkability-- sidewalks are nice, but in the future it would be nice to see 4th Ave as a pedestrian only plaza. 4th Ave already feels too small for cars that are passing through and with as many pedestrians that cross it can be dangerous

Screen Name Redacted 2/12/2024 02:44 PM	Honestly, not much. There are some old buildings that need some TLC but other than that, I like the way it is.
Screen Name Redacted 2/12/2024 02:59 PM	Prioritizing a refresh/enhancements of existing parks, roads, and infrastructure before new development. Specifically, I'd love to see road/sidewalk improvements on McIntosh and southern end of Brady Rd to connect communities to the new Columbia Palisades development and to be able to handle the increase in traffic. I'd also love it if we could refresh some of our park play structures so that I don't have to drive to Vancouver so often for park play.
Screen Name Redacted 2/13/2024 08:43 AM	Add more restaurants, cafes, wine bars.
Screen Name Redacted 2/13/2024 08:52 AM	More green spaces & pedestrian walk ways.
Screen Name Redacted 2/13/2024 09:11 AM	It would be amazing to have a park with a playground within easy walking distance of downtown. Also a dog park! Be very thoughtful about future housing development and how it will impact infrastructure, schools, environmental, etc. I think it would be wise to also try to entice larger employers to come to the city so more people can live amd work within the city limits.
Screen Name Redacted 2/13/2024 09:37 AM	I wish the church didn't own the whole block. Fun places for kid and teens to hangout.
Screen Name Redacted 2/13/2024 09:42 AM	Make the entire downtown core a pedestrian zone (as can be found in European cities and towns). We'd need to develop some parking plazas around the periphery.
Screen Name Redacted 2/13/2024 10:00 AM	Stay on track with what the people want for the future, Stop the Condo generic look building that has started and make the building fit the historic look and feel or it will be lost forever. When the mill clean up comes don't fill the area with more buildings use the space for actual gathering areas and the overflow of the events that are downtown. If we get much more the infrastructure is not going to support all the influx in wanting to bring more homes to the area. Try supporting who is already here it is hard to even go enjoy the lakes anymore.

Screen Name Redacted 2/13/2024 10:42 AM	Very slow growth will preserve it all.
Screen Name Redacted 2/13/2024 10:52 AM	Continue to encourage businesses to develop in the downtown area.
Screen Name Redacted 2/13/2024 10:55 AM	Walking/Biking is very disjoined. 500 is the primary road and should connect downtown to the lake/park. We need a nice grocery store. Right now the only option is QFC, which is almost in Vancouver - Trader Joes or Zupans would be a great addition! The downtown area needs more restaurants and community areas that are open to bring regular business to the stores. A large portion of the main blocks are closed most of the time. The mill is an eye-sore
Screen Name Redacted 2/13/2024 12:18 PM	I would like to end the ugly box condos and preserve what little is still standing in our town.
Screen Name Redacted 2/13/2024 12:47 PM	Better Access to Sport Facilities and Access to said facilities...example, turf fields, swimming center, community workout facilities, generally improvement of recreational opportunities (see Tualatain Hills Park and Rec Center). Road improvements (sidewalks, bikel anes, less potholes and delayed maintenance). Improve over crowding of schools at all levels. Better maintenance of exisiting parks. Stop adding more development without adding necessary resources (schools, parks, roads) etc...to accommodate growth.
Screen Name Redacted 2/13/2024 12:49 PM	I'd like to see more new development opportunities. Let's bring in new businesses and eateries. Make the town more walkable.
Screen Name Redacted 2/13/2024 01:27 PM	More density and apts/condos. Less parking lots and more retail/dining space. Community gathering center. Finally, mill redevelopment.
Screen Name Redacted 2/13/2024 02:09 PM	I would like to see less development.
Screen Name Redacted 2/13/2024 02:59 PM	Stop creating developments with such narrow streets kids can't even play, buses and emergency vehicles can barely fit, and families have no parking.

Screen Name Redacted 2/13/2024 06:00 PM	More multi family housing. Revamp mill area and utilize space differently.
Screen Name Redacted 2/13/2024 07:02 PM	Parking, add dog park, make it affordable for small businesses to have space
Screen Name Redacted 2/13/2024 07:34 PM	Support the police. Keep the community safe and clean at all costs.
Screen Name Redacted 2/13/2024 07:53 PM	Adding more businesses (not churches) in the downtown streets and planning for the eventual mill closing.
Screen Name Redacted 2/13/2024 09:21 PM	No more sprawl. Smart downtown planning, gradually increasing density, with smart management of car traffic.
Screen Name Redacted 2/13/2024 09:29 PM	A downtown that has a broader footprint, integrated housing with businesses.
Screen Name Redacted 2/13/2024 11:33 PM	Community events should be expanded beyond downtown to assist with growth. The mill should be mostly demolished but a small portion used as a museum. Allow for low income programs to thrive like boys and girls club instead of removing. Many people depended on those resources
Screen Name Redacted 2/14/2024 05:29 AM	I think the two intersections at 6th and Adams and 6th and Dallas are not safe - I regularly see people almost get into accidents at both of them because they expect them to both be 4-way stops. Also I wish there were a few more dining options downtown - some more like casual lunch options, or maybe a small drugstore or a bakery - more ways to get your everyday shopping done while walking around so you don't have to drive elsewhere.
Screen Name Redacted 2/14/2024 08:06 AM	Downtown is beautiful. The tenant mix is perfect. We HAVE to slow down on residential development. Let’s concentrate on fixing our lakes, lack of infrastructure and another high school that will actually “See and Serve ALL students”.
Screen Name Redacted 2/14/2024 09:39 AM	More family events in and around parks and Lacamas Lake.

Screen Name Redacted 2/14/2024 12:05 PM	Downtown-- improve the infrastructure (trees, sidewalks, cross-walks, utilities) along with improved parking opportunities, safer pedestrian-automobile interactions. City-wide, with existing trails their connectivity needs improvement, as well as new trails construction as community grows. Also preserve open space and habitat - reduce opportunity for wildfires to impact them as well as to property owners structures.
Screen Name Redacted 2/15/2024 08:30 AM	The mill- see first answer. Clean up the lake. Create a trail right around long lake.
Screen Name Redacted 2/15/2024 09:16 AM	We would love to see the town be more inclusive. We feel that the town only caters to the "rich" and leaves the average person out. For example, the events that take place usually involve going from store to store - places that have gotten so snobby and out of hand!
Screen Name Redacted 2/15/2024 09:16 AM	It needs to be refreshed with a new modern library, fire department, and more shops buildings with contemporary modern architecture like the Vancouver waterfront or how the Firstenburg library looks. We need a new downtown Camas at the waterfront that connects to the historic one, or replace the old library and older downtown buildings with more modern stores and library.
Screen Name Redacted 2/15/2024 09:26 AM	Also, you do need to bring back some short term parking spots. Having to lug 20+ lb bags of dog food blocks is ridiculous. Please put a few 10 minute spots on Cedar Street. This would be good for the bagel shop too.
Screen Name Redacted 2/15/2024 09:33 AM	I would like to see more walking/biking paths that can get residents to downtown and the Lake. Everything requires a car, but when the weather is beautiful, we all want to be out doors on the trails and lake. So many cars and few parking spaces make it a nightmare for the City. If the city focused on utilizing parking areas with trails/paths for residents and visitors to use, it might make the roads safer and more pedestrian/bike friendly. Sort of what Leavenworth had for it's visitors.
Screen Name Redacted 2/15/2024 09:39 AM	This is fucked. If you don't like what is here, then fucking move somewhere else.
Screen Name Redacted	Youth centers are needed and teen leadership social building.

2/15/2024 09:46 AM

Screen Name Redacted
2/15/2024 09:44 AM

Build another high school and probably middle and elementary as well. There are so many families moving here and not enough space in the schools. Class size is a huge issue and there is not space to create more classes. It is unfortunate that Journey Church has control of such a huge chunk of the downtown. They do a lot of great things, but they also limit future possibilities.

Screen Name Redacted
2/15/2024 09:44 AM

*We need a swimming pool! *Do something with the building at 4th & Cedar. So sorry the church owns it & it doesn’t seem to be benefiting the community. Prime location.

Screen Name Redacted
2/15/2024 09:52 AM

Better communication regarding shuttle options for downtown events.

Screen Name Redacted
2/15/2024 09:58 AM

No suggestions

Screen Name Redacted
2/15/2024 10:02 AM

3rd ave - would be nice to have more trees

Screen Name Redacted
2/15/2024 10:06 AM

More communication within the community, more acceptance of new families

Screen Name Redacted
2/15/2024 10:08 AM

Reduce the large foot print of the church downtown. We need more businesses on our great main street.

Screen Name Redacted
2/15/2024 10:18 AM

I'd like to see Camas become more pedestrian centric over time. There are areas of Camas that are really sketchy still. For example, there is a section of 3rd ave heading into Washougal that we, and apparently most pedestrians, avoid due to safety issues. As you head over the river on the 3rd heading out of downtown, the road splits into 4 lanes for apparently no reason (it is 2 lanes in downtown and then 2 lanes shortly after in Washougal), and the speed limit increases to 45. There is a sidewalk on one side of the road, but it is very narrow, and there is no safety divider to protect pedestrians. I see kids on that sidewalk relatively often going to the skatepark, and it makes my skin crawl watching them because one of these days, someone will hit a pedestrian on that road and kill them. That is the definition of a Stroad and it is dangerous. I don't see adults or folks walking their dogs to the river trail because of that stretch of road. It is such an unfortunate

	spot seeing how pedestrian centric downtown is. I'd love to see Camas build on the safety of downtown and change the few Stroads in town, including this stretch, to be a lot safer. On this road specifically, there is no reason the road needs to open up to 4 lanes. It starts as 2 lanes and then ends in 2 lanes short after the 4 lane section. This is not benefiting anyone. I'd love to see the speed limit go down, because there's no reason to speed up right before the river walk trail, keeping it slower will go a long way. But specifically, I'd like to see this stretch of road take more after downtown. Let's decrease it to 2 lanes, and then create parking along the street for that river walk and a sidewalk on the other side. This would make the walkability of Camas so much better to our local natural amenities and it will show Camas' dedication to keeping our roadways safer for families.
Screen Name Redacted 2/15/2024 10:18 AM	continue to encourage small and diverse business in downtown. improve the parks. parking downtown, hard to do and not distract from the feel. The issues with the lake need to be completed, not just studied. there must be solutions.
Screen Name Redacted 2/15/2024 10:29 AM	I would like to see forward thinking on how people are going to move in and out of the downtown area. The Everett Street corridor is getting some improvements in the future, but we need to be mindful about those improvements and know that more and more people are moving to this area and that area will bottleneck very easily today. Just a truck stopping in the road for a little bit by the lake market can shut down the entire round about very quickly and stall out many people. I also think we need to be focus on the future of education. Relying on old traditional education models need to go. We need to fully support our project based schools and make way for more innovative education models. Support publicly funded language immersion, Montessori education. Offer more education models for more diverse learning.
Screen Name Redacted 2/15/2024 10:36 AM	better parking. More food choices. Clear out all homeless. Better security at night against vandalism to small businesses. Do something with all the property from the Mill that is no longer used.
Screen Name Redacted 2/15/2024 10:41 AM	Improve the outcome of the DRAFT RI workplan that does the bare minimum to address decades of waste disposal and potential contamination from a variety of known toxic chemicals the plant has used or produced and discharged.
Screen Name Redacted	Having the church local church buy out an entire block of downtown

2/15/2024 10:43 AM	feels like an encroachment that is likely to continue. I would certainly like to see it contained whatever that my look like as it is limiting to other organizations wanting to start small businesses. The church already doesn't contribute taxes and although they do not represent 1/6th of the population of Camas, they now own 1/6th of Mainstreet. It will not feel like a historic downtown if this continues.
Screen Name Redacted 2/15/2024 10:48 AM	Camas needs improved pedestrian and bicycle access on NE Everett St. between NE 23rd Ave and Lake Rd. This may alleviate some parking issues at Round and Lacamas Lakes if more people could safely walk or ride their bikes to the lakes.
Screen Name Redacted 2/15/2024 10:50 AM	More small town places to eat. We previously had a terriyaki spot and a pizza spot that promoted easy cheap meals not only for people that work in down town but people that want to come down and experience camas and not pay an arm and a leg for a burrito and beer
Screen Name Redacted 2/15/2024 10:52 AM	The crosswalks on 3rd and 6th avenue has been very dangerous and I have had quite a few encounters were I look both ways, one car stops so I begin to cross but the other side is not paying attention and have come very close to hitting me. I have also seen it happen a lot to people crossing the street, especially during big event days in Camas that happen at night when it is dark. If we could get the crosswalk signs that flash when a person is crossing the street at major crosswalk areas (Birch, Cedar, Everette), that would significantly increase the safety of both the drivers and the pedestrians.
Screen Name Redacted 2/15/2024 10:59 AM	I feel that people are staying in campers off of 6 near the shell station. The homeless is coming through to our neighborhoods now.
Screen Name Redacted 2/15/2024 10:58 AM	Input from residents. You only care about the mill, legacy interests and developers. No one trusts you.
Screen Name Redacted 2/15/2024 10:56 AM	Take down the paper mill ! Add more parking lots
Screen Name Redacted 2/15/2024 10:59 AM	Not going through with, or modifying the Everett St Corridor project so it doesn't take away parking and somehow enhances parking safety at Acorn & the Oak Restaurant. Please do not add another roundabout at 35th.

Screen Name Redacted 2/15/2024 11:17 AM	Expand the former and some-day former Mill property and make it mixed use residential, commercial and usable green space for public recreation but keep the old-town character and feel (convert parts of the old Mill to brewery/restaurant/concert/small conventions space like Edgefield
Screen Name Redacted 2/15/2024 11:30 AM	The future the mill property needs thoughtful planning to add its blocks to the core, carrying on the streetscape and LOCALLY OWNED small businesses, with varied living options thrown in.
Screen Name Redacted 2/15/2024 11:45 AM	Community event Free concerts
Screen Name Redacted 2/15/2024 11:49 AM	Continue investment in the downtown core. Would like to see more shops/restaurants and other business that make it fun to spend an afternoon shopping and eating (no more things like State Farm offices please). It would also be nice if there were more uniform signs and such that gave it a more cohesive feel. Definitely could use more night life. The old Westly Ford property would be a prime spot for someone to do something cool.
Screen Name Redacted 2/15/2024 12:41 PM	Keep it local and unique
Screen Name Redacted 2/15/2024 12:44 PM	I'm not keen on how much property Journey Church owns in downtown; it should be left to individual business owners. Businesses I'd like to see: Frozen yogurt or ice cream -- please! -- bubble tea and a high-end bakery similar to Grand Central or St. Honore in Portland.
Screen Name Redacted 2/15/2024 12:53 PM	There should be more Restaurant options . Be more culturally diverse.
Screen Name Redacted 2/15/2024 12:56 PM	More places to eat!
Screen Name Redacted 2/15/2024 01:10 PM	am noticing more transient people or homeless people in the area. If that continues and we become more like our neighboring communities we will no longer want to live in the area or shop/dine in downtown camas

Screen Name Redacted 2/15/2024 02:08 PM	Parkin g is a big big issue for downtown. Also it seems very odd that two blocks of development are owned by the church with one building still remaining empty.
Screen Name Redacted 2/15/2024 02:16 PM	I was against taking out the pool. I thought we were at least going to get a splash pad playground there. Instead, we got nothing. Am very unhappy about all that. Need more okay things like that for the younger folk. Also, very unhappy with our leadership for slipping in that new tax last year. Myself, and many others, are not going to forget that come voting time.
Screen Name Redacted 2/15/2024 02:16 PM	More nice restaurants (like feast 316, Tommy Os, Nuestra mesa) and a kid's clothing store! I know there is the used clothes but that doesn't fit our family's needs.
Screen Name Redacted 2/15/2024 03:14 PM	ATM for Bank of America We need an outdoor public swimming pool!!!!
Screen Name Redacted 2/15/2024 03:56 PM	Add more shopping with better hours
Screen Name Redacted 2/15/2024 04:23 PM	Better pedestrian crossings from 3rd is my main concern.
Screen Name Redacted 2/15/2024 04:40 PM	I would like to have focus on preserving natural beauty and slow down development of cheap strip malls. Lets focus on quality of development. I would also like to see more hotel options near or at Downtown.
Screen Name Redacted 2/15/2024 05:20 PM	The mill property redevelopment should add to the downtown, more parking downtown, better playgrounds and sports fields, maintenance of existing trails.
Screen Name Redacted 2/15/2024 05:39 PM	More higher end restaurants
Screen Name Redacted 2/15/2024 06:46 PM	Do not charge for parking. That’s part of the charm. Keep the two way streets. Keep the events and add more.
Screen Name Redacted	1.Remove the paper mill buildings and improve the entrance into

2/15/2024 07:46 PM	downtown. 2. Improve traffic control on 3rd Ave near Garfield. After the new stripping was done several years ago with the free right turn onto Garfield, the traffic is constant up Garfield because traffic doesn't need to stop and makes it very difficult to cross Garfield from the side streets. 3. Add more trees since residential development has taken so many out. 4. Parks need some serious attention with ivy and other invasives out of control, 5. Deal with water quality issues with LaCamas and Round Lake. 6. Fire/Ems costs sound out of control.
Screen Name Redacted 2/15/2024 11:23 PM	Parking Parking Parking (Is it okay to park antime in the lot north of Grains of Wrath?!?)
Screen Name Redacted 2/16/2024 12:20 AM	Perhaps have more community activities, like an every Friday night street fair.
Screen Name Redacted 2/16/2024 05:07 AM	Less churches and more restaurants. I want to keep my money here instead of driving to Vancouver or Portland. On Sundays, it is hard to park w/ the church patrons taking all the parking.
Screen Name Redacted 2/16/2024 08:08 AM	Parking needs to be addressed, cars park right up to stop signs, angle parking in front of GOW block your vision trying to pull out onto 5th Ave. All landscaping downtown on vision clearance area's should be ground level.(all tamjupiners should be removed, accidents waiting to happen) First Friday events are awesome and draw a great crowd.
Screen Name Redacted 2/16/2024 08:40 AM	I think that Camas really needs to improve its transportation and safety infrastructure. Many of the roads lack sidewalks and bike lanes, despite all the development and new houses that are being built. I think that Camas needs to prioritize establishing walking and biking connections throughout the city, connecting areas that are currently walkable and bikeable (like downtown and within some of the newer subdivisions) to the rest of Camas (e.g., non-car transportation arteries connecting new developments such as Green Mountain area to the rest of Camas downtown area).
Screen Name Redacted 2/16/2024 09:47 AM	There should be more for kids to do, especially middle-high school age. Less businesses that require you to be into alcohol/drinking.
Screen Name Redacted 2/16/2024 11:53 AM	I wouldn't change anything. I would discourage people from trying to change it too much.

Screen Name Redacted
2/16/2024 12:34 PM

Water quality within Camas should be a high priority. Nothing adds value like a pristine body of water. Having our own little Lake Tahoe would be worth the whining of folks who don't want to give up outdated and dangerous methods of keeping a lawn green. Additionally, placing an emphasis on keeping downtown focused on thriving commercial spaces will make Camas a better place to live and visit.

Screen Name Redacted
2/16/2024 01:44 PM

The city needs a 'welcome package' for new homeowners. This should include a city map, how Camas utilites work - sewer and water charges esp, some special coupons for newcomers, etc. When we moved here only Lutz sent us a special coupon. Everything else mentioned here we had to find out on our own. Since The City of Camas handles things differently than other parts of Clark County, this information be very helpful and clear confusion for new homeowners for very little cost. As for the historic downtown - keep up the good work! Also, the weekly Camas small business newsletter is very informative and is done very well!

Screen Name Redacted
2/16/2024 04:54 PM

Close street for walking through and festivals and provide a new parking structure

Screen Name Redacted
2/16/2024 05:18 PM

We need another high school above all else. Then another middle school. The downtown church takes up most of the block tax free. I'd like to see small business thrive there instead.

Screen Name Redacted
2/16/2024 06:17 PM

As above I would leave the downtown as historic, add to the camas urban growth boundary Accommodate the growth.

Screen Name Redacted
2/17/2024 08:19 AM

Parking and xaccess.

Screen Name Redacted
2/17/2024 09:23 PM

We could really use a dog park…or two! Cleaner water in Lacamas and Round Lakes.

Screen Name Redacted
2/18/2024 09:07 AM

Make Main Street pedestrian only. It will create a better space to gather and socialize. Outdoor dining and seating areas where the parking spaces are. Cross street traffic would be allowed, but not East/West traffic. I've seen this in Europe and it's amazing.

Screen Name Redacted 2/18/2024 09:38 AM	Include more gathering spaces, for meeting others for a bite. Small restaurants, places to gather for breakfast, lunch, happy hour, dinner, or dessert after a movie.
Screen Name Redacted 2/18/2024 04:15 PM	Traffic and stop building new homes
Screen Name Redacted 2/19/2024 08:42 AM	I would love to see the mill become a more beautiful or interactive part of the landscape. I know GP is holding onto mill operations with white knuckles to avoid a cleanup, but imagine covering its walls in murals or, eventually, converting the inside into apartments! I also think we could improve our food offerings and activities for teenagers downtown. Would love to see healthy fast food (like salads or grain bowls), the return of pizza, etc. I think teens could use someplace to go be teens - it's hard to get to a mall from here if you can't drive. Finally, I love Camas, but we would all benefit from a more diverse population. Right now the city is over 75% white. I'd like to see us examine why that is and how we can promote a more inclusive city.
Screen Name Redacted 2/19/2024 11:53 AM	Road bike infrastructure (more bike lanes). Cleaning up lacamas lake.
Screen Name Redacted 2/19/2024 02:23 PM	Make the downtown core walkable (vehicle free), with ample parking around it.
Screen Name Redacted 2/20/2024 02:25 PM	• Improved area or permanent cover for the Camas Farmer’s Market —larger, covered, shadier • More options for teens—activities, stores, food options • More/safer sidewalks and bike lanes • Traffic slower on 3rd Ave! So dangerous to cross. • Crossing visibility on 5th Ave at Birch • 6th & Adams intersection • A community pool accessible to all where learning to swim is a mandatory course through public schools • Extend aesthetics and amenities and lighting of 4th Ave to 3rd, 5th and 6th • Better/more downtown parking • Central gathering space in downtown with performance area and outdoor eating area • Need good deli/bakery • Kitchen store with classes • Pizza place with good management • Quality resale store for adults • Men’s clothing store • Boba shop • Affordable teen clothes • Comic book/pop culture/record store • Better electrical in downtown for events • Underground infrastructure upgrades in downtown • Safer, walkable pedestrian areas in downtown • More or improved parking in downtown • More restaurant options • More trees on 3rd, 5th and 6th • Bulb outs on 3rd and 5th to slow traffic/improve safety • Crossing lights on 3rd (if still main downtown thoroughfare) • 4th Ave car free pedestrian only area. • A central gathering space • Permanent

	covered farmer's market location with adequate electrical and water • Downtown infrastructure can accommodate the growth we need • More housing downtown and throughout town for all income levels • More activities to do downtown after 6pm • Progress and growth while keeping the sweet hometown feel • We have a community center with swimming pool accessible to all • Heritage tree program/tree City • 27 acres to the north of 6th leaving downtown developed and well and artfully connected with historic downtown creating synergy and vibrancy for both. Good flow between both • The mill property has been cleaned up and the plan for mixed use, green space, performance/gathering area and housing has been formalized and on its way to execution • An executable maintenance and preservation plan for downtown is used by City • Downtown is a thriving local and tourist destination where businesses thrive and the community absolutely loves to come to and be a part of. Downtown is used by all parts of Camas. Flow from North Shore has been figured out and all of Camas is connected and united.
Screen Name Redacted 2/20/2024 09:33 PM	Nothing comes to mind.
Screen Name Redacted 2/21/2024 10:35 AM	I love it just the way it is! Parking is becoming more challenging.
Screen Name Redacted 2/21/2024 05:11 PM	I would love to see more small businesses and unique restaurants.
Screen Name Redacted 2/22/2024 01:22 PM	More walkways, more pedestrian friendly sidewalks up Crown Road to downtown camas. Many people walking there but does not feel safe for walkers.
Screen Name Redacted 2/23/2024 09:58 AM	Maintain parks better.
Screen Name Redacted 2/24/2024 08:28 PM	I think some roads need to add stoplights/roundabouts to replace stop signs. -add more streetlights throughout the town —improve playgrounds on all our parks. The kids (and parents) are bored, and the play equipment on ALL the playgrounds in camas need a revamp. The kids need a much bigger space of play equipment to climb and play on, and consider putting a covering (shade) over the playgrounds to be able to use during the rainy season. Also safety at parks are a big issue. If there could be more fencing or landscaping between the park and the road that would help a lot! -adding more clear signage to where things are around town. -adding city garabage

	cans outside! This will help so much with all the litter around town! - More preparedness around snow days. The snow should not paralyze an entire town if we know it's going to snow every year. The city needs to fund more plows, and ice melt and be ready for the snow so the children don't miss school, and families can't go to work. -Cleaner water resources in the lakes -More parks and rec programs for littles. There is almost no programs in the area for babies, and toddlers/children under 5. Adding more classes, sports and activities would be amazing! -more speed limit signs throughout the neighborhoods to enforce slower speeds. And also more police visibility and enforcing speed limits. —more shopping options! Another grocery store (Trader Joe's, target, Whole Foods), and more clothing store options in the camas area. -Finally, a city funded indoor playground/ sports complex. This is 100% doable and a big need in our community. This could be like firstenburg center with an indoor pool, gym and other amenities, but I think it should include a very very big indoor playground. Here is a link for a reference: https://www.plymouthmn.gov/departments/parks-recreation/plymouth-community-center/indoor-playground
Screen Name Redacted 2/27/2024 09:54 AM	Needs better parking. Better police enforcement of speeding !
Screen Name Redacted 2/27/2024 10:39 AM	1. Sidewalks/Bike Lanes: We feel that sidewalks and bike lanes are of utmost importance to the community. We live off Sierra and don't feel that it's safe for our kids to walk or ride their bikes to school on Lake Rd and Everett St. 2. Clean Lakes and Trails around them. Lacamas Lake & the park around has such potential to be a wonderful community hub but it's not really maintained and set up as such, and there are so few community events held outdoors there. It would be great to have more nicely maintained grassy areas around the lake for people to congregate and play. (Love the Lodge, the events there are great!) 3. Historic Downtown: It's disappointing that so much of it is owned by the church. To us that is not historic and not enhancing or enticing. A downtown with lots of local shops, galleries, bakeries, great cafes and restaurants is what needed to boost the entire downtown. The loss of the Camas Slices is really huge. A downtown without an incredible Pizza place or 2 is really a big loss for the town. We hope a great place, or 2 or 3 come in soon. 4. Columbia Access Downtown: We are a town on the river. It would be wonderful for the downtown to expand to front the river and have wonderful trails, shops, bakeries, restaurants, artwork etc there. (Like The Old Mill District in Bend) 4. More Community Opportunities/Classes/Camps/Volunteer Opportunities/Support for middle school and high school kids 5. We LOVE the Library. Would love to see more interactive events for it.

Screen Name Redacted 2/27/2024 11:58 AM	I'd love to see safety improvements in roads, including pot hole repairs, but no more round abouts. What could improve- planning! Absurd projects like RV "resorts", which are going to become back door routes for housing, should be stopped. Do actual affordable housing. It'll yield pride in ownership and tax revenue. Be smarter about subdivisions - we don't need so many at the expense of open spaces and farm land. Otherwise, we're just Vancouver.
Screen Name Redacted 2/27/2024 02:25 PM	No more mill.
Screen Name Redacted 2/27/2024 04:18 PM	We need actual businesses not one block entirely owned by a church on the main strip. We need to change the language in the zoning to keep that from happening on the next block. The lake needs to be clean. This is such a draw and now a HUGE drawback to a community with no pool We need to get the community rec center to do more classes as well. Other states have cities with a park district. Look at great cities park district classes and event
Screen Name Redacted 2/27/2024 04:31 PM	Listen to small businesses and the community when they say they don't want something. It's appalling how the community is blatantly ignored!
Screen Name Redacted 2/27/2024 04:57 PM	Building more community, maybe creating more parking. Would also like to see some upgrades to our playgrounds/parks and have some water features added.
Screen Name Redacted 2/27/2024 06:28 PM	Do not run business out just for the sake of "progress"
Screen Name Redacted 2/27/2024 07:09 PM	We should remove the turn left option driving down NE fourth Ave turning left onto NE Adams St. The light turns red on Adams st when no one is there and creates traffic buildup. Community filter on our drinking water and protect our lakes. Put a walking / biking train around the entire Lacamas Lake!
Screen Name Redacted 2/28/2024 08:59 AM	I would like to see some more growth. More businesses, parks, special events that incentivise me to visit downtown and to stay in downtown. Too often I visit downtown for one thing, and then I leave.

Screen Name Redacted 2/28/2024 06:52 PM	Better protected bike lanes protected from traffic.
Screen Name Redacted 2/28/2024 09:06 PM	Stop building apartments, fix existing sewer lines inatead of swnding us letters to only flush toilet paper, eurin, and I wont even say the last word.some find it rude. Also.Fix the roads.housing is taking over.we used to have a great small town, waiting for more lights, also more roundabouts, turning camas into Downtown Vancouver.I am glad we have out home without kissing our neighbors.look across the lake so sad.Yet charge impact fees ect.we don't want to pay more to cover builders.
Screen Name Redacted 2/29/2024 08:38 PM	More bike lanes and bike parking. Better maintenance of lacamas Park trails. The main trail gravel is washed out and rough in sections making it dangerous for rolling ankles and difficult for using strollers.
Screen Name Redacted 2/29/2024 09:00 PM	Historic downtown is fantastic. It would be wonderful to expand it so it is larger and still prioritizes pedestrians over cars. it would be wonderful to clean up the lakes so they're safe to swim in. It would also be great to have more bicycle lanes so that it could be safe for families to cycle around the city.
Screen Name Redacted 2/29/2024 09:46 PM	Keep it up so it stays the beautiful area that it is.
Screen Name Redacted 3/01/2024 07:51 PM	Some of the buildings could use a facelift. Would love to see some of the "non historical" buildings have larger windows, be updated to be more modern so it has a better feel when inside, and so can bring better businesses like more restaurants and interesting shops, cafes. Some of the buildings are so dark and depressing and that's why the businesses fail because it's not pleasant to be inside dark old buildings.
Screen Name Redacted 3/01/2024 09:44 PM	Have more community parks , bike lanes and amenities services.
Screen Name Redacted 3/02/2024 07:37 PM	More pickleball courts, including covered courts and dedicated pickleball-only courts; ADU rules--while they help with density and provide small-sized homes, their location can compromise look and feel of the neighbordhood (such as the one on NW Dahlia Drive that just went up); keep funding the Downtown Camas Association (DCA); provide more affordable housing, so we're not just a city of wealthy; continue asking for community input--the City is doing a great job!;

	manage compulsory growth
Screen Name Redacted 3/04/2024 02:05 AM	More parking! No more downtown housing.
Screen Name Redacted 3/06/2024 05:58 PM	Slow down on housing developments so our infrastructure can adjust to the growth
Screen Name Redacted 3/06/2024 06:24 PM	I'd like to see some parks in the eastern part of Camas. The overbuilding on Friburg-Strunk is disheartening - especially the hideous huge building on the corner of NE13th (Godwin) and Friburg and the proposed gas station. Very disheartening to have giant warehouses in an area with high end homes. We could use a grocery store there, a rec center would also be appreciated. The church property for sale on Godwin near the Heritage Trail should be bought by the city and turned into a nature area. Camas needs to think about the future - instead of these big corporate complexes that are hard to fill and warehouses - why not build a multi-purpose area - a shop and live - sort of place. A destination that will draw people. Parks and recreation needs to expand.
Screen Name Redacted 3/06/2024 06:36 PM	1:Maintain and enhance architectural standards for development. 2: Roadside landscaping and maintenance needs significant improvement--irrigation, plantings, invasive species removal. Roads need resurfacing more frequently.
Screen Name Redacted 3/06/2024 07:49 PM	Better road and roadside maintenance, reduction of invasive plants, and enhancement of open space environments.
Screen Name Redacted 3/06/2024 08:09 PM	More parking downtown; when adding denser housing, put more downtown--business downtown deserve that, will help other biz flourish as well. As Camas grows, let's maintain or grow greenspaces--parks, lake; make sure we don't lose sight of their importance. Getting the big, empty ex-headquarter buildings filled is important to the overall health of Camas.
Screen Name Redacted 3/06/2024 08:05 PM	support downtown businesses by including more housing
Screen Name Redacted 3/07/2024 01:11 AM	Better parking downtown. Not wiping out so many trees. Getting very expensive.

Screen Name Redacted
3/07/2024 09:17 AM

Demolish Georgia Pacific and invest in outdoor space with restaurants, walking paths and additional small businesses

Screen Name Redacted
3/07/2024 09:33 AM

Anytime my husband and I are able to go out later at nights (when we have a babysitter), downtown camas feels like a ghost town. Also, in the summer, it's very hard to find parking near the lake and walking trails. We tried twice last year and then gave up.

Screen Name Redacted
3/07/2024 09:38 AM

development is getting a little crazy. a development by my house received a green light - with SO Many crammed in houses, even though several neighboring residents asked for alterations.

Screen Name Redacted
3/07/2024 10:04 AM

I would like to raze the paper mill and build out some amenities on the waterfront. On a smaller scale, I'd love to see more mid-price, family friendly restaurants in downtown. I still sorely miss Twilight Pizza: It was a good midpoint price range, the food and service were always amazing, and the atmosphere was so comforting and welcoming. Nuestra Mesa is, of course, excellent, but I'd like to see two or three more midprice options. I think we need a good, all-round, sit-down bakery, like Grand Central but locally owned. And for heaven's sake, get an ice cream or frozen yogurt place downtown.

Screen Name Redacted
3/07/2024 10:11 AM

I really think downtown Camas could use a food, truck corner or parking lot. Anytime there is an event there, you would have to go into a restaurant and sit for an hour or so, and pay very high prices. I have longed to go to a place where you can just pick up, a reasonable priced item and eat as you walk along the street. I usually go home early because there’s nothing to eat. I would greatly appreciate having the papermill closed down. There is still stuff spewing in the air that we don’t know what it consists of.

Screen Name Redacted
3/07/2024 10:29 AM

I'm not sure how it could be done, but having a singular church group steadily buying up downtown is absolutely going to be the downfall of the area. Losing unique shops like Camas slice has a ripple effect on the types of business and diversity of population that will visit the area. There's no parking for any of the restaurants when the church has fuctions.

Screen Name Redacted
3/07/2024 11:41 AM

Downtown Camas has become a little bit to ideological these days. It doesn’t feel quite as welcoming as it used to. Ironically, I think it’s because it is trying to be overinclusive, to the point of pandering. This

	is especially apparent in the library. I do not like to even bring my children there any more. And I am of a minority heritage.
Screen Name Redacted 3/07/2024 12:51 PM	Needs a waterfront, and contemporary shops and restaurants. Better and larger walking paths and sidewalks. Would be great to build a bridge to the Oregon side as well so less traffic on I-205
Screen Name Redacted 3/07/2024 01:27 PM	connected sidewalks
Screen Name Redacted 3/07/2024 01:44 PM	I would like to encourage more small business growth. So much of our downtown is taken up by the church where businesses for our community members could thrive. I would also like to see more diversity in businesses. And in general, Camas has a critical need for affordable housing to promote that diversity and inclusion. The water quality issue at our lake needs to be addressed. And the businesses along Everett need protection from future road expansions. Taking away all their parking is not the right answer. They are as much a part of the culture of our town as our downtown businesses.
Screen Name Redacted 3/07/2024 04:01 PM	I would love for the seasonal farmers market to be at a more convenient time for those who can't make it downtown because of a traditional work / commute schedule. I would like a simple list of available local resources when community members seek help beyond what I can provide (ie. housing, food insecurity, heating/cooling centers, utility supplement). Related, community education (partnership with the schools) on personal responsibility and empowerment to use available resources to improve personal circumstances. Improved parking, or local transportation options to the many parks, trailheads, water access points I would love to work for a local company rather than commuting into Beaverton
Screen Name Redacted 3/07/2024 07:09 PM	Natural areas around camas are blanketed with invasive English Ivy and BlackBerry bushes. These are choking out native wildlife and plants. It degrades the natural areas and reduces posible recreation.
Screen Name Redacted 3/07/2024 07:16 PM	Update parks (specifically the play structures) to accommodate family community, more businesses downtown
Screen Name Redacted 3/07/2024 09:16 PM	Camas needs more social hubs and things to do during the rainy season. I wish there was more indoor recreation options for adults and children. I wish there were community hikes and nature days like

	the ones held at Columbia Springs. I love the quaintness of historic downtown, but part of me wishes we had more modern shopping and dining like the waterfront in Vancouver or the 5th street market in Eugene. I absolutely hate that the Camas slices building was sold to the church and am not a fan of the church taking up so much prime real estate downtown. There is so much wasted space at the library and I feel like the public buildings we do have are not utilized enough. Everywhere we have lived before would have "open gym time" at the rec centers and schools where community members could use the facilities. They would also host educational and cultural activities there too. I miss having access to regular quality and free summer park programs, the programs here are sparse and seem to cater more to outsiders than they do community members. I always feel pressured to buy things when we come downtown for events, it's awkward. Camas needs to modernize a title bit
Screen Name Redacted 3/08/2024 09:15 AM	NO MORE CHURCHES IN DOWNTOWN SPACES! bring back the pizzeria or other restaurants and shops!!, also, more bus lines!!! connect us to Vancouver and Portland!!, improve water quality in wells and lakes! no more toxic algal blooms!! spend the money so we can swim all summer!, revitalize Crown Park and update the old outdated playground!
Screen Name Redacted 3/08/2024 12:32 PM	Journey church, which takes up an entire block and could be anywhere, should not be allowed to take up an entire downtown block. This area could be used for additional restaurants and shops that would entice commerce and create a more vibrant downtown community.
Screen Name Redacted 3/08/2024 12:49 PM	No community pool.
Screen Name Redacted 3/10/2024 08:13 PM	I would like to see historic building being repurposed instead of being torn down. A stop light at the intersection of 6th and Adams would be beneficial for traffic flow.
Screen Name Redacted 3/11/2024 03:15 PM	Replacing the papermill with a massive public green space; in the more near-term -- closing the main street (don't know it's name) from traffic so that we can bike and walk there, encouraging more and more varied activities that are not just spending money at shops and restaurants/cafes. Kids don't have a play area, benches could be set up in a few areas to encourage folks to hang out together

Screen Name Redacted 3/11/2024 08:30 PM	We could definitely use more dining options downtown and a space for children to play. I also think the church downtown should consider relocating to free up space for small businesses. As for the rest of camas, we need better walking paths/sidewalks for pedestrians and more parks for children that are within 10-15 min walk of any home. Lots of driving required to get to parks for kiddos isn't ideal. Being able to walk around more easily between neighborhoods would make the city feel more connected. Specifically, need a sidewalk along 16th/hood/18th by the llama farm. I've seen too many people walk along there and it doesn't seem safe. Trees - what happened to all the trees? I grew up in this area and loved all the big mature trees. So many trees have been cut down due to new developments. How can we hold developers more accountable to preserving the beauty of the natural landscape? The tiny trees that they put up are no comparison to what used to be there that made camas so desirable. The schools are good now but with all the new housing, I think people are worried of schools overcrowding and the quality of schools going down. I urge the city to be as proactive as possible to plan and forecast to ensure we can keep up with the demand for a high quality education for our children.
Screen Name Redacted 3/11/2024 10:21 PM	I think what needs improvement are the side streets. They have always been neglected and everything is always about 4th street. There are many wonderful side street stores and the downtown is tiny, so this should be doable. Every store matters, not just 4th! Flowers, benches, flags, clean up, more art, better lighting etc.
Screen Name Redacted 3/12/2024 02:43 PM	If the mill closes completely, we need to clean it up/ destruct it and put in a nice waterfront shopping and restaurant district. We also need a public pool. And more sports fields. Probably another traditional high school.
Screen Name Redacted 3/14/2024 09:17 AM	Increasing food options, adding a bakery back in
Screen Name Redacted 3/14/2024 10:58 AM	Restaurants, kids sport facilities, entertainments
Screen Name Redacted 3/15/2024 11:29 AM	More Dog Parks, Maintain walking path system Maintain 'hometown' feel of historic downtown Refocus on sports/parks - "Historically Camas always had a city pool" Better public transport especially to downtown, limiting need for additional parking Consider adding parking meters PORT Development by the river - mixed use housing/retail, expand/improve river walk Limit hirise development to

	the waterfront (eg - new condo at the 192nd bluff) For higher density housing (rental or condo), incorporate nearby amenities (grocery,restaurant, parks) - Walkable secondary retail districts in addition to downtown(eg - Grass Valley - DON"T be limited to 'mini-malls')
Screen Name Redacted 3/15/2024 08:13 PM	There is WAY too much car-dependent development, which is an utterly unsustainable ponzi scheme. See https://youtu.be/AOc8ASeHYNw?si=3E9g7It0AOQW1zqI, https://youtu.be/7IsMeKl-Sv0?si=LOwZjQvuH8HogFZH, https://youtu.be/7Nw6qyyrTeI?si=lXCQiU3WRlDGjlfI, and https://youtu.be/ORzNZUeUHAM?si=cierWsSXXEt7T1Q6. Also the city is pretty much swallowed in invasive English ivy, which the city apparently has no concerns about because they have done next to nothing to stop its spread.
Screen Name Redacted 3/16/2024 06:19 PM	I would not like to see high rise apartment buildings. It makes an area feel very urban and enclosed. We do need a public parking area that can accommodate weekend visitors.
Screen Name Redacted 3/16/2024 06:30 PM	How much of downtown is Journey Church going to own. Not a fan of this.
Screen Name Redacted 3/16/2024 06:51 PM	The church landlord situation?! What is going on with that? What is going on with that side of the street?!
Screen Name Redacted 3/16/2024 08:19 PM	I would like to have some sort of jazz festival there or some other kind of life music in summer
Screen Name Redacted 3/16/2024 08:36 PM	A city council that does things like care and do something about being sure our water is clean and safe and don't turn on a contaminated pump. Also to care about alge bloom in the lakes.
Screen Name Redacted 3/16/2024 09:32 PM	Remove paper mill and churches, add more restaurants and shops.
Screen Name Redacted 3/16/2024 11:41 PM	CAMAS. NEEDS. A POOL. Seriously, this is hands-down the hardest part about living here. I would love to see the library open on Sunday! In terms of retail options: Our town could also use a consignment shop, a pizza place, and a few more healthy-food options. Can't wait to see the Everett Corridor project results!

Screen Name Redacted 3/17/2024 01:24 AM	I'm not sure what I want to see changed...
Screen Name Redacted 3/17/2024 07:22 AM	Improve the infrastructure in downtown (water, sewer, electrical, fiber optic) and repair the streets. Expand the focus of downtown from 3rd to 5th street.
Screen Name Redacted 3/17/2024 08:14 AM	I'd like the city to stop the church from buying up all of the real estate in downtown and effectively controlling who can own a business down there and what kind of business they can open.
Screen Name Redacted 3/17/2024 08:39 AM	We need a pizza place.
Screen Name Redacted 3/17/2024 08:49 AM	Do not continue to build more. There's already too many people. You can't find parking downtown. Big events are overly crowded.
Screen Name Redacted 3/17/2024 09:01 AM	We need an affordable public pool. Shame to those who closed the old one.
Screen Name Redacted 3/17/2024 10:29 AM	First and foremost, the water needs to be cleaner. We now have to spend a considerable amount of money (after our general water bill, which isnt cheap) on water filter systems and filter replacements. Instead of other projects, this should be the main focus until resolved. In addition, I would hope that instead of building more apartments/developments, the town would focus on providing more businesses and jobs to those who live here. Many parks could also be improved for children and families.
Screen Name Redacted 3/17/2024 10:29 AM	Say no to development whenever possible. Preserve and increase natural areas, PARTICULARLY AT THE WATERFRONT. The traffic is bad enough without adding more residents to the mix!
Screen Name Redacted 3/17/2024 10:40 AM	I don't like that the church takes up such a significant amount of downtown space.
Screen Name Redacted 3/17/2024 01:45 PM	The church should not be allowed to buy more property in the downtown section.

Screen Name Redacted 3/17/2024 05:10 PM	Added public parking
Screen Name Redacted 3/17/2024 05:27 PM	Keep a portion of the historic mill and turn it into a museum that's large enough to house the Washougal museum and showcase the rest of Camas/Washougal history. Make the rest of the area a bike/walking path, places for families, pets, picnics and a view of the river. It would be the perfect place to put in an amphitheatre to host concerts. No one wants to drive down the hill or drive past the large eye sore of falling apart mill that isn't fully operational anymore. Yes, it helped the town thrive, but we need more places for families. More family entertainment. We need an entertainment center like Big Al's or Round One. A place for kids to have fun. Families are tired of leaving Camas to travel to Vancouver and Portland for things to do. Also, why not do seasonal events such as a pop up ice rink? It brings in tons of revenue which we need as a city.
Screen Name Redacted 3/17/2024 05:43 PM	We need a parking structure. There are ways to work it so it could also house a year round farmers market with covering. Suggest looking at structure in Port Angeles
Screen Name Redacted 3/17/2024 08:22 PM	Tidying up sidewalks and curbs. Preserve the post office (it could really use some paint). Codes should be put in place for new apartments being equipped with parking space and new buildings should have codes dictating characteristics of a building that can be integrated with the existing buildings. Historical buildings that are 'for sale' should be actively made known to the local community.
Screen Name Redacted 3/18/2024 02:54 AM	Nothing
Screen Name Redacted 3/18/2024 09:51 AM	We need more restaurants and variety of spots to go for entertainment downtown , less hair as. Church places on the main strip
Screen Name Redacted 3/18/2024 11:49 AM	Need an unleashed dog park somewhere. Camas and Washougal claim to be dog friendly but there are NO UNLEASED dog parks.
Screen Name Redacted 3/18/2024 11:54 AM	NO MORE DEVELOPMENT. STOP CUTTING DOWN TREES. I have been here 9 years and the population has doubled. More people should mean MORE parks and open space, but parks are being

	compromised and open space is dwindling. The ingress is at maximum. To put in more roads means less trees and that's not acceptable. We don't want a freeway running through downtown or up the canyon. Development should happen right along Hwy 14 to divert traffic away from downtown and the natural areas. Add a little shuttle bus from the 14 development and parking lots up to Camas. No more buildings above 2 stories in the downtown area and add a few small, green parks to preserve the casual feel in that area. STOP TRAFFIC on the main street from the mill to the library. Be smart about development in the blocks surrounding that area, to encourage artsy develoment - not density. Acquire more forested land for hiking and relaxing and to preserve the feel. STOP development immediately around Lacamas lakes - no one wants to "hike" with condos looking down at them. And to preserve the (already questionable) water quality. TREE ORDINANCE - save our big Sequoias and Douglas firs. Forget about "inclusion" per se, but focus on an area where ALL people would want to visit (and are welcome) because it fills them with hope and reconnects them with earth and a positive idea of America, it's NATURAL & clean, calm, safe and unique.
Screen Name Redacted 3/18/2024 01:45 PM	Downtown Camas needs to plan for growth and include denser development with buildings with ground-floor retail, apartments above (including high-end with mountain/water views) and basement secure parking (just like what is being built on 6th Street now to replace 2 churches). Please include CTRAN and public transportation planning for downtown/Crown Park as well as neighborhoods.
Screen Name Redacted 3/19/2024 10:13 AM	Connect all the walking areas, more places to eat downtown. More places with outdoor seating
Screen Name Redacted 3/20/2024 05:25 AM	Work to give incentives to take down the paper mill. It’s time has past.
Screen Name Redacted 3/20/2024 03:29 PM	Have more rental space and housing Have more parking Have safer crosswalks Have improved mass transit, connecting Camas and east Vancouver. Have shuttle services for events or transport from recreation areas Have better traffic flow Have condos and businesses on current mill property; waterfront development Have plans with developers to preserve trees, nature, and open and green spaces Develop with infrastructure in mind (infrastructure analyzed and upgrades planned now for future growth) Build an additional high school in a different area to help diffuse traffic Be a destination Have code on what business can occupy space in downtown, to ensure

	more ground level retail. No dead zones in downtown. Have increased housing at all economic levels Extend the charming aesthetic from 2nd to 7th AVE Be a place where everyone feels welcome Absorb additional mill property, both North and on the waterfront Connect with a walking/biking trail to the port Have more activities for families and teens Have a connection from the city to our trail system and lakes
Screen Name Redacted 3/20/2024 07:26 PM	More shops, restaurants and keto street parking free!
Screen Name Redacted 3/22/2024 07:12 AM	Proper impact fees charged to accommodate ridiculous tolls on utilities, roads,schools,Traffic is discouraging. Road conditions,sewer lines are ridiculous especially for existing homes that have been here for decades.We were Camas not Camas washougal.They tried for years to merge the 2 towns,yet the city has done it without voting from home owners.lets see if we can put another bar into this town.some major businesses are owned by the school district instead of being a positive within paying taxes,as well as supporting employment.UL is a rental for the School district.Sharp is now schools.what else can this town do? Where are proper cross walks.updating sewer lines in existing neighborhoods.
Screen Name Redacted 3/22/2024 09:01 AM	would love the buildings to get a facelift. modernize but don't change character of downtown. Would love to see more sidewalks on major streets especially near schools and corridors that lead to downtown.
Screen Name Redacted 3/25/2024 10:09 PM	I wish that there was more to do downtown. I would like to see more local things for our young people to do on the evenings and weekends. I would love to see more concern and intentionality about caring for the physical environment and living things. I think there could be some replanting of native plants and trees on school and city properties. I would like to see better routes for non-motorized transportation. There are times when I would like to send my kids somewhere on bikes but there are no bike lanes or even shoulder space for them to ride in.
Screen Name Redacted 3/26/2024 09:46 AM	Improve pedestrian safety - complete sidewalks and trail access. Add bike lanes separated from traffic. Restripe 6th so there is a turn lane, Increase park and trail maintenance including correct pruning of trees. Implement fire mitigation plan. Improve sidewalks downtown to reduce tripping hazards. Consider creating community town center by reducing traffic on 4th, e.g., create a pedestrian mall, only allow east-west traffic, and so on Add workforce housing with good design so it

	fits. Increase economic opportunities so people don't need to commute to Portland.
Screen Name Redacted 3/26/2024 11:07 AM	More activities for children, more dining options
Screen Name Redacted 3/26/2024 04:18 PM	Need to figure out and develop the mill if that is an option. We need more restaurants. More activity and people downtown.
Screen Name Redacted 3/27/2024 11:46 AM	What would you like to change? More mixed-use Water quality of lakes More job opportunities Preserving/expanding tree canopy No vacancies Downtown More bike trails/opportunities for riders Redo City Hall & Fire Station Future clean-up efforts @ the Mill Add Mixed=use to Mill property, clean up to mixed-use standards More sidewalks More street lights Improve connectability/walkability to services What can we improve? More housing Downtown Roadway paving Traffic safety Pedestrian/bike safety Water/sewer/storm facilities in Downtown Park/sports field improvements More resident involvement More community gathering spaces Plan for Economic Development
Screen Name Redacted 3/27/2024 03:45 PM	§ Better access to waterfront (Washougal) - waterfront redevelopment (what Vancouver has done) § More sidewalks! Near schools, Prune Hill, main thoroughfares § Housing downtown § Housing choice / variety § More neighborhood commercial to scale (hubs) § More pocket parks, dog parks § More jobs/better jobs/ career jobs for youth § More bike-ability, crosswalks, traffic diet § Improve/expand utilities and infrastructure (stormwater) § More parking downtown, especially for events ("what's reasonable for walking distance?", shuttles, accessible for elderly, disabled) § Transit § More and better connected trails § Retain community events (July 4 fireworks, farmers market) § Maintain facilities/parks/trailheads § Architectural integrity/design standards
Screen Name Redacted 3/28/2024 01:26 PM	I was very un pleasantly surprised to find the camas had allowed two bookstores within two blocks of each other recently. Camas is too small to support two bookstores, especially in the children’s arena. Within a year I predict one of them will go out of business or will begin to fail. I don’t see how this is good planning.
Screen Name Redacted 4/01/2024 11:31 AM	· Better manage open spaces · More options for teenagers downtown · Address lake algae blooms · More inclusive community (increase diversity) · New community areas outside of downtown X · Housing

	affordability and diversity X (homelessness) · Increased entertaining/dining · Expand and maintain momentum downtown · Downtown parking challenges · Infrastructure investment · Improved bike/sidewalk access · Expand lake use beyond east end · Rethink public space downtown (more public spaces)
Screen Name Redacted 4/03/2024 08:44 AM	Don’t move here from California, because your politics ruined it, and vote for the same crap. We don’t want a big town with tons of retail space or apartments. Don’t California Washington.
Screen Name Redacted 4/03/2024 09:08 AM	Keep Camas downtown intact!! All efforts possible need to be taken to preserve and maintain historic Camas buildings!!
Screen Name Redacted 4/03/2024 10:07 AM	Preserve and create more open green space!!! Quit tearing down historic buildings and replacing them with structures that do not fit in with the "historic" ambience of the downtown area.
Screen Name Redacted 4/03/2024 10:24 AM	Although I would hate to change anything about downtown and parking garage would be super nice and the church moving out of downtown would be nice so it can be more retail and restaurants.
Screen Name Redacted 4/03/2024 10:43 AM	More sports fields and better amenities for young families
Screen Name Redacted 4/03/2024 11:02 AM	Growth and development plans don't imply action to expand. A growth and development plan can be predicated on sustaining existing boundaries. Zero growth and development can be a plan as well.
Screen Name Redacted 4/03/2024 12:34 PM	Down Town Camas needs a parking structure. Like 2 stories plus a two level basement garage. Shops above, parking in the basement.
Screen Name Redacted 4/03/2024 04:45 PM	Keep it as historic as possible. New is not always better. I love all of the downtown events that camas does.
Screen Name Redacted 4/03/2024 05:13 PM	Nothing q
Screen Name Redacted 4/03/2024 06:10 PM	Re-evaluate the almost irresistible movement of local governments partnering with large business toward the destruction of natural and

	historic places in the name of progress. Make Camas local, and not just in expensive "crafts" but in agricultural produce. Don't just be a cute outpost of Portland.
Screen Name Redacted 4/03/2024 10:03 PM	Restore Crown Park to be the crown jewel it used to be. New pool or splash park. Family friendly restaurant that serves breakfast, lunch and dinner with an old town feel in the downtown area.
Screen Name Redacted 4/03/2024 11:32 PM	Please no more apartments downtown. Please keep the downtown the focal point of our community. Please keep the lake road on north shore where it is!!!!!!!!!
Screen Name Redacted 4/04/2024 02:26 AM	Keep things cleaned up. No graffiti. Stop building so many new developments Try to preserve old buildings. The beautiful church on 6th should have been preserved. I was so upset when I saw it was sold and again when it was torn down. Camas was once an ample forest, now we cannot find many areas that remind of what Camas once was. Stop developments, keep large land plots whole. Figure out a way to filter all water going into LaCamas Lake. Do not allow nearby houses to use turf or fertilizers.
Screen Name Redacted 4/04/2024 07:30 AM	Improve keeping our historic buildings and open space. Stop putting in gigantic subdivisions
Screen Name Redacted 4/04/2024 08:05 AM	I would like to have more consistent sidewalks and maybe a "lake to city trail" from Lacamas park to downtown.
Screen Name Redacted 4/04/2024 08:11 AM	Mill
Screen Name Redacted 4/04/2024 08:23 AM	More parking
Screen Name Redacted 4/04/2024 08:34 AM	I would like us to be ever mindful of economic disparity. We were, at our core, a blue collar community. While I know that has changed and many more affluent people call Camas home, let’s strive to make people at all socioeconomic levels feel welcome and included in future plans and visions.
Screen Name Redacted	Stop taking away all the historical stuff. Stop taking down the old

4/04/2024 08:58 AM	building for more HUGE ugly buildings they are taking away from the appeal of our town. Stop taking away all the trees and nature, it's taking away from the appeal of the area. The more that's taken away, the more big ugly buildings, the more us locals hate it. We loved our history, the nature, the trails and trees...now we have clear cuts everywhere with housing developments everywhere. Taking land from all the animals and causing what will be catastrophe changes to our environment
Screen Name Redacted 4/04/2024 09:54 AM	I would like to see housing expansion slow. Especially high density housing. Street design can and should be improved! Especially 18th Ave. It is the main East access to Prune Hill, yet still terminates at a stop sign on Division.
Screen Name Redacted 4/04/2024 11:51 AM	Not a whole lot ! Love it just the way it is ! I know it will change, but keep the community feel.....small town. Part of why I live here ! It's not PORTLAND !! or even Vancouver !! It's nice to come home....away from the big cities ! Stop pandering to BIG MONEY developers !! Like I said, I know things will change, just use common sense ! Something that seems non existent these days ! PRESERVE HISTORY !!
Screen Name Redacted 4/04/2024 01:01 PM	For my family, the biggest thing that needs to be fixed is the access to the lake. We like to use the boat ramps on the northeastern side (Leadbetter Rd). The ramps are broken, the parking is a mess. There is no signage telling people not to park on the ramps and although this should be common sense, they do it anyway. The city needs to spend a little money to fix it up.
Screen Name Redacted 4/04/2024 01:15 PM	Get rid of the church on Main Street. WAY too big of a footprint that does nothing to improve downtown and takes up parking. Include flags on poles of area children art work from a variety of ages to showcase our young people’s talent.
Screen Name Redacted 4/04/2024 01:39 PM	No change, why fix what’s not broken?
Screen Name Redacted 4/04/2024 01:44 PM	Keep the present buildings up to code and standing. Any new buildings have to match the building themes of present day downtown Camas. NO new apartments in downtown Camas.
Screen Name Redacted 4/04/2024 06:13 PM	Buy part of the mill parking lot off 5th and block off driving down 4th have an open walking downtown area.

Screen Name Redacted 4/04/2024 06:58 PM	Less emphasis on big money and toney, pricey kitsch and more connection with our history and local environment.
Screen Name Redacted 4/04/2024 07:26 PM	Do something about the mill. It is an eyesore coming into down. Even Washougal has plans for beautifying their downtown and making it walking friendly. The Mill is creepy, contaminated, and mostly vacant. All those buildings as you drive in on 6th are empty and ugly. And THAT is our welcome to Camas? Get the mill to start tearing down the derelict buildings and cleaning up what they don't use anymore. Georgia Pacific is no friend of Camas anymore. They are an eyesore, a hazard, and a monument to environmental destruction.
Screen Name Redacted 4/04/2024 07:36 PM	Do no allow single non-commerce entities to buy/occupy an entire block of premium retail/restaurant space downtown. Improve road conditions in the older neighborhoods. Implement climate change solutions now to avoid costly repairs in the future.
Screen Name Redacted 4/04/2024 11:03 PM	Please don’t let one church buy up all of downtown. I’d love to see a community space where classes, activities, and special events could be held during the rainy months.
Screen Name Redacted 4/05/2024 10:37 AM	Keeping roots while being open to change
Screen Name Redacted 4/05/2024 11:41 AM	Improve the infrastructure and restore the buildings. Increase parking
Screen Name Redacted 4/06/2024 07:48 AM	Nothing really, love the historic downtown area.
Screen Name Redacted 4/06/2024 02:58 PM	Nothing! Keep it like it is. Modern buildings have no place in historic downtown. Like that ugly apartment/ business building they just built not to long ago and that they are building that they had to tear down that beautiful 1912 church to make another UGLY one!
Screen Name Redacted 4/06/2024 11:45 PM	More variety of businesses downtown.
Screen Name Redacted	DT is nearly perfect, My main issue is the new neighborhoods with

4/08/2024 09:20 AM

high density. Please don't stuff the houses close together. There's already considerable traffic in our area, and with the new high-density living situations you are allowing, this will continue to get worse and worse. Camas's charm is dependent on the quaint vibe of downtown and the surrounding neighborhoods, and also the larger lots with plenty of green in the surrounding areas. Every time a new neighborhood goes in, with the houses right on each other, and narrow streets without street parking, it starts to have a Gresham and Happy Valley feel. I mean this in the most offensive way possible. I moved to Camas from Lake Oswego bacuse of the country vibes and LACK of cookie-cutter neighborhoods. In my 6 years of owning a home here, on 232nd Ave., the growth has bee too much, and an eye sore.

Screen Name Redacted
4/08/2024 09:52 AM

Preserve the trails around Lacamas Lake. Preserve the steps from the Mill Ditch. Deal with the paper mill. Have more green space and kids play areas, especially near high density housing. More sidewalks and bike lanes. Fiscally balanced. More activities for youth like bowling and roller-skating. Flashing crosswalks at 3rd and Birch. Turn 4th Ave into a pedestrian walkway/mall and have event parking nearby. Lighted parking stalls for efficient in and out. Small swimming pool for kids, but not a huge aquatics complex. A community venue for all seasons that has police and fire access. The Paper Mill is a big question mark. Lots of empty lots that could be festival parking. Multipurpose recreation facilities.

Screen Name Redacted
4/08/2024 12:48 PM

• Better access to waterfront (Washougal) - waterfront redevelopment (what Vancouver has done) • More sidewalks! Near schools, Prune Hill, main thoroughfares. • Housing downtown • Housing choice / variety • More neighborhood commercial to scale (hubs) • More pocket parks, dog parks • More jobs/better jobs/ career jobs for youth • More bike-ability, crosswalks, traffic diet • Improve/expand utilities and infrastructure (stormwater) • More parking downtown, especially for events ("what's reasonable for walking distance?", shuttles, accessible for elderly, disabled) • Transit • More and better connected trails • Retain community events (July 4 fireworks, farmers market) • Maintain facilities/parks/trailheads • Architectural integrity/design standards

Screen Name Redacted
4/12/2024 10:29 AM

We need more affordable (under 400,000) family homes with actual yard space instead of more apartments and cookie cutter housing that create traffic on roads that can't sustain it and make downtown camas events and business almost impossible to attend. We need to make sure the design of newer buildings match the esthetic of the historic downtown camas buildings. Nobody wants to see our

	beautiful downtown turned into a a cluster of modern city style buildings. Widening roads to accommodate influx of traffic caused by all the apartments and cramped housing developments only hurts home owners and business owners, and untimely will ruin our walkable areas and surrounding nature. There needs to be a better way to meet the needs of new residents without destroying what's already here. The city also needs to actually address the lake issue and make it safe. If the city is going to continue to promote it as a family and pet friendly place, they need make sure it won't kill said pets or cause people/animals to get sick. This has gone on for a ridiculous amount of years and the city already knows what the problem is. Please fix it.
Screen Name Redacted 4/12/2024 01:45 PM	More commercial opportunities (i.e. retail/food and beverage). It would also be beneficial not to allow churches to continue to absorb former commercial spaces as they are occupying some of the limited downtown space and do not contribute to local economic growth. Especially given the vast amount of people that do not partake in religious services - they create empty spaces in the community that could better serve everyone, not just attending Christians.
Screen Name Redacted 4/12/2024 03:40 PM	We don't believe downtown Camas is an appropriate place for a church. This organization should be strongly encouraged to move to a better location with the space then used for additional restaurants and shops. Maybe expand the historic hotel and/or add another by remodeling/restoring upstairs spaces in the downtown.
Screen Name Redacted 4/12/2024 05:02 PM	I would like to see more diverse offering in downtown businesses. Many of the shops and restaurants are very high end, and fall within just a few business types (fancy salons, fancy clothing stores, expensive restaurants).
Screen Name Redacted 4/12/2024 05:38 PM	Get rid of churches on the main corridor and make room for more small business everyone can enjoy. We need a pastry place, organic food, more variety. Murals on the mill and open area museum/exhibit of the history of the mill to make it beautiful enriching for preserving the history as well as preparing for the future of it.
Screen Name Redacted 4/12/2024 08:46 PM	Parking is limited and vehicle maneuverability feels tight. I wonder if it makes sense to have more one-way streets and wider pedestrian areas.

Screen Name Redacted 4/12/2024 09:08 PM	Too many churches and church owned property makes me worried about how the city will generate enough revenue that will go back into the city itself
Screen Name Redacted 4/13/2024 04:49 AM	Seeing pictures of historic Camas is really fascinating to view. If there were more opportunities to see pictures from the past that would be nice.
Screen Name Redacted 4/13/2024 06:19 AM	Our Safeway is outdated. Would love to have a market available similar to Metropolitan Market that Tacoma/Seattle has.
Screen Name Redacted 4/13/2024 07:03 AM	I think a parking structure is necessary in the future. Moderately worried about the degradation of the mill and the toxic effects of that plus the visual of an old dilapidated mill is just not appealing.
Screen Name Redacted 4/13/2024 03:33 PM	Like to see upkeep of the area, new things tried but not pushing out the old that have been with the development of the community. Balance growth and progress with our past.
Screen Name Redacted 4/13/2024 04:36 PM	We need to make decisions that allow people who were born and raised here to continue to affordably live here.
Screen Name Redacted 4/13/2024 05:05 PM	No real changes; keep Camas what it is -- resist the urban sprawl.
Screen Name Redacted 4/13/2024 08:05 PM	how about not changing anything!
Screen Name Redacted 4/14/2024 11:03 AM	The downtown area is in need of more restaurants and other attractions. A park central to downtown would be nice. It also needs to be enlarged. I think what needs to be changed in the outlining areas is all of the high density developments. Traffic is going to increase. I have seen this in other areas I have lived. Add more single family developments. Encourage families to live here.
Screen Name Redacted 4/14/2024 11:11 AM	More people, more housing, more parks, more trails! People are an asset to our community not a burden to be avoided. We need more people but we have to provide housing and transportation choices that don't negatively impact existing residents. We have wonderful public lands but they need to be better maintened and made more

	accessible. The maintenance of our trails has greatly improved in the last few years. Keep up the good work.
Screen Name Redacted 4/14/2024 05:39 PM	The push for more outside chain businesses with non local ownership is ruining the qualities of downtown we come here for.
Screen Name Redacted 4/15/2024 06:40 AM	Less congestion - negotiate with the mill to add close-in parking. Close 4th street from Adams to Dallas as pedestrian traffic only. (see Boulder, CO. as an example)
Screen Name Redacted 4/15/2024 10:39 AM	Love the historic downtown! It might be beneficial to include some foot traffic only spaces. Foot traffic is essential to the boutique shopping that is the heart of downtown.
Screen Name Redacted 4/15/2024 10:53 AM	This question is too similar to the above. Improve and enhance are pretty much the same. This is a wasted survey question -- bummer. I will try to give a different perspective to help. Regarding downtown. No more 'national chains' such as Subway, DQ, Burgerville, or Safeway. Keep the downtown dedicated to small local businesses. Incent the local real estate owners to clean up their properties. Some properties can use some upkeep. Third Ave is a main artery and lacks charm. Add it! It would've been good to put some architectural guidance to new construction. You can add new architecture that invokes an old-period charm. In essence, the old charm of Camas is very limited to a few short blocks. Regarding Camas in general. Too much development. We are losing our green spaces to roof ghettos. Enhance the rural roads --- there is more traffic on them, specifically young drivers. They need to be safer, widened, and guard rails.
Screen Name Redacted 4/15/2024 02:26 PM	the plant is an eyesore and I'd like to see decommission, consolidation plans with a timeline
Screen Name Redacted 4/15/2024 02:56 PM	Add one or two nice sit down restaurant in downtown
Screen Name Redacted 4/15/2024 04:36 PM	Downtown is amazing the way it is and draws a lot of people here. Keep the mill. I moved here to find a city just like Camas and I'd hate to see it urbanized. People should move to an area and appreciate it, not just want to change it and make it what they moved away from. I'd like the water quality to be addressed and be able to use the lake more in the summer. So if any improvements are needed, the lake could be cleaned up.

Screen Name Redacted 4/15/2024 05:23 PM	Maybe churches shouldn't buy up the entire thing?
Screen Name Redacted 4/15/2024 06:59 PM	Do not change anything downtown. Downtown is what makes Camas so special. What can be improved is more round-a-bouts and sidewalks in the older parts of town, including sidewalks on both sides of NW 18th Ave off of Division. Also fix the Division street (off of NE 6th), so it’s not so bumpy.
Screen Name Redacted 4/16/2024 09:10 AM	Continue to improve and attract small businesses to the area. Make it a destination for people in surrounding areas to come enjoy and spend their money in downtown. Continue to keep Camas from becoming like Portland. We do not want the density, the traffic, or the busy-ness of what Portland has become. Let other places build high-density housing - keep Camas feeling like a small town.
Screen Name Redacted 4/16/2024 09:34 AM	More bike lanes, limited growth compared to currently. Would like Camas to stay a smaller town. Improved cleanliness of roadways-less litter.
Screen Name Redacted 4/16/2024 03:59 PM	I don't want anything to change. In fact, I think it was awful that the church was razed to make way for tons of high rise housing and very little available parking.
Screen Name Redacted 4/16/2024 06:51 PM	As mentioned before I think it would benefit our community to have that one block section not completely be owned by one single entity. The more diverse the businesses we have here, the better it is for all. I think providing assistance to those small local shops would also be beneficial and I think looking at some sort of height/land use code for the downtown section would also be beneficial to keep the small town feel. Lastly I'm also nervous about the expansion taking over are green areas (for example north of lacamas lake).
Screen Name Redacted 4/16/2024 08:21 PM	The city government drifts to want to spend too much of the budget on things away from the core mission of the city, especially on consultants. I would like less wasted money on consultants. Sure, you might need them for expertise like engineering, but I don't see the need to spend lots of money on consultants to spin things (like marketing) for how the city wants me to vote on issues, or in marketing in general.

Screen Name Redacted 4/17/2024 08:06 AM	Better parking/walking. Keep it small
Screen Name Redacted 4/17/2024 12:10 PM	1. Make downtown Camas a pedestrian area; make it so it can be used in the evenings (street lights) 2. Develop new hiking trails (incl. several miles long ones) 3. Sidewalks on every street 4. Build a few public pickleball courts 5. Add charging stations for EV cars
Screen Name Redacted 4/17/2024 02:49 PM	I would love to see some the old mill land cleaned up and developed into more dense mixed-use to expand downtown. Better public transit would be cool to (a street car between Camas and Washougal???)
Screen Name Redacted 4/17/2024 03:57 PM	Historical downtown district. Liberty theatre/camas antiques; historical anchor. Signage/historical tour offerings. Good jobs. Small business/merchant engagement. Diversified housing and employment. Community pool. Draw more business. Expand jobs and tax base; commercial and industrial zones. More parking and housing downtown. More medical services.
Screen Name Redacted 4/17/2024 05:10 PM	No ideas at this time.
Screen Name Redacted 4/17/2024 05:48 PM	I would like to see more child friendly development happen at crown park. Whether that’s a splash pad or an updated playground of both.
Screen Name Redacted 4/17/2024 05:58 PM	Downtown Camas has been taken over by Journey Church. This prevents the use of the entire community for business purposes and has made downtown Camas less attractive to me. I rarely go down there anymore because there just aren’t enough businesses to go to. It also reduces the income for the city from business sales tax collections. I realize the city has no control over who purchases buildings downtown, but a contingent of city administrators could visit with Journey’s commercial arm and explain the problems their growth downtown has created for the city. Lacamas Lake has a terrible parking and safety problem that needs to be addressed. Swimmers, kayakers, paddle boarders, jet skis and motor boats all use the same entry/exit point which creates a serious safety issue. There is not enough parking for the amount of use the lake gets during summer months.
Screen Name Redacted	Expand core street/downtown outwards. Don’t just build new

4/17/2024 09:07 PM	architecture buildings try to keep vibe in new construction.
Screen Name Redacted 4/18/2024 07:28 AM	More walking trails. Better integration with nature.
Screen Name Redacted 4/18/2024 09:31 AM	More walkability and bikeability outside of downtown.
Screen Name Redacted 4/18/2024 09:52 AM	The fireworks situation is getting out of hand. The weather is drier and warmer and the fireworks are loud, obnoxious, and cause trauma and stress for veterans and pets. We are upset that the city has not done anything to change the fireworks rules - we'd like to see that happen ASAP.
Screen Name Redacted 4/18/2024 02:06 PM	More parking and/or public transit downtown. Events in Camas are special but difficult to attend for those not within walking distance.
Screen Name Redacted 4/18/2024 03:33 PM	Have a luxurious coffee roaster, brunch spot, private spa, small natural grocery store, a gym, retail shops from this era such as lululemon/alo, a wood fired pizzeria.
Screen Name Redacted 4/19/2024 05:56 PM	Remove the buildings of the mill and open more access to the Columbia River. Some bike lanes in the downtown area with a few bike parking areas would be nice.
Screen Name Redacted 4/19/2024 07:24 PM	I would like to have parking available for the library. The street parking is 2 hours only and it doesn't allow me to study long hours in the library without moving my car.
Screen Name Redacted 4/20/2024 10:55 AM	Obviously, the mill is a huge part of Camas's history, but it is a huge space now that could probably be better used in other ways since so few people actually work at the mill anymore. I know repurposing that space is a massive undertaking, but it's something I would hope to see happen in the future.
Screen Name Redacted 4/20/2024 06:40 PM	Improve sidewalks, quality of roads (eg along SW 6th ave) so can walk safely without worrying about having to walk on the road with some people driving carelessly. Make power lines underground or away from trees so less disruption with falling trees in winter. Bring in more businesses, more businesses, jobs and residents.

Screen Name Redacted 4/20/2024 07:25 PM	I hope any pollution issues from the plant are being addressed. I'm retired, & don't get out much, so I can't be much help here. I've seen the maps for the corridor but I've never driven around there.
Screen Name Redacted 4/20/2024 08:25 PM	More independent owned restaurants
Screen Name Redacted 4/22/2024 09:05 AM	Downtown Camas needs more housing density. More midrise housing so that more people live in the same amount of space. Then there will be enough demand for more retail businesses to make money. Then when you have more people and more businesses, it will be a thriving community. Also, prioritize sidewalks and bike lanes so people don't have to drive everywhere.
Screen Name Redacted 4/22/2024 09:35 AM	Outdoor community gathering space. Parking and housing downtown. EV charging stations. More infrastructure like electricity, water, roads and buildings. Planning for Mill property and waterfront in general. Complete streets. Public transit. Connection of neighborhoods to downtown. Preservation of native plants/ Local jobs. Preservation of open space. Lake clean-up. Another high school/technical school. Dark sky compliant lighting. Pool.
Screen Name Redacted 4/22/2024 12:10 PM	Improve street safety in neighborhoods with high visibility crosswalks and medians, add sidewalk b/t the lakes and downtown on Everett. Do not let precious downtown real estate be used for single entity non-commercial use (i.e. the church that takes up a block). Improve water runoff in old Camas neighborhoods by Crown Park. Address speeding issues on neighborhood streets, especially coming down from Prune Hill into Crown Park area. Future-plan for climate change with more tree canopy and native plants in neighborhoods to help with both heat and storm water/flooding.
Screen Name Redacted 4/23/2024 05:00 PM	More restaurants with more diverse/ethnic offerings. More places for young people (especially teens and pre-teens) to hang out.
Screen Name Redacted 4/23/2024 09:08 PM	I have a huge issue with the increased presence of the church in the downtown area. This does not illustrate an inclusive and welcoming environment to those that are not religious or of that particular faith. Adding new restaurants, cafes and shops will draw more residents to the area.

Screen Name Redacted 4/23/2024 09:20 PM	I wish there was less parking and more bike and pedestrian infrastructure. I feel that the parking lot on NE 6th & NE Birch has a lot of potential if turned into something more productive like housing/commercial like the lot across the street. I feel the same way about the parking on NE 7th & NE Adam. There's so much potential if camas captures it!
Screen Name Redacted 4/26/2024 07:36 AM	driving & parking seems to be a problem. I eventually see more road closures to allow for walking through 4th Ave for instance. The roads feel too small as it is. But traffic and parking management would be key to deal with.
Screen Name Redacted 4/27/2024 12:34 PM	A walking street with outdoor restaurants would really enhance downtown. We are also a bit concerned about a large portion of the downtown being owned by a church rather than individual commercial businesses. We also believe that Camas needs a public pool.
Screen Name Redacted 4/27/2024 05:02 PM	Keep downtown a place where people can actually come down and do business with a wide range of locally owned shops. Keep homeless from begging on streets and from camping/ doing drugs in our parks and greenspaces. PRIORITIZE SAVING TREES AND HISTORICAL BUILDINGS.
Screen Name Redacted 4/29/2024 10:59 AM	We need to add more multi-use buildings with living areas up top and shopping/restaurants at the bottom. Please also make it more pedestrian friendly with larger newer walkways and bike lanes. You're already doing this for the rest of Camas so please modernize downtown Camas as well.
Screen Name Redacted 4/29/2024 12:38 PM	More places to park… but spaces located outside the downtown to encourage walking.
Screen Name Redacted 5/02/2024 09:40 AM	Traffic. Plan for the mill; think about what is next for that area. Growth management: we need to ensure there is workforce housing. Be wary of northward growth, consider increasing density in other areas. Preserve farmland. Housing prices. Transit connections to neighboring communities. We need 55+ housing and single level housing for transitional housing. The enrollment in the school district is projected to be steady, son plan for that. Continue renewal. More park spaces. Plan for all economic levels. Plan for population growth from climate change. Work together with Washougal.

Screen Name Redacted 5/02/2024 03:06 PM	clean up the lakes
Screen Name Redacted 5/02/2024 03:30 PM	More diverse restaurants. A place for comic books or board games. A record store
Screen Name Redacted 5/02/2024 09:31 PM	Getting into downtown via anything other than a car feels really dangerous. Vehicle speeds on 6th and 3rd into and out of downtown are incredibly high. Travelling between sr14 and downtown on 6th at 25mph as opposed to the 40-50mph speeds people routinely travel at would add maybe 1-2min while improving safety and access. I would impress on the city that efforts to slow traffic and restructure 6th Ave into a shared traffic mode, two-lane road would improve safety and massively improve the possibilities for mixed-mode transportation for locals into and out of downtown.
Screen Name Redacted 5/02/2024 10:20 PM	More guaranteed small business tax incentive / breaks to allow small business to plan for the future and develop a foothold in our town.
Screen Name Redacted 5/03/2024 08:07 AM	Enhance pedestrian accesibilty. Close off 4th Ave to motor vehicles between Adams and Everett and create a pedestrian mall with permanent outdoor dining opportunities. Think Boulder’s Pearl Street Mall .
Screen Name Redacted 5/03/2024 08:23 AM	Growth in residents should be lockstep with growth in transportation and infrastructure.
Screen Name Redacted 5/03/2024 08:42 AM	Reclaim the mill; take care of the water quality of the Lacamas Lake
Screen Name Redacted 5/03/2024 03:27 PM	Would like to improve food options
Screen Name Redacted 5/03/2024 03:28 PM	The Church breaks downtown up - that really should be retail. More restaurants, gourmet shops would be good.
Screen Name Redacted 5/03/2024 04:05 PM	Historic downtown is just fine as it is. It's walkable & plenty of avail. FREE parking. Aside from the 2 safeways + the BiMart, we lack presence of larger commercial stores (like Target, Fred M, etc.) Also, having to drive long dist. to Peace Hlth. med ctr in Vanc., - - longer term, it would be nice to have a multi-specialty Peace Hlth. clinic in

	this vicinity.
Screen Name Redacted 5/03/2024 04:05 PM	Cut and trim the trees. They have dangerous limbs that need trimming
Screen Name Redacted 5/03/2024 04:05 PM	I can't think of anything I would change.
Screen Name Redacted 5/03/2024 04:07 PM	Seeing better care for the downtown sidewalks which are filled with cracks and dirt
Screen Name Redacted 5/03/2024 04:37 PM	Crown Park upgrades
Screen Name Redacted 5/03/2024 05:41 PM	More parking , make it easier to park .
Screen Name Redacted 5/03/2024 06:03 PM	1. I am very concerned about the lack of grocery stores! There is only one in Camas, and it is small, overcrowded, has no competition to keep prices down, the produce section is inadequate, and most of the rest of the store is just unhealthy junk. With all the growth going on in our area, we need access to quality food in order to avoid becoming a food desert. We need an alternative, whether it be a decently-run Whole Foods (unlike the disaster on 164th St which closed a few years ago), or a New Seasons. An alternative would be to offer double the amount of space to entice Natural Grocers to move to Camas from 192nd St. Its signature store is found in Sedona, Az., and is a dream store offering whole, organic fresh foods and healthy alternatives to the processed foods that are directly related to heart disease, diabetes, strokes, and cancer. 2. We don't need more downtown parking! We need to get out of our cars and walk. Make it pleasant to do so---if only more trees had been planned for 5th and 3rd Avenue, our city could have been transformed into an even more wonderful attraction. We got 3rd St. right---how can we expand on it? Imagine a downtown that is so attractive that it becomes a destination point for vacationers to stretch their legs, have a meal, and enjoy the quirky shops we offer. 3. Have City Council outlaw and enforce fines for those who think a loud, mufflerless car is a happy car. It is not, at least for the general public. I don't know if electric cars are a good solution to our environmental problem, but if so, more charging stations might fit our future also. 4. Solve the water problem! I am appalled that City Council plans to release known high levels of PFAS-contaminated water into the community this summer. Why not enforce water rationing by especially targeting landscape watering.

	The high earners among us can afford to dial down their pretty landscapes, but the current plan to release PFAS into our drinking water is abhorrently unfair to those on a limited income, who have no way to mitigate the carcinogens that are released into our drinking water. (Side note: using unfiltered water from the tap in Camas, my attempt to grow broccoli sprouts has only produced slimy, inedible garbage. When the water is filtered, I can grow amazing sprouts. Fix the water supply!)
Screen Name Redacted 5/03/2024 06:01 PM	A beautiful waterfront would be nice. The mill is kind of an eyesore.
Screen Name Redacted 5/03/2024 06:31 PM	more walkability/bikeability downtown and connectivity between different parts of the city. We don't need more parking -- the downtown area especially already has soooo much parking. We need density, more affordability of housing/housing choice, we need connected trails/parks, more crosswalks and bike lanes throughout the city as well as sidewalks.
Screen Name Redacted 5/03/2024 09:16 PM	Better and more continuous bike lanes and ease of biking. Follow through on the lake management plan.
Screen Name Redacted 5/03/2024 09:55 PM	Push to keep historic downtown Camas as an economic center of the city. With the increased housing development, I have concern that the historical charm will not be able to withstand the growth. I would also like to see more effort going towards addressing the PFAS in well 13 (and wherever else it may have leached to), more transparency with Camas paper mill, and proactively holding up it’s connection to Earth Day through the coordinator, Denis Hayes.
Screen Name Redacted 5/04/2024 09:19 AM	More walkability. Block off the downtown section of 4th street for pedestrians only. Include those blocks on 3rd and 5th street to look like 3rd street to include more trees and benches.
Screen Name Redacted 5/04/2024 09:47 AM	More things to walk to in various neighborhoods.
Screen Name Redacted 5/04/2024 04:41 PM	Low speed limits (cars) throughout the entire city. More, better, and safer bike lanes (protected bike lanes where possible). Connecting up of pedestrian trails and sidewalks where gaps exist. Allow for housing CHOICE -- ADUs, multi-family, etc., especially within walking distance of downtown and transit lines.

Screen Name Redacted 5/04/2024 05:28 PM	River access, walk/bike trails connecting to Lacamas Park, more restaurants
Screen Name Redacted 5/04/2024 05:30 PM	get rid of the mill asap and we'll all be better for it. property taxes from that in an of itself will help boost building more trails. use Minneapolis as an example here. stop letting all the churches take over historic downtown and allow actual businesses to flourish. for all the homes currently in the MX use area by the lakes to actually have businesses so that area can revive itself into foot traffic. look to mill valley California here as an example. reduce parking minimums for businesses so that you can let the market decide what is successful
Screen Name Redacted 5/05/2024 08:40 AM	Design for biking, walking and transit. Less focus around cars and more around people.
Screen Name Redacted 5/05/2024 09:13 AM	Operating hours of small businesses downtown. Open earlier so that parents can shop after school drop off, but before other obligations.
Screen Name Redacted 5/05/2024 12:39 PM	Stop allowing allowing big developments to be built, preserve large lots and farms. Now that we know better, remove fluoride from our drinking water.
Screen Name Redacted 5/05/2024 03:21 PM	No more mega churches taking up an entire block of shopping area in downtown. Keep the post office, library and city hall where they are and AS THEY ARE. Provide more parking for the small restaurants and businesses on GP's property, if possible, or on 3rd St.
Screen Name Redacted 5/05/2024 04:34 PM	More independently owned businesses
Screen Name Redacted 5/05/2024 06:11 PM	More action ! City of Camas purchased amazing properties including the Leadbetter house. Downtown area is thriving, focus on the lake areas!!!
Screen Name Redacted 5/05/2024 09:37 PM	I would keep big box stores and corporations out of our city to preserve the small town feel. Our city is growing astronomically and every year it seems that the original Camas I fell in love with goes away. Little by little. Our taxes also seem to go up year after year. Many old timers who grew up in this city are finding it harder and

	harder to keep up with the rising taxes. Many old folks are on fixed incomes and the new residents and increasing taxes are driving people away.
Screen Name Redacted 5/06/2024 02:01 PM	I want to see the lake clean and the trail built so that I can ride bikes, walk, and float with my family on a clean lake
Screen Name Redacted 5/06/2024 03:27 PM	Stop now it’s not getting better.
Screen Name Redacted 5/07/2024 08:24 PM	The addition of a public turf soccer field would allow youth athletes of many sports to play and train year round. As far as downtown, I think it would be great to have two blocks cordoned off from cars permanently, allowing more room for dining and socializing of pedestrians. This could be similar to Church Street in Burlington, VT or River Street in Savannah, GA. Downtown Camas will need something special to draw people from the 192nd shopping and dining center once it is complete.
Screen Name Redacted 5/10/2024 01:55 PM	I would like to see a move to safe and sane fireworks. It is the only time of the year that I would rather be anywhere else than in Camas. It is hard on pets and people alike. I would also like to see Lacamas Lake cleaned up.
Screen Name Redacted 5/11/2024 02:20 PM	Outlaw fireworks altogether.
Screen Name Redacted 5/12/2024 07:25 AM	Potentially more parking , make Main Street pedestrian only ? Keep it affordable for families
Screen Name Redacted 5/12/2024 06:47 PM	We'd like to see the scope of downtown expanded perhaps to even include a connection to the 3rd street corridor towards Washougal. And we need to plan for that. When we have grown out of Prune Hill and the North Shore, downtown will be small and cramped and still old buildings. We need multiple town centers whether they're historical or new.
Screen Name Redacted 5/13/2024 04:33 PM	The mill must break cleaned up including ensuring contamination has not already, or will threaten our drinking water. The mill, much of with is no longer in use, should be the focus of new growth. Camas need government that respects neighborhoods, and relies on more internal

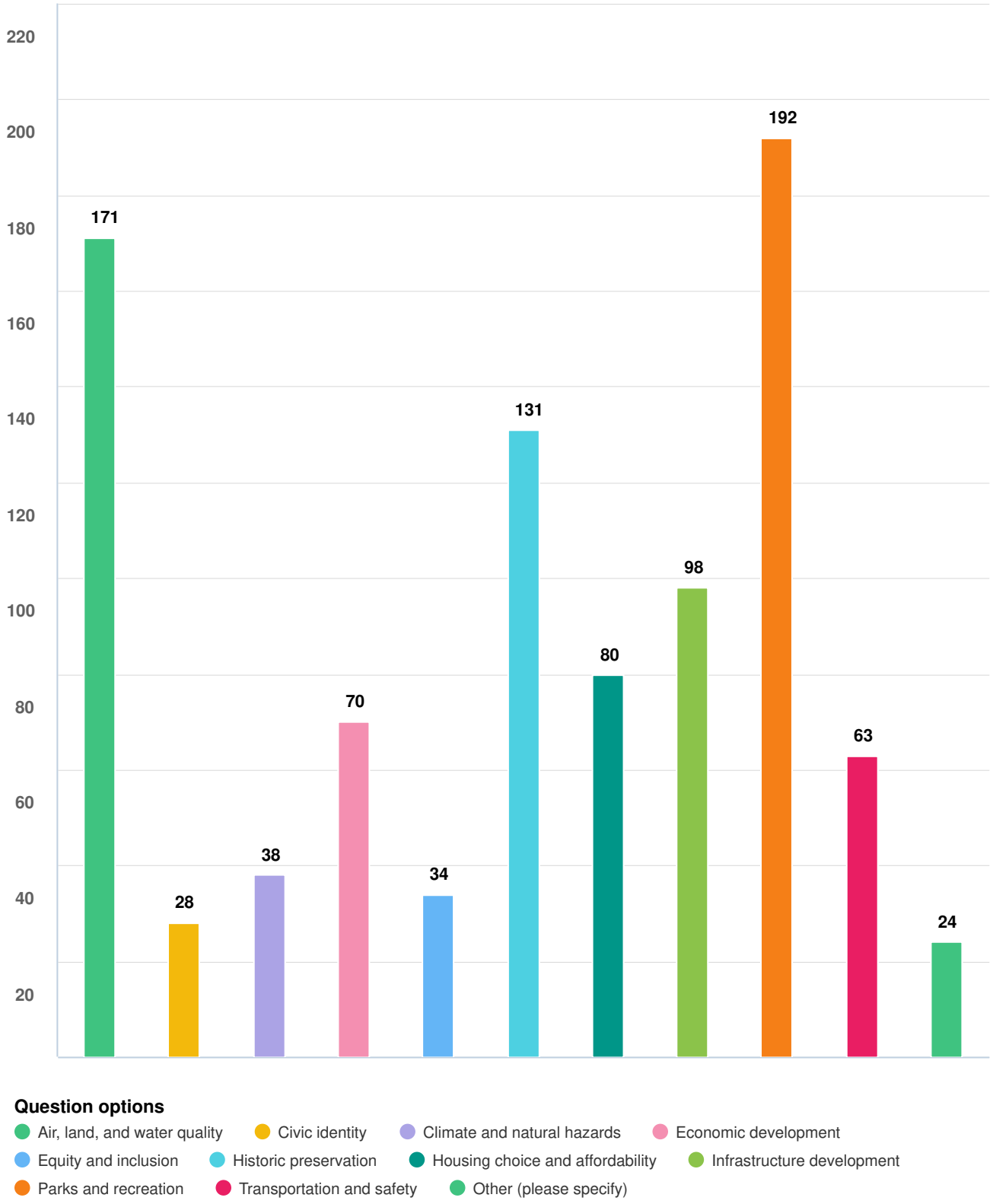
organic growth versus continued push into the forests.

Screen Name Redacted
5/15/2024 12:24 PM

Lack of connectivity/end of road. Need a car to get around. Icy roads are hazardous. Not many cheap fun things to do. Lake water quality.+ Affordable housing and housing types. Infrastructure at peak times near CHS. Traffic safety - not enough exits.+ More areas like downtown. Speed limits/street designs. Rain proof facilities. Roads/walkability/lack of sidewalks.+ Lack of bike lanes. CHS needs a pool. More trees. Dog parks. Youth activities. Emergency management and snow plows. Crown park has no pool or programs. Signs not maintained. More athletic fields - rugby pitch, ice skating rink, indoor tennis, basketball, cricket

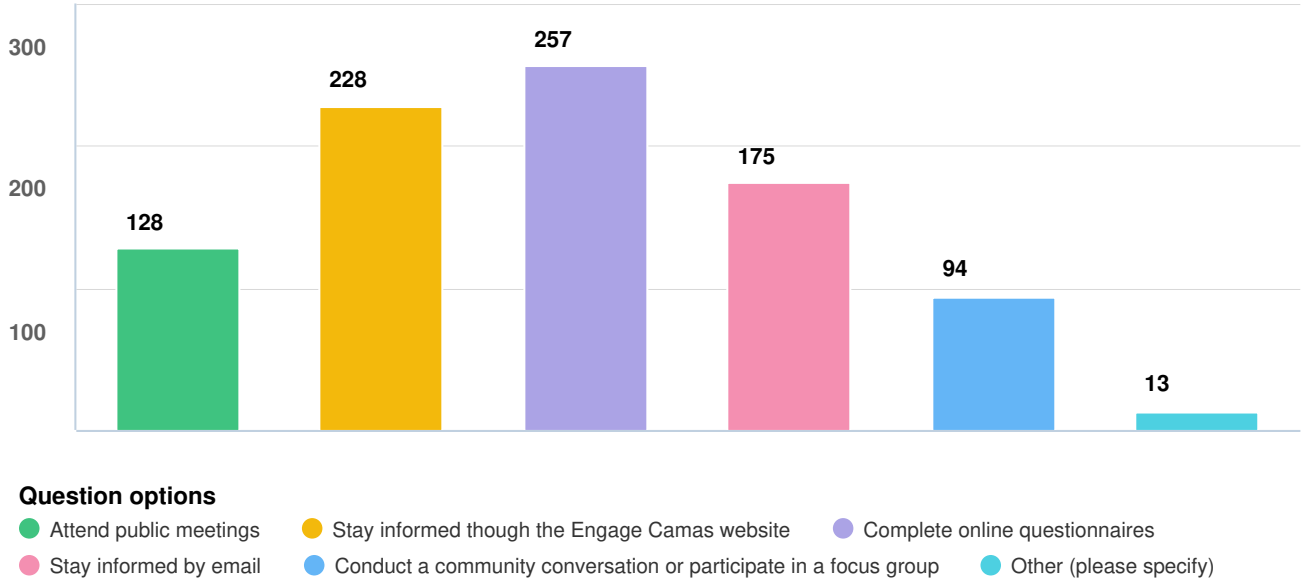
Optional question (343 response(s), 24 skipped)
Question type: Essay Question

Q4 In your opinion, what is the most important topic to address in the Our Camas 2045 process? Identify your top three priorit...



Optional question (347 response(s), 20 skipped)
Question type: Checkbox Question

Q5 In what ways would you like to participate in the process for Our Camas 2045?



Question options

- Attend public meetings
- Stay informed though the Engage Camas website
- Complete online questionnaires
- Stay informed by email
- Conduct a community conversation or participate in a focus group
- Other (please specify)

Optional question (341 response(s), 26 skipped)
Question type: Checkbox Question

Q6 As Our Camas 2045 gets underway, what people, groups, or communities should we make sure to engage in order to make this an inclusive process?

Screen Name Redacted 2/20/2024 02:02 PM	Study the number and types of tech sector jobs left in town to better understand the needs of the companies to re-invigorate that sector.
Screen Name Redacted 2/10/2024 07:55 AM	I'd like to see our young people involved since they are the future.
Screen Name Redacted 2/10/2024 09:40 AM	Everyone who is willing to participate. Make it easily available and people will engage.
Screen Name Redacted 2/10/2024 11:47 AM	Make sure to communicate with residents that have been here for more than 10 years and not just the new transplants. I see a lot of changes being made to accommodate me comers without consideration to the people that have been here for years.
Screen Name Redacted 2/10/2024 11:14 PM	No one left behind

Screen Name Redacted 2/11/2024 10:27 AM	Create surveys for any residents to participate in
Screen Name Redacted 2/12/2024 10:02 AM	I'd like to see youth conversations. I am constantly blown away by the teens in our community for bringing keen insights & well thought out issues.
Screen Name Redacted 2/12/2024 02:44 PM	Gen X and Gen Z.
Screen Name Redacted 2/13/2024 08:52 AM	Local families & long time residents 1st, Big money Developers last
Screen Name Redacted 2/13/2024 09:37 AM	Local business owners
Screen Name Redacted 2/13/2024 09:42 AM	Area Agency on Aging Churches Schools Veterans
Screen Name Redacted 2/13/2024 10:00 AM	I believe any full time residents even the young adults in our schools should be given a reasonable chance to voice their opinion by surveys. Inside and outside of the city limits. It affects us all as a whole.
Screen Name Redacted 2/13/2024 10:55 AM	Parents and community-focused people.
Screen Name Redacted 2/13/2024 12:18 PM	This is a ridiculous survey since our city officials ignore all we want and act like they care. Everyone in this town live here because it’s a town, they do NOT want a city!!!!!! Get ride of the stupid equity and inclusion BS and do what people want! We used to be a nice conservative town until all the liberals moved here and want to change us into California or Portland. If you truly want to know what people want, then have a town meeting with Q&A’s in an evening after 7pm. Not mid week or early afternoon when people are working. And give plenty of time in advance unlike the sneaky last minute meetings that no one can attend or voice their opinions.
Screen Name Redacted 2/13/2024 12:47 PM	Camas Little League, Clark County Youth Football, Camas Business Owners, CREDC

Screen Name Redacted 2/13/2024 12:49 PM	Future homeowners, local builders, developers, and local church organizations. They understand and know the true problems of the town.
Screen Name Redacted 2/13/2024 01:27 PM	The youth of camas and young families.
Screen Name Redacted 2/13/2024 02:59 PM	Our future youth Downtown families Small businesses
Screen Name Redacted 2/13/2024 06:00 PM	Those with school age children
Screen Name Redacted 2/13/2024 07:02 PM	Open minded humans
Screen Name Redacted 2/13/2024 07:53 PM	The families that actually live here - including the traditional neighborhoods like Everett Corridor and downtown. Town Hall is WAY too insulated and homogenous with the same people on committees over and over again. Stop moon eyeing the developers that over-promise and underdeliver.
Screen Name Redacted 2/13/2024 09:21 PM	First Friday attendees ... They're invested in the community.
Screen Name Redacted 2/13/2024 09:29 PM	Get the message out through multiple communication means, including print
Screen Name Redacted 2/13/2024 11:33 PM	Organizations, neighborhoods, apartments, Events, employees of businesses (not just owners), Elk, schools, resource centers
Screen Name Redacted 2/14/2024 05:29 AM	I feel like Camas can be fairly economically stratified - there are so many ultra-wealthy and upper class people here that they are generally the ones more engaged in public processes. So just more engagement of those of us who are not on that end of the spectrum.
Screen Name Redacted 2/14/2024 08:06 AM	NO OUTSIDE CONSULTANTS. Decision makers need to have a dog in the fight. Outside consultants are absolutely ruining Vancouver and have already cost the city of Camas an exorbitant amount of money. This is a well educated community, tap into that resource.

Screen Name Redacted 2/14/2024 09:39 AM	All. Businesses, Families, Community groups, Churches, School, ect.
Screen Name Redacted 2/14/2024 05:16 PM	This is a dumb question. Your Jon is to make the information available to the community and whoever wants to get involved can do so. Seeking out specific people to be "inclusive" is very exclusive.
Screen Name Redacted 2/15/2024 08:30 AM	Parents of school age kids. Retirees. Existing Camas citizens.
Screen Name Redacted 2/15/2024 09:16 AM	Please include a variety of people from all economic backgrounds.
Screen Name Redacted 2/15/2024 09:16 AM	The East Asian population is the fastest growing group in Clark County, so include more of them please.
Screen Name Redacted 2/15/2024 09:33 AM	Residents, schools and businesses.
Screen Name Redacted 2/15/2024 09:39 AM	NOT RICH FUCKERS!
Screen Name Redacted 2/15/2024 09:44 AM	Council for the Homeless, community groups that serve the low income and struggling families, local merchants
Screen Name Redacted 2/15/2024 09:44 AM	All ages including senior citizens.
Screen Name Redacted 2/15/2024 09:58 AM	Volunteer orgs such as Rotary, Lions, Soroptimists; schools including students; businesses large and small
Screen Name Redacted 2/15/2024 10:02 AM	Representative demographic group
Screen Name Redacted 2/15/2024 10:06 AM	Everyone
Screen Name Redacted	There are so many white people in Camas. Make sure to include

2/15/2024 10:18 AM	voices and experiences of other groups. We absolutely need more options for multi family housing, so include the voices and experiences of the folks who are lower income.
Screen Name Redacted 2/15/2024 10:18 AM	invite all and see who comes.
Screen Name Redacted 2/15/2024 10:29 AM	Minority communities, members of unincorporated Camas.
Screen Name Redacted 2/15/2024 10:36 AM	Care about the Families that live in Camas, and sustaining our higher standard of living than most cities. People move to Camas, and yes most are about average income. And that's ok. We do not need to build a lot of apartments.
Screen Name Redacted 2/15/2024 10:41 AM	Senior citizens who are on fixed incomes, low income families/economically disadvantaged
Screen Name Redacted 2/15/2024 10:43 AM	Local residents and business owners from all walks of life and of all denominations.
Screen Name Redacted 2/15/2024 10:48 AM	Homeowners who live in the homes they own in Camas.
Screen Name Redacted 2/15/2024 10:50 AM	Engage with the people that work down here. If you can get businesses to employ people down town and get them to stick around it only strengthens the night scene and keeps people around. Try and make it inviting to have smaller food vendors and restaurants want to make camas home
Screen Name Redacted 2/15/2024 10:52 AM	Neighborhoods, the businesses, mill workers, schools, students and teachers
Screen Name Redacted 2/15/2024 10:58 AM	Everyone. This includes “newcomers” and others whose opinions you do not respect . cCity government is just a club and is not sincerely interested in what people want. How much are you paying consultants for this bogus exercise?
Screen Name Redacted 2/15/2024 10:56 AM	All Camas residents

Screen Name Redacted 2/15/2024 11:17 AM	Camas Ivy League, Camas Tree Protectors, Schools, Audubon Clubs, Land Trust, Friends of the Columbia River, Yakima and other native tribes
Screen Name Redacted 2/15/2024 11:30 AM	The Downtown Association goes without saying, but it would be good to throw the net to include other businesses and private residents who consider this their neighborhood.
Screen Name Redacted 2/15/2024 11:45 AM	News letters
Screen Name Redacted 2/15/2024 11:49 AM	People who actually live in Camas. Especially the downtown area. Also, please stop with the "inclusive" BS.
Screen Name Redacted 2/15/2024 12:41 PM	All communities in the camas area as well as businesses
Screen Name Redacted 2/15/2024 12:44 PM	I'd really love to see some BIPOC-owned business downtown.
Screen Name Redacted 2/15/2024 12:53 PM	New families moving into the community.
Screen Name Redacted 2/15/2024 12:56 PM	By engaging in online surveys and sending out emails -- you are including the newer generations of parents (with children who just started elementary school) that plan to be here for the next 18+ years. I think that's a great first step!
Screen Name Redacted 2/15/2024 01:07 PM	Schools, churches, Homeowners groups
Screen Name Redacted 2/15/2024 02:08 PM	Please include all If old Camas along with all the new camas.
Screen Name Redacted 2/15/2024 02:16 PM	Sometimes I think it doesn’t really matter. The loudest voices and people in power just get their way, no matter what we say. Example: We gat enough signatures to force a vote on last year's new tax. Yet, the powers that be weren’t going to let that happen. What is wrong with leadership? Aren’t they there to represent us?

Screen Name Redacted 2/15/2024 04:23 PM	The DCA, Chamber, businesses and the Port.
Screen Name Redacted 2/15/2024 04:40 PM	I would prioritize long time residents. They got us to where we are at today. I am not in this group either. But the newcomers should not have an outsized voice.
Screen Name Redacted 2/15/2024 05:20 PM	School groups including PTAs, PTOs, youth sports organizations
Screen Name Redacted 2/15/2024 05:39 PM	All that wish to be engaged will be
Screen Name Redacted 2/15/2024 06:46 PM	People who’ve been here before it became over populated and unaffordable to live.
Screen Name Redacted 2/15/2024 07:46 PM	People from all walks of life (teachers, retail owners, industrial managers, senior citizens, students, non-profits, professionals) and all age groups.
Screen Name Redacted 2/15/2024 11:23 PM	Clubs , businesses and organizations are easy to find and include, but I'd like to see school age kids have input, and survey people who live in controlled rent/ low rent housing. Their input on accessibility and usability is invaluable but often overlooked.
Screen Name Redacted 2/16/2024 05:07 AM	Enough people in different stages of life and ages .
Screen Name Redacted 2/16/2024 08:08 AM	First stop with the buzz words, get the people who actually want to engage and get the job done. Don't just add people so you are politically correct. I would actually like to see a committee get something done unlike the things our City has done in the past. Please stop having a meeting to decide what to have a meeting about. Hopefully something can actually get done.
Screen Name Redacted 2/16/2024 08:40 AM	Volunteer and community outdoor groups that are involved in open space trail development and nature conservation
Screen Name Redacted	The older generations as well as what kids want to see.

2/16/2024 09:47 AM

Screen Name Redacted
2/16/2024 11:53 AM

tax payers

Screen Name Redacted
2/16/2024 12:34 PM

Not everyone wants to be front and center when it comes to speaking up. Having as many channels available for input is key. Hearing the same old naysayers screaming about the way things ought to be holds back our community. Camas has changed a lot since its inception. There's no point trying to hold back and communication is the most important factor in determining the next steps that will move us all forward.

Screen Name Redacted
2/16/2024 05:18 PM

Include those of lower income, minorities and high school students interested in seeing positive changes in the high school.

Screen Name Redacted
2/18/2024 09:07 AM

All age groups including our youth. What do they want to see in the community that they are missing today? What will keep them here in the future?

Screen Name Redacted
2/18/2024 09:38 AM

Parks and recreation, and how to maintain our local parks when there is increasing use by visitors from Portland.

Screen Name Redacted
2/18/2024 04:15 PM

All camas residents

Screen Name Redacted
2/19/2024 08:42 AM

I know there are committees dedicated to helping create the vision plan, so those of course, along with the DCA and the school district. I would also suggest a focus group comprised maining of our non-white population to talk about equity and inclusion issues.

Screen Name Redacted
2/19/2024 02:23 PM

Lower income residents, small business owners, minorities. Pleas listen and hear them.

Screen Name Redacted
2/20/2024 09:33 PM

Residents, business owners, police/fire/ems agencies, students within the school district.

Screen Name Redacted
2/21/2024 10:35 AM

BIPOC people

Screen Name Redacted 2/22/2024 01:22 PM	Families
Screen Name Redacted 2/24/2024 08:28 PM	I believe every camas resident should be aware, so maybe every household gets a letter with updates and if they'd like to stay informed they can go to meetings, or sign up emails. I also believe you should talk to middle schoolers/ high schoolers about what they like and don't like about this town, and what could change.
Screen Name Redacted 2/26/2024 08:36 AM	The people that are actually paying for it - the homeowners. And actually listen to them this time.
Screen Name Redacted 2/27/2024 09:54 AM	Open town meetings.
Screen Name Redacted 2/27/2024 10:39 AM	parents, students, teachers, 20-30 year olds, business owners, retired residents, all races/genders But also look to leaders of other towns that have already navigated what you are looking to create here in Camas.
Screen Name Redacted 2/27/2024 11:58 AM	I'm not sure it matters. We don't get listened to anyway.
Screen Name Redacted 2/27/2024 02:25 PM	Schools, community groups and conservation organizations.
Screen Name Redacted 2/27/2024 04:31 PM	The people who live here already, not the future hundreds you want to jam in for money!
Screen Name Redacted 2/27/2024 04:57 PM	Parents and kids since many of the people that live here are families.
Screen Name Redacted 2/27/2024 07:09 PM	Water & lake preservation groups
Screen Name Redacted 2/28/2024 08:59 AM	Youth groups, sports, etc. For our family the biggest driver to get us out of the house is activities with the kids (currently 2 and 4)
Screen Name Redacted 2/28/2024 06:52 PM	New residents.

Screen Name Redacted 2/28/2024 09:06 PM	How about homeowners, long time home owners.
Screen Name Redacted 2/29/2024 08:38 PM	The busiest group of people...Young parents.
Screen Name Redacted 2/29/2024 09:00 PM	Families with young kids. Cyclists. Seniors.
Screen Name Redacted 2/29/2024 09:46 PM	You definitely should listen to what people are telling you at the council meetings and through the questionnaire's. Involve less construction company's. You are letting this town be over built. We want it to stay small.
Screen Name Redacted 3/02/2024 07:37 PM	[Our group did not have time to answer this question.] I'm using this space to provide email addresses for Question 7, as it wouldn't allow me to enter more than one: vmcomie@mac.com, mbhogan31@gmail.com, koty55@msn.com, lindadevine29@gmail.com, dawn@dawnworkman.com, sandra1128@hotmail.com, dirwin@comcast.net, sb3carter@gmail.com, patricia.barnard@yahoo.com, karimarie32@yahoo.com, deanna@deponceau.com, ann.sturgeon@gmail.com, jennywu71@hotmail.com
Screen Name Redacted 3/04/2024 02:05 AM	Long time residents
Screen Name Redacted 3/06/2024 06:24 PM	Include those of us that live on the eastern side of Camas.
Screen Name Redacted 3/06/2024 06:36 PM	Forestry management or beautification.
Screen Name Redacted 3/06/2024 08:09 PM	Lake Pointe Homeowners group
Screen Name Redacted 3/06/2024 08:05 PM	school groups
Screen Name Redacted 3/07/2024 01:11 AM	I can't speak to which groups are best to engage, but it would be great to know the actual community living here is being heard.

Screen Name Redacted 3/07/2024 09:38 AM	Long-term residents, students, parents
Screen Name Redacted 3/07/2024 10:04 AM	We need more BIPOC-owned businesses downtown.
Screen Name Redacted 3/07/2024 10:11 AM	It would be really special to have another choice for breakfast in downtown Camas. I end up driving to Vancouver to get good food on the weekends. Natalia is way overpriced, greasy, and too many hashbrowns. We need choices.
Screen Name Redacted 3/07/2024 10:29 AM	school district, Clark county parks, clark county food bank, WSU extension.
Screen Name Redacted 3/07/2024 11:41 AM	Maybe fliers with a QR code around town?
Screen Name Redacted 3/07/2024 12:51 PM	Families, business owners
Screen Name Redacted 3/07/2024 01:27 PM	eldery
Screen Name Redacted 3/07/2024 01:44 PM	We need more from the lower income community.
Screen Name Redacted 3/07/2024 04:01 PM	DCA, representation of Mill workers, representation from trade / service industry / 'blue color' workers. There is a need to balance the community discussions which is currently skewed to low oversight public service staff and high income overcommitted professionals.
Screen Name Redacted 3/07/2024 07:09 PM	Natural conservation
Screen Name Redacted 3/07/2024 09:16 PM	Please include the younger people! Camas needs to modernize a bit!
Screen Name Redacted 3/08/2024 09:15 AM	people of color; people of non-majority religions (Jews, Muslims, etc)

Screen Name Redacted 3/08/2024 12:49 PM	All community members, not just business owners or large corporations
Screen Name Redacted 3/10/2024 08:13 PM	A representative sample of our entire population, considering age, gender, ethnicity, work status, family size, etc.
Screen Name Redacted 3/11/2024 08:30 PM	As many people as possible!
Screen Name Redacted 3/15/2024 08:13 PM	Young people. People who visit Camas - what attracted them to visit? What repels them? People who understand what sustainable means. People who grew up here and would like to stay but cannot afford to live here. People who enjoy and care about nature.
Screen Name Redacted 3/16/2024 06:30 PM	People in Fern Prairie who will be impacted by airport development. How about trying to engage everyone.
Screen Name Redacted 3/16/2024 06:51 PM	You can hear many who are disgruntled with growth. I'm a transplant so I get it but also naturally a place like Camas will grow. I'd hope it is mindful of the environment, the history and the things that make this a great place to live. Smart, transparent decisions about growth and if it doesnt make sense, don't do it or build it
Screen Name Redacted 3/16/2024 08:19 PM	Teenagers
Screen Name Redacted 3/16/2024 08:36 PM	Water safety, algae bloom experts, environmental experts. And listen to them, take action.
Screen Name Redacted 3/16/2024 11:41 PM	Camas School District is an integral part of our community; I would be sure to engage with them so we can keep our schools top-tier.
Screen Name Redacted 3/17/2024 01:24 AM	I want to be involved.
Screen Name Redacted 3/17/2024 07:22 AM	Downtown business owners, long time citizens, school district reps

Screen Name Redacted 3/17/2024 08:14 AM	Please continue to engage with businesses that are affected by any changes such a streets widening, etc.
Screen Name Redacted 3/17/2024 08:39 AM	Schools, businesses, citizens, and even kids!
Screen Name Redacted 3/17/2024 09:01 AM	Prune hill communities
Screen Name Redacted 3/17/2024 10:29 AM	Everyone who is a resident of Camas should be involved. Notifying by mail and asking people to weigh in their opinions would likely be best to reach all, since many don't have social media or connect online.
Screen Name Redacted 3/17/2024 10:29 AM	Sierra Club, Friends of the Columbia Gorge
Screen Name Redacted 3/17/2024 10:40 AM	I think more high school-aged programs and events. Make the town fun for them so they'll consider staying in or returning to Camas.
Screen Name Redacted 3/17/2024 01:45 PM	Residents, people that live close by and small businesses.
Screen Name Redacted 3/17/2024 05:10 PM	Parents, people with disabilities
Screen Name Redacted 3/17/2024 05:27 PM	Diverse populations and ethnic backgrounds, people with disabilities, pet owners, families and businesses.
Screen Name Redacted 3/17/2024 08:22 PM	Locals, long time members of the community (including those living elsewhere, but still active in the community), local politicians
Screen Name Redacted 3/18/2024 02:54 AM	What’s happening in the area
Screen Name Redacted 3/18/2024 09:51 AM	Parents of students and elderly
Screen Name Redacted 3/18/2024 11:49 AM	WHAT PEOPLE?? All persons who live in Camas and/or attend Camas schools! DUH!

Screen Name Redacted 3/18/2024 11:54 AM	Note: I've been to the public meetings but NEVER felt heard. "The City" has its perspective of: develop, develop, develop! and ignores the deepfelt desires of the people who live here and pay taxes, who came for the small-town feel and the TREES, that's why I can't say I want to attend meetings. So to be more "inclusive" Don't just listen to developers who want to mine Camas for all the money they can squeeze out of it! Listen to those who live here, pay taxes, love it, are building a long-term life here, and have shown they care for it (I volunteer).
Screen Name Redacted 3/18/2024 01:45 PM	Young adults (middle and high schoolers)- this is a great way for them to.learn about civic engagement, perhaps by forming a Camas Library group or groups.
Screen Name Redacted 3/20/2024 03:19 PM	Evergreen MTB Alliance
Screen Name Redacted 3/20/2024 07:26 PM	Residents who have been here a long time. People who are retired or have a fixed income.
Screen Name Redacted 3/22/2024 07:12 AM	Be transparent.
Screen Name Redacted 3/25/2024 10:09 PM	I think you need to be as available as possible, and make sure people can access information on their own time. As a parent there are so many meetings or events to attend, that I need to be able to find the information online. Please make sure you connect with the people who may not be online or who may not be able to attend a public meeting.
Screen Name Redacted 3/26/2024 09:46 AM	PTAs and PTOs CSD Local businesses, not just downtown merchants HOAs
Screen Name Redacted 3/26/2024 11:07 AM	Jewish community
Screen Name Redacted 3/26/2024 04:18 PM	Indigenous communities

Screen Name Redacted 3/27/2024 11:46 AM	These responses are from the Planning Commission meeting held on February 21, 2024, facilitated by Yvette Sennewald.
Screen Name Redacted 3/27/2024 03:45 PM	§ Chamber of Commerce § Engage other neighborhoods outside your own. *Map out areas that are not being engaged § Youth – Boy/Girl Scouts, Teen involvement (HS) § Seniors voice needs representation (AARP) § New residents (need connection, have different/outside views) § Legacy residents (those having hard time with growth) § Renters
Screen Name Redacted 4/01/2024 11:31 AM	· Minority groups; Translation of materials, Interpreters at events, Cultural events, School cultural groups > access to parents · “Push” instead of “pull” marketing · PTAs · HOAs · Churches · Seniors (Meals on Wheels) · Leverage city committees, commissions · Community leaders
Screen Name Redacted 4/03/2024 08:44 AM	How about the people that grew up here.
Screen Name Redacted 4/03/2024 09:08 AM	Many concerned folks with Camas roots are at the Forgotten Camas Washougal group at Facebook, where many concerns about Camas are expressed.
Screen Name Redacted 4/03/2024 10:07 AM	Everyone who wishes to should have the opportunity to provide feedback. Thank you for asking for input.
Screen Name Redacted 4/03/2024 10:24 AM	Long time residents!
Screen Name Redacted 4/03/2024 12:34 PM	Ask the long time residents, and lean more on their opinions as they're the ones losing the most.
Screen Name Redacted 4/03/2024 04:45 PM	Anyone who is interested.
Screen Name Redacted 4/03/2024 06:10 PM	Outsiders who have a local historical stake and awareness. The Camas "diaspora" or "ex-pats" if you will. Find out WHY they left. And don't just hear the people who say what you want to hear.
Screen Name Redacted	Please engage the many people who are generationally a part of the

4/03/2024 11:32 PM	city. The people who know the history and the direction that the city should be going in!!!!
Screen Name Redacted 4/04/2024 02:26 AM	Facebook
Screen Name Redacted 4/04/2024 07:30 AM	All...
Screen Name Redacted 4/04/2024 08:11 AM	Disabled community
Screen Name Redacted 4/04/2024 08:23 AM	Schools and businesses
Screen Name Redacted 4/04/2024 08:34 AM	Lower income residents, seniors, folks who have lived in the community for 10 years or more,
Screen Name Redacted 4/04/2024 08:58 AM	Everyone not just to richy rich or CA transplants, it seems we don't care what us actual locals feel or want, it's all for those hoity toity people that think we need to completely change our area to satisfy their richy rich needs...this is NOT the area for that
Screen Name Redacted 4/04/2024 09:54 AM	Every homeowner in the city
Screen Name Redacted 4/04/2024 11:51 AM	Stay in touch with the people of this community. Show up at downtown events, area events and talk to people. It's the people here that make this place special ! Give the people of Camas a voice in all of these changes !! "Forgotten Camas Washougal" is a fantastic group of people who really care about this area.
Screen Name Redacted 4/04/2024 01:01 PM	I think it's important to not give lip service to the community. It seems like you've got a small group that bends your ear and you do what they want. OR I am also aware that you spend a lot of money on consultants. Maybe it's to take the pressure off of you, but in reality, the blame still falls on you even if the consultant tells you to do something. You're never going to appease EVERYONE, so do what is the next right thing, the next best thing, for the people of Camas.
Screen Name Redacted	Stop with your DEI nonsense. All people should be included. You

4/04/2024 01:15 PM	don’t need to focus on a specific group or community that is absurd.
Screen Name Redacted 4/04/2024 01:39 PM	Everyone
Screen Name Redacted 4/04/2024 01:44 PM	Jeff Hunt
Screen Name Redacted 4/04/2024 06:13 PM	Retirees. People living on fixed income cannot keep up with the increase of taxes and fees. Council should not be able to buy buildings, aka Bank of America building or close pools without a vote from the people who live here in the community!
Screen Name Redacted 4/04/2024 06:58 PM	Long-term residents. Those that value our history as a blue collar community tied to our local lake and rivers, and not by expensive speed boats and exclusive communities! Anyone that values our history. Taking out the Christian Church is nothing short of criminal! You people should be ashamed of yourselves!!!!
Screen Name Redacted 4/04/2024 07:26 PM	Stop talking about inclusion unless it means a seat at the table. You guys are a brick wall--nothing gets through. I love the town, and despise it's government.
Screen Name Redacted 4/04/2024 07:36 PM	Non religious groups (we have a LOT of Christian churches and this can make other religions or nonreligious folks feel not included and/or silenced). LGBTQIA+. Young residents.
Screen Name Redacted 4/05/2024 11:41 AM	Every citizen in the city Developers should have no say in anything Look at refining zoning Include downtown camas association Get the mill owners involved
Screen Name Redacted 4/06/2024 07:48 AM	Small business owners should definitely have priority in conversations.
Screen Name Redacted 4/06/2024 02:58 PM	Everyone
Screen Name Redacted 4/06/2024 10:49 PM	All the community, not just developers and people with deep pockets.

Screen Name Redacted 4/08/2024 09:20 AM	Not sure, I'm generally happy with the moves I've seen, other than the all-important density issue of new construction. This city shouldn't need the increased revenues from high density living. It's grown so much recently that there's plenty of new revenue coming in. BTW, tip of the hat to the designers of the roundabout near Round Lake, I think it's incredibly well done. A gorgeous, and artfully done PNW roundabout. Please stay with that level of thought and pride for our community that we love so much.
Screen Name Redacted 4/08/2024 12:48 PM	• Chamber of Commerce • Engage other neighborhoods • Youth – Boy/Girl Scouts, Teen involvement (HS) • Senior voice needs representation (AARP) • New residents (need connection, have different/outside views) • Legacy residents (those having hard time with growth) • Renters
Screen Name Redacted 4/12/2024 10:29 AM	More community surveys and making sure older residents who don't use social medial are still being included in the community decisions
Screen Name Redacted 4/12/2024 01:45 PM	All members of the community should have easy opportunity to have a voice and be involved in formulating the plan for the future of their home.
Screen Name Redacted 4/12/2024 03:40 PM	No comment other than to keep doing what you're doing. For example, we received a postcard notification of the planning process.
Screen Name Redacted 4/12/2024 05:38 PM	Everyone.
Screen Name Redacted 4/12/2024 08:46 PM	local business owners, everyone who lives near enough to consider Camas home.
Screen Name Redacted 4/12/2024 09:08 PM	30-40 year olds
Screen Name Redacted 4/13/2024 04:49 AM	I think this survey is a great start to get opinions from community. From there, you can have city officials to do an out reach for anyone who shows an interest in getting more involved in decision making for Camas. I think Steve Hogan leadership is superb and we are fortunate to have him as mayor.

Screen Name Redacted 4/13/2024 06:19 AM	Offer survey to the local high schools so our students/future community members have a say. Have the students complete the survey during school time
Screen Name Redacted 4/13/2024 07:03 AM	I think residents of downtown should have a large voice.
Screen Name Redacted 4/13/2024 03:33 PM	Business owners, representatives of various walks of life - professional, trade, young, seniors, etc., experts in development and architecture and history to help balance growth with preservation of community and history.
Screen Name Redacted 4/13/2024 04:36 PM	Listen to long time locals and not let the voice of ex-Californians drown out the loyal.
Screen Name Redacted 4/13/2024 05:05 PM	low income familys, people of minority groups
Screen Name Redacted 4/14/2024 11:03 AM	All known groups in the area should be engaged with.
Screen Name Redacted 4/14/2024 11:11 AM	Talk to people where they are at and don't rely on the handful of engaged residents who are actually paying attention. Attend public events and make it easy for folks to provide input.
Screen Name Redacted 4/14/2024 05:39 PM	People who grew up here, people who are not motivated by increasing tax dollars, profits, and development. People who are interested in conservation and preserving the qualities of camas we stay here for.
Screen Name Redacted 4/15/2024 06:40 AM	Neighborhood associations such as the Goot Park Neighborhood, Oak Park neighbors, etc, Down town businesses, Downtown Churches.
Screen Name Redacted 4/15/2024 10:39 AM	Small business owners! Their voices matter to Camas' identity much more than overpaid, out of town developers.
Screen Name Redacted 4/15/2024 10:53 AM	Include the tourism industry. Economic sustainability groups, historic preservation experts, and of course environmental experts.

Screen Name Redacted 4/15/2024 02:26 PM	diverse number of residents, local businesses and other organizations currently making Camas home
Screen Name Redacted 4/15/2024 02:56 PM	Everybody should be able to have a voice
Screen Name Redacted 4/15/2024 04:36 PM	Included Camas residents, with an emphasis on citizens who have been in the area over ten years. They were here and I'd be interested in hearing their voices, what they would like to see happen to the place they have called home longer than recent transplants. I have lived here for less than a year so I am not in that group, but preserving the home town feel is vital.
Screen Name Redacted 4/15/2024 05:23 PM	Ward meetings and presentations. The "Open House" approach to divide and conquer is not appreciated.
Screen Name Redacted 4/15/2024 06:59 PM	Include senior citizens, longtime Camas residents and children under 10 for outdoor parks (they have some of the best ideas).
Screen Name Redacted 4/16/2024 09:10 AM	Only residents of Camas - preferably, people who have resided here for at least 5 years.
Screen Name Redacted 4/16/2024 03:59 PM	The city should be honest about all the costs and increases to property taxes instead of having a bunch of "feel good" meetings with plans to widen this corroder, fix the lake, etc.
Screen Name Redacted 4/16/2024 08:21 PM	Well, I think it will be helpful to engage people who don't typically participate in this. I see a people who are unplugged. I can understand a bit why. I can understand a bit why. So often it feels like the city has already chosen what they want to do; my voice doesn't matter.
Screen Name Redacted 4/17/2024 08:06 AM	Everyone possible
Screen Name Redacted 4/17/2024 02:49 PM	I live just outside city limits. I would love to see good engagement with people living outside the city limits, since those limits could expand, with those people having a say both in Camas and whether they want to be incoorperated into the city proper.

Screen Name Redacted 4/17/2024 05:10 PM	Unsure
Screen Name Redacted 4/17/2024 05:48 PM	Parents and seniors
Screen Name Redacted 4/17/2024 05:58 PM	We need to make sure our diverse population is included and feels welcome to participate and voice their ideas and needs.
Screen Name Redacted 4/17/2024 09:07 PM	All
Screen Name Redacted 4/18/2024 07:28 AM	Hiking trails. Safety. Infrastructure
Screen Name Redacted 4/18/2024 09:31 AM	Want it to be inclusive, but I'm not sure how that is best accomplished.
Screen Name Redacted 4/18/2024 09:52 AM	We'd suggest engaging with residents from around town; being proactive to reach out to minority residents so that they feel their voices are heard as well.
Screen Name Redacted 4/18/2024 03:33 PM	Create as much opportunity as possible for residents to be involved and advocate for decisions that will impact the developments.
Screen Name Redacted 4/19/2024 05:56 PM	Retailers, school staff, WDOT because of 3rd Ave, residents, AirB&B owners, bike shop owners, hiking groups.
Screen Name Redacted 4/19/2024 07:24 PM	People with knowledge in the areas needed.
Screen Name Redacted 4/20/2024 10:55 AM	People move to Camas for the schools. Education/educators should always be at the heart of any planning.
Screen Name Redacted 4/20/2024 06:40 PM	Everyone

Screen Name Redacted 4/20/2024 08:25 PM	The people that actually live in camas
Screen Name Redacted 4/22/2024 12:10 PM	Non-religious, lgbtqia+, young citizens
Screen Name Redacted 4/23/2024 09:08 PM	A combination of lifelong and newer residents should be engaged to capture various viewpoints.
Screen Name Redacted 4/23/2024 09:20 PM	Developers, Cyclists, and students.
Screen Name Redacted 4/26/2024 07:36 AM	youth. Please engage our highschoolers. Each time I have worked with them I am impressed by their ideas and dreams. They want to help.
Screen Name Redacted 4/27/2024 12:34 PM	Young adults, Seniors and Parents of Young children.
Screen Name Redacted 4/27/2024 05:02 PM	People like me who have lived and paid taxes here for years.
Screen Name Redacted 4/29/2024 10:59 AM	Business owners, pedestrians, bicyclists
Screen Name Redacted 4/29/2024 12:38 PM	All age and economic groups. Have these issues discussed with recommendations submitted by the Camas School District students.
Screen Name Redacted 5/02/2024 03:06 PM	high school kids
Screen Name Redacted 5/02/2024 09:31 PM	I'm not sure how connected the city is to large, local Camas employers (like TSMC, Analog Devices, Fisher, etc), but its difficult to partake in city listening sessions with our work schedules and I don't often hear about them unless I go looking for them. Perhaps asking employers to advertise when these sessions are happening, to incentivize or encourage Camas residents to take time off to partake in them, or to ask local employers if they would be willing to host future listening sessions where city officials can come onsite and meet with their staff would be helpful. This would really open up the pool of folks who are able to give feedback. If you can come directly to residents in the places that they already spend 40-50 hours of their

	lives where they probably aren't having to navigate childcare or intentionally leaving work to attend, you'll get a much better cross-section of who is living and working in your community and what they need.
Screen Name Redacted 5/03/2024 08:07 AM	Better outreach to residents. I had no idea this survey was happening until I read an article in the Post-Record on May 3rd.
Screen Name Redacted 5/03/2024 01:40 PM	School groups (through PTA
Screen Name Redacted 5/03/2024 04:05 PM	Since I'm a mid age 70 resident, keeping this group engaged/informed would be a priority for me. I can already see Camas growing & changing. Being included in communications is valued.
Screen Name Redacted 5/03/2024 04:05 PM	Communities that include apartments and houses not in Prune hill. There are many underprivileged communities that no one pays attention to.
Screen Name Redacted 5/03/2024 04:05 PM	All of the people who live in Camas.
Screen Name Redacted 5/03/2024 04:07 PM	It’s already pretty inclusive
Screen Name Redacted 5/03/2024 04:37 PM	New residents
Screen Name Redacted 5/03/2024 05:41 PM	Kids/teens/senior citizens
Screen Name Redacted 5/03/2024 06:03 PM	Please DO NOT use the current format and company publicly presenting the proposed roundabouts on Everett St.!!!! Attending those meetings was a total waste of time: it could've been presented in less than 10 minutes, with another 10 minutes for Q&A. I left after 75 minutes of useless twaddle, with maps that were vague and incomprehensible. Make sure that whatever outreach you use is succinct, clear, with handouts if needed, and stop "marketing" changes like what has happened as mentioned above. It is an embarrassing waste of money for the city, and tests citizens' time and patience. Of course the area needs roundabouts. But hammering on

	it over and over again is just sucking dollars from the city for unnecessary wasted time. We deserve better than that. Don't get fooled again by a slick marketer.
Screen Name Redacted 5/03/2024 06:01 PM	All of them. Old and young
Screen Name Redacted 5/03/2024 09:16 PM	Renters and young families struggling to afford housing
Screen Name Redacted 5/03/2024 09:55 PM	Everyone, especially those that have lived in Camas for generations. Focus not only specific communities, but accessibility. I didn't learn about this survey until I saw it on Facebook, which I only use an about once a month, luckily two days before the survey ends. Put signage up historic downtown and in other highly trafficked economic areas. Mail flyers out with QR codes.
Screen Name Redacted 5/04/2024 09:19 AM	Include all the economic sectors that live in Camas.
Screen Name Redacted 5/04/2024 04:41 PM	environmental groups, school communities, neighborhood associations
Screen Name Redacted 5/04/2024 05:28 PM	All, include young people
Screen Name Redacted 5/04/2024 05:30 PM	mtb-ing trail running fishing
Screen Name Redacted 5/05/2024 08:40 AM	Low income families especially around housing availability and affordability
Screen Name Redacted 5/05/2024 09:13 AM	Young, diverse families, especially those who have recently relocated to the area. We need young families to be able to live in Camas and send their kids to Camas schools.
Screen Name Redacted 5/05/2024 12:39 PM	Facebook or USPS mail
Screen Name Redacted	Make sure to engage those people/groups who live here because of

5/05/2024 03:21 PM	the green areas, wildlife and trails. We do not want those areas to be developed or cut off from each other
Screen Name Redacted 5/05/2024 06:11 PM	School District, Larger Land owners and new businesses
Screen Name Redacted 5/05/2024 09:37 PM	Long time Camas residents. People who have seen this community grow and evolve. They have a lot to say and contribute.
Screen Name Redacted 5/06/2024 02:01 PM	Schools, Port, parents, retirees, teens, churches, event attendees,
Screen Name Redacted 5/06/2024 03:27 PM	Infrastructure
Screen Name Redacted 5/07/2024 08:24 PM	Camas is not that large. Just focus on the citizens of Camas.
Screen Name Redacted 5/12/2024 07:25 AM	Elderly and those without digital access. Young families. Those with less economic means to afford housing .
Screen Name Redacted 5/12/2024 06:47 PM	Local non-profits, service and community groups. HOAs. Don't depend on putting it out on social media.
Screen Name Redacted 5/13/2024 04:33 PM	The greatest effort should be to engage people who don't participate. Many don't participate because of work and home schedules, lack of time, lack of knowledge of the process. The needs of businesses must be considered. Finally, future generations cannot participate, but their needs must be incorporated. We should leave Camas better than we found it.
Screen Name Redacted 5/13/2024 09:22 PM	Homeowners

Optional question (262 response(s), 105 skipped)
Question type: Essay Question

OurCamas2045 Mapping Tool Responses

Opportunity	COMMENT	DATE	ADDRESS
Opportunity	Trail system connecting Heritage trail to this side of the lake along the BPA power lines and connecting to the Lacamas Lake Elementary would be great to connect all the new development in Green Mountain area to the school and existing trail systems, providing walkable and bikeable transportation options within Camas	16-Feb-24	1616 Northeast 232nd Avenue, Camas, Washington 98607, United States
Opportunity	This area at the Parklands neighborhood is identified in the Camas master plan as lacking a neighborhood park. There are no walking distance park for all the homes in this neighborhood. The commercial pads have remained empty for 7 years now, and most of the neighbors would prefer a pocket park rather than an unsightly commercial building. This is a residential neighborhood and any additional commercial buildings would not be coherent.	1-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	Park	1-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	I would like to see a park at this location	1-Mar-24	3623 Northwest Mcmaster Drive, Camas, Washington 98607, United States
Opportunity	There are no community parks in walking distance from our neighborhood. This would be a lovely space for the community to gather and enjoy. No more commercial buildings please.	1-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	In our community, there is so many new developments and corporate buildings, but we need a space where we can all enjoy a neighborhood park	1-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	Excellent location for a park! Very much needed for our area!	1-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	Camas Meadows is at a crossroads - we can either add another concrete structure or create a vibrant green space for our community. The choice is clear. Our residents, both current and future, deserve a park, not another parking lot. A park in Camas Meadows means fresh air, natural beauty, and a gathering place for families. It's an investment in our health, environment, and community spirit. Let's turn this area into a green haven, not another gray footprint. Thank you for considering a brighter, greener future for our city.	2-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	In need of a community park, no walkable park in the vicinity for this large community.	2-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	We NEED a playground/park here! There is no walkable park serving allll of these homes, and more homes are currently being built. It would also help beautify the area as a contrast to the many commercial buildings popping up all around us. Camas growth has to have business and families in mind, as the balance of those two are the only way to longevity of a successful, thriving, evolving city. Thank you!	2-Mar-24	3623 Northwest Mcmaster Drive, Camas, Washington 98607, United States
Opportunity	This area needs a community park. Currently, there are no playgrounds within walking distance for the many families living in this residential area. We do not need any more empty commercial “boxes”. The City should be championing open spaces and parks.	2-Mar-24	3530 Northwest Mcmaster Drive, Camas, Washington 98607, United States
Opportunity	We need a neighborhood park, no more corporate buildings or storage unit buildings not cohesive with the families that live in our neighborhood	2-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	Please no commercial buildings here as this is by our homes and community	2-Mar-24	3937 Northwest Lake Road, Camas, Washington 98607, United States
Opportunity	As a growing community with numerous neighborhoods filled with young children, the addition of a neighborhood park would greatly enhance the childhoods experiences of our future leaders while providing a safe space for kids to congregate.	2-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	This would be a great site for a covered park and water splash playground. There are enough commercial buildings around this area but no trails or walkable places for kids to be kids. There needs to be access to safe places for kids in residential areas.	3-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	We do need a park for our kids to play nearby our house	3-Mar-24	4027 Northwest 62nd Circle, Camas, Washington 98607, United States
Opportunity	Ideal location for a community park in the fast developing master planned community of Camas Meadows	4-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	Dynamic parking fees should be implemented based on use. The more parking spots in use, the higher the fees. Provide alternatives for access to the lake such as bike racks etc. Boats and trailers should definitely pay higher fees as there are impacts to the lake water quality from the spilling of oil and gas into the water.	6-Mar-24	227 Northeast Lake Road, Camas, Washington 98607, United States
Opportunity	Develop open areas in the downtown core, add infill projects, and reduce parking lots. Move the church from the main street so that businesses which promote commerce can generate funds for the city. The church needs to find a place with less impact to the city.	6-Mar-24	605 Northeast 3rd Avenue, Camas, Washington 98607, United States
Opportunity	This section of NW Lacamas Ln suffers from very poor maintenance over the years and has become an eyesore. Many of the sunset maples planted along the roadside have died from lack of care and irrigation. The forested areas need management to encourage the success of selected trees and reduce the fire hazard. The sidewalk should be periodically cleaned so pedestrians can safely use it without fear of slipping or being entangled by blackberries.	6-Mar-24	3436 Northwest Lacamas Lane, Camas, Washington 98607, United States
Opportunity	There are no local parks and continued development of commercial buildings that only bring traffic and light pollution are not desired additions to our area.	6-Mar-24	3601 Northwest Camas Meadows Drive, Camas, Washington 98607, United States
Opportunity	In collaboration with the school district, develop an aquatic center including 25yard x 50meter competition pool and separate recreation pool on the former UL campus. The facility can provide swimming and aquatic programs for all ages, including but not limited to swim lessons, aquatic fitness, recreational year round swim team, high school swim team, lap and recreational swimming, water polo. The facility can also be used to develop a learn to swim program with the school district so that all children in Camas receive vital learn to swim instruction as part of the PE curriculum. We are surrounded by various bodies of water and learning to swim is an essential life skill that all children should have access to. Refer to current development of Lake Oswego Recreation and Aquatics Center.	6-Mar-24	2815 Northwest Leadbetter Drive, Camas, Washington 98607, United States
Opportunity	Update the very old and outdated playground equipment	8-Mar-24	623 Northeast 15th Avenue, Camas, Washington 98607, United States
Opportunity	Update the very old and outdated playground equipment	8-Mar-24	Camas Municipal Pool, 120 Northeast 17th Avenue, Camas, Washington 98607, United States
Opportunity	Relocate church and use the space for tax generating businesses like restaurants and shops	8-Mar-24	605 Northeast 3rd Avenue, Camas, Washington 98607, United States
Opportunity	Perfect area to incorporate for higher density homes	12-Mar-24	27200 Northeast 9th Street, Camas, Washington 98607, United States
Concern	A lot of speeding, racing, and extremely loud vehicles in this circle on a daily basis, most notably on the weekends.	15-Feb-24	1619 Northwest 6th Avenue, Camas, Washington 98607, United States
Concern	A lot of speeding (60 mph +) along 232nd Ave	16-Feb-24	1616 Northeast 232nd Avenue, Camas, Washington 98607, United States
Concern	U-turns should not be allowed at this busy intersection. During rush hours, this intersection is a very dangerous spot that many decide to u-turn--it creates many problems for people coming and going.	4-Mar-24	Northwest Payne Street, Camas, Washington 98607, United States
Concern	NW Payne Street has become a way for traffic to bypass Friberg-Strunk Street to get to Lake Road and head eastbound. Traffic is frequently moving at double the posted speedlimit on this road and traffic calming devices are needed--speed bumps, preferably.	4-Mar-24	6041 Northwest Payne Street, Camas, Washington 98607, United States
Concern	NW Payne Street has become a way for traffic to bypass Friberg-Strunk Street to get to Lake Road and head eastbound. Traffic is frequently moving at double the posted speedlimit on this road and traffic calming devices are needed--speed bumps, preferably.	4-Mar-24	6201 Northwest Payne Street, Camas, Washington 98607, United States
Concern	This stop sign here is often run through by cars and could have better visibility to increase safety and reduce collisions.	6-Mar-24	2335 Northwest Astor Street, Camas, Washington 98607, United States
Concern	This area currently has a yellow flashing light at this intersection that absolutely needs a stop light or turn it into a four way stop because there have been far too many almost collisions at this intersection. I see people often run the stop sign here.	6-Mar-24	513 Northeast 6th Avenue, Camas, Washington 98607, United States
Concern	This entire area is an eyesore and an environmental nightmare. The city should prioritize the shutdown and cleanup of this area. Careful planning for development should occur.	6-Mar-24	119401 SE 1 Ave, Camas, Washington 98607, United States
Concern	Rogue trail building needs to be addressed. Mountain bikers have modified terrain even after the city has removed and closed area. Notice should be made the bikes will be banned if the closures are not respected.	6-Mar-24	1701 NE 3rd Ave, Camas, Washington 98607, United States
Concern	This intersection is very dark and dangerous at night. The two dimly lit acorn lights should be replaced with downward facing brighter lights. A flashing pedestrian crossing should be installed because this is a trial access point.	6-Mar-24	Northwest Lacamas Lane, Camas, Washington 98607, United States
Concern	This section of road needs a bike lane	7-Mar-24	2305 Northeast Goodwin Road, Vancouver, Washington 98607, United States
Concern	Dahlia Rd is a common road used for connecting Prune Hill to 38th Ave. It is common for people to do double the speed limit flying down the hill. Speed bumps need to be placed here for the safety of children in the Holly Hills Neighborhood. There are lane narrowing devices in place on this road and people still drive incredibly fast and unsafe up and down this street. The lane narrowing does not help and something else needs to be incorporated please.	9-Mar-24	3429 Northwest Dahlia Drive, Camas, Washington 98607, United States
Other	Cafe Riccolo, events in downtown, library, downtown businesses and restaurants, being out on the sidewalk (From April 1st First Friday)	8-Apr-24	306 Northeast Everett Street, Camas, Washington 98607, United States
Other	Camas High School (from April 1st First Friday)	8-Apr-24	26900 Southeast 15th Street, Camas, Washington 98607, United States

Other	Heritage park and Lacamas, Lacamas has been a special summer spot. (from April 1st First Friday)	8-Apr-24	222 Northeast Lake Road, Camas, Washington 98607, United States
Other	Camas Lions Club and all the good they do (from April 1st First Friday)	8-Apr-24	Domino's Pizza, 3512 NE 3rd Ave, Camas, Washington 98607, United States
Other	Round Lake is so peaceful but also has a sense of adventure (from April 1st First Friday)	8-Apr-24	3131 Northeast Everett Street, Camas, Washington 98607, United States
Other	Walking trails and enjoying the river (from April 1st First Friday)	8-Apr-24	2565 SE 6th Ave, Camas, Washington 98607, United States
Other	Costco! Very happy we have so many shopping options (from April 1st First Friday)	8-Apr-24	4863 Northwest Lake Road, Camas, Washington 98607, United States
Other	The people, the community (from April 1st First Friday)	8-Apr-24	217 Northwest 21st Avenue, Camas, Washington 98607, United States
Other	We love converts in the park during the summer and walking our dog around the perimeter. The little library is always a must-stop too (from April 1st First Friday)	8-Apr-24	1433 Northeast Birch Street, Camas, Washington 98607, United States
Other	Lacamas Creek Bridge is a quick walk from downtown to the bridge is a go-to refresher to get out in the fresh air during the work day (from April 1st First Friday)	8-Apr-24	Lower Falls, Camas, Washington 98607, United States
Other	Paddle board and kayak and other water sports (from April 1st First Friday)	8-Apr-24	Northwest Lake Road, Camas, Washington 98607, United States
Other	The area round the port has become like home. It is so close to other areas I love - my apartment, downtown area (especially the library) the Lacamas trails and the drive to the gorge. Prior to this the Livingston Mountain area was home for me. Grew up there so it holds a special place for me.	8-Apr-24	The Puffin Cafe, 14 S A St, Washougal, Washington 98671, United States
Other	Downtown has local shops and fun events and the library. It is a friendly, small town where people know each other. (From April 1st First Friday)	8-Apr-24	528 Northeast 4th Avenue, Camas, Washington 98607, United States
Other	No comment (From April 1st First Friday)	8-Apr-24	2441 Northwest Logan Street, Camas, Washington 98607, United States
Other	As a private pilot I'd love to see an expansion of the airport and building of more hangars (From April 1st First Friday)	8-Apr-24	1109 Northeast 265th Court, Camas, Washington 98607, United States
Other	Downtown camas, First Fridays and meeting neighbors (From April 1st First Friday)	8-Apr-24	413 Northeast Everett Street, Camas, Washington 98607, United States
Other	Camas Yoga and Co! Very welcoming instructors and a great a variety of classes (From April 1st First Friday)	8-Apr-24	703 Northeast 4th Avenue, Camas, Washington 98607, United States
Other	Lacamas Lake is my happy place, I love doing stand up paddle in the summer and walking the trails in the winter (From April 1st First Friday)	8-Apr-24	Northwest Lake Road, Camas, Washington 98607, United States
Other	Downtown camas events and gatherings (From April 1st First Friday)	8-Apr-24	Fuel Medical Group, 314 ne birch st, Camas, Washington 98607, United States
Other	First Friday (From April 1st First Friday Event)	8-Apr-24	316 Northeast Dallas Street, Camas, Washington 98607, United States

OurDowntownCamas 2045 Mapping Tool Responses

CATEGORY	COMMENT	DATE	ADDRESS
Opportunity	Opportunity for Traffic calming (slowing) & bike lanes. Crossing this street can be scary because cars go way too fast.	18-Feb-24	329 Northeast 6th Avenue, Camas, Washington 98607, United States
Opportunity	Maintain/Support Downtown US Post Office: We are so lucky to have this beautiful historic USPS building in operation in downtown Camas. The copper roof and hand-painted WPA mural inside are priceless additions to the ambiance of DOwntown Camas, not to mention the convenience of having the post office close to the Library and downtown businesses. Please support and maintain this treasure! Thank you.	18-Mar-24	440 Northeast 5th Avenue, Camas, Washington 98607, United States
Opportunity	Please Add Crosswalk Here: So many people including children cross this multi-lane street at this intersection, including students from Helen Baller, Liberty and Hayes on field trips, etc. Also people cross here when they park in the neighborhood to attend events downtown. Cars usually do not stop for people waiting to cross the street (I think they don't expect people to cross because there is no formal crosswalk). There should be a striped crosswalk here for safety! Thank you.	18-Mar-24	436 Northeast Garfield Street, Camas, Washington 98607, United States
Opportunity	Excellent Model for Future Development: The newly-approved building being built here, to replace the 2 church buildings, is an excellent model for future development in the Downtown Camas area. It is essential to have denser multi-use development, with retail on the ground-floor, housing/apartments/condos on upper floors, and secured parking underground. In future, some new buildings may include office space in upper levels (with mountain/river views) for high-end business (like 125 Bank Street, Missoula, Montana). Please ensure that all future development follows a model like this. No single-story buildings should be built. Thank you.	18-Mar-24	630 Northeast 6th Avenue, Camas, Washington 98607, United States
Opportunity	YMCA/Pool Opportunity: This would be an excellent location for a future YMCA with pool. Note: For future bond measures, please DO NOT add other costs like sports fields onto a pool bond measure - it inflates costs and scares taxpayers. Keep a future bond vote lean. The past pool bond vote was a gigantic missed opportunity, alas (low interest rates). Thank you.	18-Mar-24	1101 Northwest Ash Street, Camas, Washington 98607, United States
Opportunity	This corridor has a lot of opportunity for additional mixed-used development with restaurants and apartments. The permitted office building would not serve the community so much as more retail space similar to Acorn & Oak or the Lakeside Market.	3-Apr-24	3631 Northeast Everett Street, Camas, Washington 98607, United States
Opportunity	Opportunity for an EV Charging station - Tesla Supercharger etc.	3-Apr-24	636 Northeast 2nd Avenue, Camas, Washington 98607, United States
Opportunity	This is wasted space next to the bank.	3-Apr-24	332 Northeast Cedar Street, Camas, Washington 98607, United States
Opportunity	This parking lot is wasted space and breaks up the end of Cedar in a very bad way. An anchor development here and across the way near the bank could extend Cedar	3-Apr-24	Mill City Brew Werks, 339 NE Cedar St, Camas, Washington 98607, United States
Opportunity	This street needs traffic slowing measures like a median, more vegetation, and a bike lane.	3-Apr-24	325 Northeast 3rd Avenue, Camas, Washington 98607, United States
Opportunity	Put back our pool!	4-Apr-24	120 Northeast 17th Avenue, Camas, Washington 98607, United States
Opportunity	Consider blocking off a few blocks of NE 3rd Ave for foot traffic only. Allow restaurants and pubs to push out into this pedestrian space and encourage more social and community interaction.	4-Apr-24	533 Northeast 3rd Avenue, Camas, Washington 98607, United States
Concern	Too fast! Cars go really really fast here. 4 lanes Stroad with a 25 mile an hour speeds limit. If we want people to go slow here we need to narrow the road.We could easily go down to two lanes with protected bike lanes and trees. Bike lanes that are safe enough for families will connect more people with downtown.	18-Feb-24	1642 Northeast 3rd Avenue, Camas, Washington 98607, United States
Concern	A proposed gas station and car wash at this location could create runoff to Lacamas Creek and Lacamas Lake. Local residents are keenly aware of many vehicular collisions at this intersection that are not reported in traffic reports for developers. This would add more traffic problems. Union High School is on this road.	2-Mar-24	20101 Northeast 13th Street, Camas, Washington 98607, United States
Concern	This site deserves considerable attention given its waterfront access and years of operation that have potentially impacted the soil, water and groundwater across the entire property. It should be remediated to unrestricted use and groundwater categorized (and if needed remediated) as potable water	11-Mar-24	119401 SE 1 Ave, Camas, Washington 98607, United States
Concern	Along with the mill to the north, this property should be fully remediated to unrestricted use when/where economically feasible and groundwater classified (remediated) to potable	11-Mar-24	Lewis and Clark Highway, Camas, Washington 98607, United States
Concern	Missed Opportunity: When this building was approved it should have been required to be a multi-story building with apartments/housing or high-end office space (with mountain views) on upper floors. Downtown Camas needs denser mixed-use development. No more one-story buildings should be built. Thank you.	18-Mar-24	450 Northeast 3rd Avenue, Camas, Washington 98607, United States
Concern	Dangerous Crosswalk: I cross this sidewalk most days with my child when walking to/from school. In the mornings especially, cars coming from the north (driving south) DO NOT stop. If there is a car/bus turning east onto NE 22nd, it is impossible to see people crossing in the crosswalk from the western (southbound) lane. My child and I have almost been hit several times while crossing. Drivers are always apologetic - two drivers even stopped IN the crosswalk when we were midway across the street (about 5-10 feet away from the car), rolled down their window and apologized and said they didn't see us! I wonder how many times this happens to others crossing here. This crosswalk needs a flashing light like the one further down. Thank you.	18-Mar-24	2139 Northeast Everett Street, Camas, Washington 98607, United States
Concern	Corrupt City Council using prime retail space for their offices. The city needs to move their offices!	4-Apr-24	306 Northeast Everett Street, Camas, Washington 98607, United States

Concern	People have started creating a 2nd lane of traffic at the stop sign heading out of town at the corner of the mill. While the car in the primary lane is waiting for traffic coming up Adams from the left - the downtown/mill office area - who have right-of-way to turn - or go straight- the new "2nd lane" people are sneaking around and going through the intersection while right of way traffic is also in the intersection. This started in 2020 and happens almost daily now. This intersection needs better control and signage. The 2nd lane should be right turn only or no 2nd lane space. (It's currently marked as a parking space, in front of the empty lot and below the "free public parking" lot.	4-Apr-24	430 Northeast Adams Street, Camas, Washington 98607, United States
Concern	This area has always had high pedestrian use and does not have good evening or night time lighting on the corner. It could use another crossing light as well.	4-Apr-24	1512 Northeast Everett Street, Camas, Washington 98607, United States
Concern	Walking traffic is a major driver of small businesses. Allowing a single entity to buy an entire block + more that serves no walkability on 6 days a week hurts businesses. Encourage more restaurants.	4-Apr-24	304 Northeast 4th Avenue, Camas, Washington 98607, United States
Concern	Dangerous intersection. Drivers fail to understand yield light. Convert to roundabout to allow the dominant flow of traffic.	4-Apr-24	201 Northeast 6th Avenue, Camas, Washington 98607, United States
Concern	Encourage development of retail/restaurants/commerce businesses rather than a single entity using entire block for non-commerce reasons. This is a poor use of a premium location and disrupts the feel of downtown Camas.	4-Apr-24	304 Northeast 4th Avenue, Camas, Washington 98607, United States
Concern	Three schools in the neighborhood require walking/biking/nonbus options for families nearby and NE 19th is a major road for school-age children going to and from school, as well as several pedestrians and cyclists. Both speeding and flooding on this road are common and known issues (reported to the city multiple times). The city needs to offer viable, long-term solutions for both problems.	4-Apr-24	230 Northeast 19th Avenue, Camas, Washington 98607, United States
Concern	Please consider adding a sidewalk that connects the lake recreation area to NE 22nd. This would provide safe walking/biking access from downtown all the way to the lakes.	4-Apr-24	2732 Northeast Everett Street, Camas, Washington 98607, United States
Concern	I agree that the Mill Clean Up level and adequacy is key for our City's present and future - This site deserves considerable attention given its waterfront access and years of operation that have potentially impacted the soil, water and groundwater across the entire property. It should be remediated to unrestricted use and groundwater categorized (and if needed remediated) as potable water	5-Apr-24	119401 SE 1 Ave, Camas, Washington 98607, United States
Concern	The area at the top of these steps could use some erosion control - the steps are very frequently used and you can tell right at the top there are some areas that are eroding away - don't want the steps to be damaged, or someone to fall.	5-Apr-24	756 Northeast Birch Street, Camas, Washington 98607, United States
Concern	The sidewalks are too narrow and close to the road for a 35 mph speed limit. A wider sidewalk with a buffer between the road and the sidewalk should be installed, the speed limit should be reduced to 25 mph, or the sidewalks should be relocated to run through Forest Home Park. There are often drivers traveling 5-10 mph over the speed limit who do not slow down or move over when passing children walking only a few feet away. This is a tragedy waiting to happen.	5-Apr-24	957 Northwest 6th Avenue, Camas, Washington 98607, United States
Concern	The sidewalks are too narrow and close to the road for a 35 mph speed limit. Additionally, this road has no business being four lanes. It starts as two lanes in Camas, then turns to four lanes, and then back to two in Washougal. Nearly every day, kids risk their lives walking to the skate park along this road. Reduce the number of lanes to two, lower the speed limit, widen the sidewalk, and add a bike lane.	5-Apr-24	1642 Northeast 3rd Avenue, Camas, Washington 98607, United States
Concern	Curb extensions should be added to narrow the road, slow traffic, and shorten the crosswalk distances. In the short term, this could be done cheaply by adding planters, bike racks, and art installations. A good example is Main Street in Vancouver.	5-Apr-24	231 Northeast 3rd Avenue, Camas, Washington 98607, United States
Concern	All of Crown should have sidewalks on both sides. It's dangerous for people to walk and this should go from NE 3rd Ave all the way up to at least SE Nourse Rd. for anyone walking to the highschool.	7-Apr-24	Southeast Crown Road, Camas, Washington 98607, United States
Concern	Please limit the amount of space the church can take up in downtown. Fully support everyone's right to practice their faith, but this is the part of 4th that's just dead and hurts the other retail business.	7-Apr-24	Northwest 6th Avenue, Camas, Washington 98607, United States
Concern	Please do not modernize the downtown and keep large organizations like banks, fast food, other retail chains out. One of the greatest appeals of the town is the small businesses in down town and would love to see it stay that way.	7-Apr-24	Northwest 6th Avenue, Camas, Washington 98607, United States
Concern	For new developments there should be a heavy levy on the homes to help subsidize the ever growing costs of expansion. The locals that live here should not be penalized because of growth. This is coming from someone who moved here from somewhere else. I'm happy to pay more to avoid others being hurt by the rising costs. On the flip side, give incentives for builders building homes under the median by X percentage. Give them an incentive to build lower cost homes and not million dollar McMansions.	7-Apr-24	2994 North 49th Avenue, Camas, Washington 98607, United States
Other	It would be awesome if GP allowed giant murals on the mill - could be a joint funding project. Beautifying the mill as you approach Camas would add immensely to the city while highlighting it's role in our history.	3-Apr-24	Northwest 6th Avenue, Camas, Washington 98607, United States

Our Camas 2045 Summit #1 Comment Form submissions

In response to "How do we achieve our vision? Share your top three big ideas for each topic area!"

Station 3: Our Community

- Having amenities for younger children such as smaller playgrounds, indoor play facilities, etc.
- Need for more sporting fields/indoor swimming pool for highschoolers to use
- We need to reunite our community to be supportive of everyone and encourage more diversity
- Broker a deal with GP to use the five acres where old buildings were demolished a few years ago to build a community center.
- Build a community center, arcade and mini golf.

Station 4: Our Environment

- Connect the bike infrastructure and bike rentals
- Is there a solution to the current well issue before adding more dwellings?
- We seem to be lacking mature landscaping in new construction neighborhoods, can some trees be preserved?
- Please continue including green spaces for multipurpose, especially sports rec areas for both soccer, little league, etc. (don't forget the girls softball – they have gotten the shaft when it comes to shared space) for great examples see Port of Klamath, Hazel Dells sports center and Hockinson Meadows Community Park.
- More access points to Lacamas Lake, and public transit to lake. Continuous trail around the lake.
- Encourage GP to gradually clean up the site to show they care about Camas.
- Save more parks/green spaces, keep more trees, and better garbage and recycling all over.
- How were these goals developed and how will they be used? Will there be policies that are developed as a result?
- What is a heritage tree program?
- Sometimes trees are planted too close together which makes it difficult to see oncoming traffic.
- The Port of Camas-Washougal has a program that helps property owners retrofit their buildings and improve the insulation.
- There is a coastal town in California, Los Osos, that has a walkway above marshland. There is a trail near Lacamas Lake near some lily pads and some type of boardwalk could help to stop people from walking over the lily pads.
- Parking is usually full near the trailhead for the Lacamas Heritage Trail off of NW Alexandra Lane. A larger parking lot is needed.
- Are there plans to address the well? There has been some talk about removing the well.
- The City should think about adding Redwoods to the tree canopy. They grow faster than oak or cedar trees.
- Holding listening sessions on evacuation routes is a good idea (Steve Hogan).
- Large trees should be protected at all costs. It is difficult to replace them.
- Utilities should be placed underground.
- Has the old mill come up at all in any of the vision statements?
- The City should pave the gravel pit near the mill.

Station 5: Our Neighborhoods

- More neighborhood nodes – coffee shops etc. in the suburbs.
- Need more affordable housing options – condos/townhomes
- Regulate the distance between trees when planting them. Try driving out of Deer Creek neighborhood at Ogden Street and 16th Ave to see what I mean. Once trees mature in width they block traffic sightlines on both the left and right. I have to pull into 16th Ave to see around the, albeit gorgeous, trees.
- Small pockets of business areas so people can walk from home.
- Make efforts to move power underground in some of the older neighborhoods
- Doggie waste bag stations

Station 6: Our Downtown

- More retail/restaurants would be nice to keep consistent traffic going through businesses.
- Available parking is already an issue, and I don't think a meter maid is the real solution with downtown events.
- We need a plan for potentially addressing traffic patterns at 6th Ave and Adams St.
- More diversity on type of businesses/services and more diversity in ownership. Less church/religious stamp on downtown. No chains, keep it local/small business.

Our Camas 2045 Summit #1 Poster Board Notes

In response to "Use a sticky note to write an idea for how we can achieve these goals." + indicates agreement by another attendee.

Station 3: Our Community

Goal: Camas' artistic and cultural heritage will be protected, enhanced, and commemorated.

- Start a community theatre – I'll help 503-270-7264
- Renovate/restore the community center

Goal: Community events, involvement activities, and youth focused activities will instill a sense of belonging among residents of all ages while making Camas an ideal place to raise a family.

- Create multicultural fair/event where everyone is included
- Partner with schools to have a multicultural fair

Goal: The City will promote a strong sense of community through transparent communication, outreach efforts, partnerships, and accessibility.

- Less chains of food and shopping, promote small business growth
- Partner with the school district and have regular meetings to share resources and ideas

Goal: Public places will be valued and protected spaces, with safe and well-maintained facilities that foster a sense of community and promote physical and mental health.

- Work with Camas Ivy League to maintain and control invasives
- Protect the city and county parks, remove invasive plants like Holly and blackberry and make sure modifications are for everyone
- Protect and support the library
- Use the grass are on 6th between Birch and Adams as a dog park. It will bring more people to downtown, and partner with Dog PAW, they run many parks including Dakota in Vancouver.
- We need a park/gathering space downtown. +1

Goal: Camas residents enjoy access to quality education and support their schools through partnerships and investments.

- Green Team at every school/sustainability and green practices at our schools
- Need safe transport walking corridors, also need facilities like internet
- Support economic development and green tech
- We need economic development as part of our overall vision! Bring in new businesses and support what's here!
- Add goal of strong economic development and partner with the DCA

Station 4: Our Environment

Goal: A network of parks, trails, and open space will connect neighborhoods, wildlife corridors, and natural resources and enhance the quality of life for residents and visitors.

- Heritage trailhead with parking is usually full and there are many more houses being built consider more parking for access to trail.
- Consider all the growth from new homes adds to overwhelming the park facility at round at facilities to the top side of round near lilies.
- Create boardwalk on the Lily fields trail to discourage damage by pedestrians.
- Please pave or gravel the mill ditch so it connects downtown with other amazing paths and

lakes.

Goal: Camas' infrastructure and transportation system will be able to withstand and recover quickly from extreme weather events and other hazards exacerbated by climate change.

- Bury all overhead electrical
- A pedestrian walkway on forest home Rd.
- Find upgrades to sewer and sewer systems before repaving
- Reform storm water modeling under climate scenarios to understand capacity of infrastructure and level of service requests

Goal: The City will embrace clean energy technologies to promote healthy air quality for all Camas residents.

- Retrofit older buildings to meet current code
- Clean up the GP mill to unrestricted use, recognize water clean up as potable, test at gallery wells for potential contamination of city drinking water
- Connect to our river/waterfront, stop and hold pollution sources responsible for water quality in lakes rivers and aquifers.
- More electric Car charging stations. +1

Goal: Camas' native landscape and tree canopy will be protected enhanced to maintain Camas' natural beauty and promote climate resiliency.

- Thank you for having a tree plan and maintaining our tree canopy downtown!
- Partner and support backyard habitat program
- Tree preservation on public and private property
- Save every big tree, you cannot get them back!
- Support native plants and nature spaces in the city, school green spaces and citywide bioswales. Expand list of permissible plants in bioswale.
- Redwoods.
- Remove invasive holly and blackberry
- Education to include out historical connection to founder of Earth day in city's motto and branding 'home of earth day'

Station 5: Our Neighborhoods

Goal: The City will provide public facilities that are resilient to climate change and meet the needs of the growing population.

- Recycling center instead of just garbage bins have opportunity for recycling bins.
- Please consider heat mitigation at the camas farmers market as it's getting so hot, better pavers? Covered structure or coverage system?
- Require new apartments to have air conditioning

Goal: The City will plan for and accommodate population and employment projections in a way that maintains Camas' quality of life and small town character.

- Multifamily units to allow people to walk to work but that requires a good bus system to get people around. +1

Goal: The City will cultivate a business environment that promotes local businesses and establishes Camas as a desirable place for investment

- Partners with CREDC to market the area and region to workers and tourists.

- Diverse sizes of business units, so many different businesses can exist. +1

Goal: the transportation system will accommodate anticipated growth and support the city's overall vision

- We need a lot more bike lanes particularly North Road around lake Lacamas
- As the city expanses outwards make sure the roads have the more bike lanes and sidewalk easements built by the developers buying the land
- Downtown 3rd St. must have Street elements, traffic calming to ensure pedestrian safety in crossing the street

Goal: Camas neighborhoods will be vibrant, stable, and livable with a variety of housing choices that meet all stages in the life cycle, personal preferences and a range of affordability.

- Seek to integrate all levels of income and find ways to mix into suitable areas of the community think infill with middle housing
- Too bad the Everett corridor is being sacrificed needlessly
- A YIMBY (yes, in my back yard) campaign needs to be established different housing types with different household types should not be ostracized young people and empty nesters need a place to live.

Goal: Camas will provide a setting of and quality of life that attract and retain businesses and will be home to a diverse range of employment opportunities

- Get much better. Clarify mapping with County as to buildable lands.

Goal: the multimodal transportation system will be safe and efficient for all users, facilitate access to goods and services, connect neighborhoods, and encourage healthy lifestyle choices.

- Safer bike routes
- Designated bike lanes corridors up to and through parks. +1
- Use community like bend as an example of sidewalks bike lanes and roundabouts. +1
- Connect sidewalks (Prune Hill area example, notable to walk to downtown)

Station 6: Our Downtown

Goal: Encourage redevelopment to expand opportunities Downtown for retail, office and residential.

- More downtown housing +1
- Encourage places to eat, see Vancouver Waterfront without chain restaurants.
- Partner with the Port of C-W
- Where is the vision for a properly cleaned up Mill? The City Plan is responsible for input to the state's cleanup. Without it out destiny is a sad downtown and waterfront.
- Diversity of business types. +1

Goal: Expand on civic life and services Downtown through strategic use of city owned property and vibrant community events.

- A community pool would be appreciated! +1
- A community recreation and senior center.
- Establish a community Theatre +1
- More food and food courts, better website.
- Support local business owners not generic chains.

Goal: Create a safe and connected transportation network that makes Downtown walkable, bikeable, and accessible to the rest of the city.

- Parking structure on the GP lot.
- Slow down traffic on 3rd Ave! Add trees and bulb outs and other traffic calming measures.
- Bike paths to circumnavigate new development and congestion.
- Add crosswalks on Garfield (4tj, 5th, and 6th) and at least one with a signal indicator to connect bike and pedestrian traffic safely to downtown (also through to trailheads behind church on 4th)
- Close down auto traffic on 4th street between Adams and Franklin +1
- Improve public transportation to downtown.
- More major traffic into 6th so 3rd is more pedestrian friendly.

Goal: Retain Downtown's historic character and expand its charm.

- Honor hometown heroes.
- Partner with 3-rivers museum and Clark County Historical Society
- Zone standards for mix use in downtown Camas.
- If you want to expand the City's charm, include the GP Mill in your 20 year planning process, its greyed out on your map.

Goal: Plan for a range of housing options that welcome more people to live Downtown.

- Support a straightforward and affordable permit process for ADU's especially within a mile of downtown possibly provide incentives, subsidies, breaks on property taxes etc. +1
- Live/workspaces villages and lofts with quality community spaces and gardens

Goal: Provide the right mix of development, services, and open spaces that support ways for people to live, work, and play Downtown.

- Please consider outdoor dining for sit down restaurant service, limit time from Memorial Day to Labor Day with balance of spaces taken up parking needs.
- Flex spaces for small businesses.

Our Camas 2045 Summit #1 Online Survey Submissions

An online survey was live from after the event through June 17th as an additional mechanism for feedback. The online survey received 24 responses.

1. I feel the vision statement is:

- Right on. (x8)
- Headed in the right direction, but could be improved. (x7)
- Is missing something. (x9)

2. If you feel it is missing something or could be improved, let us know how!

- Protect the small businesses already here! Don't take away CRUCIAL parking for places like acorn and oak. You're effectively dooming them. The empty property for sale near them should be used for community parking!
- Natural Beauty, safe and diverse (economically, ethically, what people do for a living and politically)
- Love the emphasis on walkability which helps foster social connection and interaction, generating connectedness in the community! Wish we had an aquatics center, but I know that was shut down unfortunately. More mixed-use buildings is nice too
- Camas locals do not want growth. We don't want more housing and businesses. We want the small town feel that we used to have.
- There is no affordable housing. The school district is losing students because young families cannot afford to move here. Utilities and taxes are pricing good families out.
- Improved transportation options in the whole Camas area - mini busses or shuttles, bike rentals, ride share programs etc. -- increase connectivity while mitigating/reducing personal vehicle use as the area density increases
- Camas is NOT inclusive. The out of state newcomers have strangled the ability for life long residents who were born and raised here to live here. There is not affordable housing and the taxes and reckless spending are out of control. The arrogance stinks.
- Increased focus on how we will maintain livability for those who have lived here for generations and cannot afford the taxes, cost of housing, and devastating impacts of urban sprawl that is at the forefront of the city's apparent plans.
- Neighborhoods need to include green spaces & trails not only for human residents but for wild plant &; animal life. Environment & community need to include space for urban/suburban farms for growing food. Downtown--"expansion" should be carefully regulated.
- "Camas is a DIVERSE and inclusive community..."
- Parking is a big issue in downtown. So if you add more businesses, you have to add more parking
- Neighborhood traffic near schools (with no bus service) should have traffic improvements to naturally slow vehicles for the sake of safety.

- The environmental section should specifically mention maintaining Lacamas Park as a priority. Can you imagine Camas with a poorly maintained Lacamas Park? The city's value would markedly decrease. (I understand multiple entities are responsible for park)
- "inclusive" is given top priority in the vision statement, but it's not a primary characteristic of Camas, nor was it found in the brainstorm survey. Who added this?

- I would like to see less church owned properties right in the center of downtown. Although I respect the religious beliefs, the massive presence takes away from more amenable area for downtown activities.
- The “living room"(downtown) has a block of buildings that don't seem to be part of it. I'm not exactly sure how the church has come to own so much of the small, intimate, downtown area. It's a shame, that space could be put to better use.
- The possessive of Camas is Camas's not Camas'
- Expanding what the City calls "downtown" - the mill's property should be viewed as part of the "downtown" footprint as it represents both constraints and large opportunities IF we include it TODAY as a part of the planning process

OUR COMMUNITY

3. How do we achieve this? Share your top three big ideas!

- Adjust zoning to allow for small business to open up shop all around camas. Not just downtown or in strip malls. But true neighborhood spots in all the developments that are driving distance from other businesses
- Continue park and library improvements, rejuvenate downtown Camas’ infrastructure to improve walkability, adding a community indoor/outdoor pool would be nice, doesn’t have to be super fancy or expensive
- We need to get rid of the two hour limit on parking in downtown so we can can support local businesses. Rather than only having time for dinner OR a movie, allow free unlimited parking so you can do both without getting a ticket.
- Listen to what the citizens want. Make things happen, don't just talk about them. Take better care of our vision clearance areas especially downtown, many hazards just waiting to happen, also breaking the cities on Municipal Codes.
- Follow through on these statements is all important!
- Lower utilities and taxes to attract families. Lower the business taxes as to not lose anymore existing businesses. Do not follow the national political ideology!!
- Leave the mill alone. It is what put the city on the map. The high school admin should be ashamed of calling the mascot Makers instead of Papermakers. We should put financial caps to ensure our original citizens are protected.
- Focus on pay for teachers opposed to admin, actively reduce sprawl, stop road expansions and developments on the north shore, maintain and care for historic places, focus on infill opposed to destroying natural areas and farmland
- your goals appear to be youth & family centered. You need to be aware of aging residents, their interests and needs.

- We need an accessible and larger community center in a central location (even if it is shared with Washougal). Downtown Camas activities couldn't be better. Engagement efforts are great--council needs to listen to citizens' wants & spend conservatively.
- Prioritize community gathering spaces. Make bike lanes accessible to major hubs with bike parking. Citizens will never prioritize healthy alternative forms of transportation if endless parking is provided across the city.
- The biggest attractions are the parks, lakes, and trails of Camas. Secondly are the excellent schools. Thirdly is the small town feel. So if you add more growth. You won’t have a small town feel anymore.
- Keep investing in art, attract more live music venues/events.

- Continue using buildings to display art. Create more public gathering spaces that are pedestrian/cyclist focused that include the natural environment and public art/cultural history.
- Community Events, clean streets, strong business network, support developers, tough on crime, keep out vagrants
- Less focus on the insidious WOKE attitude. Just accept everyone without the bend over backwards celebration, which results in a focus on differences regather than our commonalities.
- Maintaining a business friendly environment that encourages investment in new businesses such as restaurants. Utilizing public-private partnerships to bring small shops/restaurants at or near parks.

OUR ENVIRONMENT

4. How do we achieve this? Share your top three big ideas!

- Save at least some land for wildlife! Don’t develop too much and make this just another hideous bunch of cookie cutter houses and strip malls. Also, reckless driving is increasing, especially on crown road and third.
- City should buy and maintain more preserved nature land within the area. Protect all current natural areas. Slow development in green spaces and promote more density in already developed areas.
- Improve/widen more of the sidewalks downtown camas and add more bike lanes especially to N.E. 3rd Ave up Crown Rd, don’t need 4 car lanes there, continue park and infrastructure improvements, connect all trails via bike and walking paths
- Limit parking to residential passes and eliminate out of out of towners, open trails to bikes, allow park to have my bike jumps back. Stop with such environmental measures. All while stop cutting trees down m!
- Stop kicking the can down the road on maintenance of our streets. If the company fails to do the job right don't accept 1/2 ass work. Hold them accountable, also our buildings. Example Lodge building screwed up window spacing. Should have been fixed
- Follow through on these statements is all important!
- Easy. If you need to take trees down to build, then don't build there!
- Incentivize home owners to plant more trees; evaluate options for trails in residential areas and connect them to downtown; create walk/bike paths to connect Camas top to bottom, side to side - for work commute even (no cars!)
- More funding for parks. Both to improve & maintain
- Don't allow people who cut trees down to build their homes years ago to deny that same option to be afforded to others. So narcissistic. Hold Lacamas Shores accountable for their watershed issue. Leave the Everett corridor intact.
- YES! Our Camas outdoor parks/trails are un-met! YES! YES! maintain & Keep parks, trails, corridors so valuable to us all. Pls Avoid creating business/industrial developments to boost tax $$'s (which Beaverton/Hillsboro Ore did, sadly)
- Preserve open space. Preserve wildlife, wild areas, trees, agriculture, farms, not building on every available space. Trails/bike routes in connecting areas like Forest Home Road. Volunteer events to care for parks & spaces, with some kind of incentive.
- Lacamas Regional Park needs to be more responsive to trail maintenance requests and work offered by volunteers. Without volunteers the park would be overgrown and most trails would be unusable.

- Biofilter in the lakes so they are usable year-round, no more toxic algal blooms. ban harmful fertilizers
- During storms we need more snow and ice removal vehicles. Only main roads were plowed and so many people can not leave there homes if they live on streets that are not cleared
- Maintain current parks/lakes/outdoor spaces before investing in new spaces, install swales in neighborhoods to help with flooding issues, use native plantings.
- Prioritize improving collaboration between the entities that own Lacamas park AND local volunteers so that the park receives timely maintenance and enhancements. Current process excludes volunteers critical & maintenance is too delayed.
- You have a good plan here keep it up.
- By utilizing clean hydro power.
- Get the mill cleaned up; assess its risks to our drinking water; Incentivize HOAs to maintain facilities & participate more fully in our stormwater management; seek to PROTECT drinking water supplies thru sound risk planning & better wellhead protection

OUR NEIGHBORHOODS

5. How do we achieve this? Share your top three big ideas!

- Don’t overdevelop and lose all the natural beauty. Less is more
- Not sure.
- Connect all of neighborhoods and parks to downtown camas with walkable sidewalks and trails all the way to Lacamas would be great. Especially Crown Rd to NE 3rd to downtown and even to Washougal Waterfront
- I hate all of this. I want a mayor that will fight against that states growth plan. No one cares about climate change, no one wants mass transit, and especially no one wants wider roads and more round abouts. This town is getting destroyed.
- Common sense don't plant trees right beside street lights. Don't have planting areas in our sidewalks, would help with all the raised and horrible ones in neighborhoods.
- Follow through on these statements is all important!
- No public transportation in neighborhoods.
- encourage mini van shuttle services, rent a bike services, encourage personal ride sharing (co-commuting) by creating programs and digital tools for people to connect safely
- Cap taxes for people who were born here. Allow tiny homes and ADU's. Get on top of the growing homeless issue in our parks and neighborhoods.
- our goal mentions NOTHING about community Safety!! There needs to be an emphasis on crime Prevention and commitment to law enforcement, esp. if your goal is growing population.
- All developments should include green space, trails, and trees. Growth should be VERY slow, as slow as possible, to allow for adjustments to infrastructure. Less urban=more valuable and enjoyed by everyone in the long run.
- Bike lanes, playgrounds with exercise stations (think pull up and dip bars), sports courts (pickleball is the fastest growing sport in America right now)
- Add new bus routes, public transit to connect to Portland and Vancouver!!, busses to connect neighborhoods to downtown
- I think roundabouts are okay but you don’t need them everywhere. The busiest roads are Lake Road and Everett Rd.
- No new building permits until clean water is assured for all residents! Tighter restrictions on residential developer permits.

- Prioritize safe bike lanes that connect the city. By safe, I mean bike lanes that mom's & dad's feel safe using with their kids i.e. a PHYSICAL divider between car lane and bike lane for safety. This will increase # of ppl who use bikes for transportation.
- Preserve the small town vibe. Single family homes. No multi family
- Dedicated bike trails that connect neighborhoods to schools. Ensure each community has a safe walking paths that connect to parks/schools.
- TOTALLY missing the word affordable and clearly not accommodating the blue collar employees that make a City go. One only look at North Shore (Toll Brothers) and Camas Meadows (Romano) to envision what is spoken above as privileged only welcome here.

OUR DOWNTOWN

6. How do we achieve this? Share your top three big ideas!

- Another crosswalk on Garfield would be amazing
- Provide ease of development to those with a proven history of ethical growth of development.
- Needs more mixed use development, no more one story single use buildings please, yes more walkable and bikeable please, more restaurants and shopping needed, the gate to Louis Block park can be improved it looks really old, just updating downtown needed
- We don’t want to achieve this. Stop the growth, keep the small town.
- Implement pay to park in hopes of being able to get a parking garage. Parking is at a minimum now and this issue needs to be addressed ASAP. People pay to park everywhere else and they don't complain.
- Follow through on these statements is all important!
- We have enough downtown living. This keeps it clean and organized.
- Move the church from downtown to another area and use the space for businesses that actually pay tax; use that money to fund downtown upkeep;
- Increase the parking fines to better control the issue. Move the farmers market to Crown Park. Again, leave the mill alone.
- Presently, downtown Camas is NOT walkable. Each crossing of a block is a pedestrian safety matter, drivers in cars. I feel unwelcome in downtown Camas.
- Keep vital services downtown. Post Office, Library, affordable restaurants, should be prioritized over housing, wineries. New construction should be attractive, classic styles (Euro, art deco, Victorian), no big rectangles (like new apartments going in).
- Keep downtown walkable. Cars should never be a priority. If you create a beautiful downtown hub, people will come. People who walk/bike/use alternative methods of transport are more likely to spend $ at local businesses.
- Stop approving churches on the main strip. bring back a pizza by the slice place.
- I don’t know if having apartment above businesses is a good idea. Downtown is already crowded as it is. You don’t have to build on every remaining area. I often thought that downtown would be great if you made 4th street a pedestrian walkway.
- Ensure downtown remains commercial, NOT religious! A Christian church on our main street makes those of us who are not religious feel uncomfortable. A good rule - if The Satanic Temple is not welcome to do it, neither should be the Christian church.
- The historical downtown Camas St is fantastic, however it could be improved by expanding it to neighboring streets. For ex, 3rd Ave is an eyesore and not friendly to pedestrians. 5th Ave also could be developed to have a similar look & feel to 4th Ave
- Don't worry about transportation. getting to downtown is already accessible. Maybe a shuttle for seniors

- Have the church move to buildings outside the downtown area, so that the space/buildings can be used to benefit and be enjoyed by the WHOLE community.
- Redevelop the paper mill property and ensure it is safe for mixed use development.
- If you want to expand charm, start pushing to get that downtown eyesore remediated....there's nothing charming about the unseen decades of pollution there.

7. Is there anything else you would like to share about the Our Camas 2045 process?

- It looks great and like headed in the right direction for sure with focus on physical movement, getting people out of cars and more convenience for walking and social interactions and connectedness!
- No more selling land to large developers who want to cram in big houses on small lots, and stop with apartment complexes!!!! Our roads and schools do not want more growth. People moved to Camas to get away from people!!!!!!

- Please add more community meetings and add the results of our (public) input to the website and follow up emails when we share our address
- Love that you're doing this and I'm super inspired to live in this community. I'd love to learn how to get involved and join you on this journey of making the vision the reality!
- The City is hemorrhaging other people's money. This has got to stop. We cannot keep spending on the backs of others.
- Camas is now a place our friends, family, credit union, etc. advise us to stay away from and build our lives elsewhere. It’s a shame what greed and development have done to our home.
- Applause for city planners, involving Camas residents in 20 yr. projections! Looking fwd. to hearing milestone efforts to sustain the lovely charm & character of Camas.
- great job thanks
- When you have meetings instead of breaking off into groups you could have various informed speakers talk about plans then take questions from audience as they sit on seats so everyone can hear
- Lacamas park needs to be specifically named and goals for its enhancement specifically outlined. Goals for bike infrastructure must include bike lanes with physical barriers that protect cyclists from cars otherwise most families will not utilize them
- I have to be honest, the Vision statement is terrible. "inclusive" is not relevant to Camas, and will be harmful to strategic planning. The rest of the vision statement is vague. The environment statement is acceptable but also redundant.
- Love that you are asking for input, and hope it is discussed and considered.
- The open house hosted in the lodge was a poor way to communicate information. Slides being shown without explanation and timed so quickly that you couldn't read all the info was disappointing. The noise in the room meant nearly shouting to be heard.

Our Camas 2045 Community Summit No. 1 Summary
June 14, 2024

Overview

On June 12th, 2024, the City of Camas hosted *Our Camas 2045 Community Summit #1*, an open house event for its *Our Camas 2045 Comprehensive Plan and Downtown Subarea Plan* process. The purpose of this event was to report back on the outreach and engagement activities that took place over Spring 2024, reveal the draft and ask for feedback on the *Our Camas 2045 Vision Statement and Goals*, and to identify the community's big ideas for achieving the vision and goals.

More than 40 community members participated in the event at the Lacamas Lake Lodge, where kids activities and refreshments were provided. A wide range of participants included residents, business owners, families with children, and elected officials.

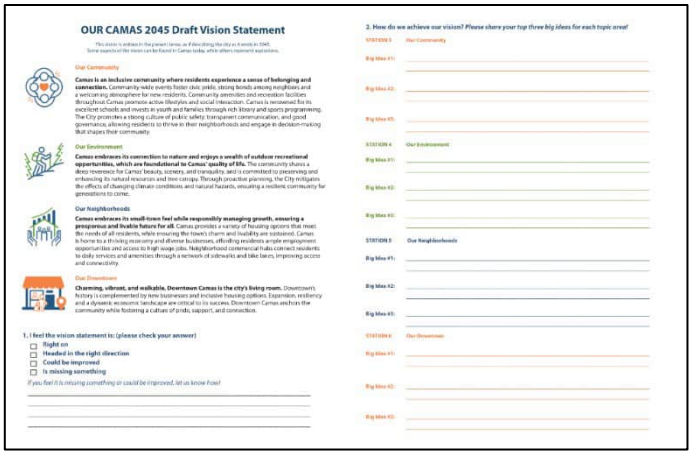
The event was organized with stations set up around the event space, those stations corresponded to each of the four themes identified in the draft Vision Statement. The four themes include: *Our Community; Our Environment; Our Neighborhoods; and Our Downtown*. Additionally, there were other stations that offered a project overview, results of the community outreach, and the draft vision statement.

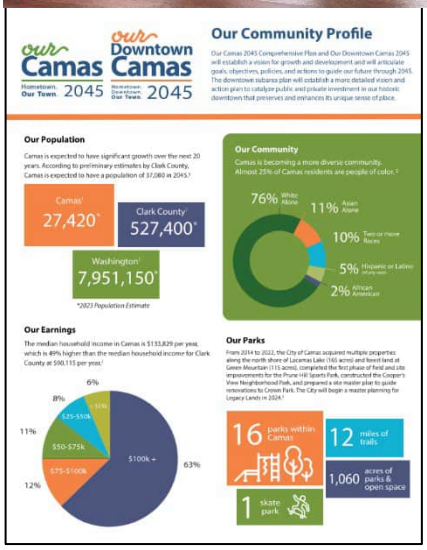
Participants were invited to review the draft vision statement and offer their feedback and share their "big ideas" for how the community can achieve the vision and the associated goals. Each station included a project team facilitator. Ideas were captured through notetaking on sticky notes on the posters, or participants could submit them in writing through a comment form. These ideas will help guide the development of goals and policies for the Comprehensive Plan.

Since the City is additionally undertaking a Downtown Subarea Plan, additional material on opportunities, constraints and background information were provided for the *Our Downtown* station.









The comment form and community profile handed out at the event.

Feedback Analysis

Discussions were robust and collaborative, resulting in many community ideas and overall feedback. Key topics of conversation included bike infrastructure, native species mitigation, tree protection, creation of neighborhood hubs, and local business support. In addition to paper comment forms, an online survey was available to complement the discussion at the event for those who could not participate in-person. A compilation of the raw notes from the

comment forms are included in Appendix A, the raw notes from the poster boards in Appendix B, and the online survey responses are captured in Appendix C.

For the Vision Statement, in response to the question "*If you feel it [Vision] is missing something or could be improved, let us know how!*" respondents felt the Vision is missing clear strategies to protect and sustain existing small businesses, including provisions for adequate parking. In addition to concrete plans to address the lack of affordable housing to retain young families and maintain school enrollment. Respondents note the vision should reflect a genuine approach to inclusivity that considers the needs of lifelong residents, addressing the impacts of high taxes and urban sprawl.

Enhanced transportation options, such as minibuses, bike rentals, and ride-sharing programs, should be proposed to reduce reliance on personal vehicles. Additionally, there is a want for a stronger emphasis on maintaining and expanding green spaces, trails, and urban farms to preserve the city's natural beauty and community health. Effective use of downtown spaces, including addressing the significant presence of church-owned properties and integrating the mill's property into the downtown planning process, is also spoken to. Finally, the vision statement should more accurately represent inclusivity based on the community's actual characteristics and needs, rather than an imposed ideal.

In response to "*How do we achieve our vision? Share your top three big ideas for each topic area!"* The following ideas were provided by Summit participants for each Vision Theme.

Our Community

Amenities for Children and Teenagers:

- Provide smaller playgrounds and indoor play facilities for younger children.
- Establish more sporting fields and advocate for an indoor swimming pool accessible to high schoolers.

Community Unity and Diversity:

- Focus on reuniting the community and fostering diversity through inclusive initiatives.

Infrastructure and Community Enhancement:

- Improve downtown infrastructure for better walkability and accessibility.
- Enhance community facilities including parks, libraries, and possibly a community indoor/outdoor pool.
- Address parking policies to support local businesses

Fiscal Responsibility and Engagement:

- Lower utility costs and taxes to attract families and retain businesses.
- Prioritize citizen engagement and accountability in city planning and policy implementation.

Cultural and Recreational Investment:

- Preserve and expand upon Camas' cultural heritage through arts and community events.
- Invest in recreational facilities like arcade and mini-golf to enhance community activities.
- Broker a deal with local entities to utilize land for a new community center.

Our Environment

Environmental Conservation and Development:

- Preserve land for wildlife and limit excessive development.
- Promote denser development in already developed areas to conserve green spaces.

Infrastructure and Transportation:

- Enhance biking infrastructure including bike rentals and connected bike paths.
- Address water and utility issues such as the current well problem and underground utility placement.

Landscaping and Tree Preservation:

- Preserve mature landscaping and save parks and green spaces.
- Protect large trees and ensure proper spacing when planting new trees.
- Consider adding Redwoods to enhance the tree canopy.

Green Spaces and Recreation:

- Develop multipurpose green spaces, especially for sports like soccer, little league, and girls' softball.
- Improve access points and public transit to Lacamas Lake.
- Create a continuous trail around Lacamas Lake and develop boardwalks to protect natural areas.

Community Cleanliness and Maintenance:

- Enhance garbage and recycling systems citywide.
- Encourage GP (Georgia Pacific) to clean up their site for improved community aesthetics and environmental health.

Community Programs and Policies:

- Implement a heritage tree program and support property owners in retrofitting for energy efficiency.
- Hold community listening sessions on evacuation routes and develop policies based on community input.

Parking and Infrastructure:

- Address parking needs, including a larger parking lot near Lacamas Heritage Trail.
- Consider paving the gravel pit near the old mill site for improved infrastructure.

Our Neighborhoods

Environmental Conservation and Development:

- Advocate for less development to preserve natural beauty and prioritize green spaces.
- Ensure developments include green space, trails, and trees.
- Regulate tree planting to avoid blocking traffic sightlines.

Infrastructure and Transportation:

- Connect neighborhoods and parks to downtown Camas with walkable sidewalks and trails.
- Prioritize bike lanes that are physically separated from car lanes for safety.
- Support dedicated bike trails that connect neighborhoods to schools and safe walking paths.

Community Safety and Quality of Life:

- Emphasize community safety, crime prevention, and support for law enforcement as the population grows.
- Address concerns about homelessness in parks and neighborhoods.

Public Transportation and Mobility Services:

- Introduce new bus routes and public transit options connecting Camas to Portland and Vancouver.
- Encourage minivan shuttle services, bike rental services, and personal ride-sharing to improve mobility options.

Urban Planning and Growth Management:

- Advocate for slower growth to allow infrastructure adjustments and maintain the small-town vibe.
- Restrict new building permits until clean water assurance for all residents and tighten residential developer permit restrictions.
- Support more neighborhood nodes and small pockets of business areas for increased walkability.
- Promote more affordable housing options such as condos and townhomes.
- Develop tools to promote affordable housing such as density bonuses for dedicated affordable housing.

Recreational Facilities and Community Amenities:

- Support amenities like playgrounds with exercise stations, sports courts (e.g., pickleball), and biking infrastructure to promote active lifestyles.
- Install doggie waste bag stations for pet owners.

Our Downtown

Urban Development and Planning:

- Support mixed-use developments over single-use buildings.
- Improve infrastructure and aesthetic appeal of downtown and overall downtown maintenance.
- Maintain small-town charm and resist further growth.
- Implement pay-to-park system to address parking shortages, potentially leading to a parking garage.
- Increase parking fines to better manage parking issues.
- Redevelop the paper mill property for mixed-use development.
- Enhance walkability downtown and prioritize pedestrians over cars.
- Expand and beautify historical downtown areas

Community and Downtown Vitality:

- Improve pedestrian safety with additional crosswalks, addressing safety concerns at block crossings.
- Maintain vital services downtown such as Post Office, Library, and affordable restaurants.
- Prioritize commercial spaces over housing in downtown areas.
- Ensure accessibility downtown, potentially implementing a shuttle service for seniors.
- Maintain the attractiveness and accessibility of downtown without significant transportation changes.
- Increase the number of retail stores and restaurants to maintain consistent business

traffic.

Cultural and Religious Concerns:

- Propose relocating churches from downtown to enhance commercial space availability and community inclusivity.
- Advocate for maintaining downtown as a commercial rather than religious hub.

Business Diversity and Ownership:

- Encourage diversity in the types of businesses and services.
- Prioritize local and small businesses over chains.

Parking and Traffic Management:

- Address the issue of available parking.
- Develop a plan to address traffic patterns at 6th Ave and Adams St.

To ensure proper implementation of the Vision and Goals, the community was asked to share ideas on how we can achieve the goals. The following key ideas were given.

Our Community

Goal: Camas' artistic and cultural heritage will be protected, enhanced, and commemorated.

- Start a community theatre with volunteer assistance.
- Renovate/restore the community center.

Goal: Community events, involvement activities, and youth-focused activities will instill a sense of belonging among residents of all ages while making Camas an ideal place to raise a family.

- Create a multicultural fair/event that includes everyone.
- Partner with schools to host a multicultural fair.

Goal: The City will promote a strong sense of community through transparent communication, outreach efforts, partnerships, and accessibility.

- Partner with the school district for regular meetings to share resources and ideas.

Goal: Public places will be valued and protected spaces, with safe and well-maintained facilities that foster a sense of community and promote physical and mental health.

- Protect city and county parks, remove invasive plants, and ensure modifications are inclusive.
- Protect and support the library.
- Establish a park/gathering space downtown.

Goal: Camas residents enjoy access to quality education and support their schools through partnerships and investments.

- Implement a Green Team at every school and promote sustainability and green practices.
- Ensure safe walking corridors and necessary facilities like internet.

Our Environment

Goal: A network of parks, trails, and open space will connect neighborhoods, wildlife corridors, and natural resources and enhance the quality of life for residents and visitors.

- Increase parking at the Heritage trailhead to accommodate growth from new housing.
- Address the capacity of park facilities with the increase in new homes.

- Create a boardwalk on the Lily fields trail to prevent damage by pedestrians.
- Pave or gravel the mill ditch to connect downtown with other paths and lakes.

Goal: Camas' infrastructure and transportation system will be able to withstand and recover quickly from extreme weather events and other hazards exacerbated by climate change.

- Bury all overhead electrical lines.
- Upgrade sewer systems before repaving roads.
- Reform storm water modeling under climate scenarios to assess infrastructure capacity and service levels.

Goal: The City will embrace clean energy technologies to promote healthy air quality for all Camas residents.

- Retrofit older buildings to meet current codes.
- Clean up the GP mill for unrestricted use and test water for contamination.
- Connect to the river/waterfront and hold pollution sources accountable.
- Install more electric car charging stations.

Goal: Camas' native landscape and tree canopy will be protected and enhanced to maintain Camas' natural beauty and promote climate resiliency.

- Maintain and implement a tree canopy plan downtown.
- Partner with and support a backyard habitat program.
- Preserve trees on public and private property, especially large trees.
- Support native plants and nature spaces in the city, including school green spaces and citywide bioswales.
- Expand the list of permissible plants in bioswales.
- Remove invasive holly and blackberry.

Our Neighborhoods

Goal: The City will provide public facilities that are resilient to climate change and meet the needs of the growing population.

- Implement a recycling center alongside garbage bins to promote recycling.
- Improve heat mitigation at the Camas farmers market with better pavers, covered structures, or coverage systems.
- Mandate new apartments to have air conditioning.

Goal: The City will plan for and accommodate population and employment projections in a way that maintains Camas' quality of life and small-town character.

- Encourage multifamily units to support walking to work, bolstered by an improved bus system.

Goal: The City will cultivate a business environment that promotes local businesses and establishes Camas as a desirable place for investment.

- Partner with CREDC to market the area and region to workers and tourists.
- Support diverse sizes of business units to accommodate various businesses.

Goal: The transportation system will accommodate anticipated growth and support the city's overall vision.

- Expand bike lanes, particularly around North Road and Lake Lacamas.
- Ensure developers include bike lanes and sidewalk easements as the city expands outward.

- Implement street elements and traffic calming on Downtown 3rd St. for pedestrian safety.

Goal: Camas neighborhoods will be vibrant, stable, and livable with a variety of housing choices that meet all stages in the life cycle, personal preferences, and a range of affordability.

- Integrate all income levels and promote infill with middle housing.
- Encourage different housing types and household mixes.

Goal: Camas will provide a setting of quality of life that attracts and retains businesses and offers a diverse range of employment opportunities.

- Improve clarity on buildable lands through mapping with the County.

Goal: The multimodal transportation system will be safe and efficient for all users, facilitate access to goods and services, connect neighborhoods, and encourage healthy lifestyle choices.

- Enhance safety on bike routes throughout the city.
- Establish designated bike lane corridors connecting to parks.
- Use community designs like Bend as a model, emphasizing sidewalks, bike lanes, and roundabouts.
- Improve sidewalk connectivity, such as in the Prune Hill area, to enable walking access to downtown.

Our Downtown

Goal: Encourage redevelopment to expand opportunities Downtown for retail, office, and residential.

- Increase downtown housing options.
- Encourage a diversity of business types, avoiding chain restaurants.
- Partner with the Port of Camas-Washougal for collaborative projects.
- Advocate for a properly cleaned-up GP Mill area to enhance downtown and waterfront appeal.

Goal: Expand on civic life and services Downtown through strategic use of city-owned property and vibrant community events.

- Support local businesses over generic chains.
- Enhance food options and food courts, improve the city's website.

Goal: Create a safe and connected transportation network that makes Downtown walkable, bikeable, and accessible to the rest of the city.

- Build a parking structure on the GP lot.
- Implement traffic calming measures on 3rd Ave, including trees and bulb outs.
- Develop bike paths around new developments and congested areas.
- Add crosswalks on Garfield and signal indicators to connect bike and pedestrian traffic safely.
- Consider closing auto traffic on 4th Street between Adams and Franklin to enhance pedestrian access.
- Improve public transportation access to downtown.
- Enhance pedestrian and bike access via major routes like 6th Street to prioritize pedestrian friendliness on 3rd Ave.

Goal: Retain Downtown's historic character and expand its charm.

- Honor hometown heroes and collaborate with local historical societies.

- Include the GP Mill in long-term planning to preserve and expand downtown charm.

Goal: Plan for a range of housing options that welcome more people to live Downtown.

- Support a straightforward permit process for ADUs near downtown, potentially with incentives or tax breaks.
- Develop live/work villages, lofts, and community spaces with gardens.

Goal: Provide the right mix of development, services, and open spaces that support ways for people to live, work, and play Downtown.

- Consider seasonal outdoor dining options and flexible spaces for small businesses.

APPENDIX A. Comment Form submissions

In response to "How do we achieve our vision? Share your top three big ideas for each topic area!"

Station 3: Our Community

- Having amenities for younger children such as smaller playgrounds, indoor play facilities, etc.
- Need for more sporting fields/indoor swimming pool for highschoolers to use
- We need to reunite our community to be supportive of everyone and encourage more diversity
- Broker a deal with GP to use the five acres where old buildings were demolished a few years ago to build a community center.
- Build a community center, arcade and mini golf.

Station 4: Our Environment

- Connect the bike infrastructure and bike rentals
- Is there a solution to the current well issue before adding more dwellings?
- We seem to be lacking mature landscaping in new construction neighborhoods, can some trees be preserved?
- Please continue including green spaces for multipurpose, especially sports rec areas for both soccer, little league, etc. (don't forget the girls softball – they have gotten the shaft when it comes to shared space) for great examples see Port of Klamath, Hazel Dells sports center and Hockinson Meadows Community Park.
- More access points to Lacamas Lake, and public transit to lake. Continuous trail around the lake.
- Encourage GP to gradually clean up the site to show they care about Camas.
- Save more parks/green spaces, keep more trees, and better garbage and recycling all over.
- How were these goals developed and how will they be used? Will there be policies that are developed as a result?
- What is a heritage tree program?
- Sometimes trees are planted too close together which makes it difficult to see oncoming traffic.
- The Port of Camas-Washougal has a program that helps property owners retrofit their buildings and improve the insulation.
- There is a coastal town in California, Los Osos, that has a walkway above marshland. There is a trail near Lacamas Lake near some lily pads and some type of boardwalk could help to stop people from walking over the lily pads.
- Parking is usually full near the trailhead for the Lacamas Heritage Trail off of NW Alexandra Lane. A larger parking lot is needed.
- Are there plans to address the well? There has been some talk about removing the well.
- The City should think about adding Redwoods to the tree canopy. They grow faster

than oak or cedar trees.
- Holding listening sessions on evacuation routes is a good idea (Steve Hogan).
- Large trees should be protected at all costs. It is difficult to replace them.
- Utilities should be placed underground.
- Has the old mill come up at all in any of the vision statements?
- The City should pave the gravel pit near the mill.

Station 5: Our Neighborhoods
- More neighborhood nodes – coffee shops etc. in the suburbs.
- Need more affordable housing options – condos/townhomes
- Regulate the distance between trees when planting them. Try driving out of Deer Creek neighborhood at Ogden Street and 16th Ave to see what I mean. Once trees mature in width they block traffic sightlines on both the left and right. I have to pull into 16th Ave to see around the, albeit gorgeous, trees.
- Small pockets of business areas so people can walk from home.
- Make efforts to move power underground in some of the older neighborhoods
- Doggie waste bag stations

Station 6: Our Downtown
- More retail/restaurants would be nice to keep consistent traffic going through businesses.
- Available parking is already an issue, and I don't think a meter maid is the real solution with downtown events.
- We need a plan for potentially addressing traffic patterns at 6th Ave and Adams St.
- More diversity on type of businesses/services and more diversity in ownership. Less church/religious stamp on downtown. No chains, keep it local/small business.

APPENDIX B. Poster Board Notes

In response to "Use a sticky note to write an idea for how we can achieve these goals." + indicates agreement by another attendee.

Station 3: Our Community

Goal: Camas' artistic and cultural heritage will be protected, enhanced, and commemorated.

- Start a community theatre – I'll help 503-270-7264
- Renovate/restore the community center

Goal: Community events, involvement activities, and youth focused activities will instill a sense of belonging among residents of all ages while making Camas an ideal place to raise a family.

- Create multicultural fair/event where everyone is included
- Partner with schools to have a multicultural fair

Goal: The City will promote a strong sense of community through transparent communication, outreach efforts, partnerships, and accessibility.

- Less chains of food and shopping, promote small business growth
- Partner with the school district and have regular meetings to share resources and ideas

Goal: Public places will be valued and protected spaces, with safe and well-maintained facilities that foster a sense of community and promote physical and mental health.

- Work with Camas Ivy League to maintain and control invasives
- Protect the city and county parks, remove invasive plants like Holly and blackberry and make sure modifications are for everyone
- Protect and support the library
- Use the grass are on 6th between Birch and Adams as a dog park. It will bring more people to downtown, and partner with Dog PAW, they run many parks including Dakota in Vancouver.
- We need a park/gathering space downtown. +1

Goal: Camas residents enjoy access to quality education and support their schools through partnerships and investments.

- Green Team at every school/sustainability and green practices at our schools
- Need safe transport walking corridors, also need facilities like internet
- Support economic development and green tech
- We need economic development as part of our overall vision! Bring in new businesses and support what's here!
- Add goal of strong economic development and partner with the DCA

Station 4: Our Environment

Goal: A network of parks, trails, and open space will connect neighborhoods, wildlife corridors, and natural resources and enhance the quality of life for residents and visitors.

- Heritage trailhead with parking is usually full and there are many more houses being

built consider more parking for access to trail.
- Consider all the growth from new homes adds to overwhelming the park facility at round at facilities to the top side of round near lilies.
- Create boardwalk on the Lily fields trail to discourage damage by pedestrians.
- Please pave or gravel the mill ditch so it connects downtown with other amazing paths and lakes.

Goal: Camas' infrastructure and transportation system will be able to withstand and recover quickly from extreme weather events and other hazards exacerbated by climate change.
- Bury all overhead electrical
- A pedestrian walkway on forest home Rd.
- Find upgrades to sewer and sewer systems before repaving
- Reform storm water modeling under climate scenarios to understand capacity of infrastructure and level of service requests

Goal: The City will embrace clean energy technologies to promote healthy air quality for all Camas residents.
- Retrofit older buildings to meet current code
- Clean up the GP mill to unrestricted use, recognize water clean up as potable, test at gallery wells for potential contamination of city drinking water
- Connect to our river/waterfront, stop and hold pollution sources responsible for water quality in lakes rivers and aquifers.
- More electric Car charging stations. +1

Goal: Camas' native landscape and tree canopy will be protected enhanced to maintain Camas' natural beauty and promote climate resiliency.
- Thank you for having a tree plan and maintaining our tree canopy downtown!
- Partner and support backyard habitat program
- Tree preservation on public and private property
- Save every big tree, you cannot get them back!
- Support native plants and nature spaces in the city, school green spaces and citywide bioswales. Expand list of permissible plants in bioswale.
- Redwoods.
- Remove invasive holly and blackberry
- Education to include out historical connection to founder of Earth day in city's motto and branding 'home of earth day'

Station 5: Our Neighborhoods
Goal: The City will provide public facilities that are resilient to climate change and meet the needs of the growing population.
- Recycling center instead of just garbage bins have opportunity for recycling bins.
- Please consider heat mitigation at the camas farmers market as it's getting so hot, better pavers? Covered structure or coverage system?
- Require new apartments to have air conditioning

Goal: The City will plan for and accommodate population and employment projections in a way that maintains Camas' quality of life and small town character.

- Multifamily units to allow people to walk to work but that requires a good bus system to get people around. +1

Goal: The City will cultivate a business environment that promotes local businesses and establishes Camas as a desirable place for investment

- Partners with CREDC to market the area and region to workers and tourists.
- Diverse sizes of business units, so many different businesses can exist. +1

Goal: the transportation system will accommodate anticipated growth and support the city's overall vision

- We need a lot more bike lanes particularly North Road around lake Lacamas
- As the city expanses outwards make sure the roads have the more bike lanes and sidewalk easements built by the developers buying the land
- Downtown 3rd St. must have Street elements, traffic calming to ensure pedestrian safety in crossing the street

Goal: Camas neighborhoods will be vibrant, stable, and livable with a variety of housing choices that meet all stages in the life cycle, personal preferences and a range of affordability.

- Seek to integrate all levels of income and find ways to mix into suitable areas of the community think infill with middle housing
- Too bad the Everett corridor is being sacrificed needlessly
- A YIMBY (yes, in my back yard) campaign needs to be established different housing types with different household types should not be ostracized young people and empty nesters need a place to live.

Goal: Camas will provide a setting of and quality of life that attract and retain businesses and will be home to a diverse range of employment opportunities

- Get much better. Clarify mapping with County as to buildable lands.

Goal: the multimodal transportation system will be safe and efficient for all users, facilitate access to goods and services, connect neighborhoods, and encourage healthy lifestyle choices.

- Safer bike routes
- Designated bike lanes corridors up to and through parks. +1
- Use community like bend as an example of sidewalks bike lanes and roundabouts. +1
- Connect sidewalks (Prune Hill area example, notable to walk to downtown)

Station 6: Our Downtown

Goal: Encourage redevelopment to expand opportunities Downtown for retail, office and residential.

- More downtown housing +1
- Encourage places to eat, see Vancouver Waterfront without chain restaurants.

- Partner with the Port of C-W
- Where is the vision for a properly cleaned up Mill? The City Plan is responsible for input to the state's cleanup. Without it out destiny is a sad downtown and waterfront.
- Diversity of business types. +1

Goal: Expand on civic life and services Downtown through strategic use of city owned property and vibrant community events.

- A community pool would be appreciated! +1
- A community recreation and senior center.
- Establish a community Theatre +1
- More food and food courts, better website.
- Support local business owners not generic chains.

Goal: Create a safe and connected transportation network that makes Downtown walkable, bikeable, and accessible to the rest of the city.

- Parking structure on the GP lot.
- Slow down traffic on 3rd Ave! Add trees and bulb outs and other traffic calming measures.
- Bike paths to circumnavigate new development and congestion.
- Add crosswalks on Garfield (4tj, 5th, and 6th) and at least one with a signal indicator to connect bike and pedestrian traffic safely to downtown (also through to trailheads behind church on 4th)
- Close down auto traffic on 4th street between Adams and Franklin +1
- Improve public transportation to downtown.
- More major traffic into 6th so 3rd is more pedestrian friendly.

Goal: Retain Downtown's historic character and expand its charm.

- Honor hometown heroes.
- Partner with 3-rivers museum and Clark County Historical Society
- Zone standards for mix use in downtown Camas.
- If you want to expand the City's charm, include the GP Mill in your 20 year planning process, its greyed out on your map.

Goal: Plan for a range of housing options that welcome more people to live Downtown.

- Support a straightforward and affordable permit process for ADU's especially within a mile of downtown possibly provide incentives, subsidies, breaks on property taxes etc. +1
- Live/workspaces villages and lofts with quality community spaces and gardens

Goal: Provide the right mix of development, services, and open spaces that support ways for people to live, work, and play Downtown.

- Please consider outdoor dining for sit down restaurant service, limit time from Memorial Day to Labor Day with balance of spaces taken up parking needs.
- Flex spaces for small businesses.

APPENDIX C. Online Survey Submissions

An online survey was live from after the event through June 17th as an additional mechanism for feedback. The online survey received 24 responses.

1. I feel the vision statement is:

- Right on. (x8)
- Headed in the right direction, but could be improved. (x7)
- Is missing something. (x9)

2. If you feel it is missing something or could be improved, let us know how!

- Protect the small businesses already here! Don't take away CRUCIAL parking for places like acorn and oak. You're effectively dooming them. The empty property for sale near them should be used for community parking!
- Natural Beauty, safe and diverse (economically, ethically, what people do for a living and politically)
- Love the emphasis on walkability which helps foster social connection and interaction, generating connectedness in the community! Wish we had an aquatics center, but I know that was shut down unfortunately. More mixed-use buildings is nice too
- Camas locals do not want growth. We don't want more housing and businesses. We want the small town feel that we used to have.
- There is no affordable housing. The school district is losing students because young families cannot afford to move here. Utilities and taxes are pricing good families out.
- Improved transportation options in the whole Camas area - mini busses or shuttles, bike rentals, ride share programs etc. -- increase connectivity while mitigating/reducing personal vehicle use as the area density increases
- Camas is NOT inclusive. The out of state newcomers have strangled the ability for life long residents who were born and raised here to live here. There is not affordable housing and the taxes and reckless spending are out of control. The arrogance stinks.
- Increased focus on how we will maintain livability for those who have lived here for generations and cannot afford the taxes, cost of housing, and devastating impacts of urban sprawl that is at the forefront of the city's apparent plans.
- Neighborhoods need to include green spaces & trails not only for human residents but for wild plant &; animal life. Environment & community need to include space for urban/suburban farms for growing food. Downtown--"expansion" should be carefully regulated.
- "Camas is a DIVERSE and inclusive community..."
- Parking is a big issue in downtown. So if you add more businesses, you have to add more parking
- Neighborhood traffic near schools (with no bus service) should have traffic improvements to naturally slow vehicles for the sake of safety.

- The environmental section should specifically mention maintaining Lacamas Park as a priority. Can you imagine Camas with a poorly maintained Lacamas Park? The city's value would markedly decrease. (I understand multiple entities are responsible for park)
- "inclusive" is given top priority in the vision statement, but it's not a primary characteristic of Camas, nor was it found in the brainstorm survey. Who added this?
- I would like to see less church owned properties right in the center of downtown. Although I respect the religious beliefs, the massive presence takes away from more amenable area for downtown activities.
- The “living room"(downtown) has a block of buildings that don't seem to be part of it. I'm not exactly sure how the church has come to own so much of the small, intimate, downtown area. It's a shame, that space could be put to better use.
- The possessive of Camas is Camas's not Camas'
- Expanding what the City calls "downtown" - the mill's property should be viewed as part of the "downtown" footprint as it represents both constraints and large opportunities IF we include it TODAY as a part of the planning process

OUR COMMUNITY

3. How do we achieve this? Share your top three big ideas!

- Adjust zoning to allow for small business to open up shop all around camas. Not just downtown or in strip malls. But true neighborhood spots in all the developments that are driving distance from other businesses
- Continue park and library improvements, rejuvenate downtown Camas’ infrastructure to improve walkability, adding a community indoor/outdoor pool would be nice, doesn’t have to be super fancy or expensive
- We need to get rid of the two hour limit on parking in downtown so we can can support local businesses. Rather than only having time for dinner OR a movie, allow free unlimited parking so you can do both without getting a ticket.
- Listen to what the citizens want. Make things happen, don't just talk about them. Take better care of our vision clearance areas especially downtown, many hazards just waiting to happen, also breaking the cities on Municipal Codes.
- Follow through on these statements is all important!
- Lower utilities and taxes to attract families. Lower the business taxes as to not lose anymore existing businesses. Do not follow the national political ideology!!
- Leave the mill alone. It is what put the city on the map. The high school admin should be ashamed of calling the mascot Makers instead of Papermakers. We should put financial caps to ensure our original citizens are protected.
- Focus on pay for teachers opposed to admin, actively reduce sprawl, stop road expansions and developments on the north shore, maintain and care for historic places, focus on infill opposed to destroying natural areas and farmland
- your goals appear to be youth & family centered. You need to be aware of aging residents, their interests and needs.

- We need an accessible and larger community center in a central location (even if it is shared with Washougal). Downtown Camas activities couldn't be better. Engagement efforts are great--council needs to listen to citizens' wants & spend conservatively.
- Prioritize community gathering spaces. Make bike lanes accessible to major hubs with bike parking. Citizens will never prioritize healthy alternative forms of transportation if endless parking is provided across the city.
- The biggest attractions are the parks, lakes, and trails of Camas. Secondly are the excellent schools. Thirdly is the small town feel. So if you add more growth. You won't have a small town feel anymore.
- Keep investing in art, attract more live music venues/events.
- Continue using buildings to display art. Create more public gathering spaces that are pedestrian/cyclist focused that include the natural environment and public art/cultural history.
- Community Events, clean streets, strong business network, support developers, tough on crime, keep out vagrants
- Less focus on the insidious WOKE attitude. Just accept everyone without the bend over backwards celebration, which results in a focus on differences regather than our commonalities.
- Maintaining a business friendly environment that encourages investment in new businesses such as restaurants. Utilizing public-private partnerships to bring small shops/restaurants at or near parks.

OUR ENVIRONMENT

4. How do we achieve this? Share your top three big ideas!

- Save at least some land for wildlife! Don't develop too much and make this just another hideous bunch of cookie cutter houses and strip malls. Also, reckless driving is increasing, especially on crown road and third.
- City should buy and maintain more preserved nature land within the area. Protect all current natural areas. Slow development in green spaces and promote more density in already developed areas.
- Improve/widen more of the sidewalks downtown camas and add more bike lanes especially to N.E. 3rd Ave up Crown Rd, don't need 4 car lanes there, continue park and infrastructure improvements, connect all trails via bike and walking paths
- Limit parking to residential passes and eliminate out of out of towners, open trails to bikes, allow park to have my bike jumps back. Stop with such environmental measures. All while stop cutting trees down m!
- Stop kicking the can down the road on maintenance of our streets. If the company fails to do the job right don't accept 1/2 ass work. Hold them accountable, also our buildings. Example Lodge building screwed up window spacing. Should have been fixed
- Follow through on these statements is all important!
- Easy. If you need to take trees down to build, then don't build there!

- Incentivize home owners to plant more trees; evaluate options for trails in residential areas and connect them to downtown; create walk/bike paths to connect Camas top to bottom, side to side - for work commute even (no cars!)
- More funding for parks. Both to improve & maintain
- Don't allow people who cut trees down to build their homes years ago to deny that same option to be afforded to others. So narcissistic. Hold Lacamas Shores accountable for their watershed issue. Leave the Everett corridor intact.
- YES! Our Camas outdoor parks/trails are un-met! YES! YES! maintain & Keep parks, trails, corridors so valuable to us all. Pls Avoid creating business/industrial developments to boost tax $$'s (which Beaverton/Hillsboro Ore did, sadly)
- Preserve open space. Preserve wildlife, wild areas, trees, agriculture, farms, not building on every available space. Trails/bike routes in connecting areas like Forest Home Road. Volunteer events to care for parks & spaces, with some kind of incentive.
- Lacamas Regional Park needs to be more responsive to trail maintenance requests and work offered by volunteers. Without volunteers the park would be overgrown and most trails would be unusable.
- Biofilter in the lakes so they are usable year-round, no more toxic algal blooms. ban harmful fertilizers
- During storms we need more snow and ice removal vehicles. Only main roads were plowed and so many people can not leave there homes if they live on streets that are not cleared
- Maintain current parks/lakes/outdoor spaces before investing in new spaces, install swales in neighborhoods to help with flooding issues, use native plantings.
- Prioritize improving collaboration between the entities that own Lacamas park AND local volunteers so that the park receives timely maintenance and enhancements. Current process excludes volunteers critical & maintenance is too delayed.
- You have a good plan here keep it up.
- By utilizing clean hydro power.
- Get the mill cleaned up; assess its risks to our drinking water; Incentivize HOAs to maintain facilities & participate more fully in our stormwater management; seek to PROTECT drinking water supplies thru sound risk planning & better wellhead protection

OUR NEIGHBORHOODS

5. How do we achieve this? Share your top three big ideas!

- Don’t overdevelop and lose all the natural beauty. Less is more
- Not sure.
- Connect all of neighborhoods and parks to downtown camas with walkable sidewalks and trails all the way to Lacamas would be great. Especially Crown Rd to NE 3rd to downtown and even to Washougal Waterfront
- I hate all of this. I want a mayor that will fight against that states growth plan. No one cares about climate change, no one wants mass transit, and especially no one wants wider roads and more round abouts. This town is getting destroyed.

- Common sense don't plant trees right beside street lights. Don't have planting areas in our sidewalks, would help with all the raised and horrible ones in neighborhoods.
- Follow through on these statements is all important!
- No public transportation in neighborhoods.
- encourage mini van shuttle services, rent a bike services, encourage personal ride sharing (co-commuting) by creating programs and digital tools for people to connect safely
- Cap taxes for people who were born here. Allow tiny homes and ADU's. Get on top of the growing homeless issue in our parks and neighborhoods.
- our goal mentions NOTHING about community Safety!! There needs to be an emphasis on crime Prevention and commitment to law enforcement, esp. if your goal is growing population.
- All developments should include green space, trails, and trees. Growth should be VERY slow, as slow as possible, to allow for adjustments to infrastructure. Less urban=more valuable and enjoyed by everyone in the long run.
- Bike lanes, playgrounds with exercise stations (think pull up and dip bars), sports courts (pickleball is the fastest growing sport in America right now)
- Add new bus routes, public transit to connect to Portland and Vancouver!!, busses to connect neighborhoods to downtown
- I think roundabouts are okay but you don’t need them everywhere. The busiest roads are Lake Road and Everett Rd.
- No new building permits until clean water is assured for all residents! Tighter restrictions on residential developer permits.
- Prioritize safe bike lanes that connect the city. By safe, I mean bike lanes that mom's & dad's feel safe using with their kids i.e. a PHYSICAL divider between car lane and bike lane for safety. This will increase # of ppl who use bikes for transportation.
- Preserve the small town vibe. Single family homes. No multi family
- Dedicated bike trails that connect neighborhoods to schools. Ensure each community has a safe walking paths that connect to parks/schools.
- TOTALLY missing the word affordable and clearly not accommodating the blue collar employees that make a City go. One only look at North Shore (Toll Brothers) and Camas Meadows (Romano) to envision what is spoken above as privileged only welcome here.

OUR DOWNTOWN

6. How do we achieve this? Share your top three big ideas!

- Another crosswalk on Garfield would be amazing
- Provide ease of development to those with a proven history of ethical growth of development.
- Needs more mixed use development, no more one story single use buildings please, yes more walkable and bikeable please, more restaurants and shopping needed, the gate to Louis Block park can be improved it looks really old, just updating downtown needed
- We don’t want to achieve this. Stop the growth, keep the small town.

- Implement pay to park in hopes of being able to get a parking garage. Parking is at a minimum now and this issue needs to be addressed ASAP. People pay to park everywhere else and they don't complain.
- Follow through on these statements is all important!
- We have enough downtown living. This keeps it clean and organized.
- Move the church from downtown to another area and use the space for businesses that actually pay tax; use that money to fund downtown upkeep;
- Increase the parking fines to better control the issue. Move the farmers market to Crown Park. Again, leave the mill alone.
- Presently, downtown Camas is NOT walkable. Each crossing of a block is a pedestrian safety matter, drivers in cars. I feel unwelcome in downtown Camas.
- Keep vital services downtown. Post Office, Library, affordable restaurants, should be prioritized over housing, wineries. New construction should be attractive, classic styles (Euro, art deco, Victorian), no big rectangles (like new apartments going in).
- Keep downtown walkable. Cars should never be a priority. If you create a beautiful downtown hub, people will come. People who walk/bike/use alternative methods of transport are more likely to spend $ at local businesses.
- Stop approving churches on the main strip. bring back a pizza by the slice place.
- I don’t know if having apartment above businesses is a good idea. Downtown is already crowded as it is. You don’t have to build on every remaining area. I often thought that downtown would be great if you made 4th street a pedestrian walkway.
- Ensure downtown remains commercial, NOT religious! A Christian church on our main street makes those of us who are not religious feel uncomfortable. A good rule - if The Satanic Temple is not welcome to do it, neither should be the Christian church.
- The historical downtown Camas St is fantastic, however it could be improved by expanding it to neighboring streets. For ex, 3rd Ave is an eyesore and not friendly to pedestrians. 5th Ave also could be developed to have a similar look & feel to 4th Ave
- Don't worry about transportation. getting to downtown is already accessible. Maybe a shuttle for seniors
- Have the church move to buildings outside the downtown area, so that the space/buildings can be used to benefit and be enjoyed by the WHOLE community.
- Redevelop the paper mill property and ensure it is safe for mixed use development.
- If you want to expand charm, start pushing to get that downtown eyesore remediated....there's nothing charming about the unseen decades of pollution there.

7. Is there anything else you would like to share about the Our Camas 2045 process?
    - It looks great and like headed in the right direction for sure with focus on physical movement, getting people out of cars and more convenience for walking and social interactions and connectedness!
    - No more selling land to large developers who want to cram in big houses on small lots, and stop with apartment complexes!!!! Our roads and schools do not want more growth. People moved to Camas to get away from people!!!!!!

- Please add more community meetings and add the results of our (public) input to the website and follow up emails when we share our address
- Love that you're doing this and I'm super inspired to live in this community. I'd love to learn how to get involved and join you on this journey of making the vision the reality!
- The City is hemorrhaging other people's money. This has got to stop. We cannot keep spending on the backs of others.
- Camas is now a place our friends, family, credit union, etc. advise us to stay away from and build our lives elsewhere. It’s a shame what greed and development have done to our home.
- Applause for city planners, involving Camas residents in 20 yr. projections! Looking fwd. to hearing milestone efforts to sustain the lovely charm & character of Camas.
- great job thanks
- When you have meetings instead of breaking off into groups you could have various informed speakers talk about plans then take questions from audience as they sit on seats so everyone can hear
- Lacamas park needs to be specifically named and goals for its enhancement specifically outlined. Goals for bike infrastructure must include bike lanes with physical barriers that protect cyclists from cars otherwise most families will not utilize them
- I have to be honest, the Vision statement is terrible. "inclusive" is not relevant to Camas, and will be harmful to strategic planning. The rest of the vision statement is vague. The environment statement is acceptable but also redundant.
- Love that you are asking for input, and hope it is discussed and considered.
- The open house hosted in the lodge was a poor way to communicate information. Slides being shown without explanation and timed so quickly that you couldn't read all the info was disappointing. The noise in the room meant nearly shouting to be heard.

Our Camas 2045 Community Summit No. 2 Summary
October 22, 2024

Overview

On October 22nd, 2024, the City of Camas hosted *Our Camas 2045 Community Summit #2*, the second open house event for its *Our Camas 2045 Comprehensive Plan and Downtown Subarea Plan* process. The purpose of this event was to have community members comment on the draft land use alternatives, provide input on development scales, review development concepts for downtown, and learn about the County's climate planning efforts and Greenhouse Gas (GHG) inventory.

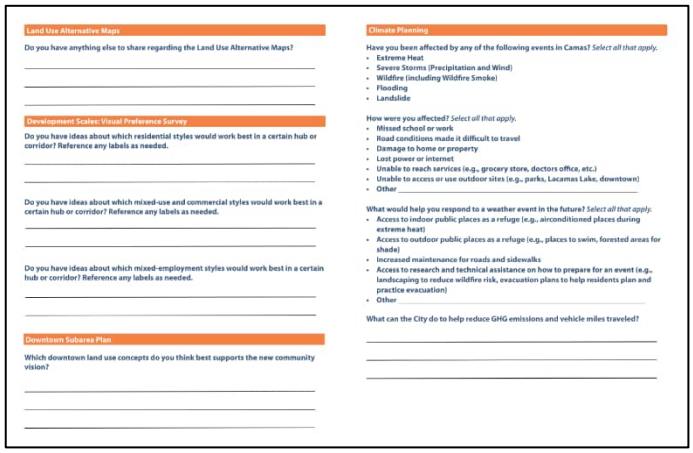
More than 45 community members participated in the event at the Camas-Washougal Fire Department Station 42, where kids activities and refreshments were provided.



The event was organized with stations set up around the room. Stations covered topics such as the *Our Camas 2045 Vision Statement and Outreach Draft Land Use Alternatives, Development Scales, Downtown Concepts, and Climate Planning.* Additional stations provided an overview of the project, and existing land use conditions for context.

Participant discussion and feedback was focused on the draft land use alternatives, a visual preference survey of development scales, and downtown redevelopment concepts. For the Draft Land Use Alternatives station, community members viewed proposed land use concepts through the lens of 'hubs' or 'corridors' and were asked if any key corridors or hubs were missing. The next station offered a visual preferences survey for different types of housing, mixed-use, commercial, and mixed-employment uses that could occur in a future land use alternative for Camas. The last station asked for community members to review several downtown redevelopment and streetscape concepts and offer their feedback. Each station included a project team facilitator, who took notes of the discussion on flipcharts and post-it notes. Comments and ideas were also captured through several sticky dot exercises (Appendix C) and in writing through a comment form (Appendix A). For people unable to attend the event, a complementary survey was available via the Engage Camas website. The results are available in Appendix B.





Land Use Alternative Maps

Do you have anything else to share regarding the Land Use Alternative Maps?

Development Scales: Visual Preference Survey

Do you have ideas about which residential styles would work best in a certain hub or corridor? Reference any labels as needed.

Do you have ideas about which mixed-use and commercial styles would work best in a certain hub or corridor? Reference any labels as needed.

Do you have ideas about which mixed-employment styles would work best in a certain hub or corridor? Reference any labels as needed.

Downtown Subarea Plan

Which downtown land use concepts do you think best supports the new community vision?

Climate Planning

Have you been affected by any of the following events in Camas? *Select all that apply.*

- Extreme Heat
- Severe Storms (Precipitation and Wind)
- Wildfire (including Wildfire Smoke)
- Flooding
- Landslide

How were you affected? *Select all that apply.*

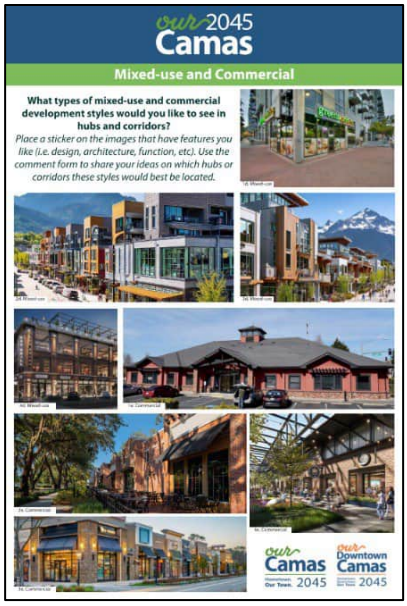
- Missed school or work
- Road conditions made it difficult to travel
- Damage to home or property
- Lost power or internet
- Unable to reach services (e.g., grocery store, doctors office, etc.)
- Unable to access or use outdoor sites (e.g., parks, Lacamas Lake, downtown)
- Other

What would help you respond to a weather event in the future? *Select all that apply.*

- Access to indoor public places as a refuge (e.g., airconditioned places during extreme heat)
- Access to outdoor public places as a refuge (e.g., places to swim, forested areas for shade)
- Increased maintenance for roads and sidewalks
- Access to research and technical assistance on how to prepare for an event (e.g., landscaping to reduce wildfire risk, evacuation plans to help residents plan and practice evacuation)
- Other

What can the City do to help reduce GHG emissions and vehicle miles traveled?

The comment form handed out at the event.



One of the Development Scales posters.

Summary of Feedback

The following sections summarize the feedback received, organized by station. This includes comments captured through discussion, comment forms and the online survey.

Draft Land Use Alternatives Station

- Most participants expressed a preference for the hub model over the corridor model. Hubs were seen as more conducive to building community, encouraging walkability, and creating spaces where residents could interact and engage in local activities. Many valued the small-town feel that hubs provide, allowing for easy access to daily needs. Some highlighted hubs as more suitable for a compact urban design, avoiding the downsides of corridor-style, car-dependent sprawl. Others noted that hubs would help concentrate community energy, drawing people to central, lively areas, which contrasts with the sprawling nature of corridors that might prioritize vehicular access and parking.
- Concerns around density varied, with some questioning whether downtown could accommodate higher-density development feasibly. North Shore residents voiced concerns about the need for a clear transition between rural/low-density areas and new, higher-density developments, with a preference for a tiered approach to prevent abrupt changes in character. Many participants expressed a desire to limit the height of downtown buildings to two stories, preserving the traditional aesthetic of the area. There was significant support for incorporating brick and other traditional materials in building façades, reinforcing Camas's historic character.
- Participants were also drawn to the idea of mixed-use developments that blend commercial and employment spaces. These were seen as essential for diversifying the local economy, creating jobs, and reducing the need for residents to shop or work outside the community. There was strong support for broadening the tax base with more commercial and retail

developments to limit the reliance on Vancouver and neighboring areas for goods and services. The potential for transforming certain underutilized properties, like the mill site, into community hubs was noted, with hopes that such projects could bring aesthetic and functional improvements to the area.

- Another priority highlighted was the importance of walkable, bike-friendly streets with green infrastructure like trees and traffic calming elements. Many participants preferred pedestrian-focused, multimodal streets with bike lanes, protected sidewalks, and transit stops that connect hubs and local neighborhoods seamlessly. Comments encouraged shifting away from auto-centric developments to form-based codes that prioritize building design and public space over specific land uses. Some attendees expressed support for removing parking minimums, which some felt hindered denser, more community-oriented development. The goal was to make hubs easily accessible on foot or by bike, fostering a community-centric lifestyle.
- Some residents advocated for single-level homes to better serve seniors and individuals with disabilities, reflecting the need for inclusive housing design. This aligns with broader suggestions that higher-density housing should be thoughtfully planned around schools and employment areas, making daily life accessible without excessive reliance on cars.
- Several residents identified specific areas that could benefit from hubs. Suggestions included developing a smaller hub at the intersection of NE Everett St and NE 15th Ave near Crown Park, enhancing the existing downtown hub, and possibly adding more hubs on Prune Hill to prevent it from being a predominantly residential area. These hubs would ideally incorporate small-scale commercial spaces, sidewalk cafes, and other community-friendly spaces. Participants noted the potential challenges of competing with Columbia Palisades but emphasized the importance of unique attractions in Camas's hubs to maintain their distinct character.

Visual Survey Development Scales Station

- ***Images of Residential Development***: The community noted the need for diverse residential options that cater to different life stages, from younger families to older adults. Brick and natural materials, paired with modern elements, are preferred for a classic look, while cottage styles were discouraged. Examples like 2a for low density and 3b for medium density (see Appendix C) — are favored in areas like North Shore, where a mix of front yards and green spaces preserve natural appeal. For central corridors like Everett, high-density options support walkability and community vibrancy without overwhelming the small-town feel. However, there's a desire to avoid towering structures near shopping areas to maintain an accessible scale. The taller buildings in Redmond, WA were cited as an undesirable style for Camas.
- ***Images of Mixed-Use and Commercial Development***: For commercial and mixed-use hubs, styles like 2d and 2e align with Camas's character by integrating small-town charm with urban functionality. Utilizing hubs in the North Shore and other regional areas are ideal for medium-density, mixed-use layouts that transition smoothly into surrounding neighborhoods. There's a strong preference for storefronts to encourage walkability and gathering spaces, as well as a

plaza near the lake, where green space and pedestrian paths promote community interaction.

- ***Images of Mixed-Employment Development***: Employment hubs should focus on smaller, adaptable buildings rather than large industrial complexes, prioritizing options like 4f and 5f with "Pacific Northwest" architectural elements. These styles align with local aesthetics by featuring sleek lines and natural materials that respect the environment, helping maintain the town's welcoming feel. Additionally, incorporating sustainable features such as green roofs or solar panels would reflect Camas's environmental values.

Downtown Sub-Area Plan Station

Land Use Concepts

- There was strong support for moderate increases in density, especially around key corridors like 3rd Avenue, where mixed-use buildings could create a lively blend of residential and commercial spaces. Many residents felt that recent apartment developments set an ideal example of density, offering a balance that complements the small-town feel. Some also embraced the idea of higher-density zones, provided they include greenspaces and plazas to support sustainability, community, and local businesses.
- Preserving the historic downtown core was a priority, with a consensus that growth around this area should retain its character. Medium-density wraps near downtown were preferred over high-rise developments, which participants felt could overshadow the town's charm. Interest in integrating the mill into plans also emerged, with suggestions to adaptively reuse the site for public and commercial spaces, such as condos, green areas, and farmers' markets, which would enrich downtown's recreational and social environment.
- Environmental considerations played a prominent role, with concerns that taller buildings could create perpetual shade, especially during winter. To maintain a pleasant downtown atmosphere, some recommended limiting taller structures to specific zones and designing south-facing facades with light-colored exteriors to reflect sunlight. Additionally, participants stressed the importance of using native plants to ensure street trees thrive in the urban landscape.

Transportation Concepts

- Transportation suggestions focused on pedestrian safety and traffic calming measures to make downtown more navigable for walkers and cyclists. The community largely opposed one-way street concepts, as these were seen as disruptive to local businesses and challenging for visitors. Instead, they advocated for improving bike connections to nearby neighborhoods and prioritizing pedestrian-friendly design, particularly on high-speed roads like NE 3rd Avenue.
- Efficient land use was a significant theme, with calls to reduce surface parking lots in favor of flexible parking solutions, allowing developers to tailor parking to actual needs. Participants felt this would improve land values, walkability, and sustainability. They also stressed the importance of greener, pedestrian-friendly streetscapes, with many favoring the Enhanced Streetscapes Option, which includes planting street trees for shade and aesthetics.

Street Enhancement & Development Studies

- Several residents specifically supported the 3rd Avenue Transformation, noting that a higher-density 3rd Avenue is preferred. Support was also shown for a Densified Downtown Street design.

Open Space Enhancements

- Community feedback revealed broad support for enhancing downtown Camas with more open and gathering spaces to create a vibrant, welcoming environment. Many participants highlighted the need for improvements to the Mill Ditch trail, which, while valued as a potential recreational asset, currently feels unsafe to some users. Residents would like to see the trail become more accessible, envisioning it as a well-lit, well-maintained pathway that connects community spaces.
- The idea of establishing a linear park along Dallas Street also received interest, as participants saw it as a way to add green space and promote walkability downtown. However, some raised concerns about the impact on on-street parking, suggesting a need to balance new open spaces with convenient access for residents, businesses, and visitors.

City Hall

- The community's feedback on Camas City Hall reflects a preference for podium parking to support a civic plaza. Residents see this as a valuable opportunity to introduce a central gathering space while maintaining essential parking capacity. The civic plaza concept received favorable feedback, especially for its potential to be located north of City Hall and offer open public seating, terraces for events, and green spaces for community gatherings.
- While most participants supported a three-story City Hall, some suggested a five-story design to maximize density without sacrificing the public plaza. The additional cost of podium construction and ensuring sufficient daylight for the northern-facing plaza were also raised. Suggestions included relocating City Hall south to 3rd Avenue to create more open space, and many community members looked to Bothell, Washington's City Hall as a model, appreciating its blend of podium parking and open public design.
- There was also a notable call for better parking options. Some people remarked that downtown currently has too much parking, while others noted the difficulty of finding parking for business employees with the existing two-hour limits. Underground parking emerged as a popular solution to both conceal and expand parking capacity, balancing the need for accessibility with the vision of a more walkable, less car-centered downtown.

<u>Climate Planning Station</u>

- There was discussion regarding stormwater management and tree canopy preservation. One resident referenced the North Shore development, expressing concern about how much of the existing tree canopy was removed. They worried that the new stormwater infrastructure, designed to direct water to an older system, may not withstand the increased flooding and extreme precipitation expected with climate change. This attendee questioned if there are any protective measures in place for existing tree canopies and restrictions on developers regarding

stormwater management to prevent overburdening outdated systems.

- Participants had questions about the building code, particularly whether it includes provisions for solar readiness or future wiring needs. Several participants asked for an update on the climate planning process, wondering if specific policies had already been drafted.
- Extreme heat, wildfires and wildfire smoke, and severe storms affected the most residents. The most common impacts were the loss of power or internet, damage to their home or property, and being unable to access or use outdoor sites. For ways that would help residents respond to a weather event, most residents noted the need for increased maintenance for roads and sidewalks, access to outdoor public places as a refuge, and access to indoor public places as a refuge.

Greenhouse Gas Inventory

- Community members emphasized increased use of electric vehicles (EVs) and suggested improving walkability to reduce dependence on car travel, particularly trips to Vancouver. Ideas included developing more mixed-use commercial spaces downtown and fostering a “shop local” culture to support area businesses and reduce transportation emissions.
- Transportation alternatives were another focal point. Residents advocated for safer pedestrian infrastructure, bike lanes, and more frequent public transit, emphasizing that these options should be of high enough quality to ensure actual usage. Many suggested connecting neighborhoods, particularly those isolated by current infrastructure limitations like Green Mountain, with safe, accessible routes to downtown. The feedback also revealed a strong interest in local job opportunities to reduce commuting. Some proposed strengthening partnerships with employers, particularly in fields like technology, to create high-quality, locally based employment options.
- Environmental initiatives were also highlighted, with suggestions for incorporating solar power in local energy strategies. One resident shared a personal account of their success with a solar roof and “power walls”, advocating for city policies that promote solar installations on rooftops and exploring biochar as a carbon sequestration tool. Others emphasized preserving existing trees, expanding green spaces, and promoting educational programs about reducing meat consumption, growing local food, and teaching young people about carbon footprints.

Natural Hazards

- Community feedback highlighted a strong interest in strategies to address the impacts of wildfire and extreme heat in Camas, with a particular focus on expanding green infrastructure. Many people expressed support for increasing shade and tree coverage, especially around schools, to mitigate heat effects on vulnerable populations.
- Participants voiced strong support for protecting Camas’s open spaces, recognizing their ecological value and the role they play in community well-being. This feedback emphasized the importance of preserving natural areas as part of Camas’s broader climate resilience efforts and integrating green infrastructure solutions across the community.

Our Camas 2045 Community Summit No. 3 Summary
January 12, 2026

Overview

Between September 15 and December 26, 2025, the City of Camas hosted *Community Summit #3* for its *Our Camas 2045 Comprehensive Plan* and *Our Downtown Camas 2045 Subarea Plan* process.

The Community Summit served as an engagement strategy to share the draft *Our Camas 2045 Comprehensive Plan* and *Our Downtown Camas 2045 Subarea Plan* with the community and help shape the next drafts and implementation actions. This summit included a mix of online engagement and in-person activities to provide community members with opportunities to review, ask questions, and provide feedback on each element (or chapter) of the draft comprehensive plan, including the Downtown subarea plan.

The City featured a different comprehensive plan element every two weeks by hosting an online survey and providing background information on the Engage Camas project websites. Summit materials (including posters, handouts, and the draft element) for each element featured during the Community Summit were available on Engage Camas. In-person engagement activities consisted of a presentation at a joint Strong Towns and Camas Earth Day Society event and a series of "Chat with a Planner" events where community members could connect with City staff.

The following figure shows the overall calendar for the summit.



Community Summit #3 Engagement Schedule

At the Strong Towns and Camas Earth Day Society event, City staff presented information on new statutory requirements for middle housing[1] (i.e., House Bills 1110 and 1337), existing zoning requirements for middle housing in Camas, and draft amendments to the City's development code and design standards (e.g., permitted unit densities, parking, dimensional standards, and unit types) to support middle housing development. Following the presentation, participants provided feedback on the following topics:

- Unit calculations and parameters for affordability;
- Accessory dwelling units (ADU), including ADU impacts to property values and proximity to neighboring properties;
- The paper mill and requirements for cleanup;
- Utility connections and fee requirements for multiple units on the same lot;
- Provisions for electric vehicles and incentives for solar technologies.

Summary of Feedback

The following sections summarize the feedback received from the online surveys hosted on the *Our Camas 2045* Engage Camas website.

Online Surveys

Each of the seven online surveys consisted of approximately 10 questions focused on actions the City could take related to goals and policies for each element. Participants were asked to review each action and consider, with the limited resources available to the City, whether it is an action the City should take. Each question included the following response options: Strongly Agree, Somewhat Agree, Neutral, Somewhat Disagree, and Strongly Disagree. Two open-ended questions also provided participants with an opportunity to share additional actions the City could consider, as well as their general thoughts on the element. The following sections summarize feedback received from each survey, organized by element. Elements with similar topics, such as Natural Environment and Climate, were administered in a combined survey and feedback covers both elements.

Community Character

Survey questions on the Community Character element were open from September 15 to September 28, and there were 36 respondents. Questions explored actions related to arts, culture, heritage, community identity, and community engagement.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
    - Provide development incentives (such as increasing lot coverage, density, or heights) for projects to protect natural topographic, geologic, vegetative, and hydrologic features and provide features such as tree-lined streets, rain gardens, and use of native landscaping.

[1] "Middle housing" refers to moderate density housing, with forms and densities that fall between single-family homes and multi-family buildings. Middle housing buildings are compatible in scale, form, and character with single-family houses but contain two or more attached, stacked, or clustered homes.

  - Develop educational and volunteer programs related to climate science and habitat conservation.
  - Develop a City education program to share information and educate the community on local government, city functions, and ways to engage with staff.

- In the open-ended questions, participants expressed an interest in promoting more community events downtown that feature arts and crafts or farmers markets. This includes offering more events in the winter and partnering with local school to establish art programs. Participants also mentioned the concept of aging in place and suggested that the City could consider pursuing BlueZone recognition. BlueZone is an organization that partners with local communities, health care providers, and cities to develop programs focused on well-being and human health. A general theme across the open responses included an interest in maintaining a small town feel and preserving open space areas and trees from development.

Housing

Survey questions on the Housing element were open from September 29 to October 12, and there were 50 respondents. Questions explored actions related to affordable housing, infill development, and zoning.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
  - Require large developments to dedicate a portion of lots/units for middle housing or ADUs as part of subdivision approval.
  - Offer financial assistance or programs to rehabilitate and repair existing housing stock.
  - Invest in existing neighborhoods to improve safety, accessibility, and livability while preserving neighborhood character.
- In the open-ended questions, participants suggested that additional actions for the City to consider could include supporting mixed-use on single family lots to increase the availability of neighborhood businesses and encouraging more infill development in existing neighborhoods to prevent sprawl and preserve natural areas. Additional suggestions for potential actions include revising the development code for ADUs to make construction and permitting more affordable. Respondents also expressed an interest in protecting rural and undeveloped areas from new subdivisions.

Natural Environment and Climate Resiliency

The joint survey on the Natural Environment and Climate Change & Resiliency elements was open from October 13 to October 26, and there were 15 respondents. Questions solicited feedback on actions related to clean water, trees, parks and recreation, trails, and climate resilience.

- The most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
  - Support cleanup efforts at the Camas Mill and other contaminated sites to protect natural resources and local water supply.
  - Develop a program (such as an Urban Forestry program) to prioritize the preservation of existing trees, develop new tree planting requirements, and support education and tree canopy data management.

  - Prepare a community wildfire protection plan that addresses wildfire prevention and requirements for fire resilient landscaping.
  - Implement targeted lake management actions to protect water quality and reduce harmful algae blooms in local waterways.

- In the open ended questions, participants suggested additional actions for the City to consider could include establishing wildlife corridors within neighborhoods, particularly at the periphery of the city, adding solar powered lights at locations throughout the city such as pedestrian crossings, involving community volunteers in environmental projects, implementing a notification system and emergency plan for wildfires , and implementing regular testing of PFAS chemicals (i.e., “forever chemicals”) in the city’s water supply. General feedback included respondents expressing interest in encouraging active modes of transportation (e.g., biking and walking), restoring native ecosystems, removing contaminants from the city’s water supply, providing space for wildlife, and preparing for wildfires.

Economic Development

Survey questions on the Economic Development element were open from October 27 to November 7, and there were 12 respondents. Questions explored actions related to local businesses, mixed-use areas, access to goods and amenities, and living-wage jobs.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
  - Partner with groups such as the Chamber of Commerce, Port of Camas-Washougal, and Columbia River Economic Development Council to proactively recruit new businesses and industries and ensure that tools and incentives are in place to attract and retain living-wage employment.
  - Launch an economic development grant program to support local business and provide incentives for new businesses and industries.
  - Encourage mixed-use zoning and neighborhood business districts to increase local access to goods and services, provide more efficient use of land, and link residents with employers and businesses.
- In the open ended questions, participants suggested that additional actions for the City to consider could include implementing incentives for small and medium-sized businesses, partnering with the Port of Camas-Washougal to provide more commercial space, revising the zoning code to not allow land zoned for commercial or industrial uses to be developed as residential uses, and providing incentives for more community spaces to allow for a meeting place for clubs and adult programs. General feedback from respondents included comments on accommodating future impacts of remote work, supporting the growth of small and medium-sized businesses, and encouraging diverse commercial and industrial uses.

Transportation and Public Facilities

Survey questions on the Transportation and Public Facilities elements were open from November 10 to November 21, and there were 8 respondents. Questions explored actions related to biking, walking, schools, utilities, and first responders.

- The top three most popular actions among participants, which included responses of Strongly

Agree or Somewhat Agree, were the following:

- Develop a Safe Routes to School program by partnering with the Camas School District to make active transportation safe and fun for children traveling to and from school.
- Incorporate sustainable design features (such as daylighting, solar, and green roofs) in existing and new public buildings.
- Update the City's Stormwater Design Standards Manual to include requirements for low-impact development or green infrastructure to reduce the amount of impervious areas in new development or redevelopment projects.

- In the open ended questions, participants shared that additional actions for the City to consider could include implementing more protected bike lanes, fixing gaps in the sidewalk infrastructure, considering policies to limit light pollution, requiring the development community to provide safe bike and pedestrian infrastructure, and protecting groundwater recharge areas. General feedback from respondents focused on either prioritizing bicycles and pedestrians or only vehicles. This contrasting feedback included respondents who are interested in expanding bike and pedestrian infrastructure as well as those who would prefer to use funding for improvements to roadway facilities to limit congestion.

Land Use

Survey questions on the Land Use element were open from November 24 to December 5, and there were 47 respondents. Questions explored actions related to housing, public services, employment and recreational uses.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
  - Update the City's development code to incorporate design standards that are sustainable and support low climate impact. Sustainable and low climate impact design standards include things like native landscaping, energy and water efficiency standards, use of non-toxic materials in construction, and site optimization to preserve green space.
  - Collaborate with partners to encourage community events, signage, and public art that celebrate the unique identities of different areas of the city.
  - Prioritize mixed use development that encourages small businesses, provides a mix of housing types, increases pedestrian and transit connections, and includes environmentally sensitive design.
- In the open ended questions, participants shared that additional actions for the City to consider could include constructing a public disc golf course, implementing parking reform, purchasing or facilitating the purchase of right of ways, acquiring easements and land transfers for bike and walking paths, providing more youth sports facilities and parks, and increasing public access near Lacamas Lake. General feedback included preserving green spaces, providing more open space, limiting growth, and aligning transportation improvements with land use plans.

Downtown Camas

Survey questions on the Downtown Camas subarea plan were open from December 8 to December 26, and there were 5 respondents. Questions focused on potential policies and incentives that could be implemented in Downtown Camas related to transportation, housing, development regulations, and

local character.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
    - Partner with local artists to create public art, murals and other interactive elements in Downtown and require new developments to provide public art.
    - Require active ground floor uses (commercial or public space) and engaging street level design (pedestrian accessible) in the Historic Main Street Core area of Downtown.
    - Develop a parking management plan for Downtown to ensure there is adequate parking for Downtown businesses and residents, and explore options for shared use parking and offsite (edge of Downtown district) parking facilities that could serve as a park and ride transit facility.
- In the open-ended questions, participants suggested that additional actions for the City to consider could include improving pedestrian crossings with flashing beacons (e.g., a crosswalk at Garfield and 6th), revising parking requirements, and establishing a parking benefit district to charge for on-street parking. General feedback included an interest in creating safer pedestrian and bicycling infrastructure, preserving the small town and working-class culture of Camas, improving curb management, refining parking requirements, and keeping Camas affordable.

Conclusion

The seven online surveys recorded responses from over 150 respondents from the community on the draft comprehensive plan and Downtown subarea plan. Surveys on housing and land use gathered the most responses with general feedback focusing on preserving existing open space as well as support for actions to encourage growth in developed areas of the city such as infill and mixed-use development or ADUs. Feedback from the Community Summit will be used to inform refinement of the draft comprehensive plan and Downtown subarea plan, including potential revisions to goals and policies, and the identification of future implementation actions.

Comprehensive Plan Update and Downtown Subarea Plan
Community Advisory Committee (CAC)

CAC Meeting #1
February 6th, 2024, 6:00- 7:30 PM
City of Camas City Hall – Council Chambers
616 NE 4th Avenue, Camas, WA 98607

AGENDA

Time	Subject	Lead
6:00	Welcome and Introductions • *What do you love about Camas and why do you want to be on this committee?*	Alan Peters, City of Camas
6:15	*Our Camas 2045* and *Our Downtown Camas 2045* Project Overview • City goals and objectives • What is a Comprehensive Plan and Downtown Subarea Plan? • Process and Equity Framework • Key Milestones and schedule	Alan Nicole McDermott, WSP
6:30	CAC Roles and Responsibilities • Review charter • Other project committees (DCA and Climate)	Anaïs Mathez, 3J Consulting
6:40	Public Participation Plan (PPP) • Stakeholder list	Anaïs
6:50	CAC Community Conversation Kit and Group Discussion • Community Conversations Kit • CAC role and responsibilities • CAC Discussion	Anaïs CAC Members
7:20	Next Steps • Community Conversations sign-up • General meeting logistics	Nicole
7:30	Adjourn	Alan

Community Advisory Committee (CAC)
Meeting Summary #1

February 6th, 2024, 6:00-7:30 PM

Meeting Attendance
Alicia Brazington
Betty Peng
Brian K. Kuhta
Carol Collier
Carrie Schulstad
Colin Casad
Greg K. Anderson
Heidi Buhman-McNeley
Jason Irving
Kim Sogge
Matthew Clarkson
Richard "Rick" Melching
Samantha Horner
Stephanie O'Dell

Marlo Maroon – *Planning Commission Liaison*
Bonnie Carter – *City Council Liaison*
Steve Hogan – *Mayor*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Yvette Sennewald, Planner

Consultant Team
Nicole McDermott, WSP
Aaron Carpenter, WSP
Margaret Raimann, SERA Architects
Matthew Arnold, SERA Architects
Anais Mathez, 3J Consulting

Welcome and Introductions
Mayor Hogan provided opening remarks. All attendees were invited to introduce themselves and share what they love about Camas and why they want to be on this committee. CAC members shared the following opening reflections:

What do you love about Camas?
- Beautiful place to raise kids
- Downtown walkability
- Love the natural beauty, trail system and tree canopy
- Love the small-town feel, recreation opportunities, sense of uniqueness, and protection of architectural integrity
- Parks, recreation, open space
- Neighbors, school district
- Love the regional accessibility and natural spaces
- Enjoy going to movie theatre, and the downtown isn't overrun
- Legacy/heritage/generational
- It feels safe, clean, and beautiful
- It's like "living in a Norman Rockwell painting"
- Proximity to airport

Why do you want to be on the committee?
- Civic duty
- Desire to serve the community
- Seen bad plans, seen good plans – want to lend expertise (background in civil engineering)

- Be a part of growth, not just haphazard growth
- As a former planning commissioner, witness to gaps in policy, and "NIMBYism". Desire to see housing that is affordable, equitable, for low to middle income families
- To honor past but intentionally move forward – desire to communicate what we can do versus what is beyond our control
- Wants to ensure the right kind of growth
- Advocate for people who are under-represented
- Desire to integrate newcomers with generational families. Advocate for affordable housing
- Interest in downtown
- Interested in bringing more housing to downtown
- Have background in real estate and interested in understanding the changes in Camas
- Desire to see better job growth

Our Camas 2045 and _Our Downtown Camas 2045_ Project Overview

Alan Peters, Community Development Director, provided an overview of the City's goals and objectives for the Comprehensive Plan and Downtown Plan, touching on topics like housing, economic development, climate, and downtown. Robert Maul, Planning Manager, described the role of the City's Comprehensive plan and the regulatory framework. Nicole McDermott, WSP, provided an overview of the project process, describing each phase of work from the existing conditions analysis, equity framework, visioning outreach, plan development, implementation and to eventual adoption. Nicole reviewed key milestones and the overall project schedule. CAC members asked the following clarifying questions:

- *Is there work outside of the City that is being done alongside this process?* Clark County provides population projections and works with communities in Urban Growth Areas (UGA)/unincorporated areas. Neighboring municipalities are going through the same periodic update requirement.

CAC Roles and Responsibilities

Anais Mathez, 3J Consulting, reviewed the CAC Charter. She discussed the Committee's roles and responsibilities, and described the function of other project committees, such as the Project Advisory Committee (PAC) and the Climate Policy Advisory Team (CPAT). She noted that CAC members are expected to meet eight times over the course of the next year. The meetings will cover the comprehensive plan and the downtown plan. CAC members had no questions or comments.

Public Participation Plan

Anais reviewed the draft Public Participation Plan (PPP). She described the engagement objectives and key project messages. She reviewed the draft stakeholder list, clarifying that the list is not meant to be exhaustive and represents a variety of interests and ways in which the City will engage community members in the process. Anais asked CAC members if they had additional ideas. CAC members offered the following additional stakeholders and partners to the list:

- Vancouver NAACP
- Boys and Girls Club
- Meals on Wheels
- Book clubs (through Camas Library)
- SW Washington League of United Latin American Citizens (LULAC)
- Non-school youth (4-H, Boys/Girls Scouts, STEM clubs, Sports Little League/Swim, etc.)
- Booster Club
- CEF (Camas Educational Foundation)

- Camas/Washougal Gardening Group
- Bike Clark County
- Other franchise utility companies (fiber)
- School of Blind/Deaf (Vancouver/Clark County) for Accessibility

Anais then reviewed the engagement activities and communication tools. CAC members had the following questions, clarifications and comments:

- Consider adding a performance metric or evaluation criteria in the draft PPP to ensure we are reaching all members of the community.
- *Will all engagement activities and tools (post cards, summits, online surveys) be used or are they just suggestions?* All activities and tools listed in the PPP will occur throughout the course of the project.
- *What outreach will we do with schools?* The consultant team will conduct Community Conversations with High School students through classes and clubs such as AP Government, Student Council, etc. A Tracking Log for Community Conversations will be shared with the CAC, which will be helpful to see which groups we are reaching, and when.
- *Does the online survey describe what we are doing with the information?* Yes, the survey describes how the feedback will inform the development of a Vision Statement. This Vision Statement will set the framework for policy making in the Comprehensive Plan and Downtown Subarea Plan.
- *What is the role of CAC members in directing discussion during a Community Conversation?* CAC members are encouraged to lead with a positive tone and are simply gathering and recording information, even if the discussion turns negative.
- *How do you account for over-representation in the online survey?* The visioning activities like the survey are qualitative, not quantitative (i.e. no statistical validity). The purpose of these outreach activities is to share information and have a wide variety of conversations through various mechanisms, in order to get a pulse of community aspirations and priorities. Qualitative, not quantitative review process.
- *Is there a "NextDoor" strategy? How engaged do we get on social media?* The City monitors social media and NextDoor. CAC members are welcome to share information out by linking to the EngageCamas website through their various channels.
- *What is the purpose of city-wide mailers?* The mailers are a communication tool. Mailers will be timed to announce the launch of the project and upcoming opportunities to get engaged, either by taking the online survey or attending a Community Summit. CAC members have a large role in overall outreach and engagement, ensuring we receive quality feedback and are able to extend the reach across many networks.

CAC Community Conversation Kit and Group Discussion

Anais covered the community Conversations Kit and Tracking Log, describing the method, approach and objectives. Due to limited time, CAC members did not have a chance to engage in a "Community Conversation." Staff will assess the next meeting agenda for time to conduct a group discussion.

Next Steps

Nicole reviewed next steps and general meeting logistics. The purpose of the next meeting will be to review the Equity Framework, Existing Conditions, and discuss initial feedback received through the survey and Community Conversations. Anais reminded CAC members to see her after the meeting for questions regarding the Community Conversations Kit and Tracking Log.

- CAC members agreed that the meeting day and time generally works, though one member suggested that the team consider starting these meetings earlier than 6pm.
- *Can CAC members receive key project and meeting materials via GoogleDrive?* Yes, the team can set up a file-sharing platform. Materials will also be posted to the EngageCamas website following the meetings.

Project staff thanked the committee for their attendance and adjourned the meeting at 7:45pm.

Comprehensive Plan Update and Downtown Subarea Plan
Community Advisory Committee (CAC)

CAC Meeting #2
March 26th, 2024, 6:00- 7:45 PM
City of Camas City Hall – Council Chambers
616 NE 4th Avenue, Camas, WA 98607

AGENDA

Time	Subject	Lead
6:00 (5min)	Welcome	Alan Peters, City of Camas
6:05 (10)	Visioning Outreach Updates • Website and survey • Community conversations • Upcoming events and activities	Anais Mathez, 3J Consulting
6:15 (30)	CAC Community Conversation • Group Discussion • Kit + tracking log reminders	Anaïs CAC Members
6:45 (20)	Existing Conditions • Demographics and Community Character • Regulatory Documents • Parks, Trails, and Open Space • Climate • Utility Infrastructure and Capacity • Transportation Network	Nicole McDermott, WSP
7:05 (15)	Equity Framework • Examples • Group Discussion – What should this look like for Camas?	Nicole
7:20 (15)	DCA Mapping Opportunities & Constraints • Group Discussion	Nicole

7:35 (10)	Next Steps • Community Conversations sign-up • General meeting logistics	Anaïs, Nicole
7:45	Adjourn	Alan

Community Advisory Committee (CAC)
Meeting Summary #2

March 26th, 2024, 6:00- 7:45 PM

Meeting Attendance
Betty Peng
Brian K. Kuhta
Carrie Schulstad
Colin Casad
Greg K. Anderson
Heidi Buhman-McNeley
Jason Irving
Kim Sogge
Matthew Clarkson
Richard "Rick" Melching
Samantha Horner
Stephanie O'Dell

Bonnie Carter – *City Council Liaison*
Steve Hogan – *Mayor*

City Staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Yvette Sennewald, Planner

Consultant Team
Nicole McDermott, WSP
Aaron Carpenter, WSP
Anais Mathez, 3J Consulting

Welcome and Introductions

Alan Peters, Community Development Director, opened the meeting and welcomed CAC members.

Visioning Outreach Updates

Anais Mathez, 3J Consulting, provided updates on the visioning outreach. Anais shared that the online survey and interactive map received over 250 responses, collectively, and that web traffic was high. She reviewed the list of Community Conversations that had been conducted, and asked CAC members for any reflections on the discussions they've been having. CAC members offered the following comments and questions:

- We've been talking about this project for a long time, but the excitement is still there. Happy for looking towards change and growth. Love downtown but know it needs to grow and grow right.
- We need to get past 'why do we have to grow' questions and get into 'what does growth look like' for the required housing and employment.
- One question from the Community Conversation was why the City is asking us what we want if they already know what is going to happen? *This is an opportunity for CAC/City to point out the change/influence these conversations/input has on the planning process.*
- Do we have goals/metrics for survey feedback responses? *The updated Public Participation Plan (PPP) includes metrics, but we are generally focused on quality over quantity.*

- Could we have talking points for FAQ/Key messages/ "soundbites"? *The PPP has key messages but a reminder that as a CAC facilitator, you don't have to have all the answers. You are mainly there to encourage discussion and capture notes.*

Anais shared that the project team hopes to wrap up Community Conversations by May, given that the Summit will report out on this feedback and that will occur in June.

CAC Community Conversation

Anais led the group through a Community Conversation and took notes on a flipchart while CAC members shared the following reflections:

What makes Camas, including our historic downtown, special today?

- People knowing/supporting each other
- Close-knit downtown business community
- Great schools
- Family Friendly
- Close to nature (paths, lake, parks)
- Clean and Safe
- Don't see a homeless problem (new residents)
- Downtown acts as living room – expands social fabric
- Events bring people downtown, and they come back for the businesses
- Compact, walkable, accessible (balanced with proximity to nature, but access to 205/14/PDX airport)
- Authentic historic charm (architecture, mill town history, "Hallmark movie")
- Library programing, Youth Sports programming
- "We pass all our bonds"

What about Camas would you like to change in the future??

- Better access to waterfront (Washougal) - waterfront redevelopment (what Vancouver has done)
- More sidewalks! Near schools, Prune Hill, main thoroughfares.
- Housing downtown
- Housing choice / variety
- More neighborhood commercial to scale (hubs)
- More pocket parks, dog parks
- More jobs/better jobs/ career jobs for youth
- More bike-ability, crosswalks, traffic diet
- Improve/expand utilities and infrastructure (stormwater)
- More parking downtown, especially for events ("what's reasonable for walking distance?", shuttles, accessible for elderly, disabled)
- Transit
- More and better connected trails

- Retain community events (July 4 fireworks, farmers market)
- Maintain facilities/parks/trailheads
- Architectural integrity/design standards

What people, groups, or communities should be involved in this process?

- Chamber of Commerce
- Engage other neighborhoods
- Youth – Boy/Girl Scouts, Teen involvement (HS)
- Senior voice needs representation (AARP)
- New residents (need connection, have different/outside views)
- Legacy residents (those having hard time with growth)
- Renters

Existing Conditions

Nicole McDermott, WSP Project Manager, provided an overview of the City's existing conditions. She reviewed data, topics and elements that will be incorporated into the Comprehensive Plan, like community character; population and employment projections; regulatory documents; natural environment; climate change; parks, trails, and open space; utility infrastructure and capital facilities; and transportation. CAC members offered the following comments and questions:

- *Why are there more jobs projected than housing?* They aren't connected in the County modeling, just based on the vacant buildable lands.
- *How has county factored in hybrid/WFH jobs?* The County has made a few adjustments to account for newer employment trends.

Equity Framework

Nicole reviewed the draft Our Camas 2045 Equity Framework. She described how the Equity Framework can guide equity considerations for the Comprehensive Plan update. The Equity Framework will be developed with the CAC based on committee and community input. She shared examples of Equity Frameworks from the City of Vancouver and King County. Nicole offered the following discussion questions:

- What resonates with you about the equity frameworks?
- How would you define Equity? Does the City or another organization currently have a definition?
- What are potential measures of success for equitable outcomes? Can climate adaptation (policies, goals, strategies, etc.) be considered a measure?
- What people, groups or communities should we reach to make this an inclusive process?

CAC members offered the following comments and questions:

- What is equity framework in general? *It's an opportunity to reflect on and confirm that we are hearing from the communities that we identified, throughout the entire process*
- I understand there unequitable policies are historic and systemic - will we inventory unequitable policies, permitting processes, etc.? *Yes, the Equity Framework can set metrics to*

make sure we are reviewing these policies.

- Hopefully the language used in the comprehensive plan is fair. "Keep Camas Camas" / "Our Camas" has different connotations and may be racially coded.
- We would be behind the times without an Equity Framework. I agree that we want equitable outcomes and buy-in from everyone. We need to ensure we hear from everyone we say we want to hear from.
- Let's involve diverse voice in process.
- Equity outcomes can look like:
    - Updates to codes/policies for obvious inequitable language.
    - Assessing if design standards preserve equitable access to parks/nature for elderly, disabled, BIPOC, lower income.
    - An improved sense of belonging.
- Audit the language and terminology in policy language
- Climate adaptation policies are important for measuring success of equitable outcomes but feels limited.
- We need to be clear in our public involvement process that we are reaching the people we want to reach.
- Equity Committee can contribute to reviewing language.
- Other measures of success include:
    - Housing choice.
    - Design standards for parks for ADA accessibility and play for all abilities.
    - Access to parks.
    - Borrow equity and "belonging" work done by the school district and incorporate in our outreach.
    - Built environment – improved capacity of civic spaces, city hall, etc.

DCA Mapping Opportunities and Constraints

Nicole provided an update on the mapping exercise conducted with the DCA on March 20th. The exercise was an initial evaluation of opportunities and constraints to consider for Downtown Camas over the next 20 years. The following comments were shared:

- Downtown Core is generally agreed, but there are additional downtown areas, sectors, areas of influence that should be accounted for.
- Area south of 3rd/2nd Street are disconnected from downtown core.
- Relocating traffic patterns to increase safety, development opportunities.
- Downtown needs better access to greenspace/new greenspace.
- The mill ditch should be reimagined.

Next Steps

Nicole reviewed next steps and general meeting logistics. Anais reminded CAC members to see her after the meeting for questions regarding the Community Conversations Kit and Tracking Log. Project staff thanked the committee for their attendance and adjourned the meeting at 7:45pm.

Comprehensive Plan Update and Downtown Subarea Plan
Community Advisory Committee (CAC)

CAC Meeting #3
June 4th, 2024, 5:30-7:30 PM
Zellerbach Administration Center - Board Meeting Room
841 NE 22nd Ave, Camas, WA

AGENDA

Time	Subject	Lead
5:30 (5 min)	Welcome and Introductions	Alan Peters, City of Camas
5:35 (15 min)	Project Updates • Visioning outreach updates • Downtown Opportunities and Constraints • Equity Framework • Project schedule	Nicole McDermott, WSP
5:50 (15 min)	Key Themes and Visioning Outreach • Activities and events • Key themes	Anaïs Mathez, 3J Consulting
6:05 (15min)	Our Camas 2045 Draft Vision Statement • Group Discussion – Are we on the right track? Is there anything missing?	Anaïs CAC Members
6:20 (50 min)	Our Camas 2045 Draft Goal Statements • Small Table Discussions – How do we achieve the vision?	Anaïs Nicole CAC Members
7:10 10 min	Report Out • Report out from each small table discussion	CAC Members
7:20 (10 min)	Next Steps • Community Summit on June 12th! • CAC Meeting #4, June 26th • Upcoming events and activities • Major milestones/project schedule	Nicole
7:30	Adjourn	Alan

Community Advisory Committee (CAC)
Meeting Summary #3

June 4th, 2024, 5:30- 7:30 PM

Meeting Attendance

Shannon Vizenor
Alicia Brazington
Betty Peng
Brian K. Kuhta
Greg K. Anderson
Heidi Buhman-McNeley
Jason Irving
Matthew Clarkson
Richard "Rick" Melching
Samantha Horner
Carol Collier

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Yvette Sennewald, Planner

Consultant team
Nicole McDermott, WSP, Inc.
Aaron Carpenter, WSP, Inc.
Anais Mathez, 3J Consulting

Welcome and Introductions
Alan Peters, Community Development Director, opened the meeting and welcomed CAC members.

Project Updates
Nicole McDermott, WSP, reviewed the agenda and provided project updates. Nicole touched on the visioning outreach activities and downtown opportunities and constraints. CAC members offered the following comments and questions:

- What's the difference between 'limited growth opportunities' vs. 'perceived development barriers'? *This reflects low vacancies/high turnover vs. redevelopment costs with old buildings.*

Nicole reviewed the draft equity framework and asked for the CAC to send additional thoughts, edits and questions to Alan by the following week. She explained that the draft definition of "equity" is specific to *Our Camas 2045,* but a similar framework is used in many current comprehensive plans. CAC members offered the following comments and questions:

- It is interesting to see small businesses identified as a group in the Equity Framework. Why is this? *Small businesses can be negatively/disproportionately affected by development changes, especially in downtown.*
- It would be good to better define "small businesses" for the purposes of this Equity Framework.

Visioning Outreach Updates
Anais Mathez, 3J Consulting, provided updates on the visioning outreach. Anais shared that the online survey and interactive map received over 500 responses collectively, and that web traffic was high. She reviewed the list of Community Conversations that had been conducted, and staffed community

events. CAC members reviewed a list of key themes gleaned from the compiled feedback throughout all of the outreach. CAC members offered the following comments and questions about the key themes?

- How often did the question of adding a school/high school come up? *The comment about a second high school was relatively infrequent. Most comments were themed around retaining the small-town feel and historic nature of downtown.*
- The school district recently put out a video about one of their properties. Is that connected to this process? *That is separate. The school district launched their own public engagement process to gather ideas for what to do with that property.*
- What waterfront are people referring to in their comments? *Likely the Mill property. Access to water, parks, and open space is a key theme throughout.*
- We see a lot of discussion about the church property downtown. *Yes, this is a hot button topic.*

Draft Our Camas 2045 Vision Statement

Anais described how key themes from the outreach were incorporated into the draft vision statement. She read aloud the four themes that make up the vision statement. CAC members offered the following comments and reflections:

Community Pride/Connection

- We might be too specific on community amenities. Visions should be more general and goals/policies more direct.
- Pets aren't mentioned.

Environment, Natural Beauty and Outdoor Recreation

- Check the wording of the phrase *"…mitigate increasing natural hazards…"*
- Add mention of "parks."
- Include an opening/closing statement for each theme.

Housing and Economic Development

- Interspersing residential areas with commercial is a tough move for the city. This might be more doable in Downtown and North Shore.
- Add more focus on growth and accommodating future residents.

Downtown

- Add more focus on growth.
- Public transportation is missing – accessibility and connectivity doesn't necessarily cover public transportation.

Other general comments included:

- The vision statement is very long. Consider shortening it.
- Consider bolding the first sentence of each statement.
- Consider updating the titles of each theme.
- Include a summary or list of topics that each vision theme covers. This could be added to the matrix.

Our Camas 2045 Draft Goal Statements: *Small Table Discussion Activity*
CAC members organized themselves into small groups to review draft goal statements for each theme and identify ideas for achieving the vision and goals. Each group reported back on the following ideas:

Community Pride

- Create an arts commission
- Incorporate more art murals. Distinguish between art for art vs. art for cultural heritage. This is also a point of discussion for the Equity Framework.
- Promote more events outside of downtown.
- Partner with the school district for mutual use facilities (pools, parks, etc.)
- Develop a Communication/Engagement Plan. Neighborhood Associations have a communication role with residents.
- Identify cultural heritage and provide educational history beyond the mill
- Construct public gathering spaces.

Environment

- Develop an urban forestry board with staff
- Create a Heritage Tree program
- Ensure parks are within walking distance to all neighborhoods
- Develop more EV parking.
- Expand dog parks
- Place more deer crossing signs
- Underground utilities
- Encourage the use of sustainable building materials

Housing and Economic Development

- Develop specific street standards
- Add more flexibility to design standards
- Develop more multifamily housing around schools for walkability
- Embracing middle housing/ADU development
- Utilize available land (across from Lacamas Lake)
- Expand transit services
- Remove parking requirements for high density housing
- Add solar panels to all city buildings

Downtown

- Downtown design review committee
- Architectural review committee
- Allow ADUs with minimal design requirements
- Construct a public plaza
- Revise design standards
- Expand tree planting efforts
- Encourage more street activities

Next Steps

Anais reviewed next steps. She reminded CAC members of the Community Summit on June 12th, from 4:30-6:30pm. The public will have an opportunity to provide similar feedback and ideas for the Vision and Goals. Anais also reminded CAC members that the next CAC meeting will be on June 26th from 5:30-7:30. That meeting will focus on the HNA/EOA Needs Assessment, reviewing feedback from the Summit, and conducting a mapping activity. Project staff thanked the committee for their attendance and adjourned the meeting at 7:30pm.

Comprehensive Plan Update and Downtown Subarea Plan
Community Advisory Committee (CAC)

CAC Meeting #4
June 26, 2024, 5:30-7:30 PM
Zellerbach Administration Center - Board Meeting Room
841 NE 22nd Ave, Camas, WA

AGENDA

Time	Subject	Lead
5:30 (5 min)	Welcome and Introductions	Alan Peters, City of Camas
5:35 (5 min)	Community Summit #1 Debrief	Anaïs Mathez, 3J Consulting
5:40 (15 min)	Revised *Our Camas 2045* Vision and Goal Statements	Anaïs
5:55 (40 min)	Review of Housing Needs Assessment (HNA) and Draft Economic Opportunity Analysis (EOA)	Tyler Bump, ECONorthwest
6:35 (50 min)	Land Use Alternatives Workshop • Overview • Mapping activity • Report back	Nicole McDermott CAC Members
7:25 (5 min)	Next Steps • CAC Meeting #5 • Upcoming events and activities • Major milestones/project schedule	Nicole
7:30	Adjourn	Alan

Community Advisory Committee (CAC)
Meeting Summary #4

June 26th, 2024, 5:30- 7:30 PM

Meeting Attendance
Carol Collier
Alicia Brazington
Betty Peng
Brian K. Kuhta
Greg K. Anderson
Heidi Buhman-McNeley
Matthew Clarkson
Richard "Rick" Melching
Samantha Horner
Kim Sogge
Carrie Schulstad
Bonnie Carter (City Council)

City staff
Alan Peters, Community Development Director
Yvette Sennewald, Planner
Doug Quinn, City Administrator
Carey Certo, Administrative Support Assistant

Consultant team
Nicole McDermott, WSP, Inc.
Aaron Carpenter, WSP, Inc.
Anais Mathez, 3J Consulting
Tyler Bump, ECONorthwest

Welcome and Introductions
Alan Peters, Community Development Director, opened the meeting and welcomed CAC members.

Project Updates
Anais Mathez, 3J Consulting, reviewed the agenda and provided project updates. Anais recapped the Community Summit #1, reviewing key topics of conversation which are outlined in CAC packets. She asked for reflections from CAC members who were present at the summit. CAC members offered the following comments:

- There did not seem to be enough talk about economic development.
- The Visioning board was a helpful explanation for people.
- Attendees seemed to have left with a more hopeful outlook.
- The frequency of comments regarding the lack of sidewalks was interesting and surprising.

Anais reviewed the updated vision statement, focusing on key changes made since the last CAC meeting. CAC members offered the following comments and questions:

- "Library and sports programing" may be limiting in the *Our Community* statement; we may consider keeping it broader.
- "Clean water" was added back in the *Our Environment* statement, based on feedback from CAC and Summit.
- A specific goal should be added for clean water.
- There is a typo in the goal statement for Downtown; add "in" to "downtown" in the third goal.

Anais clarified that the goal statements have not changed, but new goals will likely emerge as we continue in the process. Alan will bring the revised Vision Statement to City Council for adoption by resolution on July 15th.

Housing Needs Assessment/Economic Opportunities Analysis Overview
Tyler Bump, ECONorthwest, provided an overview of Camas' economic, market and housing opportunities. He reviewed the City's competitive advantages and key findings from the data analysis. Tyler noted that Camas has high retail sales, rising retail rents, and positive retail absorption. Downtown activity is back to pre-pandemic levels. He also discussed Camas' projected needed housing targets and the role of the Comprehensive Plan in meeting these targets. Discussion with the CAC focused on how which economic opportunities should be prioritized and how the City should support existing and new business. CAC members offered the following comments and questions:

- What's the jobs-to-housing ratio across the region? What is a good ratio? *Washington County is 0:9, Portland is 1:3, and Camas is 1:1, so Camas is well balanced. You can't grow housing without growing the economy.*
- Is Camas an outlier with at-home jobs? *About 25% of workers in Camas are remote. That's important to talk about in regard to local services and amenities.*
- How current is the tax data? *It is from 2022, capturing the upswing of the pandemic.*
- Is there a way to prioritize tax-generating revenue? *That can be a policy – target specific types of jobs/industries that generate higher tax revenue. A balanced mix of industries is healthy/resilient to market shifts, so a policy around a diversified economy would be smart.*
- Is there a way to grow the footprint of the downtown area? *There is room for growth in the downtown core and its edges. The downtown subarea plan will support this. Neighborhood hubs can add commercial nodes in other areas throughout the city.*
- Policies need to support housing growth and not succumb to NIMBY-ism ("not in my backyard") when affordable/dense housing comes up.
- We need to educate the community that housing choices are needed to meet the County and State target numbers.
- We need to ensure the implementation of zoning/policies can deliver these housing targets. This also becomes a communication project to tell the stories of people moving out because they can't afford to live here.

Our Camas 2045 Mapping Activity *Small Table Discussion Activity*
Nicole McDermott, WSP, shared directions for the mapping activity. CAC members organized themselves into small groups to review a large map of Camas and discuss desired future land uses, transportation connections, and areas for preservation. CAC members used different colored stickers representing different land uses and colored markers to identify trails, bike routes, transit and road connections, as well as areas for parks, nature and preservation. At the end of the mapping activity, each group reported back on the key ideas from their group:

- Promote a village feel at Pacific Rim – extend the transit route to redirect people towards downtown Camas instead of Vancouver.
- Create a connected trail out of the Mill Ditch.
- Develop a walking trail from the high school.
- Revitalize the ballfields.
- Develop the Mill into a park area surrounded by mixed-use buildings.
- Consider higher density housing near the Costco, Walmart, and school.
- Extend transit and bike lanes to connect the isolated parts of the City and create a loop around Camas.

- Create downtown connections to the Port, Oak Park and the Port of Camas-Washougal.
- Consider higher density housing and mixed use near the intersection of 38th and Parker
- Construct a downtown gateway element on 6th Avenue.

Next Steps

Nicole reviewed next steps. The CAC will meet again in early August to continue the discussion of future land uses. The CAC's feedback will be used to revise conceptual land sue alternatives to bring to Summit #2 in the fall. CAC members offered the following feedback on the mapping exercise for future use:

- Include planned development and new development on the map
- Add landmarks and street names to the map
- Identify areas that cannot be developed or changed.

Alan will follow up by email regarding dates for the next meeting in August. Nicole thanked the committee for their attendance and adjourned the meeting at 7:30pm.

Comprehensive Plan Update and Downtown Subarea Plan
Community Advisory Committee (CAC)

CAC Meeting #5
August 12th, 2024, 5:30-7:30 PM
Camas Public Library - Eva Santee/Nan Henriksen Meeting Rooms
625 NE 4th Ave, Camas, WA

AGENDA

Time	Subject	Lead
5:30 (5 min)	Welcome and Introductions	Alan Peters, City of Camas
5:35 (5 min)	Debrief of Camas Days	Aaron Carpenter WSP
5:40 (10min)	Overview of Draft Land Use Alternatives	Aaron, Nicole McDermott, WSP
5:50 (60 min)	Breakout Groups: Discussion of Draft Land Use Alternatives • Evaluating draft alternatives against draft goal statements	Anaïs Mathez, 3J Consulting CAC Members
6:50 (30 mins)	Report Back	CAC Members
7:20 (10 min)	Next Steps • CAC Meeting #6 • Upcoming events and activities • Major milestones/project schedule	Nicole
7:30	Adjourn	Alan

Community Advisory Committee (CAC)
Meeting Summary #5

August 12th, 2024, 5:30- 7:30 PM

Meeting Attendance
Carol Collier
Alicia Brazington
Betty Peng
Brian K. Kuhta
Greg K. Anderson
Richard "Rick" Melching
Matthew Clarkson
Samantha Horner
Stephanie O'Dell
Kim Sogge
Carrie Schulstad
Jason Irving
Marlo Maroon (Planning Commission)
Bonnie Carter (City Council)

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Yvette Sennewald, Planner
Carey Certo, Administrative Support Assistant

Consultant team
Nicole McDermott, WSP, Inc.
Aaron Carpenter, WSP, Inc.
Anais Mathez, 3J Consulting

Welcome and Introductions
Alan Peters, Community Development Director, opened the meeting and welcomed CAC members.

Project Updates and Debrief of Camas Days
Nicole McDermott, WSP, reviewed the agenda and provided project updates. Nicole recapped the Camas Days event and shared that the booth was well attended and there was engagement in the materials and activities provided. Alan shared that the Vision Statement was recently acknowledged by City Council in early July.

Overview of Draft Land Use Alternatives
Nicole presented the draft land use alternatives, recapping the process for creating the maps. The two alternatives reflect two concepts: focusing on growth within hubs (Alternative A) and along corridors (Alternative B).

Key characteristics of Alternative A include:
- Focuses growth into Neighborhood Hubs and Regional Hubs.
- Neighborhood Hubs – areas that have potential to support a variety of neighborhood-serving uses.
- Regional Hubs – areas that have the potential to support higher scale residential and commercial uses.
- Includes mixed-use and more employment in the western portion of the City.
- Includes pockets of higher density housing throughout the city, including south of 3rd St. in Downtown.

- Includes higher density housing near the high school.
- Includes Grove Field as new employment area.

Key characteristics of Alternative B include:

- Focuses growth into Mixed-Use Residential and Mixed-Use Commercial Corridors.
- Mixed-Use Residential – areas that are focused on more residential development with some neighborhood-serving commercial uses.
- Mixed-Use Commercial – areas that are focused on commercial and office with some higher density housing.
- Includes Mixed-Use Corridors and higher density housing in the western portion of the City.
- Similar to Alternative A, includes the following:
    - Pockets of higher density housing throughout the city, including south of 3rd St. in Downtown.
    - Includes higher density housing near the high school.
    - Includes Grove Field as new employment area.

CAC members offered the following questions:

- Are we evaluating the policies with these maps? *The policies can influence the map, and future policies may need to be added to incentivize development or guard against negative development (i.e. displacement). Policies will be discussed at a future CAC meeting.*
- What's Camas' policy on middle-housing (thresholds, etc.). *Existing multifamily housing and single-family housing standards will change to meet current state requirements in order to provide more housing/affordable housing. We don't want to do that at the detriment of jobs potential / development. Middle housing law does require Camas to allow for 2 DU per lot (4 w/in ¼ mile of transit).*

Breakout Groups: Discussion of Draft Land Use Alternatives

Anais Mathez, 3J Consulting, shared directions for the breakout group discussions. CAC members organized themselves into small groups to review the two land use alternatives side by side. CAC members were invited to reflect on the following key questions and capture their group's evaluation of the two alternatives in the worksheet provided.

- Which alternative does your group prefer? Why?
- What are some areas of agreement? What are some areas of disagreement?
- How well does each alternative support the land use goal statements?

At the end of the mapping activity, each table reported back on the key ideas from their group:

<u>Table 1:</u>

- Preference for Alternative A (Hubs)
- There was agreement that "Hubs" help retain the small-town feel
- Don't want corridors to feel like Mill Plain but do like the idea of smaller-scale corridors that could achieve small-town feel with commercial proximity

<u>Table 2:</u>

- Preference for a blended approach of Alternative A and B (Hubs and Corridors)
- There was disagreement on how to approach land uses near Parker/38th. Some preferred

keeping the natural environment.
- Alternative A (Hubs) ranked slightly higher when evaluated against the land use goals.

Table 3:
- Preference for Alternative A (Hubs), though there was interest in commercial mixed-use along some corridors
- There was agreement that "Hubs' are conducive to planned, intentional development
- There was agreement that corridors were important to help extend commercial development
- There was a desire for a hotel on HWY 14
- There was concern about creating a traffic pinch-point in the Everett Corridor
- Additional areas for housing were identified.

CAC members offered the following questions and comments:
- Are there tried and true ways to incentivize the "hub" concept? *The City prioritizing infrastructure and network improvements is important. Housing is a very important aspect for walkable commercial development as well.*
- Pushing housing density closer to industrial areas feels like it could create a scenario of "haves and have nots."

Next Steps
Nicole reviewed next steps. The second round of Community Summits for the comprehensive plan and the downtown subarea plan are currently being planned. The team will consider scheduling an additional CAC meeting in September to review refinements to the maps. The CAC offered the following final reflections:
- The Harvest Festival is on October 2nd
- Consider using the Library for the Downtown Summit
- Add landmarks and revise the color schemes for the land use alternative maps.

Nicole thanked the committee for their attendance and adjourned the meeting at 7:30pm.

Comprehensive Plan Update and Downtown Subarea Plan
Community Advisory Committee (CAC)

CAC Meeting #6
December 9, 2024, 5:30-7:30 PM
City Council Chambers

AGENDA

Time	Subject	Lead
5:30 (5 min)	Welcome and Introductions	Alan Peters, City of Camas
5:35 (30 min)	Preferred Alternative Development • Community Summit debrief • Feedback on prior alternatives • Preferred Alternative review • Jobs and housing capacity • Downtown preferred concept	Nicole McDermott, WSP Anaïs Mathez, 3J Consulting
6:05 (75 min)	Draft Comprehensive Plan Goals & Policies • Review draft Housing goals and policies • Review draft Economic Development goals and policies • Draft Climate goals and policies – Climate Policy Action Team feedback	Nicole McDermott, WSP Jennifer Cannon, ECONW
7:20 (10 min)	Next Steps • CAC Meeting #7 • Upcoming events and activities • Major milestones/project schedule	Nicole
7:30	Adjourn	Alan

Community Advisory Committee (CAC)
Meeting Summary #6

December 9th, 2024, 5:30- 7:30 PM

Meeting Attendance

Carol Collier
Betty Peng
Brian K. Kuhta
Heidi McNealy
Richard "Rick" Melching
Samantha Horner
Kim Sogge
Carrie Schulstad
Jason Irving
Marlo Maroon (Planning Commission)
Bonnie Carter (City Council)

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager

Consultant Team
Nicole McDermott, WSP
Aaron Carpenter, WSP
Anais Mathez, 3J Consulting
Jennifer Cannon, ECOnorthwest

Welcome and Introductions
Alan Peters, Community Development Director, opened the meeting and welcomed CAC members.

Preferred Alternative Development
Anais Mathez, 3J Consulting, recapped the community summit and shared the community's feedback on the preferred alternatives. The CAC provided their thoughts and reflections, sharing that they felt the event was engaging and included younger attendees, new faces, and new discussions. Some comments included hearing the desire for more economic development and more diversified types of development. Comments also included that the meeting venue was in a good location, and that the boards were engaging and the information was well presented.

Nicole McDermott, WSP, transitioned to describing the preferred alternative and how it reflects the feedback received from the CAC, public and City staff. She described how the preferred concept focused on hub development over strip development, focusing on development at intersections and in key locations. A new overlay could influence design and form, not necessarily type of use, and certain re-designations would be required to meet housing and job targets. CAC members offered the following questions/comments:

- *Is there a need/market for the designation change?* The mixed-employment designation will allow a broader option of uses which will help encourage development in spaces that historically haven't been built up or met the needs of a

larger-scale industrial complex.

- *Is there a designated economic development manager with the city?* The City uses CREDC for economic development but the City 'sets the table' with infrastructure investment and zoning/standards. We'll look at making sure goals/policies focus on economic development and jobs growth.

Draft Comprehensive Plan Goals and Policies

Jennifer Cannon, ECOnorthwest, described the purpose of the economic and housing chapters of the Comprehensive Plan, reviewing key facts and figures. She shared recommended revisions to the vision statements for both the economic and housing chapters, reviewed existing goals for both chapters and walked through key policy updates that will be needed. CAC members offered the following questions/comments:

- *Implementation is key for momentum to actually make this plan encourage development.* Implementation will come with developing the zoning code update.
- *Incubator spaces will be huge for small business development. There currently isn't space for small businesses to operate in temporary/short-term settings like a commercial kitchen.*
- *How do we go about maintenance programs to preserve affordable housing?* City partners with non-profits to help people stay where they are (maintenance, fix, age-in-place); support affordable housing redevelopment through proper zoning.

Upon conclusion of Jennifer's presentation, CAC members engaged in breakout time to review additional content on poster boards around the room. The boards related to Camas' competitive position (strengths and weaknesses), revised vision statements for the housing and economic development chapters, as well as corresponding goal language. CAC members discussed the key questions amongst themselves and provided feedback on post-it notes. The following comments were provided by CAC members (see appendix for scanned notes):

Poster 1 Comments: Competitive Position of Camas

Strengths and Opportunities	Challenges
• *Please, please, please develop mill ditch into a compelling, easy, and beautiful trail system that is clear to connect with from downtown and level it enough to encourage local resident activity and to attract visitors and encourage use of downtown along with recreation.* • *More hotels and conference space.* • *Partner with workforce development agencies and school district CTE.* • *Have city partner with DCA more strongly with the PUT credit improvement program. We do a lot of economic development and community development and can do much more with more support.*	• *Aggressive contractor management to incentivize low-cost housing.* • *Downtown doesn't have vacancy- need development to pencil so we can get more.* • *The DCA is embracing a comprehensive downtown lighting plan – 19 buildings with a state grant- will transform safety and flow downtown.* • *Improve traffic flow on 14th, 15th, and Quinault Street.* • *School areas desperately need improved safety crossings.* • *3rd Ave. safety and bike lane grant was awarded to the City.* • *Commerce promotion.*

Poster 2 Comments: Existing Economic Goals in Plan

- *The north shore area with infill*
- *We need commercial space*
- *We need a dedicated economic development director! Or at least a dedicated plan.*
- *For business during week, kids/residents during evenings and weekends.*
- *Grass Valley mixed/light industrial park with athlete fields/parks.*
- *Why not a Grass Valley Subarea Plan?*
- *We need far more manufacturing jobs.*
- *Be clear on what kinds of businesses would be most beneficial to Camas in Grass Valley so we can all be aware when we are taking prospective businesses.*
- *Allow work/live housing along and around UGA/schools and major transportation corridors.*
- *The city should look into a City staff person for economic development. Write a grant for a position.*
- *Ensure workforce housing is available for current and future workers.*
- *Focus on tourism and bring in money.*

- *Are there model cities Camas would strive to look like? (Lake Oswego, Bend, etc.)*
- *Can we compare plans with cities that have experienced similar growth? What did they do well or not?*
- *Having diverse housing options will lead to a more diverse city.*
- *Council wants to fill an economic development director and volunteer coordinator – how to fund?*

Poster 3 Comments: Existing Housing Goals in Plan

- *Citywide: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community. This goal seems very wide and difficult to achieve. Can we be more focused on affordability?*
- *More moderate density in downtown and near downtown and good connectivity (Safe, lit, easy)*
- *Be intentional- positive in messaging about adding middle housing and moderate density so community gets accustomed to why it is so important for our community and culture to include all. Show that it's not scary.*
- *Density!*
- *Consider incentivizing housing developers through zoning, taxes & fees, partnerships*
- *Partner with VHA and other orgs to identify and develop affordable housing.*
- *Partner with habitat for humanity and housing authority. Proud ground for moderate- and low-income housing.*
- *Attract a large senior housing project.*
- *More 4-5 story multi-family units, especially downtown.*
- *Builder incentives to focus on mixed use/ apartments.*
- *Green Mountain Services (commercial development), especially if expanding the UGA.*
- *Don't forget the bike paths.*
- *ADUs- make it easy to build ADUs in backyards.*
- *YIMBY policies!*
- *Incentivize small developers (housing & economic development combined!).*

Upon conclusion of the break-out, CAC members discussed their comments and questions, sharing the following:

- *What are model cities that we could copy/emulate?* We look at cities around the state and region regarding best practices for setting specific goals and policies.

Next Steps

Nicole reviewed next steps and the project schedule. The preferred alternative will be shared at a Planning Commission Briefing on December 17th and at a City Council briefing in early 2025. The CAC will meet two more times to review revised policy language for other chapters as well as the Comprehensive Plan document. The CAC's next meeting will likely be held in late February or early March 2025. Both the Comprehensive Plan and Downtown Subarea Plan are on track for adoption in Winter 2025. Nicole thanked the committee for their attendance and adjourned the meeting at 7:30pm.

Comprehensive Plan Update and Downtown Subarea Plan
Community Advisory Committee (CAC)

CAC Meeting #7
April 14th, 2025 5:30-7:30 PM
Camas City Hall – Council Chambers
616 NE 4th Ave, Camas, WA 98607

AGENDA

Time	Subject	Lead
5:30 (5 min)	Welcome and Introductions	Alan Peters, City of Camas
5:35 (10 min)	Project Recap • Preferred Land Use Alternative • Development of Goals and Policies • Downtown Subarea Planning • PC/CC Briefings	Nicole McDermott, WSP
5:45 (30min)	Review Comprehensive Plan Elements: *Key Policy Concepts and Changes* • Community Character • Land Use • Housing • Natural Environment • Climate • Transportation • Public Facilities and Services • Economic Development • Downtown Subarea Plan	Nicole
6:15 (60 min)	CAC Discussion • *Do the goals and policies accurately reflect your understanding of the priorities uncovered during the community visioning process?* • *Are there any areas that need further clarification or refinement?*	CAC Members Anais Mathez, 3J Consulting
7:15 (15 min)	Next Steps • CAC meeting schedule • Upcoming events and activities • Major milestones/project schedule	Nicole
7:30	Adjourn	Alan

Community Advisory Committee (CAC)
Meeting Summary #7

April 14th, 2025, 5:30- 7:30 PM

Meeting Attendance
Carol Collier
Betty Peng
Brian K. Kuhta
Heidi McNealy
Samantha Horner
Kim Sogge
Carrie Schulstad
Jason Irving
Alicia Brazington

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager

Consultant Team
Nicole McDermott, WSP
Anais Mathez, 3J Consulting

Welcome and Introductions
Alan Peters, Community Development Director, opened the meeting and welcomed CAC members.

Work-to-Date
Nicole provided a recap of the project and work done to date since the last CAC meeting. She reviewed the preferred land use alternative and described efforts in drafting initial goals and policies for the draft Plan. The CAC was reminded about the virtual *StoryMaps* survey currently live on the project website and was prompted to continue sharing this out among their networks. Nicole reviewed the project schedule, noting that certain procedural elements at the County level may delay adoption to late winter 2025 or early 2026. In the meantime, community outreach during the upcoming summer months will focus on rolling out the draft Plan through pop-up activities at community events rather than hosting a standalone, open house.

- A question was raised about how the public will get notified about these outreach opportunities.
    - Staff responded that once the list of events is confirmed, promotional materials will be posted and sent out, like a flyer, e-blast and citywide mailer.

The group discussed a list of potential community events and touchpoints, such as the Farmers' Market, Camas Days, football games, or even a passive poster board station set up at the Library.

Comprehensive Plan Elements: Draft Goals and Policies

Nicole presented each of the comprehensive plan elements, reviewing goal statements and describing key changes in policy direction. After the presentation, CAC members engaged in discussion and offered the following reflections, comments and questions:

- A committee member noted the absence of any mention of a community center.
    - Staff responded that this topic could potentially be addressed under the Community Character or Land Use elements. If it is not included, an explanation may be needed.
- A committee member asked why a swimming pool was not mentioned.
    - Staff indicated that a pool could fall under the Public Facilities element. Similar to the community center, it could be added or addressed explicitly if deemed appropriate.
- A question was raised regarding how dark sky policies apply in the Downtown area.
    - Staff explained that this could be addressed through lighting choices and the angle of lighting fixtures, such as avoiding neon signage.
- A member expressed concern about a policy discouraging gated communities, stating it had not been discussed previously.
    - Staff clarified that the intent is to promote neighborhood connectivity. This policy exists in the current Comprehensive Plan, and provisions in the development code currently support it. The group may want to either update the code to match the policy or consider removing it entirely.
- Another member questioned what it means to "discourage" gated communities and suggested the policy should prohibit them if that is the City's intent.
    - Staff agreed this could be flagged as a policy choice and noted the importance of aligning policies with existing code. They also emphasized the need to maintain pedestrian connectivity in all neighborhoods.
- A member noted the lack of a policy addressing noise pollution.
    - Staff responded that while a nuisance ordinance currently exists, it does not cover all noise-related issues. The draft plan touches on noise in residential buffer policies, but broader coverage is currently lacking in the code.
- On page 10, policy 3.3 was discussed. A member suggested it should be broadened to better reflect the intent to improve food access, including allowing farmstands.
- A member recommended that policies specific to Downtown should explicitly reference trail connections, in addition to broader multimodal connectivity.
- A question was raised about the existence of a specific architectural committee to review design standards.
    - Staff explained that clear and objective design standards are required by state law. They are reviewing which areas of the plan comply with these standards and evaluating potential updates to the design review process.
- Under policy H 1.2, a question was raised about how narrower streets could be compatible with sidewalks and bike paths.
    - Staff clarified that in low-traffic neighborhood settings, features like turn

lanes or full bike trails may not be necessary. They acknowledged that this policy might conflict with complete streets principles and may require clearer language.

- A suggestion was made to include a policy encouraging alley-loaded residential development.
- A member recommended aligning the Transportation and Housing elements more closely.
- Several comments discussed including language around tax incentives for affordable housing.
- Members noted that additional affordable housing requirements may apply to "middle housing" under state regulations.
- A land trust model was suggested as another affordable housing strategy, with the City's role limited to enabling it through policy.
- A recommendation was made to include a policy that incentivizes long-term affordable housing and acknowledges state requirements and tools such as land trusts.
    - Staff noted that policies H2-7 and H2-4 already speak to many of these strategies.
- A member asked whether the City should add a policy to reduce parking requirements for infill development to increase feasibility.
    - Staff responded that the recent state parking bill addresses this but only applies to cities with 30,000 or more residents. Camas is approaching that threshold, though.
- A comment was made that the plan should address parking availability for recreational areas, noting that it often competes with commercial parking and must also remain ADA accessible.
- Committee members emphasized the importance of consistency in language throughout the plan, pointing out variations such as "will try to" versus "will do this."
- A glossary was suggested to improve accessibility for readers, with "heat island" offered as an example of a term needing explanation.
- Members noted that the plan says little about impact fees beyond transportation. They recommended including a policy to define impact fees and describe their reasonable application, particularly in mixed-use and commercial areas.
- Concerns were raised about a lack of attention to maintenance of current investments. Members noted that while the City continues to invest in infrastructure and amenities, funding for ongoing maintenance is limited. This issue applies to housing, Downtown, parks, and trails.
- Policies should be more specific in defining how to "meet community needs" rather than simply calling for "adequate" funding.
- Members agreed that the plan should not be overly influenced by the loudest voices in the room. Policies should be grounded in broad community priorities.
- A suggestion was made to ensure policies reinforce and protect current successful

City programs so they are not deprioritized in the future.

- Several members reiterated the importance of consistent and directive language across policies. Redundancy, when purposeful, can be beneficial—particularly for decision-makers like the Planning Commission. References between overlapping policies should be clearly made.
- On page 23, the term “critical areas” should be defined in the glossary.
- Also on page 23, Shoreline policies should “reference” goals and policies rather than adopt them outright.
- On page 48, policy ED 1.6 prompted a discussion about the need for an economic development manager. The committee recommended either strengthening the language or identifying the position as a separate policy.

Next Steps

Nicole reviewed the project schedule. The CAC will meet one more time in the next few months to review development code concepts for implementation. Next steps include rolling out the draft Plan to the community. Nicole thanked the committee for their attendance and adjourned the meeting at 7:30pm.

Comprehensive Plan Update and Downtown Subarea Plan
Community Advisory Committee (CAC)

CAC Meeting #8
September 8, 2025, 5:30-7:30 PM
City Council Chambers

AGENDA

Time	Subject	Lead
5:30 (5 min)	Welcome and Introductions	Alan Peters, City of Camas
5:35 (15 min)	Engagement Plan and Project Schedule Update	Nicole McDermott, WSP
5:50 (60 min)	Zoning Code and Comp Plan Updates • Review draft ADU and Middle Housing codes	Alan/Nicole
6:50 (30 min)	Downtown Subarea Plan Updates • Overview of Design Manual components and status	Nicole
7:20 (10 min)	Next Steps	Nicole
7:30	Adjourn	Alan

Community Advisory Committee (CAC)
Meeting Summary #8

September 8th, 2025, 5:30-7:30 PM

Meeting Attendance
Carol Collier
Betty Peng
Richard "Rick" Melching
Kim Sogge
Carrie Schulstad
Marlo Maroon
Greg K. Anderson
Heidi McNealy
Samantha Horner

City staff
Alan Peters, Community Development Director
Madeline Coulter, Planner

Consultant Team
Nicole McDermott, WSP
Aaron Carpenter, WSP

Welcome and Introductions
Alan Peters, Community Development Director, opened the meeting and welcomed CAC members.

Work-to-Date
Alan provided a recap of the project and work done to date since the last CAC meeting. He reviewed the continued engagement over the summer including tabling at Camas Days. Alan then discussed the project schedule including the roll out of Summit #3 engagement plan, discussed further below. Alan provided an overview of the continued work on the draft comprehensive plan, downtown subarea plan, downtown design manual, and zoning code amendments and explained that the comprehensive plan adoption timeline is dependent on Clark County's comprehensive plan adoption timeline in 2026.

Discussions at this point in the meeting included the following:

- Will the jobs and housing allocation numbers change by 2026?
    - *Response:* This will likely depend on the outcome of the County's agricultural/resource land study that is currently underway. If the County determines expansion onto resource lands is not needed to meet population and employment projections, then other cities in the county may not be able to meet their housing or job allocations and the County may reallocate across all the cities within the County. The City can currently meet the jobs and housing allocations without Urban Growth Area (UGA) expansion onto resource lands.

- Do we have land use alternatives that include resource land or UGA expansion?
    - *Response:* Yes, City Council asked staff to look into an alternative that includes UGA expansions or urban reserve designation on to land currently designated for agricultural use.
- Has there been community agreement on the land use alternatives?
    - *Response:* The UGA expansion onto resource lands was a specific property owner request, which the Council discussed during their workshops. Depending on the outcome of the County's study, Community Summit #3 will provide the community an opportunity to weigh in further on the alternatives.
- Are there people lobbying the County to open resource lands expansion?
    - *Response:* Yes, other cities, specifically Ridgefield and La Center have pushed for UGA expansion onto resource lands. Camas has remained neutral, since we can accommodate either way.
- Who's the representative that represents Camas as part of the County's process?
    - *Response:* Alan indicated he is the staff representative and Mayor Hogan has also provided comments at Clark County meetings.
- What are resource lands?
    - *Response:* Alan provided GMA background and described one of the purposes of the UGA is to preserve forest lands, mineral lands, and agricultural lands. Those resource lands are preserved and have to meet requirements before they are enveloped in UGA/developed.

Engagement Plan

Alan presented the new summit format. Instead of a single, one-location event, the City will engage the community online and at several in-person events over the span of a few months to answer questions and seek feedback on the draft Comprehensive Plan and Downtown Subarea Plan. The City will focus on a different comprehensive plan element every two weeks, with activities including attendance at community events, presentation to Strong Towns Camas, and online surveys.

CAC members discussed the best location to table during First Fridays in order to maximize visibility and participation. Most agreed City Hall and the Library were too far from the majority of the activity during the First Friday event. Alan indicated he would discuss with staff and identify potential locations. Additional discussions at this point in the meeting included the following:

- *Question:* Are you doing anything to engage high school students?
    - *Response:* Not directly but we certainly could notify the school district and send materials out to their email list/classrooms. City could tag school districts' social media handles to drive engagement when element posts go live.

- *Question*: Will people be able to take the survey online at the tabling event?
    - *Response*: Yes, they can benefit from the conversation with staff and respond to the survey then and there. The goal is to capture as much feedback at the events as possible. In addition to engagement at the events, the purpose of this format of the summit is to give people the opportunity to comment at their own pace over the duration of the summit.
- *Question*: Did the last comprehensive plan update have the same level of engagement as this?
    - *Response*: Community engagement was different 10 years ago during the last update, but the City did provide multiple avenues for feedback/engagement.

Zoning Code and Comprehensive Plan Updates

Alan reviewed the housing code updates that are required to meet State mandates, which include a new middle housing code and updates to the Accessory Dwelling Unit code. Draft Middle Housing and updated ADU Codes must be adopted by Dec 31, 2025 to comply with State Housing bills HB 1110 and 1337. Alan walked through the code update slides, which are included in the attached presentation.

Discussions at this point in the meeting included the following:

- *Question*: The new State mandate would allow cities to determine if ADUs would count towards the unit densities of a parcel or if ADUs would be allowed in addition to the maximum of four primary units on a parcel. Camas proposes to count ADUs towards the density count, therefore being more restrictive in the number of dwelling units on a parcel. Why be more restrictive with our ADU code than what the State allows?
    - *Response:* The City's proposed code is a more gradual change from what is in the current code while still meeting the State mandate. The new code proposes a maximum density, not minimum requirement, so neighborhood character is likely to not shift much. Redeveloping a site will not require a developer to meet a new minimum density.
- *Question:* Regarding Unit Lot Subdivisions, is there a financial tipping point when it becomes more viable to raze old homes (that may be historical/ or generally fine) to get rebuilt to max out density? Seattle/Portland is there, where old residences are demolished and rebuilt.
    - *Response:* It's unlikely for that type of redevelopment to make sense in Camas over the planning horizon given the relatively high value of homes in the City. Even without full redevelopment of a site, the new Unit Lot Subdivision requirements can provide ownership opportunities of smaller lots/units, but it is not anticipated this will be a major driver of

redevelopment in Camas.

- The CAC discussed how water and sewer connections and impact fees can affect the feasibility for property owners to develop properties under new housing codes, especially for ADUs and infill projects. Utility connections and fees/costs will severely affect affordability of this process. The City has a tiered set of fees for ADUs, and the development community continues to provide feedback on building/permitting issues for affordability. It was recommended that City staff come up with a proposal on additional affordability measures (utilities etc.) for a Council workshop.

Downtown Subarea Plan Updates

Nicole provided an update on the Draft Downtown Subarea Plan process. Aaron provided a summary of the purpose of the Downtown Design Manual and gave an overview of some of the major points for the design standards and guidelines. The meeting was coming to a close and the CAC did not have much time for discussion of these items, but offered a few questions related to parking requirements downtown, including parking requirements for new mixed-use development. The draft design manual is in process and will be reviewed by the Downtown Advisory Committee as part of their next meeting.

Next Steps

Nicole reviewed the project schedule and reminded the CAC of the upcoming Summit engagement events. Nicole thanked the committee for their attendance and adjourned the meeting at 7:30 pm.

Comprehensive Plan Update and Downtown Subarea Plan
Climate Policy Advisory Team (CPAT)

CPAT Meeting #1
March 14th, 2024, 5:00- 7:00 PM
City of Camas City Hall – Council Chambers
616 NE 4th Avenue, Camas, WA 98607

AGENDA

Time	Subject	Lead
5:00	Welcome and Introductions • *What do you love about Camas and why do you want to be on this committee?*	Alan Peters, City of Camas Nicole McDermott, WSP
5:10	*Our Camas 2045* and *Our Downtown Camas 2045* Project Overview • City goals and objectives • What is a Comprehensive Plan and Downtown Subarea Plan? • Key Milestones and schedule • Public Participation Plan • Community Conversations • CPAT roles and responsibilities	Alan Nicole
5:30	Climate Planning Overview • State and federal planning requirements and guidance • Local planning resources • Existing conditions in Camas • Discussion	Sean McElroy, WSP
6:00	Equity Framework • State guidance • Example frameworks • Discussion	Nicole
6:20	Next Steps • Periodic updates via email and EngageCamas • General meeting logistics	Nicole
6:30	Adjourn	Alan

Climate Policy Advisory Team (CPAT)

Meeting Summary #1

March 14th, 2024, 5:00- 7:00 PM

Meeting Attendance
Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Tullis
Paul Henderson
Robert Carter
Morgan Van Fleet (online)
Nelson Holmberg
City staff
John Svilarich – *City Council Liaison (online)*
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Steve Wall, Public Works Director
Trang Lam, Parks and Recreation Director
Madeline Sutherland

Consultant Team
Nicole McDermott, WSP
Sean McElroy, WSP

Welcome and Introductions

Alan Peters, Community Development Director, provided opening remarks. All attendees were invited to introduce themselves and share what they love about Camas and why they want to be on this committee. CPAT members shared the following opening reflections:

What do you love about Camas?

- Easy access to greenspace
- Sense of place and civic and community pride
- People invest in the community
- Downtown walkability
- Downtown main street
- Love the small-town feel, recreation opportunities, and trail system
- Parks, recreation, open space
- People know their neighbors and there are good schools

Why do you want to be on the committee?

- Civic duty
- Concerned citizen
- Importance of climate change impact in Camas
- Policy and systemic changes can make a difference
- Be a part of growth and help climate be a priority
- Desire to serve the community
- Want to lend expertise and prior experience – members shared varying past and present

experiences that could benefit the committee, such as work on the Clark County Climate Advisory Group, experience with climate vulnerability assessments, environmental and climate justice, marketing, and vehicle electrification.
- Trang Lam, Parks and Recreation Director, shared that the Parks Department is working on a Parks and Open Space Management plan and will make recommendations to this group.

Our Camas 2045 and *Our Downtown Camas 2045* Project Overview

Alan provided an overview of the City's goals and objectives for the Comprehensive Plan and Downtown Plan, touching on topics like housing, economic development, climate, and downtown. Nicole McDermott, WSP, provided an overview of the project process, describing each phase of work from the existing conditions analysis, equity framework, visioning outreach, plan development, implementation and to eventual adoption. Nicole reviewed key milestones and the overall project schedule. CPAT members asked the following clarifying questions:

- *Is the geographic scope just the city boundaries for the existing conditions?* The existing conditions analysis looks at city boundaries and the Urban Growth Area as well as nearby influence areas. Clark County is leading the charge on climate change technical analysis (GHG inventory and vehicle miles traveled per capita). Neighboring municipalities are going through the same periodic update requirement.

CPAT Roles and Responsibilities

Nicole discussed the Committee's roles and responsibilities, and described the function of other project committees, such as the Project Advisory Committee (PAC) and the Community Advisory Committee (CAC). She noted that CPAT members are expected to meet four times over the course of the next year. The meetings will cover climate planning work currently in process by the County. Meetings will also be an opportunity for committee members to provide input on goals and policies for the new climate element in the comprehensive plan and an opportunity for members to incorporate climate goals and policies into the downtown subarea plan. CPAT members had no questions or comments.

Public Participation Plan

Nicole briefly discussed the public participation plan and its objectives and stakeholders that will be engaged in the process. Attendees received a copy of the plan for review prior to the meeting. CPAT members asked the following questions:

- *Would it be possible to receive a google drive link to access the public participation plan and other documents shared with the committee?* A similar effort is being done for the CAC and a link will be provided.
- *Renters are often neglected. Have you thought about a way to engage that subgroup of people?* In the broader engagement plan, social media channels might be reaching this group. Direct mailer will reach each community member and directs residents to visit the City's website to complete a survey. The team will discuss other ways to reach this group and could include a question in future outreach asking if the resident is an owner or renter.
- *In the Northshore subarea process, there was a disconnect between requesting feedback and*

the City's ability to change the process or outcomes to address that feedback. Is there a way for the public to understand the public engagement process and what guidelines are involved? Could work on messaging to help the public understand the limitations of the City and what can be achieved through the comprehensive plan and downtown subarea plan. It's important to communicate that goals and objectives should be attainable and that will vary for each agency and across cities.

CPAT Community Conversation Kit

Nicole covered the community Conversations Kit and Tracking Log, describing the method, approach and objectives. CPAT members did not have comments or questions.

Climate Planning Overview and Group Discussion

Sean McElroy, WSP, discussed the federal and state climate planning requirements, state guidance, and local planning resources used in the current draft of the existing conditions analysis for Camas. Nicole introduced discussion questions to help attendees brainstorm which communities in Camas are vulnerable to climate hazards. The discussion questions also invited attendees to share their experience with climate hazards in Camas. CPAT members shared the following information and asked the following questions:

Climate Hazards:

- Local schools are not prepared or equipped to respond to inclement weather days, particularly extreme heat.
- The hills in Camas could be considered a hazard for individuals with limited mobility.
- Older buildings in the city often have substandard foundations and might be more vulnerable to certain climate hazards such as flooding or severe weather.
- Most of the low-income housing in the city is located at a lower elevation and could be more vulnerable to flooding.
- Multiple members recalled a recent heat dome and fire that occurred near downtown. During the heat dome there were many residents who did not have access to air conditioning, cooling centers, or air filters. Smoke from the fire impacted residents with respiratory or lung diseases such as asthma. Communication during the fire event lacked efficiency as there was no preparedness plan.
- The increasing number of heat events raises the concern of increased demand for electricity and more pressure on the local energy grid.
- Streams, lakes, and waters surround Camas and water resources and residents living in close proximity are vulnerable to flooding and drought conditions. One member mentioned observing changes in water levels at Lacamas Lake in the summer.
- In addition to heat and cold extremes, strong east winds have had an impact on the local tree canopy.

CPAT Questions:

- *Is there a similar climate element for a similar sized city in Washington that is not that old?* There is a model element from the state guidance. The project team can look into examples from cities in other states.

- *Is the University of Washington webtool publicly available?* Staff will provide a link to the webtool.
- *What is the scope of the CPAT for dealing with hazards?* Implementation measures could arise through discussions with the CPAT. One of the priorities for the CPAT is to identify goals and policies for the climate element to address hazards. The project team involved in the Parks and Open Space Management plan will also have action items and recommendations for the climate element.
- *Are we going to be discussing whether each hazard is climate related, or will the discussion be on what we can do to prevent and adapt to each hazard?* The focus is on resiliency and the hazards likely exacerbated by climate change.

Equity Framework

Nicole discussed the intersection between equity and climate planning. Nicole provided two examples of equity frameworks from the City of Vancouver and King County that address the equity and climate nexus.

- *Will there be a metric in the framework to track success of meeting equity or climate goals?* A metric of success can be part of the equity framework that is developed. It will be important to get buy in from the community on equity priorities.
- *Will equity and climate be embedded in the comprehensive plan beyond a separate element?* This is an important question for developing the plan. Yes, the intention is to embed climate throughout the comprehensive plan and have the separate element. How this is achieved will be a topic for discussion as the project progresses.

Next Steps

Nicole reviewed next steps and general meeting logistics. The next CPAT meeting will likely be in the fall, following completion of the County's climate work. The project team will keep the group updated on the process through email. Nicole reminded CPAT members to reach out for questions and encouraged members to host community conversations.

- CPAT members agreed that the meeting day and time generally works. A zoom link would be preferable as well.
- *Can CPAT members receive a contact sheet?* Yes, the team can set up a file-sharing platform to share a contact sheet. Materials will also be posted to the EngageCamas website following the meetings.

Project staff thanked the committee for their attendance and adjourned the meeting at 7:00pm.

Comprehensive Plan Update and Downtown Subarea Plan
Climate Policy Advisory Team (CPAT)

CPAT Meeting #2
September 24th, 2024, 5:00- 6:30 PM
City of Camas City Hall – Council Chambers
616 NE 4th Avenue, Camas, WA 98607

AGENDA

Time	Subject	Lead
5:00 5 mins	Welcome and Introductions	Alan Peters, City of Camas Emma Johnson, WSP
5:05 15 mins	*Our Camas 2045* and *Our Downtown Camas 2045* Project Overview • Project updates • CPAT role and responsibilities	Alan Emma
5:20 25 mins	Greenhouse Gas (GHG) Inventory • Overview of analysis and results • Q&A	Claudia Denton, Parametrix
5:45 10 mins	Vulnerability and Risk – Overview • Overview of the relationship between climate hazards, vulnerability, and risk	Emma
5:55 30 mins	Vulnerability and Risk – Group Activity • Identification of vulnerable assets in Camas o Participants will use sticky notes to identify assets vulnerable to climate hazards • Group discussion of assets and potential policies to improve resiliency	Sean McElroy, WSP Emma
6:25 5 mins	Next Steps • CPAT Meeting #3 • Upcoming events and activities	Emma
6:30	Adjourn	Alan

Climate Policy Advisory Team (CPAT)
Meeting #2 Summary

September 24th, 2024, 5:00- 6:30 PM

Meeting Attendance

Committee Members
Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
Nelson Holmberg
Diana Rutherford (online)
John Svilarich – *City Council Liaison*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Bryan Rachal, Director of Communications (online)
Madeline Sutherland, Assistant Planner

Consultant Team
Emma Johnson, WSP
Sean McElroy, WSP
Claudia Denton, Parametrix (online)

Welcome and Introductions

Alan Peters, Community Development Director, provided opening remarks. All attendees were invited to introduce themselves and share why they wanted to be on this committee. CPAT members shared the following opening reflections:

- Concerned citizen
- Importance of climate change impacts in Camas
- Policy and systemic changes can make a difference
- Want to lend expertise (background in marketing)
- Work in urban forestry
- Member of EatWell Camas
- Background in environmental consulting and environmental justice

Our Camas 2045 and *Our Downtown Camas 2045* Project Overview

Alan provided an update on the Comprehensive Plan and Downtown Subarea Plan, touching on the allocations for population, housing, and employment provided by Clark County, as well as adoption of the draft vision statement.

CPAT Roles and Responsibilities

Emma Johnson, WSP, discussed the Committee's roles and responsibilities, and described the function of other project committees, such as the Project Advisory Committee (PAC) and the Community Advisory Committee (CAC). She noted that CPAT members will meet two more times over the course

of the project. Upcoming meetings will likely cover goals and policies for the new climate element as well as future climate planning actions. CPAT members had no questions or comments.

Climate Change and Resiliency Element

Emma reviewed the purpose of the Greenhouse Gas (GHG) Emissions Reduction sub-element and Resilience sub-element, as well as supporting analysis for each. The GHG inventory report, which is complete, will support the GHG reduction sub-element. As part of the Resilience sub-element, attendees will participate in a vulnerability and risk assessment exercise to identify vulnerable assets and potential ways to improve Camas' resiliency. A focused vulnerability and risk assessment is also being prepared under the City's agreement with Clark County, which will evaluate the vulnerability of lakes and outdoor recreational areas in Camas to extreme heat. CPAT members had no questions or comments.

Camas GHG Inventory Results Presentation

Claudia Denton, Parametrix, gave a presentation on the results of a GHG emissions inventory prepared for Camas. The presentation summarized the purpose, methodology, and results of the inventory for Camas, including topics such as total, local, and imported emissions, and GHG emissions by sector. CPAT members asked the following questions:

- *Are the metrics showing total emissions or per capita emissions?* Metrics for Camas include total citywide emissions and per capita emissions, both of which include a combination of local and imported emissions (i.e., local plus imported emissions equal total emissions in Camas). There are four sectors within local and imported emissions.
- *How do emissions in Camas compare to other cities? How are we doing overall?* Some caution is recommended when comparing Camas directly to other cities, as methodologies may differ, as well as existing conditions. The best comparison will be to evaluate how emissions in Camas change over the next 3-5 years. However, generally Camas is doing well in the Building Energy sector due to the electricity grid from Clark PUD, and Goods Production emissions are slightly better than some other cities. The largest impact for GHG emissions in Camas is from large industries and refrigeration. It is recommended that communities work with local industries to reduce emissions, rather than push for them to relocate, as it is more effective to keep industries within communities that care about climate change.
- *Is the state looking into adopting a standard methodology for inventories, so that the inventories can be used to compare cities?* There are no plans at the moment, which helps avoid barriers to entry for jurisdictions or consultants wanting to conduct inventories.
- *Is the metric for solid waste based on consumption?* Actual emissions for solid waste are recorded by each landfill operator/owner and reflect the amount of methane emitted. The metric for Camas is based on the waste that is produced by Camas and transported to the landfill.
- *Some cities are requiring air conditioning for new construction. How does that counter with the policy recommendation to reduce electricity demand?* We will need to balance reducing GHG emissions with other needs, like keeping our communities safe and healthy. There are some options to reduce emissions associated with air conditioning. Heat pumps release fewer

fugitive gases and are more efficient. Supporting policies that encourage denser land uses, particularly housing, also increase energy efficiency since smaller units have smaller electricity demand.

- *Which sector includes new construction and construction vehicles?* The transportation sector includes construction vehicles. Stationary vehicles and equipment are included under the buildings and energy sector. Building materials and construction or demolition fall under the industrial processes sector.
- *Is there a breakdown of energy use by source (e.g., heating, cooling)?* No, but there are other resources and studies that can be used as a comparison to the GHG inventory data for Camas.

A copy of the Camas GHG inventory report will be sent to CPAT members following the meeting.

Climate Hazards in Camas

Emma provided an overview of the hazard rankings for climate hazards in Camas. Climate hazards with a "high" ranking include extreme heat and extreme precipitation. She also described the two maps that were prepared to visualize the location of climate hazards in Camas, but cautioned that hazards are often citywide and/or unpredictable.

Group Activity - Vulnerable Assets in Camas

Sean McElroy, WSP facilitated a group activity and discussion on vulnerable assets in Camas as part of the vulnerability and risk assessment for the Resilience sub-element. The purpose of the activity was to obtain feedback from the CPAT members about vulnerable assets in Camas that should be prioritized in the climate element. CPAT members used sticky notes to identify local assets on the climate hazard maps. The following list identifies the priority local assets/asset themes that were frequently identified:

- The lakes
- Trees (tree canopy, street trees, mature trees, native species)
- Open space (parks, trail system)
- Schools
- Emergency shelters and evacuation routes
- Power lines
- Elderly and low-income populations
- Urban development in northeast Camas

The following asset-hazard pairings and other considerations were identified on the two maps:

Map: Wildfires, Extreme Heat, & Drought

- Open space and wildfires
- Fire risk due to dead/dying vegetation
- Fire danger due to mass weed remove (fuel)
- Need for coordination with larger region fire fighters

- Fireworks
- Financial stability of schools (enrollment up and down)
- Non-point source pollution
- Private shade trees
- Tree health/canopy and heat
- Loss of native species
- Parks and loss of vegetation
- Air quality in dense neighborhoods adjacent to polluting entities
- Heat stress on low-income and elderly populations
- Heat and social networks
- Street trees, heat stress/death
- Drought and wind, resulting in large trees falling on power lines and impacting ecosystems

Map: Flooding, Landslides, & Extreme Precipitation

- Trail system and erosion
- Trees and power lines (interaction during weather events)
- Power lines and transportation
- Flooding and transportation
- Haight dam
- PFAS
- More development near the lakes – dangerous runoff
- Precipitation (snow) and tree canopy
- Snow, flood, and smoke days impact schools
- Parks and flooding
- Hills and ice
- Old/irreplaceable trees
- Trail erosion, overuse, lack of maintenance – trees dying
- Insufficient emergency shelters/backup power
- Emergency routes blocked by flooding
- Drought and wind, resulting in large trees falling on power lines and impacting ecosystems
- Financial stability of schools (enrollment up and down)
- East winds
- Stormwater overflows – erosion and pollution

Following the mapping activity, CPAT members were asked to share their top concern(s) for asset-hazard pairs and/or ideas for improving resiliency. Members shared the following:

- Flooding and extreme precipitation effects on downstream pollution and stream management
- Extreme heat and wildfire smoke effects on schools and older houses
- We need to take more steps to prevent and reduce damage from wildfires (e.g., policies to remove landscaping debris from City properties)
- Wildfire smoke effects on community health
- Extreme weather and effects on the community from a widespread power outage (a response

plan would improve our resiliency to this hazard)
- Extreme weather can/has disrupted the food distribution chain in Camas and increased food insecurity
- Extreme heat and severe weather have/will have effects on walkability and transportation access, especially for people with disabilities (e.g., hills can become inaccessible and dangerous)
- Flooding caused by the Columbia and Washougal Rivers
- Camas needs to maintain large canopy/mature trees to improve resiliency to extreme heat (need more enforcement of the City's tree plan)
- Could improve our tree canopy's resiliency to winter storms through education on tree pruning

Next Steps

Emma reviewed next steps and general meeting logistics. The project team will complete a vulnerability and risk assessment based on feedback provided during this meeting, as well as feedback from the community. The purpose of the next meeting will be to review draft policies for the climate element. Emma also reminded CPAT members of the upcoming Community Summit where attendees will have an opportunity to review land use alternatives, and the community will be asked to weigh in on climate hazards and resiliency.

Project staff thanked the committee for their attendance and adjourned the meeting at 6:30pm.

Comprehensive Plan Update and Downtown Subarea Plan
Climate Policy Advisory Team (CPAT)

CPAT Meeting #3
November 12th, 2024, 5:00 - 7:00 PM
City of Camas City Hall – Council Chambers
616 NE 4th Avenue, Camas, WA 98607

AGENDA

Time	Subject	Lead
5:00 5 mins	Welcome	Alan Peters, City of Camas Emma Johnson, WSP
5:05 15 mins	*Our Camas 2045* and *Our Downtown Camas 2045* Project Updates	Alan
5:20 10 mins	Community Summit #2 and Survey Results • Review community feedback on climate hazards, GHG inventory, vulnerability, and resiliency	Sean McElroy, WSP
5:30 45 mins	Climate Resilience and GHG Reduction Goals – Group Activity • Review Department of Commerce guidance on selection of goals and policies for each sub-element • Group discussion of potential goals to improve resiliency and reduce GHGs	Emma
6:15 15 mins	Climate Policy Criteria • Review guidance and discuss approach to prioritizing climate policies	Emma
6:30 25 mins	Overburdened Communities – Group Activity • Review state requirements and guidance for addressing environmental justice • Group discussion of overburdened communities and vulnerable populations within Camas	Sean
6:55 5 mins	Next Steps • CPAT Meeting #4 • Upcoming events and activities	Emma
7:00	Adjourn	Alan

Climate Policy Advisory Team (CPAT)
Meeting #3 Summary

November 14th, 2024, 5:00- 7:00 PM

Meeting Attendance
Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
John Svilarich – *City Council Liaison*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Steve Wall, Public Works Director
Madeline Sutherland, Assistant Planner

Consultant Team
Emma Johnson, WSP
Sean McElroy, WSP

Welcome and Introductions
Alan Peters, Community Development Director, provided opening remarks. All attendees were invited to introduce themselves and participate in a short icebreaker.

Our Camas 2045 and *Our Downtown Camas 2045* Project Overview
Alan Peters provided an update on the Comprehensive Plan and Downtown Plan as well as a recap of the second Community Summit.

Community Summit #2 and Survey Results
Sean McElroy, WSP, discussed the results from an online survey, which included questions related to the impacts of natural hazards and climate resiliency and vulnerability. Community members were invited to participate in an online survey as part of the second Community Summit and provided feedback on the impact of climate hazards in their community.

Climate Resilience and GHG Reduction Goals Group Activity
Emma Johnson, WSP, reviewed the purpose of the model climate element created by the Department of Commerce (Commerce) and the role of the CPAT in reviewing, selecting, and customizing measures to reflect local conditions, values, and climate goals and targets. Clark County has shared their draft countywide planning policies, which contain the following policies related to GHG and VMT targets.

- Greenhouse gas reduction subelements shall be developed with an overall target of reaching net-zero greenhouse gas emissions by 2050 in alignment with the statewide greenhouse gas emissions reductions set forth in RCW 70A.45.020(1). Individual jurisdictions may choose to set

greenhouse gas reduction targets to achieve net-zero emissions faster than the statewide goal.

- Greenhouse gas reduction subelements shall be developed with an overall vehicle miles traveled per capita goal in alignment with the statewide vehicle miles traveled per capita goal of fifty percent reduction in annual per capita vehicle miles traveled by 2050 compared to the baseline set forth in RCW 47.01.440. Individual jurisdictions may choose to set vehicle miles traveled per capita reduction goals more ambitious than the statewide goal.

CPAT members discussed the above targets, and noted it will be difficult for a small community such as Camas to achieve. The cumulative impact on those targets would also be led by larger cities in the county such as Vancouver. The group agreed to use the statewide targets, as setting more ambitious targets would likely not be feasible.

Lead by Kim Lottig, the group reviewed each GHG reduction and resiliency goal from the model element and voted on whether the goal is a priority for the City and whether revisions are needed to tailor the goal to Camas. One key decision was to develop at least one goal to address each emissions source category from the GHG emissions inventory (Buildings & Energy, Transportation, Solid Waste and Wastewater, and Industrial Process and Product Use). CPAT members also provided notes on their worksheet for each suggested goal.

A list of the draft goals, including feedback from the meeting and potential policies, will be sent to the CPAT members following the meeting.

Climate Policy Criteria

Emma briefly reviewed the guidance recommendation for selecting GHG and resiliency policies. Most of the meeting was dedicated to reviewing the draft goals from the model element and policies will be selected once the preliminary list of goals is finalized.

Overburdened Communities Group Activity

Sean briefly discussed the state requirements and guidance for addressing climate change and environmental justice, including the definition of overburdened communities and vulnerable populations. The *Our Camas 2045* Equity Framework identifies equity communities. CPAT members were invited to share their thoughts on areas in the city that could be considered overburdened communities, and which other groups of people could be considered vulnerable populations in Camas. CPAT members identified the following as either overburdened communities or vulnerable populations:

- Oaks Park
- Housing near SR 14 and along 192nd Avenue
- Steep streets
- Lacamas Creek Post Acute
- Areas near the waterfront and mill
- Overhead utilities (e.g., power lines) near housing

- Green Mountain community

Next Steps

Emma reviewed next steps and general meeting logistics. The project team will put together a list of draft goals for the GHG and Resiliency sub-elements based on feedback provided during this meeting. The purpose of the next meeting will be to review draft policies for the climate element. Emma mentioned that the preferred land use concept will be developed based on feedback from the Community Summit and it will be reviewed by the Community Advisory Committee, Planning Commission, and City Council in late 2024/early 2025. The comprehensive plan and subarea plan will be adopted by the end of 2025, including zoning code amendments and new downtown development standards.

Project staff thanked the committee for their attendance and adjourned the meeting at 7:00pm.

Comprehensive Plan Update and Downtown Subarea Plan
Climate Policy Advisory Team (CPAT)

CPAT Meeting #4
January 23rd, 2024, 5:00 - 7:30 PM
City of Camas City Hall – Council Chambers
616 NE 4th Avenue, Camas, WA 98607

AGENDA

Time	Subject	Lead
5:00 5 mins	Welcome	Alan Peters, City of Camas Emma Johnson, WSP
5:05 5 mins	*Our Camas 2045* and *Our Downtown Camas 2045* Project Updates	Alan

5:10
135 mins
	Climate Resilience and GHG Reduction Policies – Group Activity
	• Group discussion of potential policies to improve resiliency and reduce GHGs
	• Discussion questions:
	  ○ Is this policy a priority for Camas?
	  ○ Is this policy Camas-specific?
		Sean McElroy, WSP
		Emma

7:25 5 mins	Next Steps • Upcoming events and activities	Emma
7:30	Adjourn	Alan

Climate Policy Advisory Team (CPAT)
Meeting #4 Summary

January 23rd, 2025, 5:00- 7:30 PM

Meeting Attendance

Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
Amy Hyland
John Svilarich – *City Council Liaison*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Steve Wall, Public Works Director
Madeline Sutherland, Assistant Planner

Consultant Team
Emma Johnson, WSP
Sean McElroy, WSP

Welcome and Introductions

Alan Peters, Community Development Director, provided opening remarks.

Our Camas 2045 and Our Downtown Camas 2045 Project Updates

Alan provided a brief update on activities for the comprehensive plan, including development of the land use alternatives and upcoming activities for the Downtown Advisory Committee and Community Advisory Committee.

Climate Resilience and GHG Reduction Policies – Group Activity

Emma Johnson and Sean McElroy, WSP, facilitated a group discussion to refine and narrow down the potential list of climate goals and policies. CPAT members were provided a handout with the current list of goals and policies as well as a table organized by goal, policy, and measure type (GHG reduction or resiliency). The group was invited to review the set of policies under each goal and indicate their preference of either removing, revising, or leaving each policy as is. CPAT members could indicate their preference with a thumbs up to keep the policy as is, thumbs to the side to revise or move the policy to another goal, or thumbs down to remove the policy.

The group decided to begin with reviewing the larger set of resiliency policies (37) before reviewing the shorter list of GHG reduction policies (27).

CPAT members provided the following general feedback:

- Revise goal and policy text to be more specific to the Camas's priorities and needs. This includes removing policies or goals that could be addressed under other elements or existing City plans (e.g., RES-8 was recommended for deletion as sustainable waste practices are

already widely adopted by the community).

- Combine GHG reduction and resiliency goals and policies to reduce redundancy (e.g., combine GHG-3 and RES-4 to address the efficiency and resiliency of the transportation system).
- Some policies are better suited as potential action items to support climate policies under the same topic (e.g., renewable energy sources).
- Confirm whether some policies are already addressed in the City's code during the code audit for Camas 2045.

Project staff thanked the committee for their attendance and adjourned the meeting at 7:30pm.

Comprehensive Plan Update and Downtown Subarea Plan
Climate Policy Advisory Team (CPAT)

CPAT Meeting #5
March 27th, 2024, 5:00 - 6:30 PM
Virtual – Zoom
https://us06web.zoom.us/j/87050212245?pwd=pQ29J4MGJ7MbaB8LRpqbY5ezOSI4eM.1

AGENDA

Time	Subject	Lead
5:00 5 mins	Welcome	Alan Peters, City of Camas Emma Johnson, WSP
5:05 10 mins	Climate Goals & Policies – Changes since CPAT Meeting #4	Sean McElroy, WSP Emma
5:15 30 mins	Looking ahead – Ways to keep the momentum going • Examples of Climate Change Advisory Committees • Discussion questions	Alan Emma
5:45 40 mins	Action items – GHG reduction & Resilience follow up measures • Action items recommended by CAPA and City staff • Action items recommended by CPAT	Dana Hellman, CAPA Strategies Alan Emma
6:25 5 mins	Next Steps • Upcoming events and activities	Sean
6:30	Adjourn	Alan

Climate Policy Advisory Team (CPAT)
Meeting #5 Summary

March 27th, 2025, 5:00- 6:30 PM (Virtual)

Meeting Attendance
Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
Nelson Holmberg
John Svilarich – *City Council Liaison*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Madeline Coulter, Assistant Planner

Consultant Team
Emma Johnson, WSP
Sean McElroy, WSP
Dana Hellman, CAPA Strategies

Welcome and Introductions
Alan Peters, Community Development Director, provided opening remarks. Dana Hellman introduced herself to the group.

Climate Goals & Policies – Changes since CPAT Meeting #4
Sean McElroy, WSP, provided an update on revisions to goals and policies included in the draft climate element. Following the previous CPAT meeting, a condensed list of goals and policies was created by moving some policies to other elements (e.g., transportation) and eliminating redundancies with other elements. The draft climate element now has 21 policies, which is down from 39 policies at the prior meeting. Policies in other elements that support climate goals will be flagged with a leaf symbol.

Looking ahead – Ways to keep the momentum going
Alan Peters gave a short introduction on the City's interest in continuing the CPAT group once the climate element is adopted, and some potential ideas for doing so. Following Alan's introduction, Emma Johnson, WSP, described examples of advisory groups from other Washington cities and counties that focus on climate change. Examples included:

- City of Bainbridge Island – Climate Change Advisory Committee
- City of Redmond – Environmental Sustainability Advisory Committee
- City of Port Townsend/Jefferson County – Climate Action Committee
- City of Pullman – Environmental Resilience Commission

Similar to the Camas Parks and Recreation Commission, these advisory committees are formed to advise the City on specific topics, such as GHG reduction, and key actions include annual progress

reports or work plans, GHG inventories, and developing or implementing a climate action plan. Members are typically appointed by each jurisdiction and include term limits. Members often include technical professionals with expertise in areas such as energy or climate science, as well as members of the public, and liaisons from government, agencies, and the business community. Emma also briefly described two examples of actions plans from the City of Redmond (Sustainability Action Plan) and Port of Vancouver (Climate Action Plan).

CPAT members provided the following feedback:

- The City of Vancouver has community engagement activities for climate topics. The City hosted a "climate pub" where residents could participate in trivia and a brainstorming session.
- Farmers markets could serve as a venue for future community engagement and education on climate action within Camas.
- Membership from NW Natural or Clark PUD on the advisory committee would add perspective from local utilities.
- The committee could collaborate with the library and serve as a standing committee for climate change or environmental sustainability.
- Members agreed that the formation of a climate focused advisory committee would be valuable to support City staff. If a climate action plan is explored, the advisory committee could help to encourage achieving goals associated with the plan. The advisory committee could also help staff apply policies from the climate element during development proposals and provide technical expertise during staff decisions.
- Members suggested that some immediate steps should be taken before presenting the idea to City Council. An initial step would be to identify how the advisory committee could support existing work or a future climate action plan.

Action items – GHG reduction & Resilience follow up measures

Dana Hellman, CAPA Strategies, reviewed a list of action items that could support the climate goals and policies, with a focus on actions that would improve community health and well-being. Dana also provided a list of actions based on the Vulnerability and Risk Assessment that was prepared by CAPA Strategies for Camas. The assessment focuses on the risk of extreme heat on outdoor recreation sites in Camas. One of Dana's recommendations includes adding language in CL-7.2 about "adaptive measures" such as short-term cooling amenities and community education/awareness building.

After Dana's overview of recommended action items, the group reviewed the current list of goals and policies to brainstorm additional ideas for action items. CPAT members shared the following feedback:

- There is an opportunity on private property to implement action items related to maintaining and expanding tree canopy.
- Friends of Trees is a nonprofit organization that helps private property owners plant trees. A partnership with this organization or similar organization could help homeowners in replacing dead or unhealthy trees.
- Action items could be developed specific to natural hazards and potential impacts such as

winter weather, erosion from heavy rains, snowplows, and downed trees.

- Proper pruning techniques for trees (e.g., removing tree suckers) should be encouraged, particularly when trees are covered with ice. The expertise of private property owners could be leveraged and shared within the community.
- Tree maintenance should be tailored to each tree species.
- Climate adaptive trees should be encouraged consistent with the Parks & Open Space Management Plan.
- Backup generators could be introduced at resiliency hubs.
- Permanent or temporary structures in the city could be identified for warming and cooling shelters. City Council has been discussing the potential need for emergency shelters.
- Action items should acknowledge the health aspects of impacts from natural hazards.

Next Steps

Sean reviewed next steps. The project team will review feedback from the meeting on action items and continue to revise the draft goals and policies for the climate element. Sean also mentioned that the Downtown Advisory Committee is currently reviewing the Downtown goals, policies, and design manual outline and the Community Advisory Committee will review all goals and policies in April. Other upcoming activities for the comprehensive plan update include finalizing the preferred alternative with City Council in April or May and community review of the draft comprehensive plan this summer.

Project staff thanked the committee for their attendance and adjourned the meeting at 6:30pm.

Downtown Subarea Plan
Our Downtown Camas 2045

DCA Meeting #1
February 6th, 2024, 3:00- 4:00 PM
Camas City Hall – Council Chambers
616 NE 4th Ave, Camas, WA 98607

AGENDA

Time	Subject	Lead
3:00	Welcome and Introductions	Margaret Raimann, SERA Design City Staff All
3:15	Project Overview and Schedule	Margaret Nicole McDermott, WSP Anais Mathez, 3J
3:25	Urban Design 101 & Initial Downtown Camas Site Assessment	Matt Arnold, SERA Design
3:55	Next Steps	Margaret
4:00	Adjourn	

MEETING SUMMARY

Welcome & Introductions

- Downtown Camas Association attendees introduced the organization, themselves, their history with Downtown, and their hopes / concerns for this process. City staff and the consultants also made their introductions.

Project Overview & Schedule

- The consultants reviewed the project purpose and schedule, placing the Downtown Subarea Plan into the context of the Comprehensive Plan efforts. In so doing, they also described the Public Participation Plan and its associated tools.

Urban Design 101

- SERA staff reviewed high level urban design principles that foster thriving downtowns, connecting those to the strengths and opportunities present in Downtown Camas today. They also previewed an activity in which the committee will be engaged at their March 2024 meeting – wherein participants will map their own assessment of Downtown.

Next Steps

- SERA and the rest of the consultant team will be preparing an existing conditions assessment for Downtown; SERA will also be conducting a series of interviews with Downtown stakeholders. Findings from these activities will be presented at the committee meeting in March 2024.

Downtown Subarea Plan
Our Downtown Camas 2045

DCA Meeting #2
March 20th, 2024, 3:00- 5:00 PM
Camas Public Library – Eva Santee Meeting Room
625 NE 4th Ave, Camas, WA 98607

AGENDA

Time	Subject	Lead
3:00	Welcome and General Updates	Margaret Raimann, SERA Design
3:15	Downtown Site Assessment: Existing Conditions • Assessment of physical conditions, transportation and infrastructure systems, and high-level market conditions. • Summary of stakeholder interviews	Margaret
3:40	Downtown Site Assessment: Opportunities & Constraints • Basemap drawing exercise • *What are the edges, districts, nodes, landmarks, and paths that define Downtown Camas?* • *Where are the key opportunities and constraints in Downtown Camas over the next 20 years?*	Matt Arnold, SERA Design All
4:10	Break	All
4:15	Opportunities & Constraints Mapping Exercise • To elucidate participant feedback	All
4:55	Next Steps • Community Visioning • Draft Opportunities & Constraints Memorandum	Margaret Nicole McDermott, WSP
5:00	Adjourn	

MEETING SUMMARY

Downtown Site Assessment

- Existing Conditions: SERA staff reviewed existing conditions for Downtown, highlighting key findings in terms of topography / slopes, development patterns, building forms, parks and open space, zoning, historic resources, connectivity and mobility (for automobiles, pedestrians, bicyclists, and transit), parking, and utilities.
- Market Analysis: SERA also presented market analysis findings prepared by ECONorthwest, including an assessment of retail rents and vacancies and visitor data.
- Opportunities & Constraint:
    - The SERA team presented a summary of the results from a range of stakeholder interviews conducted over the preceding weeks. Particular findings included:
        - The strong sense of place in the Downtown core and an interest in expanding that beyond 4th Avenue. Related: historic structures should be preserved and complemented somehow with new uses and buildings.
        - Positive support for Downtown businesses, and concerns that new development and investment may displace existing businesses
        - A desire to continue increasing housing density and a recognition that there is additional development potential in the area. (This was somewhat offset by concerns about the pace of development and concerns about existing zoning and development controls.)
        - An urge to improve the public realm and create more gathering places
        - Concerns about parking with increased development / density
        - Safety issues for pedestrians, particularly along 3rd and 5th Avenues.
        - Interactions with the City have generally been seen as positive.
    - The SERA team led an interactive session wherein participants created their own mental maps of Downtown, focusing on paths, edges, nodes, districts, landmarks, and gateways. Participants shared their own key findings with the group, and these will next inform the Draft Opportunities & Constraints Map and Assessment that will be presented at the committee's meeting in May.

Next Steps

- First Community Summit: 430-630p on June 12, 2024 (227 NE Lake Road, Camas)

Downtown Subarea Plan
Our Downtown Camas 2045

DAC Meeting #3
May 16th, 2024, 3:00- 5:00 PM
Council Chambers – Camas City Hall
616 N E 4th Ave, Camas, WA 98607

AGENDA

Time	Subject	Lead
3:00	Welcome and General Updates	Matt Arnold, SERA Design
3:15	Downtown Subarea Plan Recap • DAC Roles & Responsibilities • Recap of work and meetings to-date	Matt
3:20	Downtown Opportunities & Constraints Discussion • Downtown Subareas • Gateways • Transportation • Parks & Open Space	Matt All
4:15	Break	All
4:15	Downtown Vision & Goals • Draft Vision Statement • Draft Goals	All
4:55	Next Steps	Matt Nicole McDermott, WSP
5:00	Adjourn	

MEETING SUMMARY

Downtown Subarea Plan Recap

- Committee Make-up: While the committee began with solely representation from the Downtown Camas Association, additional members were added from the project's broader Citizen Advisory Committee (CAC) and was thus renamed the Downtown Advisory Committee (DAC).

Downtown Opportunities & Constraints

- Transportation:
    - DAC members raised several questions about the pedestrian and bikeway networks, and requested that DKS (the project's transportation consultant) provide additional information to inform refinement and improvement to these facilities.
        - When considering bike movements in particular, it should be noted that e-bikes are really changing the potential for more biking by more people in Camas as the topography can be more easily overcome with an e-bike.
        - There should be more covered bike parking / end-of-trip amenities/services.
    - Could some streets be made pedestrian-only? This has previously been considered for 4th, but parking and delivery may provide challenges. Perhaps a better system for regular, temporary closures could be looked at. There was also a question as to how this might relate to the proposed plaza associated with the new fire station.
    - There are challenges at the Dallas / 6th intersection related to the lack of stop control. This causes issues for pedestrians, who have difficulties crossing at this location.
- Historic Resources:
    - DAC members stressed how important preservation is – particularly for buildings not currently on the Register (and therefore not subject to the Register's protections). It was noted that the Design Guidelines that emerge from this project could be a key piece here, but that the City could also look at incentives for maintenance of historic structures. It was noted that seismic upgrades are typically triggered by a change in use / occupancy, but that damage could cause a safety issue that would be addressed through the City's Code Enforcement.
- Land Use:
    - Consider integration of 2nd and 3rd into the development pattern of the historic core –

with complementary uses.

- Parking standards are an important consideration for new and redevelopment.

- Gateways:
  - Are gateways meant for visitors or residents? The answer may tilt the design one way or the other (but perhaps they could serve both users).
  - The Gateway off 6th from the Railroad Bridge – where should this be located? At 2nd? Or the traffic light at 3rd? Would its location change if more of the Downtown energy and development pattern crossed 3rd? Could this be a multi-block / transition gateway?
  - Another Gateway location could be along 3rd near Louis Bloch Park. (Issues with sideways in this area were noted.)

- Parks & Open Space:
  - There is a strong need for more parks / open spaces / gathering areas downtown.
  - The Mill Ditch is an important trail opportunity – and connecting downtown to the Three Lakes area is a long-held community notion. The ditch itself could be filled in to make more space for trail users, but a comprehensive plan should be developed. Also, road crossings will be key. (Question: could it be named the Virginia Warren Memorial Trail?)

Downtown Vision & Goals

- Draft Vision:
  - Consider an addition that reflects the need to nurture *current* businesses and maintain business longevity.
  - Some DAC members questioned whether the Draft statement is too packed and too long – perhaps formulaic and not 'human' enough. (The "our town" and "our downtown" sentiment is missing, as is the 'heart.')
  - The draft statement is currently missing sustainability and climate elements. (Perhaps it could mention tree-lined streets?)
  - While it speaks to the commercial and economic aspects of downtown, the sense of belonging / place is missing. (Downtown should be 'welcoming' to everyone.)

- Goals:
    - These should be more action oriented.
    - We should "retain *and expand* Downtown's historic charm" (while recognizing that there may be some tension there).
    - Could add a new goal related to growth.
    - There should be something that relates to preserving existing economic vitality.

Downtown Subarea Plan
Our Downtown Camas 2045

DAC Meeting #4
September 19th, 2024, 3:00- 5:00 PM
Council Chambers – Camas City Hall
616 N E 4th Ave, Camas, WA 98607

AGENDA

Time	Subject	Lead
3:00	General Announcements	All
3:05	Comprehensive Plan Update	Nicole McDermott, WSP
3:10	Vision and Goals	Matt Arnold, SERA Design
3:15	Existing Conditions, Opportunities & Constraints	Matt
3:20	Land Use Concepts	Matt
3:45	Development Opportunity Studies	Matt
4:10	Break	All
4:15	Open Space Studies	Matt
4:35	Transportation Studies	Matt
4:55	Next Steps	Matt, Nicole
5:00	Adjourn	

MEETING SUMMARY

Comprehensive Plan Update

- Nicole M. provided an update on Our Camas 2045, the update of the City's Comprehensive Plan and a preview of the upcoming Community Summit #2 (10/22/24).

Vision and Goals

- Matt A. recapped the Vision Statement for Downtown (accepted by City Council) and the associated Goals.

Existing Conditions, Opportunities & Constraints

- Matt A. reviewed key pieces of the existing conditions for Downtown, emphasizing in particular the existing zoning. He then described the projected work flow for the project, explaining that the land use, development, open space, and transportation concepts being presented and worked on today by the DAC will inform not only the Downtown Plan, but the eventual zoning and design guidelines for Downtown and the broader Comprehensive Plan.

Land Use Concepts

- Matt A. described a series of land use concepts for the various subdistricts of Downtown Camas. The concepts described a range of residential / mixed-use densities and locations, and presented key questions about the desired future for the 3rd Avenue corridor.
    - Participants noted that 3rd Avenue is often seen as a barrier, and that walkability should be improved there.
    - While a couple participants thought the auto-oriented uses should be maintained on 3rd, and others leaned towards the high-density option, most felt that a mix of medium-density uses with a stronger street presence would be most appropriate. (One participant noted that there has been some reinvestment pointing towards retail and office uses along 3rd and to the south.) It was noted that taller buildings here could affect views to the river from further upland, and that this should be given further consideration.
    - Participants generally agreed that land uses and development forms adjacent / proximate to the historic core of 4th Avenue should complement and support the character and sense of place along 4th.
- Matt A. described concepts for frontages along the various corridors in Downtown, noting

that some areas should emphasize active, commercial ground floors, while others may have larger setbacks and landscaping.

Open Space Studies

- Mill Ditch:
    - Connecting Downtown to the Three Lakes continues to be important for participants, who also reminded the team that a name for a revamped Mill Ditch trail could be the Viriginia Warren Memorial Trail (as had been discussed in but not adopted through previous processes).
- New Civic Plaza:
    - Participants were generally supportive of transforming 4th between the Library and (a new) City Hall in order to create a larger public plaza there.
- Dallas Greenway:
    - While participants were somewhat skeptical about closing a portion of Dallas to auto traffic, they were generally supportive of significant enhancing Dallas to promote pedestrian and bicycle use (and safety). They wondered what this could look like on a block-by-block basis as Dallas moves through Downtown and up the hill to the north.

Transportation Studies

- Participants generally appreciated the "Slow L" option, but more broadly supported the slowing of traffic generally through Downtown, recognizing that this could be achieved via a variety of means (road diets, new development, streetscape enhancements, traffic calming improvements, etc.).
- Dallas / 3rd and Adams / 6th were suggested as possible roundabout candidates.
- Additional consideration should be given to the role of the 5th, 6th, and 2nd corridors through Downtown, and how their changing development character affect mobility.
- It was noted that the Mill property, once master planned / redeveloped, could play a key role in the overall transportation system for Downtown.

Downtown Subarea Plan
Our Downtown Camas 2045

DAC Meeting #5
December 9th, 2024, 3:00- 5:00 PM
Council Chambers
616 NE 4th Ave, Camas, WA

AGENDA

Time	Subject	Lead
3:00	Welcome and General Updates	Margaret Raimann, SERA
3:05	Community Summit #2 and Survey Recap • Brief overview of Community Summit #2 and survey feedback	Margaret Nicole McDermott, WSP
3:15	Downtown Subarea Plan: Updated Concepts • Review and discuss updated land use concepts, open space, and civic hub	Margaret All
4:00	Break	All
4:05	Downtown Subarea Plan: Draft Plan Outline • Review a preliminary outline for the Downtown Subarea Plan ○ *Who is/are the key audience(s) for the Plan?*	Margaret All
4:25	Downtown Subarea Plan: Policy Discussion • Review existing policies that inform planning in Downtown • Review Subarea Plan vision and goal statements • Discuss initial ideas for policies that will implement the Downtown Subarea Plan ○ *Who do you see as champions for implementing the goals of the Downtown Plan?*	Margaret All

4:55	Next Steps • Draft Subarea Plan • Draft Policies	Margaret
5:00	Adjourn	

Downtown Advisory Committee (DAC)
Draft Meeting #5 Summary

December 9th, 2024, 3:00- 5:00 PM

General Updates and Community Summit Updates

Margaret Raimann, SERA Design, reviewed the agenda and the purpose of the meeting. Margaret provided a recap of Community Summit #2, which took place in October 2024, and a summary of the findings from an accompanying online survey. The survey was available for community members to provide input on the content from Community Summit #2, which included both the Comprehensive Plan and the Downtown Subarea Plan. Key takeaways for the feedback on the Downtown Subarea Plan were:

- Plan for moderate increases in density, including mixed-use buildings along key corridors
- Preserve historic downtown core
- Prioritize transportation concepts that promote pedestrian safety and traffic calming
- Explore flexible parking solutions and enhanced streetscapes to allow for efficient land use, walkability, and sustainability
- Provide more open spaces and gathering spaces through a connected open space network
- Support civic hub with podium parking to allow for civic plaza space

Downtown Subarea Plan: Updated Concepts

Margaret presented updates to the preferred land use concept for Downtown as well as expanded concepts for the open space network and civic hub. Feedback from Community Summit #2 led to refinement of the land use concept, which focuses on medium-density and mixed-use development in key corridors of Downtown. The preferred land use concept balances the community's vision for residential uses Downtown and preservation of the Historic Main Street Core, while addressing market feasibility of mixed-use buildings.

DAC members offered the following questions and comments:

- How are we addressing parking in the land use concepts, particularly the perception that there is limited parking Downtown? *While there is sufficient parking available in the proximity of Downtown, part of this perception comes from the lack of safety in crossing 3rd and 5th Avenues. The DAC discussed that having dedicated city parking near the Downtown Core would help with the perception. Improved crossings and transformation of 3rd and 5th Avenues in the long term would also create safer connections and a more walkable downtown.*
- How will development at 192nd and the Port of Camas-Washougal change the potential demand for mixed-use development Downtown? *The market Downtown is unique in that it has transit and might draw different residents than these other areas. The group*

discussed the need to balance the current market realities, while recognizing the long-term planning goals of the subarea plan and the vision for more mixed-use Downtown. The DAC expressed interest in seeing mixed-use in key areas, specifically along 3rd and 5th Avenues.

- Rename the Main Street Core zone to the *Historic* Main Street Core to emphasize the importance of the historic character.

Expanded concepts for the open space network included a discussion and renderings of the Dallas Greenway and civic plaza as part of the civic hub.

DAC members offered the following questions:

- Are there precedent examples of a linear park that crosses a hillside? *The Dallas Greenway would include a significant slope to the north of Downtown. The DAC requested expanding the linear park north of 6th Avenue.*
- Can the Mill Ditch be a safer route for bikes? *The plan can clearly define how this area would be used for bikes so that there is a safe bicycling route into Downtown.*

Downtown Subarea Plan: Draft Plan Outline

Margaret presented a draft outline and storyboard that showed how the content developed for the Downtown Subarea Plan would come together in a document. This started a discussion about who the audience is for the plan to provide insight on areas to focus on in the plan.

DAC members provided input on both the groups they would like to see using the plan and how they might implement the plan:

- Developers
- Building owners
- New and current City Council members
- Downtown Camas Association
- Funding agencies
- Example to other Main Street programs
- Staff for work planning and investments
- Recruitment for new businesses
- Georgia Pacific Mill
- Historic District designation
- C-Tran
- Investment recruitment tool
- Columbia River Economic Development Council
- Visit Vancouver

Downtown Subarea Plan: Policy Discussion

Margaret and Nicole McDermott, WSP, introduced how the policies developed for the Downtown Subarea Plan will help to guide the future policy direction for implementation of the plan. Policies will also be developed for the Comprehensive Plan, but a separate set of policies

will be written for Downtown. These policies help to set priorities and provide direction to the City following adoption of the Plan. The DAC discussed policies that they would like to see written for Downtown:

- Address climate issues through policies related to encouraging reuse vs full redevelopment
- Stormwater, sewer, trees, sidewalk and other infrastructure improvements:
    - Ensure adequate infrastructure to serve land uses.
    - Make sure that timing of infrastructure is considered in the plan implementation.
- Address 3rd and 5th Avenue pedestrian safety
- Connectivity: Improve connections to and from Downtown
- Expand character of Downtown to the broader boundary defined in the plan
- Focus on pedestrian activation through plazas and public spaces
- Support economic development Downtown
- Address accessibility needs both with ADA and beyond
- Accommodate a flexibility of spaces and variety of uses through use of public space (sidewalks, parking, etc.)
- Define the historic character of 4th Avenue through specific streetscape elements.

Next Steps

The consultant team and City will be working on a draft of the subarea plan in the coming months and will share a version of the draft with the DAC.

Margaret thanked the committee for their attendance and adjourned the meeting at 5:00pm.

Downtown Subarea Plan
Our Downtown Camas 2045

DAC Meeting #6
March 24th, 2025, 3:00- 5:00 PM
Council Chambers
616 NE 4th Ave, Camas, WA

AGENDA

Time	Subject	Lead
3:00	Welcome and General Updates	Margaret Raimann, SERA
3:05	Downtown Design Guidelines Manual: Presentation • Land Use Planning and Zoning-to-Date • Sample Downtown Design Guidelines • Potential Components for Consideration	Bryan Robinson and Nicole McDermott, WSP
3:20	Downtown Design Guidelines Manual: Discussion • What features / design elements of the Main Street Core area do you want to preserve? • Are you more interested in regulating the public realm or building details? And what about each is important? • Are there any design elements of the Main Street Core that you would like to see in other areas of Downtown? • How specific / prescriptive do you want the updated Design Guidelines to be? • How do you see incentives being helpful for the implementation of the Design Guidelines?	Bryan, Nicole All
4:00	Break	All

4:05	Downtown Subarea Plan Draft Policies: Discussion [see Attachment A] • Do the policies reflect your priorities for implementation of the Downtown Subarea Plan? • What's missing from the policies? • Do you have any suggested changes to the policy language?	Margaret All
4:55	Next Steps • Draft Subarea Plan • Draft Design Guidelines	Margaret, Bryan, Nicole
5:00	Adjourn	

ATTACHMENT A

Downtown Subarea Plan
Our Downtown Camas 2045
DRAFT - Policies

The draft goals and policies listed below reflect work and discussions to-date on the Downtown Subarea Plan that will advance priorities and implementation over the next 20 years.

Goal DT-1: Architecture and Design

Retain Downtown's historic design and expand its charm.

- DT-1.1: Protect and enhance downtown's design, including the integrity of the Historic Main Street Core, through clear and objective zoning standards and design guidelines.
- DT-1.2: Explore improvements to the public realm that reinforce downtown's charm through a Streetscape Plan and continued investment in community amenities.
- DT-1.3: Ensure that downtown design standards are up-to-date and reflect the goals and policies of the Downtown Subarea Plan.
- DT-1.4: Promote the addition of street trees, landscape planters, green walls, and other landscaping elements that improve aesthetics, provide shade, and enhance the pedestrian experience.
- DT-1.5: Incorporate public art, murals, and interactive elements to create a unique sense of place.
- DT-1.6: Require new buildings to complement the existing architectural character while allowing for contemporary design elements.
- DT-1.7: Encourage the use of pedestrian-scale buildings and street lighting to highlight building facades and architectural features while enhancing safety and visibility.

Goal DT-2: Downtown Housing

Provide a range of housing options that welcome more people to live Downtown.

- DT-2.1: Allow development of a range of housing types, including both rental and ownership

options, for a range of income levels within the zoning districts in the Downtown Subarea Plan boundary.

- DT-2.2: Explore incentives to increase housing capacity and encourage the development of diverse housing types, ADUs, affordable housing, senior housing, and mixed-use or live/work units downtown.
- DT-2.3: Develop specific design standards for new housing built to complement the existing development within downtown, ensuring the regulations and permitting processes are clear and objective.
- DT-2.4: Continue to implement housing affordability strategies that meet the needs of Camas households downtown while preserving existing affordable housing.
- DT-2.5: Encourage housing downtown to provide features that foster healthy living such as community gardens, open spaces, and recreation areas.

Goal DT-3: Urban Amenities

Provide the right mix of development, services, and public spaces that support ways for people to live, work, and play Downtown.

- DT-3.1: Require active ground floor uses and engaging street level design in the Historic Main Street Core zoning district.
- DT-3.2: Support park and open space improvements and improved connectivity to the Mill Ditch Trail and Louis Bloch Park, as illustrated in the Downtown Subarea Plan.
- DT-3.3: Evaluate how Camas regulations support visitor lodging and tourism activities downtown.
- DT-3.4: Explore opportunities for additional public spaces, including public plazas, pocket parks, pedestrian-only streets, and community gardens.
- DT-3.5: Create a parklet program that converts downtown curbside parking spaces, when and where appropriate, into community seating spaces available for businesses and residents.
- DT-3.6: Establish a policy requiring that new public and private projects provide public art, including murals, sculptures, or interactive elements within public spaces.
- DT-3.7: Support and incentivize business and property owners to incorporate outdoor patios, seating areas, planters, and other landscape features that contribute to an inviting and dynamic streetscape.

Goal DT-4: Economic Development

Encourage (re)development to expand opportunities Downtown for retail, office, and residential.

- DT-4.1: Support partnerships with community groups focused on advocating for the future of Downtown Camas, such as the Downtown Camas Association.
- DT-4.2: Evaluate the Camas Municipal Code and permitting procedures to identify ways to increase flexibility in enabling businesses to expand, grow, or redevelop at existing locations.
- DT-4.3: Collaborate with public agencies, private parties, and non-profits in marketing and outreach efforts that attract visitors and sustain existing local businesses and attract new development/redevelopment while maintaining the historic charm of downtown.
- DT-4.4: Partner with the Downtown Camas Association, Camas-Washougal Chamber of Commerce, and other similar organizations to expand incentives available to small local businesses such as credit improvement programs.
- DT-4.5: Prioritize City investments that capitalize on nearby redevelopment efforts to reinforce economic and physical connections to downtown.
- DT-4.6: Evaluate financing tools to help investments in community infrastructure and encourage redevelopment of key areas.
- DT-4.7: Address infrastructure improvements necessary for redevelopment projects.
- DT-4.8: Encourage development and redevelopment that reinforces the role of public spaces in Downtown Camas as a vibrant center of activity, particularly for vulnerable populations such as youth and elderly.
- DT-4.9: Develop strategies to mitigate displacement of existing businesses downtown, particularly in areas of increased investment and redevelopment.
- DT-4.10: Work to achieve a diverse set of local businesses downtown that are complementary and economically resilient, balancing needs of residents, workers, and visitors.

Goal DT-5: Civic Life

Expand on civic life and services Downtown through strategic use of City-owned property and vibrant community events.

- DT-5.1: Ensure that city hall, the library and primary services remain downtown, in the heart of

the city.

- DT-5.2: Fulfill the vision for a central gathering place in the heart of downtown through the development of a Civic Hub, which will include a civic plaza that supports existing community events and be a catalyst for new events.
- DT-5.3: Support flexibility and provide prioritized infrastructure investments at the Civic Hub along NE 4th Ave to create shared spaces to accommodate the growth of pedestrian-friendly events including the Farmers Market.
- DT-5.4: Develop guidelines and permitting procedures that allow for seasonal or temporary use of public spaces for outdoor dining, retail displays, and community events, while ensuring pedestrian flow and safety.

Goal DT-6: Multimodal Connectivity

Create a safe and connected transportation network that makes Downtown walkable and bikeable.

- DT-6.1: Encourage placemaking and wayfinding efforts downtown to develop a distinct identity and attract visitors.
- DT-6.2: Ensure downtown sidewalks are wide, unobstructed, and well-maintained to accommodate all users.
- DT-6.3: Implement traffic-calming measures such curb extensions, raised crosswalks and intersections, and unique pavement treatments that improve pedestrian safety and enhance downtown design.
- DT-6.4: Improve bicycle infrastructure with new dedicated bike lanes, sharrows, intersection improvements, and bicycle parking and racks. Encourage the use of priority bicycle parking for community events.
- DT-6.5: Enhance connections between the Historic Main Street Core and downtown residential neighborhoods, including Evergreen Terrace and south of NE 3rd Ave.
- DT-6.6: Install benches, shade structures, and public seating along pedestrian routes to create a more comfortable walking environment.
- DT-6.7: Ensure adequate parking downtown for continued business growth and consider developing a parking management plan. Seek out opportunities for shared use parking and additional parking on the edges of the downtown district, which could also serve as a park and ride transit facility.

Downtown Advisory Committee (DAC)
Draft Meeting #6 Summary

March 24th, 2025, 3:00- 5:00 PM

Downtown Design Guidelines: Presentation and Discussion
Bryan Robinson and Nicole McDermott, WSP, presented an introduction to the process of updating the Downtown Design Guidelines Manual and Zoning Code for the new zoning districts defined in the Downtown Subarea Plan. The presentation included examples from jurisdictions with similar elements to Downtown Camas across Washington and Oregon. DAC members asked questions throughout the presentation and answered specific discussion questions.

The goal of the discussion was to understand the types of elements that the DAC would like to see regulated in the zoning code and guidelines, as well as the level of restriction / flexibility that the code and guidelines should provide for future development / redevelopment.

DAC members offered the following questions and comments:

- In general, DAC members would like to preserve / enhance the following elements in Downtown:
    - Attention to charm, scale, and intimate feel of downtown
    - Continue thoughtful approach to public art
    - Bulb-outs / curb extensions to preserve walkability
    - Flower baskets and street trees
    - Building and landscaping / tree lighting, lampposts
    - Awnings / weather protections
    - Remove permanent structures that no longer serve the public realm (e.g., giant planters on NE 4th Ave.)
    - Commercial use at ground floor, specifically restaurants and retail
    - Lighting / signage regulations (e.g., brightness restrictions)
    - Regulate public realm (e.g., building design, public space between building/street)
    - Create reliable parking options, even if it's a lot that's a few blocks away

Additional / expanded discussions about specific elements are categorized by topic below:

- Lighting:
    - Lighting layers should be considered for exterior lighting on buildings.
        - The DCA currently has a grant to add lighting to existing buildings and it could be a good standard for new buildings.
        - These standards could differ by zoning district.
    - Consider a lumen level / foot-candle limit for all lighting on buildings
    - Pedestrian lighting should be spread out beyond Main Street Core
- Public Art

    - Would like to see more follow-through / clarity on the public art fee requirement for new development
    - Public art is important, but needs to be done with care
    - The City is working on a Public Art Program as part of the Strategic Plan process
- Awnings
    - Can awnings be required with a change of use / building permit?
    - Weather protection is something that is consistently missing and should be addressed
    - Do awnings cover the door or the entire length of your building? Some DAC members stated a preference for the entire building
- "Active Ground Floor" terminology
    - What does "active" mean? Can it be specific to restaurants and retail in the Main Street Core?
    - Desire to make sure uses remain commercial on ground floor
- Height
    - Interest in zoning protection for height in the Main Street Core, and potentially also in areas outside the core
- Facades, Building Materials
    - What prevents someone from changing historic character and façade? Can we regulate color?
    - More interest in regulating aesthetics than materials. There needs to be more guidance/regulation than there currently is but not super prescriptive.
        - Does this include materials on only NE 4th? Or all materials in other zoning districts?
        - The key is the aesthetic. People love downtown's eclectic nature but want to see some sideboards around future design.
- Parklets / outdoor dining
    - Uncertainty around implementing parklets if they take up parking space; they would need a set of design standards / be attractive.
    - Concern that downtown is inviting as-is, which includes the ease of finding parking and walking around. That environment would need to remain, and if it is harder to park that might change the ease of navigating Downtown.
- Parking
    - Part of the issue with parking is not being able to "count on" a spot. Designated parking areas, even if a few blocks from a destination, might be worth it since it would more/less guarantee parking spots.
- Permitting Process / Design Manual Applicability
    - Are there thresholds for when design guidelines kick in currently?
        - *City staff stated it's currently when a building permit is required.*
    - Interest in more clarity around when design guidelines would apply, what triggers it (Change of use? New development only?)
        - The goal of the new guidelines and zoning would be to be as clear and objective as possible.

- Future proofing
    - Can the guidelines account for future building materials (e.g., cutting-edge tech for siding) or future uses, since it's a 20-year plan and there will be some unknowns?
        - Opportunities to amend zoning code and guidelines as necessary in the future for new/emerging technology.
    - Consider future options for EV charging stations, downtown Wi-Fi, consider future generations
        - Implementation plan can include exploration of this.
- Incentives
    - MFTE exists now as an incentive.
    - What other incentives would be needed in the future, even if market isn't supporting certain development now, but could be in the next 20 years?
    - Where are City initiatives vs building/developer-owner driven initiatives?
- Downtown residential zone
    - Interest in setting design standards in residential areas.
        - State regulations require the same level of requirements for missing middle housing types as SF residential.
    - Some expressed concern over redevelopment that has happened in Evergreen Terrace in terms of the style/design of the housing, others expressed a desire to maintain setbacks and scale but less concerned about design.
    - Currently the code only regulates setbacks and building code/permit.
    - Can Camas establish its own historic design guidelines/designations to preserve residential areas?
        - Discussion of a potential optional program for homeowners.

Downtown Subarea Plan Policies: Policy Discussion

Margaret Raimann, SERA Design, presented the draft policies that will accompany the Downtown Subarea Plan. DAC members received the list of draft policies along with the agenda for the meeting and provided feedback during the meeting.

DAC members offered the following feedback during the meeting:

- DT-1.7: Encourage the use of pedestrian-scale buildings and street lighting to highlight building facades and architectural features while enhancing safety and visibility.
    - Be clear about the meaning of street lighting.
    - Could this also include wayfinding signage and other signage?
- DT-1.5: Incorporate public art, murals, and interactive elements to create a unique sense of place.
    - Can we be specific here about how funds for public art are used?
- DT-2.1: Allow development of a range of housing types, including both rental and ownership options, for a range of income levels within the zoning districts in the Downtown Subarea Plan boundary.
    - Should we include language about "increasing density"?

- DT-3.1: Require active ground floor uses and engaging street level design in the Historic Main Street Core zoning district.
    - Should “active ground floor” be defined here? (Restaurants/retail?)
- DT-3.2: Support park and open space improvements and improved connectivity to the Mill Ditch Trail and Louis Bloch Park, as illustrated in the Downtown Subarea Plan.
    - Can the Mill Ditch Trail improvements be specific about bicycle connections?
- DT-3.5: Create a parklet program that converts downtown curbside parking spaces, when and where appropriate, into community seating spaces available for businesses and residents.
    - Can we add language that states the parklets are temporary?
- Add to Goal DT-3:
    - Consider fees/revenue generation for maintaining urban amenities and /or a public process for review of privately funded urban amenities.
- Goal DT-4:
    - Look at combining 4.1, 4.3, and 4.4 due to redundancies.
    - Opportunity for collaboration with the city for façade improvement programs (reduce fees, streamline permitting, etc.)
    - Consider adding a policy related to job creation; there is an opportunity for living wage jobs/innovation (light industrial uses).
- DT-6.6: Install benches, shade structures, and public seating along pedestrian routes to create a more comfortable walking environment.
    - Shade or a different pavement surface is especially important in areas where Farmers Market operates.

Next Steps

Brian, Nicole, and Margaret presented the next steps for the project, which include a draft Design Guidelines Framework Document, updated draft policies, and a Draft Subarea Plan document. DAC members were encouraged to provide additional feedback on the draft policies via email if they have more comments or questions.

The meeting adjourned at 5:05pm.

Appendix B: Housing Action Plan (2024)

City of Camas

Housing Action Plan

FINAL REPORT
2021



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Prepared by

Mosaic Community Planning, LLC and
Marketek, Inc.

For

City of Camas
616 NE Fourth Avenue
Camas, WA 98607

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Acknowledgements

The City of Camas thanks community members that shared their time, knowledge, and ideas during development of this Housing Action Plan. The City looks forward to continued engagement with residents and other stakeholders during implementation of this Plan.

Camas City Council

Ellen Burton, Mayor Pro Tem
Greg Anderson
Bonnie Carter
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Steve Hogan
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Chapter 1:
Introduction



The City of Camas created this Housing Action Plan (HAP) to encourage housing diversity, affordability, and access to opportunity for people of all incomes. The goal of the plan is to help the community achieve a greater variety of housing types and costs to better meet the needs and desires of individuals and families.

Additional objectives of the Plan include:

- Relying on thorough data and an inclusive public participation process to understand current and future housing needs.
- Assessing existing housing resources and policies and identify ways to build on or improve them.
- Outlining strategies the City of Camas plans to take to meet the community's housing needs over the next ten years and beyond.
- Furthering the city's Comprehensive Plan housing goals and be adopted by City Council.

Camas received a grant to support this project from the Washington State Department of Commerce under the Urban Residential Building Capacity Grant Program established by House Bill 1923. In 2019, the Washington State Legislature passed HB 1923 to encourage all cities under the Growth Management Act (GMA) to adopt actions to increase residential building capacity and prioritize affordable, inclusive neighborhoods. Developing a Housing Action Plan was one option through which cities could receive grant funds under HB 1923.[1]

This document outlines the process and findings of Camas's housing research, including community outreach through virtual meetings, a survey, and an interactive project website. It culminates with strategy recommendations for expanding housing diversity and affordability in Camas. Major components include:

- Community Engagement Overview
- Demographic Trends Analysis
- Housing Supply Analysis
- Housing Need Estimates & Gaps
- Recommended Housing Strategies
- Implementation Plan

Figure 1: Camas HAP Project Phases



[1] Washington State Department of Commerce, "Urban Residential Capacity Grant Program Overview." Retrieved from: https://deptofcommerce.box.com/shared/static/5r9951piax26mz19hez4j5d1gobi6l08.pdf

Following adoption of the HAP by Camas City Council, the City will work to implement strategies included in the Plan over the next several years.

Definitions

Affordable Housing

The definition used throughout this analysis is congruent with the U.S Department of Housing and Urban Development's definition of "affordable housing" as housing that costs no more than 30% of a household's total monthly gross income. For rental housing, the 30% amount would be inclusive of any tenant-paid utility costs. For homeowners, the 30% amount would include the mortgage payment, property taxes, homeowners insurance, and any homeowners' association fees.

Comprehensive Plan

"Comprehensive plans" are the centerpiece of local planning efforts. A comprehensive plan articulates a series of goals, objectives, policies, actions, and standards that are intended to guide the day-to-day decisions of elected officials and local government staff.

Growth Management Act (GMA)

The Washington State Legislature enacted the Growth Management Act (GMA) in 1990, following a lengthy process led by the Growth Strategies Commission. It was motivated by several factors, including rapid suburban development and traffic congestion and the decrease of farmland and open space. The passage of HB 2929 set forth 13 statewide goals, numerous new policies and requirements, and new planning and revenue authorities for counties and cities.

HB 2929 required counties with high growth rates, which includes Clark County, to plan. A city must follow the lead of the county in which it is located and must plan under the rules of the GMA. GMA-planning counties and cities are required to develop and adopt comprehensive plans, followed by zoning and other development regulations to implement those plans. The GMA also calls for communities to review and, if necessary, revise their plans and regulations every eight years to ensure they remain up to date.

Clark County is required to plan for the population projected to grow in the County over the next 20 years. The county and the cities are to work together to distribute growth forecasts across all cities, unincorporated growth areas, and rural areas, with an emphasis on accommodating growth within urban areas to preserve rural and natural resource lands.

HUD Area Median Family Income (HAMFI or MFI)

To determine household income limits for eligibility in federal affordable housing programs, the U.S. Department of Housing and Urban Development calculates

median family income by household size for counties and metropolitan areas throughout the United States. The median family income for a given geography and household size is the midpoint of the income distribution for similarly-sized households within that geography.

According to HUD's HAMFI data, Camas falls within the Portland-Vancouver-Hillsboro, OR-WA metropolitan area. As of 2021, HUD estimated the MFI for that area at $96,900.

Protected Classes

Title VIII of the Civil Rights Act of 1968 prohibits housing discrimination based on race, color, national origin or ancestry, sex, or religion. The 1988 Fair Housing Amendments Act added familial status and mental and physical handicap as "protected classes."

The Washington State Law Against Discrimination includes four protected classes in addition to those protected at the federal level. They include marital status, sexual orientation and gender identity, source of income, and veteran/ military status.

Zoning

"Zoning" establishes separate districts (zones) for different types of land use, such as commercial, residential, and industrial. These areas are shown on the city's Zoning Map. Within each zone, standards are adopted to regulate the size, use, and location of sites and buildings. Requirements for protecting critical areas, standards for landscaping and parking, and subdividing land are also addressed. Zoning regulations adopted by the City are contained within Title 18 of the Camas Municipal Code.

Commercial Zones are intended to provide services and employment primarily to residents. Commercial zones may also include residential development such as apartments as part of a mixed-use project. An example of a commercial site that includes residential development can be found at the Grass Valley Master Plan project on NW 20th Avenue.

Industrial Zones provide for a wide range of industrial and manufacturing uses. Types of activities in this zone include assembly, manufacturing, fabrication, processing, bulk handling and storage, research facilities, associated warehousing, and heavy trucking.

Light Industrial/Business Park Zones provide for uses, such as offices related to industrial usage, research and development, limited commercial, and associated warehousing uses. Development standards require a campus-like setting with generous landscaping and setbacks from roadways.

Multifamily Zones are intended to provide for dwellings, such as row houses, condominiums, and apartments. It is desirable for these zones to be adjacent

to parks and transportation systems (e.g., bus stops). The maximum number of units that are allowed per acre in a multifamily zone is 18 units per acre. Only 5% of the city is zoned for multifamily uses.

Single-Family Residential Zones are intended for dwellings that are typically a single dwelling or a duplex (attached dwelling). Approximately 48% of the city is zoned for single-family use. The city also allows for an Accessory Dwelling Unit (ADU) on single family lots that are not otherwise prohibited by restrictive HOA covenants.

Data Sources

Decennial Census

Data collected by the Decennial Census for 2010 and 2000 is used in this Assessment (older Census data is only used in conjunction with more recent data in order to illustrate trends). The Decennial Census data is used by the U.S. Census Bureau to create several different datasets:

2010 and 2000 Census Summary File 1 (SF 1) – This dataset contains what is known as "100% data," meaning that it contains the data collected from every household that participated in the Census and is not based on a representative sample of the population. Though this dataset is very broad in terms of coverage of the total population, it is limited in the depth of the information collected. Basic characteristics such as age, sex, and race are collected, but not more detailed information such as disability status, occupation, and income. The statistics are available for a variety of geographic levels with most tables obtainable down to the census tract or block group level.

2000 Census Summary File 3 (SF 3) – Containing sample data from approximately one in every six U.S. households, this dataset is compiled from respondents who received the "long form" Census survey. This comprehensive and highly detailed dataset contains information on such topics as ancestry, level of education, occupation, commute time to work, and home value. The SF 3 dataset was discontinued for the 2010 Census, but many of the variables from SF 3 are included in the American Community Survey.

American Community Survey (ACS)

The American Community Survey is an ongoing statistical survey that samples a small percentage of the U.S. population every year, thus providing communities with more current population and housing data throughout the 10 years between censuses. This approach trades the accuracy of the Decennial Census Data for the relative immediacy of continuously polled data from every year. ACS data is compiled from an annual sample of approximately 3 million addresses rather than an actual count (like the Decennial Census's SF 1 data) and therefore is susceptible to sampling errors. This data is released in two different formats: single-year estimates and multi-year estimates.

ACS Multi-Year Estimates – More current than Census 2010 data, this dataset is one of the most frequently used. Because sampling error is reduced when estimates are collected over a longer period of time, 5-year estimates will be more accurate (but less recent) than 1-year estimates. The 2014-2018 ACS 5-year estimates are used most often in this HAP.

Comprehensive Housing Affordability Strategy (CHAS)

CHAS data is a special tabulation of the U.S. Census Bureau's American Community Survey (ACS) that is largely not available through standard Census products. The special dataset provides counts of the number of households with a variety of housing needs, in a range of income brackets, and for different household types of particular interest to planners and policy makers. The most recent available CHAS data is based on 2013-2017 American Community Survey 5-year estimates.

City of Camas Building Permits

The City of Camas provided monthly residential building permit data from 2017 through 2020. Permit data included development type (single or multifamily) and unit square footage. Mosaic Community Planning analyzed building permit data for comparisons to 2010 and 2015 permit data included in *Camas 2035.*

Washington Center for Real Estate Research

The Washington Center for Real Estate Research provides housing data for local governments in Washington, including those developing Housing Action Plans under HB 1923, through its Housing Market Data Toolkit. The toolkit includes a compilation of relevant Census data, information about local for-sale and rental markets, housing permit and completion data, and a housing affordability index. The toolkit is publicly available at https://wcrer.be.uw.edu/housing-market-data-toolkit/.

Chapter 2:
Community Input





Camas residents and employees have a wide range of unique housing needs and preferences. To be successful, the Housing Action Plan must be grounded in a thorough understanding of local housing needs, as well as reflective of residents' ideas for the future. Implementation of the Plan depends on local support built, in part, through an inclusive and open community engagement process.

The City of Camas's goals for engaging the public during the HAP include:

- **Inform** residents about the Housing Action Plan, the planning process, and local housing affordability needs.
- **Understand** local housing issues, needs, and preferences, specifically those related to affordability and development opportunities and barriers.
- **Be inclusive** of a range of perspectives, including people who are particularly impacted by housing affordability, communities at risk of displacement, other vulnerable populations, and groups who have historically been left out of community planning processes.
- **Be transparent** to openly reflect the variety of viewpoints within the community, as well as the City's process used to develop and implement the Housing Action Plan.
- **Build support** for zoning and housing policies that address affordability and other issues identified by the community.

The community engagement process for the Housing Action Plan used a variety of virtual engagement tools in place of traditional face to face engagement methods. To gather input from the public, the project team conducted two virtual public meetings, seven focus groups, and maintained a website for resident engagement, including a public survey.

In total, over 300 people participated in developing the Housing Action Plan. About 50 people joined a community meeting or focus group and 307 took the survey. This section summarizes feedback received through each of these methods.

Community Meetings

Two virtual public meetings were held in September. Each meeting began with a presentation by the project team that included an overview of the HAP and a few data points about housing in Camas. The team then asked participants for their opinions on the city's housing needs and current supply through in-meeting Zoom polls and small group discussions.

Table 1: Zoom Poll Discussion Summary – Does Camas Need Greater Variety in Housing Types and Prices?

STRONGLY AGREE

- Most new housing in Camas is not affordable for half of the population.
- Housing should be built with a focus on active transportation, such as biking and walking, and on mitigating climate change.
- With two teenage boys, I would love to have kids be able to move back as adults. However, there are not a lot of affordable or starter homes.
- I was trying to help a young man who was homeless find housing but could not find anything. I do not feel like Camas has a good foothold in caring for the aging or a diverse population, including people of different ethnic backgrounds, colors, and gender identities. Camas does feel like it is a Caucasian space. I do not know that that helps us embrace a holistic view of what we could be.

NEITHER AGREE NOR DISAGREE

- There's benefit to the vitality of a small town with some density. With a community like Camas where a lot of the population is by Vancouver, it is easy to patronize businesses there rather than downtown, so we lose vitality to businesses there. Development of downtown interests me most.
- I am still learning and have no idea what we have. I thought we have a pretty diverse community, but everything can improve.
- I am indifferent. What does the housing mixture look like? What are the services to provide for residents? How can new residents be supported? People are being priced out.

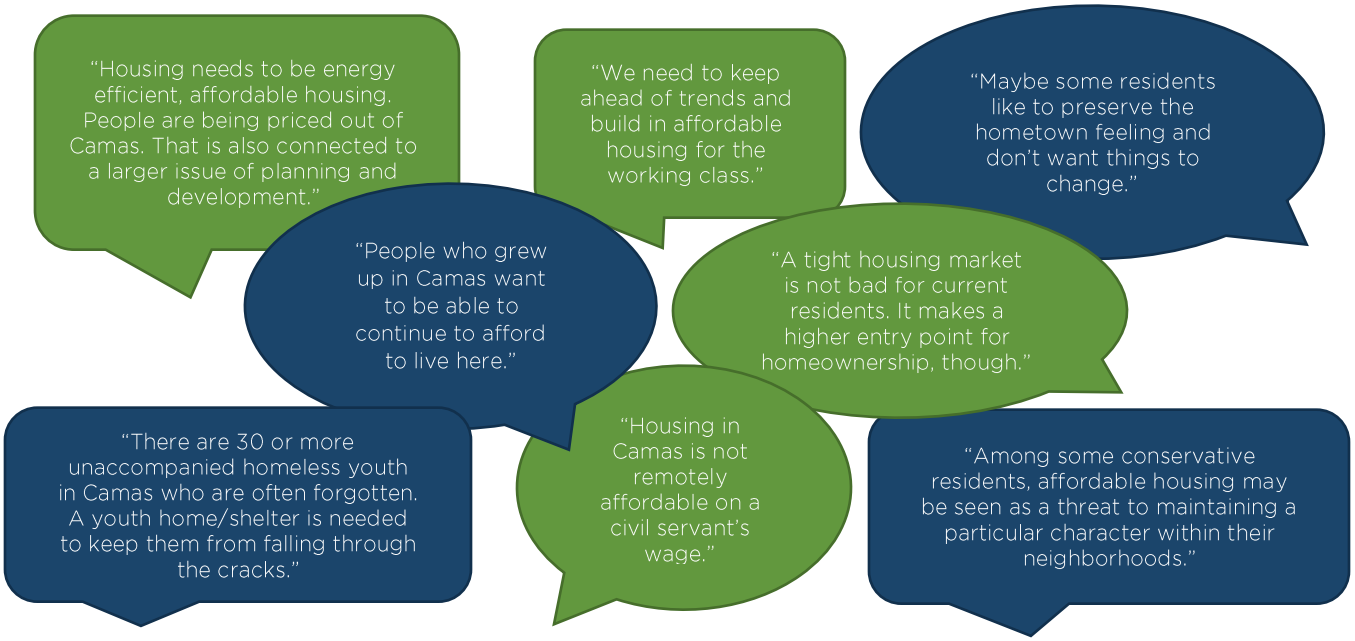
SOMEWHAT AGREE

- I am still getting grounded on these issues, so I would like to know the socioeconomic spread in Camas and whether the housing needs are meeting the needs of those who live here. Are people working here having to commute because they cannot afford housing? Is it safe to bike on our roads?
- There are lots of big houses in Camas and not many small housing types.
- Long-time residents say they cannot afford houses here.
- Retiring in Camas is questionable related to affordability and modest housing sizes.
- We need more options for starter and mid-range homes.
- There does need to be a greater variety of housing in Clark County as a whole.
- More variety is necessary to include people 'priced out.'

SOMEWHAT OR STRONGLY DISAGREE

- On the west side, if you look at the variety of development, there is quite a lot. Not as much strictly in the City of Camas, but in the area in general.
- How would residential growth affect current homeowners, schools, and growth in the city?
- I am concerned about increased density. Let us not be Portland with no parking. Impact fees do not reflect the actual price of supporting new residents. We need to pay-as-we-go and not use more bond measures to support development.

Figure 2: Comments on Housing Variety



Housing Types Most Needed in Camas

Discussion Question: What particular types of housing do you feel like are most needed in Camas (e.g. housing for students, singles, elderly, homeless, disabled, etc.)? What does housing for that population look like (apartments, single-family homes, townhomes, ADUs, etc.)?

Housing types should address the needs of minorities and homeless families (who may live "doubled-up" with other families), participants suggest. More affordable housing types might include condos, manufactured housing and mobile parks, and tiny homes – housing types that might allow the owner to accumulate equity quickly. However, additional regulations may be needed to allow these housing types in the city. Other suggestions include mixed use housing to provide walkability, access to transportation and access to nature. Some participants also posited that denser development would make service delivery more efficient. Others inquired about studying an "appropriate amount" of housing for the range of incomes in Camas, including low-income housing, as long as the city maintains its "community feel."

Families moving to Camas may be in search of good schools and greater affordability than other cities on the west coast. "Camas is still a small town asking big city questions," one participant noted. However, some feel that the prevalence of large, single-family homes does not necessarily reflect a "healthy, stable community." Some participants seek greater balance in housing types without experiencing a loss of community.

Specific housing types identified by participants include:



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Starter Homes

"As kids move out, they often cannot return as adults because they cannot afford Camas."

"Potential needs are housing for kids coming back after school and family retiring here."



Accessory Dwelling Units (ADUs)

"ADUs, cluster homes could help meet need."

"From a real estate perspective, 99% of clients coming to Camas are families. Some ask for an ADU to bring a parent. Some go 'out in country' or out of Camas if that is a priority."

"There are 20 ADUs in the entire city and not very many permit applications coming in."



Accessible Housing

"Retirees or older population needs 'accessible' housing – e.g., no stairs."

Apartments and Condominiums

"Part of a vital downtown is going to be more residential units, apartments, or condos on those blocks."

"Camas is getting more expensive. Multifamily units are $100k/unit up north and $150k/unit here. Unfortunately, it is going to push people out."



Senior Housing

"For the elderly, we do not have much. No communities serving seniors."



Development Opportunities

Discussion Question: Are there development opportunities for housing types needed in Camas? What opportunities could Camas leverage to encourage development of housing to meet local needs? (E.g. infrastructure or amenities that would support or add value to new residential development; policy or incentive programs that would incentivize new development types, etc.)

Table 2: Community Meeting Discussion Summary – Development Opportunities and Challenges

OPPORTUNITIES
• Use tax credits to construct multi-family housing • Utilize "supports" and/or change government financing options to encourage housing diversity • Provide community amenities, such as good restaurants and other businesses that may be perceived as cool/edgy. • Increase the job base in the area to attract people. With good transportation, you may get young professionals who will want starter homes. • Continue to revitalize the downtown business district, making it easier to access. It is difficult to get downtown on a bike - roads or trails, dedicated bike path from the lake area to downtown would be good.
CHALLENGES
• Without apparent room for new housing, then one option would be to redevelop existing areas/knock down existing structures. However, I am doubtful that would be well-received. • Most HOAs do not allow ADUs on lots. • It is hard to park in downtown right now. It is not clear where housing would fit downtown or out 192nd. • Construction is occurring downtown but I do not see sites where housing could go. • Building is really expensive. The price of supplies is through the roof. • Incentives and subsidies do not work. The cost does not pencil out.

Development Barriers

Discussion Questions: Are there barriers to housing development in Camas? What barriers exist to production of needed housing types? What keeps the market from meeting these housing needs?

- Regulations, statutes, and policies.
- State laws that Camas officials must abide by and do not have control over.
- Permits and fees for single family development that are different than those for multifamily development.
- The GMA (Growth Management Act) is designed to encourage more dense building. If a city does not have much land, prices will go up.

- Available land is being used up.
- Large houses are more profitable to build.
- Demand drives housing development. Housing – attached or detached – must accommodate families since people move to Camas for schools. People do not move to Camas for the local jobs. In fact, most residents commute. People leave places like Portland and move to Camas for the natural setting and a quality of life.
- Preferences of residents who want to live in the suburbs.
- Choices made by the city on what housing to build, not what the demand is, are what matter. Participants argue that many people want to move to a good school district with affordable housing. The question, they ask, is whether the city wants to develop with more dense housing, more affordability, and with active transportation requirements.

Focus Groups and Interviews

Stakeholders participated in seven focus groups during October and November. Participants included professionals in the fields of housing and homeless services, education, government, transportation, and urban planning, as well as high school students. Several questions were posed in the focus groups and responses are summarized below.

Why are people moving to Camas?

Focus group participants describe the city as a great place to live for schools and safe neighborhoods. Residents enjoy the proximity to Portland and Portland International Airport (PDX). Camas also offers more affordability and lower taxes than Portland, Sacramento, or other California cities. The city's small-town atmosphere – resembling the feel of the old mill town – and its charming downtown provide rich and beloved character. Other features enjoyed by residents include trails and sports. Residents enjoy Camas for the quality of life available in the city.

What types of housing does Camas need more of?

Participants want housing that reflects a variety of stages of life, including housing for college students and single adults. They express a desire for entry level homes, ranging from 1,500 to 2,000 square feet or sold for less than $200,000. Stakeholders also want housing that enables seniors to age in place. There is some interest in higher density or "vertical" housing, such as apartments or condos, particularly in downtown. Some participants desire more unique housing products, and developments serving low-income residents through the local housing authority.

Is housing affordability a problem in Camas? Are there other barriers to living in Camas?

In short, yes. The city's housing supply is mostly large single-family, leaving limited housing choices for residents of a range of incomes, including lower income households. Participants acknowledge that negative perceptions about affordable housing may have racial or anti-poverty undertones. But participants suggest re-framing affordable housing, so that it is located downtown, is attractive and offers housing for professionals such as teachers. Other barriers to living in Camas include limited housing for people who want to downsize, limited housing turnover, lack of public transit, few local jobs and increasing taxes for longtime residents and retirees.

What are the challenges to the development of new housing?

One challenge may be the remaining land in the city, some of which may have steep slopes and wetlands. The cost of available land, including impact fees, may also present a challenge to development. Other challenges to having a variety of housing types may include the limited history of this product type in the city (which might make developers cautious about embarking on new housing types), limited encouragement by the city to try new housing products (e.g. building "vertically" in downtown), developers' difficulty with rezonings and difficulty making multifamily projects "pencil out." People report no incentives for affordable housing. People also report that developers are not given enough rules: that downtown zoning is too non-specific and that there should be a plan for downtown. Other indirect issues include limited bus service, the need for parking structures downtown. Although the city has a tax abatement program focused on 80% AMI, the program may not be as widely known as it could be, with some participants stating that the city offers no incentives for affordable housing. Some report that residential uses should be better balanced with commercial and industrial demands to drive down housing costs.

What are some policies or programs that Camas could enact to support a variety of housing types and price points?

Address perceptions about multi-family or affordable housing. Participants believe that, for one, the city must deal with the perceptions of current residents about multi-family or affordable housing. Where affordable housing stigma is very strong, the city should consider housing design, and should take into account how people will be welcomed in the city, or what messages they will receive if they need affordable housing. Residents desire some housing for families with lower incomes, e.g. families earning less than 80% AMI. Participants suggest new development from the Vancouver Housing Authority, inclusionary zoning, and funding for housing rehabilitation as a means to provide housing for families with lower incomes.

Try new strategies. To improve the variety of housing types in the city, participants suggest that the city address the preponderance of single-family housing, which is located even in medium density zoning districts. The city should identify new developers who are building higher densities in other locales, such as Vancouver, or inquire with developers about why they do not provide a variety of housing types (e.g. location, access to transit/bike paths/trails, etc.). There should be additional ADU development, with their use restricted for short-term rentals. Finally, the city could try out policies such as transfer of development rights, or reducing impact fees to encourage missing housing types, such as entry level housing. Some even suggest expanding the city's growth boundary.

Address parking. Participants note that a city-funded parking structure might make developers more interested in building higher density in the city. Some even suggest a parking assessment fund with designated fees per parking space.

Consider workforce housing. One downtown business, Fuel Medical Group, has younger employees and might be interested in creating housing for their workers. Workforce housing might reduce commute times and transportation costs for residents and could incentivize a range of industries in the city, allowing for a variety of workers from different educational and economic backgrounds to work and live in the city.

Address concerns about loss of character. Additional concerns address in focus groups include concerns that sprawl will have the effect of destroying natural habitats. Participants noted that there appeared to be no consequences for tree removal, nor were developers required to plant indigenous trees. While some participants like changes in the city, they acknowledge that there are genuine fears that the city will lose its small-town character and natural landscape with too much growth.

Housing Survey



A public survey was available on the *Let's Talk Camas Housing* website (letstalkcamashousing.us) from August 13, 2020 to November 12, 2020 and received 307 responses. The 19-question survey focused on participants' views on housing affordability and access, housing types and costs, and future housing development in Camas. This section shares key findings, with complete survey results available in an appendix to this Plan.

Table 3: Camas Housing Survey Participant Demographics

Participants Living and Working in Camas	• 95% of survey respondents live in Camas. • 36% of respondents work in Camas. • Respondents live in all areas of the city. The largest number of respondents (59) live closest to NE Everett Street.
Tenure and Homeownership	• 88% of respondents own their home. • 9% of respondents are renters. • 2% of respondents live with family or friends, while another 2% provide housing to more than their immediate family.
Age	• Nearly 58% of respondents are between 40 and 60 years old. • 21% were between 20 and 40 years old. Another 21% were over 60.
Income	• Just under one-third of respondent households earned between $100,000 and $149,000 annually (29%). • 40% of respondent households earn more than $150,000 per year, while 31% earn less than $100,000.
Race and Ethnicity	• 75% of respondents identified as white. 12% identified as "other," followed by respondents who were Hispanic (5.2%), Asian/Pacific Islander (4.5%), Native American (1.7%), Black (1%) and Arab or Middle Eastern (0.7%)
Representative Responses About who to Engage in the Conversation about Housing Diversity	• "Seniors, college students, unemployed, rental owners" • "BIPOC families" • "CREDC, environmental councils, public" • "Georgia Pacific" • "Only Camas citizens should have a say about Camas"

Housing Options in Camas

- More than half of all participants (56%) say they are "somewhat satisfied" or "very satisfied" with the housing options available in Camas. However, 31% are either "somewhat dissatisfied" or "very dissatisfied" with the range of available housing options.
- Cost is the leading factor that limits housing choices (identified by 49% of residents), followed by a lack of desired amenities such as outdoor space and parking (19%), and "other" reasons (14%). 31% stated that no size, cost, availability, accessibility, or qualification factors limit their housing choices.

Housing Supply in Camas

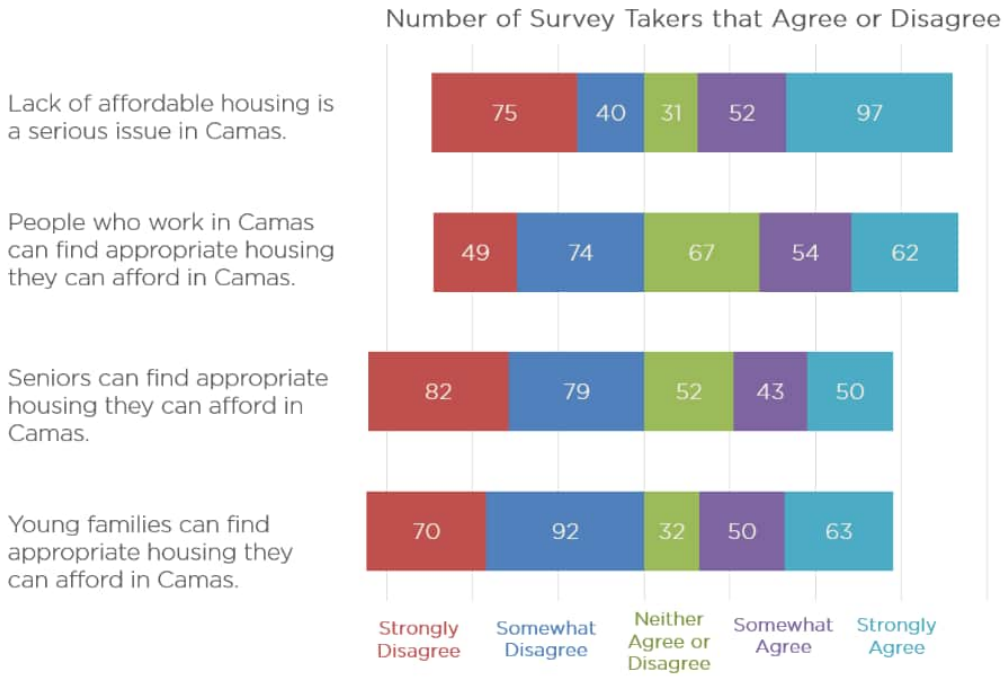
- One-third of respondents (32%) "strongly agree" that lack of affordable housing is a serious issue in Camas, while 28% "strongly disagree." Looking at responses to this prompt by income shows that respondents with lower household incomes are more likely to see affordable housing as an issue in Camas.

  For participants with household incomes under $75,000, 62% either "somewhat agree" or "strongly agree" that lack of affordable housing is a serious issue in Camas; about 24% either "somewhat disagree" or "strongly disagree."

  In contrast, participants with household incomes over $150,000 were less likely to see lack of affordable housing as a serious issue in Camas. About 42% "somewhat agree" or "strongly agree" that it is a serious issue, and 45% "somewhat disagree" or "strongly disagree."

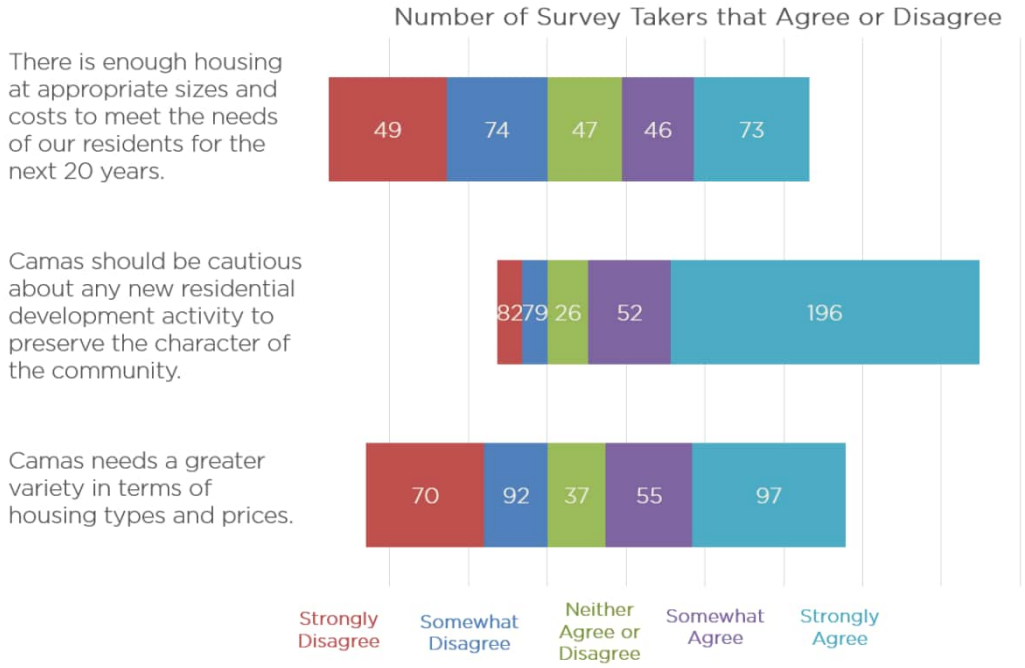
- About one-half of participants (53%) "somewhat disagree" or "strongly disagree" that young families can find appropriate housing they can afford.
- About one-half of participants (53%) "somewhat disagree" or "strongly disagree" that seniors can find appropriate housing they can afford.
- Forty percent of participants (40%) "somewhat disagree" or "strongly disagree" and 38% "somewhat agree" or "strongly agree" that people who work in Camas can find appropriate housing in Camas.

Figure 3: Housing Survey Responses to Housing Affordability



- One-third of participants (32%) "strongly agree" that Camas needs greater variety in terms of housing, while 24% "strongly disagree."
- Two-thirds of participants (64%) "strongly agree" that Camas should be cautious about any new residential development activity to preserve the character of the community.
- Forty-five percent (45%) "somewhat disagree" or "strongly disagree" that there is enough housing at appropriate sizes and costs to meet the needs of residents for the next 20 years. However, 39% "somewhat agree" or "strongly agree" that Camas has enough appropriately sized/priced housing.

Figure 4: Housing Survey Responses to Future Housing Development



Housing Needs in Camas

- Participants note that the biggest shortage of for-sale housing occurs in the $250,000 to $349,000 price range.
- The biggest shortage of rental housing occurs in the $800 to $999 price range.
- Residents primarily feel that over the next 20 years, new housing would be most appropriate in older neighborhoods and vacant/underdeveloped commercial and industrial properties, followed by mixed-use developments.
- Most Camas residents (57%) have not considered adding an accessory dwelling unit (ADU) to their property, compared to 34% who have.
- Of those residents who gave their reasons for wanting an ADU, over one-third said they would use it to provide a residence for relatives and friends. 20

percent would provide a residence for a caregiver, and another 19 percent would earn extra income by renting out the space.

- When asked what type of assistance would be helpful to meet housing affordability needs in the city, 41% identified "more affordable for-sale units." One-third of residents said that first-time homebuyer down payment assistance and more affordable rental units would also help with housing affordability.
- The greatest barrier to obtaining housing in Camas was a lack of affordable housing. However, one-third of the respondents stated that none of the issues listed were barriers to obtaining housing.

Figure 5: Housing Survey Responses about Types of Housing Assistance

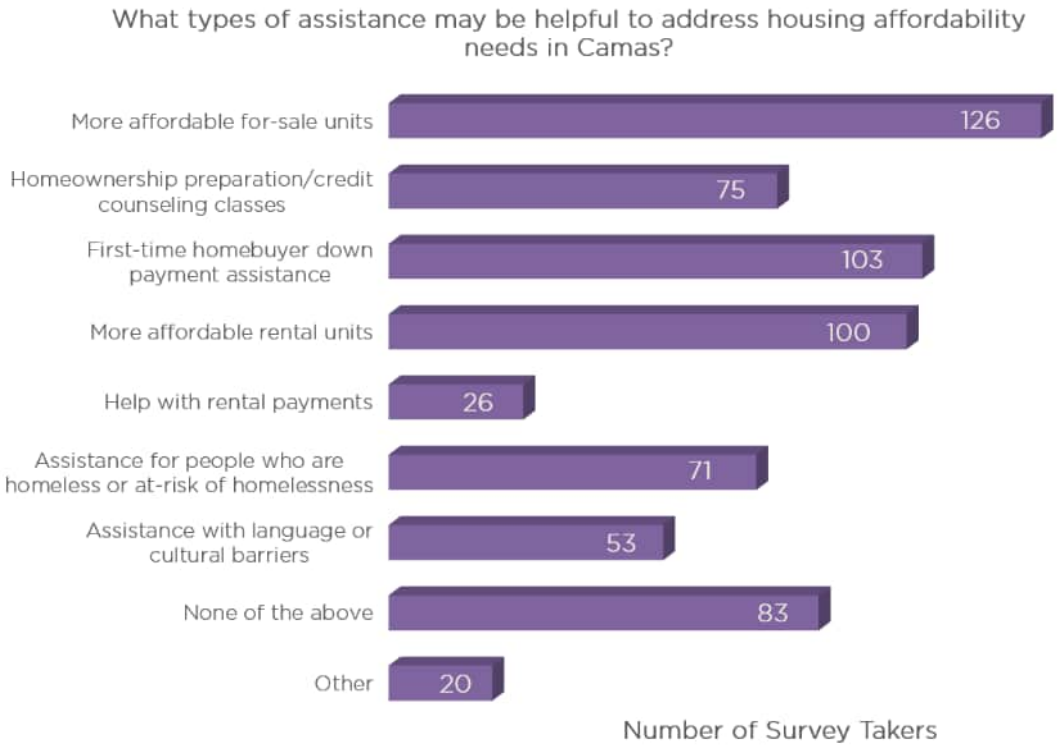
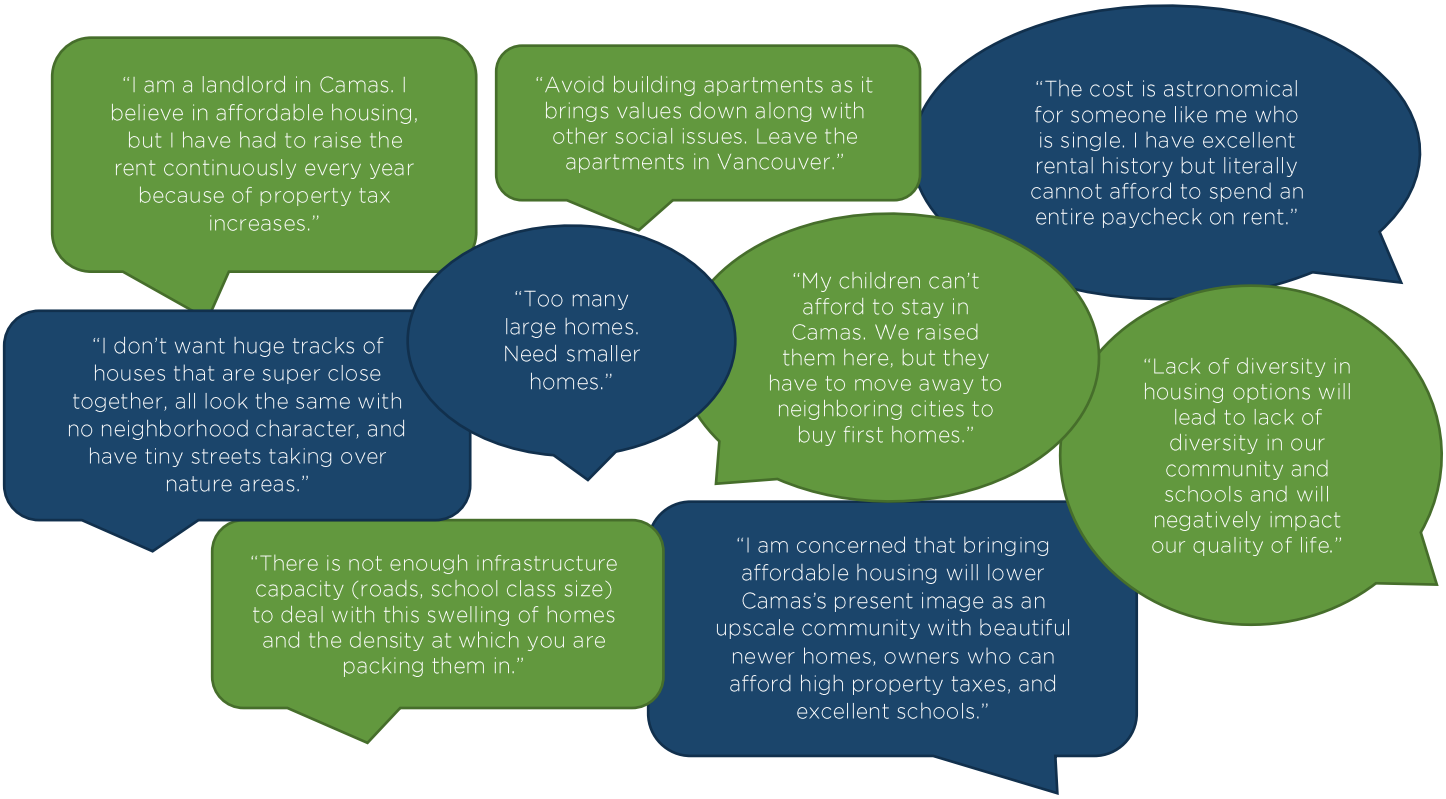


Figure 6: Representative Comments about Housing Concerns in Camas



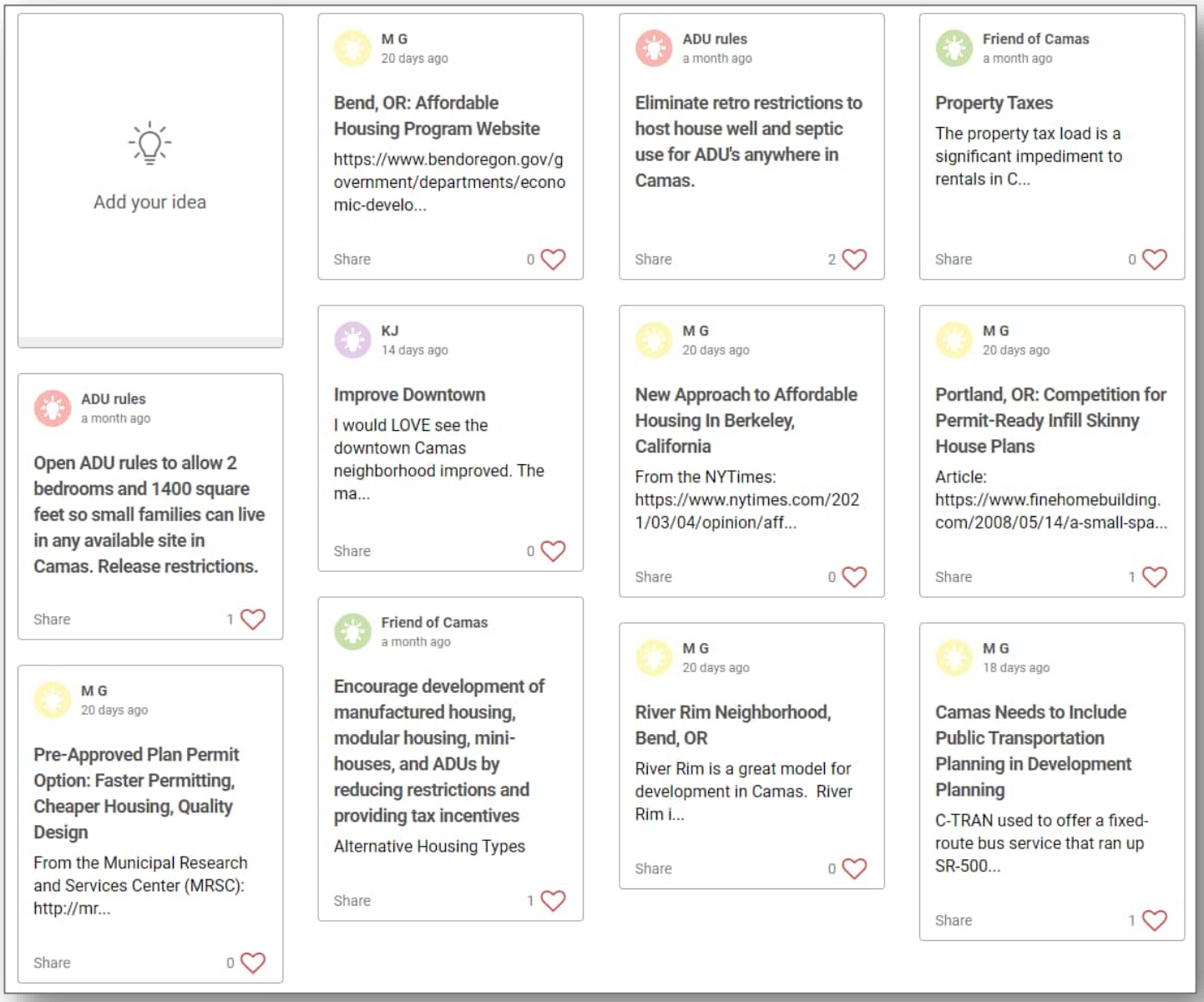
Project Website

Throughout the HAP planning process, the project team maintained an interactive website at LetsTalkCamasHousing.us. The site provided background information on the project, a schedule of upcoming meetings or other key dates, videos and discussion notes from public meetings, and presentations and drafts of the HAP. The site also offered opportunities for visitors to leave questions to be answered by the project team, share their vision for housing in Camas, and view and 'like' ideas shared by others.

Throughout the course of the project, the site received about 2,500 visits from about 1,580 people. About 150 people downloaded the HAP Draft Existing Conditions and Housing Needs document and 100 downloaded the Draft Preliminary Housing Strategies or the complete draft of the HAP.

The figure on the following page shares ideas received on the website's interactive board in response to a question asking what housing types or approaches will best meet the community's housing needs.

Figure 7: Comments Received on LetsTalkCamasHousing.us



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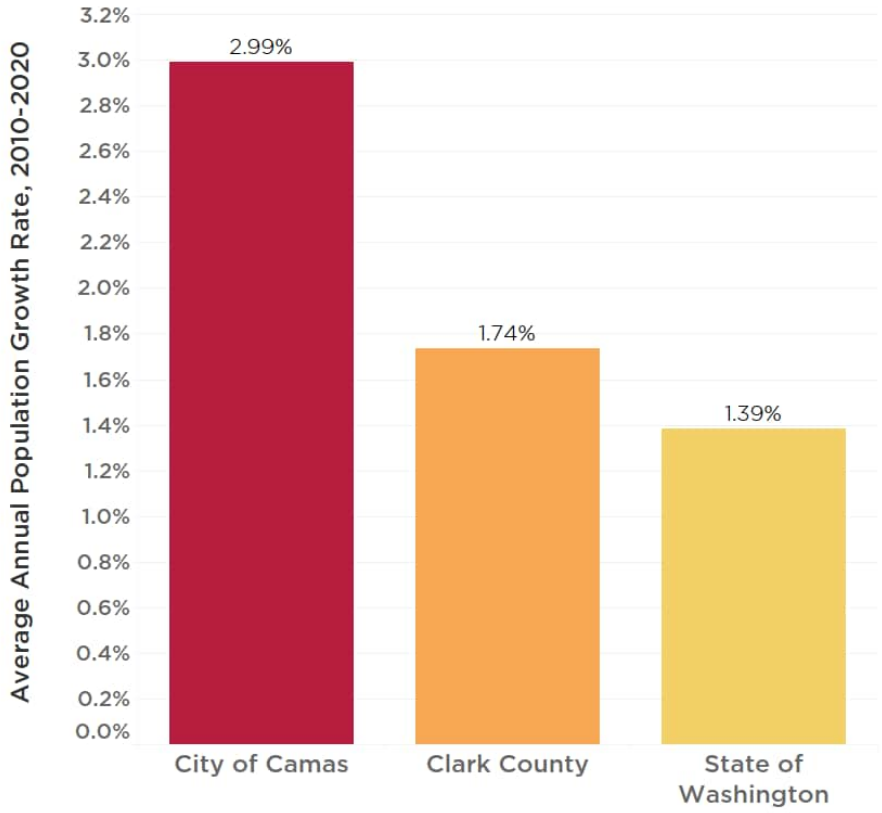
Chapter 3:
Demographic Trends



Population Growth

As of April 2020, the City of Camas had a population of 25,140, representing a 29.9% increase from its 2010 population of 19,355. This growth rate was somewhat higher than Clark County's overall rate. During the same time period, the county's population increased by 17.4%, from 425,363 to 499,200. Camas experienced an average annual population growth rate of 2.99% from 2010 to 2020, higher than that of both Clark County (1.74%) and the state of Washington (1.39%) (see Figure 6).

Figure 8: Average Annual Population Growth Rate, City of Camas, Clark County, and State of Washington, 2010-2020



Data Source: Washington State, Office of Financial Management. (2020). April 1 official population estimates

Because of the city's higher growth rate, Camas residents have made up an increasing share of Clark County's population. The city's population made up 5.0% of Clark County residents in 2020, an increase from the 2010 share of 4.6%. Camas's population increase of 5,795 residents over the 10-year period represents 7.8% of the county's overall increase of 73,837 residents.

The State of Washington Office of Financial Management projects that Clark County's population will grow to 643,522 by 2040, an increase of 28.9% from its 2020 population (see Table 4).

The City's 2016 Comprehensive Plan estimates an average annual population growth in the city of Camas of 2.46% from 2015 to 2035. The City's projected growth is based on anticipated countywide population growth, which is then allocated to each city within Clark County. Extending the city's population growth projection out through 2040 using this rate yields an estimated population of 36,912 in 2040 for Camas. Because this growth rate was adopted by the City in *Camas 2035* and was prepared in coordination with Clark County forecasts, this estimate is used in the housing need projections in Chapter 5.

Table 4: Projected Population Change, City of Camas and Clark County, 2020-2040

YEAR	2020	2025	2030	2035	2040
City of Camas with average annual growth rate of 2.46% applied to 2015 population of 22,843 (from City of Camas 2016 Comprehensive Plan)	25,140	28,471	31,284	34,098	36,912
Clark County ("medium series" projections from Washington State Office of Financial Management)	499,200	540,344	576,879	611,968	643,552

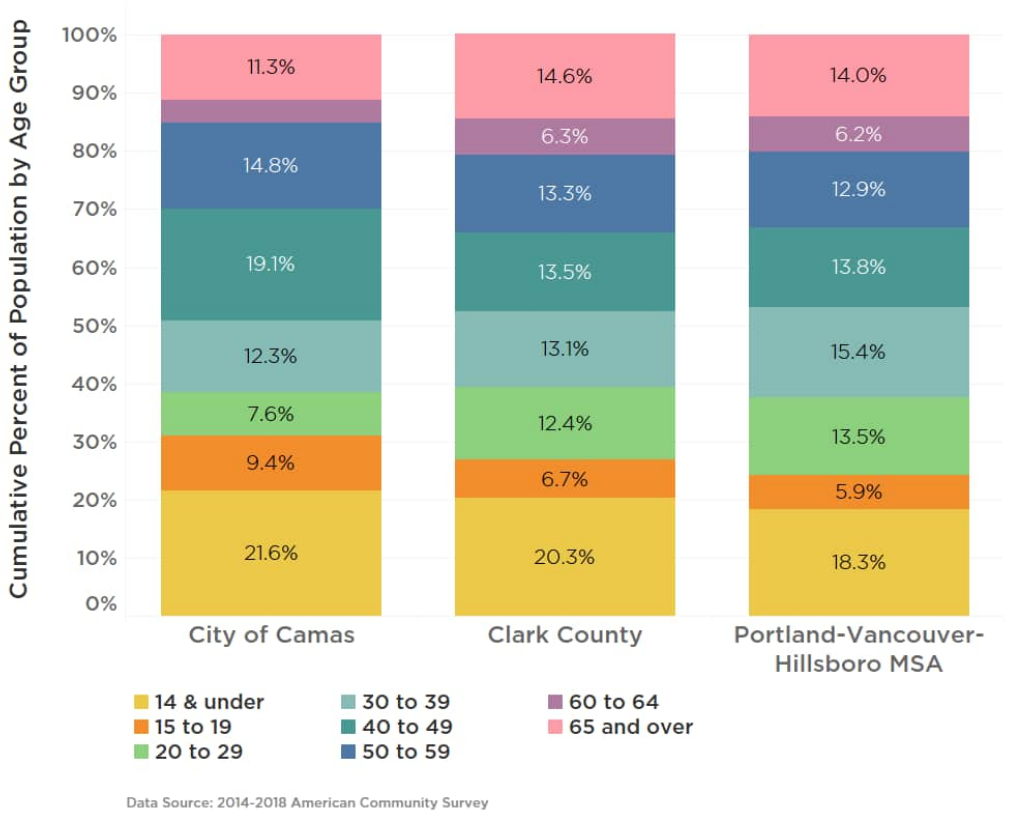
Source: Washington State, Office of Financial Management (2020), Mosaic Community Planning Calculations

Demographic Overview

Age

Composition of the population by age group varies throughout the region. Camas has slightly higher percentages of residents aged 19 and under and ages 40 to 59 compared to Clark County and the Portland-Vancouver-Hillsboro metropolitan area. At the same time, residents aged 20 to 39 and aged 60 and over comprise lower percentages of the City's population than they do that of the county and region (see Figure 9). Based on stakeholder interviews, these differences may be indicative of both push and pull factors for different age groups in Camas, including the high quality of schools in the city-- a draw for families with children-- and a lack of housing options available to meet the needs of younger adults and elderly residents, among other factors.

Figure 9: Percent of Population by Age Group, City of Camas, Clark County, and Portland-Vancouver-Hillsboro MSA, 2014-2018

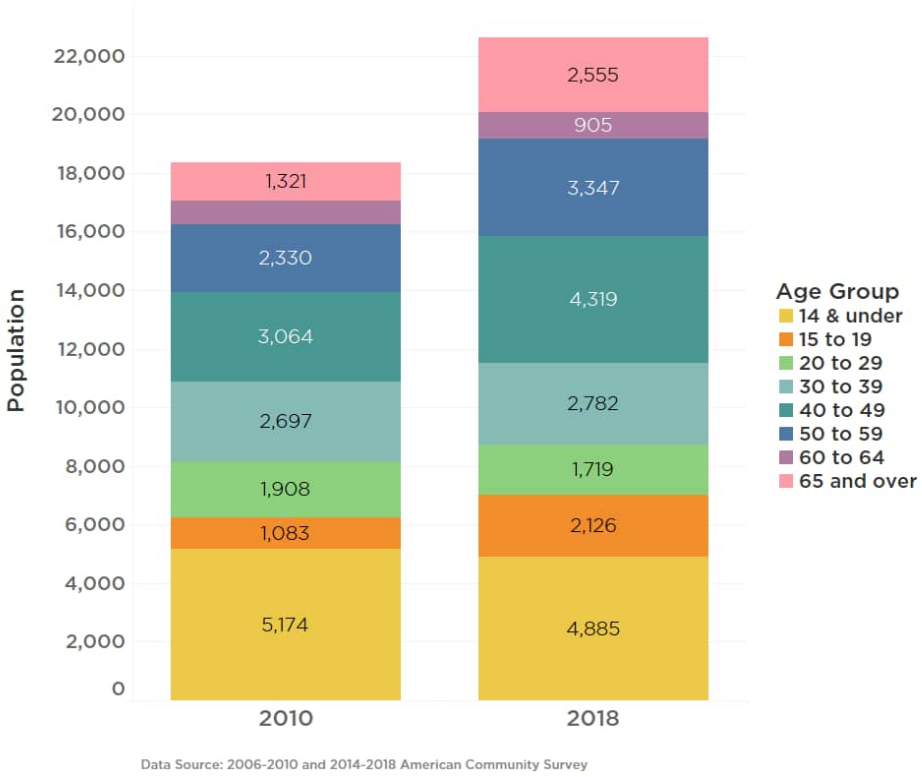


Data Source: 2014-2018 American Community Survey

The composition of the city's population by age has shifted since 2010, with much of the growth concentrated in upper age categories. About 85% of the city's population growth from 2010 to 2018 was due to increases in the numbers of residents aged 40 and over (see Figure 10). Residents in these age categories saw their share of the city's population increase during the time period, from about 40.9% to 49.2%.

Similarly, residents under age 40 declined as a share of the city's population, making up 59.2% of all residents in 2010 and just 50.9% in 2018. All age groups under 40 years old except residents aged 15 to 19 made up a smaller share of the population in 2018 than they did in 2010. The numbers of children aged 14 and under and residents aged 20 to 29 living in the city dropped slightly, while the numbers of residents aged 30 to 39 increased slightly.

Figure 10: Population by Age Group, City of Camas, 2006-2010 and 2014-2018

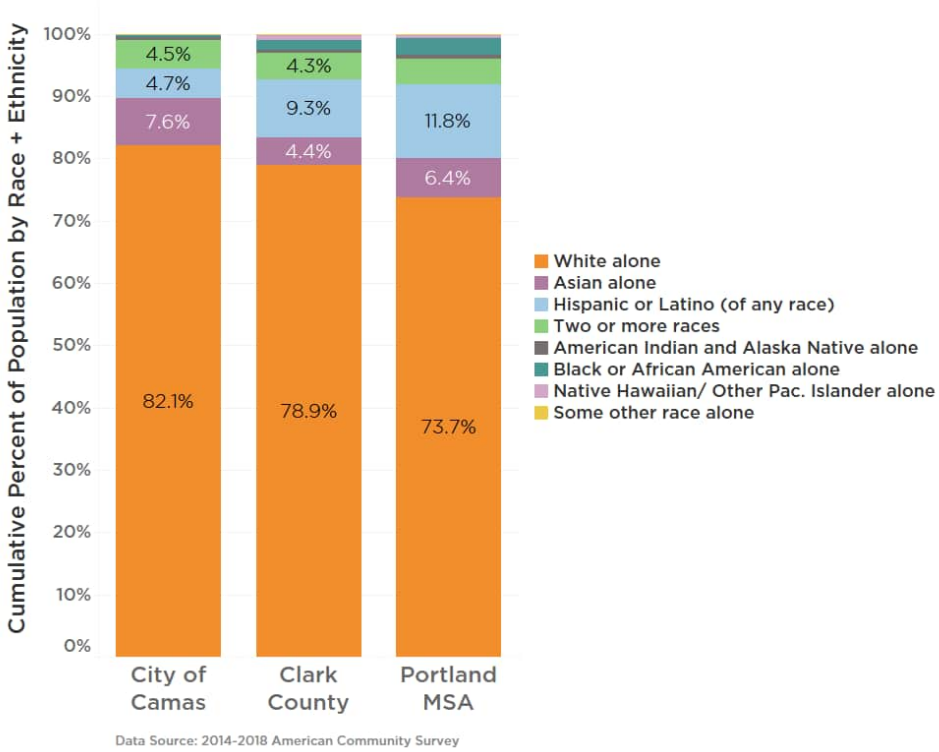


Data Source: 2006-2010 and 2014-2018 American Community Survey

Race and Ethnicity

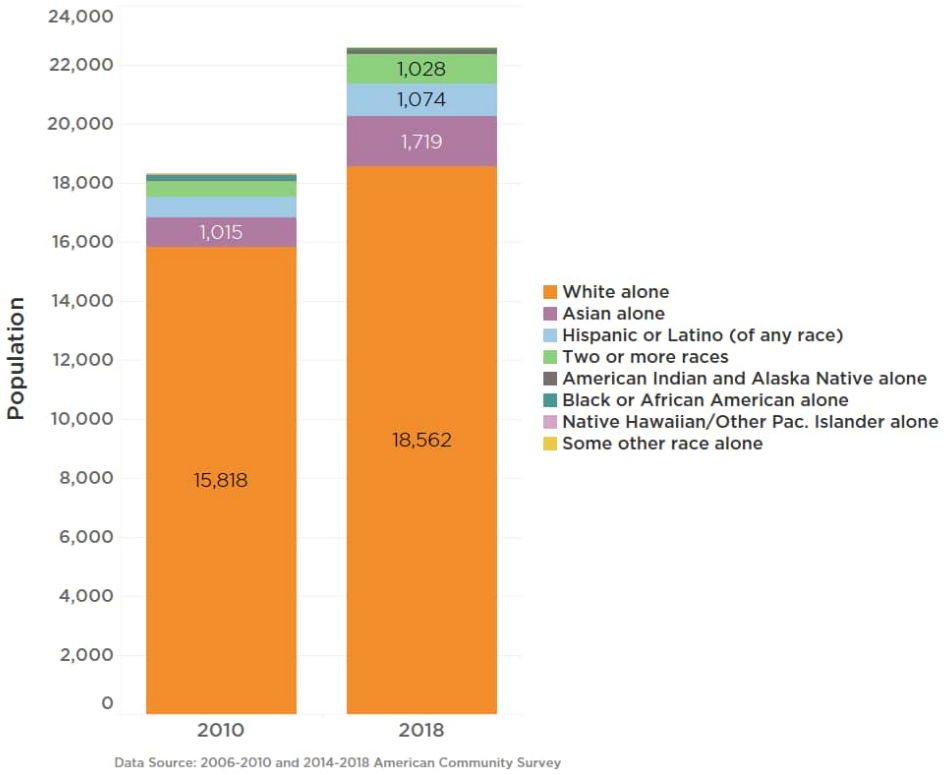
White residents make up the vast majority (82.1%) of Camas's population. Asian residents, Hispanic residents (of any race) and residents of two or more races are the next most common races and ethnicities, comprising 7.6%, 4.7%, and 4.5% of the city's population, respectively. White and Asian residents in particular make up a greater proportion of Camas's population than that of Clark County and the Portland-Vancouver-Hillsboro metropolitan area, while Hispanic and Black residents comprise a lower percentage of the population in Camas than in the county and region (see Figure 11).

Figure 11: Percent of Population by Race and Ethnicity, City of Camas, Clark County, and Portland-Vancouver-Hillsboro OR-WA Metro Area, 2014-2018



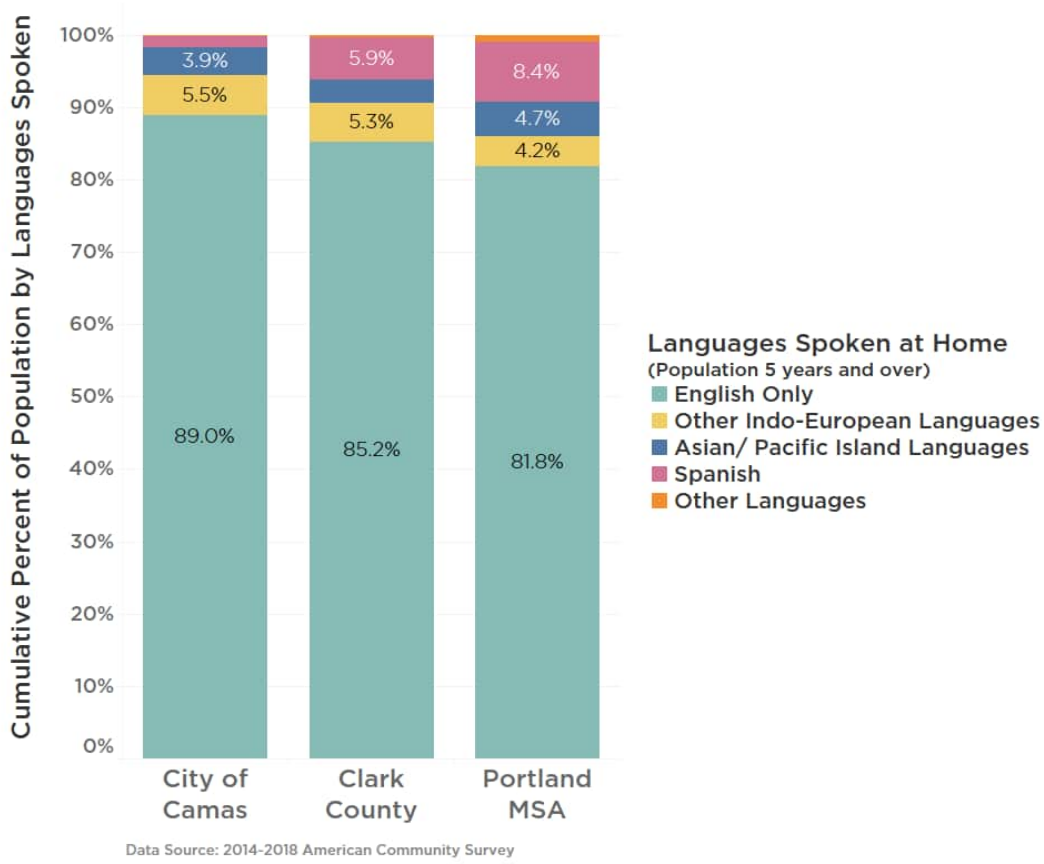
While white residents comprise 82.1% of the city's population, they make up a lower percentage of the city's population growth from 2010 to 2018, about 64.3%. During that time, the city experienced an increase in Asian residents (16.5% of population growth), residents of two or more races (11.6% of population growth), Hispanic residents (8.7% of population growth), and Native American residents (2.0% of population growth). The populations of Black residents, Native Hawaiian and other Pacific Islander residents, and residents of other races declined during the time period (see Figure 12).

Figure 12: Population by Race and Ethnicity, City of Camas, 2006-2010 and 2014-2018



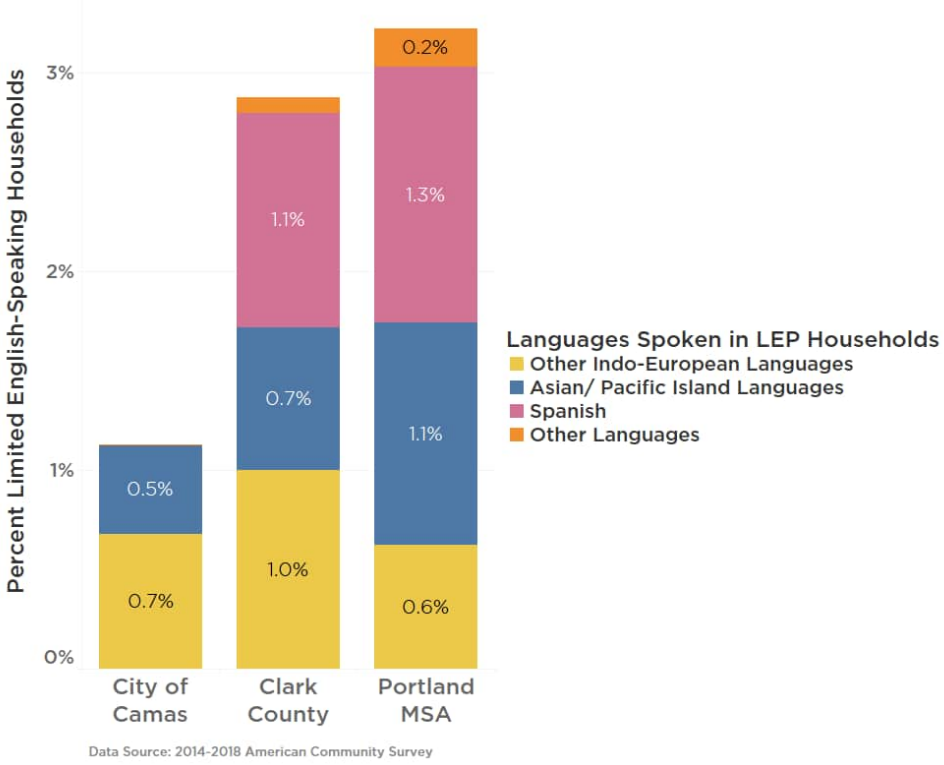
The majority of Camas residents (89.0%) speak only English at home, while smaller percentages speak other Indo-European languages (5.5%), Asian/Pacific island languages (3.9%), Spanish (1.5%), and other languages (0.2%). Residents of Camas are less likely to speak languages other than English at home (11.0%) than those living in Clark County and the Portland-Vancouver-Hillsboro MSA, where 14.8% and 18.2% of residents speak a language other than English, respectively (see Figure 13).

Figure 13: Percent of Population by Language Spoken at Home (Population 5 Years and Over), City of Camas, Clark County, and Portland-Vancouver-Hillsboro OR-WA Metro Area, 2014-2018



An estimated 90 households in Camas have limited English proficiency (1.1% of all households in Camas). An estimated 54 of these households with limited English proficiency (0.7% of all households) speak other Indo-European languages, and an estimated 36 of the households speak Asian and Pacific island languages (0.5% of all households). The percentage of households with limited English proficiency in Camas (1.1%) is close to one third of that in Clark County (2.9%) and the Portland-Vancouver-Hillsboro metropolitan area (3.2%).

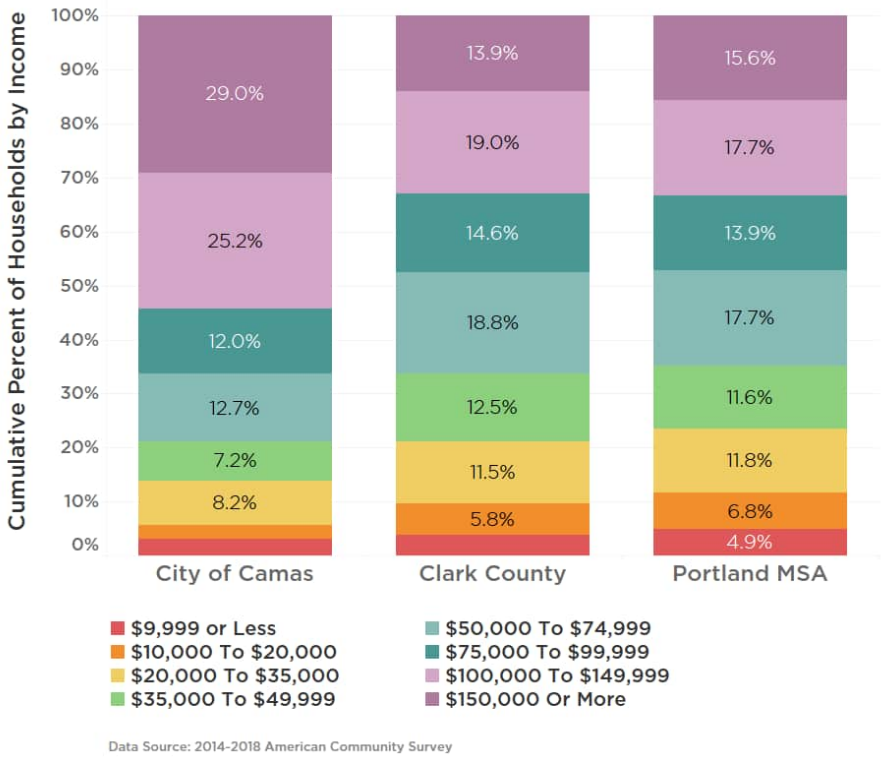
Figure 14: Percent Limited English-Speaking Households, City of Camas, Clark County, and Portland-Vancouver-Hillsboro OR-WA Metro Area, 2014-2018



Income

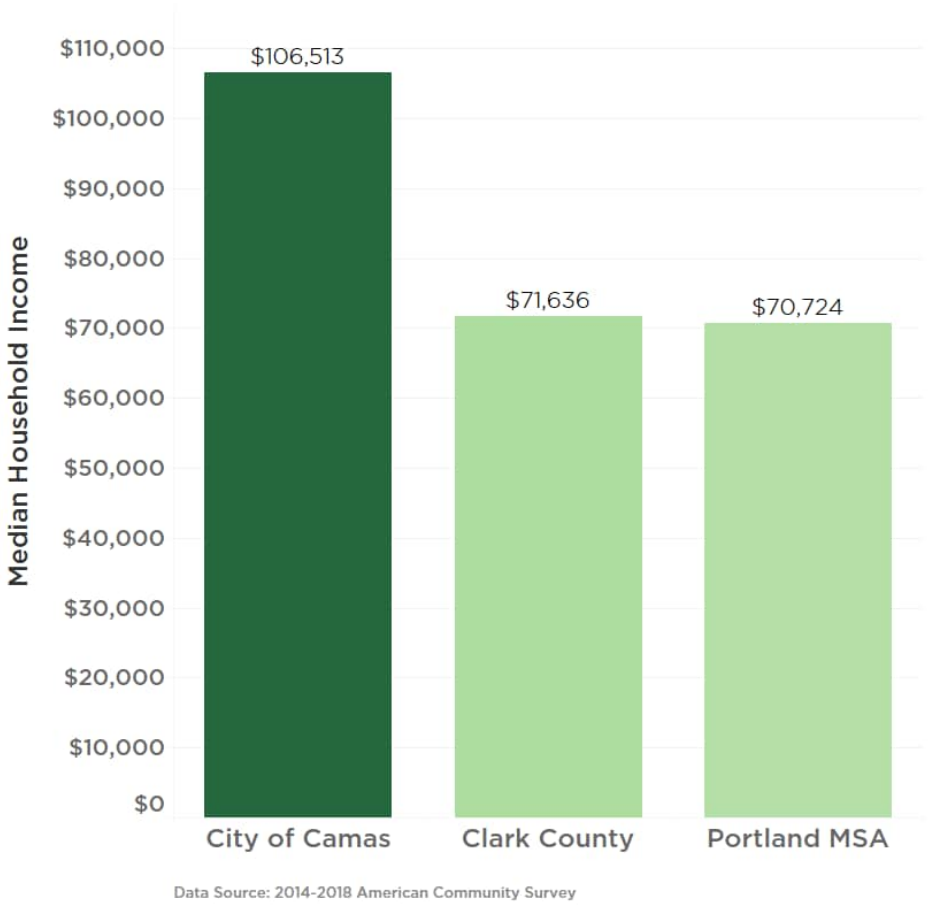
Households in the city of Camas tend to be in higher income categories than those in Clark County and the Portland-Vancouver-Hillsboro metropolitan area (see Figure 15). More than half (54.2%) of Camas households earn $100,000 or more per year, while just 13.9% earn $35,000 or less. Relative to Camas, the county and region are both home to a higher proportion of households earning at all income levels $99,999 and below per year and have lower percentages of households earning $100,000 to $149,999, and $150,000 or more. Stakeholders in focus groups and community meetings noted that high rents and home prices make finding housing in Camas particularly challenging for residents with lower incomes.

Figure 15: Population by Income Group, City of Camas, Clark County, and Portland-Vancouver-Hillsboro OR-WA Metro Area, 2014-2018



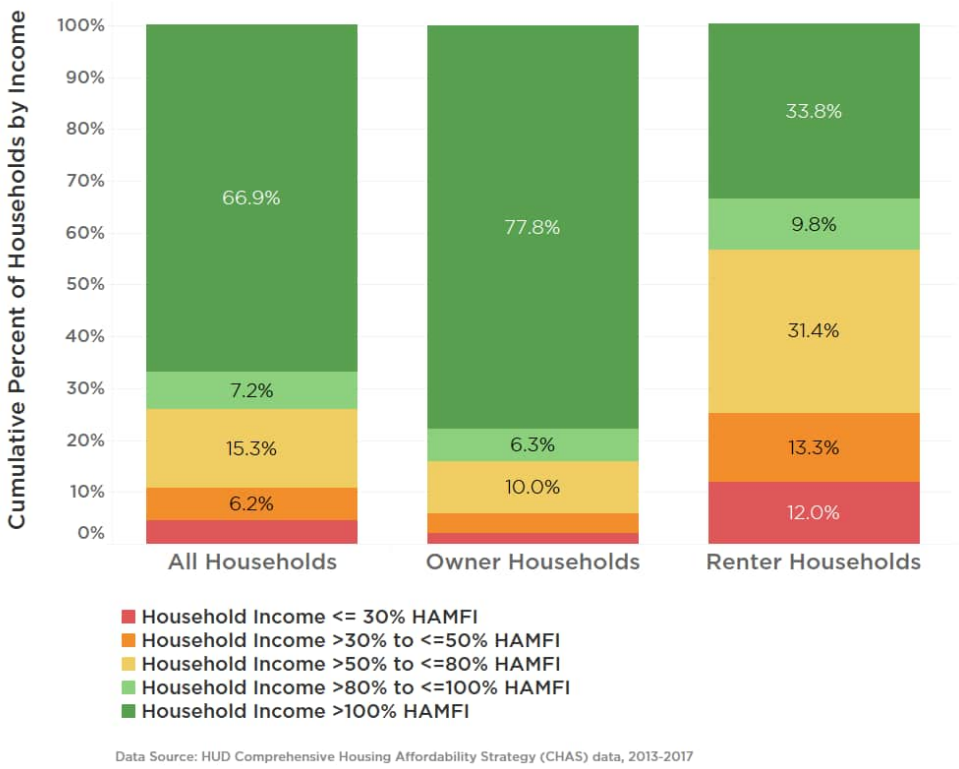
Because higher percentages of Camas households fall in the upper income categories, the city's median household income ($106,513) is significantly higher than those of both Clark County and the Portland-Vancouver-Hillsboro metropolitan area ($71,636 and $70724, respectively, see Figure 16).

Figure 16: Median Household Income, City of Camas, Clark County, and Portland-Vancouver-Hillsboro OR-WA Metro Area, 2014-2018



An estimated 66.9% of all households in Camas have incomes greater than the HUD Area Median Family Income (HAMFI), while 33.1% of households have incomes below HAMFI (see Figure 17). Renter households in the city tend to have lower incomes than owner households, indicating that they are more likely to experience housing cost burdens. An estimated 25.3% of renter households have incomes at or below 50% HAMFI, and 31.4% have incomes between 50% and 80% HAMFI. In contrast, just 6.0% of owner households have incomes at or below 50% HAMFI, and 10.0% have incomes between 50% and 80% HAMFI.

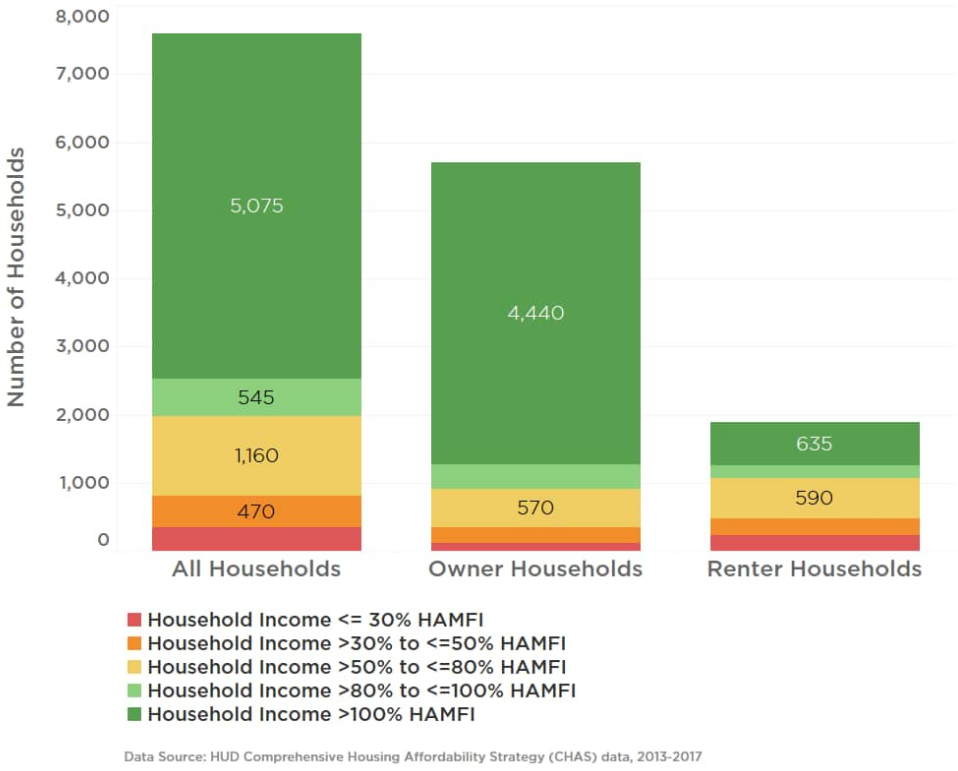
Figure 17: Percentages of Owner and Rental Households by Percent HUD Area Median Family Income, City of Camas, 2013-2017



Data Source: HUD Comprehensive Housing Affordability Strategy (CHAS) data, 2013-2017

Most households in Camas own their homes (75.2%), while a lower percentage are renters (24.8%) (see Figure 18). Renters outnumber owners in the lower income categories, while homeowners are more likely to fall in the higher income categories and, in particular, to earn more than 100% HAMFI. About seven times as many owner households as renter households earn 100% HAMFI (4,440 and 635 households, respectively). Renter households earning less than 30% HAMFI, between 30% and 50% HAMFI, and between 50% and 80% HAMFI (225, 250, and 590 households, respectively) outnumber owners in those categories (120, 220, and 570 households, respectively).

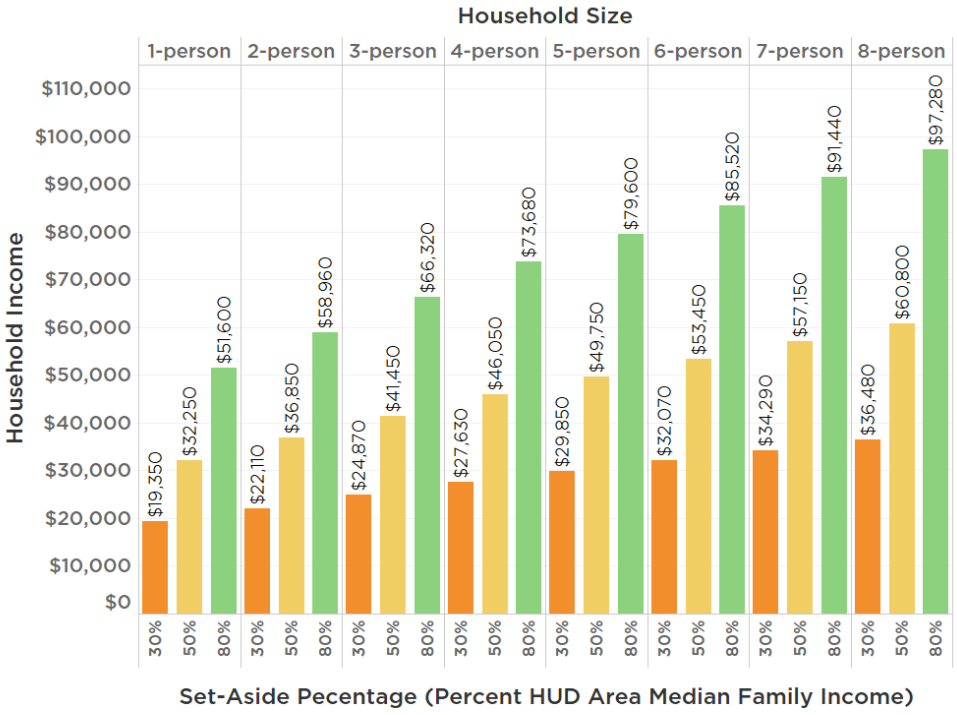
Figure 18: Numbers of Owner and Rental Households by Percent of HUD Area Median Family Income, City of Camas, 2013-2017



Data Source: HUD Comprehensive Housing Affordability Strategy (CHAS) data, 2013-2017

HUD's categorizations of households by income level in the previous graphs take into consideration differences in household size to reflect differences in living expenses by household size. Figure 19 shows the differences in income limits by family size for households to be classified as earning less than 30%, 50%, and 80% HAMFI in Clark County. Notably, households with more members may earn significantly more than smaller households and still be classified in the same income categories. For example, a family of six may earn up to $53,450 and be categorized as earning below 50% HAMFI, while a family of two would need to earn below $36,850 to be in that category. Similarly, a one-person household with an income of $50,000 would be considered just below 80% HAMFI, while a five-person household at that income level would fall just above 50% HAMFI. These income categories show that households at a wide range of income levels earn below 30% and up to 50% or 80% HAMFI.

Figure 19: Income Limits by Household Size for Selected Percentages of HUD Area Median Family Income, Clark County, 2020



Data Source: Washington State Housing Finance Commission. (2020). Income and Rent Limits for All Tax Credit and Bond Financed Properties. Clark County Income and Rent Limits. Effective 4/1/20.

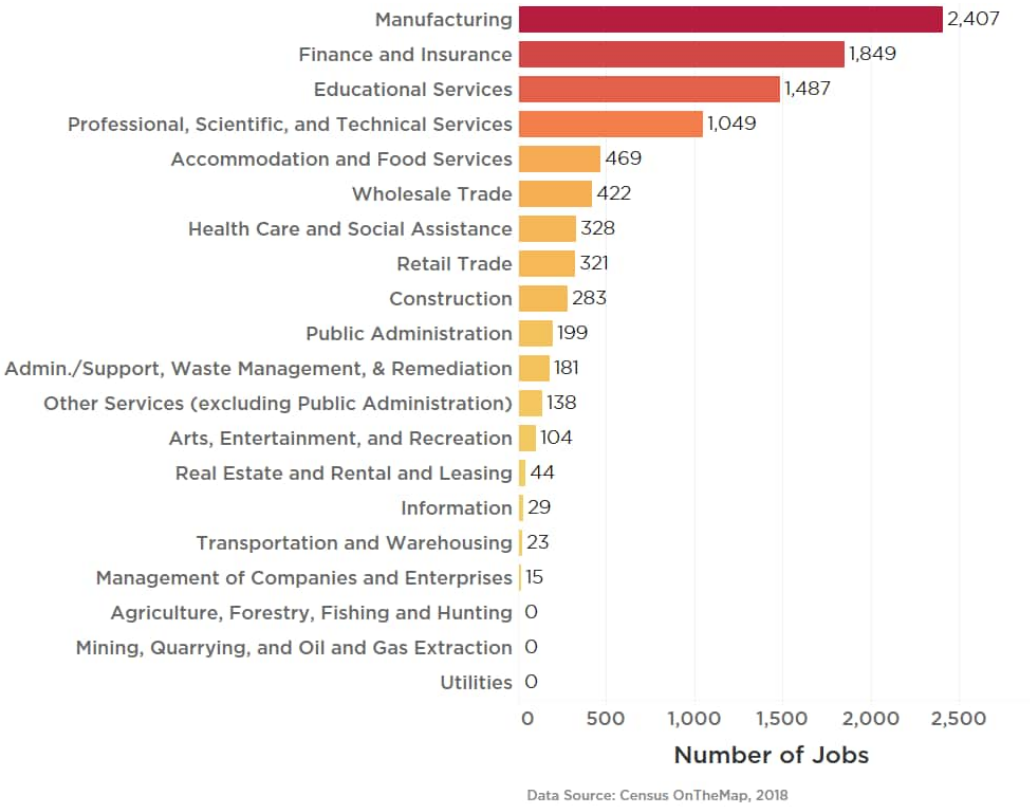
Economic Conditions and Trends

Current Workforce and Employment Trends

An estimated 9,348 total jobs were located in the city of Camas as of 2018. Jobs in the sectors of manufacturing, finance and insurance, educational services, and professional, scientific, and technical services make up most of these jobs (72.6%, or an estimated 6,792 jobs). In addition to those top sectors, the accommodation and food services, wholesale trade, retail trade, and healthcare and social assistance sectors each provide between 300 and 500 jobs in the city (see Figure 20). Of the 9,348 jobs located in Camas, an estimated 8,969 (95.9%) are workers' primary jobs,[2] indicating that some individuals working in the city hold multiple jobs.

[2] A primary job is the highest paying job for an individual worker for the year. The count of primary jobs is the same as the count of workers.

Figure 20: Number of Jobs by NAICS Industry Sector (All Jobs), City of Camas, 2018



The top employers in 2020 were Fisher Investments (1,725 employees), Wafertech (1,000), and the Camas School District (800 employees). Fisher Investments, a professional services investment firm, comprises 20.2% of the city's jobs and represents the fastest growing sector of employment in the city (see Figure 21).

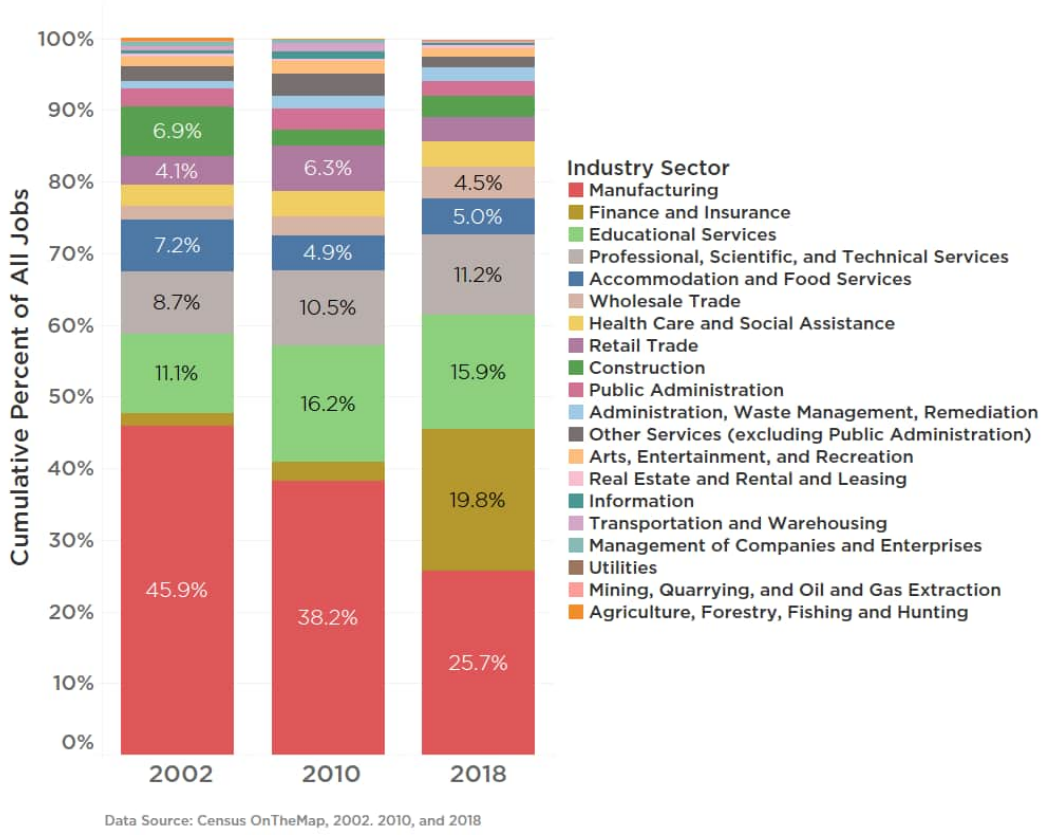
Figure 21: Principal Employers, City of Camas, 2020

EMPLOYER	EMPLOYEES	PERCENT OF TOTAL CITY EMPLOYMENT
Fisher Investments	1,725	20.2%
Wafertech	1,000	11.7%
Camas School District	800	9.4%
Linear Technology (Analog)	340	4.0%
Sigma Design	273	3.2%
City of Camas	226	2.6%
Georgia Pacific	150	1.8%
Fuel Medical	150	1.8%
Plexys	91	1.1%
Bodycote	50	0.6%
Total	4,805	56.3%

Data Source: Washington Employment Security Department, Columbian Newspaper

While manufacturing jobs made up a high proportion of all jobs in 2018 and prior decades, the share has been declining over time, and the city's economy has become more diversified. In 2018, jobs in finance and insurance, educational services, wholesale trade, and professional, scientific, and technical services made up increasing proportions of jobs in the city (see Figure 22).

Figure 22: Jobs Located in the City of Camas by NAICS Industry Sector, 2002, 2010, and 2018 (All Jobs)

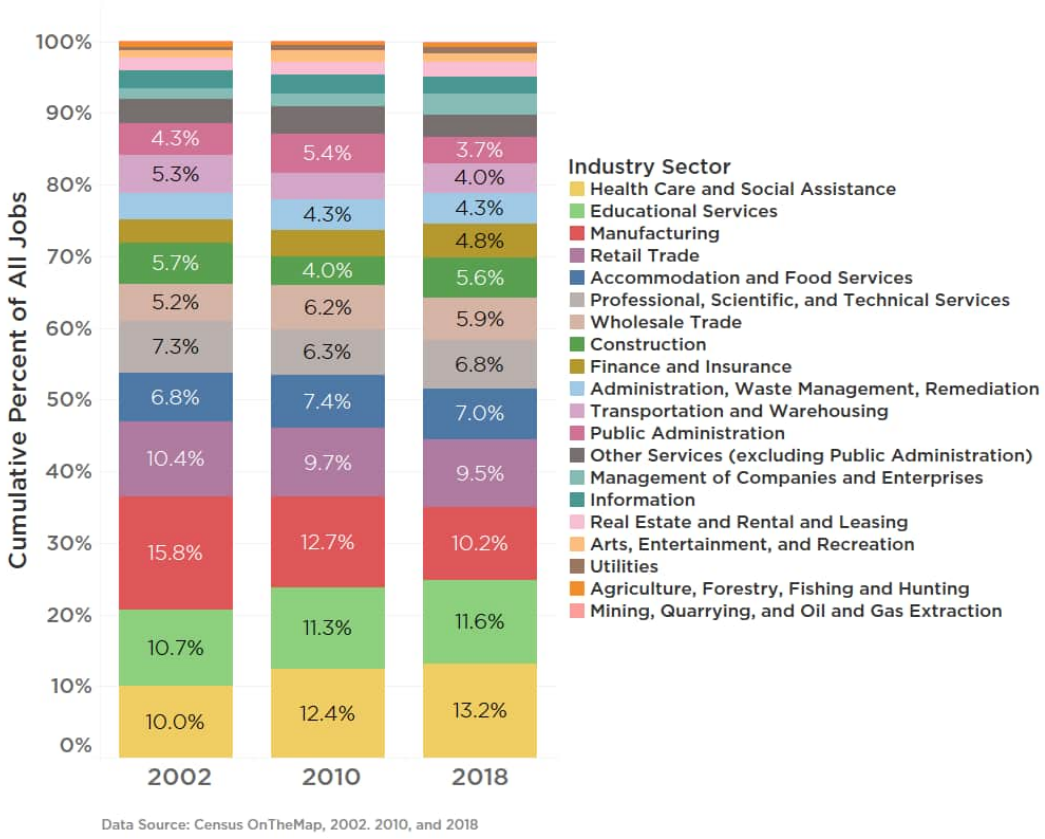


Data Source: Census OnTheMap, 2002. 2010, and 2018

While manufacturing jobs have represented the largest share of jobs based in Camas, the city's residents are employed in a more diverse array of industry sectors (see Figure 23). As manufacturing jobs declined as a proportion of jobs located in the city from 2002 to 2018, healthcare and social assistance and educational services overtook manufacturing as residents' top sources of employment. During that time period, healthcare and social assistance, finance and insurance, and management of companies and enterprises saw the greatest increases as shares of jobs held by Camas residents (3.2, 1.5, and 1.3 percentage point increases, respectively), while manufacturing and transportation and warehousing saw the greatest declines (5.6and 1.3 percentage point declines, respectively). Other industry sectors have remained relatively constant as shares of total jobs held by Camas residents, each increasing or declining as shares of jobs held by residents by less than 1 percentage point.

The differences in industry sectors of jobs located in the city and jobs held by the city's residents indicate high levels of commuting into and out of the city by workers and residents to access employment.

Figure 23: Jobs Held by Camas Residents by NAICS Industry Sector, 2002, 2010, and 2018 (All Jobs)



Data Source: Census OnTheMap, 2002. 2010, and 2018

As these shifts in industry sectors have occurred, the city has seen an increase in the numbers of jobs with higher wages, while the numbers of jobs with low and very-low wages have remained relatively constant (see Figure 24). Longitudinal Employer-Household Dynamics (LEHD) statistics track jobs in the wage categories of $1,250 per month and below ($15,000 per year and below); $1,251 to $3,333 per month ($15,001 to $39,996 per year); and $3,333 per month and above ($39,996 per year and above). Although not an exact indicator of living wages, the percentage of jobs that pay $3,333 and above can be used to approximate the potential for households to be able afford to support their families based on typical expenses, family size, composition, and location. For example, in Clark County, a household with two working adults and two children is estimated to require $73,017 per year in income before taxes to afford basic

expenses such as housing, food, childcare, medical care, transportation, taxes, and other expenses.[3]

In this way, if two workers in a household with that composition earn $39,996 per year and above, the household would typically be able to afford estimated basic expenses in Clark County. However, in the case of some other household compositions—for example, a household with two adults in which only one is working, or with two working adults and three or more children—the working individuals would need to have incomes significantly more than $39,996 per year, making the wage categories less useful in some cases. Still, these categories provide a useful benchmark for examining changes in employee wages and ability to afford basic expenses over time.

From 2010 to 2018, Camas gained an estimated 2,814 jobs with wages of $3,333 per month and above, a 78.2% increase. The city also gained an estimated 6 jobs with wages between $1,251 and $3,333 and 1 job with wages of $1,250 per month and below.

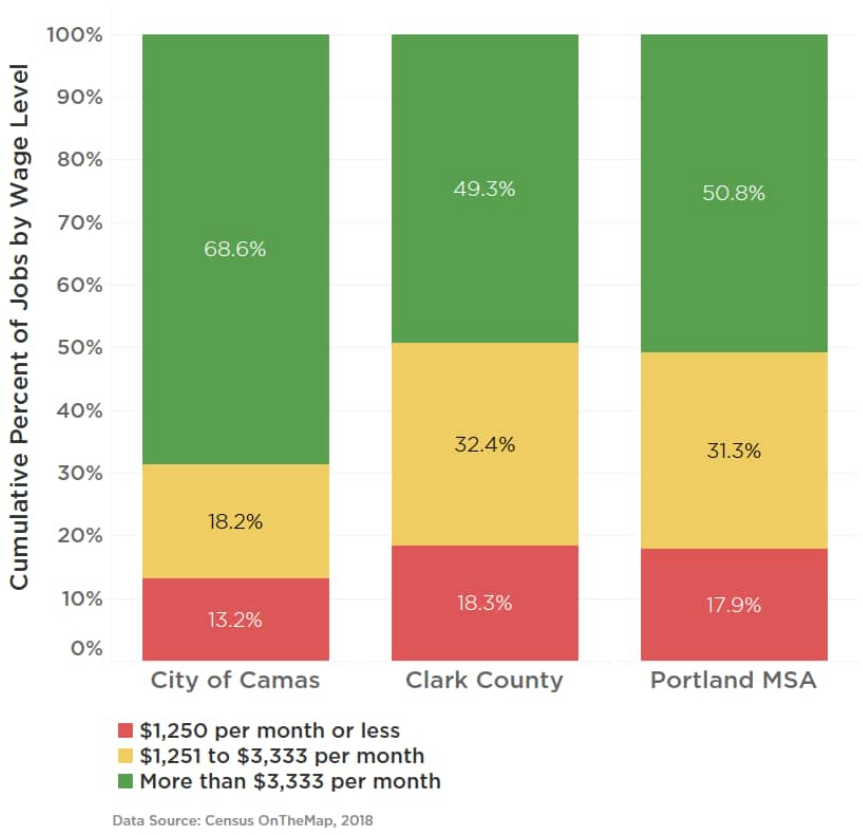
Relative to Clark County and the Portland-Vancouver-Hillsboro metropolitan area, Camas has a higher percentage of jobs that pay more than $3,333 per month and lower percentages of jobs that pay less than $3,333 per month (see Figure 25). Still, an estimated 31.4% of jobs located in the city pay less than $3,333 per month, indicating that many employees working in Camas may have difficulty meeting basic needs or affording housing in the city. Notably, the median household income in Camas is $106,513, and just 13.9% of residents earn $35,000 or less. The higher proportion of low-wage jobs located in the city relative to the low proportion of residents with lower incomes indicates that many Camas residents work at higher-paying jobs based outside of the city, while residents working lower-wage jobs often must commute into the city.

[3] MIT Living Wage Calculator. (2020). Living Wage Calculation for Clark County, Washington. Retrieved from: https://livingwage.mit.edu/counties/53011

Figure 24: Number of Jobs by Wage Level (All Jobs), City of Camas, 2010 and 2018



Figure 25: Percent of Jobs by Wage (All Jobs), City of Camas, Clark County, and Portland-Vancouver-Hillsboro OR-WA Metro Area, 2018

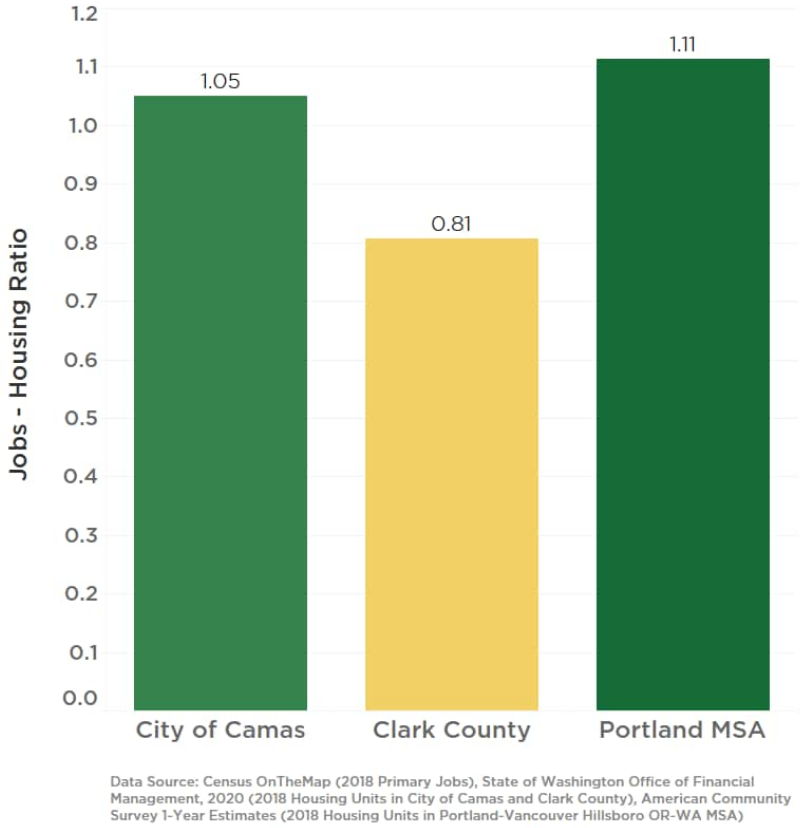


Jobs-Housing Balance

As of 2018, an estimated 8,969 primary jobs and 8,538 housing units were located in Camas, a ratio of 1.05 jobs per housing unit. In Clark County as a whole, there were an estimated 149,193 jobs and 184,794 housing units, a jobs-housing ratio of .81.

The jobs-housing ratios in Camas and the Portland-Vancouver-Hillsboro metropolitan area (a jobs-housing ratio of 1.11) are significantly higher than the county's ratio, pointing to the clustering of jobs in and around the city of Portland. Given similar unemployment and labor force participation rates among the jurisdictions, the lower jobs-housing ratio in Clark County indicates that residents living further from job centers in and around the city of Portland are more likely to commute outside of their jurisdictions for work or to work from home for employers located outside of the county.

Figure 26: Jobs – Housing Ratio, City of Camas, Clark County, and Portland-Vancouver-Hillsboro OR-WA Metro Area, 2018 (Primary Jobs)

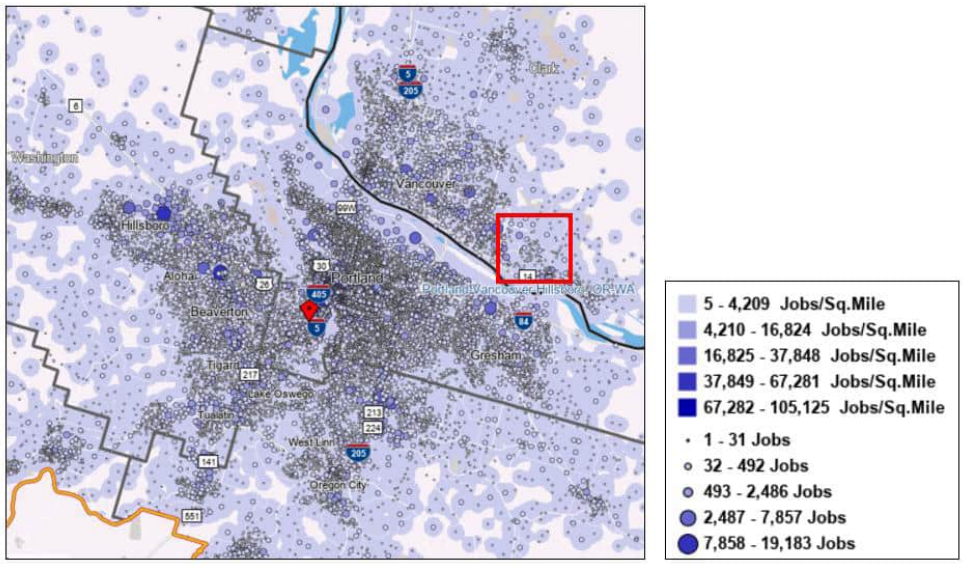


Data Source: Census OnTheMap (2018 Primary Jobs), State of Washington Office of Financial Management, 2020 (2018 Housing Units in City of Camas and Clark County), American Community Survey 1-Year Estimates (2018 Housing Units in Portland-Vancouver Hillsboro OR-WA MSA)

Geographic Distribution of Jobs

Jobs in the region are clustered in the city of Portland and in some of its surrounding suburbs (see Figure 27). In Clark County, jobs tend to be clustered in the southern portion of the county in and around Vancouver, which lies about 14 miles west of Camas (see Figure 28). Jobs in the city of Camas itself are clustered in the city's downtown (southeast Camas) and in the northern and western portions of the city (see Figure 29).

Figure 27: Locations of Jobs in Portland-Vancouver-Hillsboro OR-WA MSA, 2017 (All Jobs)



Data Source: Census OnTheMap, 2017. City of Camas

Figure 28: Locations of Jobs in Clark County, 2017 (All Jobs)

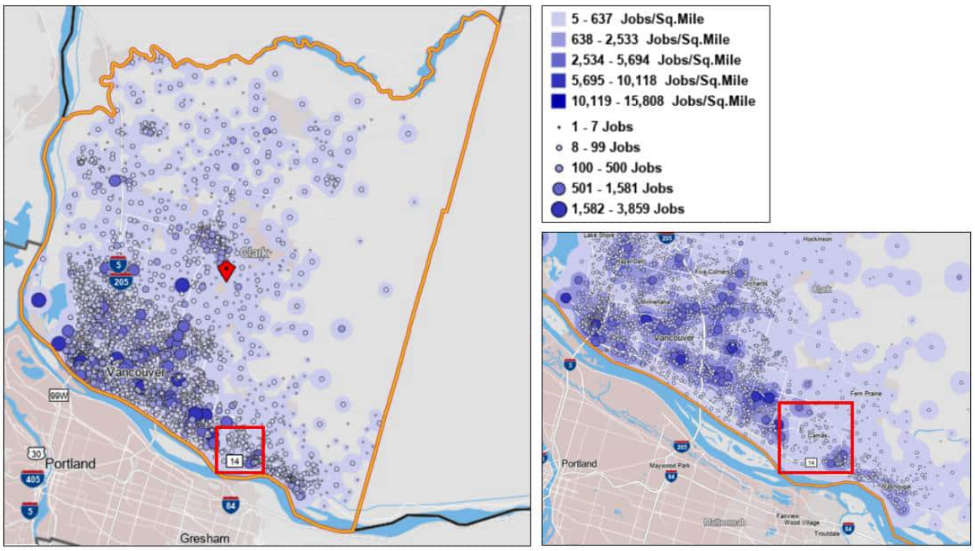
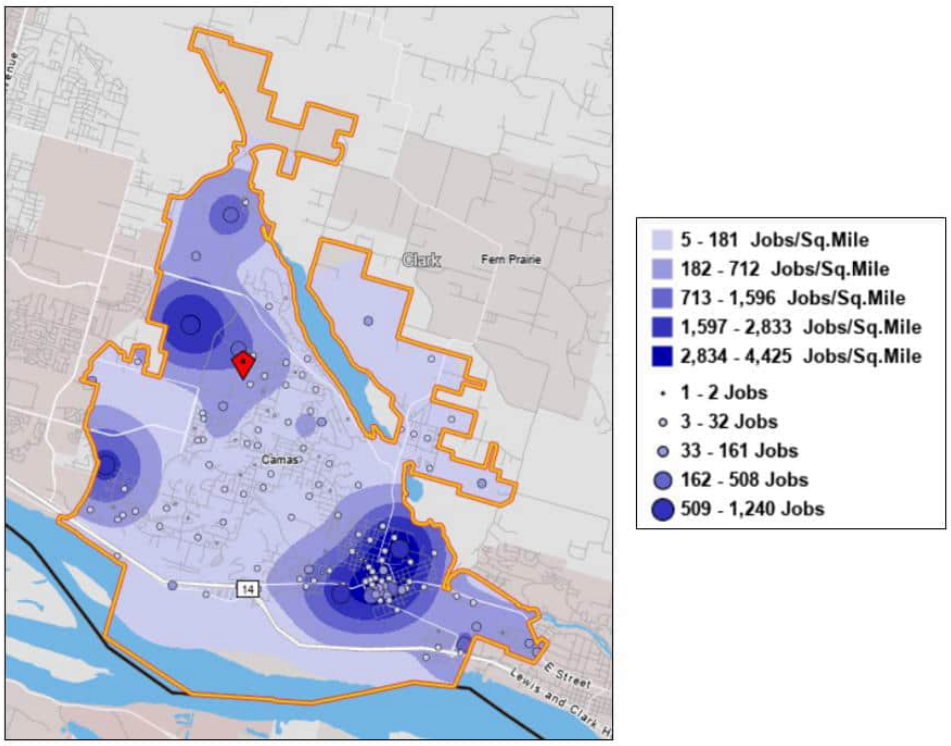


Figure 29: Locations of Jobs, City of Camas, 2017 (All Jobs)



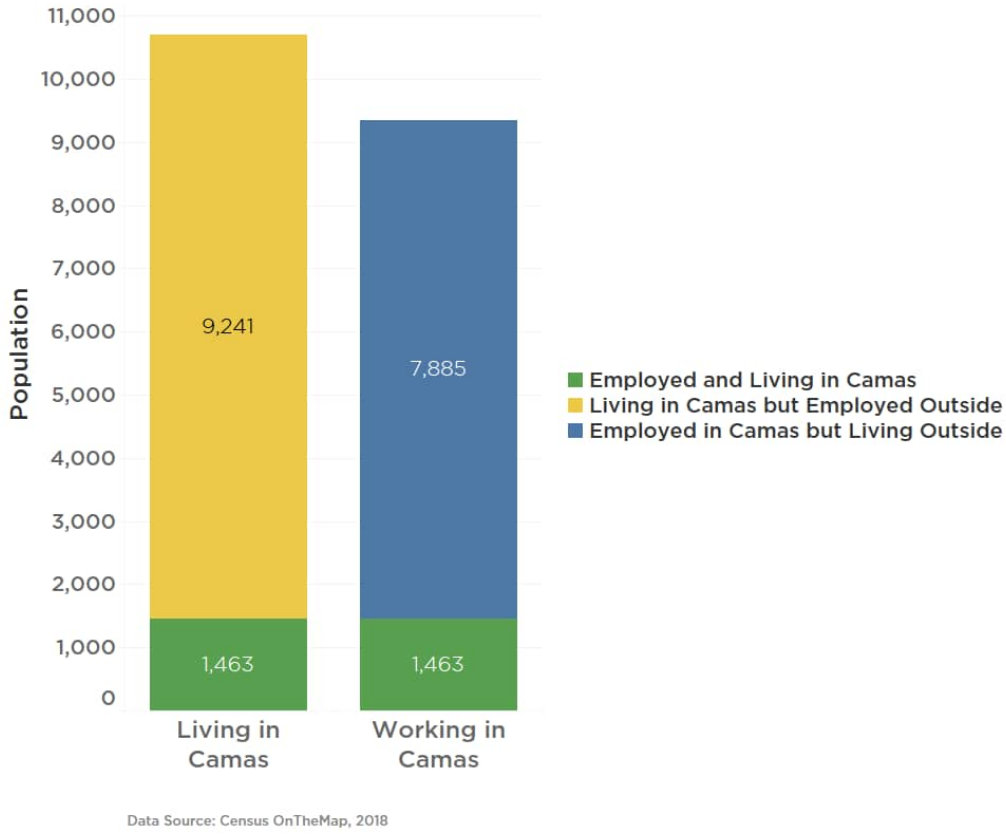
Data Source: Census OnTheMap, 2017

Commuting Patterns

While an estimated 9,348 jobs are located within the city of Camas, just 1,463 are held by residents who both live and work in the city (15.7 of jobs in Camas). An estimated 7,885 jobs (84.3% of jobs in the city) are held by workers who are employed in Camas but live outside of the city. At the same time, an estimated 9,241 of the 10,704 jobs held by Camas residents (86.3% of jobs held by residents) are located outside of the city (see Figure 30).

Residents and stakeholders who participated in this planning process also noted that Camas residents tend to be employed outside of the city or state, with some emphasizing a need to attract additional high-wage jobs to the city. Participants more often noted schools, amenities, and other quality of life factors as reasons that residents move to Camas than jobs located within the city. Stakeholders also emphasized a lack of affordable housing as a primary reason that individuals employed in Camas may have to find housing outside of the city.

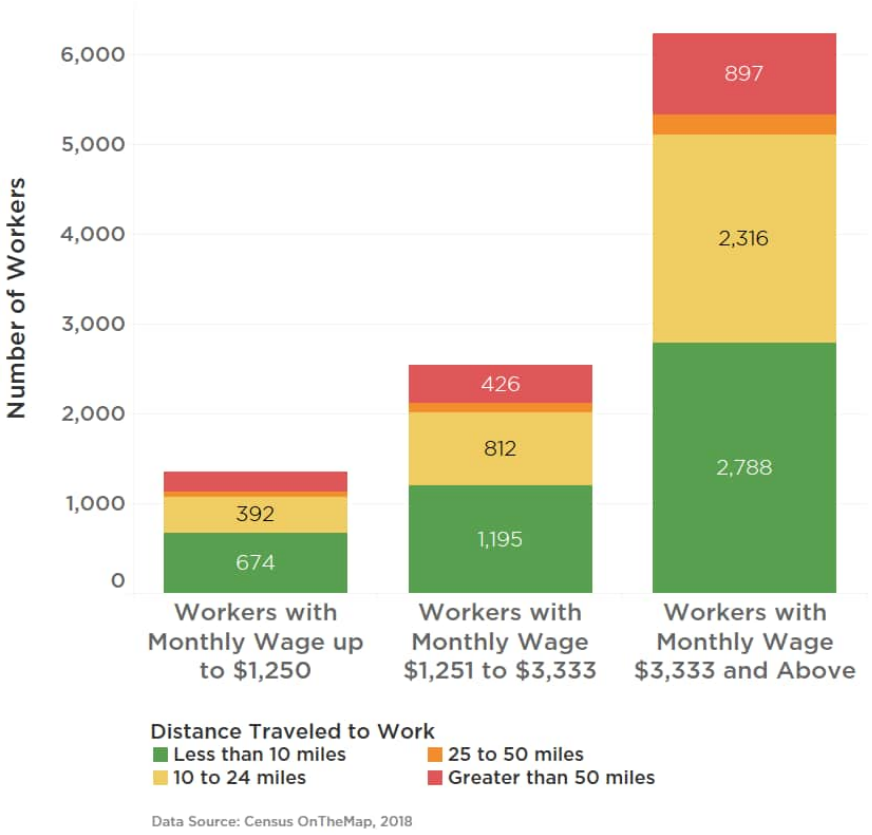
Figure 30: Commuting Patterns of Resident and Non-Resident Workers, City of Camas, 2018 (All Jobs)



Commute distances vary only slightly by workers' wage levels. An estimated 84.7% of all workers commute 50 miles or less to their jobs, and 80.8% commute less than 25 miles. At the same time, an estimated 15.3% of all workers commute more than 50 miles to their jobs, and 19.1% commute more than 25 miles.

Workers with lower wages are slightly more likely than higher-wage workers to commute more than 50 miles for their jobs (16.7% of workers with monthly wages up to $3,333, and 14.4% of workers with wages $3,333 and above). Lower-wage workers are also slightly more likely to commute less than 10 miles to work (50.0% of workers with monthly wages up to $1,250, 46.9% of workers with monthly wages of $1,251 to $3,333, and 44.8% of workers with wages $3,333 and above).

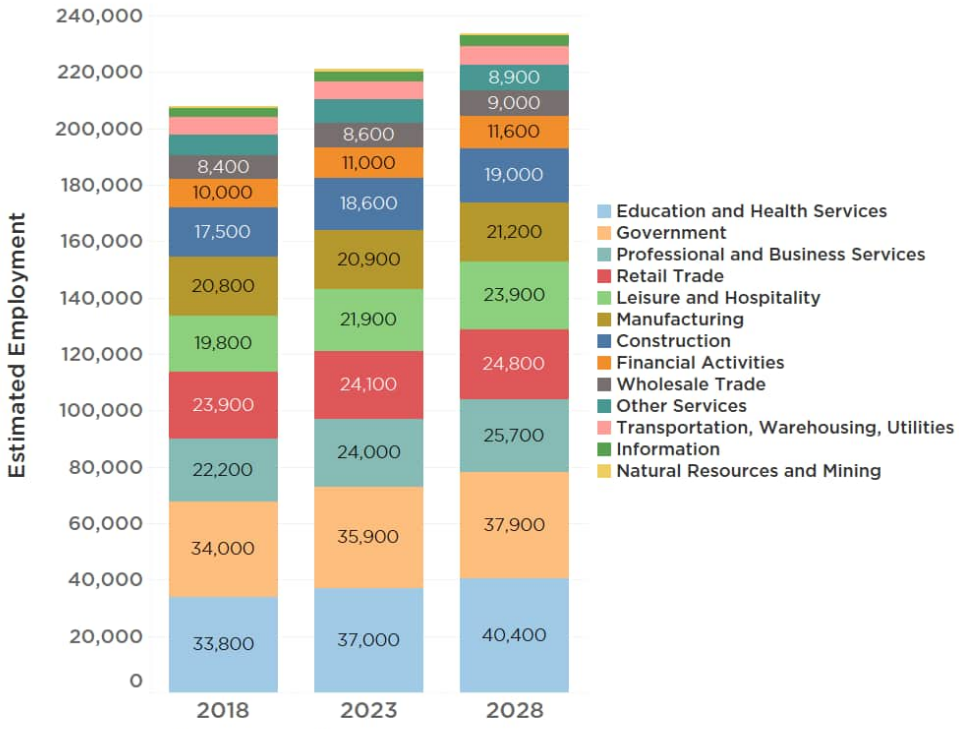
Figure 31: Distance Traveled to Work by Wage, City of Camas Residents (for Primary Jobs), 2018



Employment Projections

Total non-farm employment in the Southwest Washington region is projected to grow from 208,000 to 233,900 from 2018 to 2028, an increase of 25,900 jobs. Education and health services (40,400 jobs), government (37,900 jobs), professional and business services (25,700 jobs), and retail trade (24,800 jobs) are projected to continue providing the most jobs in the region, while the sectors projected to add the most jobs by 2028 include education and health services (6,600 jobs), leisure and hospitality (4,100 jobs), government (3,900 jobs), and professional and business services (3,500 jobs). The information, leisure and hospitality, and education and health services sectors are projected to have the fastest average annual growth rates during the time period (2.3%, 2.1%, and 2.0%, respectively). The manufacturing, retail trade, and wholesale trade sectors are projected to have the slowest average annual growth rates (0.19%, 0.38%, and 0.71%, respectively).

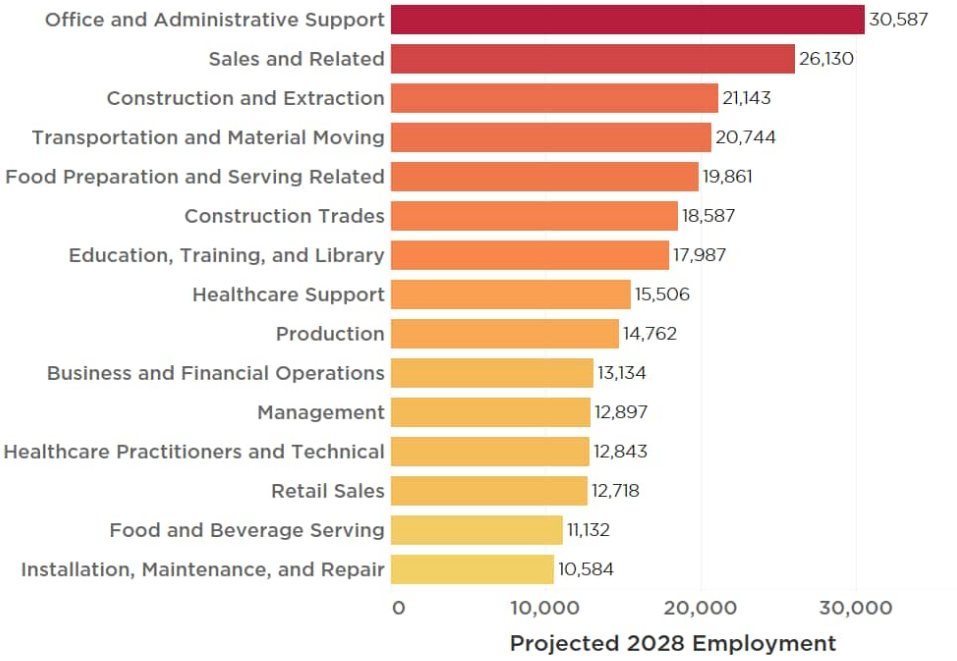
Figure 32: Projected Employment, Southwest Washington Region, 2018, 2023, and 2028



Data Source: Washington State Employment Security Department. (September 2020). Long-term industry employment projections.

Occupations projected to have the highest employment in the region in 2028 include office and administrative support (30,587 jobs), sales and related occupations (26,130 jobs), construction and extraction (21,143 jobs), and transportation and material moving (20,744 jobs) (see Figure 33). The most common occupations reflect the industry sectors with the highest projected employment, including education and health services (education, training, and library, healthcare support, and healthcare practitioners and technical occupations), professional and business services (office and administrative support, sales and related occupations, business and financial operations, and management), retail trade (retail sales), and leisure and hospitality (food preparation and serving related occupations, and food and beverage serving).

Figure 33: Projected Employment for Top Occupations*, Southwest Washington Region, 2028



Data Source: Washington State Employment Security Department. (September 2020). Long-term alternative occupational employment projections.

*Graph includes occupations with > 10,000 projected employment in 2028

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Chapter 4:
Housing Supply



In 2018, the City of Camas had approximately 8,330 total housing units and was composed of 7,972 households. Between 2000 and 2018, Camas housing units and households increased 75%, with the number of households growing slightly faster than the number of housing units. Over this period, Camas also grew at faster rate than Clark County. From 2000 to 2018, the county increased its housing units by 34%, while the number of households increased by 35%.

Table 5: Total Units and Households, Camas and Clark County, WA

	2000		2010		2014-2018		2000-2018 PERCENT CHANGE	
	TOTAL UNITS	HOUSE HOLDS	TOTAL UNITS	HOUSE HOLDS	TOTAL UNITS	HOUSE HOLDS	TOTAL UNITS	HOUSE HOLDS
City of Camas	4,736	4,480	7,072	6,273	8,330	7,972	75.9%	77.9%
Clark County	134,030	127,208	167,413	155,042	179,523	171,522	33.9%	34.8%

Data Source: U.S. Census Bureau, Tables H003, H004, H1 and 2014-2018 5-Year American Community Survey Table B25001, B25003

An accounting of the various types of housing units in Camas finds that 89% of the city's housing units are single-unit structures, according to 2014-2018 American Community Survey data. In actual units, the number of single-unit structures in the city increased from 4,039 to 7,415, a gain of 3,376 single-unit structures.[4] Over the same period (2000-2018), duplexes, triplexes and quadraplexes continued to make up only 5% of the city's structures, although the city gained 205 duplex, triplex or quadraplex units.

Multifamily structures with 5 or more units comprised 8% of all housing units in 2000 and 5% as of 2014-2018 estimates. ACS estimates report that the city had a net increase of only 13 units in structures containing 5 units or more. However, more current date provided by the City of Camas (examined later in this chapter) indicates additional multifamily development not included in ACS estimates.

The 2014-2018 ACS data estimates 85 mobile homes within Camas, unchanged from 2000. City staff, however, note a much smaller number (about 10) through 2013, when remaining mobile homes were cleared from park land.

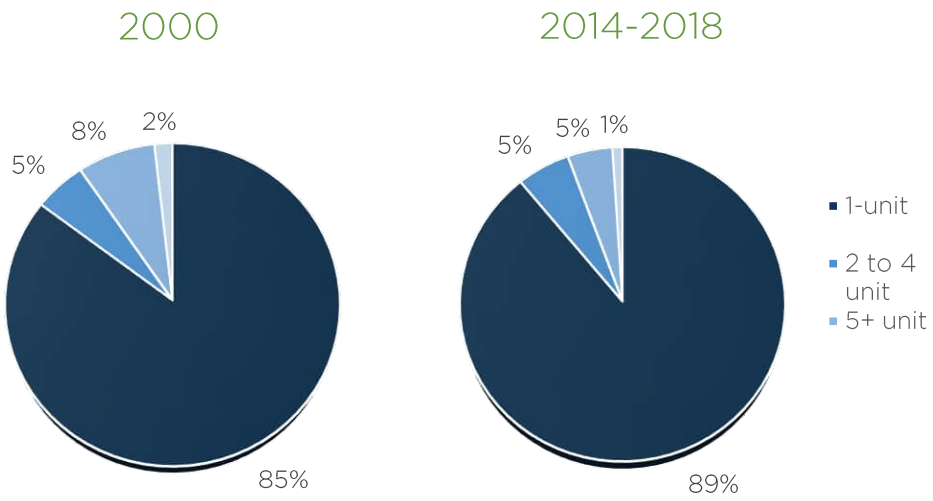
[4] Housing units broken down by structure type are indicated for the year 2000 in estimates provided by the Washington Office of Financial Management.

Table 6: Total Housing Units by Structure Type in Camas

YEAR	TOTAL HOUSING UNITS	1-UNIT	2 TO 4 UNIT	5+ UNIT	MOBILE HOMES	SPECIALS
2000	4,736	4,039	246	366	85	0
2014-2018	8,330	7,415	451	379	85	0

Data Source: OFM "Adjusted Census 2000 Population and Housing by Type of Structure and Group Quarters for the State, Counties and Cities," Table 2, 2014-2018 5-Year ACS Estimates, Table DP04

Figure 34: Percentage of Housing Units in Camas by Structure Type



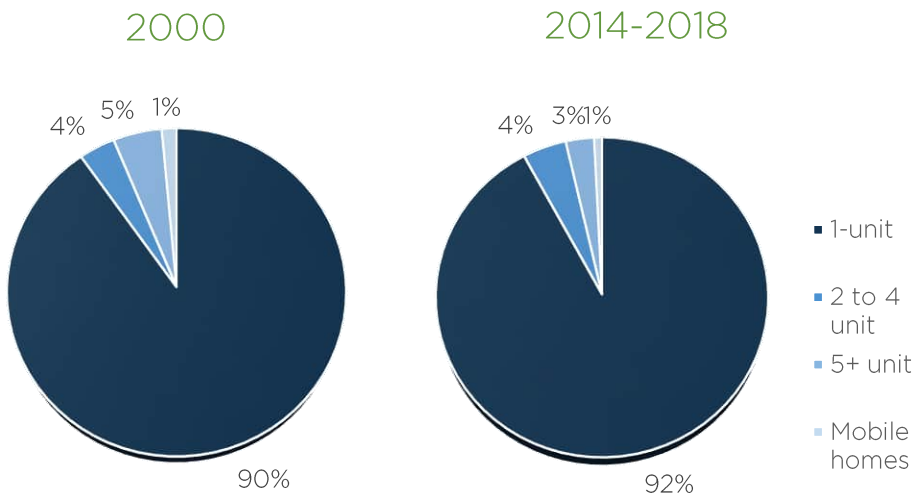
As single-unit structures increased over the 18-year period, so too did the number of Camas residents who lived in single-unit structures. While the city nearly doubled in population, growth trends indicate that single-unit structures continued to be in demand for a growing number of households. By 2018, 92% of Camas residents lived in single-unit housing, up from 90% in 2000. It follows then that multifamily units, which lost supply over the 18-year period also experienced a decrease in the share of residents living in multifamily structures with 5 or more units (-2% points).

Table 7: Population in Housing Units by Structure Type, 2000

YEAR	TOTAL HOUSEHOLD POPULATION	1-UNIT	2 TO 4 UNIT	5+ UNIT	MOBILE HOMES	SPECIALS
2000	12,462	11,239	445	597	181	0
2014-2018	22,554	20,769	975	634	176	0-

Data Source: OFM "Adjusted Census 2000 Population and Housing by Type of Structure and Group Quarters for the State, Counties and Cities," Table 2, 2014-2018 5-Year ACS Estimates, Table B25033

Figure 35: Percentage of Households living in Camas by Structure Type



Housing Tenure

In 2018, approximately 77% of Camas households owned their homes, compared to 23% who rented. Homeownership rates in Camas exceed the homeownership rates of both Clark County (67%) and the Portland-Vancouver-Hillsboro MSA (62%), as shown in Table 6. Trends in homeownership over time indicate that Camas has sustained significantly higher homeownership rates than the county and MSA, at least since 2012 (see Figure 37).

Figure 36: Share of Owners and Renters in Camas, 2018

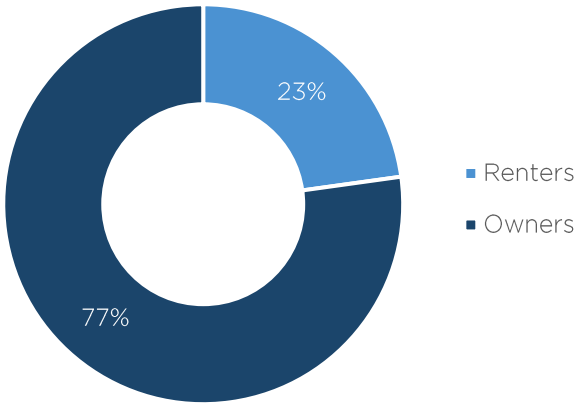


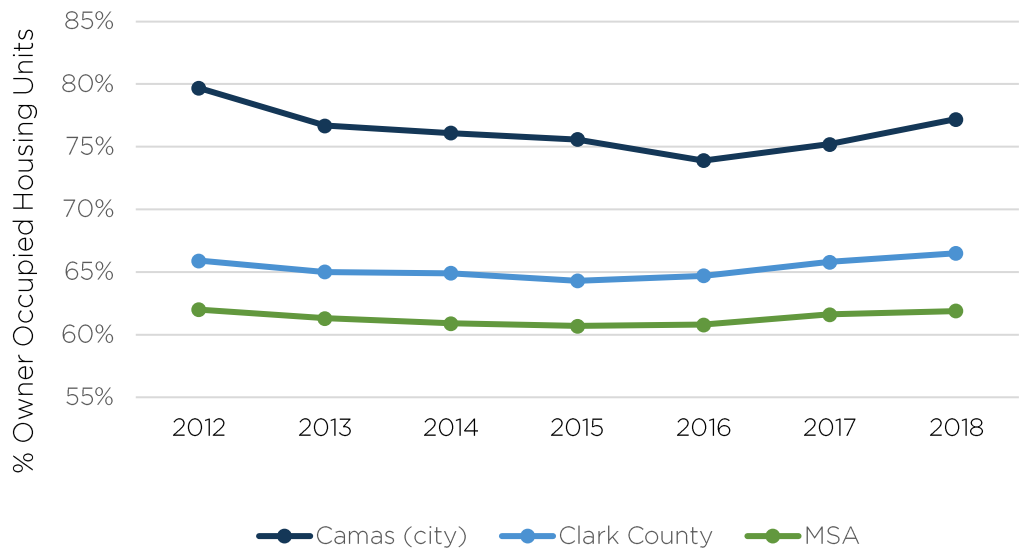
Table 8: Tenure by Households in Camas and the Region, 2014-2018

	HOUSEHOLDS	% OWNERS	% RENTERS
City of Camas	7,672	77.2%	22.8%
Clark County	171,522	66.5%	33.5%
Portland-Vancouver-Hillsboro MSA	925,631	61.9%	38.1%

Data Source: U.S. Census Bureau, Table B25003

Over the period shown below, the highest rates of homeownership in Camas occurred in 2012, when approximately 80% of residents were homeowners. Estimates indicate that 2018 showed the second highest homeownership rate for any year in this period. The city's homeownership rates dipped slightly between 2013-2017, but never fell below 73%. Camas renters made up slightly more than one-fifth (23%) of the city's residents, as shown in Table 6. By comparison, one third of Clark County residents (34%) are renters, as are nearly 40% of residents in the wider MSA.

Figure 37: Camas Homeownership Rate, 2012-2018



Data Source: 5-Year ACS Estimates from 2008-2012 through 2014-2018, Table B25003

Camas's large share of single-unit structures, described earlier, indicates that a significant number of the city's renters live in single-unit structures. In 2018, 50% of Camas renters lived in detached, single-unit structures, up from 45% in 2010 (see Figure 38 and Figure 39). Eight percent of renters lived in attached, single-unit structures in 2018, down from 12% in 2010. Nearly one quarter of the city's renters (24%) lived in duplexes, triplexes and quadraplexes in 2018 (+1% point). The share of renters living in structures with 20+ units has remained at 5% since the beginning of the decade, however, the percentage of residents living in structures with 5-19 units decreased from 13% to 11% over this period.

Camas stands apart from Clark County and the MSA, which both experienced slower growth (+2% points in the county) or no growth (+0% points in the MSA) in the percentage of renters living in single unit detached housing. While Camas had fewer renters living in townhomes and rowhouses during this period (-4% points), as did Clark County (-1% point), the MSA showed an increase in households living in this housing type (+1% point). Between 2010 and 2018, both Clark County and the MSA had fewer renters living in duplexes, triplexes and quadraplexes and multifamily structures with 5-19 units (-1% point), but more renters living in structures with 20+ units (+1% point). Fewer people in Camas rented mobile homes over this period (-1.2% points), which Clark County and the MSA either showed slight increases in mobile home renters (+0.2% in Clark County) or remained essentially the same (-0.06% in the MSA).

Figure 38: Renter Occupied Housing Units by Structure Type, 2010

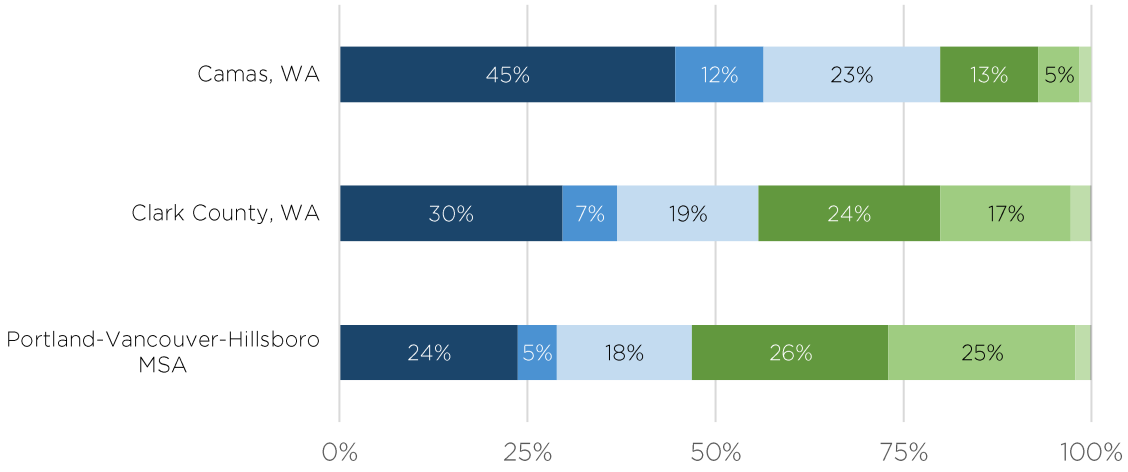
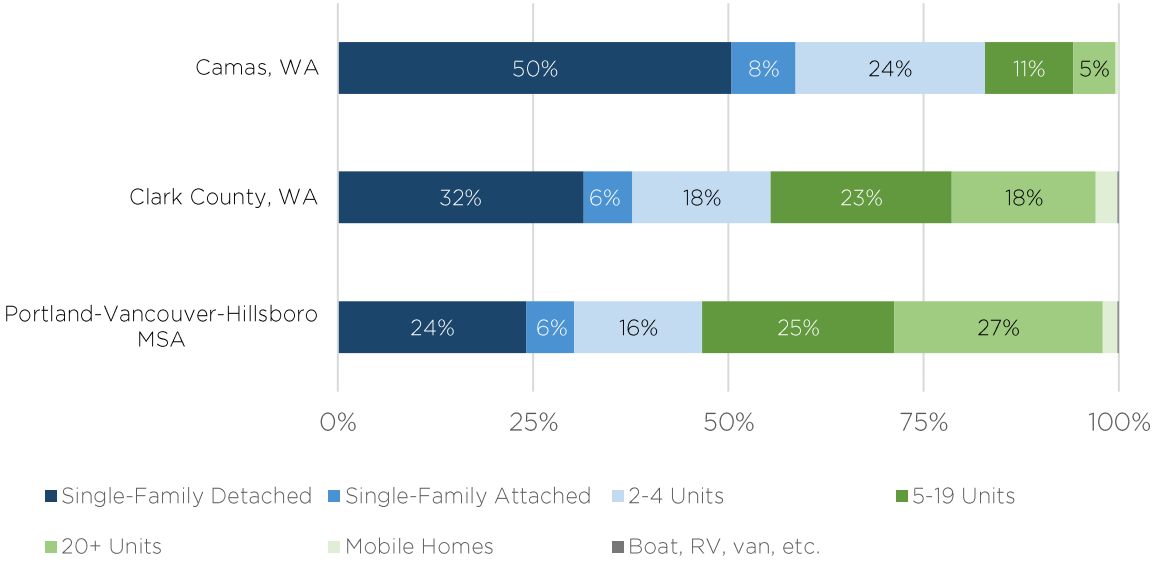


Figure 39: Renter Occupied Housing Units by Structure Type, 2014-2018



Data Source: 5-Year ACS Estimates from 2006-2010 through 2014-2018, Table B25032.
Structure types which are not labeled above had a share of less than 3%.

Unlike renters, Camas homeowners predominantly lived in single-family detached units (95%). Homeowners living in townhomes and rowhouses made up 4% of all homeowners. However, both the share of homeowners living in structures with 5-19 units and 20+ units declined over this period, even though both housing types began the decade representing less than 1% of all owner-occupied homes. Camas homeowners also owned duplexes, triplexes, quadraplexes at a rate of less than 1%. These factors may indicate homeowner preference for a specific

housing type (single-family detached), however, as shares of other housing types decrease, homeowners may have fewer multifamily options. Limited options for the purchase of homes in multi-unit structures could affect homeownership rates for single individuals, young adults, couples without children, small families, empty nesters, our other family or non-family households seeking middle-housing units for homeownership.

Figure 40: Occupied Owner Housing Units by Structure Type, 2010

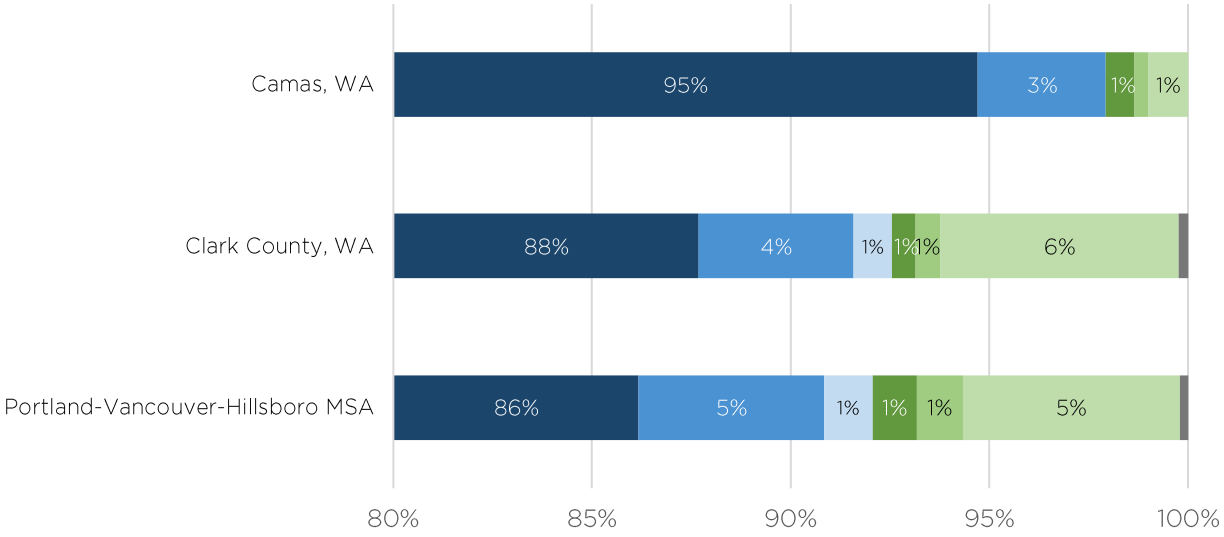
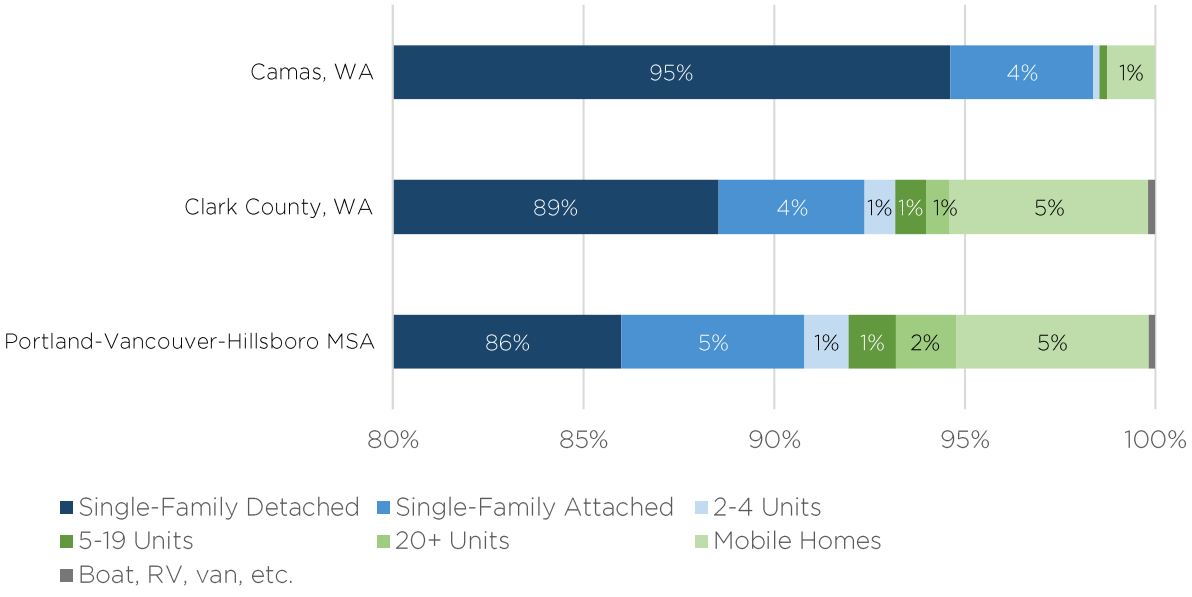


Figure 41: Occupied Owner Housing Units by Structure Type, 2014-2018



Data Source: 2006-2010 and 2014-2018 5-Year American Community Survey, Table B25032.
Structure types which are not labeled above had a share of less than 1%.

Household Size

In 2018, the average household in Camas contained 2.83 individuals. The average Camas family had 3.21 members. Both households and family sizes in Camas are larger than those in Clark County and the Portland-Vancouver-Hillsboro MSA, as shown in Table 7. Since 2010, however, average household size and average family size in Camas have decreased. Average household size decreased from 2.92 persons in 2010 to 2.83 in 2018; average family size decreased from 3.33 persons to 3.21. In contrast, both households and family sizes in Clark County and the MSA grew larger over this period.

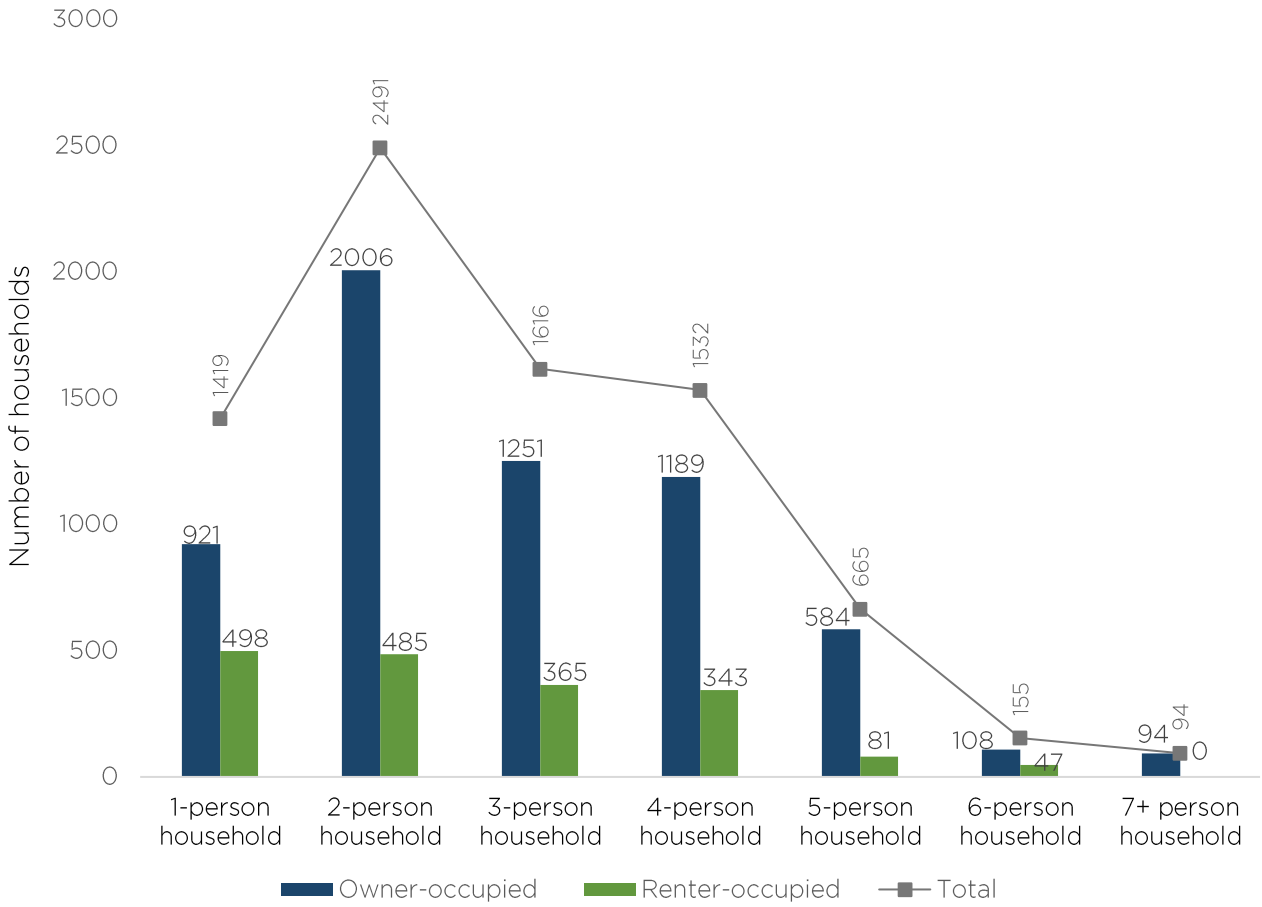
Table 9: Household Size in Camas, 2014-2018

	AVERAGE HOUSEHOLD SIZE		AVERAGE FAMILY SIZE	
	2006-2010	2014-2018	2006-2010	2014-2018
City of Camas	2.92	2.83	3.33	3.21
Clark County	2.65	2.69	3.14	3.17
Portland-Vancouver-Hillsboro MSA	2.51	2.57	3.10	3.12

Data Source: U.S. Census Bureau, Table B25003

As indicated by Camas's average household size, the largest share of owner-occupied households are two-person households (2,006 households), followed by three-person households (1,251) and four-person households (1,189). Renter households tend to be smaller than owner households, with the greatest shares of renter households containing one-person (498 households) or two people (485 households). However, 45% of renter households have 3 or more members, again indicating the high rates of family rentals in the city.

Figure 42: Household Size by Housing Tenure, 2014-2018



Data Source: 2014-2018 5-Year ACS Estimates, Table B25009

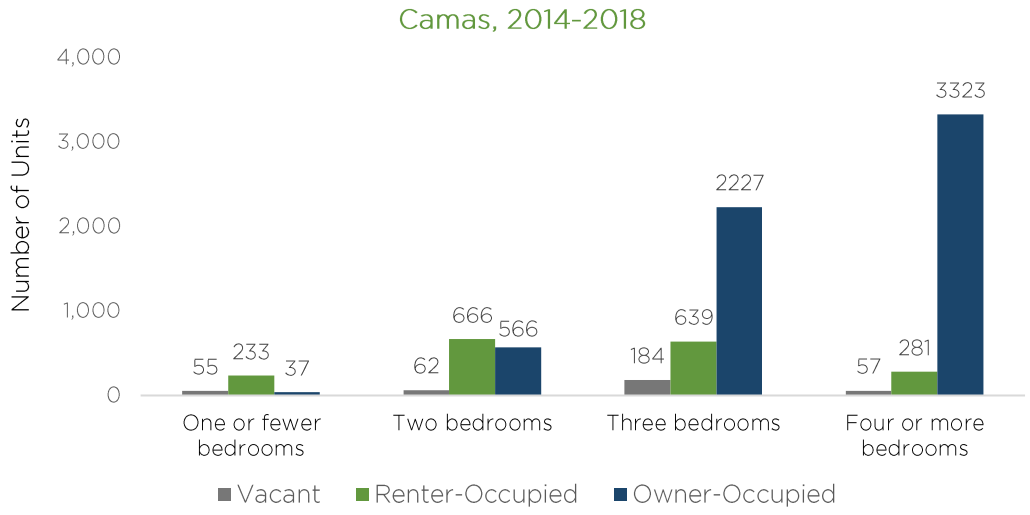
Unit Size

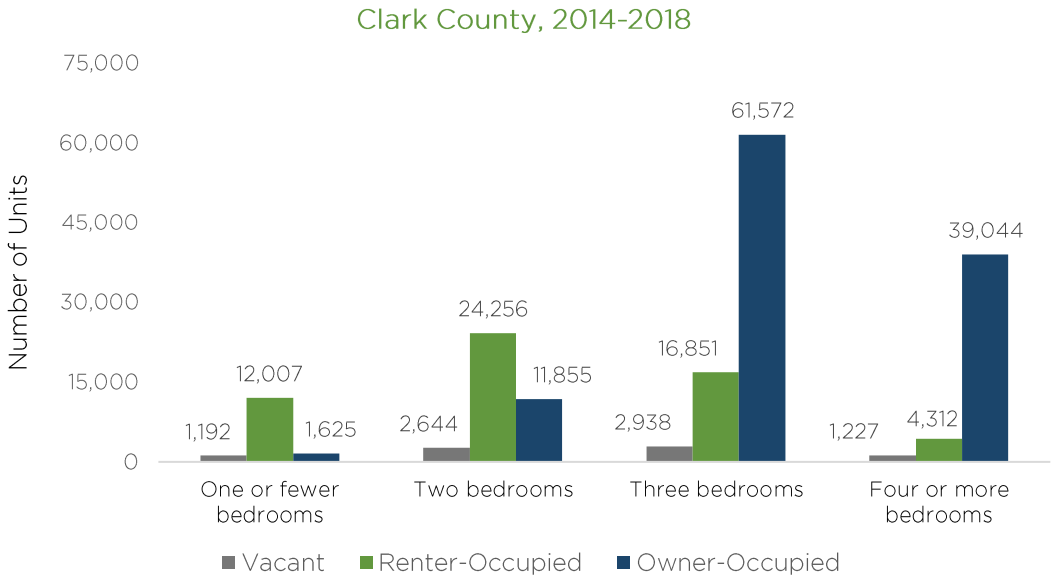
Owner-occupied housing units in Camas tend to be large units, with approximately 54% of owner-occupied units having 4 or more bedrooms. Fully 90% of owner-occupied homes have at least three bedrooms. Of the remaining 10% of owner-occupied units, 9% of owner-occupied units have two-bedrooms, while less than 1% are studios or have one bedroom. Conversely, renter-occupied units in Camas tend to be smaller than owner-occupied units. Renter units are largely two-bedroom units (37%) or three-bedroom units (35%). Four-bedroom units only make up 15% of the city's rental units, while studios and one-bedroom units make up the smallest share at 13%.

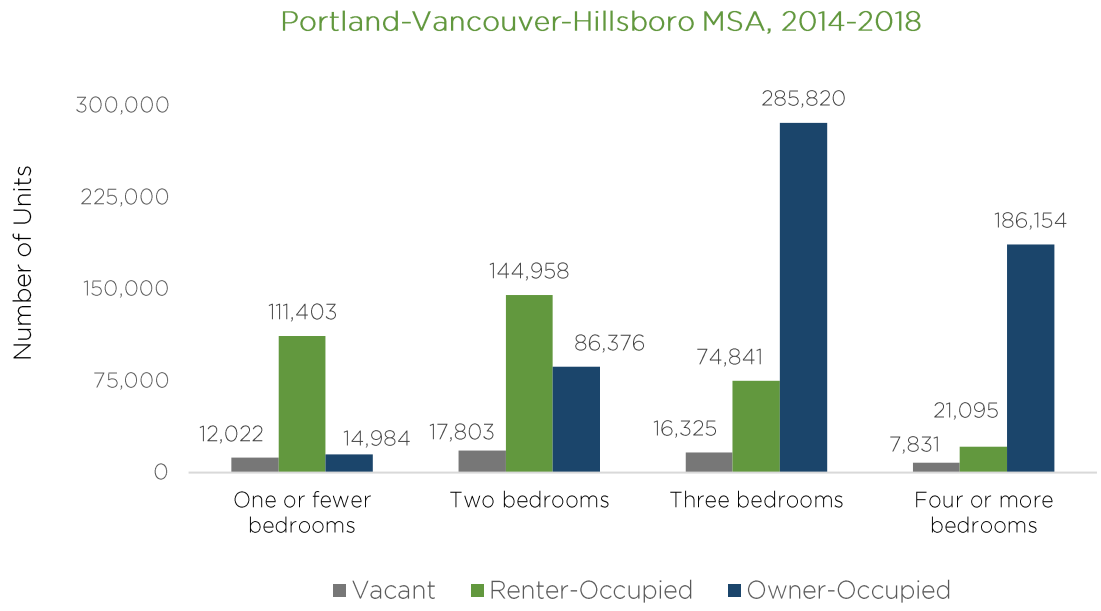
Camas's owner-occupied unit size is, on average, larger than that of Clark County or the greater MSA. In the county and region, owner units are most likely to be three-bedroom units, with three-bedroom units comprising 54% and 50% of owner-occupied housing in those jurisdictions, respectively. One-third (34%) of

homeowners in Clark County live in units with four or more bedrooms, as do nearly one-third of owner households (32%) in the MSA. Only 1.4% of owner units in Clark County and 2.6% in the MSA are studios or one-bedroom. Rental trends in the county and MSA share some similarities with Camas: two-bedroom units are the most common rental housing type in all three jurisdictions. In Camas, four-bedroom rental units make up a larger share of rental units than one-bedroom units (15% vs. 13%). This trend is reversed in the county and MSA, where one-bedroom units make up larger shares of rental housing than four-bedroom rental units (20% one-bedroom to 8% four-bedroom in the county; 32% one-bedroom to 6% four-bedroom in the MSA).

Figure 43: Number of Bedrooms







Data Source: 2014-2018 5-Year American Community Survey, Table B25042

Housing Age and Condition

Housing in Camas tends to be of newer stock than housing in Clark County and the larger MSA. In the 1990s, Camas experienced a sharp increase in housing production, compared to previous decades. Over 65% of Camas's housing was built after 1990, representing a significantly higher percentage of housing units than in Clark County (50.8% built since 1990) or in the Portland-Vancouver-Hillsboro MSA (38.5% built since 1990). American Community Survey estimates used in Figure 44 and Table 10 are based on survey data collected from 2014 through 2018, meaning that estimates of very-recently-constructed housing (i.e., the 2010 to 2018 category) do not reflect all construction since 2010. The "Housing Production" section of this chapter delves more deeply into recently constructed housing in Camas.

Newer housing stock may indicate that overall, the housing stock in Camas is in better condition than in surrounding areas where housing supply is older. It should be noted, however, that around 10% of Camas housing stock (10.7%) was built before 1940, a share that is more than double the amount of housing in Clark County built before 1940.

Figure 44: Camas Housing Units by Year Structure Built

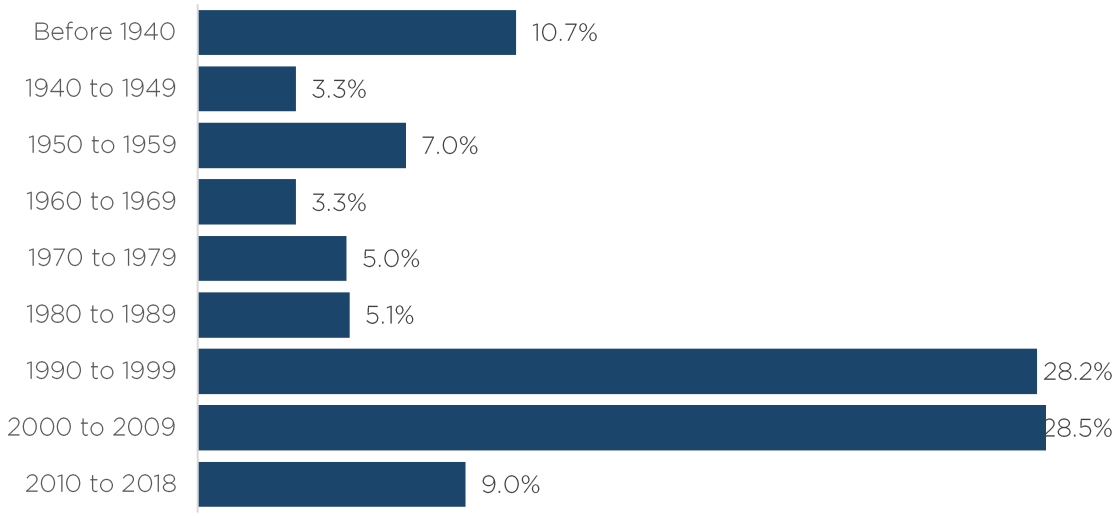


Table 10: Housing Units by Year Structure Built, 2014-2018

	CAMAS	CLARK COUNTY	PORTLAND – VANCOUVER – HILLSBORO MSA
Before 1940	10.70%	4.40%	12.30%
1940 to 1950	3.30%	3.20%	4.60%
1950 to 1960	7.00%	4.90%	7.10%
1960 to 1970	3.30%	6.80%	8.60%
1970 to 1980	5.00%	17.50%	17.50%
1980 to 1990	5.10%	12.30%	11.40%
1990 to 1999	28.20%	25.10%	18.70%
2000 to 2009	28.50%	18.90%	14.80%
2010 to 2018	9.00%	6.80%	5.00%

Data Source: 2014-2018 5-Year American Community Survey, Table B25034

While age of housing provides a general narrative about the housing conditions, other physical features related to housing condition are captured by the US Census Bureau. For example, the American Community Survey captures those households that lack complete kitchen or plumbing facilities. According to these estimates, approximately 14 homes (0.2%) in Camas lack complete kitchen facilities, such as cooking facilities, a refrigerator, or a sink with piped water. An estimated 31 homes (0.4%) lack complete plumbing facilities, meaning that they

lack hot and cold piped water, a flush toilet, or a bathtub or shower. While ACS data provides these estimates, they are subject to sampling error and the actual number of homes in Camas with a lack of complete kitchen or plumbing facilities may be lower. Overall, the data indicates that homes without complete kitchen or plumbing facilities make up very small percentages of Camas's stock, and lower shares than they do throughout the MSA.

Table 11: Housing Lacking Complete Kitchen or Plumbing Facilities, 2014-2018

	TOTAL HOUSING UNITS	LACKING COMPLETE KITCHEN FACILITIES		LACKING COMPLETE PLUMBING FACILITIES	
		NUMBER	SHARE	NUMBER	SHARE
Camas, WA	8,330	14	0.2%	31	0.4%
Clark County, WA	179,523	3,172	1.8%	806	0.4%
Portland – Vancouver – Hillsboro MSA	979,612	17,404	1.8%	7,598	0.8%

Data Source: 2014-2018 5-Year American Community Survey, Table B25051 and B25047

Vacancy Rates

Vacancy rates are important indicators of the city's housing market. In 2018, vacancy rates for units for purchase in Camas was 2.1%. Clark County and the MSA had even tighter homebuying markets, with approximately 1% vacancy in both areas. Rental vacancy rates almost universally hovered at 3% for Camas, Clark County and the MSA. Low vacancy rates, such as those seen across the region, tend to indicate a limited housing supply, higher housing prices, and loss of affordable units (or, in some cases, high risk of gentrification).

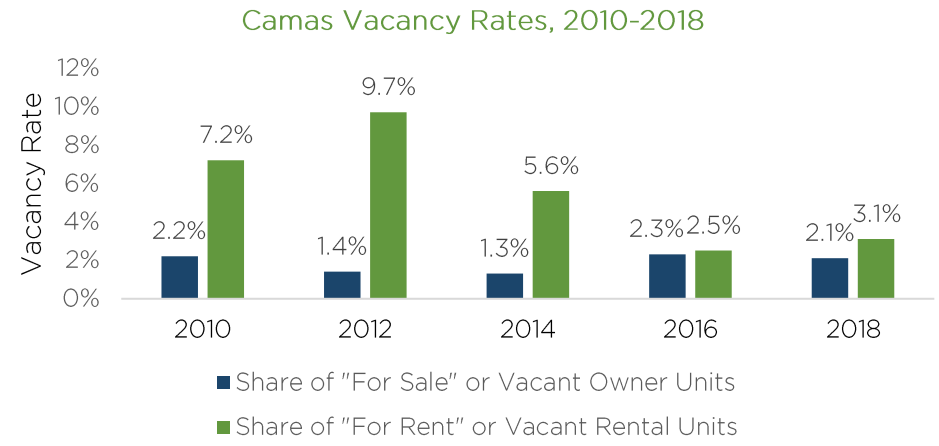
Vacancy rates in Camas, Clark County and the MSA between 2010 and 2018 are shown in Figure 45 below. The percentage of "for sale" units in Camas did not exceed 2.3% between 2010 and 2018, with some of the city's lowest "for sale" rates observed as the US emerged from the Great Recession (1.4% in 2012 and 1.3% in 2014). Rental vacancies in Camas varied widely over this period. In 2012, for example, rental vacancies reached 9.7% at the same the owner-occupied unit vacancies were reaching some of their lowest levels. By 2016, Camas's rental market had recovered; rental vacancies of 2.5% nearly matched the low vacancy rate in for-sale units. Clark County and the MSA experienced less variation in rental vacancy rates over the period. Both owner-occupied and renter vacancy rates in these jurisdictions have declined over time, with only a small uptick in all renter vacancies by 2018.

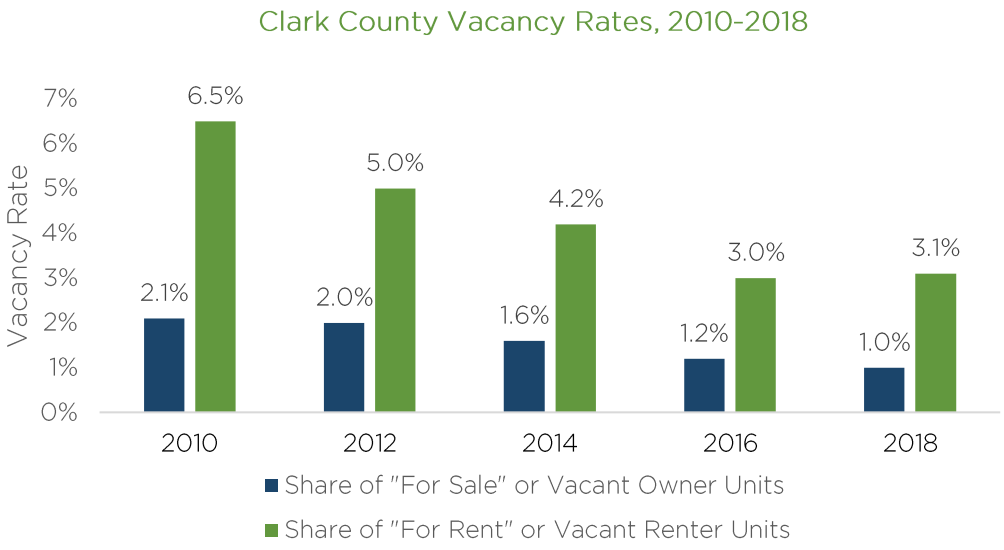
Table 12: For Sale and Rental Vacancy Rates in Camas, 2014-2018

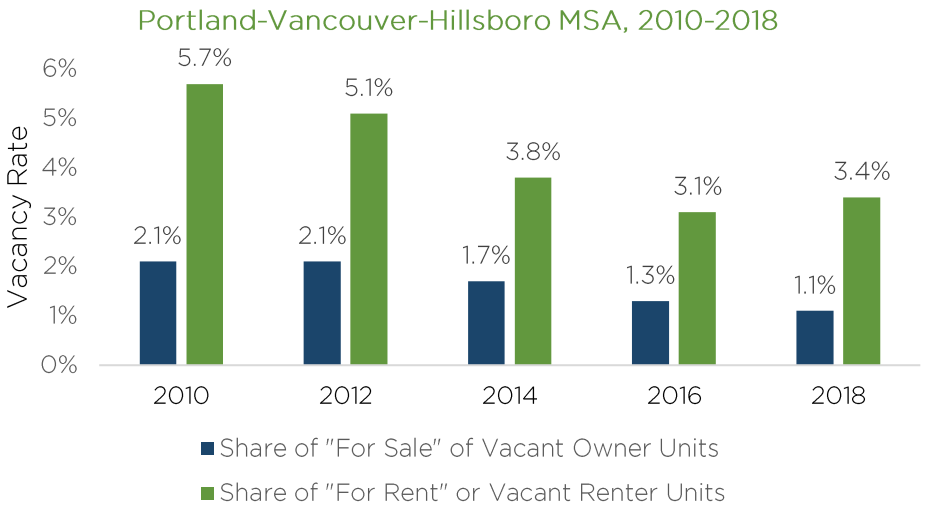
	OWNER HOUSING UNITS			RENTAL HOUSING UNITS		
	AVAILABLE (VACANT)	TOTAL	VACANCY RATE	AVAILABLE (VACANT)	TOTAL	VACANCY RATE
City of Camas	129	6,153	2.1%	57	1,819	3.1%
Clark County	1,102	114,096	1.0%	1,790	57,426	3.1%
Portland-Vancouver-Hillsboro MSA	6,111	573,334	1.1%	11,870	352,297	3.4%

Data Source: 2014 – 2018 5-Year American Community Survey, Tables DP04 and B25004. Vacancy figures shown reflect the number of "For rent" and "For sale only" housing units.

Figure 45: Vacancy Rate







Data Source: 2006-2010 and 2014-2018 5-Year American Community Survey, Table B25004

To assist jurisdictions completing Housing Action Plans, the Washington Center for Real Estate Research (WCRER) at the University of Washington made a variety of data available to jurisdictions, including data about the local rental market. The table below shares vacancy rates for market-rate rental properties by number of bedrooms in Camas based on a survey of 20+ unit multifamily complexes prepared by WCRER in September 2020. Overall, the rental vacancy rate was low at about 1.6% for the 7 complexes (with a total of 570 units) included in the survey. One-bedroom units were more likely to have availability (4.2% vacant) while larger units (2 and 3 bedrooms) had considerably more constrained availability, including no vacant 3-bedroom units.

Low rental vacancy rates were common for the 25 communities surveyed by WCRER, with averages ranging from as low as 0.2% to as high as 6.9%. Most communities (21 out of 25) had average rental vacancy rates under 2%.

Table 13: Rental Vacancy in Properties with 20+ Units in Camas, September 2020

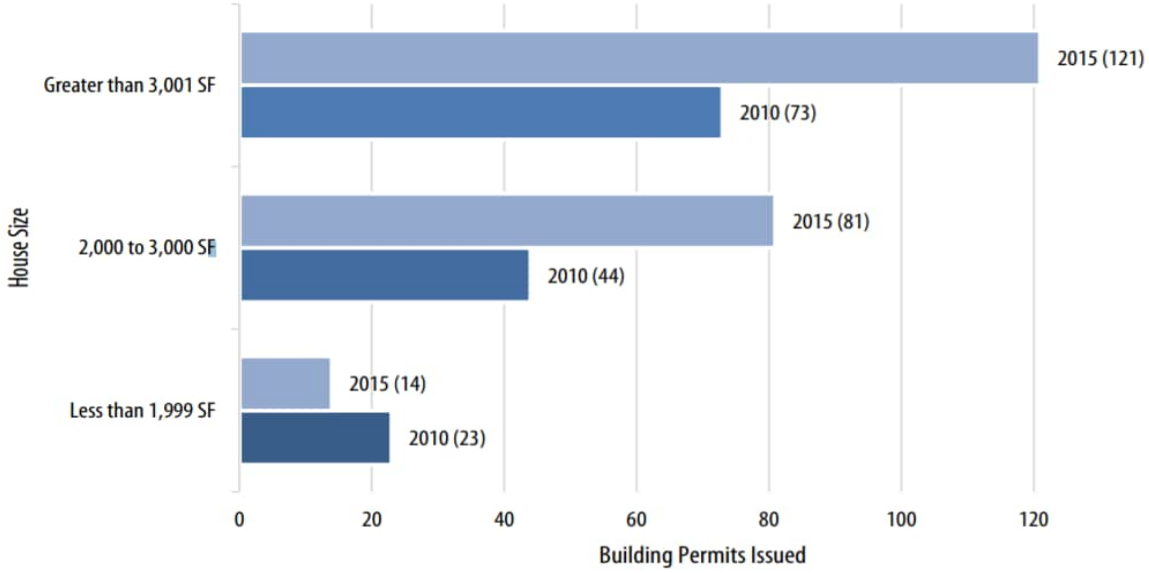
	1-BEDROOM		2-BEDROOM		3-BEDROOM	
	# OF UNITS	VACANCY RATE	# OF UNITS	VACANCY RATE	# OF UNITS	VACANCY RATE
City of Camas	168	4.2%	330	0.6%	72	0.0%

Data Source: Washington Center for Real Estate Research survey of multifamily properties with 20+ units, Conducted in September 2020, Retrieved from https://wcrer.be.uw.edu/housing-market-data-toolkit/

Housing Production

The Camas 2035 Comprehensive Plan identified trends in the city's housing production from 2010 to 2015. In 2010, Camas permitted 23 units under 1,999 square feet, 44 units between 2,000 and 3,000 sq. ft. and 73 units over 3,001 sq. ft. By 2015, the city had permitted 37 more mid-range units (2,000 to 3,000 sq. ft.) than in 2010, and 48 more units over 3,001 sq. ft. In contrast, smaller housing units (1,999 sq. ft. or less) decline over this period, with 9 fewer units permitted than in 2010. Production trends in Camas indicate a continued preference for housing units with a larger footprint. The city's limited housing supply under 1,999 sq. ft. could pose difficulties for a range of family and non-family types appropriately sized or appropriately priced housing in Camas.

Figure 46: Housing Production in Camas, 2010 and 2015



Data Source: Camas 2035 Comprehensive Plan

In 2020, Camas permitted 338 new single-family residences, about 56% above the 216 units permitted in 2015.5 The majority of these units were over 3,000 square feet (52.4%) and 45.6% were between 2,000 and 3,000 square feet. Only seven units (2.1%) were under 2,000 square feet. These trends indicate a continued preference for housing units with a larger footprint. The city's limited housing supply under 2,000 square feet poses difficulties for a range of family

[5] City of Camas permit data provided by month for 2020.

and non-family households seeking appropriately sized or appropriately priced housing in Camas.

Although there were no multifamily permits issued by the City in 2020, Camas's supply of rental housing in large, multifamily developments increased significantly in recent years. The table below indicates the city's current stock of multifamily housing, including townhomes and apartments. In 2020 alone, two new multifamily developments were completed, adding nearly 300 apartments to the city's multifamily stock. These developments added to the city's supply of smaller housing units, particularly 1-bedroom and 2-bedroom rental units.

Table 14: Multifamily Apartment and Townhouse Developments in Camas, 2020

DEVELOPMENT NAME	TYPE	YEAR BUILT	NUMBER OF UNITS
7th Avenue Townhomes, 710 NW 7th Avenue	Townhomes	2015	10
Camas House Apartments, 1102-1138 E. 1st Avenue	Apartments	1979	16
Camas Ridge, 1420 NW 28th Avenue	Apartments	2011	51
Clara Apartments, 608 NE Birch Street	Apartments	2020	32
Crown Villa, 1529 Division Street	Apartments	1986	19
First Avenue Apartments, 1410 E. 1st Avenue	Apartments	1972	11
Hill Crest Apartments, 1222 NW Couch Street	Apartments	1971	5
Kielo at Grass Valley, 5988 NW 38th Avenue	Apartments	2020	276
Lloyd Apartments, 1022-1050 E. 1st Avenue	Apartments	1954	8
Logan Place Village, 1346 NW 25th Avenue	Townhomes	2014	26
Parker Village, 20th Avenue & NW Brady Road	Townhomes	2018	60
Parklands at Camas Meadows, NW Longbow Lane	Townhomes		24
River Place Apartments, 1718 SE 11th Avenue	Apartments	1998	20
River View Apartments, 3003 NE 3rd Avenue	Apartments	1995	60
Russell Street Townhouses, 1820 SE Seventh Ave	Townhomes	1996	9
Stoneleaf Townhomes, 5843 NW 26th Avenue	Townhomes	2015	12
Terrace at River Oaks, 3009 NE 3rd Avenue	Apartments	2018	120
Third Avenue Apartments, 2615 NE 3rd Avenue	Apartments	2000	42

Data Source: Mosaic Community Planning research via apartment listing services; City of Camas Staff Report "Annual Comprehensive Plan Amendments, City File Numbers CPA20-01, CPA20-02, and CPA20-03," August 11, 2020

Housing Costs

Housing cost and affordability are another important area for examination, given Camas's low vacancy rates, large unit size, and newer housing stock – variables that may indicate less affordability for both rentals and for-sale housing. Looking at housing from a bird's eye view, tools such as the Washington Center for Real Estate Research's housing affordability index (HAI) provide context for local affordability by observing housing affordability at the county level. The HAI gives a general measurement of the likelihood that middle income families can afford the mortgage on a median priced home. A score of 100 indicates the middle family can afford median home prices, and scores above 100 show increasing levels of affordability.[6] In Table 15 shown below, Clark County's scores on the HAI have been greater than 100 for the past four years, indicating that overall median income earning families experience housing affordability. First time homebuyers in Clark County, on the other hand, received scores below 100, indicating that tight markets and housing affordability directly affect first time homebuyers in the county in ways that may not be experienced by existing or long-time homeowners.

Table 15: Housing Affordability Index for Camas and Clark County, 2017 to 2020

	Q2 2017	Q2 2018	Q2 2019	Q2 2020
Clark County	123.3	109.1	114.5	125.7
Clark County, First Time Buyers	73.2	65.8	81.3	94.5
Washington State	123.7	105.4	98.4	106.2
Washington State, First Time Buyers	71.2	61.2	69.9	81.2

Data Source: Washington Center for Real Estate Research, "Housing Market Snapshot, 2017-2020."[7] http://wcrer.be.uw.edu/archived-reports/

Scaling down to Camas, the affordability picture becomes starker. Figure 47 and Figure 48 indicates that Clark County home values are significantly less than values in Camas. Zillow data identifies median home values in the 65th percentile range, also called the top tier, and the 35th percentile range or bottom tier. In September 2010, the predominant range of Camas's housing values spanned

[6] Washington Center for Real Estate Research. "Housing Affordability Index, State of Washington and Counties, Fourth Quarter 2011," Accessed October 30, 2020. http://realestate.washington.edu/wp-content/uploads/2013/10/2011Q4-HAI.pdf

[7] Washington Center for Real Estate Research, "Housing Market Snapshot, 2017-2020." Accessed October 30, 2020. http://wcrer.be.uw.edu/archived-reports/

from $215,056 to $450,519. Bottom tier median housing values were $41,884 higher in Camas than in Clark County, while top tier median values were $123,007 higher in Camas. By September 2020, Camas's median home values had nearly doubled at the bottom tier - $406,456 - and had reached $744,922 at the top tier. 2020 figures indicate that bottom tier values were now $71,107 greater and top tier values were $179,764 greater than those across Clark County. Due to these differences in home value shown over time, the HAI may be an insufficient tool to interpret affordability in the city of Camas. However, the HAI does offer some instruction. Where Clark County offers limited affordability for first-time homebuyers, these pressures may be extreme for first time homebuyers in Camas, who already face challenges due to the city's limited supply of smaller starter homes.

Figure 47: Bottom and Top Tier Home Values in Camas, 2010-2020

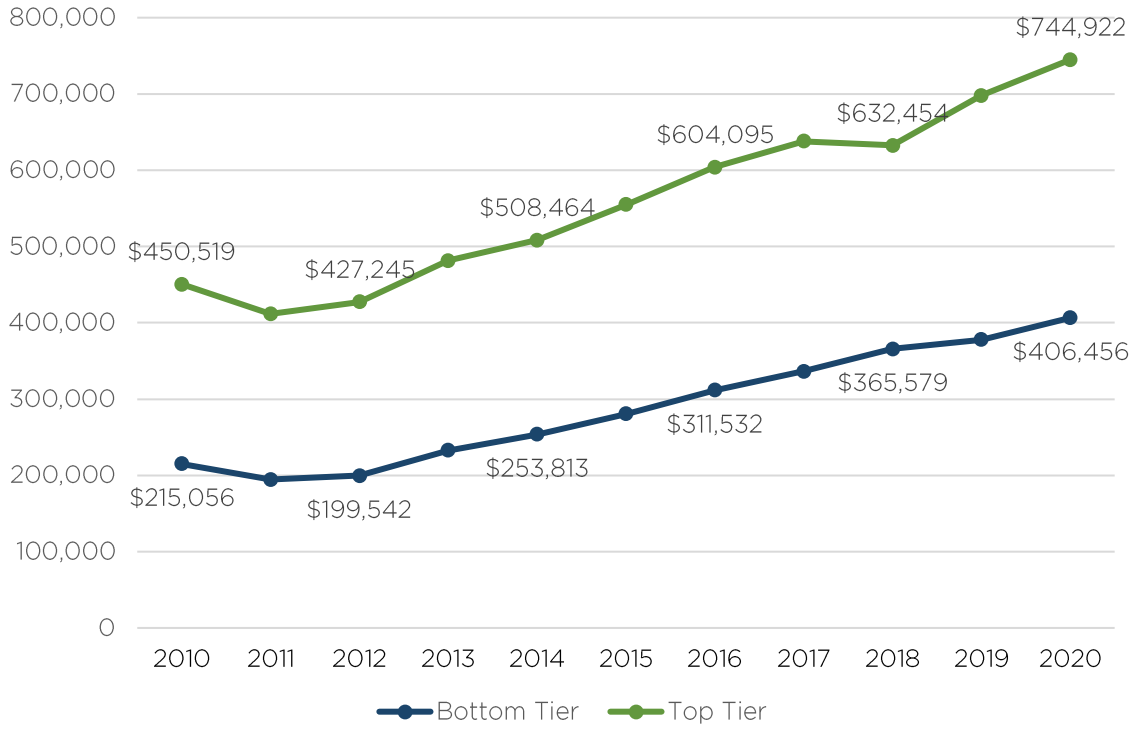
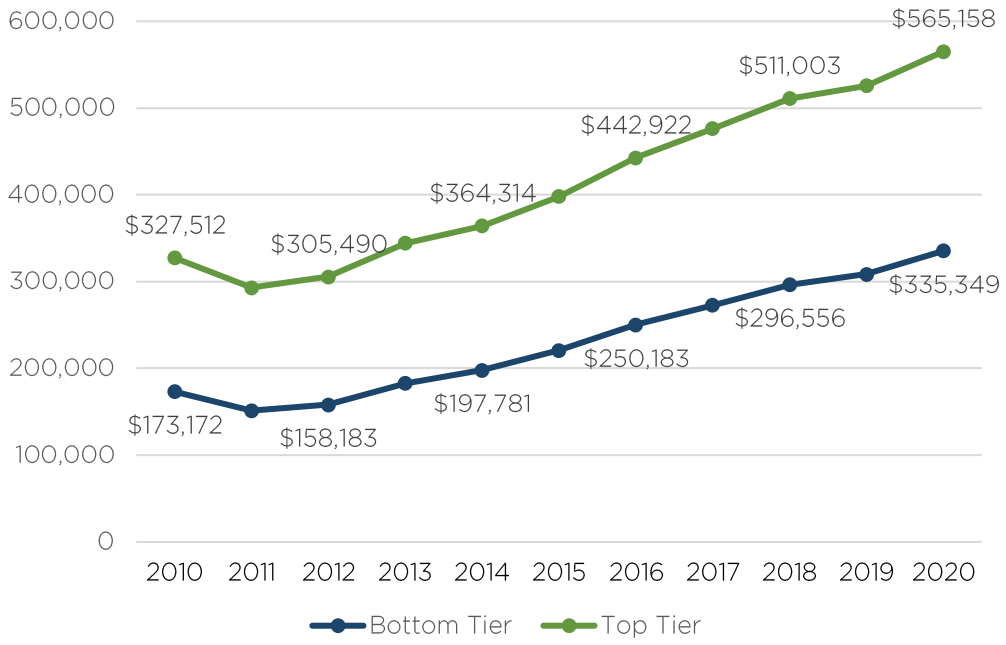


Figure 48: Existing Single Family Homes Prices in Clark County, 2010 - 2020



Data Source: Zillow. "Zillow Home Value Index - Bottom and Top Tier Time Series, 2010 – 2020." https://www.zillow.com/research/data/

Monthly owner and renter costs also provide insight into Camas's affordability. Table 16 below shows Census estimates of median home value in Camas. In 2018, the median home value in Camas was $403,800, compared to $296,800 in Clark County and $342,900 in the MSA. 78% of Camas residents had a mortgage in 2018, perhaps attributed to the lower age of the housing stock. Homeowners with a mortgage paid $2,184 per month in housing costs, compared to their neighbors in Clark County whose median costs were $1,699 (a difference of $485). Homeowners in the MSA spent $1,832 on monthly housing costs, or $352 less than in Camas.

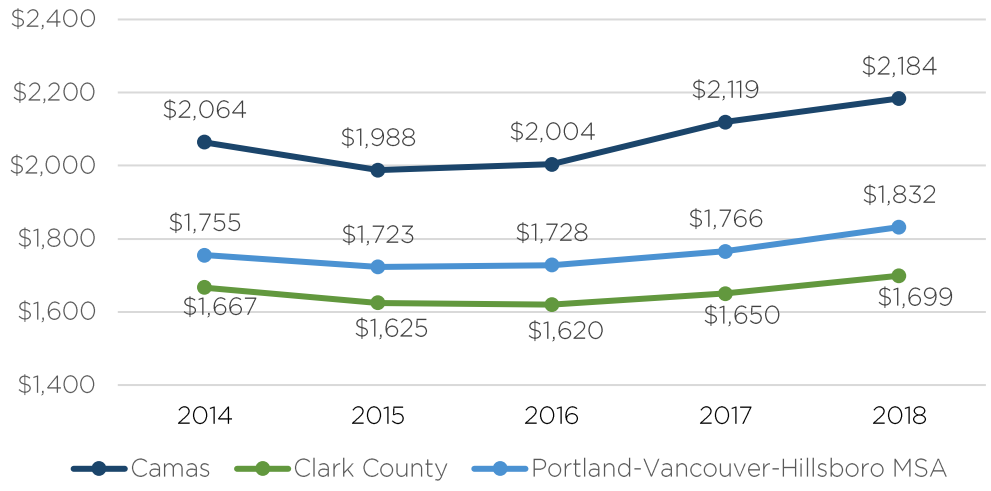
Clark County and the MSA also have larger shares of homeowners without a mortgage – 27% in the county and 28% in the MSA, compared to 22% in Camas. All households without mortgages show median monthly costs that are within $100 ($535 in Clark County, $603 in the MSA, and $630 in Camas), indicating that other monthly owner costs (e.g., utilities, insurance, etc.) are relatively similar across the region and that housing value.

Table 16: Median Home Value and Monthly Owner Costs in Camas, 2018

	TOTAL OWNER-OCCUPIED UNITS	MEDIAN HOME VALUE	WITH A MORTGAGE		WITHOUT A MORTGAGE	
			SHARE OF TOTAL	MEDIAN MONTHLY OWNER COSTS	SHARE OF TOTAL	MEDIAN MONTHLY OWNER COSTS
Camas, WA	6,153	$403,800	78%	$2,184	22%	$630
Clark County, WA	114,096	$296,800	73%	$1,699	27%	$535
Portland – Vancouver – Hillsboro MSA	573,334	$342,900	72%	$1,832	28%	$603

Data Source: 2014-2018 5-Year American Community Survey, Table DP04

Figure 49: Median Monthly Costs for Homeowners with a Mortgage, 2014-2018



Data Source: 2014-2018 5-Year American Community Survey, Table DP04

Rental Housing Costs

Interestingly, renter costs in Camas are more similar to renter costs in Clark County and the MSA than owner costs. The median rent in Camas is $1,217, only $24 more than in the MSA and $37 more than in Clark County. Figure 50 shows that since 2014, median rents have risen in all 3 jurisdictions. Camas's median rent increased by $159 over the 5-year period. Clark County and the MSA showed median rent increases between $217 and $225 over this period. Despite the rising rental costs, median rents in Camas are nearly $1,000 less than monthly owner costs in the city. This factor alone may cause households with lower incomes to

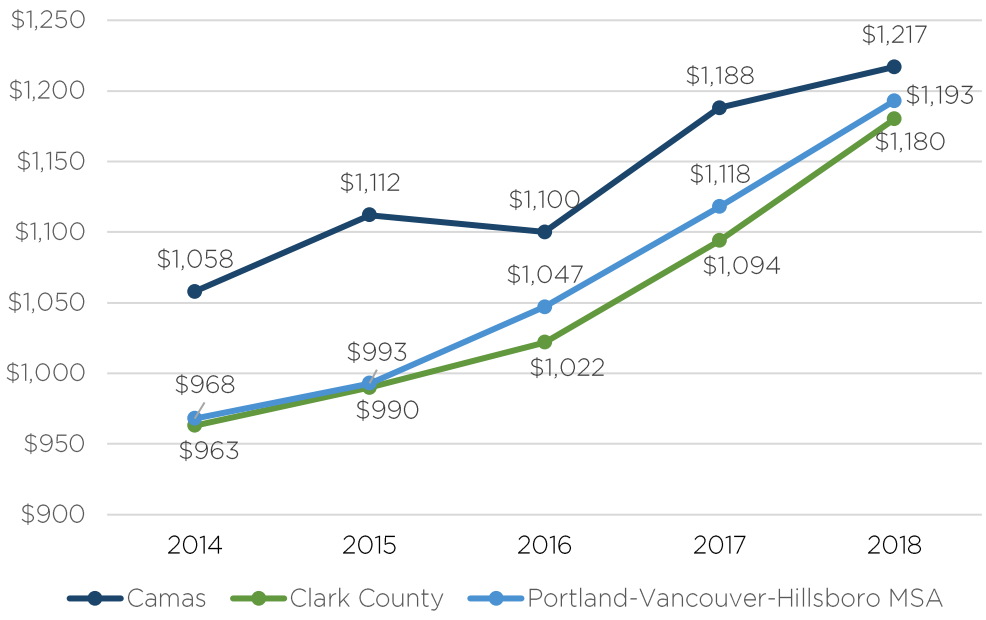
remain renters in Camas or to purchase homes outside of the city where owner costs may be more affordable.

Table 17: Median Renter Costs in Camas, 2018

	TOTAL RENTER-OCCUPIED UNITS	MEDIAN RENT
Camas, WA	1,819	$1,217
Clark County, WA	57,426	$1,180
Portland – Vancouver – Hillsboro MSA	352,297	$1,193

Data Source: 2014-2018 5-Year American Community Survey, Table DP04

Figure 50: Median Monthly Renter Costs, 2014-2018



The Washington Center for Real Estate Research's (WCRER's) rental market survey conducted in September 2020 also collected data about rents by number of bedrooms. Average rents in Camas by unit type are shown in the table that follows, indicating higher averages than medians reported through American Community Survey data. The average 1-bedroom rental rate was $1,299, the average 2-bedroom rented for $1,442, and the average 3-bedroom for $1,789.

Table 18: Average Rental Rates in Properties with 20+ Units in Camas, September 2020

	1-BEDROOM		2-BEDROOM		3-BEDROOM	
	# OF UNITS	AVERAGE RENT	# OF UNITS	AVERAGE RENT	# OF UNITS	AVERAGE RENT
City of Camas	168	$1,299	330	$1,442	72	$1,789

Data Source: Washington Center for Real Estate Research survey of multifamily properties with 20+ units, Conducted in September 2020, Retrieved from https://wcrer.be.uw.edu/housing-market-data-toolkit/

Special Needs Housing

The most recent census data on special housing in Camas indicates that in 2010, there were two types of facilities that offered special housing in the city: nursing homes and "other non-institutional facilities." In that year, 78 Camas residents lived in nursing homes, skilled nursing facilities or other non-institutional special housing. Comparatively, there are 3,178 special housing residents in Clark County. Camas serves 2.4% of the county's population residing in special housing.

Table 20 indicates the number and type of special housing available in the county, which includes state prisons, local jails, group homes, emergency and transitional shelters, and residential treatment centers.

Table 19: Special Housing Inventory in Camas, 2010

INSTITUTIONALIZED POPULATION	FACILITY TYPE
62	Nursing facilities/Skilled-nursing facilities
16	Other noninstitutional facilities

Data Source: 2010 Decennial Census, Table PCT20

Table 20: Special Housing Inventory in Clark County, 2010

INSTITUTIONALIZED POPULATION	FACILITY TYPE
219	State prisons
727	Local jails and other municipal confinement facilities
4	Group homes for juveniles (non-correctional)
695	Nursing facilities/Skilled-nursing facilities
14	Hospitals with patients who have no usual home elsewhere
370	Emergency and transitional shelters (with sleeping facilities) for people experiencing homelessness
667	Group homes intended for adults
36	Residential treatment centers for adults
381	Workers' group living quarters and Job Corps centers
65	Other noninstitutional facilities

Data Source: 2010 Decennial Census, Table PCT20

Subsidized Housing

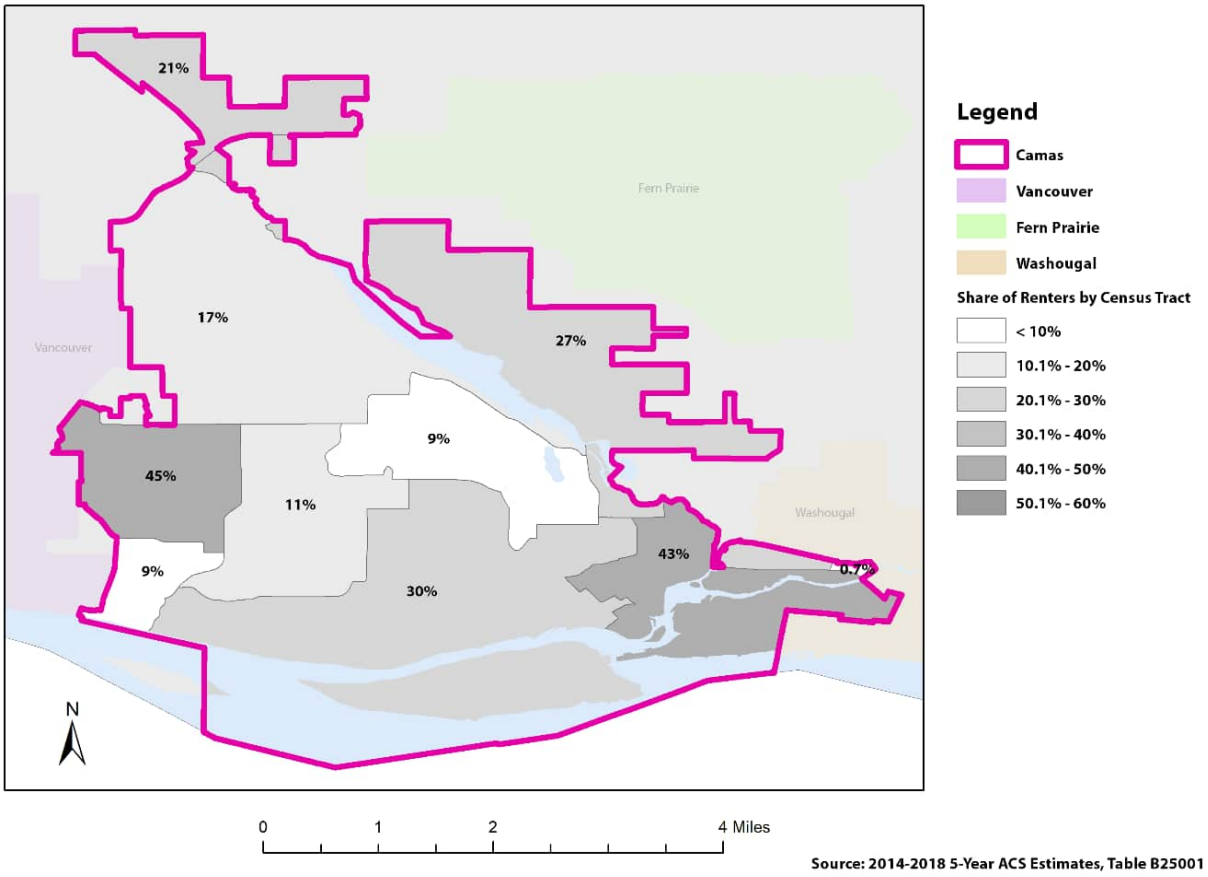
Camas also provides a small number of subsidized units for individuals earning low to moderate incomes in the city. Camas, which falls into the Portland-Vancouver-Hillsboro MSA, has an area median income of $74,700.[8] Therefore, subsidized housing serves households earning no more than 80% AMI, or $59,750, with many subsidized households typically earning low incomes (30 - 50% AMI) or very low incomes (30% AMI or less).

HUD "Picture of Subsidized Household" data indicates that Camas census tracts contain 92 subsidized units as of 2018: 67 housing choice vouchers and 25 project-based section 8 units. Both subsidized housing types are offered by the Vancouver Housing Authority (VHAUSA). VHAUSA manages 19 senior units at the Crown Villa Apartments, which were built in 1986. VHAUSA also offers project-based section 8 at its Camas Ridge development, which is a mixed-use project. HUD's LIHTC database does not indicate any LIHTC developments located in the city of Camas. The city's 92 subsidized units make up 1.1% of all housing units in Camas.

[8] HUD User. "FY 2017 Income Limits Documentation System." Accessed October 29, 2020. https://www.huduser.gov/portal/datasets/il/il2017/2017summary.odn

The distribution of vouchers and section 8 units is shown in the maps below. Vouchers and Project-based Section 8 units are predominantly found in census tracts with higher renter rates, such as downtown Camas and in western Camas along the Vancouver border. Since these tracts may be shared with adjacent cities, the numbers of subsidized units may be smaller than identified below.

Figure 51: Percentage of Renters in Camas, 2014-2018



Source: 2014-2018 5-Year ACS Estimates, Table B25001

Figure 52: Housing Choice Vouchers in Camas, 2018

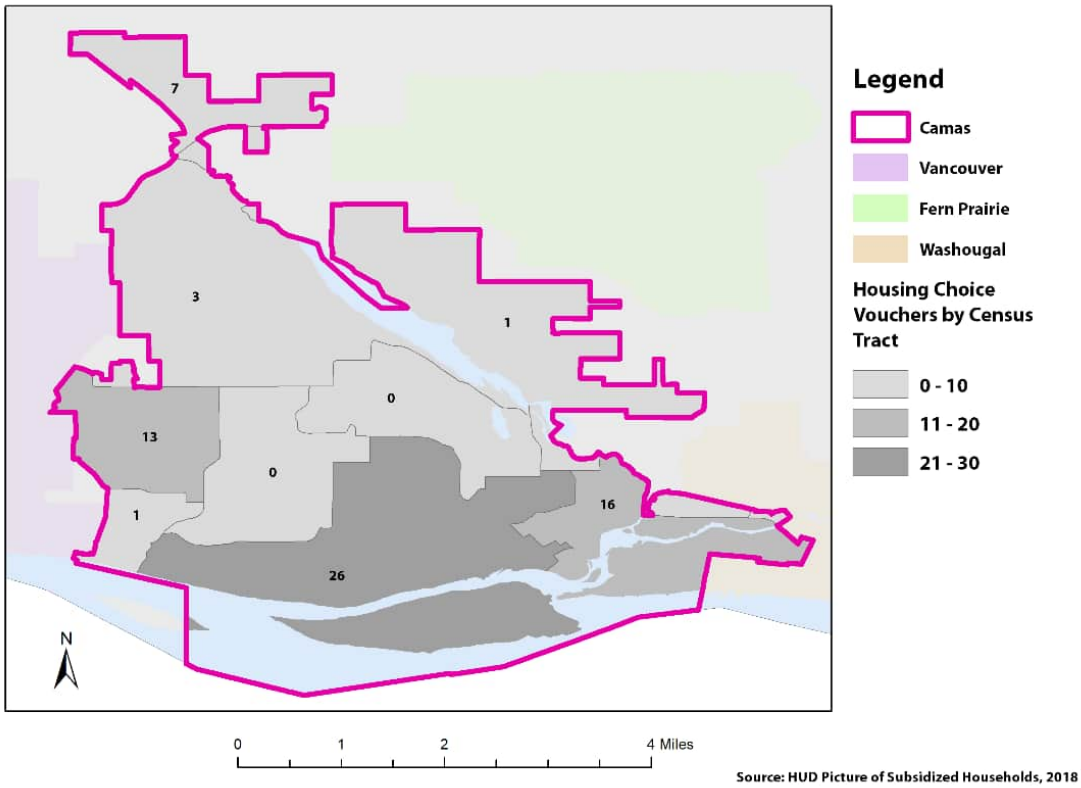
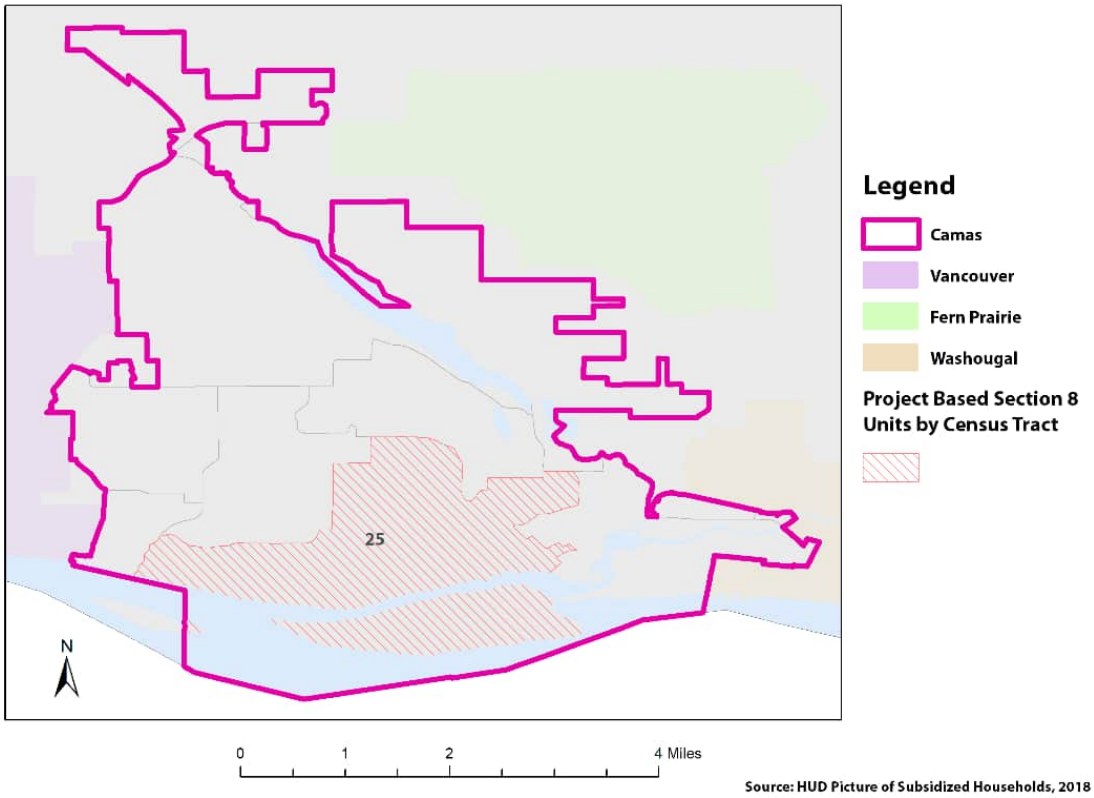


Figure 53: Project Based Section 8 Units in Camas, 2018



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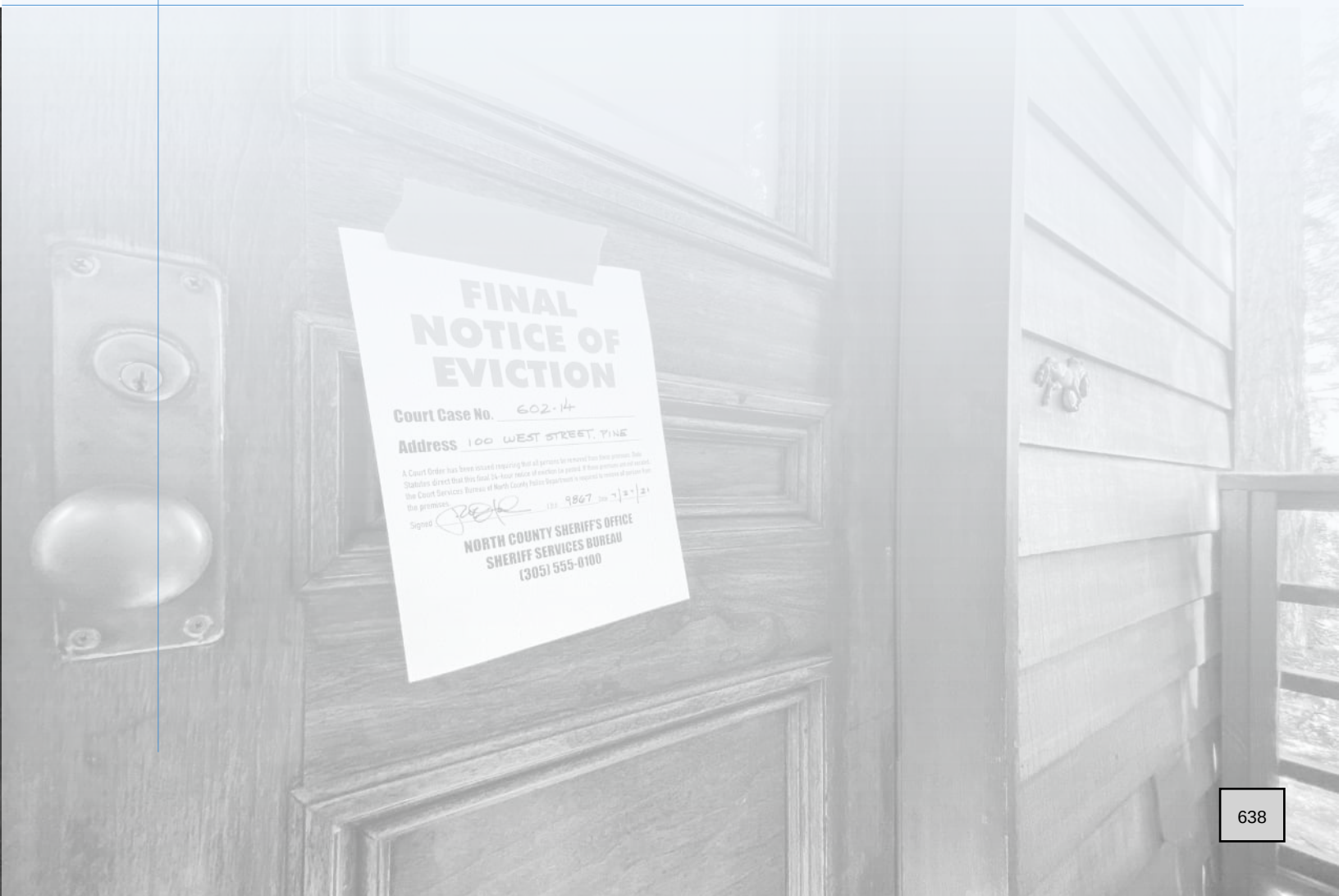
Chapter 5:
Housing Needs



This chapter of the Housing Action Plan examines housing needs from two perspectives: first, existing housing needs by Camas households who face one or more housing problems such as affordability or overcrowding; and second, projected need for new housing units generated by population growth over the next 20 years.

Existing Housing Needs

Housing cost and condition are key components of housing need. Housing barriers may exist in a jurisdiction when some groups have greater difficulty accessing housing in good condition and that they can afford. To assess affordability and other types of housing needs, the U.S. Department of Housing and Urban Development (HUD) defines four housing problems:

1. A household is *cost burdened* if monthly housing costs (including mortgage payments, property taxes, insurance, and utilities for owners and rent and utilities for renters) exceed 30% of monthly income.
2. A household is *overcrowded* if there is more than one person per room, not including kitchen or bathrooms.
3. A housing unit *lacks complete kitchen facilities* if it lacks one or more of the following: cooking facilities, a refrigerator, or a sink with piped water.
4. A housing unit *lacks complete plumbing facilities* if it lacks one or more of the following: hot and cold piped water, a flush toilet, or a bathtub or shower.

HUD also defines four severe housing problems, including a severe cost burden (more than 50% of monthly housing income is spent on housing costs), severe overcrowding (more than 1.5 people per room, not including kitchens or bathrooms), lack of complete kitchen facilities (as described above), and lack of complete plumbing facilities (also as described above).

To assess housing need, HUD receives a special tabulation of data from the U. S. Census Bureau's American Community Survey that is largely not available through standard Census products. This data, known as Comprehensive Housing Affordability Strategy (CHAS) data, counts the number of households that fit certain combinations of HUD-specified criteria, such as housing needs by race and ethnicity.

Of the four types of housing problems, Table 17 illustrates that cost burdens affect far more households than any of the others. Over 40% of Camas renters spend more than 30% of their income on housing expenses, while about 14% spend more than 50% of their household income on these expenses. Other housing needs impact significantly fewer renters, less than 1% combined. Renters are about twice as likely to face a housing problem as homeowners, with 42.3% of renters having one or more housing needs compared to 21.0% of owners.

For homeowners, cost burdens and severe cost burdens are again the most common housing needs. About one-in-five owners in Camas spends more than 30% of their income on housing. A smaller share (6.4%) spends more than 50%. Overcrowding and a lack of complete plumbing or kitchen facilities are uncommon but impact around 75 homeowners (or about 1.3% of all Camas homeowners).

Overall, this data indicates that affordability is the key housing need for many in Camas, impacting nearly 2,000 households (1,135 owners and 785 renters).

Table 21: Estimated Housing Needs by Type in Camas, 2017

HOUSING NEED	OWNERS		RENTERS		TOTAL	
	HOUSE-HOLDS	SHARE OF TOTAL	HOUSE-HOLDS	SHARE OF TOTAL	HOUSE-HOLDS	SHARE OF TOTAL
Cost burden	1,135	19.9%	785	41.8%	1,920	25.3%
Severe cost burden	365	6.4%	270	14.4%	635	8.4%
Overcrowding	74	1.3%	14	0.7%	88	1.2%
Severe overcrowding	4	0.1%	10	0.5%	14	0.2%
Lacking complete facilities	15	0.3%	0	0.0%	15	0.2%
Total households with needs	1,200	21.0%	795	42.3%	1,995	26.3%
Total households	5,710	100.0%	795	100.0%	7,590	100.0%

Note: Households with a severe cost burden are a subset of households with a cost burden. Severely overcrowded households are a subset of overcrowded households. The number of total needs (i.e., sum of cost burdens, overcrowding, and lack of facilities) is greater than the total number of households with needs because some households have more than one of the housing problems.

Data Source: 2013-2017 Comprehensive Housing Affordability Strategy data, Tables 1, 3, 8, and 10, Retrieved from https://www.huduser.gov/portal/datasets/cp.html

To better understand how housing costs impact Camas households, Table 18 segments housing need by income level. This data shows that lower income households are heavily impacted by a lack of affordability. Of those with incomes under 30% of the median family income (MFI), four-out-of-five face difficulty finding suitable housing, including 90% of homeowners.

Affordability difficulties persist for the next two income levels (31-50% MFI and 51-80% MFI) as well, where more than one-half of households spend over 30% of income on housing.

At moderate and middle incomes (81-100% MFI and 101-120% MFI), housing needs are reduced for renters but remain high (around 38-48%) for homeowners. These figures suggest that while rental options are more limited, there are units available to moderate/middle income households and higher. Homeownership

opportunities, however, are more restricted even for households earning above the area's median income. These findings corroborate housing supply data related to home sales prices and permit data related to housing size.

Table 22: Estimated Housing Needs by Income Group in Camas, 2017

HOUSEHOLD INCOME	OWNER HOUSEHOLDS			RENTER HOUSEHOLDS			TOTAL HOUSEHOLDS		
	WITH NEEDS	TOTAL	SHARE WITH NEEDS	WITH NEEDS	TOTAL	SHARE WITH NEEDS	WITH NEEDS	TOTAL	SHARE WITH NEEDS
0-30% MFI	110	120	91.7%	170	225	75.6%	280	345	81.2%
31-50% MFI	115	220	52.3%	215	255	84.3%	330	475	69.5%
51-80% MFI	365	575	63.5%	335	590	56.8%	700	1,165	60.1%
81-100% MFI	175	360	48.6%	20	180	11.1%	195	540	36.1%
101-120% MFI	165	430	38.4%	30	185	16.2%	195	615	31.7%
120-140% MFI	95	405	23.5%	0	70	0.0%	95	475	20.0%
Over 140% MFI	175	3,600	4.9%	25	380	6.6%	200	3,980	5.0%

Note: Area Median Family Income ("MFI") is calculated by the U.S. Department of Housing and Urban Development (HUD) by household size. For the Portland-Vancouver-Hillsboro metro area (which includes Camas), the median income in 2017 was $74,700. For a four-person household, 30% AMI = $24,600, 50% AMI = $37,350, 80% AMI = $59,750, 120% AMI = $89,640, and 140% AMI = $104,580.

Data Source: 2013-2017 Comprehensive Housing Affordability Strategy data, Table 11, Retrieved from https://www.huduser.gov/portal/datasets/cp.html

A key question in housing affordability and equity is the prevalence of housing issues by householder race and ethnicity. Table 20 on the following page shows housing need rates by race and ethnicity in Camas.

For homeowners, this data shows that about one-fifth of white householders in Camas have a housing need, but that three other groups are more likely to have difficulty affording their homes. More than 90% of Native American or Alaska Native homeowners have a housing need, as do 41.4% of Hispanic or Latino homeowners and 36.0% of other or multiple race homeowners.

On the rental side, about two-out-of-five white and two-out-of-five other or multiple race households have a housing need. Only one group is more likely to face difficulty affording a place to rent – Asian or Pacific Islander households, of whom 88.2% have a housing problem. Notably, CHAS data counted no Black or African American households in Camas with a housing need, however, data indicates only a small number of Black households overall (60 total).

As some focus group participants discussed, prohibitively high housing costs are often more likely to impact households of color, meaning that elevated costs in Camas may impact the city's racial and ethnic composition. Housing need data

indicates that, particularly related to homeownership, racial and ethnic minority households, specifically Hispanics or Latinos and Native Americans or Alaska Natives, are more likely to spend more of their income to live in Camas than do white households.

Table 23: Estimated Housing Needs by Race and Ethnicity in Camas, 2017

HOUSEHOLDER RACE AND ETHNICITY	OWNER HOUSEHOLDS			RENTER HOUSEHOLDS			TOTAL HOUSEHOLDS		
	WITH NEEDS	TOTAL	SHARE WITH NEEDS	WITH NEEDS	TOTAL	SHARE WITH NEEDS	WITH NEEDS	TOTAL	SHARE WITH NEEDS
Non-Hispanic or Non-Latino									
White	1,010	4,900	20.6%	690	1,650	41.8%	1,700	6,550	26.0%
Black or African American	0	60	0.0%	0	0	0.0%	0	60	0.0%
Asian or Pacific Islander	44	434	10.1%	30	34	88.2%	74	468	15.8%
Native American or Alaska Native	39	43	90.7%	0	10	0.0%	39	53	73.6%
Other or Multiple Races	45	125	36.0%	25	55	45.5%	70	180	38.9%
Hispanic or Latino	60	145	41.4%	40	130	30.8%	100	275	36.4%

Data Source: 2013-2017 Comprehensive Housing Affordability Strategy data, Table 1, Retrieved from https://www.huduser.gov/portal/datasets/cp.html

Housing Need Projections

This section focuses on housing need over the next 20 years based on population growth forecasts for the city of Camas. While the previous data discussed existing needs related to affordability and other housing issues, here we turn to the need for development of new housing units through 2040.

Table 24 estimates the need for new housing units in Camas over the next 20 years, based on current population estimates from the Washington Office of Financial Management and projected population growth rates from the City's Comprehensive Plan, *Camas 2035.* The city's 2020 population of 25,140 residents is forecast to grow by 11,772 residents over the next 20 years, reaching about 36,912 residents by 2040. Assuming an average household size of about 2.7 people, this projected population growth translates to an additional 4,360 households by 2040. Finally, assuming a vacancy rate of 5% indicates projected need for 4,589 new housing units in Camas over the next 20 years, or an average of 229 housing units per year.

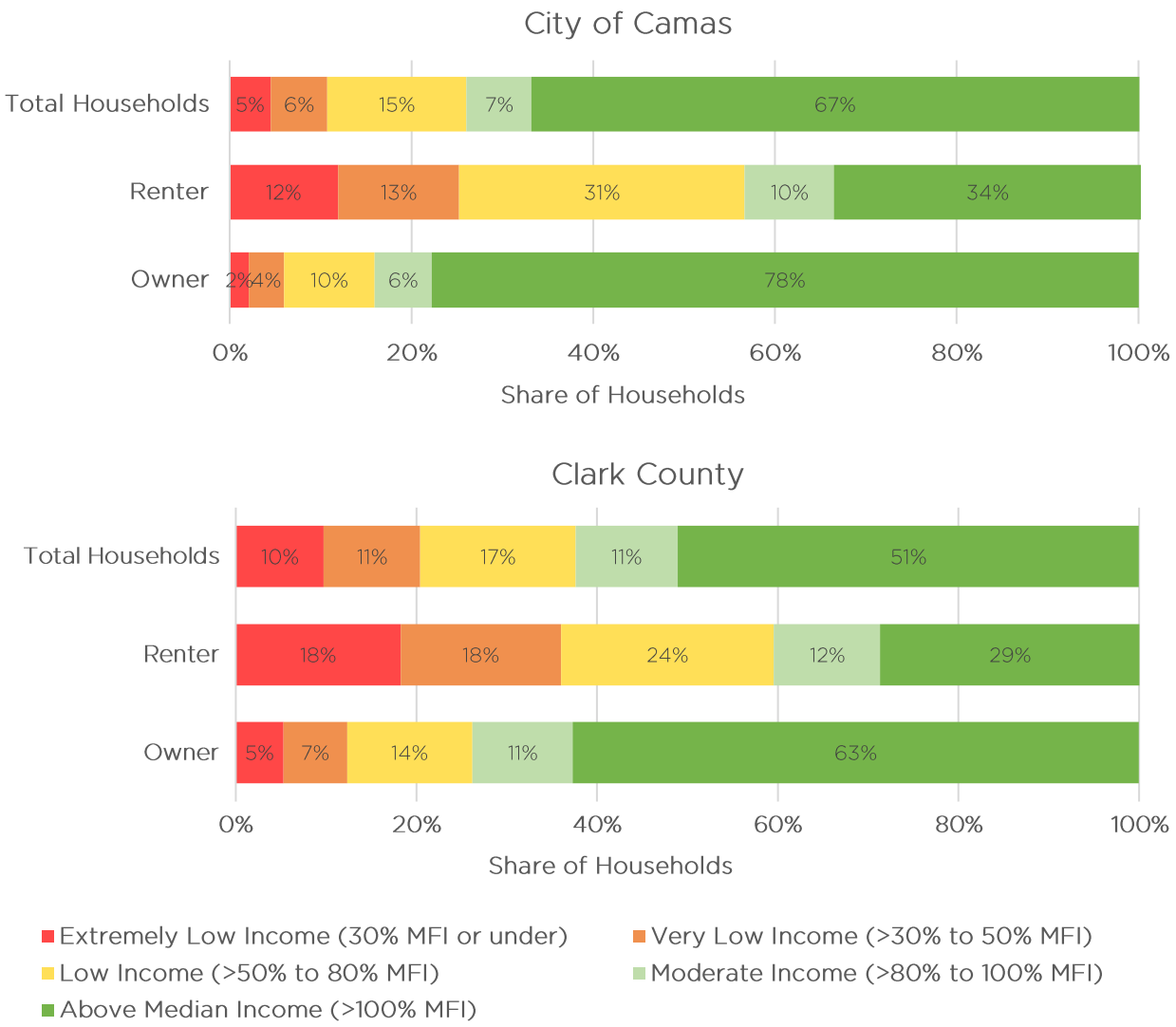
Table 24: Projected 20-Year Housing Need in City of Camas

2020 Population Estimate[1]	25,140 residents
2040 Population Projection[2]	36,912 residents
Projected Population Growth (2020-2040)	11,772 residents
Average Household Size[3]	2.7 people per household
Projected Household Growth (2020-2040)	4,360 households
Vacancy Rate Assumption[4]	5%
Projected Housing Units Needed (2020-2040)	**4,589 housing units**
Average Annual Housing Unit Production Needed	**229 housing units**

1. From State of Washington Office of Financial Management April 1, 2020 Population Estimates.
2. Projected growth rates based on population forecasts from *Camas 2035*, adopted June 2016.
3. Average household size in Clark County from 2015-2019 5-Year American Community Survey estimates. Average household size in Camas was 2.81 as of 2015-2019 5-Year ACS data, which represented a steady decline from 2.98 as of 2010-2014 5-Year ACS data. It is assumed that household size in Camas will continue to decline over the 20-year planning period to reach an average similar to that of the county.
4. From Washington State Department of Commerce's *Guidance for Developing a Housing Needs Assessment – Public Review Draft*, March 2020. The Department of Commerce considers a 5% vacancy rate to be the point where there is sufficient housing stock to allow space for people to move while maintaining a healthy level of competition in the market.

Comprehensive Housing Affordability Strategy (CHAS) data provides a breakdown of households in Camas and Clark County by income level that can be used to segment projected future housing needs. Figure 18 in Chapter 3 identified income levels for Camas households, which are presented again on the following page with a comparison to Clark County. As shown, Camas has proportionally fewer lower- and moderate-income households than Clark County. About one-third of Camas households have incomes under the median family income compared to about one-half of Clark County households with incomes under the median.

Figure 54: Share of Household by Income Level in Camas and Clark County, 2013-2017



Note: Area Median Family Income ("MFI") is calculated by the U.S. Department of Housing and Urban Development (HUD) by household size. For the Portland-Vancouver-Hillsboro metro area (which includes Camas), the median income in 2017 was $74,700. For a four-person household, 30% AMI = $24,600, 50% AMI = $37,350, 80% AMI = $59,750, 120% AMI = $89,640, and 140% AMI = $104,580.

Data Source: 2013-2017 Comprehensive Housing Affordability Strategy data, From https://www.huduser.gov/portal/datasets/cp.html

Table 25 segments projected future housing needs by household income level and tenure. Income level assumptions for projected future housing need are based on CHAS data for the city and county (shown in Figure 54) and assume that future housing development in Camas will allow for additional affordability for low- and moderate-income households beyond what is currently available. Segmentation by tenure is based on homeownership rates in Camas and Clark County by income level (also from CHAS data displayed in Figure 54).

As shown, the majority of projected future housing need in Camas (60% or 2,753 units) will be for units affordable to households with incomes at or above the area median family income. About 40% of projected future housing need will be for units affordable to households with low or moderate incomes, including a mix of rental and for-sale housing.

Table 25: Projected Future Housing Need by Income Level and Tenure

HOUSEHOLD INCOME BAND (MFI = MEDIAN FAMILY INCOME)	ASSUMED SHARE OF HOUSING NEED	20-YEAR HOUSING NEED		
		TOTAL	OWNER	RENTER
Extremely Low Income (30% MFI or under)	7%	321	112	209
Very Low Income (>30%-50% MFI)	8%	367	165	202
Low Income (>50%-80% MFI)	16%	734	367	367
Moderate Income (>80%-100% MFI)	9%	413	268	145
Above Median Income (>100% MFI)	60%	2,753	2,340	413
Total	**100%**	**4,589**	**3,254**	**1,335**

Data Source: Mosaic 20-Year Future Housing Need Projections; 2013-2017 Comprehensive Housing Affordability Strategy data, From https://www.huduser.gov/portal/datasets/cp.html

To accommodate the variety of new households anticipated, as well as to better serve existing households with difficultly affording their homes, Camas will need housing options diverse in type, tenure, and cost. The next section assesses the city's supply of vacant buildable land available to meet future housing need using Clark County's Vacant Buildable Lands Model.

Vacant Buildable Land

To assist the county and cities plan for population and job growth, Clark County maintains a Vacant Buildable Lands Model (VBLM) that analyzes potential capacity for residential, commercial, and industrial land development within urban growth areas. The VBLM identifies vacant and underutilized parcels and classifies them regarding suitability for development. Environmentally constrained land (including wetlands, land in the 100-year floodplain, slopes greater than 15 percent, designated shorelines, and other environmentally sensitive areas) are excluded. The residential model also excludes tax exempt parcels, lots under 5,000 square feet, and easements and right of ways.[9]

The VBLM applies planning assumptions to the inventory of vacant and underutilized land to estimate the potential for additional housing and employment. For residential land, the model assumes a deduction for infrastructure and for vacant, underutilized, and constrained land not expected to ever be developed to arrive at net developable acres. A "housing units per acre" standard is then applied to net developable residential acreage to estimate the potential capacity for new housing units. For Camas, the model assumes 6 housing units will be developed per net developable acre.

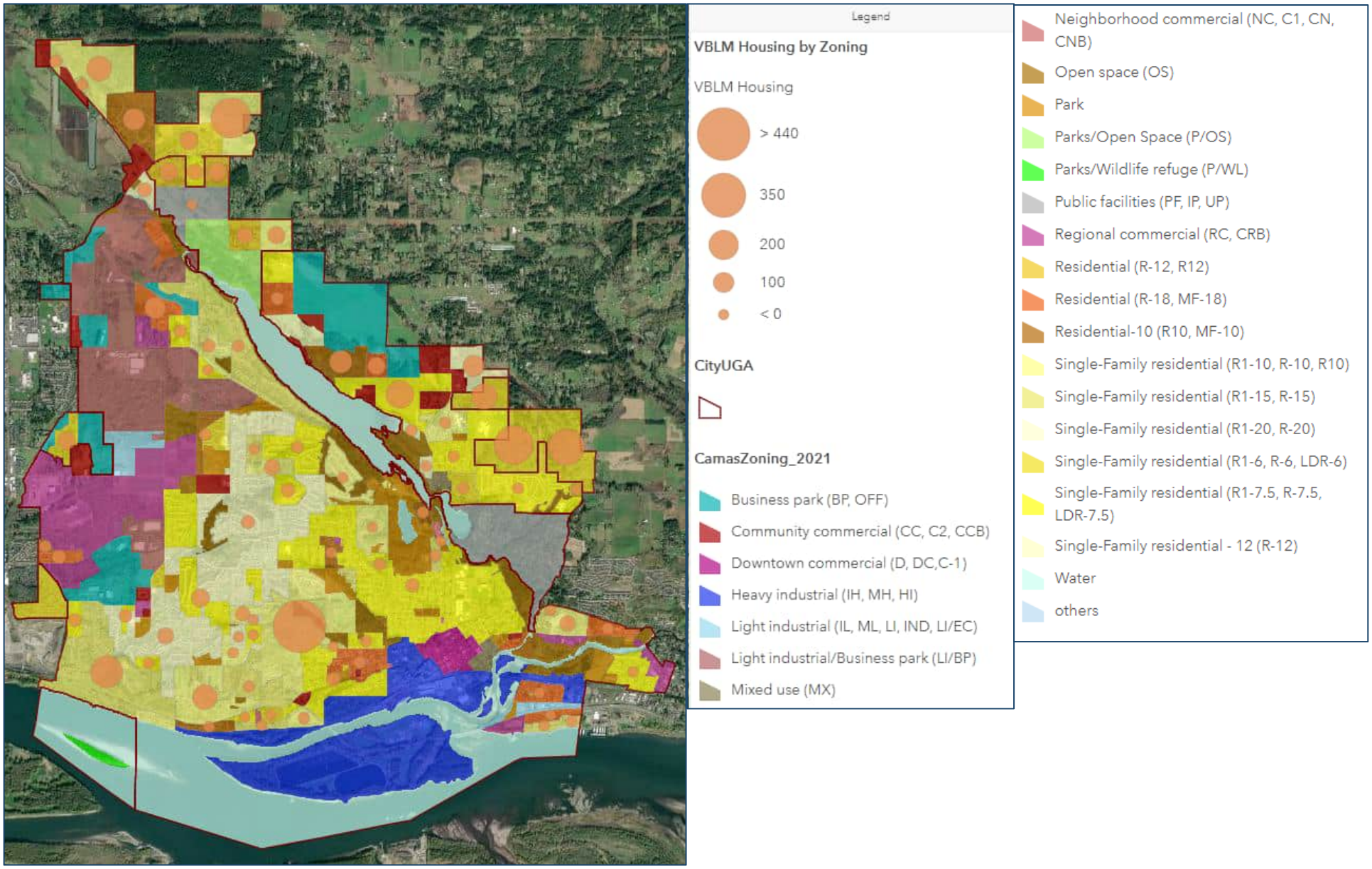
Figure 55 displays the VBLM for Camas, indicating areas of the city where vacant or underutilized residential land may support additional housing units. This model is currently under refinement by the City of Camas. City staff indicate that one area identified as having capacity for about 440 additional housing (along NW Forest Home Road) is not suitable for development due to topographical issues not captured in the VBLM.

The VBLM estimates that Camas has capacity for an additional 3,731 housing units (see Figure 55) in its urban growth area (UGA). The majority of this capacity is in single-family zoning districts (3,163 units or 84.8%), including 8.3% in low-density single-family districts (308 units), 52.3% in medium-density single-family districts (1,950 units), and 24.3% in high-density single-family districts (905 units). The VBLM estimates that vacant land zoned for multifamily housing has capacity for about 568 additional housing units.

Camas's projected future housing needs through 2040 indicate need for an additional 4,589 units. Comparing this figure to the VBLM's housing capacity estimate of about 3,731 to 4,171 units indicates that Camas may need to develop approaches to enhance residential capacity to best meet needs over the next 20 years. Strategies may include increasing average density above the 6 units/acre assumed by the VBLM or re-zoning commercial land for residential use, particularly for multifamily development. Both approaches are in keeping with recent development activity in Camas.

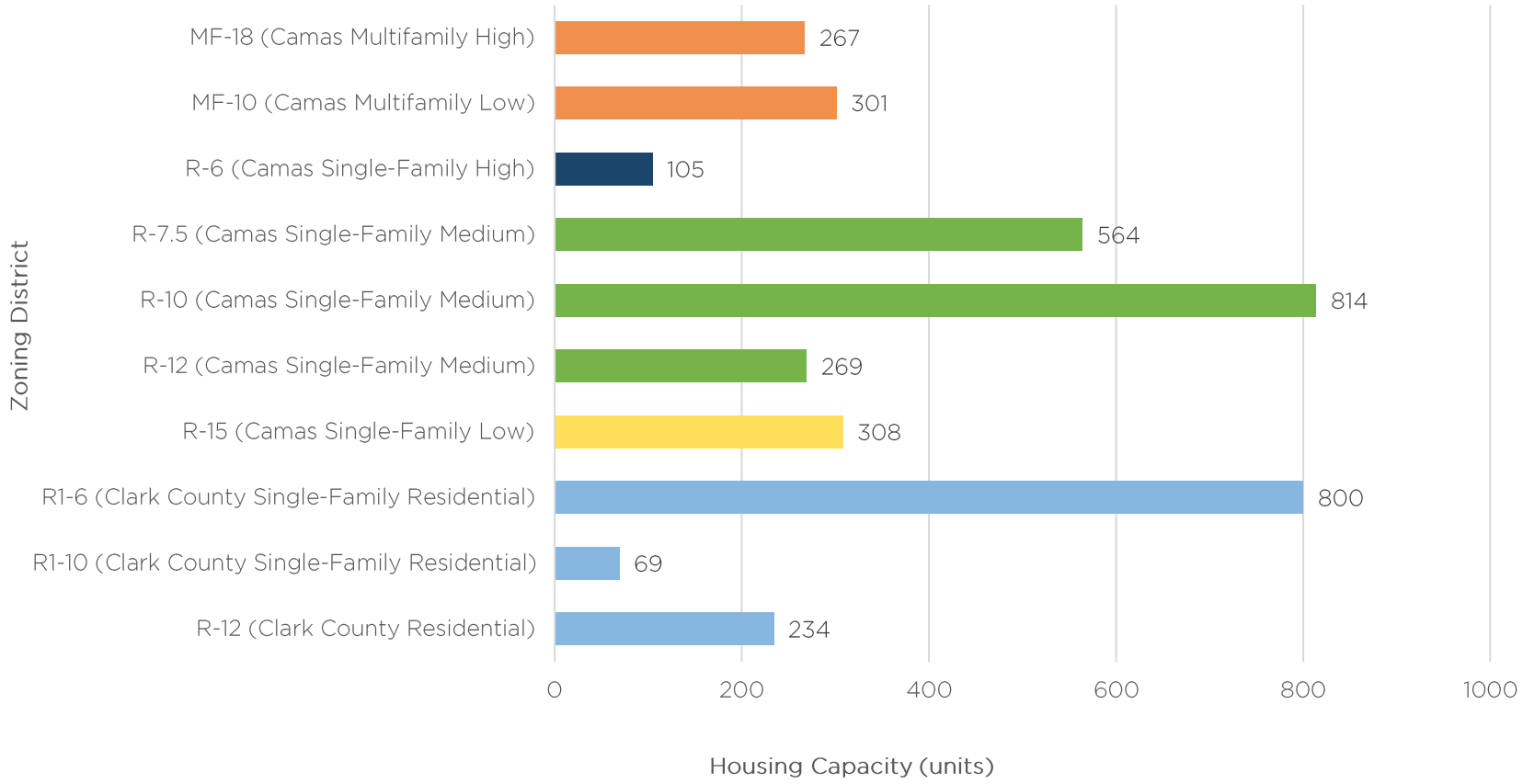
[9] Clark County, "Vacant Buildable Lands Model Methodology and Criteria." Retrieved from https://gis.clark.wa.gov//vblm/assets/VBLM.pdf.

Figure 55: City of Camas Housing Development Capacity on Vacant Buildable Land



Data Source: Clark County Vacant Buildable Land Model, From https://clarkcountywa.maps.arcgis.com/apps/opsdashboard/index.html#/782db6feb53d43ba8167036c1a0ab81b

Figure 56: Housing Development Capacity by Zoning District in the Camas Urban Growth Area



Note: Does not include housing capacity along NW Forest Home Road reported in the VBLM due to topography issues that preclude development there, as identified by City of Camas staff.

Data Source: Clark County Vacant Buildable Land Model, From https://clarkcountywa.maps.arcgis.com/apps/opsdashboard/index.html#/782db6feb53d43ba8167036c1a0ab81b

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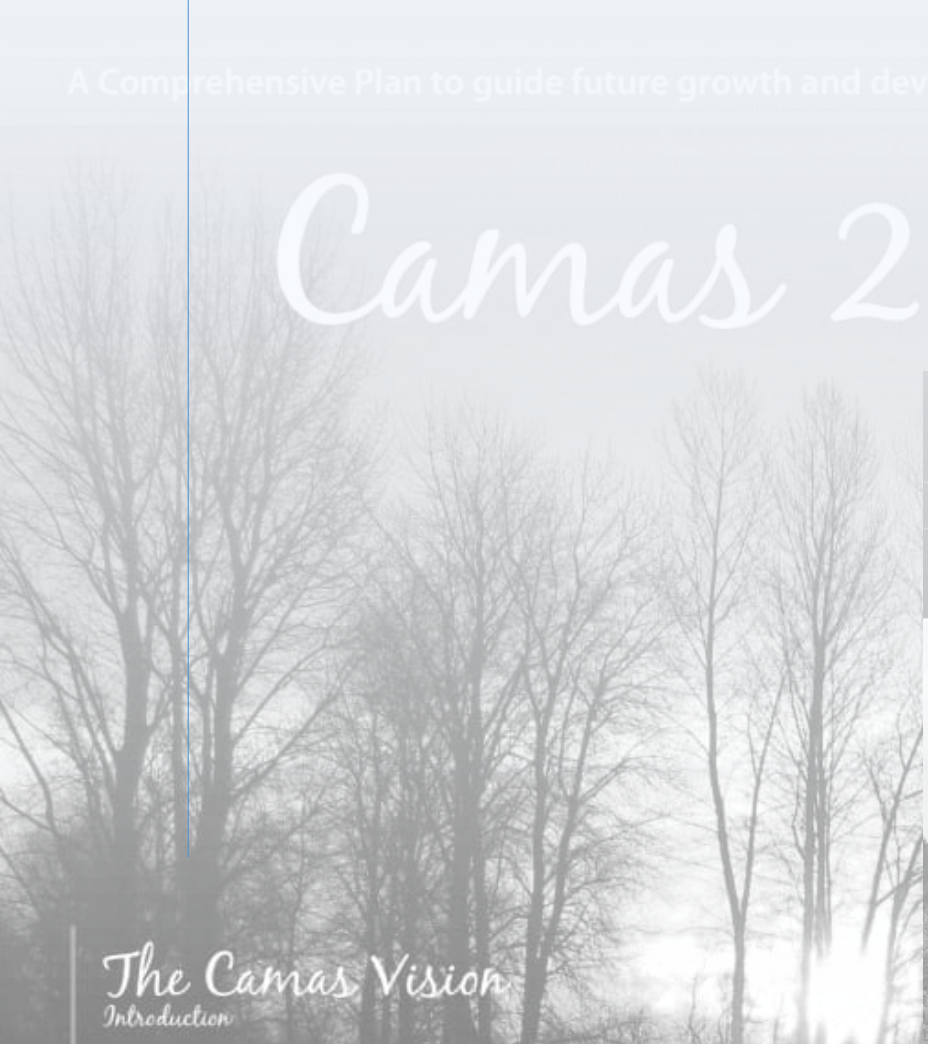
Chapter 6:
Housing Policy Review



Comprehensive land use planning, as embodied in the Camas 2035 Comprehensive Plan, is a critical process by which communities address myriad public policy issues such as housing, transportation, health, recreation, environmental protection, commercial and retail services, and land values, and address how the interconnection and complexity of these issues can ultimately impact the entire municipality. "The land use decisions made by a community shape its very character – what it's like to walk through, what it's like to drive through, who lives in it, what kinds of jobs and businesses exist in it, how well the natural environment survives, and whether the community is an attractive one or an ugly one."[10] Likewise, state and local policy decisions regarding land use and zoning have a direct and profound impact on housing development approaches, shaping a community or region's potential diversity, growth, and opportunity for all. Local zoning codes determine where housing can be built, the type of housing that is allowed, and the amount and density of housing that can be provided. Zoning also can directly or indirectly affect the cost of developing housing, making it harder or easier to accommodate affordable housing.

Although comprehensive plans and zoning and land use codes play an important role in regulating the health and safety of the structural environment, overly restrictive codes can negatively impact housing affordability and the diversity of housing options within a jurisdiction. Conversely, these same regulatory tools can also be wielded to increase affordability and housing choice.

This chapter will review the various policies, plans, ordinances, and programs that influence housing development in Camas and evaluate the effectiveness of this overall housing policy framework in achieving the City's housing goals as expressed in the Camas 2035 Comprehensive Plan. To evaluate how well the policy framework is working, the goals set in the comprehensive plan's housing element will be compared with data and development trends originally presented in Chapter 4.

Housing Goals

Before the Camas 2035 Comprehensive Plan was adopted by the City in 2016, the community was engaged in a robust visioning process involving multiple vision summits, a public forum, resident surveys, and other opportunities for public participation. In developing the vision, residents were asked to project out 20 years into the future imagining Camas as they would wish it to be in 2035. While the entirety of the Camas 2035 plan is united under an overarching vision statement, the plan's housing element casts this specific vision for the City's future neighborhoods and housing:

[10] John M. Levy. Contemporary Urban Planning, Eighth Edition. Upper Saddle River, NJ: Pearson Prentice Hall, 2009.

> *In the year 2035, residents of Camas continue to appreciate their safe, diverse, and welcoming community. Those raised in Camas will return for family-wage jobs and to ultimately retire here. Camas is a well-planned and connected city where residents enjoy pedestrian and bicycle paths between neighborhoods and to downtown. There is a wide variety and range of housing for all ages and income levels.*

The housing element goes on to identify housing needs and present an analysis of the City's housing supply. From there, the plan establishes a set of three housing goals designed to guide the City toward a future with a housing supply adequate for residents of all ages and income levels. Specifically, the three housing goals are these:

Citywide Housing Goal: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community.

Affordable Housing Goal: Create a diversified housing stock that meets the needs of all economic segments of the community through new developments, preservation, and collaborative partnerships.

Senior and Special Needs Housing Goal: Encourage and support a variety of housing opportunities for those with special needs, particularly those with challenges relating to age, health, or disability.

Each of these three goals is accompanied in the Camas 2035 housing element by a list of policies intended to effectuate the related goal. As these three goals represent the community's vision for the future and have been formally adopted as City policy within the scope of the comprehensive plan, they set an important standard against which to measure actual trends in housing development. Is the City's overall housing policy framework helping the Camas community realize its vision? This is the question considered in the following sections of this chapter.

Housing Policy Framework

Housing development in Camas is shaped by a framework of interconnected state and local policies that, while not always formally linked together, frequently interact with one another. At a local level, these policies are primarily functions of the zoning code, design requirements, and housing and building codes, in conjunction with the comprehensive plan. At the state level, Washington's Growth Management Act (RCW 36.70A) imposes specific housing planning regulations on counties (including Clark County) that meet certain growth

management requirements and are considered by the Act to be "fully planning" counties. Within these counties, the Growth Management Act governs local comprehensive planning processes and establishes policy goals that encourage local governments to plan proactively for housing affordability and to promote a diverse mixture of housing types and sizes to accommodate the varied needs of residents. A further set of state-level housing planning expectations are contained in draft guidance issued by the Washington Department of Commerce for communities that choose to develop Housing Action Plans.

Considering the totality of this framework that guides housing planning and development in Camas, 12 specific housing policy items are reviewed here for their impact on housing within the City. These twelve items are primarily derived from the City's zoning code, but often are responsive to state planning requirements as well. In many cases, the local policies composing this framework are in substantial alignment with the recommended actions enumerated in the Growth Management Act and the Department of Commerce's Guidance for Developing a Housing Action Plan and likely represent affirmative steps toward achieving the Camas 2035 housing goals. Other policies reviewed as part of the framework are more likely to act as barriers to increasing construction of additional affordable and market rate housing in a greater variety of housing types and at prices that are accessible to a greater range of incomes. These policy items present opportunities for adjustments that may better advance the City's housing goals.

Policies Supportive of the City's Housing Goals

Multifamily Zones: In the multifamily (MF) zones, apartments as well as duplex/two-family homes, townhomes/rowhouses, single family detached homes, and designated manufactured homes are permitted by right when complying with lot and design guidelines. This allows for more housing variety within the MF zones. It is important that these uses are permitted by right, rather than having to go through the costlier and less predictable conditional use review process. In expensive housing markets like Camas, attached housing and multifamily housing is a key element to providing affordable rental or ownership housing because higher density increases the economical use of land and spreads out building infrastructure costs among the number of dwelling units. The multifamily zones require a minimum 6 units per acre (u/a), in line with the goal set by the Comprehensive Plan for residential uses. The maximum density is set as 10 u/a in the MF-10 zones, 18 u/a in the MF-18 zone, and 24 u/a in the MF-C overlay.

The permitted uses and lot standards including minimum lot areas (3,000 sq. ft. for MF-10, 2,100 sq. ft. for MF-18, and none for the MF-C overlay), lot dimensions, setbacks, and lot coverage are reasonable for accommodating greater housing supply and density. However, density may be limited by other design criteria including maximum height allowances of 3 stories/35 feet in MF-10, 4 stories/50 ft. in MF-18, and 1 story/18 ft. in the MF-C overlay. Additionally, a relatively small share of the City's vacant buildable land (about 13%) is currently zoned for

multifamily development, and a portion of that was recently acquired by the City for use as park space.

Multifamily Tax Exemption (MFTE): A multifamily tax exemption is a waiver of property taxes to encourage and incentivize affordable housing production and redevelopment in "residential targeted areas" designated by the city. State law (RCW 84.14) allows qualifying cities to grant developers of certain residential and mixed-use projects a property tax exemption (for eight or twelve years) on the value of new residential improvements, rehabilitation, or conversion of residential buildings in the designated areas. A 12-year exemption is allowed for projects that incorporate a minimum percentage (typically 20%) of income-restricted units. Camas adopted its MFTE program in December 2014, and currently designates three targeted areas: the Downtown District, the Northwest 6th Avenue Corridor District, and the Northeast 3rd Avenue District. The ordinance provides that to be eligible for 12-year tax abatements, applicants must commit to renting or selling at least 20% of units as affordable housing to low- and moderate-income households. Projects intended exclusively for owner occupancy may meet this standard through housing affordable to moderate-income households. As of January 2021, one property, the Clara Apartments at SW 6th Avenue, has qualified for the program. 2021 will be the first year the 30-unit development (with 6 affordable units) qualifies for the tax exemption.

Mixed Use Zones: The MX and DC (Downtown Commercial) districts provide opportunity for higher density residential uses in close proximity to commercial services, retail, offices and transit in a more compact design and efficient use of land. Currently, there are two MX districts which were added during the 2016 Comprehensive Plan update, though as of January 2021 neither had yet resulted in new housing units. Single family detached, supportive housing for persons with disabilities, duplex/2-family, and designated manufactured homes are permitted by right. Multifamily and rowhouses/ townhomes are conditional uses. The minimum lot size in the MX district is 1,800 sq. ft.; maximum density permitted is 24 units per acre; and there is no maximum height restriction. In the DC district, residential uses may be permitted outright if part of a mixed-use building and where the residential units are not located on the ground level; otherwise residential uses require conditional use approval. The zoning code does not prescribe minimum lot area or maximum density for residential uses or maximum building heights in the DC district, but developments are subject to review in accordance with the adopted Downtown Design Manual.

Planned Residential Developments (PRD) and Flexible Development: The zoning code establishes some development categories that allow more flexibility and efficiency in site design, uses, and density placement. A developer may seek PRD approval, on a minimum 10 acre parcel, in both the R and MF zones, and is a way to include more diversity of housing types and lot sizes in the typically large-lot, single-family detached zones of the city while maintaining and protecting open space for recreation and environmentally sensitive areas. In Camas, an approved PRD must include both single family detached lots (with a minimum 4,000 sq. ft.) and a multifamily component, which may contain either attached or detached single-family units on lots smaller than 4,000 sq. ft. or may contain a mix of duplexes, rowhouses, apartments, and designated manufacturing homes.

However, 50-75% of dwellings must be single-family detached units. City council may grant up to a 20% density bonus above the maximum allowed in the underlying zoning district. A flexible development approval is an alternative to the PRD. In a Flexible Development, the density of residential development may be increased in accordance with the City's Density Transfer Standards of the underlying zone, or, if in a multifamily zone, then standards may reflect those of the MF-18 zone (the highest density MF zone). Building heights may be increased by one story above the underlying zoning standard.

Short Plats: Camas has adopted a short plat process for subdivision development of a parcel up to nine lots, the maximum allowed under the Growth Management Act. Short plats may be administratively approved making for a more streamlined permit process instead of needing to go through a lengthier public and city council subdivision review process. This also can provide costs savings to the developer which ideally are passed to the homebuyer. The guidance encourages jurisdictions couple the short plat process other development regulations like cottage housing, small lot development, flexible development regulations, or zero lot line development to have the most impact on housing supply and housing diversity planning goals.

Lot Size Averaging: The dimensional and density standards in the R and MF zones include lot size averaging, along with a minimum and maximum lot size and minimum and maximum density allowance. Lot size averaging can be applied to infill development, short plats, and larger subdivisions and is not limited to Planned Residential (PRD) or cluster developments. This can allow for greater diversity of lot sizes and housing types within new housing developments as individual lots located within a development may be smaller than typically permitted, provided the average of all lots does not exceed the maximum allowed density. This also can lead to more efficiency in accommodating critical areas and unusually shaped parcels, the potential for more units, and may make the smaller lots a more affordable option within the development. It also decreases the likelihood of the developer having to seek costly variances for lots that deviate slightly from the minimum lot size requirement or to go through the additional review procedures typical of Planned Residential Developments (PRDs).

Accessory Dwelling Units: An accessory dwelling unit (ADU), attached or detached, that meets the zoning code's development standards is permitted by right in any zone that permits residential uses. The property owner must occupy either the principal or accessory dwelling and the accessory dwelling must not exceed 40% of the area of the primary dwelling's living area. The City will not impose a separate water system development charge for connection of accessory dwelling units to the city water system. There are some design requirements to protect the residential character and neighboring property owners, but the ADU ordinance is quite generous when compared to other jurisdictions and offers an alternative and low-impact form of affordable housing. ADUs may be helpful in providing new and more affordable housing options in neighborhoods that are already built out or where the planning goal is to maintain single-family character but more density. ADUs may address the housing needs of seniors, small families, and a range of incomes, including middle and low-income households.

Manufactured Housing: "Designated manufactured homes" (factory constructed with pitched roofs and exterior siding similar in appearance to conventional site-built IBC single-family residences and installed on a permanent foundation) are an alternative, typically more affordable housing product and are permitted by right on individual lots in all residential R and MF zones. The zoning code also makes provision for the siting of typical manufactured homes in manufactured home parks, dwellings built on a permanent chassis with or without a permanent foundation and complying with the National Manufactured Home Construction and Safety Standards Act of 1974, as a conditional use in the MF zones. As of March 2021, Camas permits "tiny homes" in manufactured home parks, in compliance with state laws (WA State Engrossed Substitute Senate Bill 5383, July 28, 2019). However, the City of Camas has only one manufactured home park and new manufactured home parks are only allowed as a conditional use in MF zones.

Housing for Persons with Disabilities: The zoning code regulations protect housing for persons with disabilities who require group living arrangements and/or onsite supportive services. Adult family homes, residential care facilities, supported living arrangements, and housing for the disabled are expressly permitted uses in all single-family Residential and MF districts. Adult family homes, group homes, and "housing for the disabled" (which does not have a specific definition in the zoning code) also are permitted uses in the mixed-use MX and downtown DC districts. The code does not impose spacing or dispersions requirements or additional zoning permits to site these types of supportive housing for persons with disabilities.

Policies that May Impede Housing Goals

Exclusionary zoning standards in the single-family R zones: Exclusionary zoning is understood to mean zoning regulations which impose unreasonable residential design regulations that are not congruent with the actual standards necessary to protect the health and safety of current average household sizes and prevent overcrowding. Zoning policies that impose barriers to housing development by making developable land and construction costlier than they are inherently can take different forms and may include: high minimum lot sizes, low density allowances, wide street frontages, large setbacks, low maximum building heights, restrictions against infill development, restrictions on the types of housing that may be constructed in certain residential zones, arbitrary or antiquated historic preservation standards, minimum off-street parking requirements, restrictions against residential conversions to multi-unit buildings, lengthy permitting processes, development impact fees. While Camas's zoning code permits smaller lots and some housing type diversity in some PRDs, multifamily, and mixed use zones, the vast majority of land is devoted to single-family detached dwellings, with development controls related to minimum lot sizes, density, setbacks, lot coverage, height restrictions, historical preservation, etc. that limit housing diversity, density, and socioeconomic integration within many desirable neighborhoods. Camas's zoning ordinance may be overly restrictive and exclusionary to the point of artificially limiting the affordable housing inventory and directly contributing to higher housing and rental costs. The allowed uses in

the single-family R zones are too restrictive. (Only single family detached housing and ADUs are permitted by right; duplex/2-family units are a conditional use; or duplex/2-family and apartments as part of an approved PRD.) The conditional use permit process for duplex/two-family units in the R zones adds artificial cost and uncertainty to development of these typically more affordable "missing middle" housing types and still excludes on the majority of residential land designations other small to modest-scale housing types that bridge the gap between detached single family homes and urban-scaled multifamily development like triplexes, townhouses, detached garden homes, cottage housing, courtyard apartments, and other small-scale apartment buildings.

Large minimum lot sizes and low density for majority of residential acreage: Camas's Comprehensive Plan and Plan Map show the majority of residential land use is designated for single family detached units with 4,913 acres of land in the city having a single-family zoning designation and single family uses comprising 48% of the land designations. Minimum lot sizes and maximum densities for the R zones range from 15,000 sq. ft. lots and 2.9 units per acre (u/a) in the low-density R-15 zone to 6,000 sq. ft. lots and 7.2 u/a in the high density R-6 zone. The medium density single family zones, which comprise the greatest share of the R zone acreage, include the R-12 district with a minimum lot size of 9,600 sq. ft. (12,000 sq. ft. average lot area) and maximum density of 3.6 u/a; the R-10 district with a minimum lot size of 8,000 sq. ft. (10,000 sq. ft. average lot area) and 4.3 u/a; and the R.7.5 district with a minimum lot size of 6,000 sq. ft. (7,500 sq. ft. average lot area) and 5.8 u/a density. Camas's Comprehensive Plan sets an overall average residential density of 6 u/a. Only the R-6 zone, which comprises less than 10% of the single-family land designation acreage, allows for the 6 u/a goal. Densities higher than 6 u/a are permitted (but not required) in the multifamily MF zones, which set minimum densities at 6 u/a. The zoning code does not mandate a required minimum livable floor space for dwelling units in the R zones, but the Land Development ordinance (Municipal Code 17.19.030) does provide a building envelope standard for single-family residential zones, finding "a suitable size and configuration generally includes a building envelope capable of siting a forty-foot by forty-foot square dwelling within the building envelope" or a minimum 1,600 sq. ft. one-story home.

Limited multifamily zoned land: Clark County's Vacant Buildable Land Model estimates that there are about 95 acres of developable multifamily-zoned land in the Camas UGA, making up about 13.6% of all developable residential land. However, the City recently acquired about 100 acres of multifamily-zoned land in the North Shore for use as park space. While much of this land would not be buildable due to environmental constraints, the VBLM indicates about 24 acres of potentially buildable multifamily land in that area. This acquisition thus reduces the availability of developable multifamily-zoned land in Camas to about 70 acres in locations throughout the city.

"Family" definition: While not directly related to housing development, a zoning code's definition of family can impact where groups of unrelated persons rightfully can live within a jurisdiction. Unreasonably restrictive definitions may limit the housing supply for nontraditional families and for persons with disabilities who reside together in congregate living situations. Camas's zoning

code limits the definition of "family" to persons related by blood or marriage, or two persons with functional disabilities, or not more than five unrelated persons. While this definition is consistent with state law and is not the most restrictive compared to other Washington jurisdictions, it neglects functionally equivalent relationships by adoption, foster care, or other legal guardianship connections, which is problematic under due process scrutiny. More progressive zoning and planning models define single family in terms of a "functional family" or "single housekeeping unit" sharing common space, meals, and household responsibilities, and/or leave maximum occupancy per dwelling as a matter of safety regulated by the building code rather than the zoning regulations.

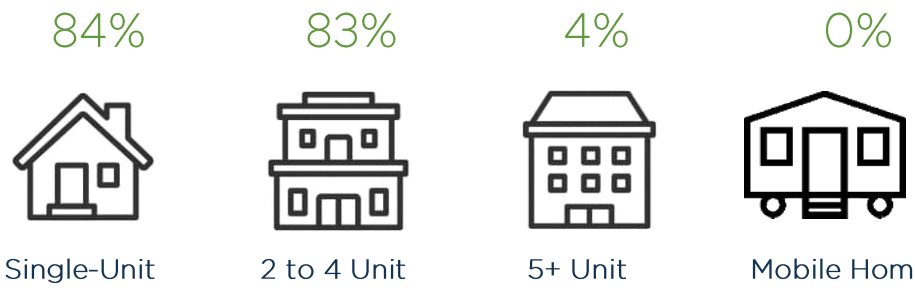
Progress Toward Housing Goals

Has the City's current housing policy framework been successful in advancing the housing goals? Are the current policies working? To answer these questions, this section will revisit the three housing goals from the Camas 2035 Comprehensive Plan in the context of an analysis of actual housing development activity to determine whether progress is being made toward the community's goals and future vision for housing in the city.

In the analysis of Camas's housing supply presented in Chapter 4, the data on units by structure type indicates that share of the city's housing stock comprised of detached single-unit structures increased from 85% in 2000 to 89% as of the 2014-2018 American Community Survey estimates. Duplexes, triplexes, and quadplexes as a group held a steady 5% share of the city's housing stock over this same period. The share of housing units in multifamily structures of five or more units decreased from 8% to 5% and the share of mobile homes decreased from 2% to 1%.

In raw numbers, the data on housing by structure type reveals that the number of duplexes, triplexes, and quadplexes did increase significantly between the 2000 Census count and the 2014-2018 ACS estimates, from 246 to 451 units (an increase of 83%). Given the city's rapid overall growth during this time period, that increase was only sufficient to keep pace; the share of the city's housing stock composed of these units remained an even 5%. The number of multifamily housing units in 5+ unit striuctures was virtually unchanged (See Table 6 and Figure 34).

Figure 57: Percent Increase by Housing Type: 2000 to 2018



Data Source: OFM "Adjusted Census 2000 Population and Housing by Type of Structure and Group Quarters for the State, Counties and Cities," Table 2, 2014-2018 5-Year ACS Estimates, Table DP04

While Census Bureau estimates do not reveal substantial additional multifamily development, very-recently-constructed units do include a mix of apartment and townhome developments, including Clara Apartments (32 units), Kielo at Grass Valley (276 units), Parker Village (60 units), and Terrace at River Oaks (120 units) (See Table 14). 2020 Census data and future American Community Survey 5-Year Estimates would expected to include these additional multifamily units as new data is released.

Another indicator, this one predating the development of the Camas 2035 plan, tracks local residential building permit data by square footage. Comparing the 2010 and 2015 permit data, the number of smaller dwellings (under 2,000 square feet) constructed in Camas declined from 23 to 14, a 39% drop (see Chapter 4, Figure 46). By 2020, only 4 units smaller than 2,000 square feet were permitted, making up just 2.1% of total permits. Between 2010 and 2015, new housing construction increased markedly for larger-sized homes. For those between 2,000 and 3,000 square feet, production increased by 84%; production of homes greater than 3,001 square feet increased by 66% between 2010 and 2015. Continuing to monitor the trends within this data will be a helpful metric for evaluating progress toward the City's housing goals into the future.

The data points considered in this section suggest that the City's current housing policy framework may not be sufficient to incentivize housing development of the type and scale that will achieve the community's vision. Each of the three housing goals established by the Camas 2035 plan are grounded to a large degree in advancing variety in the city's housing stock. This variety is expected to help the city meet the housing needs of a diverse community, including households facing affordability challenges and those with special needs who may require alternatives to the predominantly single-family detached dwellings that exist today.

Using variety as a gauge, the data reviewed here presents one positive finding: the component of the city's housing stock composed of 2-, 3-, and 4-unit structures has grown at generally the same pace as the housing stock as a whole.

That this important "middle housing" market segment is experiencing growth and not being outpaced by the addition single-family structures is significant. The policies and plans underpinning this factor should be preserved or enhanced where possible for the city to continue gaining ground.

Other than that bright spot, the remaining indicators generally point to a loss of variety among larger-scale multifamily structures containing 5 or more units and in smaller units of less than 1,999 square feet. While neither of these categories declined in absolute terms, both lost share within the overall housing stock, outpaced by more rapid construction of single-family structures and larger-sized dwellings.

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Chapter 7:
Housing Strategies



This chapter describes recommended strategies and implementation activities to expand housing supply, diversity, and affordability in Camas. Each strategy serves to advance one or more of the HAP goals outlined below.

Housing Action Plan Goals

Camas's Housing Action Plan responds to key housing needs and gaps identified through community engagement, analysis of current and future housing needs, demographic and housing market trends, and availability of vacant buildable land. Based on the findings outlined in Chapters 2 through 6, the planning team identified four overarching Housing Action Plan goals:

- **Develop Housing to Accommodate Growth.** Projections based on anticipated population growth indicate the need for about 4,590 additional housing units in Camas through 2040. In contrast, Clark County's Vacant Buildable Lands Model identifies capacity for an additional 3,730 housing units in Camas based on the City's current average of 6 dwelling units per acre. Thoughtful changes to Camas's zoning and development regulations can allow the City to better accommodate projected growth.

- **Diversify the Housing Mix.** Since 2010, development in Camas has trended toward larger, single-family homes. In 2020, 98% of units permitted were single-family homes over 2,000 square feet; most were over 3,000 square feet. Community input, demographic data, and housing need estimates indicate a need for more diverse housing options, including smaller homes and multifamily housing. A greater variety of housing types can better serve young families, small households, seniors, people with disabilities, and people with a greater variety of incomes. In considering smaller housing types, Camas will be deliberate about maintaining a safe pedestrian environment.

- **Increase Housing Affordability.** Most recent estimates show that for about 42% of renters and 20% of owners in Camas, housing is unaffordable. Young families, seniors, and people who work in Camas may have particular difficulty affording housing there. To an extent, diversifying the housing mix can assist in addressing affordability by offering smaller, less expensive housing types. To meet needs of households of all incomes, including lower- and moderate-income residents, however, more proactive approaches to encourage subsidized housing will be needed.

- **Preserve Existing Affordable Housing.** In addition to increasing the availability of affordable housing, Camas should adopt strategies to preserve its existing affordable housing and prevent displacement of residents. Community members noted particular concern for preservation of existing affordable housing, particularly smaller single-family properties, in older neighborhoods near downtown.

  Table 26 outlines housing strategies recommended for Camas, with each explored further in the next section.

Table 26: Housing Action Plan Strategies

STRATEGY	GOALS			
	DEVELOP HOUSING	DIVERSIFY HOUSING MIX	INCREASE HOUSING AFFORDABILITY	PRESERVE AFFORDABLE HOUSING
Strategy 1: Expand housing opportunity in mixed use and downtown commercial districts	♦	♦		
Strategy 2: Consider making targeted rezones during Comprehensive Plan updates	♦			
Strategy 3: Diversify allowed housing types and update related lot and dimensional standards	♦	♦	♦	
Strategy 4: Focus on key areas with residential development or redevelopment potential. Expand more mixed-use areas throughout the city.	♦	♦		
Strategy 5: Continue community conversations around housing and housing for all	♦	♦	♦	♦
Strategy 6: Communicate available affordable housing resources			♦	
Strategy 7: Build partnerships to develop and preserve affordable housing for individuals, families, and seniors. Explore expansion of the MFTE program.			♦	♦
Strategy 8: Explore funding source and cost reduction options for affordable housing	♦	♦	♦	♦

Housing Action Plan Strategies

Upzoning Strategies

Upzoning refers to zoning code modifications that allow denser land uses in existing zoning districts to increase the buildable capacity of land. This is distinct from, but related to rezoning, which can achieve the same effect by changing the zoning classification of land to one that carries higher density standards. Upzoning can be achieved in a variety of ways, including increasing the minimum and/or maximum density allowed in a district, reducing or eliminating minimum lot sizes, reducing setback requirements, raising building height maximums, and allowing denser uses such as multifamily in single-family zones. The Washington Department of Commerce describes upzoning as a regulatory tool with particular utility in communities with "a deficit of development capacity relative to ongoing population growth, minimal activity in areas desired for development or redevelopment, or a lack of residential development near public infrastructure."[11] In isolation, upzoning can lead to increased property values and the intrinsic luxury development and displacement that can accompany it; however, as one of a variety of tools applied together, upzoning can be effective in leveraging a greater housing supply from development activity that is or would have occurred anyway.

The Case for Upzoning in Camas

Camas is growing steadily, and development sites are in demand. By making incremental increases to the minimum density required or otherwise small changes to allow options for greater density and different housing types, the City will increase its housing supply and diversity with only minimal modifications to the established character of residential zones. The increased supply will be produced by market forces, without requiring investment on the City's part beyond the infrastructure and public amenities Camas already offers. Higher densities will make more efficient use of the City's infrastructure investments.

Application of the upzoning recommendations described here may be made across-the-board for the entire city by changing the standards for existing zoning districts so that all property in a particular zoning district is subject to an amended set of standards. Alternatively, the City could approach upzoning by outright rezoning certain areas, perhaps large tracts of vacant land and/or nodes of a more urban character, to a higher density zoning classification. Under the former approach, the upzoning will affect more property owners but is achieved through a less administratively rigorous process (amending zoning district

[11] Washington State Department of Commerce. (June 2020). Guidance for Developing a Housing Action Plan-Public Review Draft. www.commerce.wa.gov/serving-communities/growth-management/growth-management-topics/planning-for-housing/.

standards) compared to the latter approach which, while more targeted, introduces the complexities of rezoning.

The greatest and most immediate impact will be achieved by applying upzoning recommendations to vacant land, areas that are harder to develop, or large lots that could accommodate being subdivided. Rezoning or amending zoning standards for established or built-out neighborhoods may not have an immediate effect on housing supply but can incrementally lead to some moderate densification over time as lots are redeveloped. While unlikely to significantly affect the City's housing supply in the near term, the utility of such a gradual tool should not be overlooked. As the city is increasingly built out, redevelopment of sites will likely become more common and upzoning established neighborhoods creates an outlet to keep development pressure from overheating the market.

Best Practices for Implementing Upzoning Policies

The Washington State Department of Commerce produced a draft guidebook in 2020 containing strategies to help Washington communities promote housing diversity and affordability through their Housing Action Plans.[12] Several of the strategies described in that guidance relate to upzoning and related tools. The best practices and considerations below are adapted from the Department of Commerce's guidebook.

- Increasing residential density makes more efficient use of existing public infrastructure; therefore, prime candidates for upzoning are neighborhoods rich in amenities such as parks and greenspace, public transportation access, commercial and retail nodes, and other place-based investments.
- The best opportunities for significant impact lie in the application of upzoning to vacant tracts of land which will have the direct effect of increasing the number of housing units produced when the property is developed thereby accommodating population growth within denser, more compact areas.
- Upzoning may increase property value and encourage development of parcels that otherwise would not have been profitable to build out. For this reason, upzoning may create an indirect incentive that can potentially be tied into affordability requirements, such as those that may be imposed under an inclusionary housing policy. Upzoning should therefore be considered in tandem with any program of affordability requirements.
- The City should be clear with residents about the intent behind any upzoning strategies it intends to implement and should carefully communicate the need for the change and how it will benefit the city and its strategic goals. It may be helpful to highlight for the public standards that are not changing (e.g. design standards, height limits, open space requirements) and how those standards will continue to ensure compatibility of denser housing development within the existing community.

[12] Ibid.

Strategy 1: Expand Housing Opportunity in Mixed Use and Downtown Commercial Districts

The City's Downtown Commercial and Mixed Use (DC and MX) districts offer some unique and nuanced opportunities to support housing density and diversity. Through some modest changes to the authorized uses in these zones, these areas, which currently offer some of the City's highest-density and most flexible land use conditions, can potentially be made more attractive for developers looking to add various housing types into their developments.

The City includes 3+ unit attached single-family uses (such as rowhouses or townhomes) in the same classification as apartments in the use table for these two zones. By breaking this out and regulating it separately from apartment and other multifamily uses, greater flexibility is added to both the DC and MX districts. In the MX district, multifamily and rowhouse-type development is currently a conditional use; Camas can allow rowhouses by right while keeping apartment development a conditional us, given the City Code's other conditions which guide development here. Similarly, in the DC district, the City can retain some modified conditions on apartment uses while opening up opportunity for 2- and 3-family dwelling types by allowing them as of right.

One key regulatory condition applied in the City's DC zone is a requirement that multifamily residential uses must be part of a mixed use building that contains no ground-level residential units in order to be permitted by right. In a commercial-focused area, the focus on ground-level retail is an important one, but the City may consider relaxing the requirement such that ground floor residential on side streets is allowed.



Rowhouses
(from Sightline Missing Middle Homes Photo Library, https://www.flickr.com/people/sightline_middle_housing/)

Table 27: Proposed Changes to Authorized Uses in DC and MX Zones

RESIDENTIAL USES	CURRENT USES		PROPOSED USES	
	DC	MX	DC	MX
Adult family home, residential care facility, supported living arrangement, or housing for the disabled	P	P	P	P
Apartments	C/P*	C	C/P†	C
Assisted living	P	P	P	P
Designated manufactured homes	X	P	X	P
Duplex or two-family dwelling	C/P*	P	P	P
Residential attached housing for three or more units, e.g. rowhouses (currently grouped into the "apartments" use category)	--	--	P	P
Single-family dwelling (detached)	X	P	X	P
Cottage housing (new use designation)	--	--	X	P

* Residential uses may be outright permitted if part of a mixed use building, where residential use is not located on the ground level; otherwise it shall be a conditional use.

† Residential uses may be outright permitted if part of a mixed use building, where residential use is not located on the ground level *along the primary street frontage*; otherwise it shall be a conditional use.

Strategy 2: Consider Making Targeted Rezones during Comprehensive Plan Updates

Washington's Growth Management Act encourages cities to authorize a minimum net density of six dwelling units per acre (u/a) in all residential zones, where the residential development capacity will increase within the city. Currently, Camas sets its Comprehensive Plan goal for an average residential density of 6 u/a, but most of the designated residential land is currently zoned for a lower minimum to maximum density (dwelling units/net acre) range requirement because 48% of the city's land designation is within one of the single-family R designations. The city does not require new single-family developments to meet a minimum density, however there is a minimum unit requirement of 6 u/a in multifamily zones.

The table that follows includes all the residential zoning districts in the city and the current range of unit per acres. The highlighted zones represent the greatest percentage of city's land area that is designated for residential uses (70% overall) and do not achieve a 6 u/a minimum or average. In addition, the R-10, R-7.5, and R-6 zones have a greater share of vacant undeveloped land and underdeveloped lands compared to all other residential zones.

To achieve desired residential densities, the City of Camas can consider opportunities to selectively rezone parcels in strategic locations (urban nodes, vacant land, industrial lands) to a higher density zoning district during Comprehensive Plan updates. Ideally, rezones would reflect that the built density in the area is higher than the current zoning classification. Rezones could also focus on areas that are relatively undeveloped or underdeveloped or for focused redevelopment (e.g., mill property).

Table 28: Minimum and Maximum Densities and Residential Land in Camas's Residential Zoning Districts

ZONING DISTRICT	CURRENT DENSITY		RESIDENTIAL LAND	
	MIN	MAX	ACRES	% OF TOTAL
R-15	2-3 u/a*	2.9 u/a	716.3	15%
R-12	3-4 u/a*	3.6 u/a	925.4	19%
R-10	4-5 u/a*	4.3 u/a	989.3	20%
R-7.5	5-6 u/a*	5.8 u/a	1,534.3	31%
R-6	6-7 u/a*	7.2 u/a	191.1	4%
MF-18	6 u/a	18 u/a	312.2	6%
MF-10	6 u/a	10 u/a	245.9	5%
MF-C	6 u/a	24 u/a	0.0	0%

* In these zones, minimum density is not mandatory. Maximum density is mandatory in all zones. The current requirement is to achieve an **average** lot size for the new development.

Note: Zoning districts highlighted in yellow represent the greatest percentage of city's land area that is designated for residential uses (70% overall).

Strategy 3: Diversify Allowed Housing Types and Update Related Lot and Dimensional Standards

Since adoption of Camas's zoning code, innovative housing types not contemplated by Camas's regulations have gained more traction and popularity in other jurisdictions for providing greater housing choice and affordability: tiny homes, cottage developments, stacked flat condominiums, courtyard apartments, and cluster developments. These housing types could be added to the permitted use tables and permitted by right in any residential zone where they would comply with the density and dimensional standards.

In addition to allowing cottage housing by right in residential zones, the City should consider allowing duplexes and 3+ unit attached housing types (such as triplexes, rowhouses, and townhomes) by right in any residential zone. If these types meet the density, dimensional, and any other design standards applicable

to the zoning district, they should be allowed without a conditional use permit in order to incorporate greater variety into the City's housing stock.

Note that these housing types are typically prohibited within existing platted subdivisions and by homeowner associations. Meaning that if supported, then a further analysis on the potential effectiveness of this strategy would include a review of available vacant parcels and vacant infill lots that are unencumbered by an HOA.





Cottage Clusters in Shoreline (L) and Kirkland, WA (R)







Duplex and Triplex Housing
(from Sightline Missing Middle Homes Photo Library, https://www.flickr.com/people/sightline_middle_housing/)

Changing from conditional use to permitted use can translate to substantial building cost savings and more predictability for developers. Currently, planning fees for a residential conditional use permit start at $3,360 + $103 per unit, in addition to all the development and impact fee calculations.

Table 29: Proposed Changes to Authorized Uses in Residential and Multifamily Zones

RESIDENTIAL USES	CURRENT USES		PROPOSED USES	
	R	MF	R	MF
Adult family home, residential care facility, supported living arrangement, or housing for the disabled	P	P	P	P
Apartments	P*	P	P*	P
Assisted living	C	P	C	P
Designated manufactured homes	P	P	P	P
Duplex or two-family dwelling	C	P	P	P
Manufactured home	X	X	X	X
Manufactured home park	X	C	X	C
Nursing, rest, convalescent, retirement home	C	P	C	P
Residential attached housing for three or more units (e.g., rowhouses)	X/P*	P	P	P
Single-family dwelling (detached)	P	P	P	P
Cottage housing	X	P**	P	P

*Permitted in the R zones as part of a planned development only.

**Cottage housing is currently permitted as a zoning overlay in MF zones.

Recent state legislative updates require tiny homes and recreational vehicles to be permitted uses in manufactured home parks and allow local jurisdictions more flexibility to authorize them in other zones. This year Camas amended the development code to allow tiny homes within manufactured home parks, however they may consider including permitting provisions for tiny homes outside a 5-acre manufactured home community. Low-cost, low-impact tiny homes, especially in a cluster or "village" around common open space, should not require a minimum 5-acre parcel like MHPs or large minimum lot sizes, and could be incorporated into the traditionally single-family R zones and the MF zones. Camas could also consider relaxing the restriction on manufactured homes only being allowed in approved manufactured home parks, especially as an affordable way to site an ADU.

Where alternative housing types are authorized, the City also may consider reducing the off-street parking requirements as lower-income, generation Z, senior, and non-traditional single-family development households have been shown to have lower rates of car ownership. A parking study by a certified transportation planner or engineer may demonstrate that fewer off-street

parking spaces are needed than currently required. In addition to assessing actual parking needs, any such parking study should consider potential impacts to pedestrian safety and adjacent street congestion.

The Growth Management Act encourages cities to "create one or more zoning districts of medium density in which individual lots may be no larger than three thousand five hundred square feet and single-family residences may be no larger than one thousand two hundred square feet."[13] Lots this size are allowed under the current multifamily and mixed-use districts, but not in any medium-density single-family district. Providing such an option can make more feasible the development of more housing stock and more affordable housing types like small lot detached homes, zero lot line developments, cottage homes, townhomes/rowhouses, duplexes, triplexes, and other similar housing types compatible in scale and impact with single-family detached housing. As Camas allows new housing types, the City should update corresponding lot and dimension standards to ensure consistency.

In addition to updating lot and dimensional standards, the City should also consider updating its design standards manual to codify residential design requirements. This approach would allow for an administrative approval process for residential designs.

Rezoning and Focused Planning Efforts

Strategy 4: Focus on Key Areas with Residential Development or Redevelopment Potential. Expand More Mixed-Use Areas throughout the City.

Rezoning to a higher density would provide more flexibility and allow for greater housing diversity citywide, in particular it would support downtown housing. However, as Figure 55 (in Chapter 5 of the Housing Action Plan) shows, much of Camas's residential capacity is on larger tracts of vacant or partially-vacant land north of Lacamas Lake. To achieve a desired mix of housing types, the City should evaluate key areas with residential development or redevelopment potential and consider possible rezoning opportunities, including possible rezoning to allow more mixed-use areas and more multifamily development by right.

Looking at the North Shore area as an example, the area includes many of the city's remaining large tracts of vacant land. At least one third of land in the North Shore is considered "vacant critical" and development opportunity is limited in these environmentally sensitive areas. To preserve this land, the City recently acquired about 100 acres in that area, including some residentially-zoned land, for use as park space. While this land will not be available for residential

[13] RCW 36.70A.600(1)(m)

development, there are a few smaller, adjacent parcels with housing potential. Additionally, nearby land currently zoned as a business park may have potential for some housing development. The City should evaluate these areas and consider how updated residential zoning designations and permitted uses outlined in Strategies 2 and 3 will impact housing potential or if rezoning certain sites would better allow the city to attract desired housing types.

The City should take a similar approach for other development or redevelopment areas in Camas, such as the industrial property that is currently owned by the Georgia-Pacific mill, to identify potential planning or rezoning efforts that would best encourage development of housing to meet current and future needs.

Communicating Housing as a Priority

Community input shows a variety of viewpoints among City of Camas residents, from those that see greater housing diversity and affordability as a crucial goal to those that see no need for additional residential development, particularly apartment or affordable housing development, in the city. In implementing this Housing Action Plan, the City of Camas should also work to communicate its housing planning priorities and build understanding around the benefits of housing that meets the needs of all residents.

Strategy 5: Continue Community Conversations around Housing and Housing for All

The City of Camas should develop community conversations that last beyond this project. To date, the Housing Action Plan engaged thousands of Camas residents through the project website, social media, and readership in the newspaper and school bulletins. However, continued communication is needed.

The Housing Action Plan builds on goals established in the City's Comprehensive Plan, including to:

- Promote development of a variety of housing choices that meet the needs of all members of the community;
- Create a diversified housing stock that meets the needs of all economic segments of the community through new development, preservation, and collaborative partnerships; and
- Encourage and support a variety of housing opportunities for those with special needs.

To achieve these goals and implement strategies outlined in this HAP, efforts to build understanding around housing diversity and affordability will be important. The City should foster inclusive community conversations that connect housing to other issues, such as economic vitality, jobs, schools, and transportation. The

City should focus on communicating a "housing for all" perspective and exploring connections between community values and housing. These conversations could be led by the City's library and communications teams to ensure that the topic of housing is viewed wholistically.

During the public engagement process, for example, Camas residents describe the city as a great place to live, with good schools, safe neighborhoods, and access to Portland and the airport. The city's small-town atmosphere and its charming downtown provide rich and beloved character. Other features enjoyed by residents include the city's natural landscape, its trails, and its sports activities. Residents want housing that reflects a variety of stages of life, including for college students and single adults. They express a desire for entry level homes and housing that enables seniors to age in place. There is some interest in apartments or condos, particularly in downtown, and some residents desire more unique housing products and developments serving a greater range of incomes, including low- and moderate-income residents.

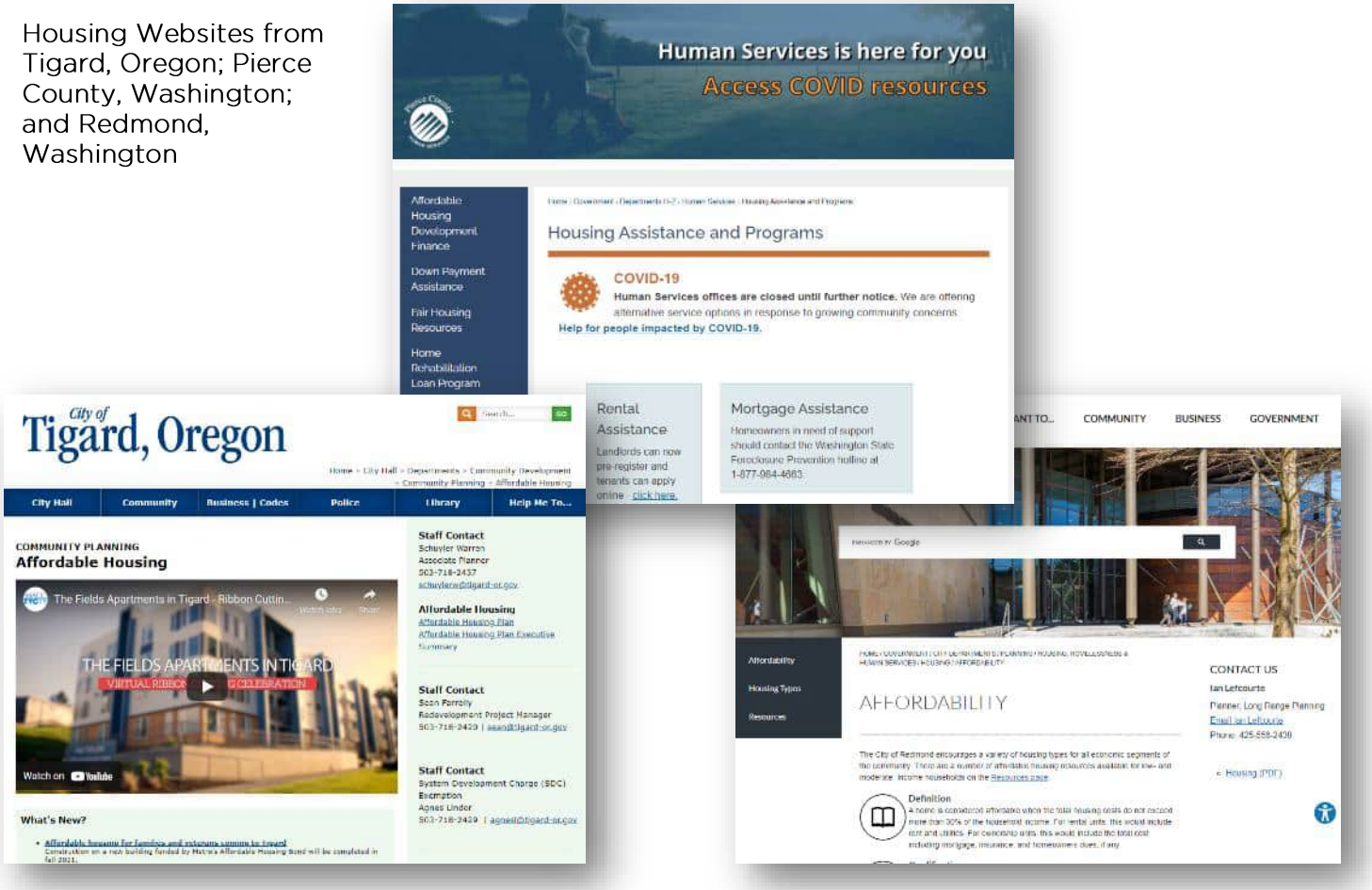
The City can build on these ideas in future public engagement, including those related to HAP implementation or other planning efforts.

Strategy 6: Communicate Housing Resources and Opportunities

To communicate that housing affordability is important to the City of Camas and to inform residents and housing professionals about the availability of housing resources, Camas should develop a page on the City's website dedicated to housing. This page could share information about the current supply of affordable housing in the city, including Camas Ridge and Crown Villa Apartments, with links to the Vancouver Housing Authority. It could also provide information about first time homebuyer assistance available through the Washington State Housing Finance Commission's down payment assistance program, Proud Ground (when assistance is available in Clark County), and others. Camas could also consider hosting a home buyer education event through the Washington State Housing Finance Commission or other partner and advertising it on this page.

In addition to information for households, the City should also advertise resources available for housing developers, landlords, and other housing industry professionals, such as the City's Multifamily Tax Exemption and any other potential incentives.

Housing Websites from Tigard, Oregon; Pierce County, Washington; and Redmond, Washington



Developing Partnerships

Strategy 7: Build Partnerships to Develop and Preserve Affordable Housing for Individuals, Families, and Seniors. Explore Expansion of the MFTE Program.

Nationally, the Low Income Housing Tax Credit (LIHTC) program is the primary source of subsidy for development of new affordable housing. The LIHTC program makes available an indirect federal subsidy for investors in affordable rental housing, ultimately offsetting a portion of the development cost. As a condition of the LIHTC subsidy received, the resulting housing must meet certain affordability conditions. The Internal Revenue Service allocates LIHTCs annually to each state's housing finance agency, which then awards them on a competitive basis to project applicants within the state.

At present there are no LIHTC developments in Camas. However, the City of Camas should build capacity to build connections with LIHTC developers and the

Washington State Housing Finance Commission (WSHFC). The City could annually review the WSHFC's Qualified Allocation Plan (QAP) and work proactively to promote any city sites with scoring advantages to prospective developers. If the City inventoried available parcels and identified those that would be high scorers under the QAP, the City could directly, or through a real estate broker, market these sites to LIHTC developers. This reduces the time and expense developers put into scouting sites and communicates Camas's commitment to bringing in LIHTC housing. In doing this, the City could also focus on attracting LIHTC developers for senior properties, if desired.

Similarly, the City should continue to develop its relationship with the Vancouver Housing Authority to identify roles Camas can play in creating new affordable housing in the city and preserving existing VHA-owned or managed units.

Within this strategy (and in combination with Strategy 6), Camas could also explore the possibility of expanding its Multifamily Tax Exemption program. The City should continue to communicate that program to developers.

Developing Funding Resources

Strategy 8: Explore Funding Source and Cost Reduction Options for Affordable Housing

Periodically, state and/or the federal governments create opportunities for cities and counties to support affordable housing development and retention. This strategy encourages the city to pursue and implement a funding source or combination of sources, as it/they become available.

Possible funding sources may include proceeds from an affordable housing sales tax, loans or grants from the Washington State Housing Trust Fund, or Clark County's Community Development Block Grant (CDBG) or HOME Investment Partnership programs. CDBG funds, for example, may be used to support infrastructure development associated with affordable housing development or improve living conditions in existing low- and moderate-income neighborhoods.

Additionally, if Camas adopts an inclusionary housing policy with an in-lieu fee option, those fees can serve as source of funding for the activities listed above.

Exploring potential funding options may better support opportunities for affordable housing, such as:

- Incenting desired developments (such as affordable housing, senior housing, accessible housing, or other types identified by the City);
- Providing down payment assistance to first time buyers; and
- Helping income-eligible or senior homeowners make needed housing repairs to remain in their homes.

In addition to exploring funding sources for affordable housing, the City of Camas could also explore the possibility of restructuring the City's impact fees to reflect the size of residential structures. The current impact fee system charges the same rate for any single-family residence, regardless of size. For example, a 4,000 square foot single-family home would have the same impact fee as a 1,000 square foot home. Restructuring the impact fee system to a tiered approach based on size has the potential to reduce costs and enhance affordability of smaller, single-family properties. The City could also consider opportunities to reduce costs for existing low- and moderate-income and/or senior homeowners.

City of Camas

Housing Action Plan

APPENDIX

June 2021



Appendix A:
Implementation Plan

Camas's Housing Action Plan (HAP) outlines eight strategies for making advancements towards the City's housing goals over the next several years. For each strategy, implementation will require additional research, analysis, and refinement by City staff. Potential suggested policy or regulation changes based on HAP strategies would then be presented to the Camas Planning Commission for consideration and to City Council for approval and adoption.

The City of Camas Community Development Department develops an annual Work Plan that will incorporate HAP strategies for further research, analysis, and potential implementation. The table below suggests potential next steps, timeframe, partners, and outcome measurements for each strategy. This table is intended to guide Work Plan development but should be used flexibly as implementation of the HAP and planning needs in the Camas evolve.

Table A-1: Suggested Housing Action Plan Strategy Implementation Plan

STRATEGY	START TIMEFRAME	RESPONSIBLE PARTY & POTENTIAL PARTNERS	PROGRESS MEASUREMENTS
STRATEGY #1			
Expand housing opportunity in mixed use and downtown commercial districts	2021	• Planning Division Staff • Planning Commission	• Adoption of zoning amendment • Annual tracking of housing units permitted by type
Suggested Next Steps:	• Consider drafting a zoning code amendment revising the Authorized Use table to allow duplex and 3+ unit attached single-family housing (triplexes, quads, and rowhouses) by right in DC and MX districts and modifying conditions on the permitting of multifamily uses to allow ground-floor residential use on side streets. • Present draft zoning code amendment to Planning Commission for consideration and to City Council for approval and adoption.		
STRATEGY #2			
Consider making targeted rezones during Comprehensive Plan updates	2021/ Ongoing	• Planning Division Staff • Planning Commission	• Adoption of amended zoning map • Share of residential land by zoning district
Suggested Next Steps:	• Identify strategic locations (such as urban nodes, vacant land, and industrial lands) where rezoning may be needed to achieve desired residential mix/density or to reflect a built density that is higher than the current zoning classification. • Research and analyze potential benefits and impacts of rezoning in these areas to determine if rezoning is recommended. • If recommended, draft amended zoning map for consideration by Planning Commission and City Council during Comprehensive Plan updates.		
STRATEGY #3			
Diversify allowed housing types and update related lot and dimensional standards	2022	• Planning Division Staff • Planning Commission	• Adoption of zoning amendment • Annual tracking of housing units permitted by type
Suggested Next Steps:	• Consider drafting a zoning code amendment revising the Authorized Use table to allow cottage housing, duplexes, triplexes, quads, and rowhouses by right in all R zoning districts. Consider whether additional uses should be created (e.g., courtyard apartments, cluster developments) and add to Authorized use table as appropriate. Update minimum and maximum lot dimension standards to be consistent with new housing types. • Consider contracting with a transportation planner or engineer for a study of parking requirements to determine where and/or if off-street parking requirements can be reduced in some areas or for some housing types, and to evaluate alternative means for meeting parking requirements. • Consider updating the City's design standards manual to codify residential design requirements to allow for an administrative approval process for residential designs. • Present draft zoning code amendments and/or amended design standards manual to Planning Commission for consideration and to City Council for approval and adoption.		

STRATEGY	START TIMEFRAME	RESPONSIBLE PARTY & POTENTIAL PARTNERS	PROGRESS MEASUREMENTS
STRATEGY #4			
Strategy 4: Focus on key areas with residential development or redevelopment potential. Expand more mixed-use areas throughout the city.	2021/ Ongoing	• Planning Division Staff • Planning Commission	• Share of residential land by zoning district, including availability of land for mixed-use and multifamily development
Suggested Next Steps:	• Identify strategic locations (such as urban nodes, vacant land, and industrial lands) with residential development or redevelopment potential. • Analyze and evaluate the impact of updated residential zoning designations and permitted uses outlined in Strategies 2 and 3. Assess whether rezoning certain sites would better allow the city to attract desired housing types. Consider opportunities for increasing availability of land for mixed-use and multifamily development. Consider developing sub-area plans for key development/ redevelopment areas.		
STRATEGY #5			
Strategy 5: Continue community conversations around housing and housing for all	2022/ Ongoing	• Planning Division Staff • Communications Staff • Camas Public Library • Elected Officials • Community Organizations • Business Community	• Number of activities and number of persons engaged
Suggested Next Steps:	• Explore and develop avenues for continuing community conversations about housing, housing for all, and housing's connections to economic vitality, jobs, schools, and transportation. Such possible avenues include the Camas Public Library, City website and social media, and collaboration with community organizations.		
STRATEGY #6			
Strategy 6: Communicate available affordable housing resources	2022/ Ongoing	• Planning Division Staff • Communications Staff	• Number of website visitors • Number of inquiries about the City's MFTE or other incentives • Number of affordable housing units built
Suggested Next Steps:	• Develop a page on the City of Camas website dedicated to housing. This page could share information about the current supply of affordable housing in the city and about first time homebuyer assistance available through the Washington State Housing Finance Commission's down payment assistance program and others. • Advertise resources available for housing developers, landlords, and other housing industry professionals, such as the City's Multifamily Tax Exemption (MFTE) and any other potential incentives.		

STRATEGY	START TIMEFRAME	RESPONSIBLE PARTY & POTENTIAL PARTNERS	PROGRESS MEASUREMENTS
STRATEGY #7			
Strategy 7: Build partnerships to develop and preserve affordable housing for individuals, families, and seniors. Explore expansion of the MFTE program.	2023/ Ongoing	• Planning Division Staff • Planning Commission • Communications Staff • Development Community	• Number of developer outreach efforts • Number of inquiries about the City's MFTE or other incentives • Number of affordable housing units built
Suggested Next Steps:	• Review the Washington State Housing Finance Commission's (WSHFC's) Qualified Allocation Plan (QAP) for Low Income Housing Tax Credits (LIHTC). • Develop an outreach strategy to prospective LIHTC, including but not limited to the Vancouver Housing Authority, and developers of affordable housing or other housing types desired by the City of Camas. • Explore the possibility of expanding the City's Multifamily Tax Exemption (MFTE) program. If recommended, present to Planning Commission for consideration and to City Council for approval and adoption.		
STRATEGY #8			
Strategy 8: Explore funding source and cost reduction options for affordable housing	2022/ Ongoing	• Planning Division Staff • Planning Commission	• Adoption of a revised impact fee structure • Number of affordable housing units built or preserved
Suggested Next Steps:	• Develop a strategy for identifying and tracking potential funding opportunities for affordable housing development or retention. As possible opportunities become available, evaluate suitability in Camas and, if an opportunity is recommended by staff, present to Planning Commission and City Council for consideration. • Explore the possibility of restructuring the City's impact fees to reflect the size of residential structures. If this approach is recommended by staff, develop a revised structure for presentation to Planning Commission and City Council. • Consider opportunities to reduce costs for existing low- and moderate-income and/or senior homeowners.		

Appendix B:
Survey Results

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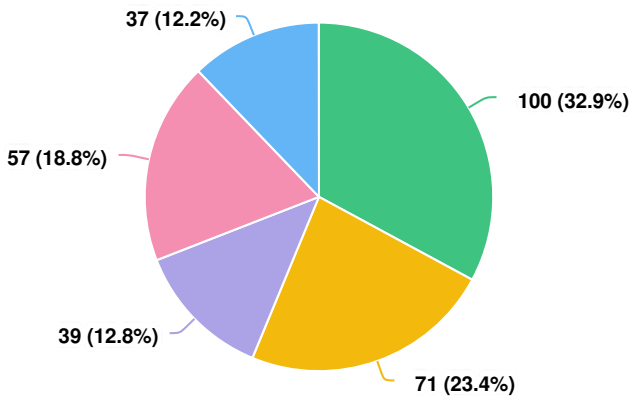
Camas Housing Survey

SURVEY RESPONSE REPORT
13 August 2020 - 22 June 2021

PROJECT NAME:
Your Housing Ideas

SURVEY QUESTIONS

Q1 How satisfied are you with the housing options currently available in Camas?

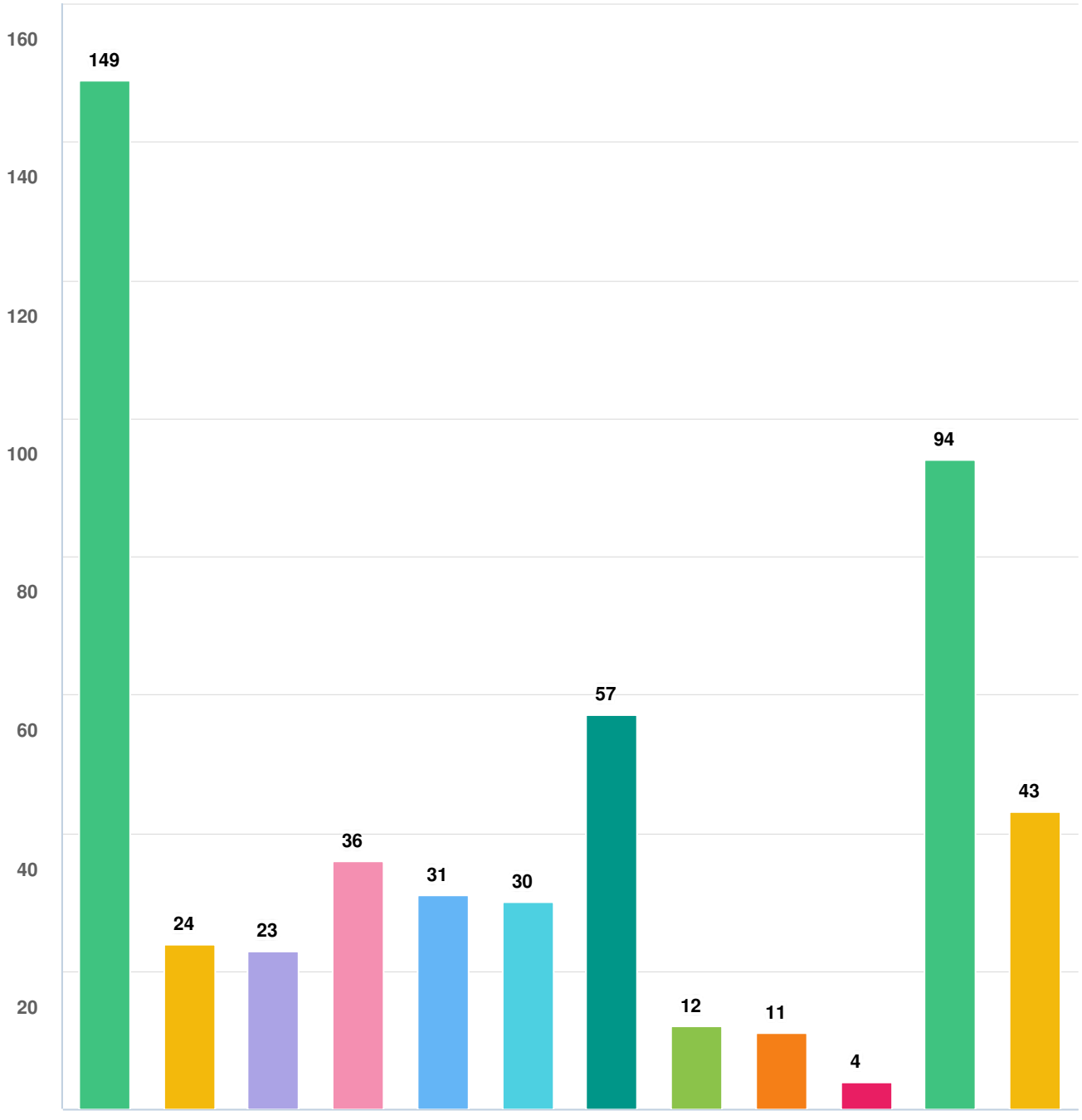


Question options

Very Satisfied
Somewhat Satisfied
Neither Satisfied nor Dissatisfied
Somewhat Dissatisfied
Very Dissatisfied

Optional question (304 response(s), 3 skipped)
Question type: Radio Button Question

Q2 Which factors most limit the housing choices available to you in Camas? Select up to three.



Question options

Cost
Location (too far from work, school, or other destinations)
Too small for my needs
Too large for my needs
Too few units available for sale
Too few units available for rent
Lacking desired amenities (outdoor space, parking, etc.)
Units are not accessible to persons with disabilities
Difficulty qualifying for a mortgage loan
Difficulty qualifying for a lease
None of these factors limit my housing choices
Other (please specify)

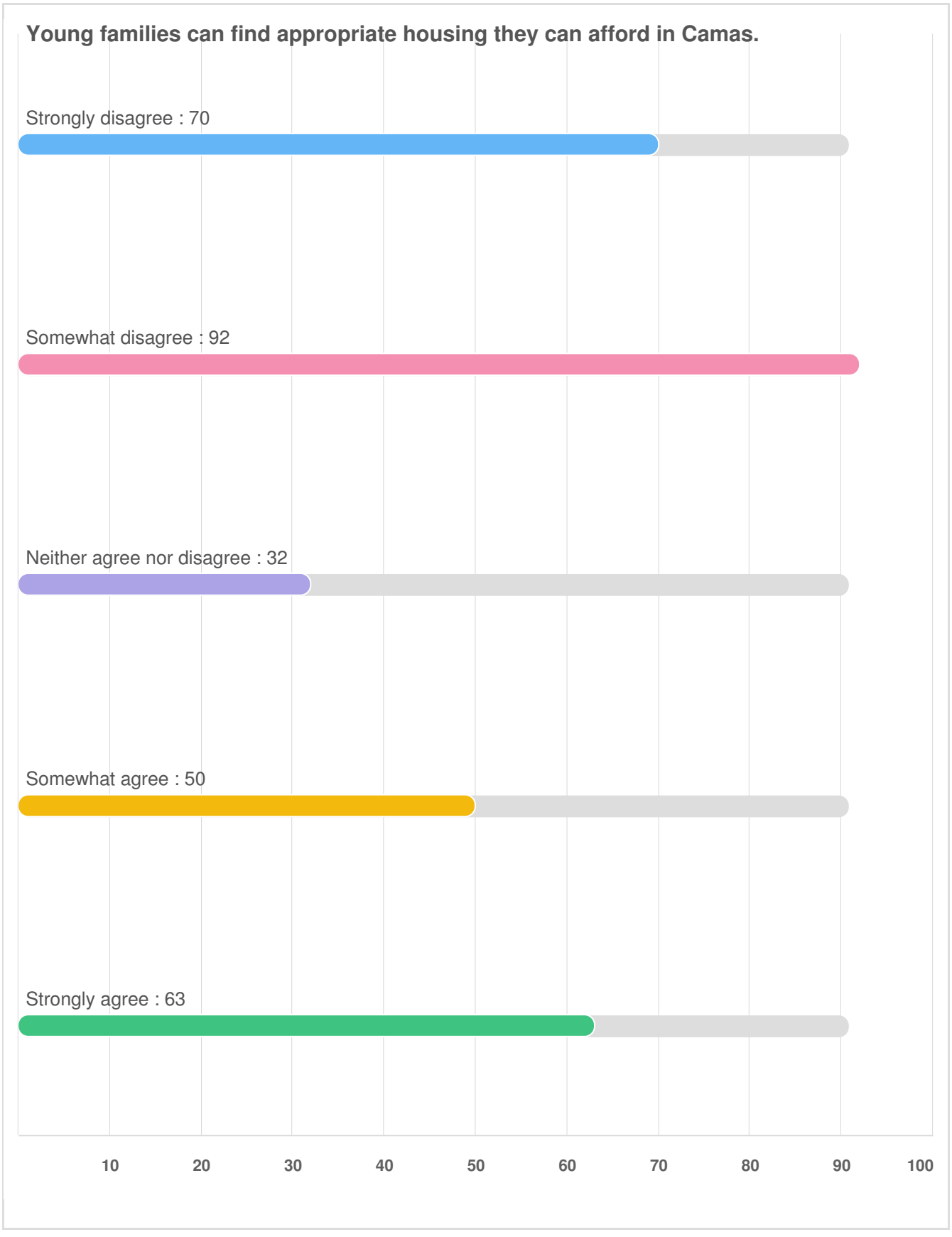
Optional question (306 response(s), 1 skipped)
Question type: Checkbox Question

Q3 Please indicate how strongly you agree with the following statements.

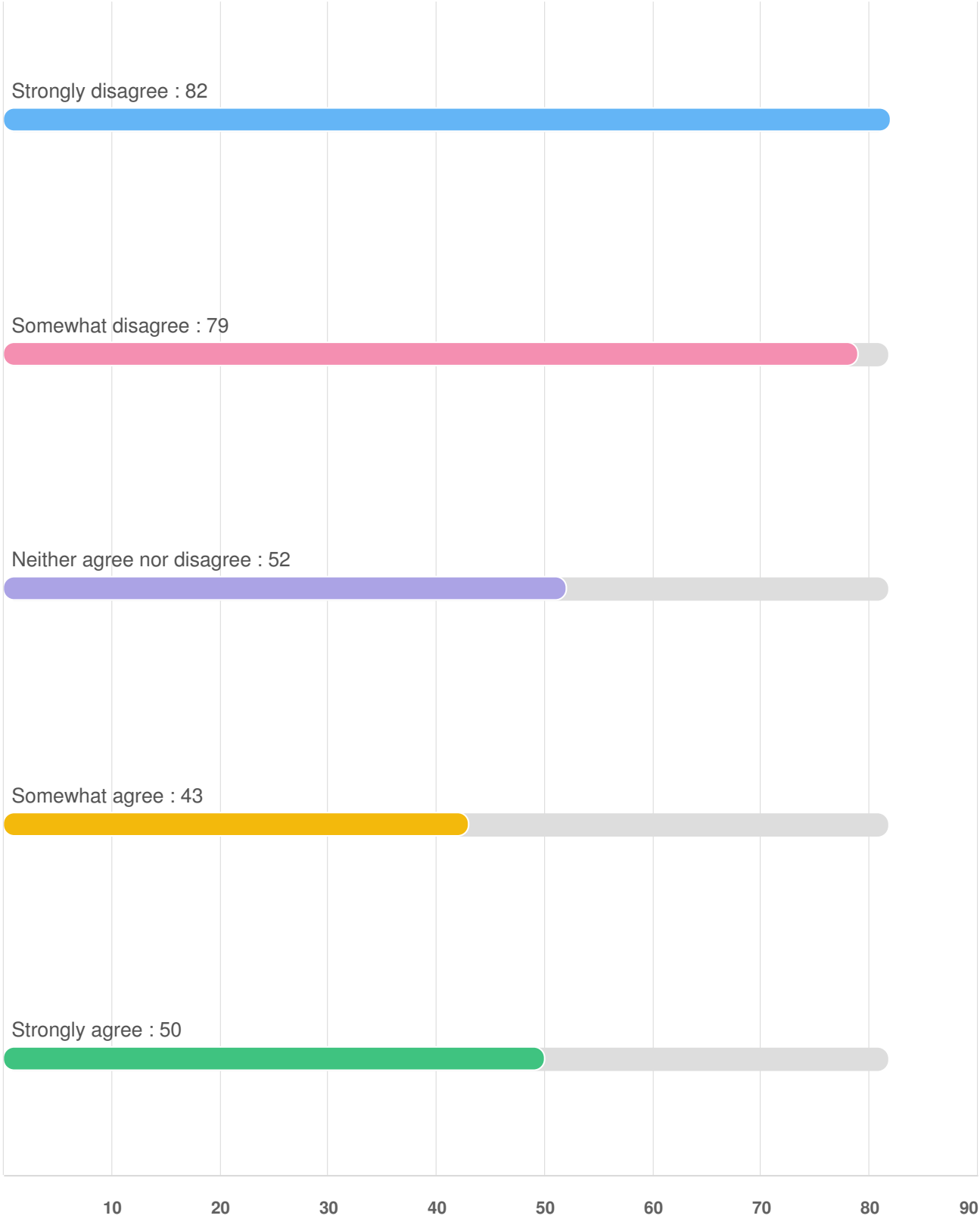


Optional question (307 response(s), 0 skipped)
Question type: Likert Question

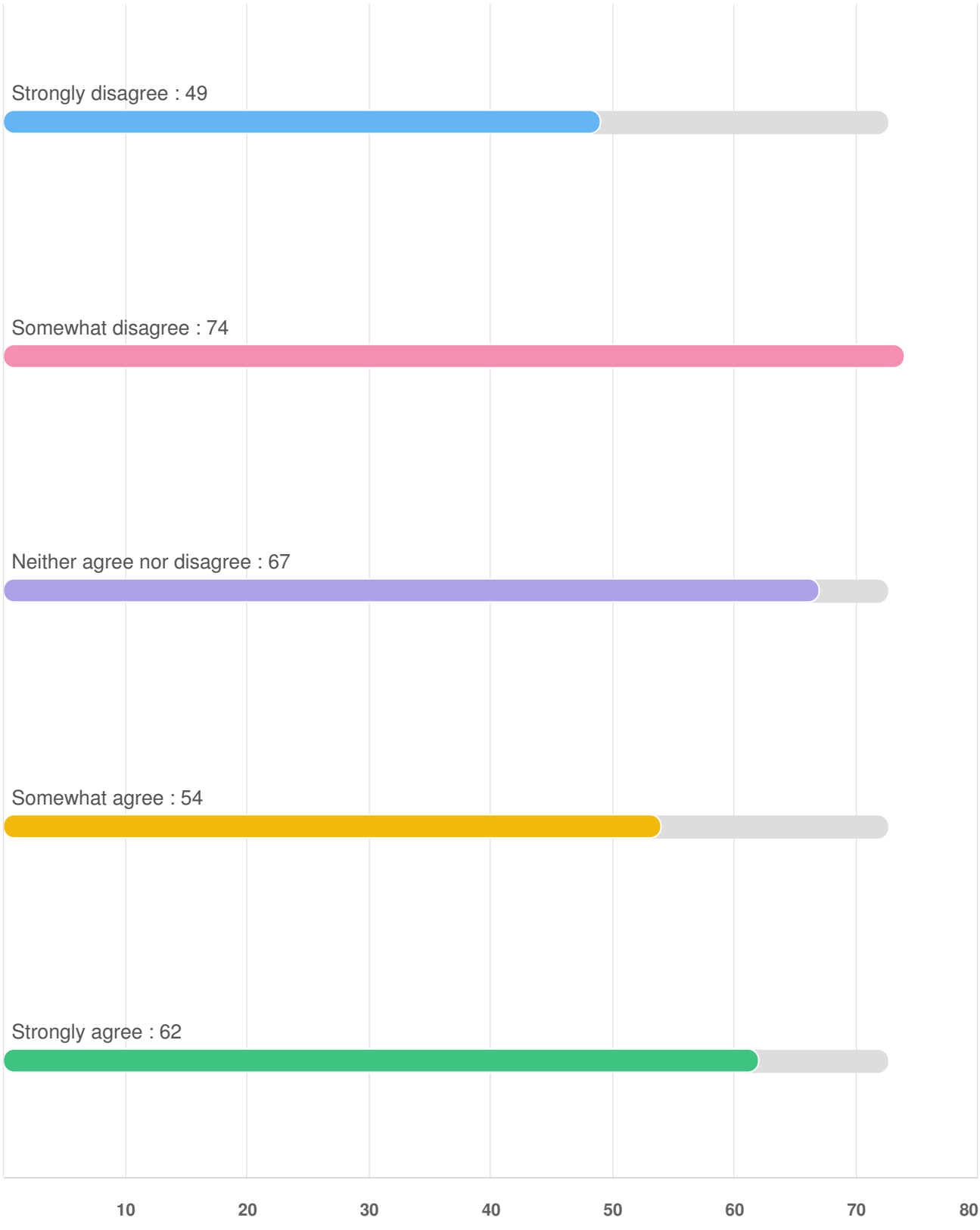
Q3 Please indicate how strongly you agree with the following statements.



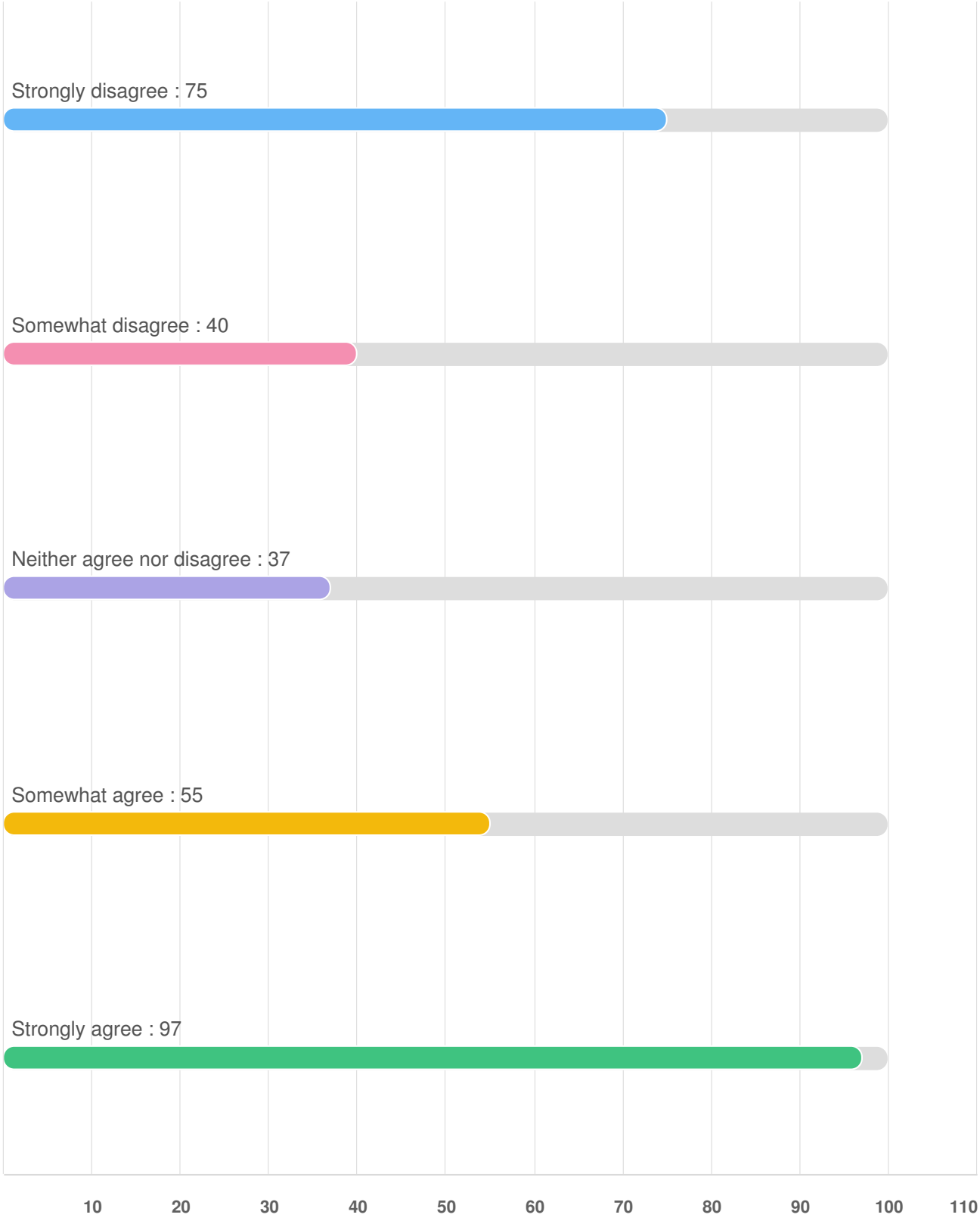
Seniors can find appropriate housing they can afford in Camas.



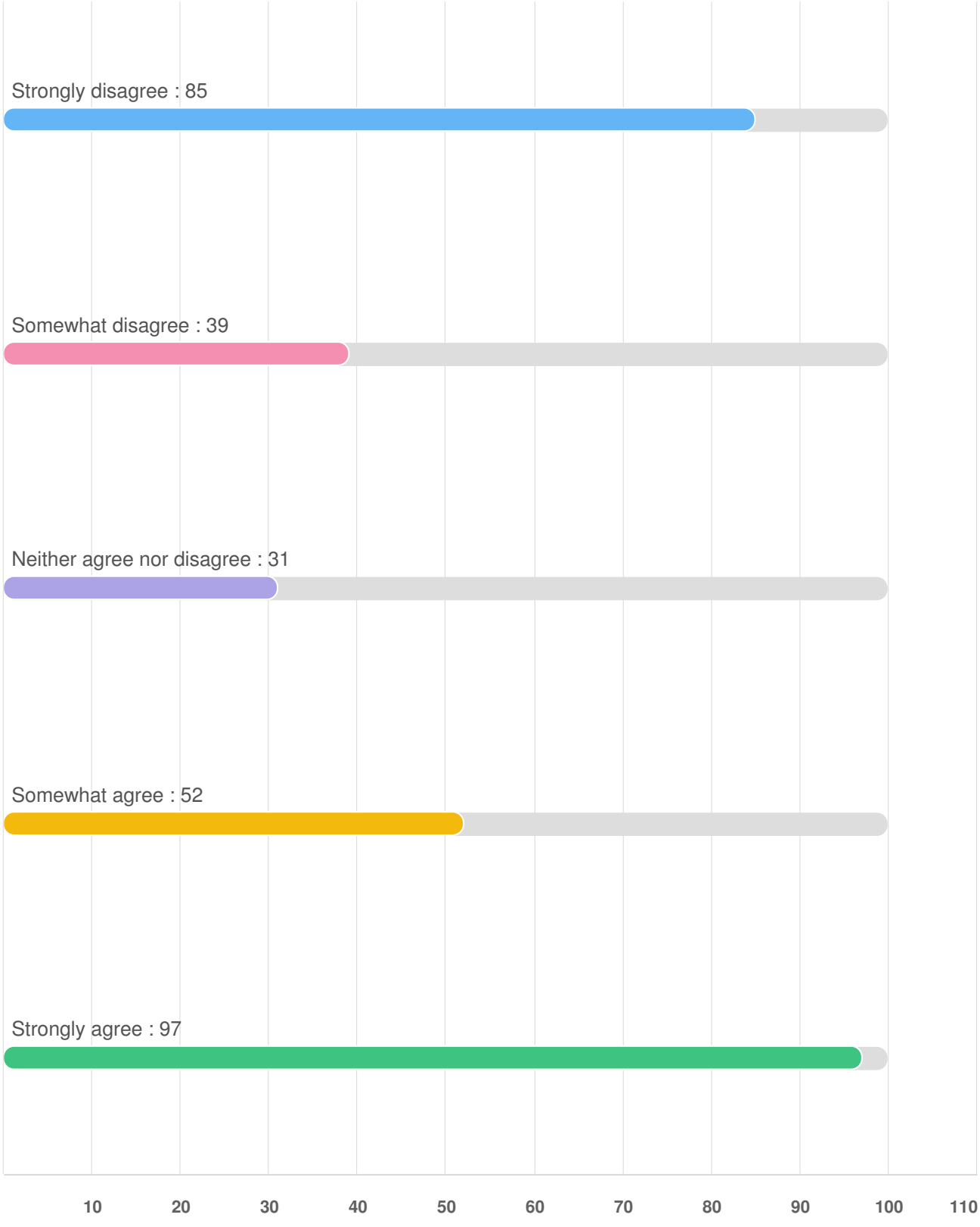
People who work in Camas can find appropriate housing they can afford in Camas.



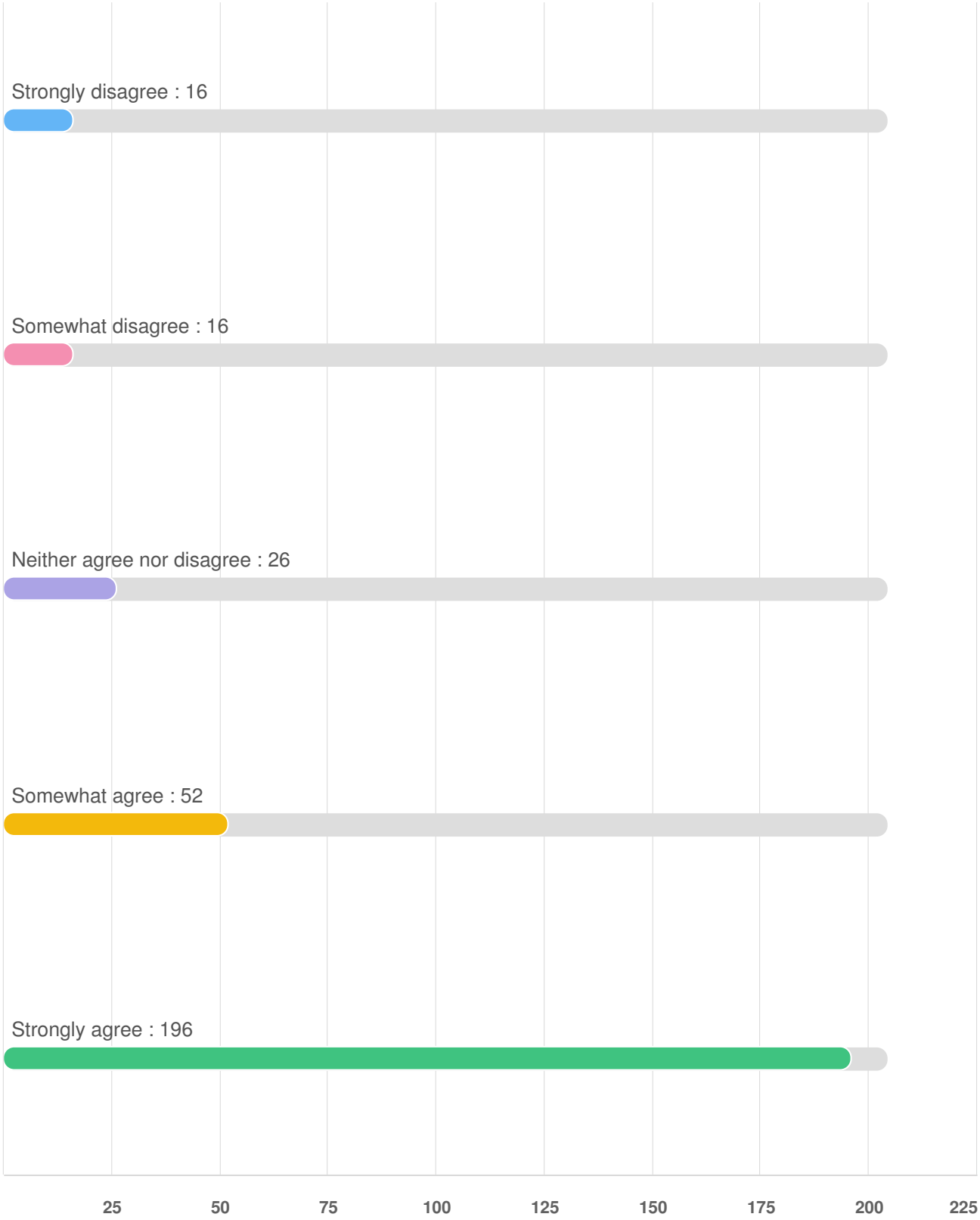
Camas needs greater variety in terms of housing types and prices.



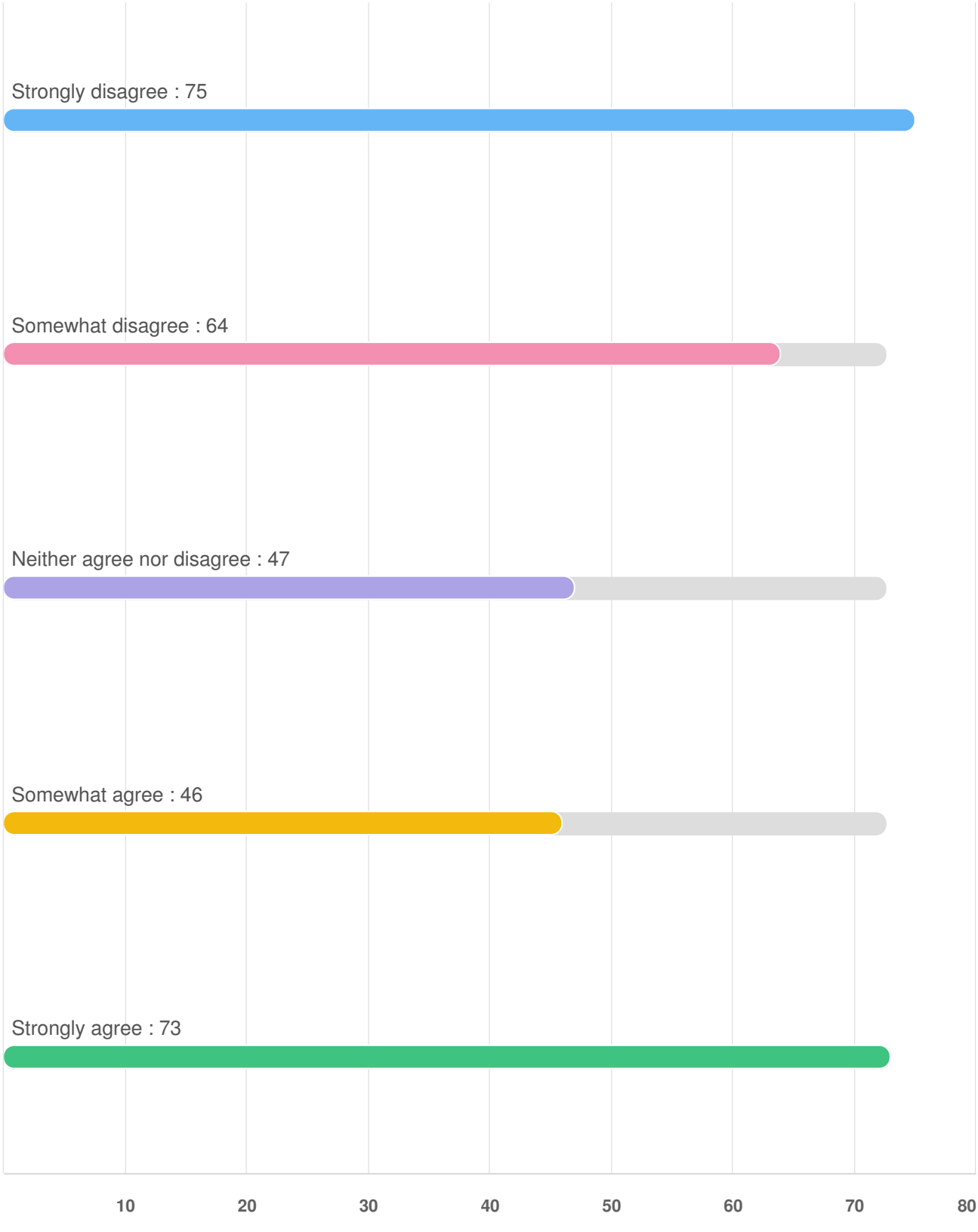
Lack of affordable housing is a serious issue in Camas.



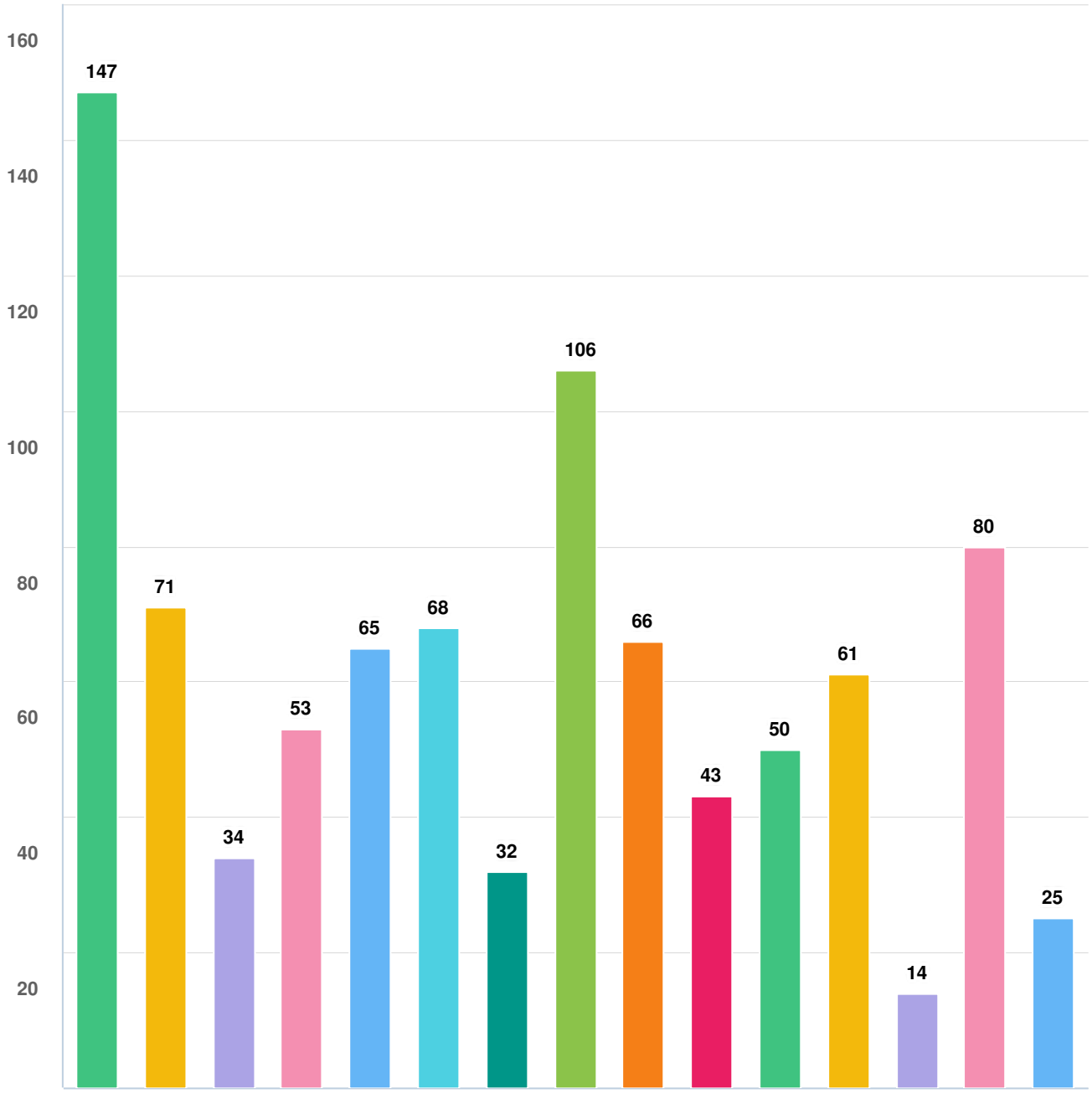
Camas should be cautious about any new residential development activity to preserve the character of the community.



There is enough housing at appropriate sizes and costs to meet the needs of our residents for the next 20 years.



Q4 Which of the following types of housing does Camas need more of? Check all that apply.

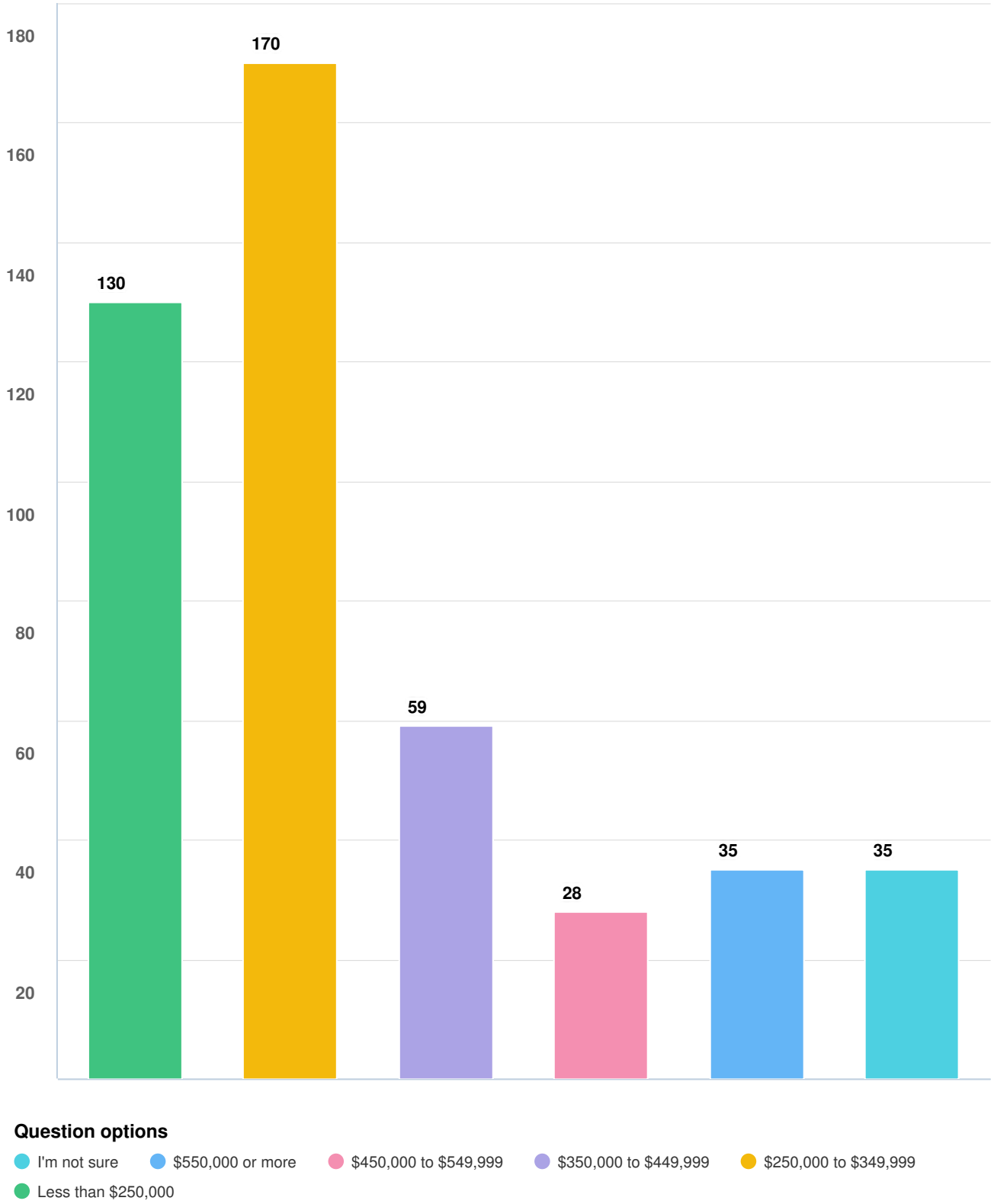


Question options

Other (please specify) · There is enough housing to meet our city's needs · I'm not sure
Accessory dwelling units (e.g., basement apartments, granny flats, carriage houses) · Tiny homes
Supportive housing for people with special needs · Accessible housing/assisted housing for people with disabilities
Senior housing · Luxury apartments · Mid-range apartments · Affordable/workforce apartments
Duplexes, triplexes, or four-plexes · Rowhouses · Large single-family homes · Small single-family homes

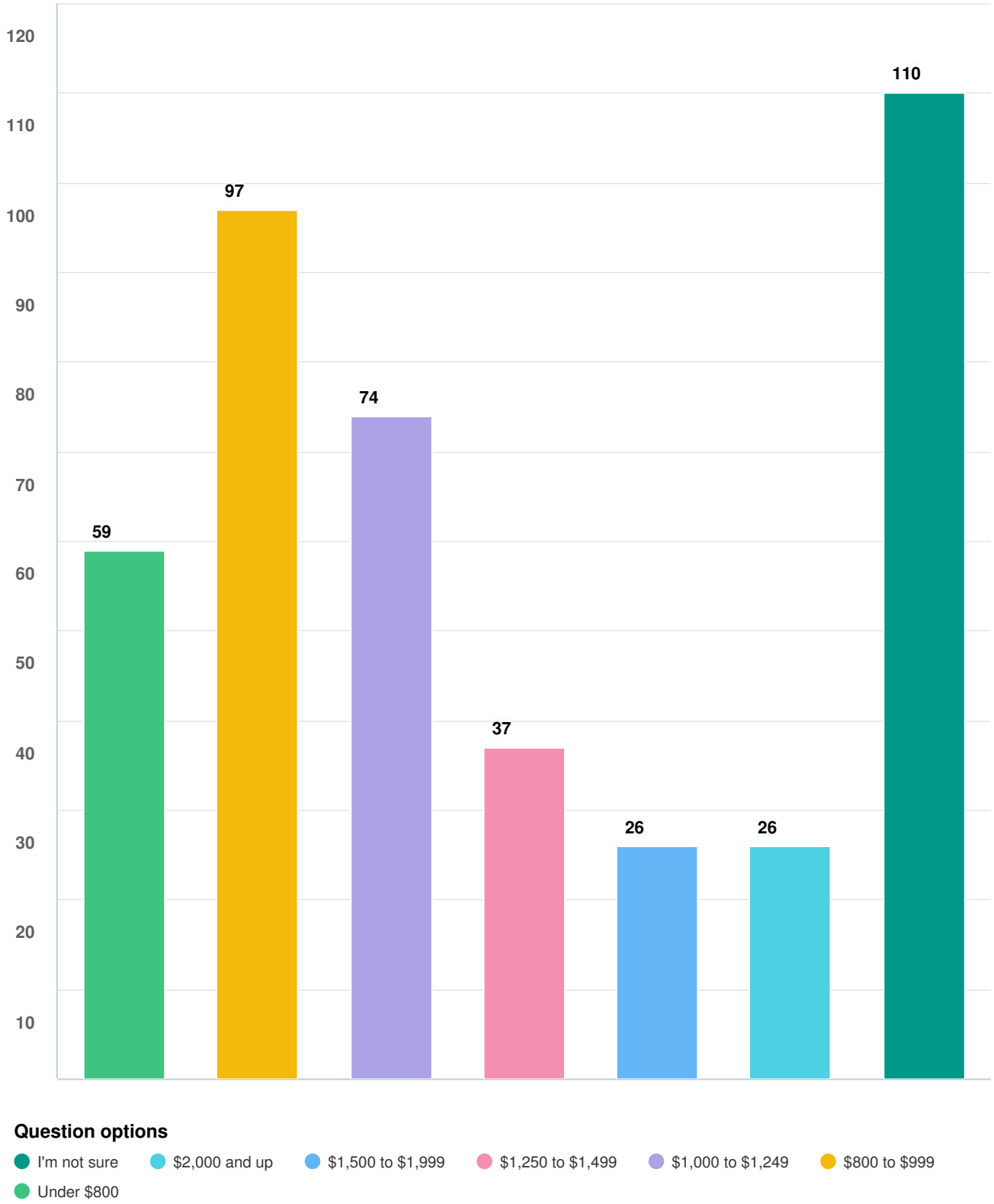
Optional question (306 response(s), 1 skipped)
Question type: Checkbox Question

Q5 In your opinion, what price range(s) have the biggest shortage of for-sale housing in Camas? Select up to two.



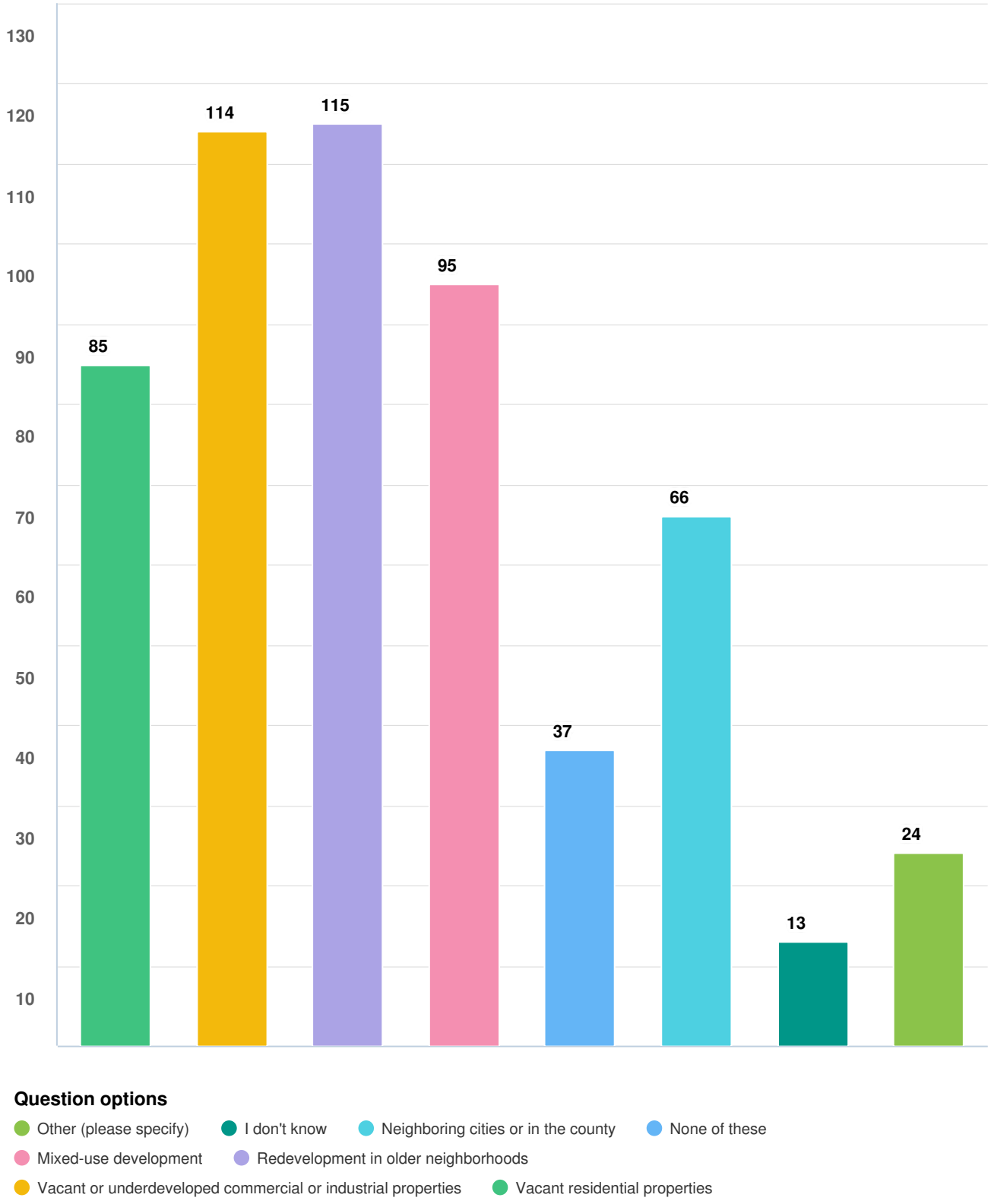
Optional question (302 response(s), 5 skipped)
Question type: Checkbox Question

Q6 In your opinion, what rental range(s) have the biggest shortage of rental housing in Camas? Select up to two.



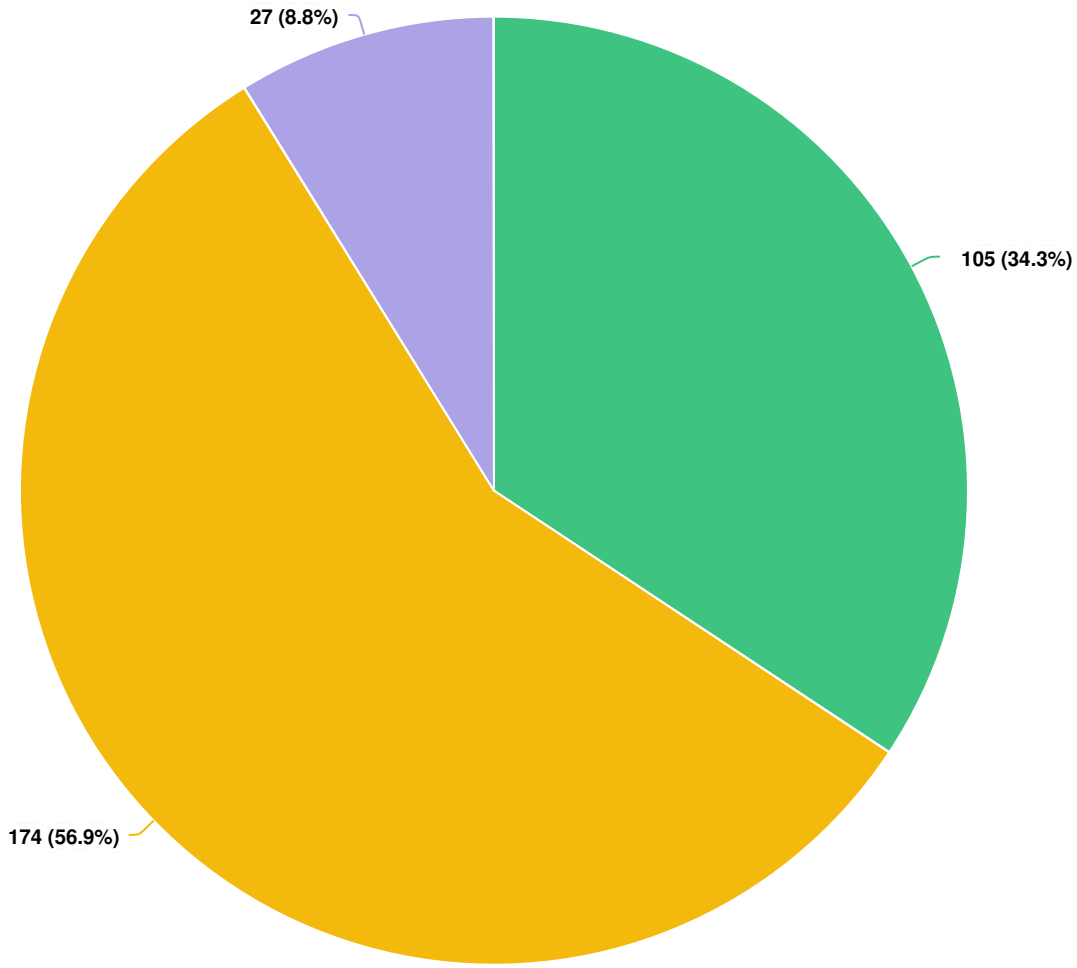
Optional question (303 response(s), 4 skipped)
Question type: Checkbox Question

Q7 Thinking about Camas over the next 20 years, where do you think new housing would be most appropriate, considering that it could be any type (e.g single family homes, ADUs, rowhouses, apartments, etc.)? Check all that apply.



Optional question (305 response(s), 2 skipped)
Question type: Checkbox Question

Q8 If you are a homeowner, have you ever considered adding an Accessory Dwelling Unit (ADU) to your property?

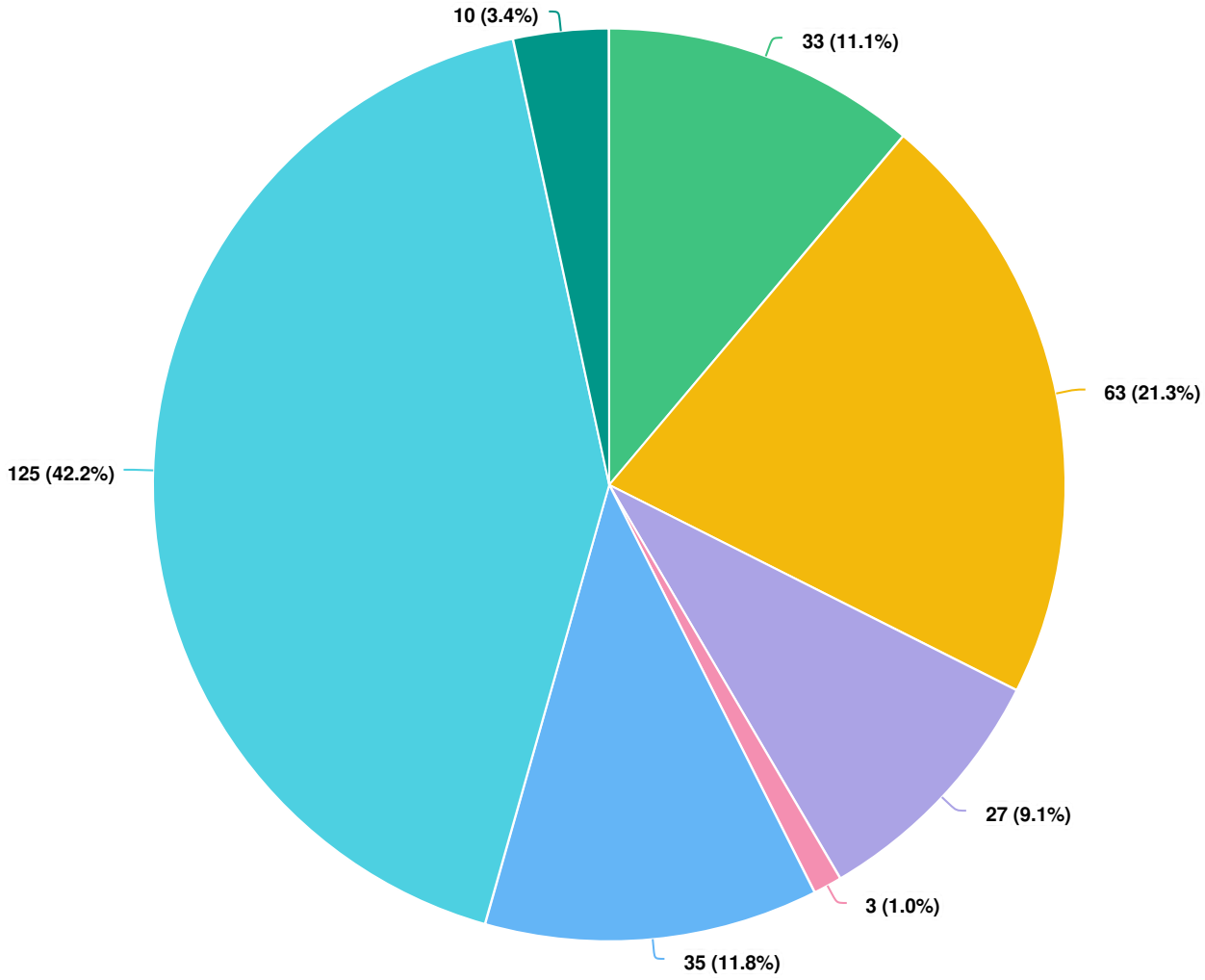


Question options

Not applicable / I am not a homeowner No Yes

Optional question (306 response(s), 1 skipped)
Question type: Radio Button Question

Q9 If you considered adding an ADU to your property, what would be your primary intent in doing so?

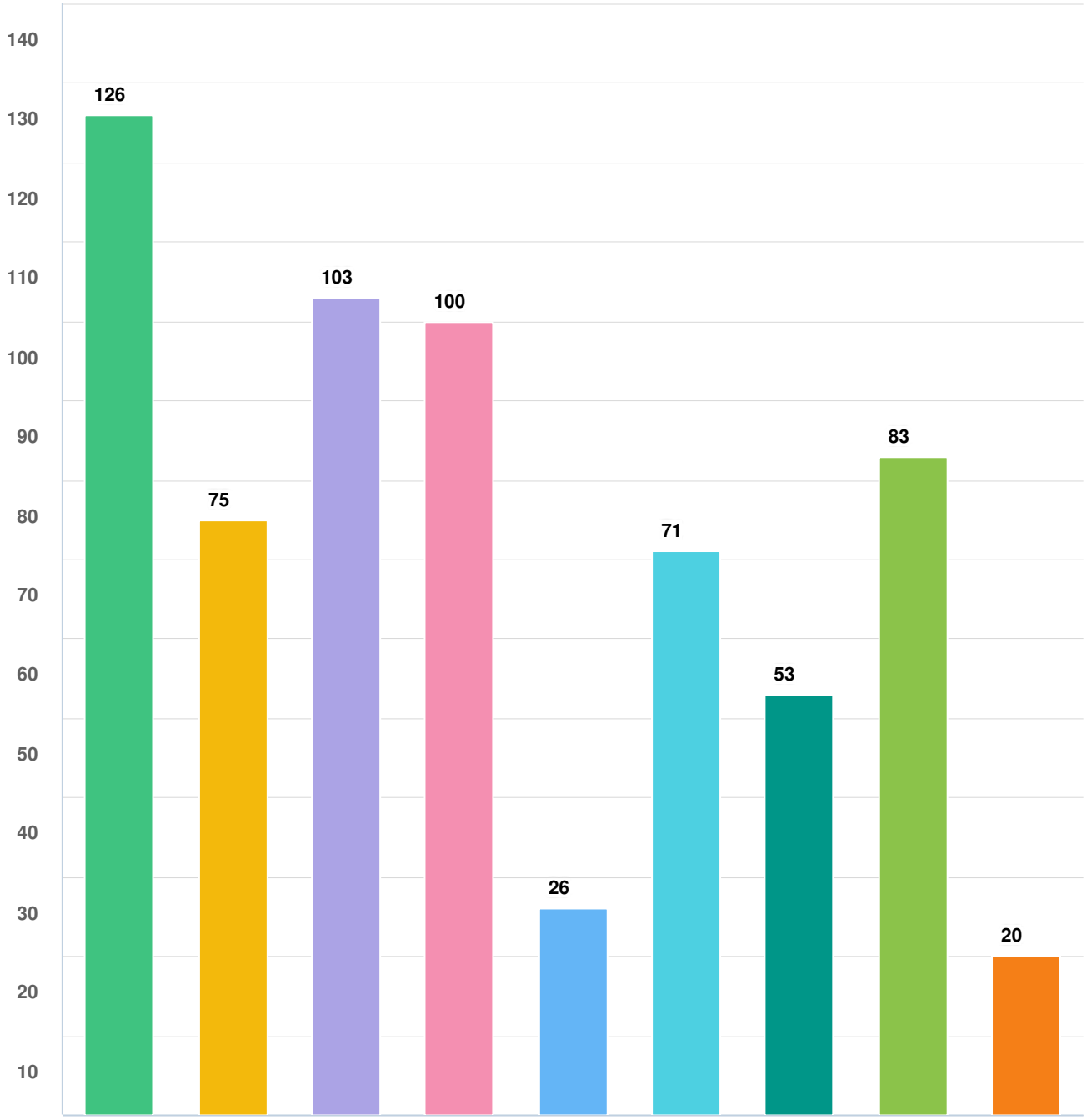


Question options

- Other (please specify)
- Not applicable
- Earn extra income by renting the space
- Increase the value of your home
- Create a guesthouse
- Provide a residence for relatives or friends
- Provide a residence for someone in need of care or a caregiver

Optional question (296 response(s), 11 skipped)
Question type: Radio Button Question

Q10 What types of assistance may be helpful to address housing affordability needs in Camas? Check all that apply.

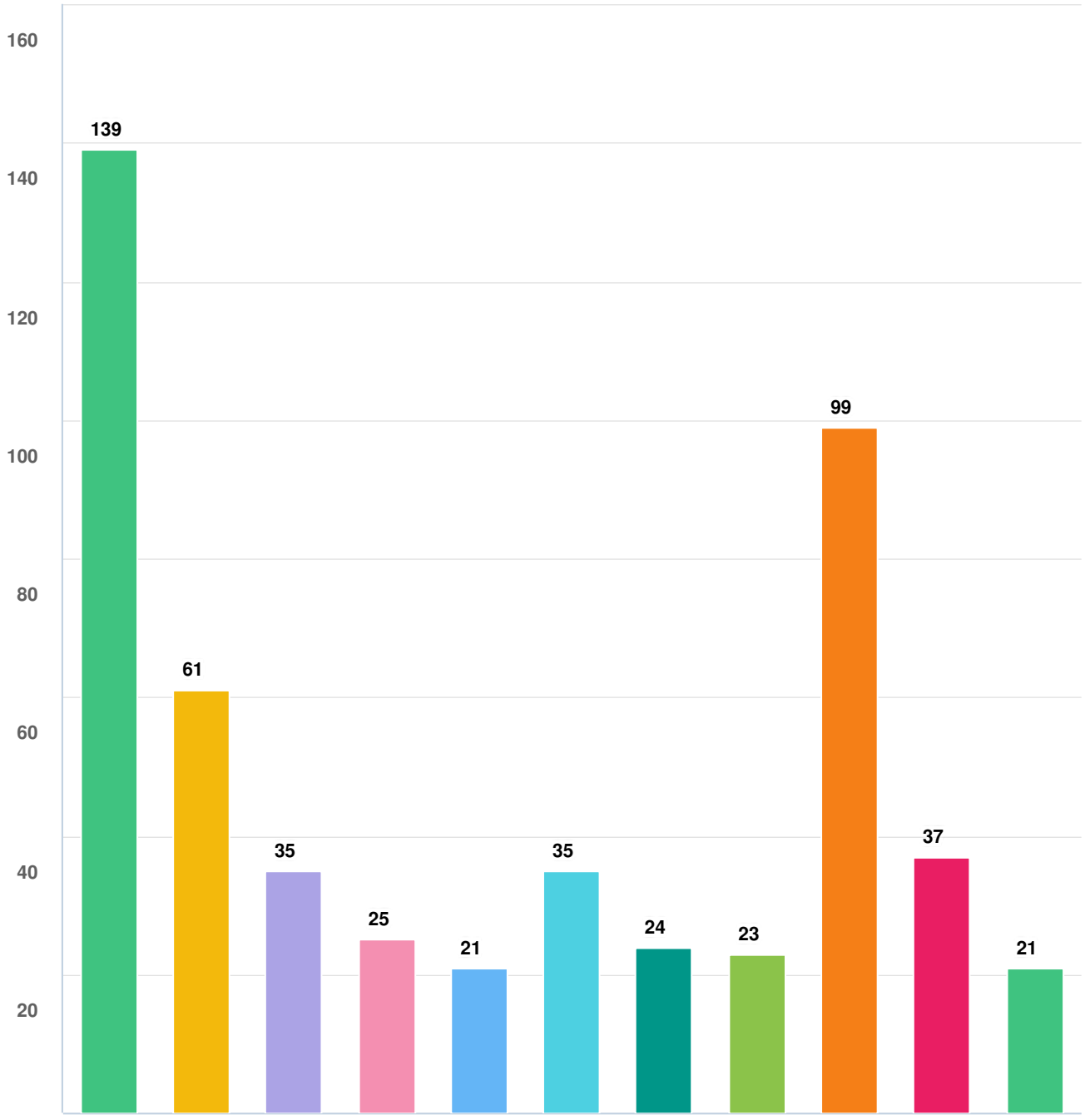


Question options

Other (please specify) · None of the above · Assistance with language or cultural barriers · Assistance for people who are homeless or at-risk of homelessness · Help with rental payments · More affordable rental units · First-time homebuyer down payment assistance · Homeownership preparation / credit counseling classes · More affordable for-sale units

Optional question (304 response(s), 3 skipped)
Question type: Checkbox Question

Q11 Are any of the following barriers to obtaining housing in Camas? Check all that apply.



Question options

Other (please specify) I'm not sure None of the above Bias based on race or ethnicity
Discrimination or steering by real estate agents Discrimination by landlords or rental agents
Discrimination by mortgage lenders Difficulty qualifying for a lease Difficulty obtaining a mortgage
Housing is too big or too small Lack of affordable housing

Optional question (303 response(s), 4 skipped)
Question type: Checkbox Question

Q12 Are there any other issues or concerns you have about housing in Camas?

Screen Name Redacted 9/28/2020 02:19 PM	Too many cookie cutter neighborhoods that are taking over open space. Growth needs to be managed and be thoughtful.
Screen Name Redacted 9/28/2020 02:24 PM	Too much large single family housing in the hills, without enough environmental regulation.
Screen Name Redacted 9/28/2020 02:42 PM	Too many HOA's; vacant bank-owned properties; prices too high for quality of homes (both old and new); lack of housing downtown
Screen Name Redacted 9/28/2020 03:10 PM	It seems majority of residential neighborhoods are redundantly governed by private HOA. There should be easy way for new owners or potential new owners to opt-out of HOA rules and be govern solely through Camas city government.
Screen Name Redacted 9/28/2020 03:13 PM	Planning for increased housing in downtown/close to downtown for best use of space while considering parking. It's unfortunate that the people who work in downtown and make it so wonderful can not always afford to live in Camas.
Screen Name Redacted 9/28/2020 03:17 PM	Starter homes at 450k is unacceptable. 20% down for a new family starting out is not realistic. Inventory below 450k is hard to attain (multiple offers).
Screen Name Redacted 9/28/2020 03:40 PM	Camas is trying to jam way too much housing in too small an area. We already have major issues with runoff spoiling the lakes and creeks. It is not environmentally appropriate to build so much when it spoils the waterways. Also, there isn't enough fresh water supply for more homes.
Screen Name Redacted	Any new development should

9/28/2020 04:48 PM	consider development through the lens more sustainable development, reducing climate change, and promoting healthy lifestyles.
Screen Name Redacted 9/28/2020 06:15 PM	Lot sizes which are very small and offer nearly no outside open space.
Screen Name Redacted 9/28/2020 06:47 PM	Logistics. Everything gets tied up in the process and the fees are obscene. Camas can't even handle the traffic currently. Roads must be 4 lanes and roundabouts two lane. Drrr
Screen Name Redacted 9/28/2020 07:12 PM	I don't understand why we let developers squeeze so many houses on a lot and tear down all the trees.
Screen Name Redacted 9/28/2020 10:36 PM	I don't want huge tracks of houses that are super close together, all look the same with no neighborhood character, and have tiny streets taking over nature areas. I don't want Camas to look like California I want it to keep it's character. The smaller houses with distinct character in the Crown park area are much more pleasant than the new developments around Woodburn for example. I would rather variety all mixed into a neighborhood to help varieties of people to intermix and give neighborhoods interest.
Screen Name Redacted 9/28/2020 11:32 PM	The way Camas has allowed developers to ruin the Woodburn school area is shameful. It is easy to see that they allowed this for the high property tax amount we all have to pay. Each home having to pay these high property taxes twice a year - we get it it's about the money. The homes are crammed together, flag lot upon flag lot until they look like apartments complete with parking lots because there are TOO many homes in a square foot and they can't even park their cars in their 'driveways' ...The homes don't even

	appear to be up to code (they are closer than 5 ft) to the next home - it looks disgusting and takes away from our Camas charm - WE despise this - (except Californian's) so PLEASE do us all a favor and DO NOT continue to do this sort of building - it ruins our town...in many ways. So instead have the homes a respectable distance and sprinkled throughout Camas within older neighborhoods as well as new developments and in outer lying areas -- Keeping in mind the tree's - they are disappearing - WE do not want to end up a little Silicon Valley - let's be mindful of our resources and environment before they are gone - and we are nothing more than just another 'big' town.
Screen Name Redacted 9/29/2020 05:36 AM	Too many houses close together. Wrecking land that animals were using as their home.
Screen Name Redacted 9/29/2020 05:47 AM	Avoid building apartments as it brings values down along with other social issues. Leave the apartments in Vancouver
Screen Name Redacted 9/29/2020 09:50 AM	City infrastructure development needs to come before the housing development. The infrastructure needs to be paid by the developers and new homeowners. Existing homeowners should not bear the cost of new development. Any consideration of ADU or increased density in existing neighborhoods needs to include street and parking needs. Increased density will quickly change the culture and dynamics of Camas. There are plenty of lower cost housing options within minutes of Camas. Why do we feel that Camas needs to offer all types of housing? We are a suburb of Vancouver and Portland not a stand-alone city.

Screen Name Redacted 9/29/2020 10:21 AM	Probably have enough single-family homes planned. I'm concerned about schools being able to handle the increase in population.
Screen Name Redacted 9/29/2020 01:33 PM	Too many developments going in. The urban growth needs to slow. And the developments that are going on, are too tight and close to neighbors. I can't even find a house to buy that has a place for us to park our boat.
Screen Name Redacted 9/29/2020 03:08 PM	Houses are jammed together in tiny lots with no trees or open spaces
Screen Name Redacted 9/29/2020 04:20 PM	nope
Screen Name Redacted 9/29/2020 04:26 PM	over population.
Screen Name Redacted 9/30/2020 12:14 AM	traffic congestion seems to be increasing in Camas/Washougal, SPECIFICALLY commercial vehicles, double axle dump trucks, etc. both NE 3rd Ave thru town East/West That drive WAY too fast. This is making this a LESS livable community. so, no matter WHAT you may do w/ housing expansions/opportunities . . . need to consider livability factors, please. Hwy 14 roundabouts - - don't care for them.
Screen Name Redacted 9/30/2020 07:55 AM	Lack of diversity in housing options will lead to lack of diversity in our community and schools and will negatively impact our quality of life.
Screen Name Redacted 9/30/2020 11:06 AM	As we increase the density I'm concerned about having enough off-street parking. Adding to the traffic issues.
Screen Name Redacted 9/30/2020 12:10 PM	Rows and rows of new housing (whichever type) are not the only answer to creating space where people want to live. How can we increase our walkable spaces, mixed-

	use development, and access to high quality amenities for all Camas citizens?
Screen Name Redacted 9/30/2020 01:14 PM	If we have more developments, please focus on quality of construction, environmental impacts and developer-provided free space, and developers contributing to enlarging school capacity so existing citizens donipay the price.
Screen Name Redacted 9/30/2020 02:39 PM	Architecture plays a significant role in shaping the future of a community. We should be considering how our decisions might look 100 years from through social, environmental, and financial outcomes.
Screen Name Redacted 9/30/2020 02:45 PM	Please limit huge storage unit buildings
Screen Name Redacted 10/01/2020 03:58 PM	OVER-DEVELOPMENT already! Enough is enough! Not one tree is left standing when you guys let these greedy developers in. AND THEN YOU ALLOWED FOR BUILDING ON OUR WETLANDS???? WTF????
Screen Name Redacted 10/01/2020 11:43 PM	For homeowners- property taxes are out of control. They are on the verge of pricing current and new homeowners out of the city. Very unfortunate.
Screen Name Redacted 10/02/2020 10:57 AM	I see Camas trying to be everything to everyone...WE ARE NOT! We shouldn't try to fit to every one's needs. STOP giving away what most have worked hard for and want to live in an area where there is safety, good schools and good policing, low crime...that's what we work hard for and pay way too much in taxes to do so!
Screen Name Redacted 10/03/2020 09:17 AM	Our concern would be to change the dynamic in Camas . This city has small town atmosphere but provides big city amenities. Multiple dwelling

	units do not add to this city anything that is positive. Increasing traffic, crime and population is what we will get. This resident does not support multiple dwelling units.
Screen Name Redacted 10/03/2020 08:54 PM	I am concerned with how high the price is for small starter homes and that there are bidding wars for homes.
Screen Name Redacted 10/05/2020 08:05 PM	There are enough affordable housing options in Camas. I would like to see luxury condos in areas that are needing redevelopment.
Screen Name Redacted 10/06/2020 09:36 AM	We moved to Camas to get away from the big city feel, crime, vandalism, graffiti. We do not want low income housing in camas. Many homeowners will be likely to move if this happens.
Screen Name Redacted 10/06/2020 09:49 AM	Camas is known as a safe, quaint town. Increased population places the city in a high rate of crime.
Screen Name Redacted 10/06/2020 09:51 AM	You are destroying the environment and trees with all of the houses you are allowing. There is not enough infrastructure capacity (roads, school class size) to deal with this swelling of homes and the density of which you are packing them in.
Screen Name Redacted 10/06/2020 10:00 AM	Please don’t turn Camas into Portland
Screen Name Redacted 10/06/2020 10:00 AM	Affordable housing for seniors
Screen Name Redacted 10/06/2020 10:03 AM	Maintain the current housing. Don’t bring Portland’s problems to Camas by creating rampant low income or government assisted housing.
Screen Name Redacted 10/06/2020 10:19 AM	We do not want or need low income housing to drag down our property values. Let the market do its job.
Screen Name Redacted	Stop building on Camas land. We

10/06/2020 10:35 AM	are ruining the small town open country feel!
Screen Name Redacted 10/06/2020 10:36 AM	To many huge houses for the rich which drives up the market causing those who have lived here most of their lives to be unable to afford it. No more!!
Screen Name Redacted 10/06/2020 11:19 AM	We do not need the city to come in and decide what kind of housing is needed. It is up to the buyers and sellers. If you truly want to help, cut down city spending and lower taxes so people can pay off their property faster.
Screen Name Redacted 10/06/2020 11:58 AM	There are almost no options for middle class residents.
Screen Name Redacted 10/06/2020 12:03 PM	Too much development. Houses too close together.
Screen Name Redacted 10/06/2020 12:24 PM	That it is being over developed and is going to lose the charm that brought families here in the first place
Screen Name Redacted 10/06/2020 01:02 PM	We do not need more apartments or high density housing. Leave that to Vancouver and Portland. We do not want to be those places.
Screen Name Redacted 10/06/2020 03:27 PM	Yes, the City has shown a lack of respect for our green spaces and parks! Cutting down our trees and building ridiculous round abouts! More housing is just more housing and probems!!! Getting a survey like this is so disheartening- do you city employees even live in Camas or are you trying to justify your jobs?
Screen Name Redacted 10/06/2020 06:46 PM	No
Screen Name Redacted 10/06/2020 06:56 PM	We have plenty of housing and do not need to build. We need to preserve our small town
Screen Name Redacted	Sad to see the loss of green space

10/06/2020 10:58 PM	on the mountains.
Screen Name Redacted 10/08/2020 04:10 AM	Please keep Camas an aspirational town and don't dilute the tax base. Don't make the mistakes so many cities and towns make by adding density and increasing low income housing. We are not immune to the problems other cities and towns face . Attracting home buyers who are willing to pay high per capita property taxes helps the city maintain a high level of services.
Screen Name Redacted 10/08/2020 01:10 PM	Keep Camas rural.
Screen Name Redacted 10/09/2020 05:07 PM	Single story homes on large lots
Screen Name Redacted 10/09/2020 05:23 PM	The charm of the city is being ruined by over building in wildlife habitat
Screen Name Redacted 10/09/2020 05:44 PM	Impact fees and exorbitant permit and utility hookup fees have produced housing developments that only larger corporate builders can afford to make. Since govt fees are so high, we see neighborhoods that no one would aspire to live in. High density a long way from public transport is counterintuitive to what cities should desire.
Screen Name Redacted 10/09/2020 08:04 PM	Development plans for the north side of the lake need to be very, very carefully planned and considered so that the charm of Camas is not destroyed, and a larger traffic nightmare is not created. I don't think ADUs are the answer unless there are strict zoning regulations. For example, property with 2DU per acre can easily accommodate the parking issues and noise level created by an ADU. Smaller lots do not enhance livability for neighborhoods, but

	create parking headaches and additional noise and congestion. If Camas is intent on growth, it would be amazing to study master planned communities such as Highlands Ranch, CO and Rancho Santa Margarita or Ladera Ranch in Orange County. These communities have tried to balance housing needs and livability.
Screen Name Redacted 10/09/2020 08:18 PM	people afraid of growth
Screen Name Redacted 10/09/2020 08:19 PM	Small lots, crammed housing. Looking like a shitty city.
Screen Name Redacted 10/09/2020 08:33 PM	The cost is astronomical for someone like me who is single! I'm 47 years old living with my mother because of the price's of apartments! I have worked my whole life since age 15 and I never dreamed there would be a time I couldn't afford an apartment! I have excellent rental history but literally can not afford to spend an entire paycheck on rent because I am single!
Screen Name Redacted 10/09/2020 08:41 PM	The issues I have with regards to housing is that new housing will kill the natural open spaces that we were known for. Current housing around the core center of Camas is looking dilapidated and in bad need of code compliance to get these people to clean up their houses & yards...Drive around and you will see. I predict that if these eyesores continue, it will create a big divide between the old downtown and the new subdivisions...
Screen Name Redacted 10/09/2020 08:41 PM	Stop new housing developments (subdivisions) of big houses. Add public transportation. Think about schools/infrastucture (roads) before adding new housing.

Screen Name Redacted 10/09/2020 08:54 PM	Too many dangerous fireworks. Two days of the year it's uninhabitable.
Screen Name Redacted 10/09/2020 09:26 PM	Concerned about the future of the new housing developments and the condition/value they will have 20 years from now. Tract homes tend to lose value and are less likely to keep families in the city long term. If too many are built, the concentration can negatively impact the future of the Camas community.
Screen Name Redacted 10/09/2020 09:58 PM	We don't need anymore small row houses or townhouses with no backyards that cost as much as a whole house in Washougal or Vancouver.
Screen Name Redacted 10/09/2020 10:03 PM	Increased housing is destroying our city. Stop Turing us into another California LA!
Screen Name Redacted 10/09/2020 10:14 PM	When one house on property is sold (or a golf course) and the land is rezone to have lots thatvaye 5k-6k square feet is ridiculous. It is not sustainable for the Camas infrastructure especially schools.
Screen Name Redacted 10/09/2020 10:17 PM	Too many sub divisions
Screen Name Redacted 10/10/2020 01:12 AM	Too many large homes need smaller homes
Screen Name Redacted 10/10/2020 04:02 AM	None
Screen Name Redacted 10/10/2020 06:46 AM	What were the impact fees on the hundreds of new homes being built this last few years? And why the heck have our property taxes continued to increase so greatly every yr when our homes are getting older and there are so many new homes that are now paying taxes as well.

Screen Name Redacted 10/10/2020 07:47 AM	Stop any further developments. Camas is getting too big and it's affecting schools, traffic, utilities, etc!
Screen Name Redacted 10/10/2020 07:59 AM	I don’t want rapid development or the large scale addition of more housing.
Screen Name Redacted 10/10/2020 08:11 AM	I own a home outside of the city limits and there is so much red tape one has to go through to get a permit to build any structure on there property.
Screen Name Redacted 10/10/2020 08:57 AM	I am a landlord in Camas. I rent my places below market on purpose because I believe in affordable housing, and my tenants are amazing and respectful because of that. But I have had to raise the rent continuously every year because of property tax increases. That to me is the biggest hurdle for affordability.
Screen Name Redacted 10/10/2020 10:04 AM	Camas has way too much housing development going on and it's ruining the landscape and our town. Traffic, overcrowded schools are already a problem. Not enough parking downtown as it is and new building/development just continues regardless. Think about those who have lived here, those who moved here and purchased older homes to avoid contributing to development. Think about those folks who have lived here a lifetime, paid off their homes and can no longer afford to live here b/c of the high taxes! Crime has increased! Do NOT turn beautiful Camas over to greedy builders. You will turn our town into something out of California! Camasonians do NOT want that - listen to your fellow neighbors!
Screen Name Redacted 10/10/2020 10:57 AM	I am concerned with convenient, short-term solutions like ADU's that will be difficult to control, have the ability to change neighborhoods with

	overcrowding of cars, turn into VRBO's and violated CC&R's. I am not for any subsidized government housing.
Screen Name Redacted 10/10/2020 11:40 AM	Too many small lot housing divisions. Concerned about property values. Concerned about growth and increased crime.
Screen Name Redacted 10/10/2020 11:53 AM	Traffic in existing neighborhoods is an issue. The more we build, the worse it will get. Sierra Drive is a mess. There needs be a barrier put up at 38th and Sierra to eliminate the highway type situation currently on Sierra. Speed is a huge factor. These are supposed to be neighborhoods. They should only have neighborhood traffic. Not trucks, and cars passing through.
Screen Name Redacted 10/10/2020 12:16 PM	Not sure.
Screen Name Redacted 10/10/2020 01:58 PM	You have ignored citizens desire that NO development occur on the Northshore of Lacamas Lake. You have failed to ask "if" citizens even want more multi-unit apartments and rental properties, instead of being a city primarily of families who own their homes. You have failed to give us demographic information about median family income, the ages, and number of people living in a home. Do we have the infrastructure to support increased growth in housing? Everett/SR 500 is already jammed, and your roundabout will at best be a temporary fix along this main north-south corridor. You allowed the placement of the high school to be in a location that could not support the added traffic congestion the high school brought. The location of the high school in turn, triggered more home development in the northeast

	area of the city, further adding to the traffic congestion problems. We now have a mill that has laid off significant numbers of workers. Most of us see the handwriting on the wall, and that the mill will ultimately close. That means what happens with all the GP real estate? It seems to me that should be the focus of "development" discussions among the community. How to attract new businesses to the downtown area? Should we allow some of that GP land to be redeveloped into new housing? Or should it be reserved for business redevelopment? Should some of it become "mixed use" development? Should it be a park and residential, and if so, what type of residential development? We have a lot of businesses struggling right now due to COVID. How can we help them recover and create jobs in our city?
Screen Name Redacted 10/10/2020 02:07 PM	Please stop the housing developments. We are being over populated and Camas is becoming less livable. Keep apartments close to downtown, walkable and close to transit. Please keep our Camas livable, not squished together in cookie cutter houses on postage stamp size lots. Please keep this area open and livable.
Screen Name Redacted 10/10/2020 02:17 PM	Too much building, ruining the culture of the city.
Screen Name Redacted 10/10/2020 03:41 PM	My concerns are mostly around planning, zoning and character preservation. I dislike when the greenbelt buffer between the road and new housing disappears. I don’t like overly groomed and manicured streets/sidewalks (i.e. Californian suburbia). I love the segments in town that have forest and trees on both sides so you forget you are right

	next to a subdivision.
Screen Name Redacted 10/10/2020 03:45 PM	It's very elite and white.
Screen Name Redacted 10/10/2020 03:46 PM	Concerned about demands placed upon the city by outside authorities (such as state government) to increase housing supply. Housing supply can adequately be addressed by the city.
Screen Name Redacted 10/10/2020 04:02 PM	No
Screen Name Redacted 10/10/2020 04:11 PM	This is not Portland and we will not sit silent while you try to impose Portland ideas in our area.
Screen Name Redacted 10/10/2020 04:22 PM	I hope City of Camas does not follow the policies followed by Portland. Folks move from Portland metro to get away from those policies.
Screen Name Redacted 10/10/2020 04:35 PM	Rising property taxes and school levies. Oh, and city government employees thinking they know what is best for Camas residents. "Of all tyrannies, a tyranny sincerely exercised for the good of its victims may be the most oppressive. It would be better to live under robber barons than under omnipotent moral busybodies. The robber baron's cruelty may sometimes sleep, his cupidity may at some point be satiated; but those who torment us for our own good will torment us without end for they do so with the approval of their own conscience." C.S. Lewis
Screen Name Redacted 10/10/2020 04:38 PM	My children can’t afford to stay in Camas. We raised them here, they graduated from Camas but have to move away to neighboring cities to buy first homes.
Screen Name Redacted 10/10/2020 04:43 PM	Stop high density housing developments. Stop taking away

	green spaces and outdoor recreation. We have plenty of housing.
Screen Name Redacted 10/10/2020 04:55 PM	Traffic, parking, road improvements needed if more development occurs. Paid for by the developers
Screen Name Redacted 10/10/2020 04:57 PM	This is NOT Portland, don't try to make it Portland. We don't need Mayor Wheeler and J. Hardesty ideals. This all seems familiar.....
Screen Name Redacted 10/10/2020 04:58 PM	I am concerned that bringing in "affordable housing" will lower Camas' present image as an upscale community with beautiful newer homes. owners who can afford high property taxes and levies, and excellent schools. Not every community needs to have tiny homes, subsidized rental properties, etc. We don't need or want this kind of development or growth, and we should avoid it, not invite or solicit it. Please don't downscale Camas or make it like Portland.
Screen Name Redacted 10/10/2020 05:06 PM	Camas is a great community that will change for the worse if we surrender to political correctness and allow it to become Portland. Those influences need to stay in Portland.
Screen Name Redacted 10/10/2020 05:20 PM	It appears we have many 'luxury' apartments but I don't see many smaller, single family homes that are in a lower price range.
Screen Name Redacted 10/10/2020 05:21 PM	Cost
Screen Name Redacted 10/10/2020 06:22 PM	loss of green\open space.
Screen Name Redacted 10/10/2020 06:36 PM	Not planned out well enough. We should sacrifice our Forrest and outdoor areas to get more people in houses. This will eliminate the reasons people want to move here.

Screen Name Redacted 10/10/2020 07:31 PM	Lack of city planning/urban sprawl
Screen Name Redacted 10/10/2020 07:44 PM	Its really important to be to preserve the greenspaces in camas as we look to add residents. Ensuring we have a good, functioning park/sidewalk/naturepath system to connect neighborhoods will keep the quality of life here and keep camas a desirable place to move. We also need to preserve accessibility of downtown!
Screen Name Redacted 10/10/2020 08:02 PM	Gads - who wrote up this questionnaire - clearly they feel there is some desperate need here - what am I missing - other than a dispassionately written questionnaire. And, just exactly when did you quit beating your wife? Seriously, you expect intelligent responses to these leading questions???
Screen Name Redacted 10/10/2020 08:34 PM	My main concern is finding a smaller affordable house if we downsize our current house.
Screen Name Redacted 10/10/2020 08:34 PM	The homeless are not dealt with. Police allow them to live in parks and neighborhoods and decrease value to homes and safety.
Screen Name Redacted 10/10/2020 08:41 PM	For someone that built their house in the mid-90s, now that I'm a senior the property taxes are more than I can afford. It's sad.
Screen Name Redacted 10/10/2020 08:44 PM	The new apartment complex in down town Camas looks horrible. It does not flow with the City. It looks just like downtown Portland, Actually I bet the builder is a Portland individual. They have no imagination. Where is the authenticity? It is a terrible reminder of what can happen to a lovely city like Camas if people do not pay attention. Shame on Camas City leaders for allowing a terrible looking

	structure to be in Camas. Where are you morals?? or your pocket book? I see
Screen Name Redacted 10/10/2020 08:57 PM	The main Issue I see is that the demand for housing of all types is higher than availability. The demand is high due to people wanting to relocate to Camas because it is such a great city. Real estate is always cyclical so if we try to add enough housing to accommodate everyone we will find a gluttony of houses when the market turns down.
Screen Name Redacted 10/10/2020 09:05 PM	Yes, let’s keep Camas what it is, let’s make sure it’s not Going to be next Portland!
Screen Name Redacted 10/10/2020 09:40 PM	Don't want to live in a place with HOA. Want house that is 3 bed 2 bath and around 1500sq ft.
Screen Name Redacted 10/10/2020 10:23 PM	Allow market forces to drive the types and sizes of single family homes.
Screen Name Redacted 10/10/2020 10:44 PM	No
Screen Name Redacted 10/11/2020 07:25 AM	New building downtown with no new parking options
Screen Name Redacted 10/11/2020 08:10 AM	Prices have gone through the roof which is why we bought a new townhome here in Camas. The prices for a nice house were just too expensive for what you get. That's simply a function of the market and what people (us) would accept. We hated the idea of having to spend $800K for a house that would really be worth $500K in a normalized market, again which is why we just bought a new townhome and figured we'll move out of Camas when our kids graduate high school and use our equity for a home somewhere else at that time. I don't think it's a good idea for the government,

	especially a City government to artificially deflate/inflate pricing or availability. You start approving lower cost homes or affordable apartments or the like and manipulate the market all you're doing is asking for trouble down the road. Stay in the business of running the City and don't get in the business of accommodating or manipulating the local housing market. Let the market deal with that.
Screen Name Redacted 10/11/2020 08:54 AM	I am concerned there is too much building happening.
Screen Name Redacted 10/11/2020 09:02 AM	Lack of open space foresight and planning
Screen Name Redacted 10/11/2020 09:04 AM	I've experienced classism in Camas. There's a culture here that suggests that those who live "on the hill/ridge" are superior to those living "down the hill." That, in itself, made me reconsider my choice to live here.
Screen Name Redacted 10/11/2020 09:32 AM	Transit option from downtown Camas to Portland. Embrace our bedroom community status and make downtown walkable.
Screen Name Redacted 10/11/2020 10:29 AM	Too many new housing developments without concerns for the increase in traffic
Screen Name Redacted 10/11/2020 11:09 AM	I worry that open areas, wetlands, forests will be overbuilt. Especially with rental units and condo-developments. I like the small town atmosphere and worry Camas will become a subdivision extention of Vancouver.
Screen Name Redacted 10/11/2020 11:22 AM	Do NOT use Mill Lands to build residential. Even the caveats GP put in with the few they've "donated" (with headaches) to the City are startlingly clear. Learn from what happened in San Francisco - that property the US Navy sold to the

	City, insisted all clean and then huge scandal. Mill Lands need to be Super-funded. Do NOT touch them and certainly NOT for residential.
Screen Name Redacted 10/11/2020 12:21 PM	The reason people have moved into Camas and pay high property taxes is to retain a quality of life. If you dilute that quality, the people who are willing to pay for the standard will go somewhere else.
Screen Name Redacted 10/11/2020 01:47 PM	There has been too much high density building in camas that is taking away green spaces and outdoor recreation. If there's to be more development, it should be done more wisely with existing spaces.
Screen Name Redacted 10/11/2020 02:52 PM	Expand the trails and park areas
Screen Name Redacted 10/11/2020 03:49 PM	Vancouver has built a lot of affordable housing along 4th Plain. The area is notorious for high crime, awful schools and rampant homelessness. Why are we even considering replicating that in Camas. There are a lot of far more affordable areas in Clark county than Camas. If people are looking for affordability they should look elsewhere.
Screen Name Redacted 10/11/2020 10:41 PM	I hate seeing huge homes on tiny lots that tear down forests.....also way overpriced.
Screen Name Redacted 10/12/2020 11:59 AM	The city is selling out to big developers who don't care about the impact of cramming as many houses into a small case as they can to make the most money. It is ruining the landscape of the area as houses are built right on top of each other. This also impacts how many people are accessing small roads and the pathways around the lakes. Obviously the city gets more money

	from taxes for these developments but at what cost? This area is starting to look like California and is not set up for the influx of so many people living in such a small space.
Screen Name Redacted 10/12/2020 01:18 PM	Taxes
Screen Name Redacted 10/12/2020 03:12 PM	Concerns with maintaining forested areas & waterways. Very concerned with losing or not building community park space.
Screen Name Redacted 10/13/2020 03:40 AM	Sprawl is a major concern of mine, especially tearing down forests or open spaces to build.
Screen Name Redacted 10/13/2020 11:06 PM	Stop clear cutting trees and building roundabouts please.
Screen Name Redacted 10/14/2020 08:46 PM	More single-family homes under 2200 sq ft
Screen Name Redacted 10/15/2020 01:56 PM	Symbols of hate are being openly displayed in neighborhoods. Recent acts of hate and terrorism to BIPOC citizens and families have caused many to move away for their safety, i.e. the bear effigy, multiple threatening letters, and some folks have even had neighbors come to their door to tell them they are unwelcome. Don't develop lower income & accessible communities separate from mid/upper income neighborhoods! We have tons of industrial and a fair number of over sized residential properties that can be developed into mixed and multi family. The mill properties by 6th and along the river should redevelop into mixed live/work w affordable condos and give the city access to the river downtown.
Screen Name Redacted 10/16/2020 02:19 PM	Camas is becoming way too crowded. Slow the growth, especially for the wealthy.

Screen Name Redacted 10/16/2020 07:38 PM	That the city administrators are going to be more focused on cramming people into the city rather than making it a more habitable place to live. The ill-sized roads, crummy parks, and discontinuous sidewalks/bike lanes decrease the appeal of living here. Encouraging multi-unit dwellings or apartment complexes will do nothing to aid this but make more these neighborhoods subject to more crime and be less-desirable.
Screen Name Redacted 10/16/2020 07:49 PM	I do worry about adding more multi-unit rentals, as they make for more temporary citizens of Camas who do not often have the same investment in the community, yet can still vote to raise our property taxes. Also, many, many houses have been/are being added to Camas recently, yet only a little has been done to address our roads. Most of them are not wide enough to accommodate this growth, and I see plenty of congestion in our future.
Screen Name Redacted 10/17/2020 12:00 PM	Architectural style is lacking. More modern homes would really help. And we need to bury those power lines. More side walks.
Screen Name Redacted 10/17/2020 06:43 PM	Please bury powerlines so they don’t keep getting taken down by trees and lose electricity every winter!
Screen Name Redacted 10/19/2020 01:35 PM	We seem to have too much high end housing and not enough midrange and affordable housing. Also I would like to ensure that our neighborhoods are intentionally mixed price so that we welcome, rather than exclude, residents. I am also not a fan of gated communities. Many of these questions seem like they require actual data rather than opinions. Seems like you would have an assessment of what housing stock is

	available across cost and need levels. Now, putting data collection aside, I can also see where knowing public perception of available housing is also useful - as long as you have a clear sense of the full demographics of those responding. You might add education, size/composition of household (#/ages, ?single, multi generational, etc)
Screen Name Redacted 10/19/2020 03:19 PM	The development of underdeveloped territory within our city worries me. I don't want any of the beautiful min-forests or plains-like areas to be cut down and replaced by more houses. I am also worried that out here, we're a little biased when it comes to race, ethnicity, some forms of religion and the relationship between these people and their real estate/rental agents.
Screen Name Redacted 10/20/2020 07:10 PM	Stop building new homes. Getting over populated and taking away from the natural setting of the city.
Screen Name Redacted 10/20/2020 07:10 PM	Stop building new homes. Over populated. Taking away from our beautiful natural environment.
Screen Name Redacted 10/20/2020 08:32 PM	We have to decide if we as a City want do things that promote the development of more housing at the current fast rate, or sit back and let nature take its course (let the market decide). I don't know what the right answer is.
Screen Name Redacted 10/22/2020 03:49 PM	My husband and I would like to buy a home in Camas but there aren't enough small homes available.
Screen Name Redacted 10/23/2020 10:07 AM	I'm concerned with cramming too many people within our current developed footprint, lowering existing home values by adding homes that take up most of their lot, or, worse, tearing apart treed areas when there

	is cleared farmland up for sale available just beyond our area. The VERY WORST thing would be to alter homes in downtown Camas in a way that destroys their historic character. The homes don't have to be huge, modern, or expensive to be special. Regardless of home size, the environment should be the #1 priority. We have the unique opportunity of designing around such beautiful nature, and taking advantage of that will protect both the environment and future values of our investments as the rest of the surrounding areas pack in as many people into cookie-cutter structures with non-indigenous landscaping that lacks anything that sets them apart from any other given city. I would've moved to Tigard or Beaverton if I wanted that.
Screen Name Redacted 10/24/2020 09:29 AM	Keep the Camas charm
Screen Name Redacted 10/25/2020 12:08 PM	Do not give cost, tax or impact fee discounts to new rental construction. If supports are required do rental assistance that goes directly to the landlord.
Screen Name Redacted 10/26/2020 11:58 AM	Is it safe / welcoming for diverse people? Are you a welcoming community?
Screen Name Redacted 10/26/2020 03:25 PM	Redlining and other discriminatory practices. lack or community resources for house-less community.
Screen Name Redacted 10/26/2020 04:48 PM	A huge majority of what is being built is luxury high end homes affordable to a small percentage of people. Also, so many forested areas have been clear cut to make way for subdivisions that are too tightly packed. Camas only seems to be focused on building residences instead of a balance between

	amenities and housing options. Camas is just one subdivision after another.
Screen Name Redacted 10/27/2020 10:08 AM	Development of enormous, overly-expensive housing developments has run amok. They are ugly, poorly built, and wipe out hundreds of acres of forest and farmland. All we seem to be doing is building for the rich.
Screen Name Redacted 10/28/2020 03:34 PM	The market has gone so crazy in Camas that a normal $450K-$500K house now goes for $800K. That is probably not accurate but close enough. Houses here are way above what a house should sell for. We decided that instead of upgrading over the next few years we'll just take our profit and move out when the last of our kids graduate from Camas HS in 5 years. Another problem I see with Camas housing is there is so much, how do I put it, cookie-cutter half-way decent housing i.e. Woodburn Hill, Green Mountain, etc that the character of Camas is changing to, - well a cookie-cutter community. I get it, those are affordable for the most part but we already see some of those even newer homes starting to age not so gracefully.
Screen Name Redacted 10/28/2020 05:47 PM	This survey is framed to elicit responses that would show support for low end housing vs. how residents want to see growth over the next 20 years.
Screen Name Redacted 10/28/2020 08:42 PM	So much private land is being purchased by outside developers. Camas is losing its green, and lush forests. We are losing so much, and feeling helpless in our own city.
Screen Name Redacted 10/28/2020 08:47 PM	There seems to be too many high-end, luxury homes. Would prefer to see smaller sized family homes and Co-op type of communities. Also

	incentives for solar and passive housing.
Screen Name Redacted 10/28/2020 08:57 PM	Increased Property taxes & high costs of homes.
Screen Name Redacted 10/28/2020 09:46 PM	Space for local farming (animals and vegetable) must be interspersed with housing development to feed the local population, we can't rely on large, faraway factory farms to feed our community. People need views of and experience in nature for well-being, and wildlife needs green space to co-exist with us. Natural space should be valued, and a certain percent of mature trees should be retained on each property developed. Any development should be planned with an eye to the future, what will the neighborhood look like in 30-50 years? There are mature, spaced-out developments in Portland that are a delight to walk thru, and there are crowded streets that are only inhabited by necessity instead of by choice.
Screen Name Redacted 10/28/2020 09:46 PM	1) Public transit access; 2) accessibility (single level living) for universal design; 3) high-density development close to downtown;
Screen Name Redacted 10/28/2020 11:24 PM	We need to express our values in this town. Law abiding- good education- and be nice!!
Screen Name Redacted 10/29/2020 12:03 AM	Do not develop north shore- build in all open spaces in city limits first
Screen Name Redacted 10/29/2020 08:06 AM	Stop forcing "affordable" housing into a market that doesn't want it. Your "affordable" housing that is at Round Lake isn't exactly affordable to those who truly need affordable housing. The market will determine what the value of a property is. Stop buying into the mentality that people should be able to live on minimum wages.

	Minimum wage is supposed to be where you start, not where you stop. Artificially inflating wages and artificially capping housing prices is the first step towards socialism.
Screen Name Redacted 10/29/2020 08:36 AM	High property taxes. And, Camas pushes and bends to developers fir new housing; but, the city doesn't take care of the older existing neighborhoods which are becoming an eyesore. The older neighborhoods are overdue for road and new sidewalk work, and underground utilities (paid by the City)
Screen Name Redacted 10/29/2020 08:44 AM	That it's going to become crowded with fewer trees, smaller lots housed shoved together and so totally ruing what remaining ambience left since this weak city has rolled over and let every greedy developer destroy open area after open area.
Screen Name Redacted 10/29/2020 09:03 AM	Grow slowly
Screen Name Redacted 10/29/2020 10:10 AM	Mega-developments that eliminate natural green space, trees, and habitat should be avoided. There should be more homes with decent sized lots created. If a development is created, a certain number of trees must be retained. We need to ensure that there are eco-barriers are created to keep contamination out of the lake systems.
Screen Name Redacted 10/29/2020 12:25 PM	The city should cater to current residents not future residents.
Screen Name Redacted 10/29/2020 03:43 PM	I'm mostly concerned that increased population density in Camas will contribute to unsatisfactory living conditions for those in the community. Packing people together isn't healthy for the individual or the city. People have the responsibility to

	financially prepare for housing well in advance of need.
Screen Name Redacted 10/29/2020 07:49 PM	Everything is so expensive. Older homes should be more affordable.
Screen Name Redacted 10/29/2020 09:13 PM	There are too many developments with HOAs. Also, unfortunately, when residential lots are split, multi-family houses are built rather than affordable single family homes. This results in more rentals rather than owner-occupied properties. Creating more opportunities for home ownership contributes to the stability of the community because of the financial and emotional investment of the people who buy them.
Screen Name Redacted 10/29/2020 09:39 PM	I would like to see Camas housing evolve with respect to our history, retaining the character of our town but moving forward with modern solutions, having sizable and affordable spaces for children and adults to play, keeping nature and its benefits easily accessible to our citizens a priority in new development.
Screen Name Redacted 10/30/2020 11:09 AM	Too many developments!!!! No longer country feel .overcrowded
Screen Name Redacted 10/30/2020 12:27 PM	The agenda to provide alittle packed in revenue chasing town turned into a small city with nothing but upper class individuals
Screen Name Redacted 10/30/2020 12:43 PM	you have no questions about protecting the natural environment. You should never develop grass valley which is home to many bird species. There are developments already at 192nd and Brady, 102nd near 38th, and others west of Lacamas Lake, this is enough protect wetlands, open space, and natural areas. They mean something to life on this planet. We are more than just

	humans. Portland is trying middle housing, density and ADU's. That is a primary reason we moved from Portland to Camas. Protect Camas. We can't provide housing for those Portland who can't tolerate the lifestyles, safety and health issues in California and Portland. My wife and I are not conservatives.
Screen Name Redacted 10/30/2020 01:10 PM	Too many track town houses being built
Screen Name Redacted 10/30/2020 01:52 PM	It would be a shame to see the character of Camas destroyed with housing covering all the nice open spaces. Let's preserve the beauty of the area. We should not cover every space with housing. When building is excessive there is a lot of tree and habitat loss. It would be good to have low-cost housing such as the Stephens Creek development in Southwest Portland. In addition to providing much needed housing, it might lead to greater ethnic diversity in the area.
Screen Name Redacted 10/30/2020 03:47 PM	Property taxes are high.
Screen Name Redacted 10/30/2020 09:44 PM	It is over developed as it is.
Screen Name Redacted 10/30/2020 11:15 PM	I am concerned by the huge, single-family homes developments that go into Camas, year after year. We don't need one more housing development full of large, expensive homes. This truly concerns me. We need diversity!!!! As the CSD Homeless Liaison, I am very concerned for our homeless youth. Can we please problem solve how to take care of these youth? Supportive housing? Youth shelter? We cannot be ignorant of the most vulnerable in our community.

Screen Name Redacted 10/31/2020 10:24 AM	NO APARTMENTS OR MOBILE HOMES PARKS
Screen Name Redacted 11/01/2020 12:46 PM	Don't change what made Camas a sought after town: nice suburban residential and open parks and farms. Camas doesn't need apartments or townhomes or low income residential, there's plenty of room for that in Vancouver.
Screen Name Redacted 11/04/2020 12:06 PM	In addition to housing, we need to ensure the infrastructure is there to support more housing. For instance, that we have room in neighboring schools or the ability to add a school in order to support an influx of families with students. And mixed use spaces allowing for, say, retail below and housing above could help with raising city funds via taxes.
Screen Name Redacted 11/04/2020 05:59 PM	Just too many LARGE homes taking over areas that make Camas special. First time home buyers or smaller families are unable to live here due to cost and lack of appropriate housing.
Screen Name Redacted 11/04/2020 06:36 PM	The lack of affordable housing is very concerning. How would a new teacher move here and teach here, for example? How would a newer firefighter be able to support their family in this community?
Screen Name Redacted 11/04/2020 07:48 PM	We have got to stop letting developers clear cut and destroy our vacant lands. I want to see the lake in lake road but I see brick walls. Also if a park or playground is added in a development it should be city property and owned and managed by the city so all residents can play not jusy those in the association of that development. Save the tree, prioritize greenspaces and hold developers accountable to all the people.

Screen Name Redacted 11/05/2020 12:46 AM	The clear-cutting of trees for developments is a serious problem. Lack of affordable housing for many who work here and for people who would make wonderful members of our community.
Screen Name Redacted 11/05/2020 07:36 AM	Can we please STOP new development....

Optional question (187 response(s), 120 skipped)
Question type: Essay Question

Q13 Which partners should be engaged in the conversation about housing diversity and affordability in Camas? What resources could they bring to the table?

Screen Name Redacted 9/28/2020 02:19 PM	I think diversity in our town is a huge concern. I'm not sure people of color feel welcomed.
Screen Name Redacted 9/28/2020 02:42 PM	Groups that support the interests of BIPOC in our community; EDI training and influence on policy in housing & development
Screen Name Redacted 9/28/2020 03:10 PM	Dissolving HOAs/or severely limiting HOAs power would increase diversity and affordability in Camas. And, at least anecdotally local real estate agents seem to promulgate negative stereotypes on dense living. But increasing density is the logical solution to increase housing supply, particularly for lower-cost units.
Screen Name Redacted 9/28/2020 03:13 PM	Downtown Camas Association—concerns and needs of downtown employees and owners. Recruiting businesses downtown and Camas in general is affected by housing availability.
Screen Name Redacted 9/28/2020 03:17 PM	The school district. Our schools need to be able to handle the growth & they are currently popping at the seams, especially CHS. More homes = 2nd traditional high school needed

	FIRST. Don't seek to attract new residents if the city cannot support them.
Screen Name Redacted 9/28/2020 03:40 PM	Housing diversity is not needed. Stop!
Screen Name Redacted 9/28/2020 06:15 PM	Banks, lending institutions, escrow companies and companies to help in ownership obstacles.
Screen Name Redacted 9/28/2020 06:47 PM	Hire the right people. Dont pay consultants
Screen Name Redacted 9/29/2020 09:50 AM	Existing homeowners are your constituency. Start there. Not your special interest groups.
Screen Name Redacted 9/29/2020 04:20 PM	banking industry / realtors
Screen Name Redacted 9/29/2020 04:26 PM	People who live here. You should ask them how they feel about overcrowding.
Screen Name Redacted 9/30/2020 12:14 AM	city, county, state governance partners; faith-based partners; seniors; families with children under age 18
Screen Name Redacted 9/30/2020 11:06 AM	LULAC - Ed Hamilton NAACP Council for the Homeless YWCA Clark County City of Vancouver City of Washougal Mortgage brokers and lenders
Screen Name Redacted 9/30/2020 12:10 PM	Camas public school district, local leaders of color (business owners, clergy, public service, volunteers, etc)
Screen Name Redacted 9/30/2020 02:21 PM	Nonprofits serving camas or Clark county.
Screen Name Redacted 9/30/2020 02:39 PM	The public is great, but not terribly useful. Most people lack the perspective and understanding to offer much value, with some rare exceptions. Perhaps having a clear objective in mind first (that is

	actionable, not just business babble) then ideating with a variety of stakeholders using design thinking frameworks to surface possible solutions would be an effective approach?
Screen Name Redacted 9/30/2020 02:45 PM	Seniors, college students, unemployed, rental owners
Screen Name Redacted 10/01/2020 03:58 PM	Shovels to plant trees, access to water for wildlife.
Screen Name Redacted 10/02/2020 10:57 AM	Seriously? Is there something I am missing on this topic? Why the concern? IS there some type of incentive to the city to do this? Perhaps the city needs to have business people on their council & in roles that can assist the City of Camas to do a better job in maintaining our small town the way it should be...clean, friendly and SAFE!
Screen Name Redacted 10/03/2020 08:54 PM	city leaders, citizen representatives, school district personnel, church communities, experts in the field, city planners
Screen Name Redacted 10/05/2020 08:05 PM	Homeowners, companies like Fisher Investments and Wafer-tech. In my opinion, the city is lacking basic amenities such as shopping and retail services. There also seems to be a decline in tech companies with the exit of Sharp and UL. I'm not sure why the school district keeps buying valuable, taxable property.
Screen Name Redacted 10/06/2020 09:36 AM	Send a survey to every single homeowner.
Screen Name Redacted 10/06/2020 09:51 AM	the community itself.
Screen Name Redacted 10/06/2020 10:03 AM	Camas Council, Clark County, HOAs in the area, major businesses in Camas, Police and Fire.

Screen Name Redacted 10/06/2020 10:19 AM	Home owners and residents. And keep the racial discrimination nonsense out of the conversation. If people have the money and good credit, they can buy in Camas. “Systemic racism” is not a problem in our community. We have people from various backgrounds...many educated and accomplished immigrants that bring vibrancy, talent and flavor to our community. What we DO NOT want or need is creating a magnet for drug addicts and people with mental illness who flock to our town to get subsidized housing. Who ever has plans to turn us into Portland had better knock it off.
Screen Name Redacted 10/06/2020 10:35 AM	Local residents only. "Experts" are not, they only have an agenda.
Screen Name Redacted 10/06/2020 11:19 AM	No one. Let the market decide. Keep government and "academic" "scholars" out of our decisions.
Screen Name Redacted 10/06/2020 11:58 AM	Teachers! Not only do they know how their wage (alone) makes home ownership in Camas an issue, but they also have direct contact with students and their parents so they can offer that perspective, as well.
Screen Name Redacted 10/06/2020 01:02 PM	Everyone. Just because someone can afford housing here doesn't mean they shouldn't have a voice.
Screen Name Redacted 10/06/2020 03:27 PM	Help our school district educate kids- and put your efforts in the right direction! This is way more important than your zoning questions-
Screen Name Redacted 10/06/2020 06:46 PM	Current residence. Do not include developers/contractors should be involved. Do not pay for “consultants”. Let the current citizens determine what they want.. don’t grow just because everyone says we need to.

Screen Name Redacted 10/06/2020 06:56 PM	Citizens only and Let us vote. No developers or consultants that have the opportunity for financial gains from the outcome. Have all decisions open for the citizens at city council meetings
Screen Name Redacted 10/06/2020 10:58 PM	None
Screen Name Redacted 10/08/2020 01:10 PM	Only Camas citizens should have say about Camas!
Screen Name Redacted 10/09/2020 05:23 PM	residents
Screen Name Redacted 10/09/2020 05:44 PM	Small builders and Camas citizens
Screen Name Redacted 10/09/2020 08:19 PM	Don’t ruin this small town.
Screen Name Redacted 10/09/2020 08:33 PM	I don’t know
Screen Name Redacted 10/09/2020 08:41 PM	Obviously certain city staff members, Camas tax payers, and representatives from a city or town going through the same thing Camas is experiencing. A wealth of knowledge is a phone call away-
Screen Name Redacted 10/09/2020 08:41 PM	Mass transit
Screen Name Redacted 10/09/2020 09:58 PM	The people of camas. Especially those who have lived here for longer than 10 years.
Screen Name Redacted 10/09/2020 10:03 PM	Stop the building!
Screen Name Redacted 10/09/2020 10:14 PM	Existing residents
Screen Name Redacted 10/09/2020 10:17 PM	None

Screen Name Redacted 10/10/2020 04:02 AM	Local Banks should be more helpful
Screen Name Redacted 10/10/2020 07:59 AM	The residents of Camas.
Screen Name Redacted 10/10/2020 08:11 AM	County and state regulations for building codes and fees to be more favorable to the builder or owner.
Screen Name Redacted 10/10/2020 08:57 AM	Small local landlords like myself should be included.
Screen Name Redacted 10/10/2020 10:04 AM	Bring to the table the current homeowners/neighbors who would be directly affected by low housing units and apartment planning BEFORE permits have been approved/issued for building. It is a known fact that crime is higher around apartments and low housing developments. Think of Camasonians and current tax paying homeowners first.
Screen Name Redacted 10/10/2020 10:15 AM	I strongly disagree with diversity initiatives since they are racist, based upon quotas and potentially illegal. Eligibility for housing, jobs/promotions should always be based upon merit and requisite qualifications.
Screen Name Redacted 10/10/2020 10:57 AM	Citizens, builder's association, get younger people with families and seniors that want to downsize involved.
Screen Name Redacted 10/10/2020 11:53 AM	Stop building. Fix what we have.
Screen Name Redacted 10/10/2020 12:16 PM	Don’t know of any
Screen Name Redacted 10/10/2020 01:58 PM	Freedom. Property rights. Tax-paying citizens. How about a diversity of farms and rural lands? How about letting the people truly decide "if" they

	want multi-million dollar homes along the Northshore? How about listening when the people say they want to focus development south of the lake? Too many special interests seek too much control. You can't even clean up Lacamas Lake. You ignore citizens wishes regarding the Northshore development. Why should we trust you will consider any input citizens offer now?
Screen Name Redacted 10/10/2020 02:07 PM	Listen to residents. I don't think we want to be squished together. Keep traffic in mind, and parks and open spaces, walking trails and such.
Screen Name Redacted 10/10/2020 02:17 PM	Do not interfere in the market conditions. Allow supply and demand to work, and if you want to help first time homeowners develop a stipend program to help with down payments.
Screen Name Redacted 10/10/2020 03:41 PM	I dont understand the question. But I do have lots of experience as a consultant for real estate developers and feel the town needs more restrictive planning.
Screen Name Redacted 10/10/2020 03:46 PM	No other "partners" needed. There are laws that address such things as housing discrimination and bank redlining. "Critical race theory" hucksters are not needed in Camas.
Screen Name Redacted 10/10/2020 04:02 PM	Camas is fine the way it is.
Screen Name Redacted 10/10/2020 04:35 PM	None because I don't think these are issues that need to be addressed or "fixed" by the city.
Screen Name Redacted 10/10/2020 04:38 PM	Builders and remodlers. We need more affordable housing not just street of dreams developments.
Screen Name Redacted 10/10/2020 04:55 PM	Don't know enough about the options available and who the 'partners' are but there should be community meetings about this

Screen Name Redacted 10/10/2020 04:57 PM	None whatsoever.
Screen Name Redacted 10/10/2020 04:58 PM	Existing homeowners for sure.....those who have made a large investment in their homes. Those organizations whose only goal is to serve the underserved with all manner of low cost housing need to hear our opposition. I am talking about "affordability" only. Diversity is an entirely different story. Latinos and African Americans should be welcomed to join the considerable presence of Asians that we already have.
Screen Name Redacted 10/10/2020 05:06 PM	Only those who understand, value and wish to preserve Camas' character. We could certainly use more affordable housing for buyers who can't afford a half million dollar home, but those options must be for people who plan to own and contribute to Camas' culture and appeal.
Screen Name Redacted 10/10/2020 05:20 PM	A diverse variety of folks representing not only sellers, buyers, lenders, landlords, but also women, men, minorities, renters, and homeowners.
Screen Name Redacted 10/10/2020 08:02 PM	How about realators?
Screen Name Redacted 10/10/2020 08:34 PM	Only those that were born and raised in the county. Californian's should not have input as they created this issue we are in.
Screen Name Redacted 10/10/2020 08:41 PM	The citizens, especially citizens that live close to any proposed development.
Screen Name Redacted 10/10/2020 10:23 PM	Don't agree with the premise, stope government meddling in market forces.
Screen Name Redacted 10/10/2020 10:44 PM	Let citizens decide for themselves.

Screen Name Redacted 10/10/2020 10:45 PM	I think Camas Is perfect. I think the development needs to stop. Camas is big enough and we're slowly loosing our small town feel with all this nonsense of development and affordability. There's plenty of diversity already. In my block alone we have at least 7 countries represented including mine of Mexico. I moved to Camas in 2005 and even back then Camas was and is a beautiful place to live. Plenty of diversity. I love it!
Screen Name Redacted 10/11/2020 07:25 AM	Habitat for humanity
Screen Name Redacted 10/11/2020 08:10 AM	I don't feel like that's the business of City government at this time. What does "housing diversity" even mean? What is affordable? Are you saying to lower the bar of entry artificially so people who normally couldn't afford housing now all of the sudden can afford housing? Problem with surveys like this is you don't define your assumptions so it's hard to understand the context around this question.
Screen Name Redacted 10/11/2020 08:54 AM	Anyone from Portland that will tell you what not to do
Screen Name Redacted 10/11/2020 09:02 AM	Environmental Parks and Open space School Board Public
Screen Name Redacted 10/11/2020 09:04 AM	Definitely a focus group of people of color, another of people with student loan debt (who would otherwise be able to buy homes in the area), and people who are working class. Each group can attest to their lived experiences and help others empathize with the real barriers to living comfortably here.
Screen Name Redacted	Land use representatives, homeless

10/11/2020 11:09 AM	and mental health professionals. Seniors.
Screen Name Redacted 10/11/2020 11:22 AM	Do your research into what other Cities have done, successfully. Mimic them. Camas seems very naive in all its Equity ways. So, you will have a steep climb in this learning.
Screen Name Redacted 10/11/2020 12:21 PM	Property owners who have vested interest in the community
Screen Name Redacted 10/11/2020 02:52 PM	Not the mega rich corporations
Screen Name Redacted 10/11/2020 03:49 PM	Partners (developers, special interest groups) that aren't donating to the campaigns of people on the city council.
Screen Name Redacted 10/11/2020 10:41 PM	Surveys from every Camas resident would be ideal.
Screen Name Redacted 10/12/2020 11:59 AM	People who are less concerned with making money and are more concerned with preserving what is a popular destination without ruining it with overcrowding and eye sore developments.
Screen Name Redacted 10/12/2020 01:18 PM	No one. If you want affordable or diversity look at other areas that are affordable and diversified. Take pride in what we have ..we can't please everyone!
Screen Name Redacted 10/12/2020 03:12 PM	Forestry service - how to live with wild animals as neighbors
Screen Name Redacted 10/13/2020 03:40 AM	People who have desired to move here but couldn't.
Screen Name Redacted 10/13/2020 11:06 PM	Students from local colleges, BIPOC community leaders in Vancouver and Portland, Homelessness prevention organizations, architects working on new types of housing that foster community and affordability

Screen Name Redacted 10/15/2020 01:56 PM	BIPOC families. Also lower income and less networked folks who may have not seen this survey. People who don't live in Camas who might move here if there were more diverse housing options. Get the mill to clean up and redevelop mill properties near downtown, and along the river.
Screen Name Redacted 10/16/2020 07:38 PM	Actual homeowners in Camas, WA, the people with a vested interest in the place they call home. We do not need mini-Portland over here.
Screen Name Redacted 10/16/2020 07:49 PM	The home owners of Camas should be engaged, as they are invested in the community and care about the well-being of the City. There are good reasons to live in Camas; let's hope we can keep them.
Screen Name Redacted 10/17/2020 12:00 PM	Home owners, builders, city personnel. I'd bring a thorough understanding of the current support that Washington offers as well as an understanding of the offerings from surrounding cities.
Screen Name Redacted 10/19/2020 01:35 PM	schools - as they hopefully have a good idea about the needs of their students' families
Screen Name Redacted 10/19/2020 03:19 PM	I am not sure.
Screen Name Redacted 10/20/2020 07:10 PM	None. Take that to Vancouver.
Screen Name Redacted 10/20/2020 07:10 PM	None
Screen Name Redacted 10/23/2020 10:07 AM	We should have an environmental council that includes cleaning up our lake and protecting the trees that guided Lewis and Clark westward. Thoughtful planning with consideration to the landscape can still allow for multi-family units.

	Removal of natural resources (ie, trees...) should have considerable fees (likewise, project-crippling fines for removal without said permits) to ensure development is done with our children's futures as the first consideration. Also, and this is so important, there should be crystal clear, publicly broadcast paper trails that ensure developers, council members, city employees, and others aren't simply lining each others' pockets. We should have a paid arborist on staff for the city to aid in this process, as well as a volunteer council of local residents to cross-check the integrity of the process.
Screen Name Redacted 10/25/2020 12:08 PM	Existing landlords. Do NOT engage the BIA or a representative of the real estate profession. They will lobby. They won't be advocating for the prospective resident or for the best interests or needs of the city. We need to look towards people who have Camas long term interests at heart. We don't want the transactional!
Screen Name Redacted 10/26/2020 12:58 PM	Realtors could have good ideas. Mortgage loaners too. Financial counselors with their experiences working with families. City utility staff too because the 5 utilities billed to residences is expensive and effects affordability. County staff could provide estimated property taxes on housing, which also effects affordability.
Screen Name Redacted 10/26/2020 03:25 PM	An Equity Director would be a useful tool in helping to steer Camas into being a welcoming community to people of all races and ethnicities and people of every socioeconomic status.
Screen Name Redacted	I would love it if Camas would

10/26/2020 04:48 PM	partner with creative people who know how to properly plan for livability in terms of repurposing existing structures and creating residences that are walkable to mom & pop type markets etc. Resources they could bring is I guess previous success stories of diverse projects.
Screen Name Redacted 10/27/2020 10:08 AM	Vancouver Housing Authority, People who need housing for disabled or elderly family members, Providers of community housing for the disabled, like L'Arche. We have talked about turning our properly into a L'Arche community home, but aren't sure we can afford it. But this is a big issue for us. Our daughter was in the special ed program at Camas High, and none of her friends seem to have any housing options, and several have ended up being exploited by people who want access to their SSI checks. We can do better than this.
Screen Name Redacted 10/28/2020 03:34 PM	Honestly I have no idea. I mean, who can move the real estate market to a more normalized situation? We have buyers coming up from California cashing out, coming up here and paying silly-high prices for anything that goes for sale here in Camas. Great for the buyers for sure and great for the City of Camas tax base. Those buyers are in heaven for many reasons, including moving to our amazing, beautiful Camas. And happy to have all of them and others as neighbors but it put us in a bad spot for affordable housing here. At this point you're doing what you can in terms of "affordability" by approving communities like Woodburn Hill and Green Mountain. How could you really be more affordable than that? Those entry-level homes are about as cheap as it

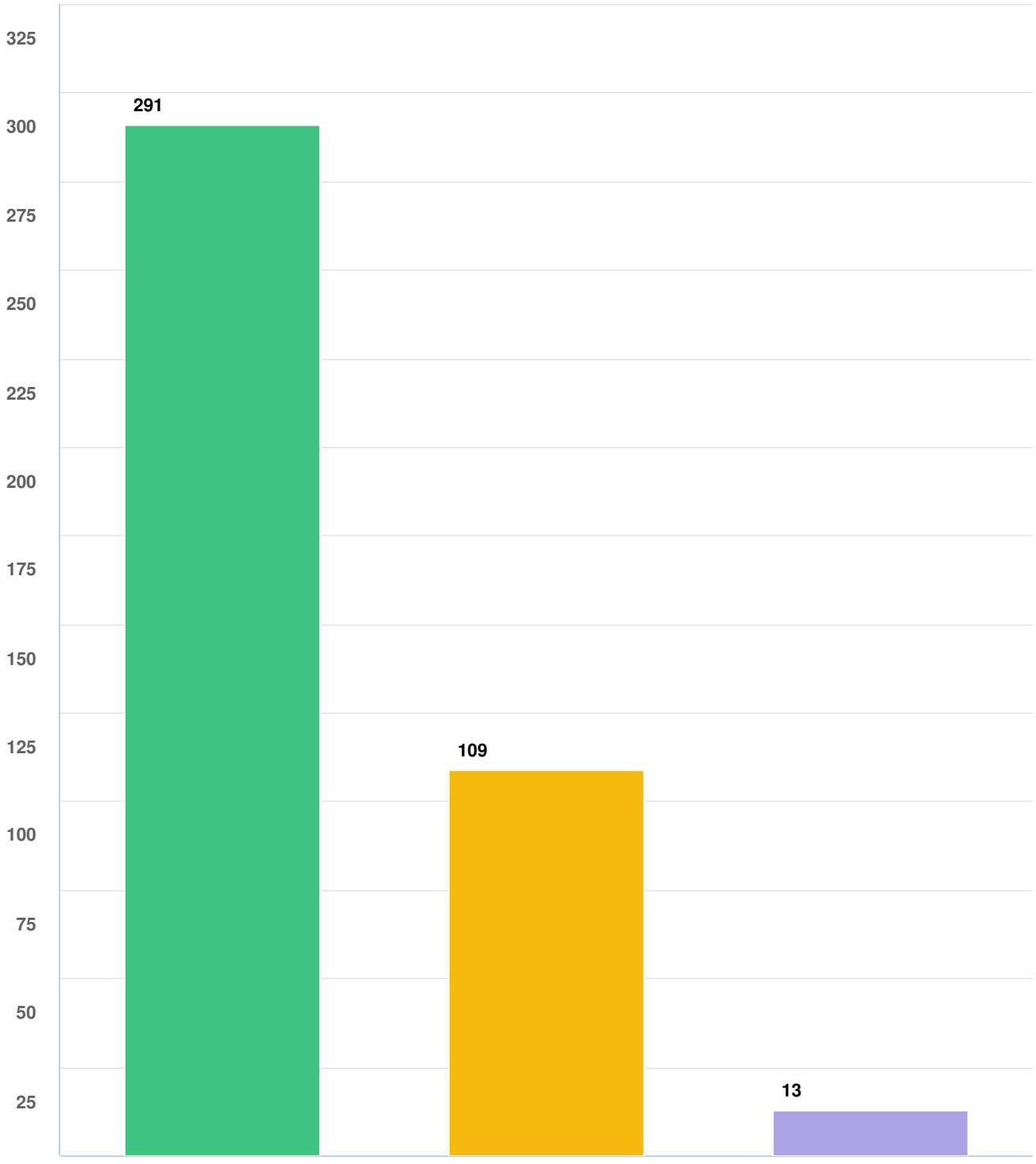
	gets for single family homes. I suppose you could build cheaper homes somewhere but no one will build those, I doubt there's money for a developer for that. And I wouldn't support local tax incentives for that type of housing, that much cheaper than the entry-level homes out there. Maybe bring in developers and ask them about building lower income housing and see what they say? I wouldn't think there are any politicians who know any better than a developer or even City staff.
Screen Name Redacted 10/28/2020 05:47 PM	Residents in neighborhoods where you are desiring to put low cost housing.
Screen Name Redacted 10/28/2020 08:42 PM	Futurewise and Camas City Planning: Bring much needed information, transparency and (hopefully) solutions. Please don't sell our town.
Screen Name Redacted 10/28/2020 09:46 PM	I don't have any to suggest.
Screen Name Redacted 10/28/2020 09:46 PM	1) Camas City Council needs an Equity Subcommittee; 2) Build a working relationship/partnership C-TRAN for planning public transit to serve more Camas households efficiently -- this is an absolute priority for Camas's future attractiveness and livability; 3) While Bend, OR is not perfect, it has been dealing with similar growth issues for a long time and may provide helpful ideas/examples;
Screen Name Redacted 10/28/2020 11:24 PM	None!
Screen Name Redacted 10/29/2020 08:36 AM	Citizens, HUD, licensed city planners, agency for the aging and disabled. Designers.
Screen Name Redacted	Who says we need diversity and

10/29/2020 08:44 AM	affordable housing? This is a presumptuous assumption from typically left-wing liberals.
Screen Name Redacted 10/29/2020 09:03 AM	I'm not aware of a diversity issue in Camas. Please don't create an issue that doesn't exist.
Screen Name Redacted 10/29/2020 10:10 AM	CREDC, environmental councils, public.
Screen Name Redacted 10/29/2020 12:25 PM	Voters.
Screen Name Redacted 10/29/2020 03:43 PM	Above all, Camas residents.
Screen Name Redacted 10/29/2020 09:13 PM	I can only think of who not to ask to join conversation—large developers such as DR Horton and Lennar.
Screen Name Redacted 10/29/2020 09:39 PM	Georgia Pacific; so much of their unused and full-of-potential land could completely revolutionize our downtown.
Screen Name Redacted 10/30/2020 12:27 PM	Not all Californians and real-estate agencies/Companies.....
Screen Name Redacted 10/30/2020 12:43 PM	Environmental Organizations, less emphasis from developers, local citizenry .
Screen Name Redacted 10/30/2020 01:52 PM	Environmental groups. Environmental impact studies should be performed on any area that is being considered for development.
Screen Name Redacted 10/30/2020 03:47 PM	Clark County Housing Authority, builders, planning departments from Camas and a city with successful multi-use/multi-income housing options, homelessness leaders in our community, professionals with experience in housing diversity.
Screen Name Redacted 10/30/2020 09:44 PM	A real economic team that can balance this mess out right now.
Screen Name Redacted	CORE Industries owners, Rachel &

10/30/2020 11:15 PM	Kevin Barber. Also the owners of Sumner House. They are very involved in helping serve our community and are passionate about meeting basic needs. They have a genuine heart for the community and they have a long history in Camas. Their wisdom is invaluable.
Screen Name Redacted 10/31/2020 10:24 AM	RESIDENTS
Screen Name Redacted 11/01/2020 12:46 PM	Anything that would add more park and open space and not turn it into Vancouver or Portland.
Screen Name Redacted 11/04/2020 12:06 PM	Local equity groups, school administrators, groups advocating for seniors and lower-income residents
Screen Name Redacted 11/04/2020 07:48 PM	Groups with people of color, single parents, families who were raised here and now can't afford to buy and rise their families here.
Screen Name Redacted 11/05/2020 12:46 AM	Citizens (Especially those earning below the median income), developers, city council, homeless and at-risk outreach programs, social workers, teachers, and community-focused economists.

Optional question (127 response(s), 180 skipped)
Question type: Essay Question

Q14 Do you live or work in Camas? Check any that apply.

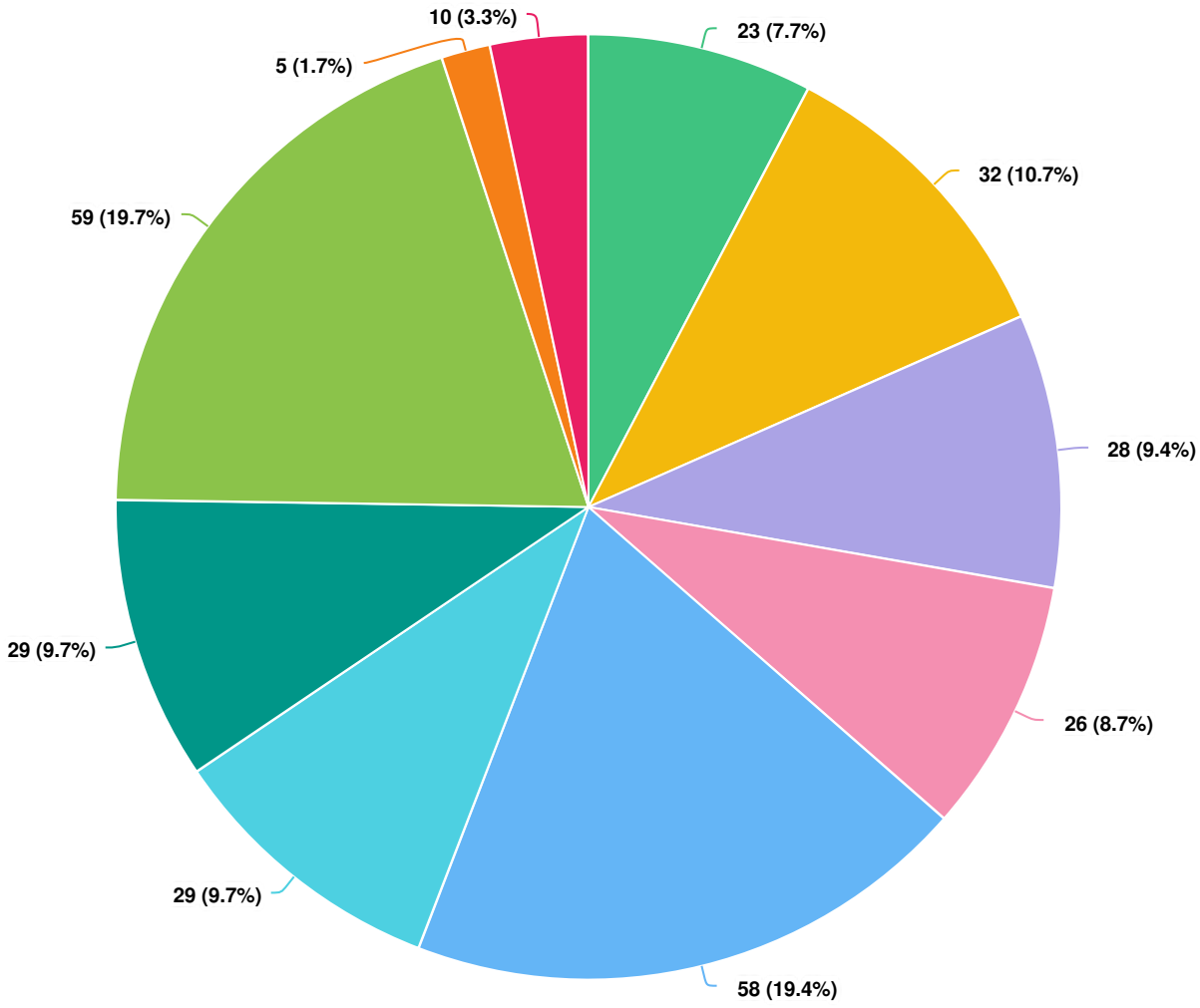


Question options

I don't live or work in Camas I work in Camas I live in Camas

Optional question (306 response(s), 1 skipped)
Question type: Checkbox Question

Q15 What street(s) is nearest to where you live in Camas?

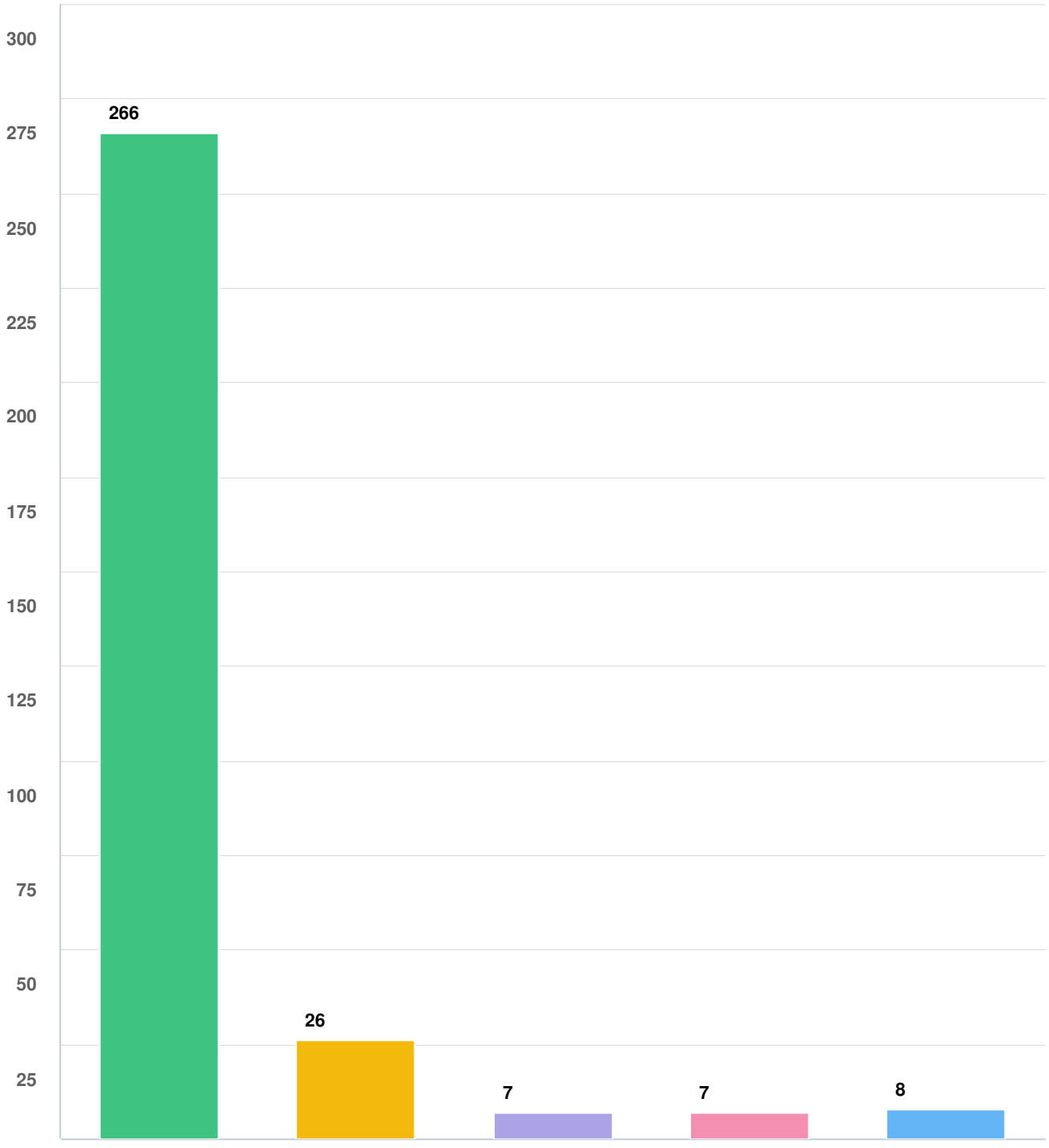


Question options

Not applicable / I don't live in Camas
SE 6th Avenue
NE Everett Street
NE 3rd Avenue
NW McIntosh Road
NW Lake Road
NW 38th Avenue
NW 28th Avenue / NW Fargo Street
NW 16th Avenue / NW 18th Avenue
NW 6th Avenue

Optional question (299 response(s), 8 skipped)
Question type: Radio Button Question

Q16 Do you own or rent your home? Check any that apply.



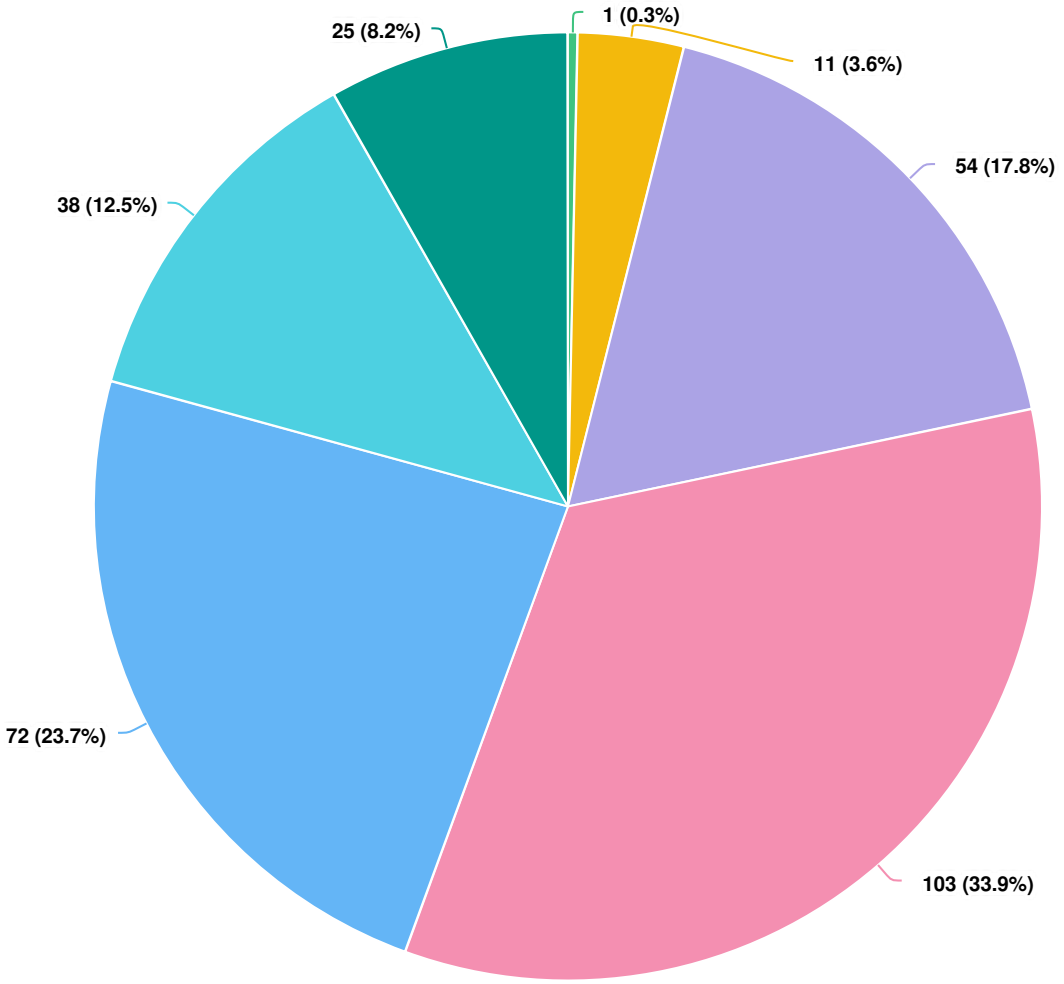
Question options

Other (please specify) I provide housing to more than my immediate family I live with friends or relatives

I rent my home I own my home

Optional question (302 response(s), 5 skipped)
Question type: Checkbox Question

Q17 What is your age group?

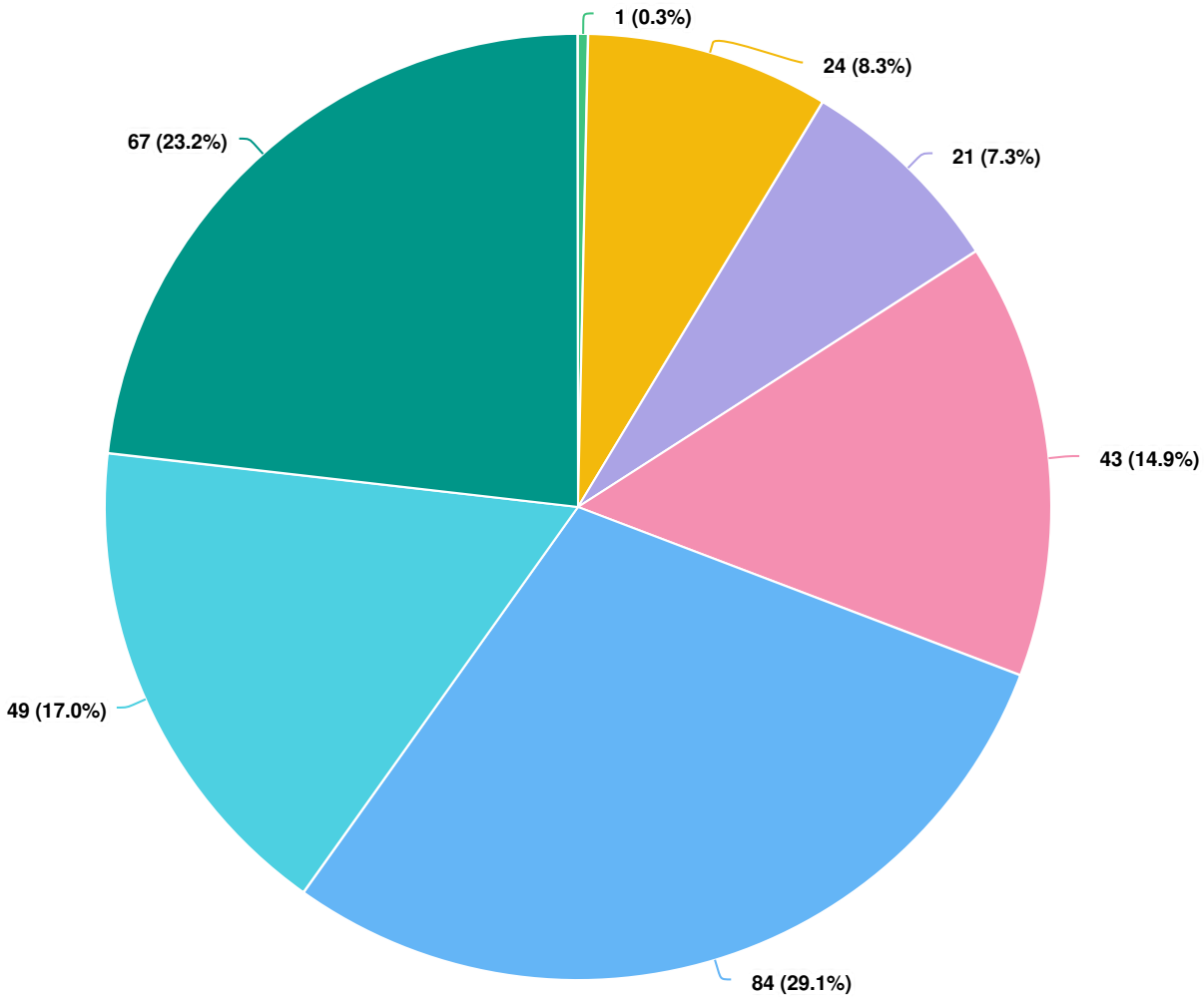


Question options

70 or over | 60 to 69 | 50 to 59 | 40 to 49 | 30 to 39 | 18 to 29 | Under 18

Optional question (304 response(s), 3 skipped)
Question type: Radio Button Question

Q18 What is your total household income?

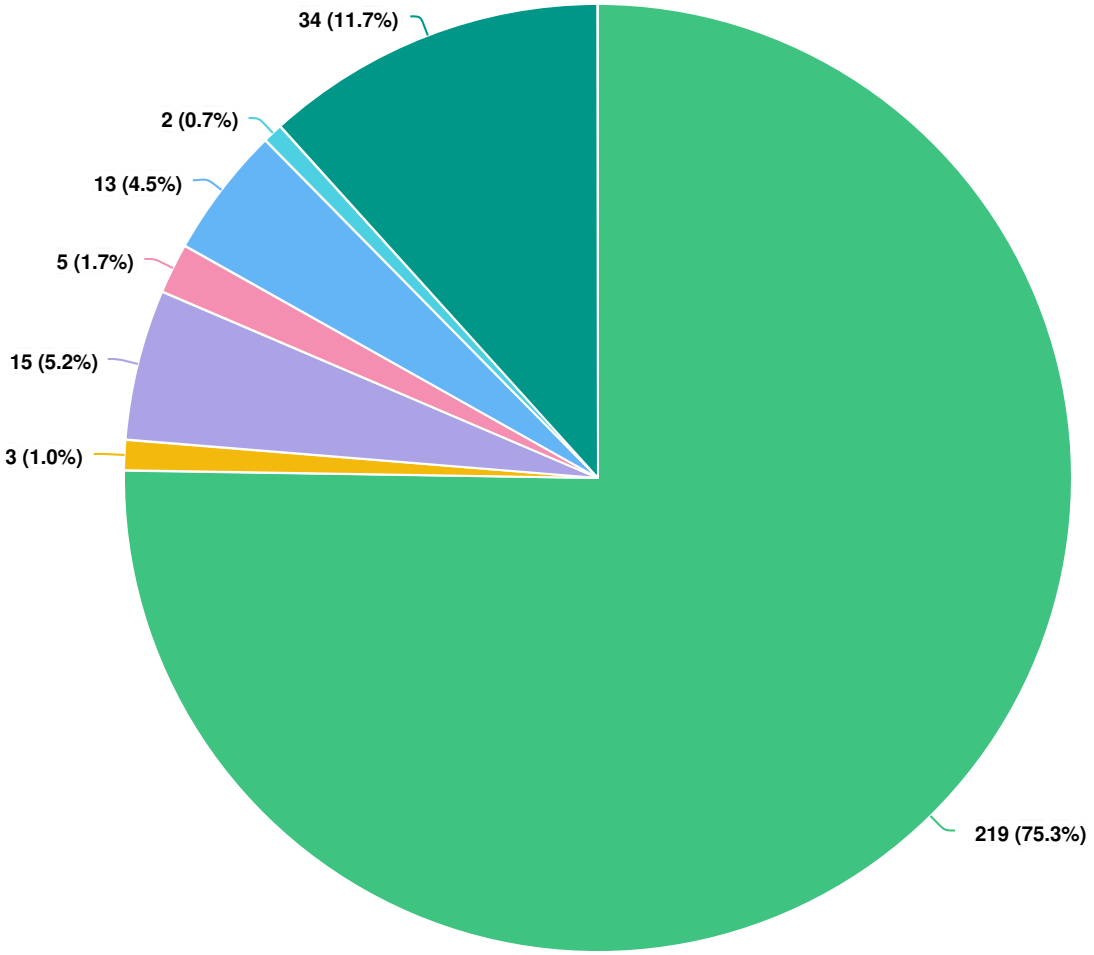


Question options

$200,000 or more | $150,000 to $199,999 | $100,000 to $149,999 | $75,000 to $99,999 | $50,000 to $74,999 | $25,000 to $49,999 | Less than $25,000

Optional question (289 response(s), 18 skipped)
Question type: Radio Button Question

Q19 Which of the below best describes your race / ethnicity?



Question options

Other (please specify) Arab or Middle Eastern Asian or Pacific Islander Native American
Hispanic or Latino Black or African American White

Optional question (291 response(s), 16 skipped)
Question type: Radio Button Question

Appendix C:
Public Comments

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Exhibit 1
April 20, 2021

To City of Camas Commissioners and Staff

Subject: City's New Housing Plan

Unfortunately I am unable to make tonight's meeting since I coach a boys soccer team here in town, I did feel the need to comment on this plan, please accept this document as public testimony. I understand the City is in the process of creating a Housing Action Plan to support more housing diversity and affordability. The objective of this plan was to get public participation to understand current and future needs, the study included 300 participants, while we live in a City of 20,000 residents do you feel this was an accurate and thorough process by staff? What marketing or steps did staff take to get participants? I did not hear of the plan until after the public participation was closed, so I am worried that much of the public was not aware of this study. While I agree that diversity and affordability are valuable goals, I do not think these should be the primary goal of the City's Housing Plan. More importantly you may encourage developers to develop high rises and apartments, but you can't set the price tag of that house, nor their rent. That is at the discretion of the developer or landlord. Why aren't we evaluating our current housing situations and trying to build a better community landscape, ie. Require a percent of development to be open space or parks, public areas like play fields or community firepits, how about community markets or subdivision farmers markets like NorthWest Crossings in Bend, OR. High Density Developments require parking, when cars park on both sides of a narrow road and kids have nowhere to play except in the streets it creates driving hazards that are dangerous. Lookout Ridge in Washougal is a prime example of high density gone wrong. The Lookout Ridge Apartment structure has zero parking, cars are parked across sidewalk paths, cars are parked down the street into neighboring community's, this development is nowhere near a bus route and you cannot walk to a market? I was hoping that the City of Washougal would have seen the error of this development, yet they are looking at 3000sqft lots at NorthSide on 23rd St, the far edge of the City's UGB. There are plenty of spaces closer to Washougal and Camas Downtown Core that would accommodate 3000sqft lots. I'd encourage the City to look at Infill and redevelopment inside the city core first before adding incentives to the developers building at the edge or periphery of our town.

If the City wants to focus on affordability, I ask that you look at costs you have direct control over, like water and sewer rates, our city has some of the highest sewer and water rates in the county. Perhaps the city should be looking at sharing the cost of sewer and water extensions with our neighbor Washougal utilizing conditional use agreements. How about looking at outsourcing these services to Clark Regional WasteWater District or Clark Public Utilities. Has there ever been as study on these topics?

I ask the Council to consider these comments before making a housing plan that has incentives for developers and not the residents of Camas.

Ken Navidi

322 NE Cedar St. Camas, WA

From: Community Development Email
Sent: Tuesday, April 20, 2021 1:21 PM
To: Sarah Fox
Subject: FW: High density housing plan

Here's a comment received in the cdev inbox

Madeline Sutherland (She/Her)
Assistant Planner
Desk 360-817-7237
Cell 360-326-5524
www.cityofcamas.us | msutherland@cityofcamas.us

-----Original Message-----
From: charity noble <charitynoble1@gmail.com>
Sent: Tuesday, April 20, 2021 1:08 PM
To: Community Development Email <communitydevelopment@cityofcamas.us>
Subject: High density housing plan

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Hello,

I would like to submit my concerns for the housing plan that is being presented to you this evening, April 20th.

I have concerns that this high density housing plan is not based on what camas residents need or want. The initial housing survey was open for anyone to participate, in any city or state...this does not reflect a true picture of the housing needs/desires for camas.

Many people move to camas to get away from high density cities. I'm concerned if we require developers to build a minimum of 6 units/acre that will turn camas into an overpopulated town and cause many tax payers to consider moving.

This plan was created by a company in Georgia, which doesn't seem to make sense to me. How could a Georgia resident know or understand the uniqueness and beauty of camas? Why not hire a local company that might have better insight?

Our schools, first responders, and infrastructure will be greatly impacted by the high density plan. I understand that camas must keep within compliance of the GMA...but we've seen a lot of development in the last year or two, including the massive apartment building near 192nd. Doesn't all this development count toward GMA requirements?

I'm asking you to please not rush into approving a plan that I feel is not right for camas.

Thank you,
Charity Dubay
Sent from my iPhone

From: Vince Wang <ruoniu_wang@hotmail.com>
Sent: Wednesday, March 10, 2021 2:10 PM
To: Sarah Fox; External link
Subject: Let's Talk Camas Housing: Sharing some resources about inclusionary zoning
Attachments: Shared Equity Housing One-Pager.pdf

Hi Sarah and Melissa,

My name is Vince Wang and I am a resident in Camas. I learned from a recent article (https://www.camaspostrecord.com/news/2021/mar/04/no-place-to-call-home-camas-housing-study-shows-lack-of-affordable-options/) that the city is exploring IZ policies. I happen to conduct a nationwide research study on inclusionary housing and would like to share some resources. Happy to chat more if there is any question or interest in knowing more on this front.

Here is a Shelterforce article that touches some of the questions about IZ brought up by city commissioners: https://shelterforce.org/2021/03/10/inclusionary-housing-secrets-to-success/

Here is the link to the newly published study: https://groundedsolutions.org/tools-for-success/resource-library/inclusionary-housing-united-statesAnd

Here is the link to the mapping tool and database: https://inclusionaryhousing.org/map/More

Broadly, I think the city could benefit from shared equity homeownership models to help lower-income, first-time homebuyers and help create inclusive and equitable communities. See the attached one-pager with some high-level information.

You can reach me via email or by cell 352-727-3747.

Best regards,
Vince

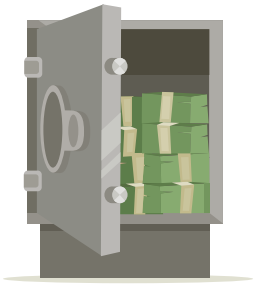
Shared Equity Housing

By the Numbers

1985-2018

Grounded Solutions Network, in partnership with the Lincoln Institute of Land Policy, has authored the most comprehensive study of shared equity housing programs conducted to date. ***Tracking Growth and Evaluating Performance of Shared Equity Homeownership Programs During Housing Market Fluctuations*** is based on data* collected from more than 4,000 housing units across 20 states over three decades, highlighting how shared equity homeownership promotes sustainable wealth building opportunities and lasting affordability for lower-income households.

*Source: HomeKeeper National Data Hub



The median shared equity household accumulates

$14,000

in earned equity. (compared to a median initial investment of $1,875)

6 out of 10



shared equity homeowners use their earned equity to eventually purchase a traditional market rate home.

7 out of 10

shared equity homeowners are first-time homebuyers



The share of minority households living in shared equity homes increased from

13% (1985-2000) to **43%** (2013-2018)





Over

99%

of shared equity homes avoid foreclosure proceedings



95%

of shared equity homes are priced affordably (under 30% of monthly income) for households earning 80 percent of AMI or below

GROUNDED SOLUTIONS NETWORK

LINCOLN INSTITUTE OF LAND POLICY

From: Randal Friedman <randalfriedman@gmail.com>
Sent: Tuesday, May 4, 2021 3:16 PM
To: Melissa Mailloux <melissa@mosaiccommunityplanning.com>
Cc: Sarah Fox <SFox@cityofcamas.us>
Subject: DRAFT HOUSING STUDY

Melissa — I'm very disappointed in this draft.

I took the time to participate in two focus groups.

Nothing of the two main points I made is acknowledged even though both are quite valid. My primary point about Georgia Pacific's property is even more relevant as I watch the 27 acre lab property demolished to the ground. Surrounded on three sides by residential, but still zoned Heavy Industry, it alone could support 500 units at an M-18 designation. That's 11% of our total 2040 need! Yet it doesn't exist for purposes of this draft Study. Nor does any other part of their property which is in the process of the issuance of a cleanup order. Why not make it clear the City of Camas would support a rezoning? At least on the lab property now being demolished?

In case you haven't seen it, our community has come together to ask the State of Washington to ensure a cleanup beyond heavy industrial standards. If nothing else, so that property could be available to meet housing mandates they are imposing. https://www.camaspostrecord.com/news/2021/apr/29/camas-residents-officials-weigh-in-on-paper-mill-cleanup-plan/

You seem intent on pushing state-mandated density further out, spreading it out, and reducing parking needs. Why don't you speak to the obvious: Downtown and mill property can be a significant part of a 2040 solution.

I find it classist and disrespectful to lower-income households, seniors, and others you "assume" won't have a car. Are you suggesting they can't find a better job that needs personal transportation? Are you suggesting their medical needs are limited to bus lines or expensive Uber drives for cancer treatment in Portland? Are you suggesting they can't have the same options for education, and recreation as their fellow citizens with cars? Are you suggesting they can't shop and dine where they would like? You are taking all this freedom away with your assumption.

The truth is many will have cars, and those cars will be parked further out in neighborhoods. Great to think of a senior having to negotiate groceries for several blocks. The truth is you are creating the Portland reality where Districts like Division and Hawthorne, with their high density units without parking, are impacting adjoining neighborhoods. I hear it from Portland folks loud and clear.

I suggested an in-lieu fee to build efficient parking downtown and allow more units instead of costly on-site parking. All part of my suggestion to focus on Downtown. Not a word I could find this considered by this draft Study.

I am glad you recognize that city fees make a difference, and a small unit shouldn't pay the same fees as a 5,000 sq ft McMansion. We agree on that.

You seem to have come in with an agenda to push inclusionary housing requirements. Great…make housing more expensive for everyone else. This in part to make up for the things you could have done if your goal was to actually make housing more affordable and accessible. Quite simply, if for purposes of discussion you could build 2,000 units in the greater downtown by 2040, that's 2,000 units that don't have to be built via inclusionary requirements, among others, that either raise the price of housing or impact surrounding neighborhoods.

If you really want to build a walkable and accessible Camas, cramming more units in outlying residential areas is not the way. Building downtown is. This is our path to meet housing and climate change mandates coming from Olympia.

You are putting Camas on the way to becoming Portland. Pretending people don't have cars in areas where they are needed, Pretending only wealthier people have cars, etc. You are perpetuating classism. Why don't you ask some of the recent households that have moved from Portland why they left?

Camas deserves better from this critically needed study. Our housing market is out of control.

Frankly, I'm wondering why I bothered to participate?

I will be sharing this via social media.

Randal Friedman

Sarah Fox

From: Sarah Fox
Sent: Tuesday, May 4, 2021 5:19 PM
To: 'Randal Friedman'
Cc: Melissa Mailloux
Subject: RE: DRAFT HOUSING STUDY
Attachments: Camas_HAP_-_Draft_HAP_Ver_7_Housing_Strategies.pdf

Randal,
Your comments will be added to the record and provided to the Planning Commission.

In reading your comments, I interpreted that an important aspect was misunderstood.

The draft HAP provides a suite of strategies from a multitude of options to achieve the city's goals. The plan will focus on lands within the city limits, not outside the city limits. Each strategy (if the HAP is approved) must in turn be further developed, analyzed, vetted and brought back to council for adoption. For example, a density standard or change to the zoning map, would be brought through the legislative process after the HAP is approved.

It seems as if you may have missed that the downtown housing strategy is the first in priority (Version 7 attached). The second strategy in priority is focused on upzoning and rezoning **targeted areas**. One of the targeted areas *could be* the heavy industrial properties. In short, there is much more work ahead of us once the strategies of this plan are accepted by Council. The scope of the HAP does not include narrowing its focus to the block level, as that is work for the next phase.

And finally, Camas has strategies for shared parking and reductions for mixed use buildings already in our code, and so this isn't a new concept, but could be refined further based on the strategy. The rate of car ownership is a well-studied subject in relation to the total cost of housing. Meaning that if the goal is to provide housing for those whose income is below the median, then any additional factor that could lower their rent should be considered. Car ownership has been declining among certain populations, and has become a matter of choice for others. There is a body of research devoted to what they call "right sized parking", which seeks to avoid overbuilding parking. The project team can provide more context and information on this aspect at upcoming meetings.

Sarah Fox, AICP (She/Her)
Senior Planner
Desk 360-817-7269
Cell 360-513-2729
www.cityofcamas.us | sfox@cityofcamas.us

From: Randal Friedman <randalfriedman@gmail.com>
Sent: Tuesday, May 4, 2021 6:35 PM
To: Sarah Fox <SFox@cityofcamas.us>
Cc: Melissa Mailloux <melissa@mosaiccommunityplanning.com>
Subject: Re: DRAFT HOUSING STUDY

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Sarah — I don't think you fully understand me as well

Of course these are an array of strategies that are just proposals. They still have a process to go through. My point is this array would be different if, for example, this Study show specific to the mill property, the ability to accommodate 2,000 housing units of various types. That's 2,000 units that now off the table.

You and I both know when you say ""downtown" in Camas you are talking about our historic downtown and not the mill. Just like being the only Clark County property not in Clark Public Utility's jurisdiction, it seems treated as its own entity barred from anything planned over it but heavy industry.

Certainly makes the cleanup cheaper.

A growing number of people believe the mill should be on the table for conversation, especially when critical cleanup issues, such as land use, are being made. Unlike our Port, the City of Camas has been conspicuously silent about the draft clean up order and Public Participation Plan. This needs to change.

This Housing Study could easily provide the concept al road map for the Port. How about "Strategy X: working with the Port of Camas-Washougal on a conceptual plan for future reuse, such reuse to provide at least 2,000 units of housing to meet State mandates."

It defies logic the 27 acres being demolished cannot be considered for state-mandated housing, but someone's next-door lot sporting a tri-plex by right can. That is on the table.

If your response is saying the mill property is a "targeted area" then say so directly. Moreover, assign a planning goal to it for 2040 housing. Then back off some of these potentially intrusive other strategies.

I think our community needs to understand that choice, and be presented with it for discussion.

That was the point I made at two focus group discussions quite clearly. Obviously it wasn't heard.

As to "carless" people, there's a real difference between the real world and studies. Basic to your cited assumption is the resident of that unit doesn't deserve the same entitlement as everyone else: the provision of a parking spot. Why? Because the City refused to consider state-mandated housing at the mill, but instead took away your parking spot to help a developer save money to make up units that should have gone to the mill property. Whew!

From: Kevin Brady <Kevin.Brady@otak.com>
Sent: Thursday, May 6, 2021 7:13 AM
To: Sarah Fox
Subject: RE: Checking in

Sarah –

I reviewed this document again, and believe the main 'takeaway' is a potential need to have more direct communication with actual affordable housing developers – see Developing Partnerships, Page 20 of the report. I would suggest putting together a list of sites (preferably City-owned or with amenable owner) and providing a brief zoning/development summary and cost estimate related to a pro forma for each of these sites. You could then reach out to affordable housing developers to see if they would be interested in providing feedback on the feasibility of developing, with the hope that they might actually do so ...

Happy to chat more …

Otak
Kevin Brady | Senior Planner
Direct: 360.906.9423 | Mobile: 503-504-1951

From: Sarah Fox <SFox@cityofcamas.us>
Sent: Friday, April 30, 2021 3:49 PM
To: Kevin Brady <Kevin.Brady@otak.com>
Subject: RE: Checking in

Kevin,
Thank you for reaching out and discussing your thoughts on the first six chapters of the draft HAP. Attached is the draft Chapter 7 – Housing Strategies. I would appreciate your feedback.

City of Camas WASHINGTON
Sarah Fox, AICP (She/Her)
Senior Planner
Desk 360-817-7269
Cell 360-513-2729
www.cityofcamas.us | sfox@cityofcamas.us

BUILDING INDUSTRY ASSOCIATION OF CLARK COUNTY

May 17, 2021

Camas Planning Commission
616 NE 4th Ave.
Camas, WA 98607

RE: Camas Housing Action Plan

Dear Planning Commission and Community Development Staff;

I am writing to you on behalf of the Building Industry Association of Clark County (BIA) to respond to the request for comment on the proposed Housing Action Plan for the City of Camas. The action plan aims to explore strategies for affordable housing options and increased density.

Based on the proposed plan, we believe the majority of the strategies mentioned would be positive both for builders and the community of Camas. However, there were key points and suggestions that would disincentivize builders from building more affordable housing in Camas. The following strategies would hinder any efforts to build more housing, specifically affordable, middle-level housing in the City of Camas.

1. Mandatory Inclusionary Housing Policy in Camas:

Mandating a percentage of units built to be reserved as affordable units would hurt efforts to create more affordable housing options in the City of Camas. Providing incentives to builders such as reducing parking requirements, providing density bonuses, or other zoning-related strategies would be a better approach. Camas has the highest median household income in Clark County at $106,513 and such efforts would target those who make substantially less than the median income (60%-80% of median household income). Housing is considered affordable when 30% or less of household income is spent on housing. Based on this definition of affordable, those at the 60% level could afford a mortgage or rental payment of $1,598. We believe this is an achievable goal and mandating more stringent requirements would disincentivize building. The City of Camas needs to decide whether their intent is to create more affordable housing options for the community or if the goal is to create more low-income housing options.

Developers have a choice in when and where they build, having requirements for affordable units based on the size of the development, or requiring contribution to an affordable housing fund, creates incentives for dodging these requirements (i.e. building right below a certain size to avoid requirements). We believe the best strategy is to allow the market to dictate what is built. The city could up-zone areas in the urban core to elicit more affordable high-rise rental units, while at the same time allowing diversified housing types to create opportunities for row houses, town homes, cottage housing, and tiny homes. This strategy is exciting because it allows for homeownership rather than depending on rental units to achieve affordability. As mentioned in the plan, this could take place as a part of infill, redevelopment, vacant land development, etc. ADUs would also be a

great solution, where allowed. We are in full support of diversifying housing types as outlined in strategy three. We assert that a wholistic approach to address housing affordability is the best path forward.

2. Explore Funding Source Options for Affordable Housing:

As mentioned by the Planning Commission, monitoring outside funding sources may take a large amount of staff time. In contrast, incentives like those mentioned above and within the study would be pragmatic and efficient in the use of staff time and resources.

Moreover, the restructuring of impact fees based on the size of residential development would have the opposite effect desired. Average net profit for a builder in Clark County is 8%, well below the national average of 8.89% (according to a NYU Stern database of 7,000 companies across all sectors). Calculating these variable impact fees would enhance complexity and take more of staff's time.

In addition, builders and developers are struggling because the cost of building materials has skyrocketed. For example, framing lumber has increased the cost of new home construction by $36,000 Any additional costs will invariably be passed onto the buyer, negating any efforts to make housing more affordable. Additionally, an inflated increase of fees will not only affect current projects, but also require builders to reconsider future developments in Camas. Any increase in cost makes surrounding areas (not in Camas) more attractive to buyers and developers.

3. Explore Density Modifications in the R Zones:

We are supportive of this strategy. However, we are concerned with the suggestion of up-zoning to a 6-unit minimum density across all single family residential zoning districts. Up-zoning would be better used in urban nodes, vacant land, and the urban core in general. Downtown Camas is ripe for redevelopment and efforts should be focused there. We are concerned that increasing minimum density may lead to a loss of character for many residential areas in Camas and could discourage people from moving to Camas because the character and small town feel would be lost. As previously stated, this strategy may lead homebuyers to other jurisdictions if implemented. We agree with the Planning Commission that selective rezoning would be preferable to up-zoning.

We applaud the efforts of the Planning Commission and staff in considering and creating the Housing Action Plan. Going forward, we hope to be a partner to create mutually beneficial solutions for builders, buyers, and the City of Camas. We appreciate staff reaching out to the BIA to get our input on this matter.

Sincerely,



Justin Wood
Government Affairs Coordinator

From: Jihun Han <jihun@ccrealtors.com>
Sent: Tuesday, May 18, 2021 9:51 AM
To: Sarah Fox
Subject: Re: Camas Housing Action Plan

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Hi Sarah,

My apologies for the delay in getting back to you. We had a virtual conference last week that took up most of my time. This looks spot on! Is there anything else you were looking for in regards to this?

Jihun Han / Director of REALTOR® Advocacy
jihun@ccrealtors.com

Clark County Association of REALTORS®
Direct: 503.501.1677 / Ext. 3102/ Fax: 360.695.8254
1514 Broadway St. STE 102
Vancouver, WA. 98663
www.ccrealtors.com

From: Sarah Fox <SFox@cityofcamas.us>
Date: Friday, May 7, 2021 at 11:48 AM
To: Jihun Han <jihun@ccrealtors.com>
Subject: Camas Housing Action Plan

This is the second of two emails. The draft HAP Chapters 1-6 were too large a file to send in one email.

Link to April meeting of the Planning Commission
Link to upcoming May meeting of the Planning Commission
Link to Let's Talk Camas Housing website

Sarah Fox, AICP (She/Her)
Senior Planner
Desk 360-817-7269
Cell 360-513-2729
www.cityofcamas.us | sfox@cityofcamas.us

From: Alan Peters <alanpeters@gmail.com>
Sent: Tuesday, May 18, 2021 12:59 PM
To: Community Development Email <communitydevelopment@cityofcamas.us>
Subject: Housing Action Plan Comments

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Dear Planning Commission,

First, I'd like to acknowledge the work of the planning commission, staff, and the consultant team on the Housing Action Plan. I participated as a focus group member and know that the project team valued my input and that of other group members. The focus group represented a variety of viewpoints and the team did a great job of synthesizing our perspectives into a plan that reflects the diversity of our group and of the community as a whole.

Second, I'd like to express my support for the Housing Action Plan. The plan's goals and strategies will support the Camas 2035 Comprehensive Plan's vision of a diverse Camas, with a wide variety and range of housing for all ages and income levels. I am excited by the recommendations to expand housing opportunities in our downtown areas, to upzone the city's residential zones, and to allow for a diversity of housing types throughout the city. My neighborhood on Prune Hill includes homes ranging from 1,400 sq. ft. to 8,000 sq. ft. While all these homes are single-family, the assortment makes for an attractive streetscape and a diverse neighborhood of folks in different stages of life. If the plan is implemented, more of Camas may realize the benefits of a variety of housing types and densities present throughout our neighborhoods. If the plan is successful, more people will have access to the quality of life that Camas residents enjoy.

I encourage the planning commission to vote to recommend that the city council adopt the Housing Action Plan. And yet the plan is only a starting point. There is much work to be done if we want to realize the Camas 2035 vision, including work by the community to further explore the plan's strategies and implement them in the coming months and years.

Finally, a word about the mill. Today it is still operating, but if it someday closes, it may continue to be a jobs center, it may turn into housing, it may become a public park. More likely it will be mixed-use. But currently, the mill site is not a viable option we can count on to accommodate anticipated growth over the next 14 years. Still, the plan does not preclude the use of the mill site for future housing development (strategies 1 and 5 support this possibility), but it does not hinge our housing future on the chance that the mill will close. There are many large tracts of vacant land in our urban growth boundary that will be developed before then, and these sites provide our best opportunities to accommodate our housing needs in the coming years.

Alan Peters
4050 NW 12th Ave, Camas, WA

From: Vince Wang <ruoniu_wang@hotmail.com>
Sent: Monday, May 24, 2021 9:59 PM
To: Sarah Fox
Cc: Melissa Mailloux
Subject: RE: Let's Talk Camas Housing: Sharing some resources about inclusionary zoning

Sarah and Melissa,

Thanks for inviting me to the meeting last week. You both did an excellent job in presenting the plan and facilitating the meeting. And I think all the strategies you brought to the commissioners for consideration are on target in addressing community's needs. I stayed for the most of the meeting; and I, sadness to say, left the meeting with much disappointment. I was going to put my comments below to the public channel. But now I am passing them to you, feeling this way may be more "polite." I don't know how much can be changed/challenged at this stage given decisions have already been made by the commissioners. Feel free to share my comments with anyone you think should be aware of.

In essence, I question the validity of decisions made by the commissioners in meeting the due diligence.

I left the May 18 planning commission meeting with disappointment. When commissioners interpreted community's ask for "diversity" and "affordability," what I heard is a narrow definition of those terms. Their intentionally leaving out of lower-/moderate-income residents when talking about affordability and not even say a word about race and ethnicity when talking about diversity is concerning. Also, I don't like the process of how the commissioners killed strategies 6 and 11. I observed that a couple commissioners essentially used their subjective opinions of "I feel this is wrong" to object demonstrated successful programs with long-term effect in at least some communities across the country. To be clear, I am not saying these strategies will surely be effective in our community. But the concerns brought up by a couple commissioners show plainly superficial and partial understanding of those strategies. And I don't see them bother to learn more about how these strategies could potentially benefit the community and directly help promote diversity and affordability - despite the fact that our planner and consultant have put effort to investigate more upon their previous request and suggested them to think further during the meeting. The City has invested tremendous time and resources to come up a housing plan that – ideally and desirably – works for all, but fundamental issues are intentionally left out and potentially important strategies are stricken out by in my view some short-sighted commissioners who only prioritize "lower hanging fruits."

The City is becoming more diverse, and housing market dynamics caused by regional, national, and global forces have made the affordability issue more severe to existing residents (let alone those who want to move here) and to higher income levels (and unfortunately we know that this trend is ongoing and is very likely to stay). Without the real commitment and dare to confronting these challenges, we are more likely to be headed in a more expensive, exclusive community.

Vince

STATE OF WASHINGTON
DEPARTMENT OF COMMERCE
1011 Plum Street SE • PO Box 42525 • Olympia, Washington 98504-2525 • (360) 725-4000
www.commerce.wa.gov

June 2, 2021

Camas City Council
c/o Sarah Fox, Senior Planner
City of Camas
616 NE Fourth Avenue
Camas, Washington 98607

Sent Via Electronic Mail

RE: Draft Housing Action Plan

Dear council members:

Thank you for the opportunity to comment on your proposed draft housing action plan (HAP). We appreciate your coordination with our agency as you work to fulfill the HB 1923 grant contract to develop this plan.

Camas has done a good job at completing all of the required items within the HB 1923 grant contract. The HAP if implemented as designed will help the city meet its housing needs by accommodating the future population demand with a greater diversity of housing options and greater affordability, while addressing displacement and preserving affordable housing. We especially like and applaud city's work on the following items:

- The stakeholder focus groups and interviews, which in combination with the survey and other outreach, will help the city plan to address the specific needs and desires of Camas that may not have been evident in the data.
- The buildable lands analysis review of Camas' building capacity will be very helpful in informing the actions that will need to take place from the HAP to accommodate growth within the community.
- The specificity of the actions recommended within the strategies will help the city quickly transition to taking actions that will increase housing capacity, diversify the housing options, and address housing affordability and displacement.
- The prioritization of actions as recommended by the Planning Commission is a best practice that we recommend all cities incorporate into their HAPs. A prioritized action list will help the city quickly take next steps in its upcoming work plan to address the city's housing needs.

As the city looks to adoption and implementation of this strong set of housing strategies, we have a few suggestions for strengthening your plan.

- We recommend the city include a table of actions associated with each strategy to compile the recommendations in one place. We recommend this table include additional information that will help the city to take the next steps to implement the actions, including level of effort or amount of resources needed to complete, agencies or partners involved, and/or considerations or action needed.
- We recommend the city make a plan for how to monitor the goals within the HAP. A monitoring plan would allow the city to measure its progress and evaluate which changes have been effective at meeting the goals, and which might need modifications to meet the intended purpose.

Additionally, the Washington State legislature has funded additional grants to increase residential building capacity in the next biennium. Please be on the lookout for future funding opportunities to implement actions with this HAP coming through Commerce in the late summer or early fall.

Congratulations to the staff for the great work the draft housing action plan represents. If you have any questions or need technical assistance, please feel free to contact me at steve.roberge@commerce.wa.gov or (360) 764-0112. We extend our continued support to the City of Camas as you review this draft plan for adoption as intended direction for housing policy.

Sincerely,



Steve Roberge
GMS Deputy Managing Director
Growth Management Services

cc: Sarah Fox, Senior Planner, City of Camas
Phil Bourquin, Community Development Director, City of Camas
David Andersen, AICP, Managing Director, Growth Management Services
Steve Roberge, Deputy Managing Director, Growth Management Services
Anne Fritzel, AICP, Senior Housing Planner, Growth Management Services
Laura Hodgson, Associate Housing Planner, Growth Management Services

Randal Friedman
1187 NW 10th Ave
Camas, WA 98607

Acting Mayor Ellen Burton
City of Camas
616 NE 4th Ave
Camas, WA 98607

Ellen -- For 32 years I was the US Navy's civilian representative to the State of California. Often speaking for all the military services, I spoke simple truths and spoke them plainly. I spoke to powerful interests such as International Shipping's trade association, the Los Angeles Department of Water and Power and the Pay Day Lending industry. Plain and simple truths to protect the military mission so dependent on California's land, sea and air space.

It was the voice of the Admiral, I was often reminded, when I spoke this plain truth. That's where my expression "plain truth" comes from. Plain truth can challenge the "*status quo*" making all the more reason it needs to be spoken.

Camas is at a point where plain truths are needed.

The Council voted 6-0 to recognize the Camas Mill as central to Camas' future, and state those reasons in writing to Governor Inslee's Department of Ecology Director.

With full support from the Port, Camas is on its way embracing a future with great opportunity for every interest group, including our young families. From riverfront restoration to hotels, from hi-tech offices to thousands of housing units, it all comes together consistent with protection of our historic downtown. The mill property is the future Camas where affordable housing, and other sustainable development with the lowest carbon footprint, belongs.

This future depends on proper cleanup hence the City's bold action to Director Watson. As noted in your letter it is a future offering "opportunities for a wide variety of future uses." Apparently, though, not housing.

I offer a new Housing Strategy implementing this future.

It isn't new to staff and the consultant team. I suggested in both focus groups it was the most important action this plan should take. Discussed on the next page, it was brought up more than a year ago in the North Shore visioning process.

Speaking plain truth, this strategy must be included in any Housing Action Plan reflecting evolving Camas policy.

New Housing Action Plan Strategy

- Recognize decommissioned portions of the Camas Mill are desirable locations for housing consistent with affordability, high-density, and low-carbon goals. These shuttered facilities should be rezoned to mixed use and have remediation sufficient to support Camas' housing needs. The mill property and downtown should be the primary focus for maintaining affordable housing in Camas.

All that's needed now is a page of supporting text for explanation and context. If resources are an issue, there are any number of expert volunteers that could agree on a conceptual approach. I'll be the first Volunteer. It needn't cost money. We don't need a consultant to write it.

Just as I asked for decisive action to send a support letter to Director Watson, I ask you take decisive action directing staff to add this strategy, or something similar, before a public hearing is held.

Directing thousands of required housing units out of neighborhoods to downtown should be basic to the public discussion, and not something from an invisible voice on a Zoom call.

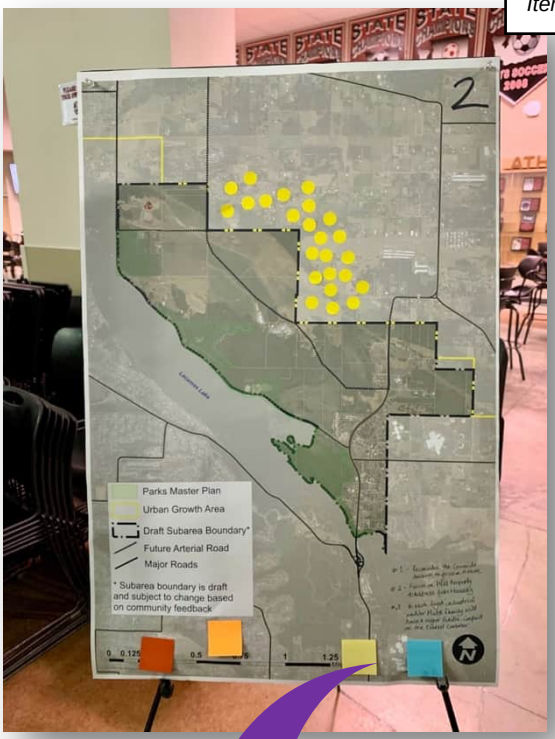
This was a message from the North Shore Sub-Area Plan "visioning" meeting February 4th, 2020. I heard it referred to at this past meeting.

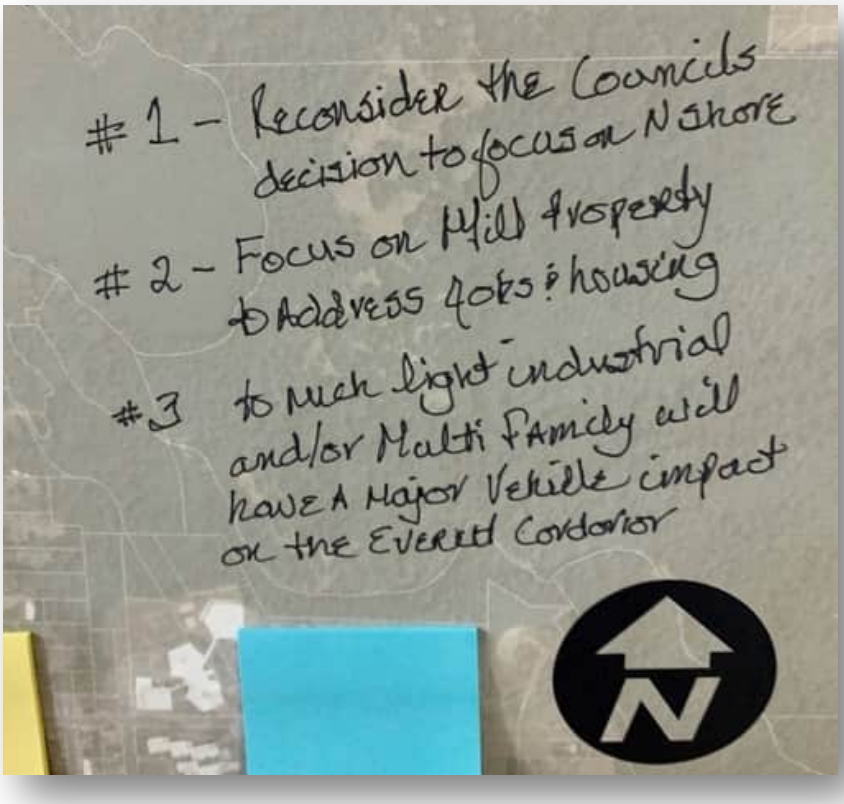
The notes on the "winning" map, the map that refused to recognize the North Shore for intense development, said:

- #2 - Focus on Mill Property to address jobs & housing

What was #1?

- #1 - Reconsider the Councils decision to focus on N Shore





Despite not being included on the North Shore's City's web page, this map remains an expression of the people of Camas. They spoke some plain truth. It needs to be listened to. Staff needs to be told to do this.

Staff represents the community and not the other way around. Who's driving this agenda? The community or consultants?

It should be a central question in considering an Interim Mayor and/or Interim City Administrator.

It starts with this Housing Action Plan.

I hope you agree it is finally time for recognizing what Camas residents identified when last we could meet in public.

They said it clearly. Let's get started.

We can also start at next week's virtual Town Hall.

Randal Friedman

From: Ellen Burton
Sent: Thursday, June 10, 2021 9:35 AM
To: Sarah Fox
Cc: Phil Bourquin
Subject: Fwd: FOLLOW-UP ON HOUSING ACTION PLAN PUBLIC COMMENTS

Hi Sarah,
Here is a comment about including the 26 acres in the housing plan for density considerations.
Thanks,
Ellen

Begin forwarded message:

> **From:** Carrie Schulstad <director@downtowncamas.com>
> **Date:** June 10, 2021 at 9:05:26 AM PDT
> **To:** Ellen Burton <EBurton@cityofcamas.us>
> **Cc:** Caroline Mercury <csmercury@outlook.com>, Sarah Laughlin <slaughlin@fuelmedical.com>, Randy Curtis <curtisrm@comcast.net>, Randal Friedman <randalfriedman@gmail.com>
> **Subject: Re: FOLLOW-UP ON HOUSING ACTION PLAN PUBLIC COMMENTS**
>
> WARNING: This message originated outside the City of Camas Mail system. DO NOT CLICK on links or open attachments unless you recognize the sender and are expecting the content. If you are unsure, click the Phish Alert button to redirect the email for ITD review.
>
> Hi Ellen,
> I concur with Randal. The way our current downtown and the downtown into the future will truly thrive is with more close in housing and thoughtful mixed use and physical amenities that bring the community together. Let's show how this can be done not just well, but the best possible! On both the 27 acres (soon hopefully!) and the main campus when able. We know our town and our Main Street very well and this is what we're asking to have considered. Thank you.
>
> Carrie Schulstad
> Downtown Camas Association
> 360-904-0218
> director@downtowncamas.com
>
> > On Jun 9, 2021, at 2:28 PM, Randal Friedman <randalfriedman@gmail.com> wrote:
> >
> > The attached letter provides follow-up and a specific recommendation on the Housing Action Plan recognizing downtown and decommissioned parts of the Camas Mill as the central focus of housing policy versus the current approach pushing it into neighborhoods.
> >
> > I would also ask this be discussed at next weeks virtual town hall.
> >
> > Thank you for your heroics in keeping Camas moving forward.

Melissa Mailloux

From: Melissa Mailloux <melissa@mosaiccommunityplanning.com> on behalf of Melissa Mailloux
Sent: Wednesday, June 23, 2021 6:26 PM
To: Melissa Mailloux
Subject: FW: Public Comment for Hearing for Camas Housing Action Plan

From: Carrie Schulstad <director@downtowncamas.com>
Sent: Monday, June 21, 2021 6:14 PM
To: Public Comments <publiccomments@cityofcamas.us>
Subject: Public Comment for Hearing for Camas Housing Action Plan

WARNING: This message originated outside the City of Camas Mail system. DO NOT CLICK on links or open attachments unless you recognize the sender and are expecting the content. If you are unsure, click the Phish Alert button to redirect the email for ITD review.

Thank you City Council and staff for this opportunity to give comment.

It is imperative for Downtown Camas to have more close-in housing to truly thrive. For a historic downtown to be the most robust, it should be an “18 hour downtown”, 6pm-12MN and this happens when you have people living in and very close to downtown and supporting businesses during these hours.

The healthier and more robust our downtown core is, the more amenities and offerings and strength we have for our entire community.

It’s so very important that we are visioning the future for our downtown including housing. The mill property will have significant future potential and it’s important to be considering best future uses for our community now. It is key as we move forward to have housing options so people can live and work in close proximity. We want people who work in downtown to be able to afford to live in Camas, and for people with diverse income levels and ages to have the option to live close to downtown.

We appreciate that you are already looking at the downtown commercial zone as you’re considering different housing options. The DCA encourages the City to include all of downtown including future mill properties in the housing visioning and planning process. It can help satisfy housing mandates and needs, and also bolster the economic health of our downtown. Thank you.

Carrie

Carrie Schulstad

Executive Director
Downtown Camas Association
360.904.0218 cell
www.downtowncamas.com

Let’s Talk Possibilities!

"The mission of the Downtown Camas Association is to develop and promote historic Downtown Camas by creating a vibrant social, cultural and economic center of the community while emphasizing preservation of our city’s historic features."

Appendix C: Housing Analysis (2024)

Date:	May 23, 2024
To:	Alan Peters, City of Camas (cc: Nicole McDermott, WSP)
From:	Tyler Bump, Jennifer Cannon, Mary Chase, ECOnorthwest
Subject:	Revised Housing Analysis, City of Camas Comprehensive Plan Update

Section 1. Housing Element Analysis

Introduction

The City of Camas Comprehensive Plan update offers an opportunity to refine the vision, goals, and policies to address the current housing needs for the next 20 years from 2025 to 2045. The Comprehensive Plan is a foundational document that provides a vision and policy direction for managing growth and development while considering effects on the built and natural environment and public facilities.

The Housing Element will include recalibrated goals and policies to better accommodate the diverse household needs of the whole community across the income spectrum. The City is facing housing challenges that would benefit from improved access to more housing options, more affordable housing for older adults, smaller housing, more rentals and homeownership opportunities. Housing needs are not one-size-fits-all and instead should be thought of as a menu of different options with sufficient variety for different household incomes and sizes, personal or household preferences, life stages of people, and community location needs.

The Housing Element should identify sufficient land and strategies to accommodate existing and projected housing needs for all segments of the community over the next 20 years. In addition, it seeks to enhance neighborhoods, support the maintenance and improvement of existing housing stock and guide the development of new housing stock to accommodate a range of income levels, ages and special needs.

The Housing Element is supported by a housing needs analysis that quantifies existing and projected housing needs and identifies the number of housing units necessary to accommodate projected growth. Housing analysis is an important exercise as a community's housing needs tend to continually evolve based on changes in the broader economy, local demographics, and the regulatory environment.

The approach for updating the Housing Element will be informed by community input, state legislation requirements, priorities for the city, a comprehensive housing inventory and analysis based on the best available existing data, provided in the following section. This analysis evaluates the current and projected housing, existing conditions, housing market dynamics, and housing demand and includes detail on the community demographics, housing stock, housing market dynamics, expected housing demand, and special housing needs in the City of Camas. The insights from this analysis help build a factual basis for the housing policy updates.

Housing Action Plan

The City of Camas completed its Housing Action Plan in 2021, including a thorough community engagement process about current housing needs in the City. This included two virtual public meetings, seven focus groups and interviews, a housing survey with over 300 responses, a project website, and written public comments. Key findings about community priorities included:

- **Camas needs a greater variety of housing choices at a range of price points to meet residents' diverse needs**. Specific types of housing needed included starter homes for young adults looking to purchase a house, accessory dwelling units (ADUs), accessible housing for older adults, and apartments/condominiums.
- **There are development opportunities and incentives that the City could deploy to support more types of housing**, such as tax credits for multifamily construction, city-funded parking structures, strategically using available land, and working with Homeowner Associations (HOAs) to remove barriers for ADU development.
- **Cost was a leading factor that participants noted for limiting housing choice in Camas.** Addressing perceptions about affordable and multifamily housing is important to meet housing needs. Much of the housing stock today is single-family detached homes, but new multifamily/ mixed-use buildings near transit and central areas could expand options in the city.

Planning Framework

The City of Camas's first Comprehensive Growth Management Plan was adopted in 1994, which was replaced by the current Comprehensive Plan in June 2016 to fulfill the requirements of Washington State's Growth Management Act (GMA). The GMA is a series of state statutes first adopted in 1990 aimed at managing population growth, particularly in the state's fast-growing areas.

In Clark County, RCW 36.70A.040 requires all cities to "fully plan" for the elements of a Comprehensive Plan, including land use, housing, capital facilities, utilities, transportation, and climate change.[1] The current update process is part of a period update also required by the GMA, as part of an established schedule by the County.

The Clark County Countywide Planning Policies provides helpful guidance on the Comprehensive Plan update. Clark County is currently in the process of updating its Comprehensive Plan and its Countywide Planning Policies. The existing 20-year growth plan spans 2015-2035 and includes a Housing Element with relevant policies for jurisdictions within the County. Please see the Appendix for a summary of the existing relevant Clark County Countywide Planning Policies.

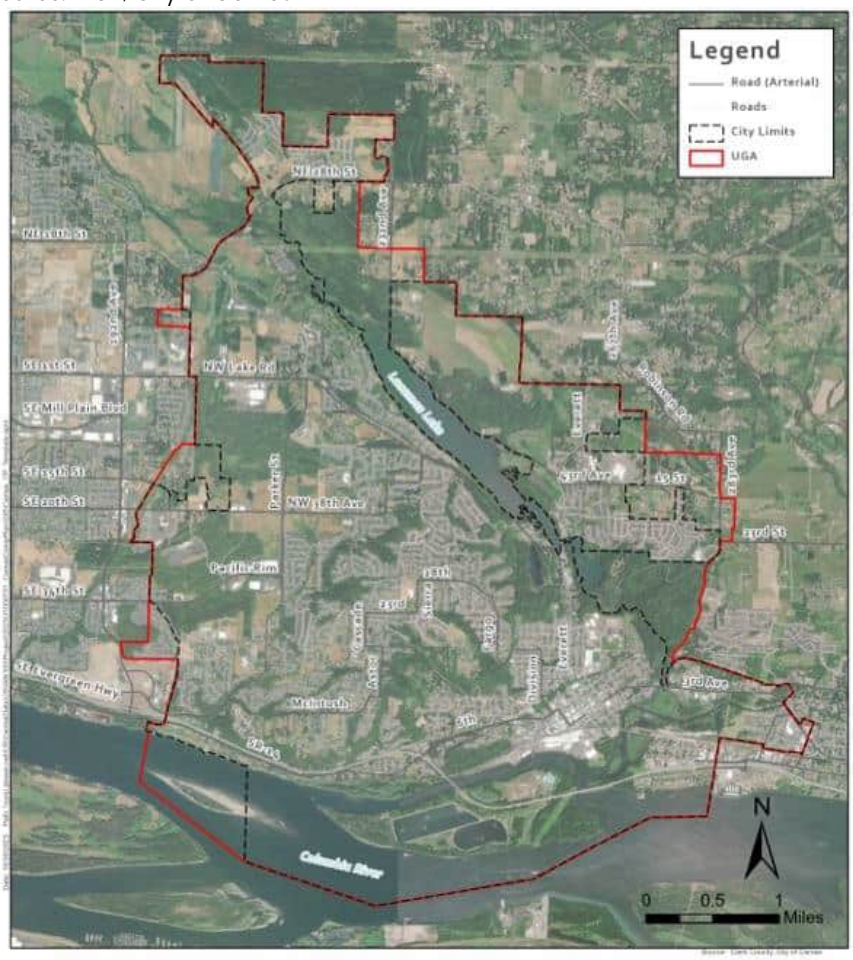
[1] The GMA includes other optional elements for economic development, parks and recreation, conservation, energy, sub areas, and ports.

City of Camas Profile

The City of Camas is a highly desirable place to live, offering a prime location nearby the growing cities and employment centers of Vancouver and Portland, and the smaller cities of Washougal and Battle Ground in south Clark County. The city is interconnected to the Portland Metropolitan region, located east and adjacent from Vancouver and northeast of Portland (see map below). Similar to the City of Vancouver, Camas has experienced high population growth over the last two decades, with an average annual growth rate of 5.2% which is double the rate of growth in Clark County and Washington State. Camas is generally more expensive both for rental housing and home prices compared with Clark County overall, including other suburban jurisdictions and larger cities like Vancouver and Portland. However, it does offer relatively low property taxes that can attract households from Oregon; consequently, this urban area has been absorbing some of the Portland metropolitan region's population growth over the past decade. The housing market in Camas has experienced accelerating demand trickling from the region, with median housing sales prices doubling over the past decade and the cost of average market rent for a one-bedroom apartment surpassing the cost in Portland and Vancouver.

This housing needs analysis includes many comparisons to the City of Camas and to Clark County, as a whole including both incorporated and unincorporated areas in the county, and in some cases, other cities, to provide helpful comparisons.

Exhibit 1. Site Location Map, City of Camas
Source: WSP, City of Camas



Summary of Findings

A summary of key findings from this Economic Development Element analysis is provided below to help describe key insights regarding the economic context, economic opportunities and challenges, and to inform Comprehensive Plan policy updates. The next section provides the full results and detail regarding these findings.

Community Demographic Trends

- **Since 2000, Camas has grown at a faster rate than Clark County or Washington State overall, more than doubling in size by 2023.** Camas's peer cities in Clark County like Battle Ground and Washougal have also seen higher rates of growth over the County average. As the population of these smaller cities increases, demand for housing also rises and affects the way that cities like Camas must plan to meet residents' housing needs.
- **In terms of land, Camas has expanded incrementally over time through annexations.** In the 2000's and early 2010's, the City added large new areas on the north side of Lacamas Lake, with a large portion of this area zoned for multifamily housing alongside employment and commercial areas.
- **Camas is becoming a more diverse community.** The share of people of color increased from 13 in 2008-2012 to 24 in 2018-2022. The City has also become slightly more diverse compared to Clark County overall (where 21 percent of residents were people of color in 2018-2022).
- **Camas is seeing a larger share of couples and families with children** and has a higher share of both groups than the County or State. The City also had a larger median household size, particularly in owner-occupied households.
- **Median household income in Camas is higher than both Clark County and the state of Washington at $133,000 in 2018-2022.** Adjusting for inflation, median income in the City still increased by 31 percent since 2008-2012. This increase is primarily due to growth in high-income households earning over $100,000 per year.
- **Median income in Camas is above the area median income (AMI).** In 2023, HUD determined the AMI to be $114,400 for a family of four in the Portland-Vancouver-Hillsboro, OR-WA MSA (including Camas). This is lower than median income in Camas itself which was $133,000 in 2018-2022 (Exhibit 14) and has been consistently lower than the City over time.
- **Four out of five households in Camas owned their homes in 2018-2022, at a higher rate than either Clark County or Washington.** The share of renter households stayed the same in Camas since 2008-2012, showing less than a 1 percent increase over this time period.
- **County-level trends indicate that homeownership disparities exist for some groups by race and ethnicity in Pierce County,** with households who are Black or African American, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Hispanic or Latino (of any race), two or more races, or another race not listed had lower rates of homeownership.
- **At the County level, income levels also vary by race and ethnicity.** White households were generally in line with the overall median, while income was higher for American Indian or Alaska Native and

Asian households. In Clark County, households who were Black or African American, Native Hawaiian or Pacific Islander, Hispanic or Latino, two or more races, or another race had lower median household incomes than the overall average.

- **Overall levels of housing cost burden are decreasing, but more renters and low-income households experience higher rates.** In 2018-2022, 24 percent of all households experienced cost burden, lower than Clark County's rate of 33 percent overall. However, Different types of households may face varying levels of cost burden. In Camas, a higher share of renter households experienced cost burden in 2018-2022 compared to homeowners. Also in this time period, 100 percent of households earning less than $20,000 experienced severe cost burden (paying 50 percent or more of monthly income towards housing). Although cost burden is generally lower for homeowners, more people of color in Camas who own their homes experience cost burden compared to white, non-Hispanic homeowners.

Existing Housing Inventory

- **Camas and Clark County have both seen growth in their number of housing units in the past two decades.** Camas has seen a 108% change between 2000 and 2023 (annually this equates with an average of 221 new homes). The City of Camas's growth in housing units was lower than its population change (120%), indicating that the City has not been keeping pace by adding to its supply to meet the rising demand.

- **Camas and Clark County have both had steadily low vacancy rates for all housing units in total** (both at 4% in 2018-2022 with little change over the last decade). This level of vacancy is indicative of a healthy housing market with natural rates of turnover; however, the slight decrease in both the City and County could begin to indicate constrained supply of housing.

- **For two-bedroom multifamily units, Camas has seen spikes in vacancy, but these align with new construction trends** which can temporarily raise vacancy rates for newly delivered units but do not indicate long-term vacancy. In 2023, the City saw over 200 new housing units delivered, likely accounting for the fluctuation in vacancies, as well as deliveries in 2017 and 2020.

- **Since 2015, the City has permitted 2,763 new housing units.** Single detached homes have accounted for the largest share (70%) of new permits in the City of Camas, and another 8 percent were made up of attached townhomes. While apartments, condos, and units in mixed-use buildings made up 20 percent of new permits between 2015-2024, middle housing types like duplexes, triplexes, quadplexes, and accessory dwelling units (ADUs) were only 2 percent of all permits.

- **Median home sale prices in Camas and Clark County have increased over the last ten years,** with Camas's average prices generally remaining higher than the County or comparison cities of Battle Ground and Washougal. In 2023, the average home sale price in the City was **$704,000,** increasing by 119 percent since 2013. In comparison with surrounding jurisdictions, the average home sale in Camas was more expensive than the average home in the City of Portland (by $196,000) or Clark County (by $173,000) in 2023.

- **Prices are also increasing quickly in Camas and Clark County for the average 2-bedroom multifamily rental.** In 2024 year-to-date, the average 2-bedroom apartment rent was over $1,800 in the City and over $1,700 in Clark County. This indicates over a 35 percent increase since 2010 in the

City and County. Average 2-bedroom multifamily rents in Portland tracked closely with Camas in the 2010's, while rents in Vancouver remained lower (generally following countywide trends). Since 2020, rents in Camas have risen higher than both cities on average.

- **Compared with home sale price and rent increases in Camas, only households earning over 150 percent or more of AMI would be able to afford the average home in the City as of 2023.** However, the average 2-bedroom apartment is still affordable to households between 50 and 80 percent of AMI in Camas.
- **The City of Camas had 98 units of regulated affordable housing in 6 buildings** according to data from Oregon Metro and the City. Approximately half of these units are affordable respectively for residents between 30-50% of AMI and 50-80% of AMI. The City also has several long-term care residential facilities for older adults providing 135 units.

Future Housing Demand

- **Since 2000, Camas has grown at a faster rate than Clark County overall but is expected to slow based on County estimates by 2045.** The County's interim projections assume that new population growth in Camas is estimated to grow at an annual rate of 1.2% and account for 4.05% of countywide population growth.
- **County allocations show the need for 4,226 new housing units in Camas by 2045, adding around 211 new housing units per year.**
- **The City would add about 311 new units to meet the new permanent supportive housing target and 1,766 units affordable to low-income households below 80% of AMI by 2045.**
- **Camas residents with disabilities may require additional housing features for accessibility to meet their needs.** In 2018-2022, 8 percent of residents in Camas had at least one disability. The most common type of disability in the City was cognitive difficulties, followed by ambulatory and vision difficulties. These disabilities can require housing accommodations such as zero-step entryways, ramps, lifts, or other accessibility features.

Community Demographic Trends

Understanding population and housing characteristics are important for context for developing policies that anticipate the needs and goals of Camas. Key trends such as population growth, household size and composition, homeownership, and residents' characteristics like age, income, and race and ethnicity provide useful information about how Camas is changing and what changes are affecting housing demand in the city. Tracking these trends also helps to work towards equitable outcomes, by recognizing where there are existing gaps and what groups may face disproportionate challenges to accessing housing that meets their needs.

This assessment relied on data primarily sourced from the United States Census Bureau's 5-year American Community Survey (ACS) estimates,[2] CoStar, Washington Office of Financial Management (OFM), the United States Department of Housing and Urban Development (HUD), and the City of Camas. Primary geographies used include the City of Camas, Clark County, and Washington State, as well as targeted comparisons with surrounding comparable cities of Battle Ground and Washougal.

In some cases, the margin of error (MOE) with the Census Bureau's ACS data and other sources can be very high, severely reducing the accuracy of some variables. This typically happens for groups with smaller sample sizes or data filtered to smaller geographies. Where data is not available at the city level, we include information at the County level.

The Washington State Office of Financial Management (OFM) provides official state and local population estimates and projections for use in the allocation of funds, growth management, and other planning functions. This section utilizes official population estimates from 2000-2023 to understand Camas's population growth over the last few decades, as well as estimates of households and projections of these data through 2044.

Population Growth, Age, Race and Ethnicity

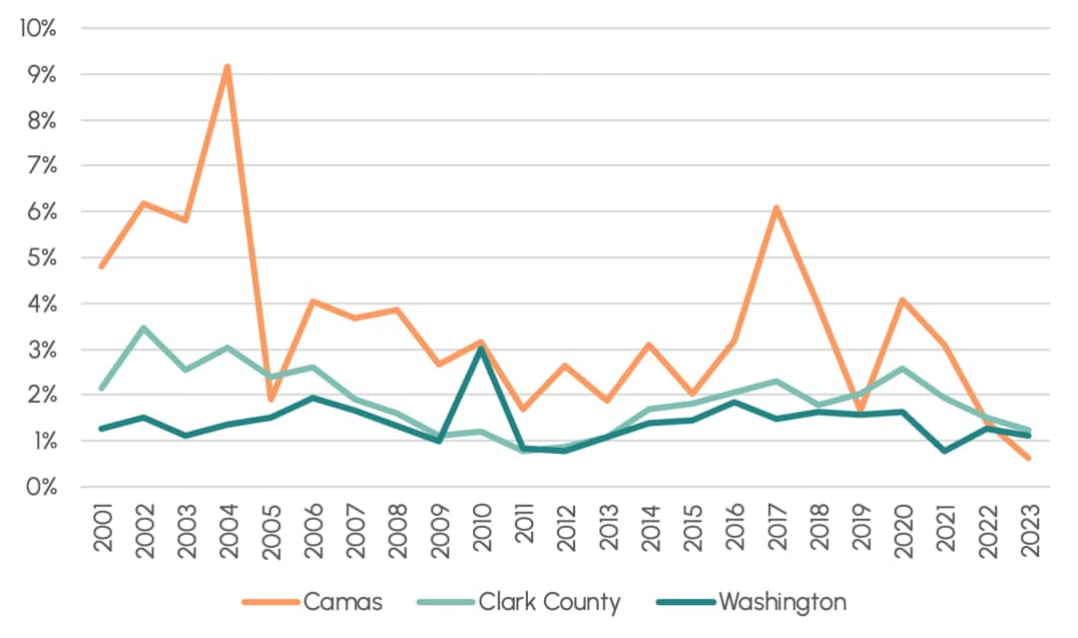
Since 2000, Camas has grown at a faster rate than Clark County or Washington State overall, increasing by 120% (or 5.2% annually on average). The City saw its greatest increases in population in 2004, 2017, and 2020 (Exhibit 3). Camas's peer cities in Clark County like Battle Ground and Washougal have also seen higher rates of growth over the County average per year. As the population of these smaller cities increase, demand for housing also rises and affects the way that cities like Camas must plan to meet residents' housing needs.

[2] 5-year estimates use data collected over a longer period of time used to increased statistical reliability of the data by using a larger sample for geographies with populations under and small groups within a population. Since Camas's population is below the threshold of 65,000 residents, 1-year estimates are not available at the city level. This report generally uses the most current estimates at the time of writing; for ACS data this is 2018-2022, as well as comparison over time to 2008-2012 data.

Exhibit 2. Total Population, Camas, Clark County, Washington, and Comparison Geographies, 2000-2023
Source: WA Office of Financial Management (Intercensal and postcensal)

JURISDICTION	POPULATION			CHANGE, 2000-2023	PERCENT CHANGE, 2000-2023	AAGR 2000-2023
	2000	2010	2023			
City of Camas	**12,462**	**19,355**	**27,420**	**14,958**	**120%**	**5.2%**
Clark County	342,194	425,363	527,400	185,206	54%	2.4%
City of Battle Ground	9,206	17,571	21,910	12,704	138%	6.0%
City of Washougal	8,595	14,095	17,490	8,895	103%	4.5%
Washington State	5,757,761	6,724,540	7,951,150	2,193,389	38%	1.7%

Exhibit 3. Population Growth Change Year-over-Year (YOY), Camas, Clark County, and Washington, 2000-2023
Source: WA Office of Financial Management (Intercensal and postcensal)

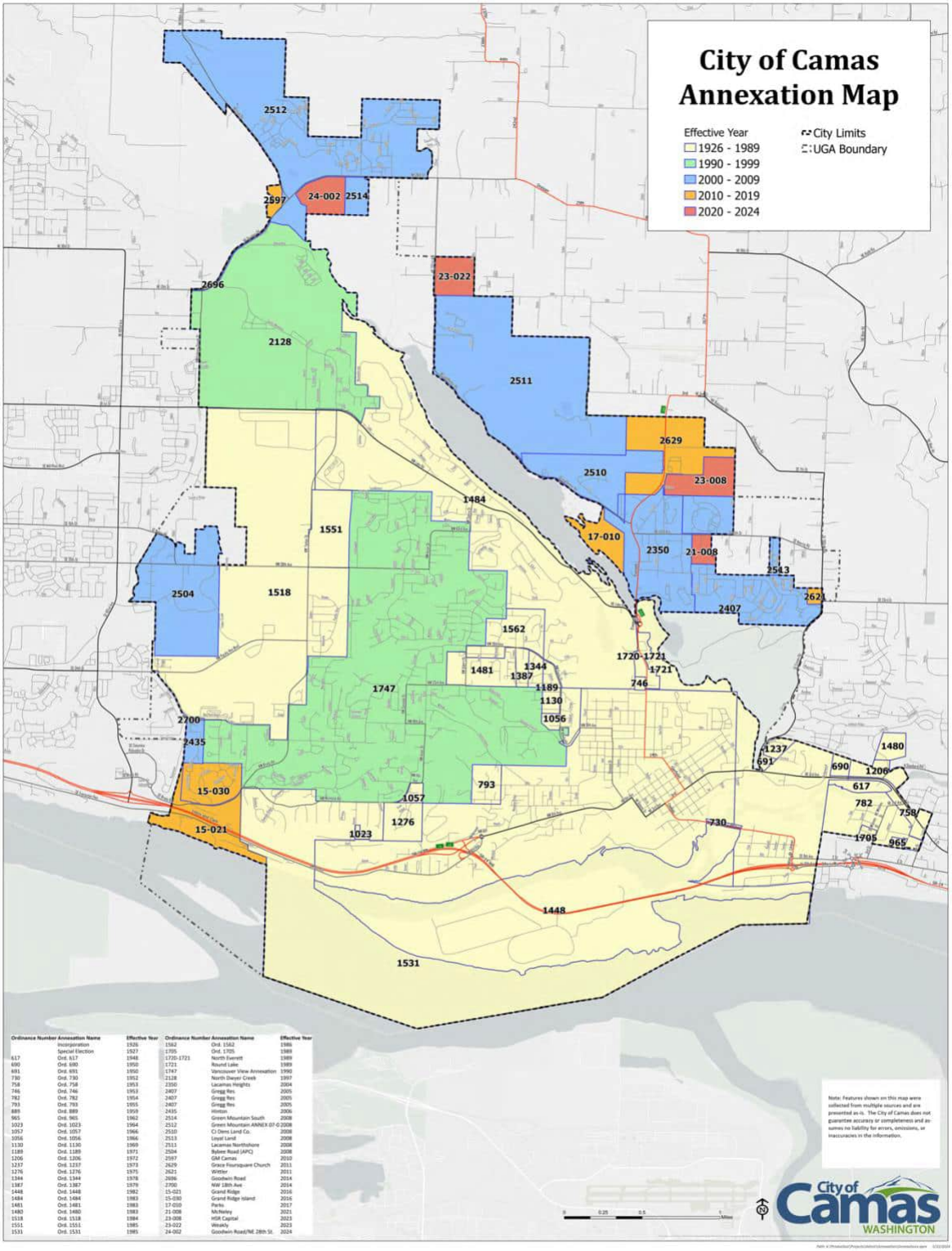


In terms of land, Camas has expanded incrementally over time through annexations. Although annexations can be used to bring in different types of land uses to a city (industrial, open space, etc.), the addition of new residential land use areas can increase the City's population and capacity for new housing. Exhibit 4 below shows new annexations in Camas as of 2016.[3] In the 2000's and early 2010's, the City added large new areas on the north side of Lacamas Lake, with a large portion of this area zoned for multifamily housing alongside employment and commercial areas.

[3] Since the City's most recent annexation map, it has also annexed an additional 154 acres across four parcels since 2016.

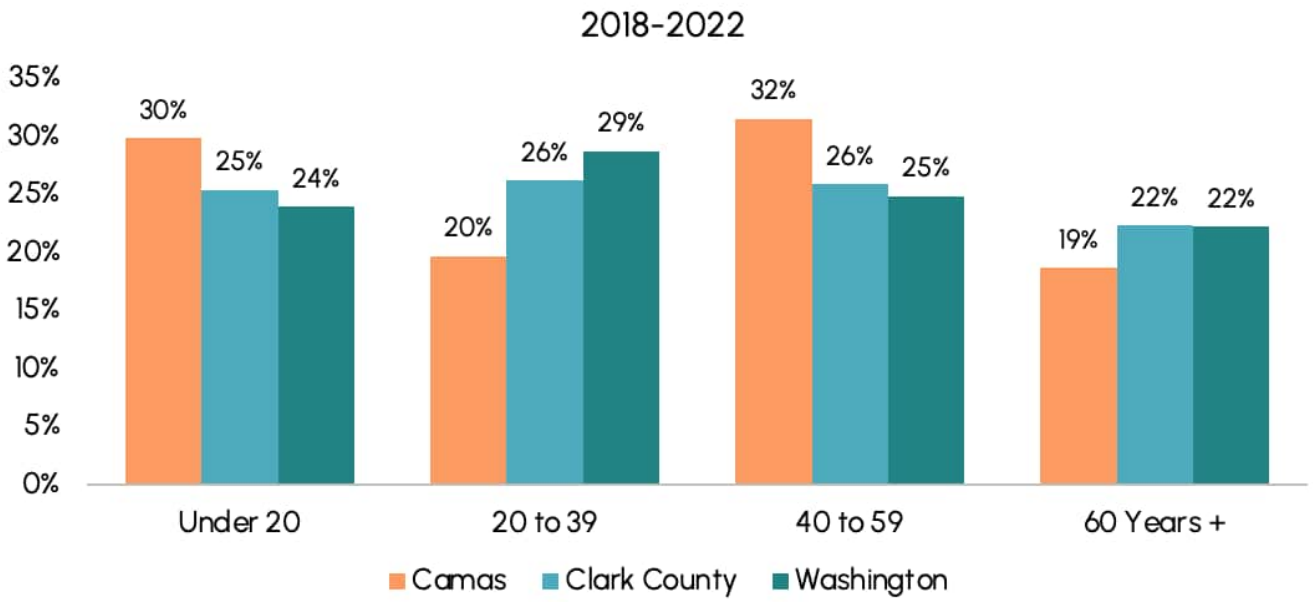
Exhibit 4. City of Camas Annexations Through 2024

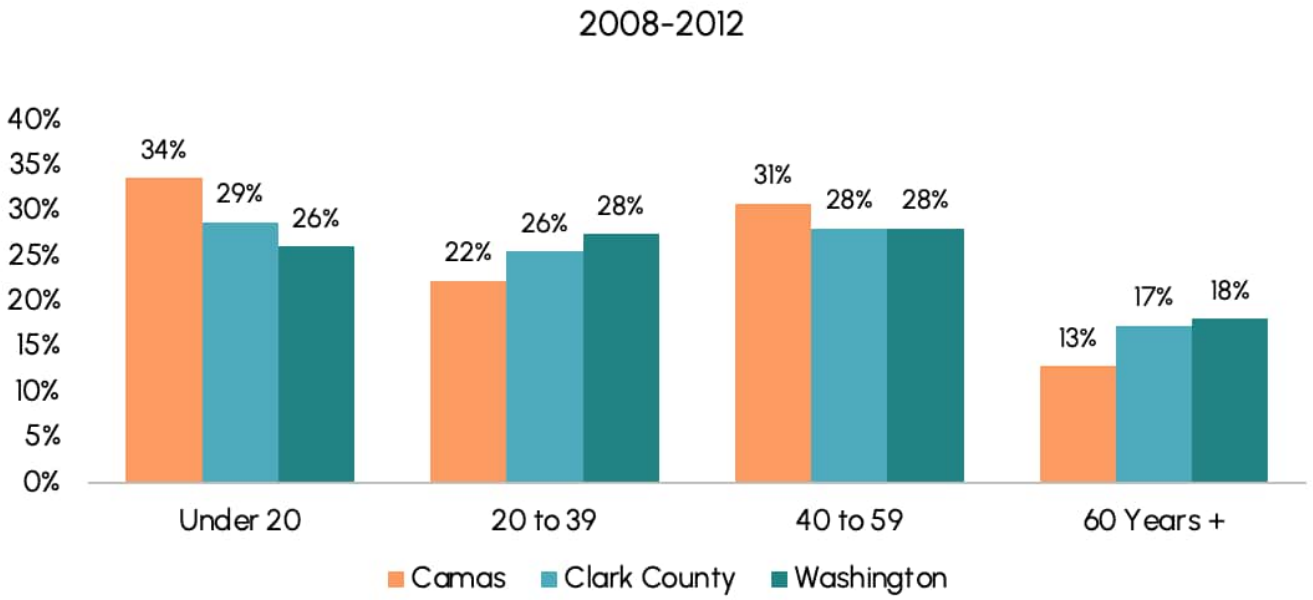
Source: City of Camas



Camas has a quickly aging population. Between 2008-2012 and 2018-2022, Camas's share of residents under 18 saw the greatest decline from 34 to 30 percent of the population while the share of residents aged 60 years or over increased in this time period from 13 to 19 percent. The share of adults between the ages of 20 and 59 remained relatively stable.

Exhibit 5. Age Distribution, Camas, Clark County, and Washington, 2008-2012, 2018-2022
Source: U.S. Census Bureau, 2008-2012, 2018-2022 ACS 5-Year Estimates.





Median age in Camas increased by 4.3 years between 2008-2012 and 2018-2022, rising faster than Clark County or the State of Washington overall. Households' housing needs can change depending on different stages of life. For example, early- to mid-career workers (typically falling in the age 20 to

39 years category), multigenerational families with children, or older persons entering retirement may all have differing needs for the location, price, size, layout, or other features of their homes.

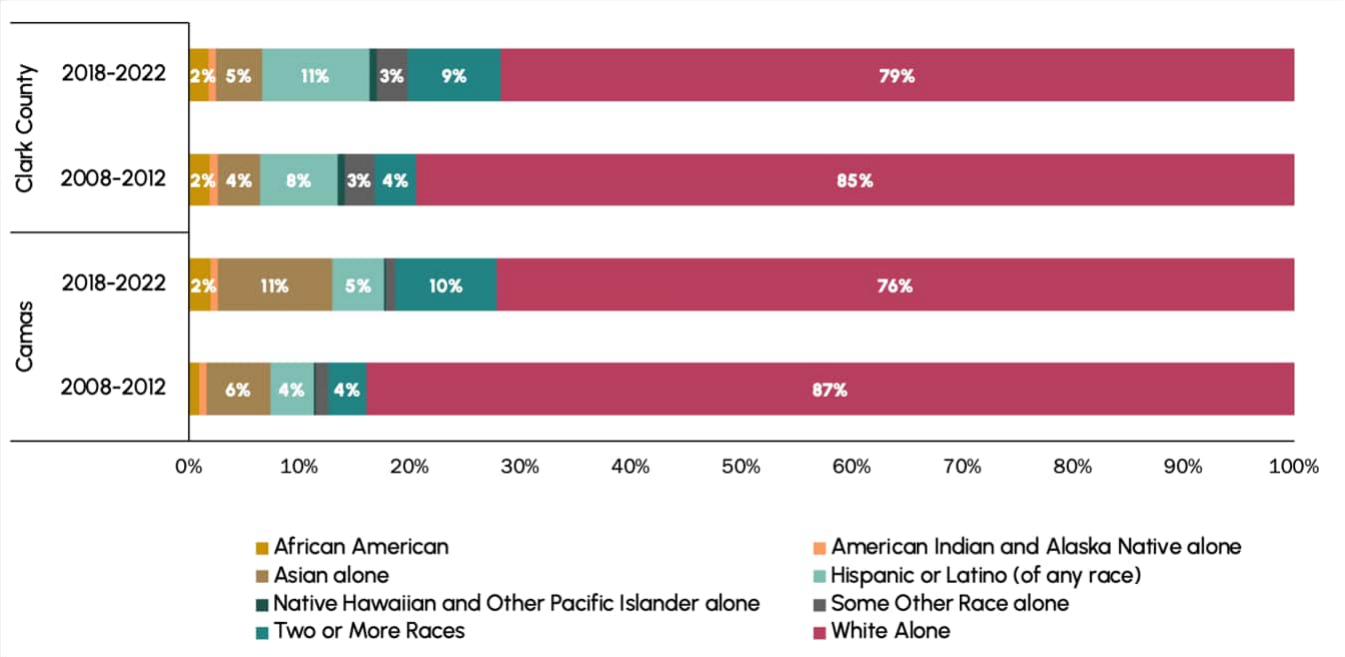
Growth of adults aged 50 and over is also reflected in shrinking household sizes and changing types shown below in Exhibit 9 and Exhibit 10, indicating a growing need for housing to accommodate older adults.

Exhibit 6. Median Age, Camas, Clark County, Washington, and Comparison Geographies 2008-2012, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates

JURISDICTION	2008-2012	2018-2022	CHANGE
City of Camas	36	40	+4.3
Clark County	37	39	+2.0
State of Washington	37	38	+0.8

Camas is becoming a more diverse community, with the share of people of color increasing between 2008-2012 and 2018-2022. The City has also become slightly more diverse compared to Clark County overall. In 2018-2022, approximately one quarter percent of residents in Camas were people of color. The City saw the greatest increase since 2008-2012 in the share of residents who are Asian or two or more races; these groups grew respectively by 5 and 6 percent points. Changes to a city's race and ethnicity profile can indicate changing housing needs due to disparate impacts of historic and systemic discriminations faced by many people of color for accessing housing.

Exhibit 7. Population by Race and Ethnicity, Camas and Clark County, 2008-2012, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates
Note: Labels not shown for values ≤1%



Household Trends

Change in number of households over time is helpful for understanding a number of trends alongside overall population growth, such as household formation. **Between 2000 and 2023, the City of Camas saw a higher annual rate of household growth compared to Clark County and Washington. Comparison cities of Battle Ground and Washougal saw similar or greater growth rates, increasing by 4.0 and 2.9 percent respectively per year since 2000.** Growth in smaller cities within Clark County and the region require intentional planning to make sure new housing needs are being met in the community.

Exhibit 8. Total Households, Camas, Clark County, Washington, and Comparison Geographies, 2000-2023
Source: OFM

JURISDICTION	2000	2010	2023	CHANGE 2000-2023	PERCENT CHANGE 2000-2023	AAGR (2000-2023)
City of Camas	4,736	5,952	9,833	5,097	108%	3.2%
Clark County	134,030	167,413	207,044	73,014	54%	1.9%
City of Battle Ground	3,209	5,952	7,945	4,736	148%	4.0%
City of Washougal	3,463	5,673	6,655	3,192	92%	2.9%
State of Washington	2,451,081	2,886,948	3,341,640	890,559	36%	1.4%

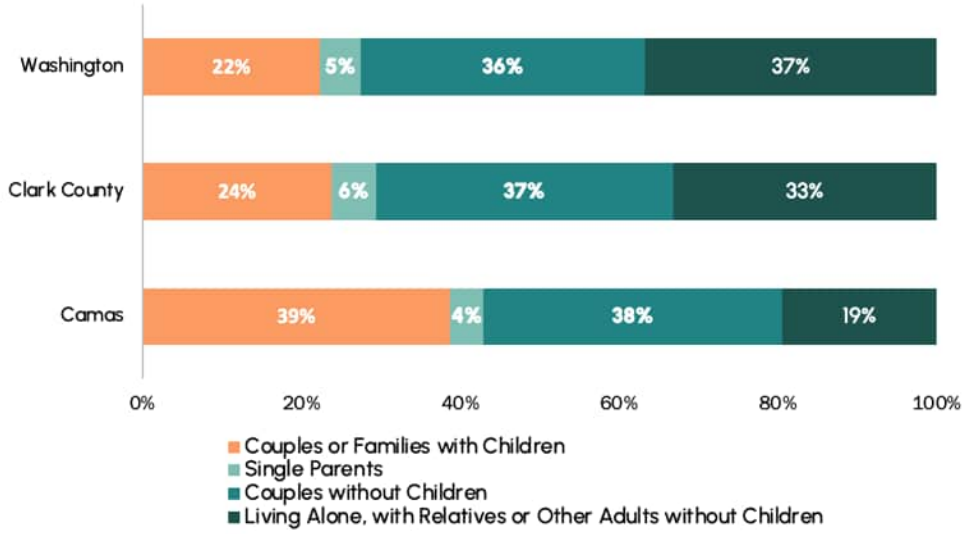
Changing household sizes and types have implications for the different types of housing units needed in a City. In Camas, the share of 1- and 2-person households grew between 2008-2012 and 2018-2022, while the share of 3- and 4-person households decreased. This could indicate a 'downsizing' trend where many older adults may seek out smaller units as adult children establish new households.

Exhibit 9. Household Size Distribution, Camas and Clark County, 2008-2012, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



Household types in Camas however indicate a larger share of couples or families with children in the City compared with Clark County or Washington overall, with a smaller share of residents living alone or with extended relatives. This may indicate a trend of **multigenerational households** in the city, where several generations of a family co-habitate.

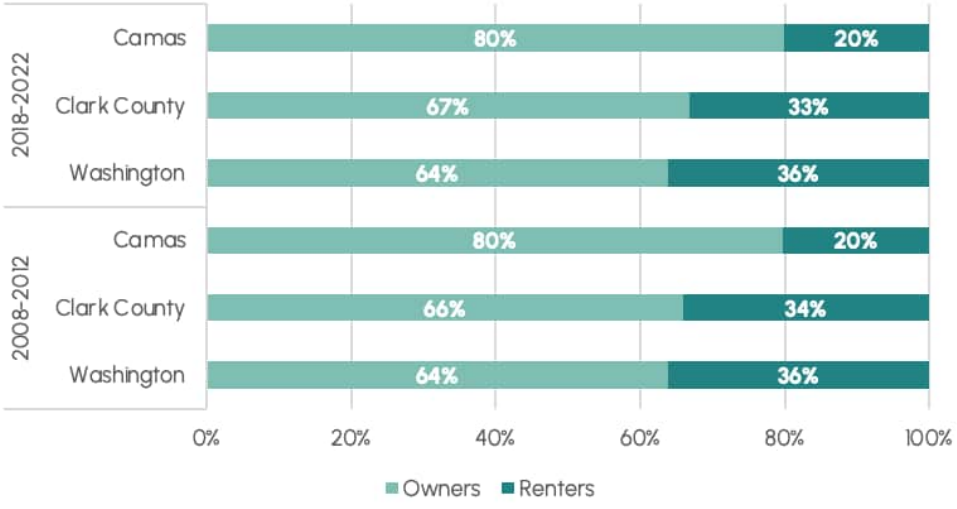
Exhibit 10. Household Type, Camas, Clark County, and Washington, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



Household Tenure

Household tenure refers to the ownership status of residents in their homes, either as owners or renters of their home. In 2018-2022, **80 percent of households in Camas owned their homes, at a higher rate than either Clark County or Washington.** The share of renter households stayed the same in Camas since 2008-2012, showing less than a 1 percent increase over this time period.

Exhibit 11. Household Tenure, Camas and Clark County, 2008-2012, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



Camas maintained a larger median household size than the County or the State in both 2008-2012 and 2018-2022, with little change in the City. In both periods owner-occupied households tended to be larger than renter households.

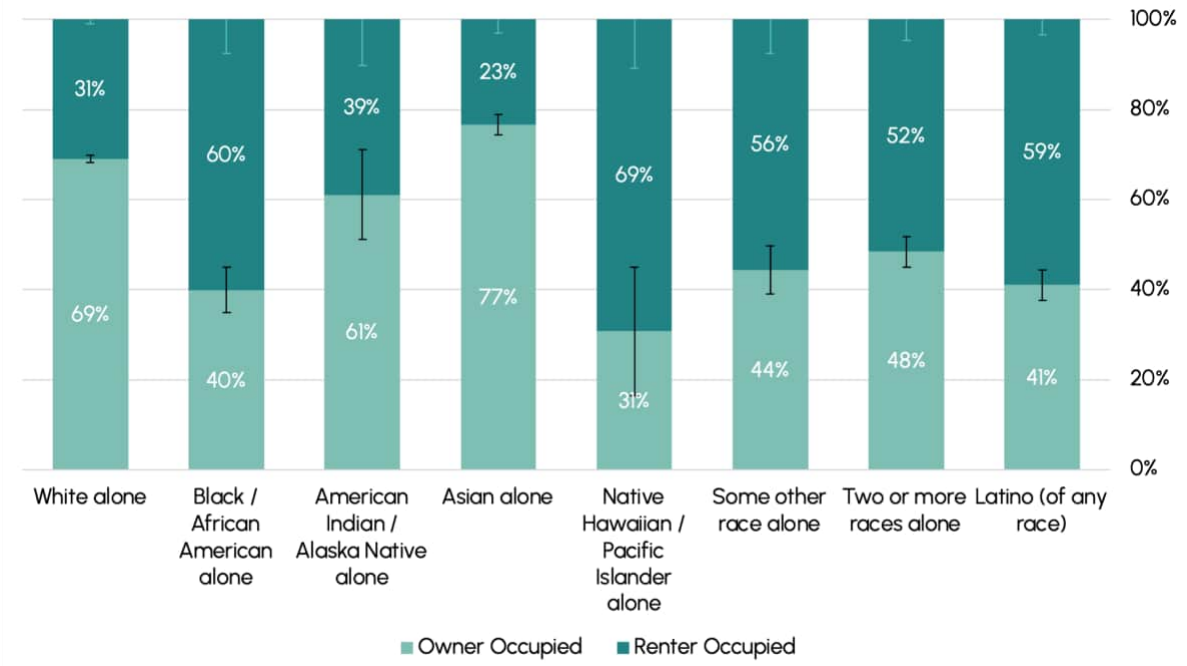
Exhibit 12. Average Household Size by Tenure, Camas, Clark County, and Washington, 2008-2012, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates

	CAMAS	CLARK COUNTY	WASHINGTON
2008-2012			
Average household size	**2.96**	2.67	2.52
Owner-occupied units	**3.01**	2.75	2.61
Renter-occupied units	**2.74**	2.52	2.35
2018-2022			
Average household size	**2.95**	2.65	2.53
Owner-occupied units	**3.07**	2.72	2.66
Renter-occupied units	**2.48**	2.49	2.3
Change 2008-2012 to 2018-2022			
Average household size	**-0.01**	-0.02	0.01
Owner-occupied units	**0.06**	-0.03	0.05
Renter-occupied units	**-0.26**	-0.03	-0.05

Homeownership rates can often vary by race and ethnicity, as many people of color face historic and systemic barriers from a legacy of discriminatory practices in the United States. In Camas today, margins of error are too high to disaggregate homeownership by race and ethnicity.

However, **County-level trends indicate that disparities exist for some groups in Clark County, with households who are Black or African American, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Hispanic or Latino (of any race), two or more races, or another race not listed had lower rates of homeownership. Native Hawaiian or Pacific Islander**, Black or African American, and Latino of any race had the lowest homeownership rates with over half renting their home. White and Asian households both had rates of homeownership above the County average overall (Exhibit 11) at 69 percent and 77 percent. Intentional policies to remove barriers to homeownership can help to reduce these disparities.

Exhibit 13. Homeownership by Race, Clark County, 2018-2022
Source: U.S. Census Bureau, 2018-2022 ACS 5-Year Estimates



Household Income Trends

Income is a critical factor for determining housing choices. A household's level of income influences both the type of housing they are able to afford (e.g., single-family detached homes, multifamily units) and their tenure (whether a household has the option to purchase a home or rent). **Median household income in Camas is higher than both Clark County and the state of Washington at $133,000 in 2018-2022. Adjusting for inflation, median income in the City still increased by 31 percent since 2008-2012. This increase is primarily due to growth in households earning over $100,000 per year (Exhibit 15).**

Exhibit 14. Median Household Income, Camas, Clark County, and Washington (2022$)
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates
Note: 2008-2012 values are adjusted for inflation

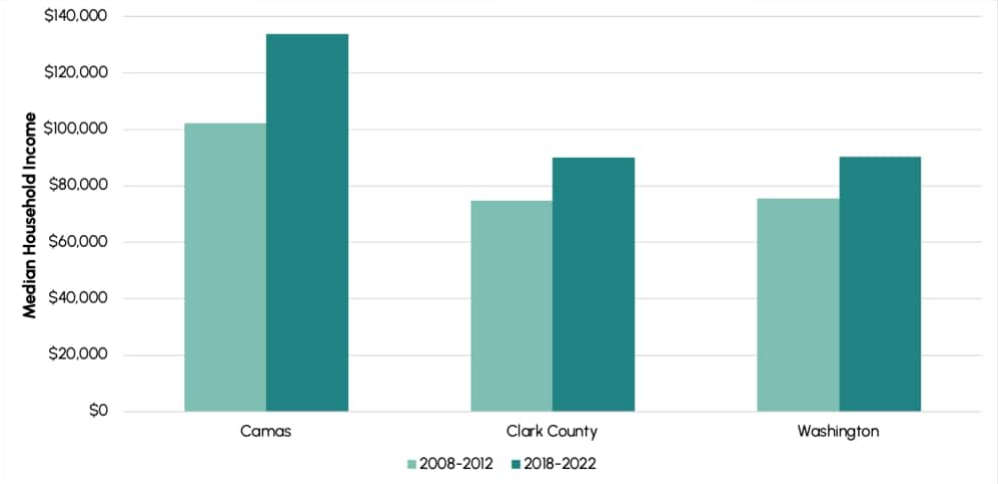
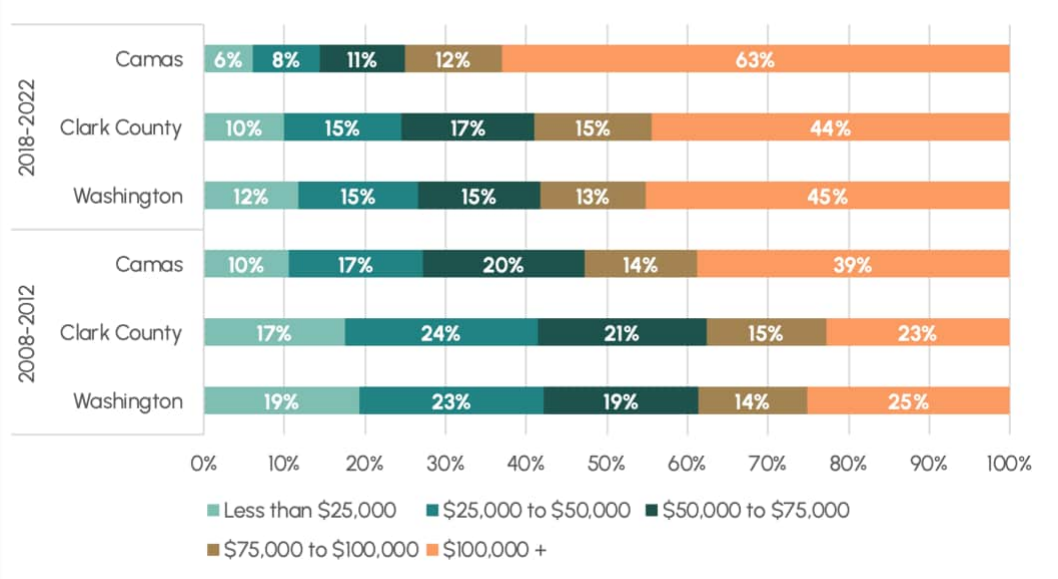


Exhibit 15. Change in Household Income Distribution, Camas and Clark County, 2008-2012, 2018-2022

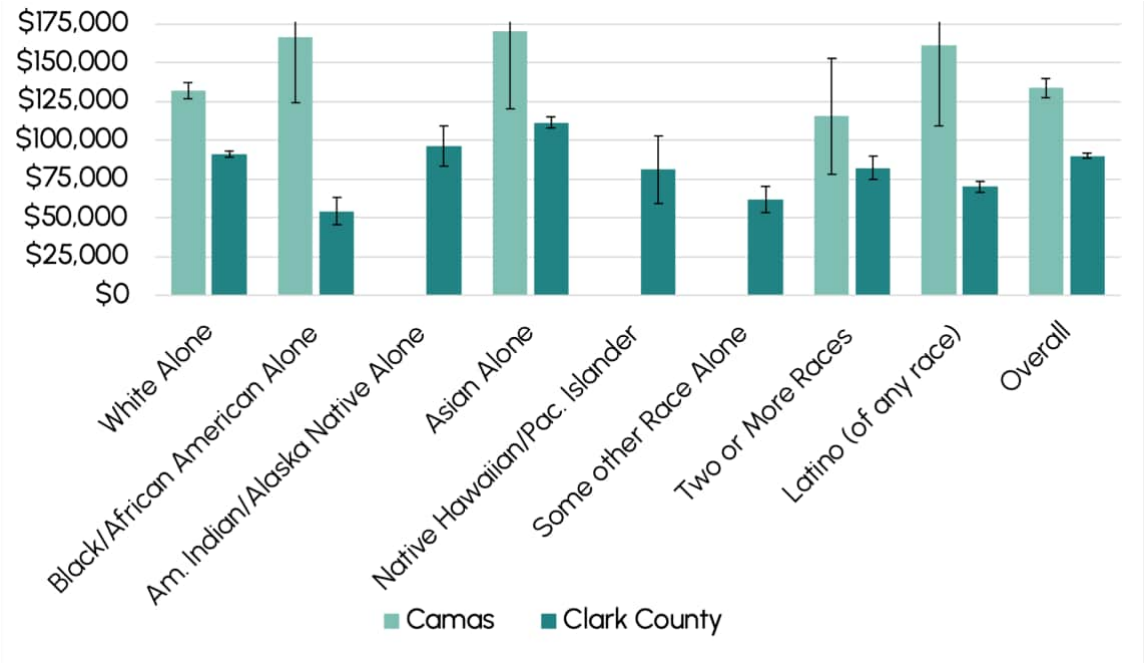
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



Median household income is higher in Camas than in the County for all groups by race and ethnicity (where data was accurate enough to be interpreted). White residents in Camas had approximately the same median income as the City overall, while Black or African American, Asian, and Hispanic or Latino residents indicated higher median income. Household income for those who were two or more races was the only group estimated to be below average for the City. However, high margins of error for many groups in the City of Camas may lead to inaccuracies in this data.

At the County level, income for white households was generally in line with the overall median, while income was higher for American Indian or Alaska Native and Asian households. In Clark County, households who were Black or African American, Native Hawaiian or Pacific Islander, Hispanic or Latino, two or more races, or another race had lower median household incomes than the overall average. Considering the high margins of error for the data provided at the City level, it is possible that these disparities also exist for the same households of color in Camas.

Exhibit 16. Median Household Income by Race and Ethnicity, Camas and Clark County, 2018-2022
Source: U.S. Census Bureau, 2018-2022 ACS 5-Year Estimates
Note: Due to limited data, median income for some groups is not available at the City level.



Another aspect of analyzing household incomes is the Area Median Income (AMI). AMI is defined as the midpoint of a specific area's income distribution and is defined each year by the Department of Housing and Urban Development (HUD).[4] HUD includes Camas as part of the Clark County in the Portland-Vancouver-Hillsboro, OR-WA MSA. **In 2023, HUD determined the AMI to be $114,400 for a family of four in the area. This is lower than median income in Camas itself which was $133,000 in 2018-2022 (Exhibit 14) and has been consistently lower than the City over time.**

Exhibit 17. Median Family Income (MFI) for a Family of Four, Camas and Clark County (2023$)
Source: HUD

	EXTREMELY LOW (30%)	LOW (50%)	MODERATE (80%)	MEDIAN (100%)	HIGH (120%+)
2019	$26,350	$43,950	$70,300	**$87,900**	$105.500
2023	$33,850	$56,400	$90,200	**$114,400**	$137,300

[4] AMI/ Median Family Income (MFI) looks at how much each income level can afford in housing costs which is helpful for understanding housing affordability. Each year, the HUD uses data from the U.S. Census to define an area's MFI based on family size. The MFI benchmark helps determine eligibility for HUD housing programs (often including rent-restricted housing) and supports the tracking of different housing needs for a range of household incomes. If the term AMI is used in an unqualified manor, this reference is synonymous with HUD's MFI.

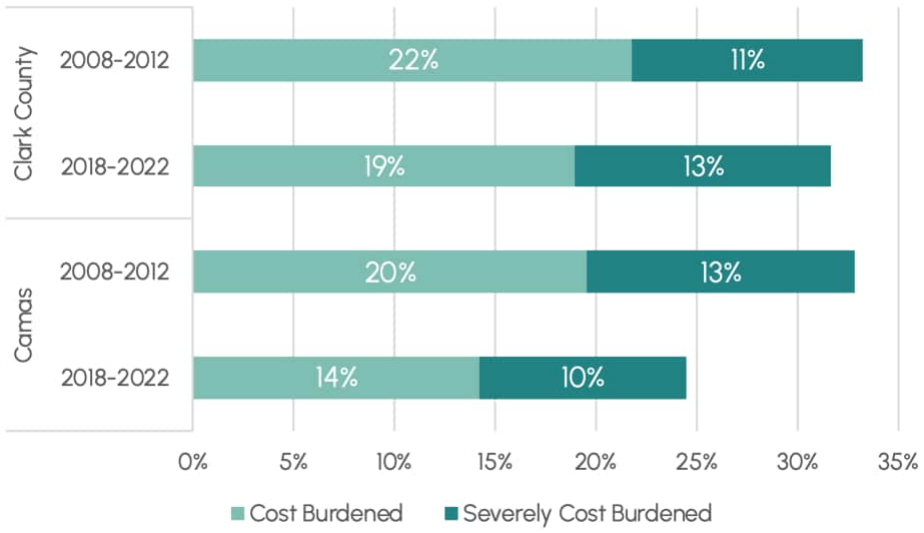
Cost Burden

Housing costs are typically the largest portion of a household budget, and typically include mortgage or rent payment, utilities, interest, and insurance. HUD guidelines indicate that households paying more than 30% of their income on housing experience "cost burden" and households paying more than 50% experience "severe cost burden." Using cost burden as an indicator is one method of determining how well a city is meeting its need to provide housing that is affordable to all households in a community.

Cost burdening for owner-occupied households is less common because mortgage lenders typically ensure that a household can pay its debt obligations before signing off on a loan. However, cost burdening can occur when a household secures a mortgage and then sees its income decline. In addition, retired persons subsisting on a fixed income can experience cost burden associated with increased property taxes rising above their financial limitations.

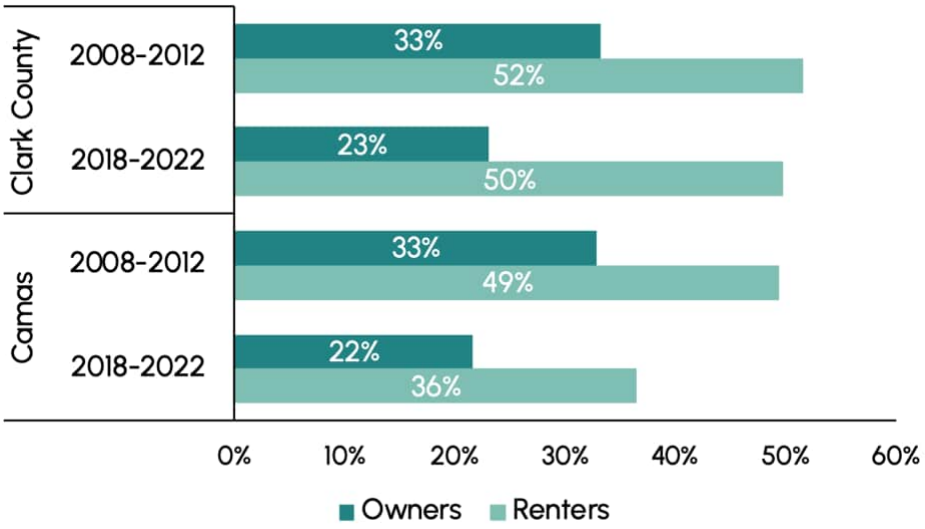
Total rates of cost burdened households decreased in Camas between 2008-2012 and 2018-2022, falling below Clark County's average. In 2018-2022, 24 percent of all households experienced cost burden, compared to 33 percent in the County overall.

Exhibit 18. Cost Burden for All Households, Camas and Clark County, 2008-2012, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



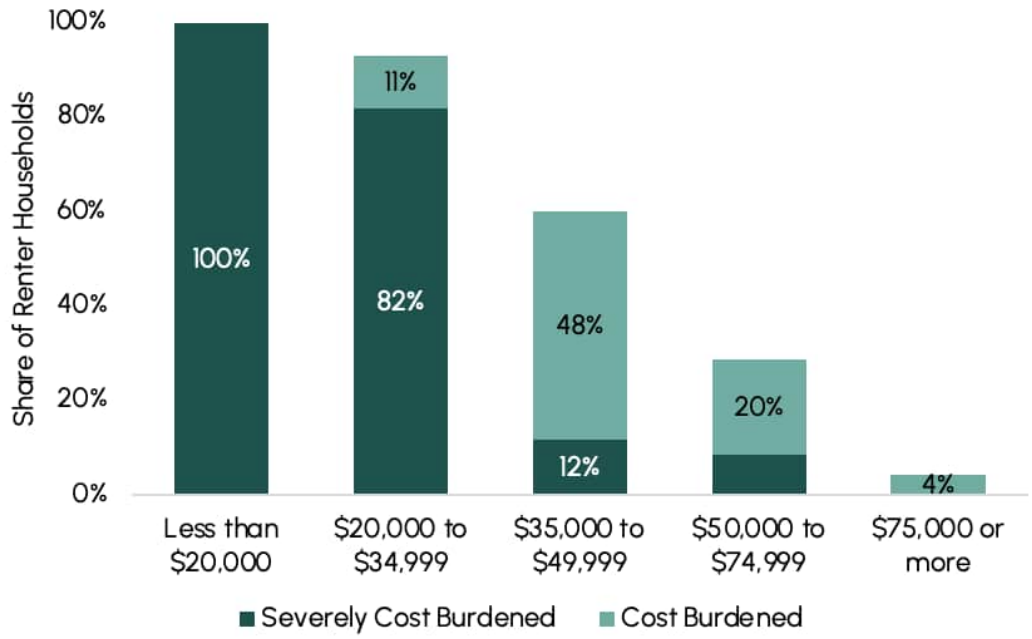
Different types of households may face varying levels of cost burden. Renters are often more vulnerable to increasing housing costs due to property owner decisions and changing demand trends. **In Camas, a higher share of renter households experienced cost burden in 2018-2022 compared to homeowners but saw a greater decrease since 2008-2012.**

Exhibit 19. Cost Burden by Tenure, Camas and Clark County
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



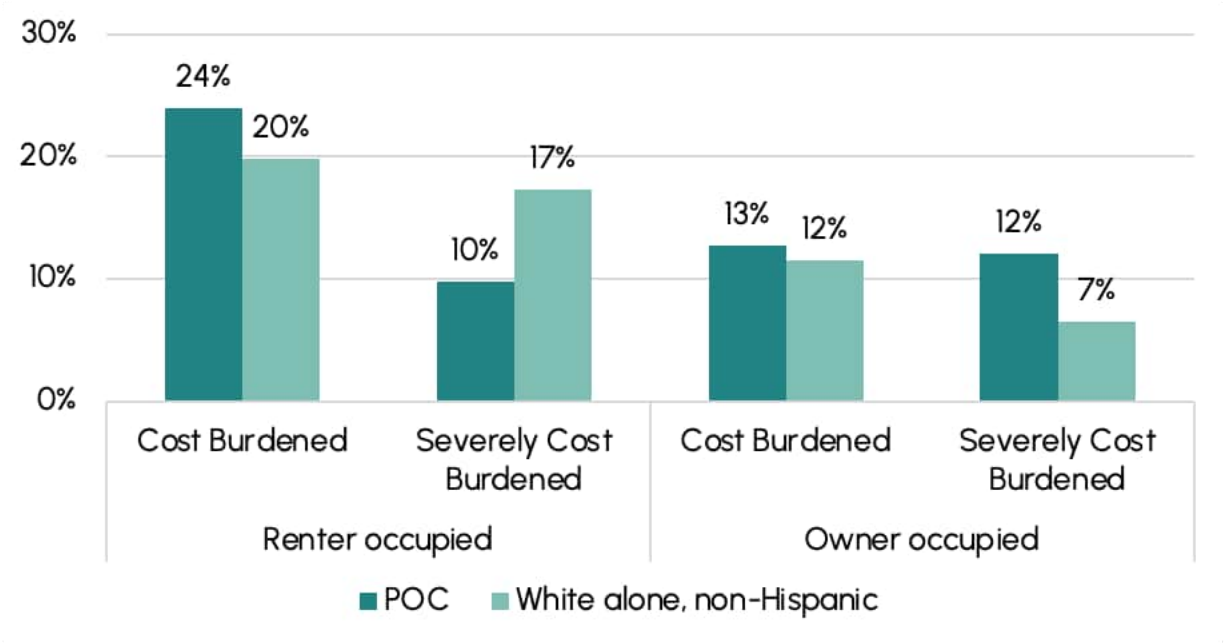
Cost burden is also higher in Camas for lower-income households, who are often less able to absorb changes to monthly housing costs. In 2018-2022, **100 percent of households earning less than $20,000 experienced severe cost burden (paying 50 percent or more of monthly income towards housing).** In comparison, 93 percent of those earning $20,000 to $34,999 per year were cost burdened or severely cost burdened. The rate of cost burden proportionately reduces for those earning higher incomes, with only four percent of those earning $75,000 or more per year experiencing any cost burden.

Exhibit 20. Cost Burden by Income, Camas, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



Cost burden for people of color in Camas is generally higher compared to White, Non-Hispanic households, particularly for homeowners of color. **In 2016-2020, 25 percent of homeowners of color were cost burdened, compared to 19 percent of White, Non-Hispanic homeowners.**

Exhibit 21. Cost Burden for People of Color (POC) and White Households by Tenure, Camas, 2016-2020
Source: 2016-2020 CHAS



Existing Housing Inventory

Understanding the City's existing housing supply and characteristics is critical for planning to meet future housing demand. This section provides information about homes in Camas today, including growth over time, vacancy rates, housing costs, and implications for housing affordability.

Housing Units

Similar to growth in population, Camas and Clark County have both seen growth in their number of housing units in the past two decades. Camas has seen a 108% change since 2000 (annually this equals 4.7% growth or 221 new homes), representing a greater proportionate increase than both the County and Washington State.

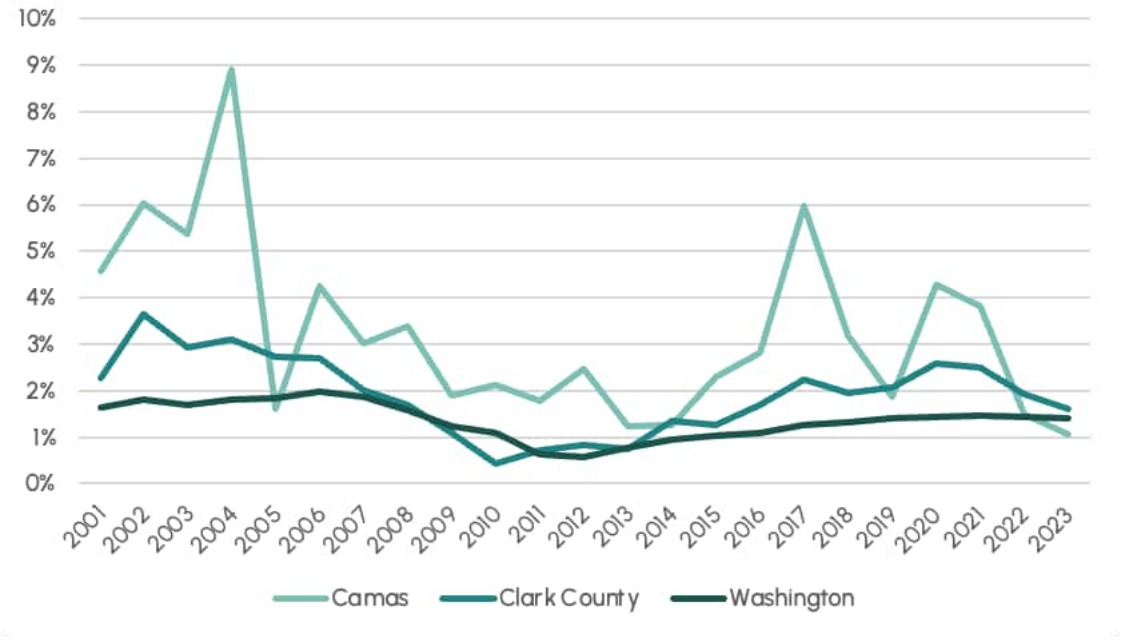
The City of Camas's growth in housing units was lower than its population change as shown above in

Exhibit 2 (120% or 5.3% AAGR), indicating that the City has not been keeping pace by adding to its supply to meet the rising demand. A sharp spike in housing production in 2017 and 2020 reflected population growth trends in the City (Exhibit 23).

Exhibit 22. Total Housing Units, Camas, Clark County, and Washington 2000-2022
Source: OFM

JURISDICTION	2000	2010	2023	CHANGE 2000-2023	PERCENT CHANGE 2000-2023	AAGR (2000-2023)
City of Camas	4,736	7,072	9,833	5,097	108%	4.7%
Clark County	134,030	167,413	207,044	73,014	54%	2.4%
State of Washington	2,451,081	2,886,948	3,341,640	890,559	36%	1.6%

Exhibit 23. Household Growth Change Year-over-Year (YOY), Camas, Clark County, and Washington 2000-2023
Source: WA Office of Financial Management (Intercensal and postcensal). Note: Some of the spikes in household growth were partially attributed to annexations to the City of Camas.



Vacancy Rate

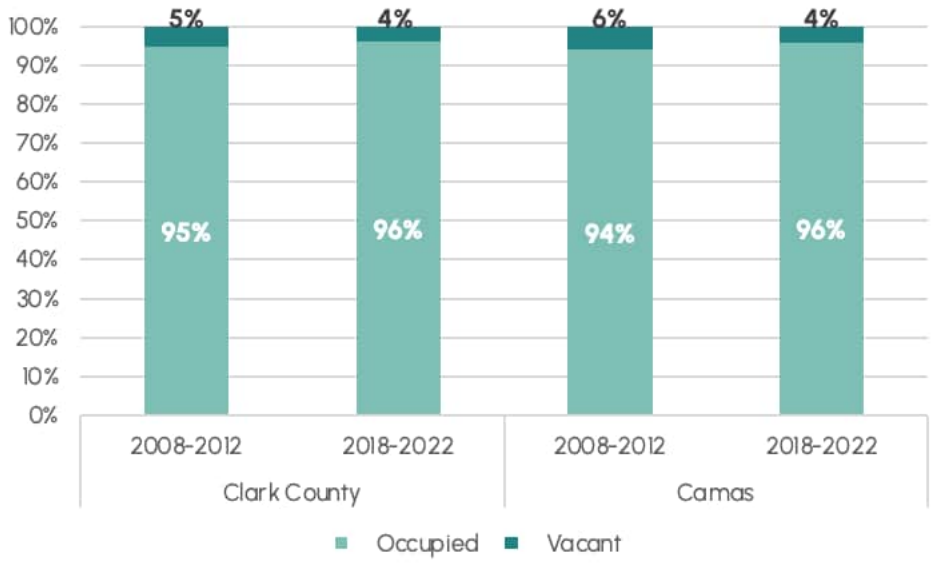
The Census defines vacancy as "unoccupied housing units considered vacant."[5] Vacancy status is determined by how the unit would likely be occupied (e.g., for rent, for sale, or for seasonal use only).

[5] US Census Bureau, "American Community Survey and Puerto Rico Community Survey 2022 Subject Definitions," https://www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html, 45-46.

Vacancy rates are cyclical and represent the lag between demand and the market's response to demand for additional dwelling units. Vacancy rates for rental and multifamily units are typically higher than those for owner-occupied and single-family dwelling units.

Between 2008-2012 and 2018-2022, Camas and Clark County saw steadily low vacancy rates for all housing units in total. This level of vacancy is indicative of a healthy housing market with natural rates of turnover; extremely low vacancy rates can indicate a more constrained supply that is not meeting housing demand. However, the slight decrease in both the City and County could begin to indicate constrained supply of housing.

Exhibit 24. Vacancy Rate, All Housing Units, Camas and Clark County, 2008-2012, 2018-2023
Source: ACS 5-Year Estimates



Below, Exhibit 25 shows the 2-bedroom multifamily vacancy rate for Camas according to CoStar (a real estate market platform). Camas's vacancy rate in 2024 year-to-date was high at 18.4 percent, rising quickly since 2022. The City's sharp spike in the past two years aligns with new construction trends, which can temporarily raise vacancy rates for newly delivered units but do not indicate long-term vacancy. In 2023, the City saw over 200 new housing units delivered, likely accounting for the fluctuation in vacancies, as well as deliveries in 2017 and 2020 that correspond with high vacancies. Two-bedroom vacancies have been comparatively low in Clark County overall and stood at 7.4% in 2024 YTD. New deliveries have increased over the last decade, with the most annual deliveries in 2023 (1,306 units).

Exhibit 25. 2-Bedroom Multifamily Units Vacancy Rate, Camas and Clark County, 2014-2024 (YTD)
Source: CoStar

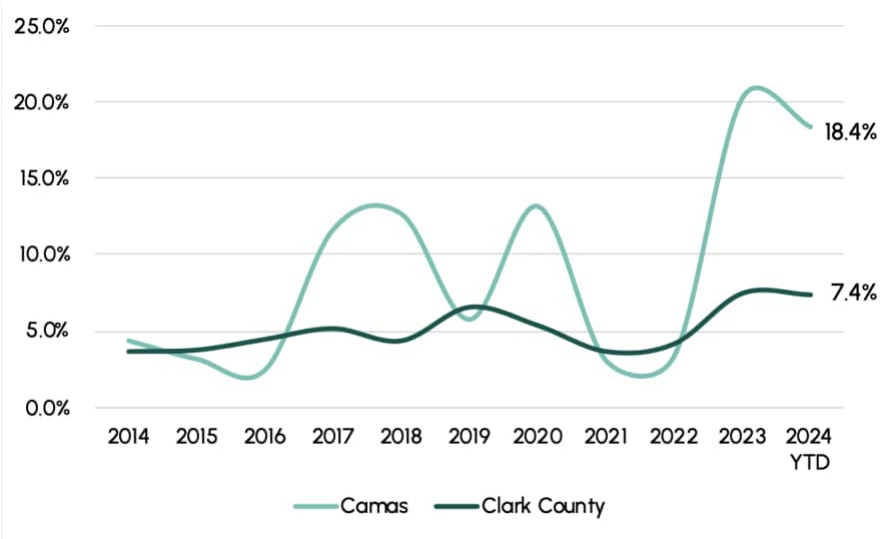
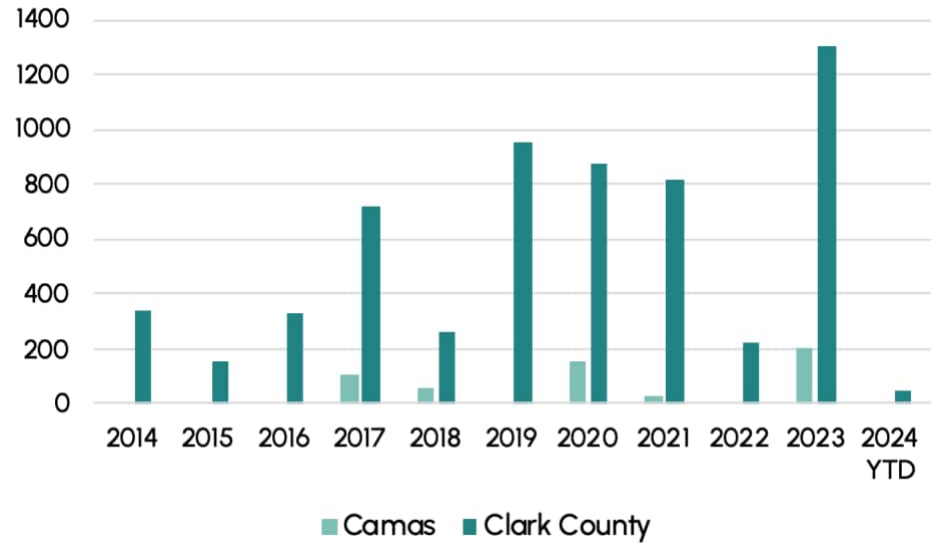


Exhibit 26. 2-Bedroom Multifamily Deliveries (Units), Camas and Clark County, 2014-2024 (YTD)
Source: CoStar



Housing Production

This analysis examined the City's building permit data from 2015 to 2023 to supplement housing development trends. Exhibit 27 below shows permitting trends for 2,763 new units by type, ranging from single-unit detached homes to units in larger multifamily developments.

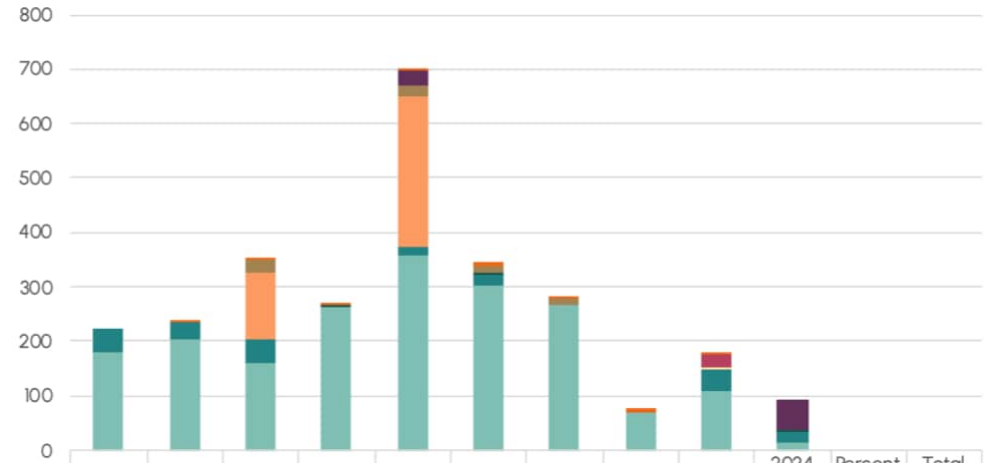
MIDDLE HOUSING POLICY IN WA

'Middle housing' refers to moderate-density housing types between single-family detached homes and larger multifamily housing. HB 1110 became effective in July 2023 and requires that designated Growth Management Act (GMA) planning cities in Washington must allow certain minimum densities for middle housing within 6 months after their periodic update due date.

Camas is counted as a Tier 2 city under this policy, which must allow for 2 dwelling units per lot or higher in predominantly residential zones, as well as 4 dwelling units per lot within a quarter mile of major transit stops and for affordable housing (ESHB 1110, Sec. 3(1)(c)).

Over the last decade from 2015 to 2024 (year to date), single-unit detached homes have accounted for the largest share (70%) of new permits in the City of Camas. The second most prevalent type of permitted housing was multi-unit housing (apartments, condos, and units in mixed-use buildings) encompassing 20% of new permits. Attached townhomes comprised 8% of the total and middle housing types like duplexes, triplexes, quadplexes, and accessory dwelling units (ADUs) were only 2% of all permits.

Exhibit 27. City of Camas Housing Permit Data, 2015-2024 (YTD)
Source: City of Camas. Note: This includes permits that were finalized.

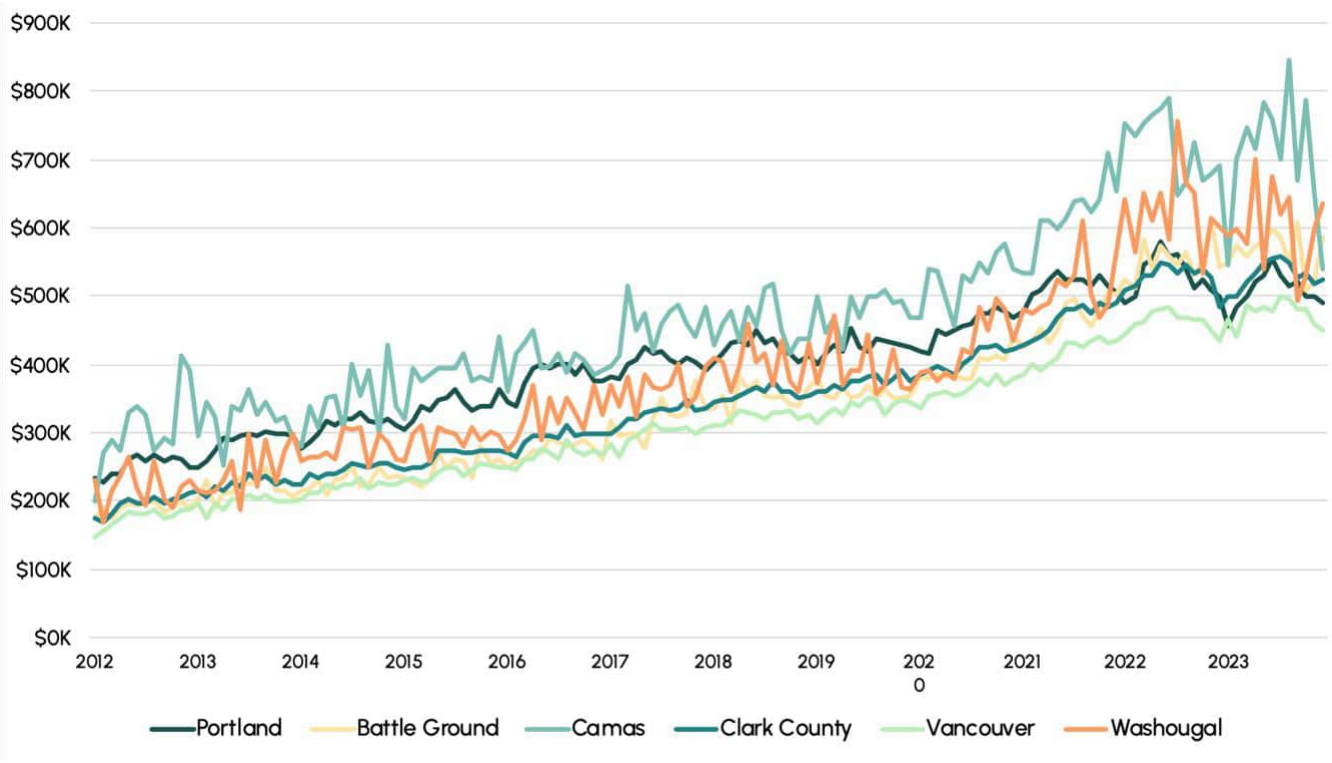


	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024 YTD	Percent of Total	Total Number
Total	224	237	351	270	703	345	282	79	180	92	100%	2763
ADU	0	1	1	2	5	6	4	8	4	0	1%	31
Mixed Use	0	0	0	0	30	0	0	0	0	56	3%	86
Condos	0	0	25	2	18	14	10	0	0	0	2%	69
Apartments	0	0	120	0	276	0	0	0	0	0	14%	396
Quadplex	0	0	0	0	0	0	0	0	25	0	1%	25
Triplex	0	0	0	0	0	0	0	0	1	0	0%	1
Duplex	0	0	0	4	1	2	2	1	0	1	0%	11
Townhome	45	33	44	0	14	19	0	0	43	20	8%	218
Single Unit (Detached)	179	203	161	262	359	304	266	70	107	15	70%	1926

Housing Costs

Changes in housing costs relative to incomes and demographics trends have important implications for cities' supply of affordable and accessible housing. **Median home sale prices in Camas and Clark County have increased over the last ten years, with Camas's average prices generally remaining higher than the County or comparison cities of Battle Ground and Washougal.** In 2023, the average of monthly median home sale prices in the City was $704,000, increasing by 119 percent since 2013. In comparison with surrounding jurisdictions, the average home sale in Camas was more expensive than the average home in the City of Portland (by $196,000) or Clark County (by $173,000) in 2023. Other suburban cities like Battle Ground and Washougal were closer to prices in Camas but still remained lower

Exhibit 28. Change in Median Home Sale Price, Camas, 2013-2023
Source: Redfin

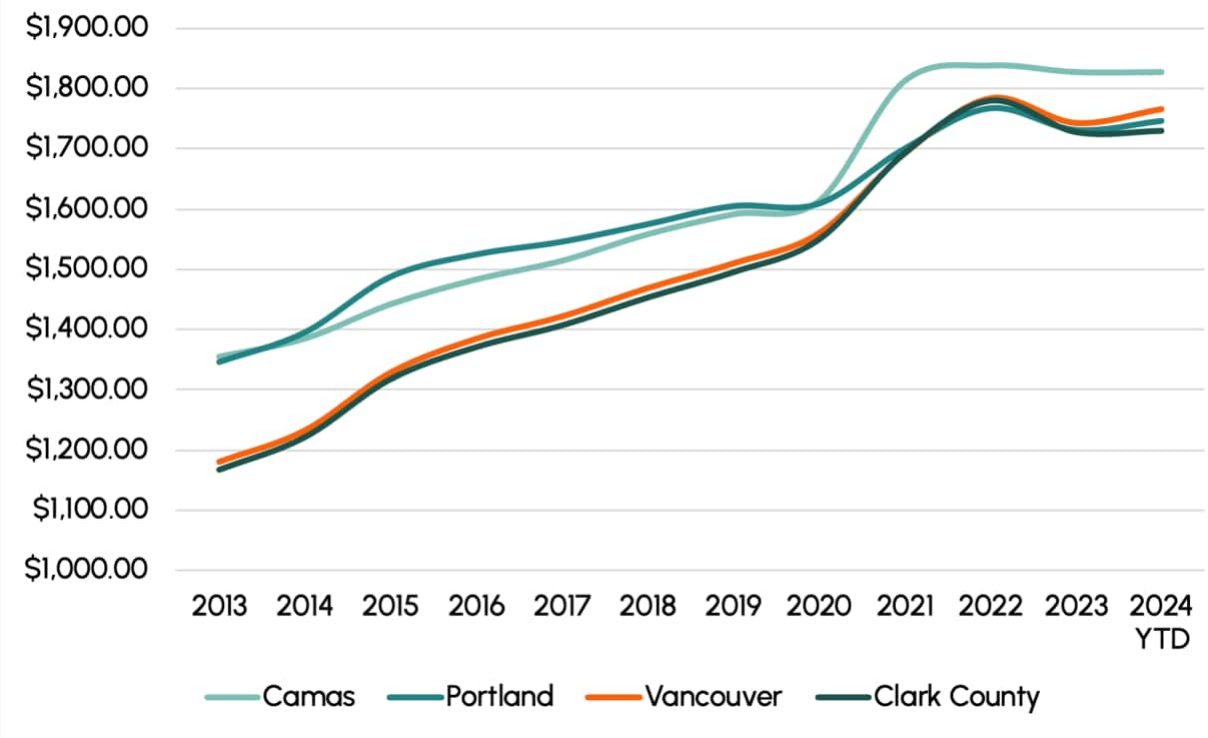


JURISDICTION	2013	2023	CHANGE 2013-2023	PERCENT CHANGE 2013-2023
City of Camas	$321,000	$704,000	$383,000	119%
Clark County	$225,000	$531,000	$306,000	136%
City of Battle Ground	$218,000	$566,000	$348,000	160%
City of Washougal	$244,000	$600,000	$356,000	146%
City of Vancouver	$199,000	$475,000	$276,000	139%
City of Portland	$309,000	$508,000	$199,000	64%

Prices are also increasing quickly in the City of Camas and Clark County for the average 2-bedroom multifamily rental unit. In 2024 year-to-date, the average 2-bedroom apartment rent was over $1,800 in the City and over $1,700 in Clark County (Exhibit 29). This indicates over a 35 percent increase change since 2010 in the City and County. Average 2-bedroom multifamily rents in Portland tracked closely with Camas during the 2010's, while rents in Vancouver remained lower (generally following countywide trends). Since 2020, rents in Camas have risen higher than both cities on average.

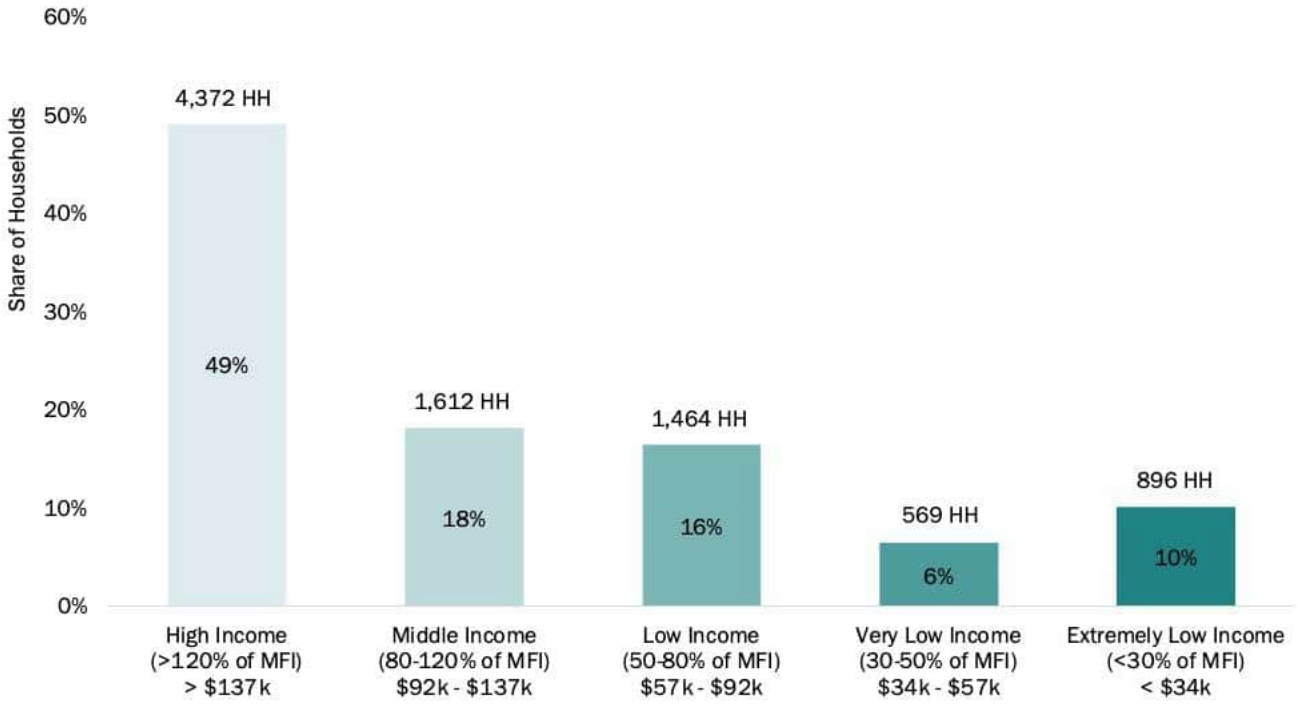
Exhibit 29. Asking Rent For 2-Bedroom Multifamily Units, 2010-2023, Camas, Portland, Vancouver, and Clark County, 2013-2024 YTD

Source: CoStar



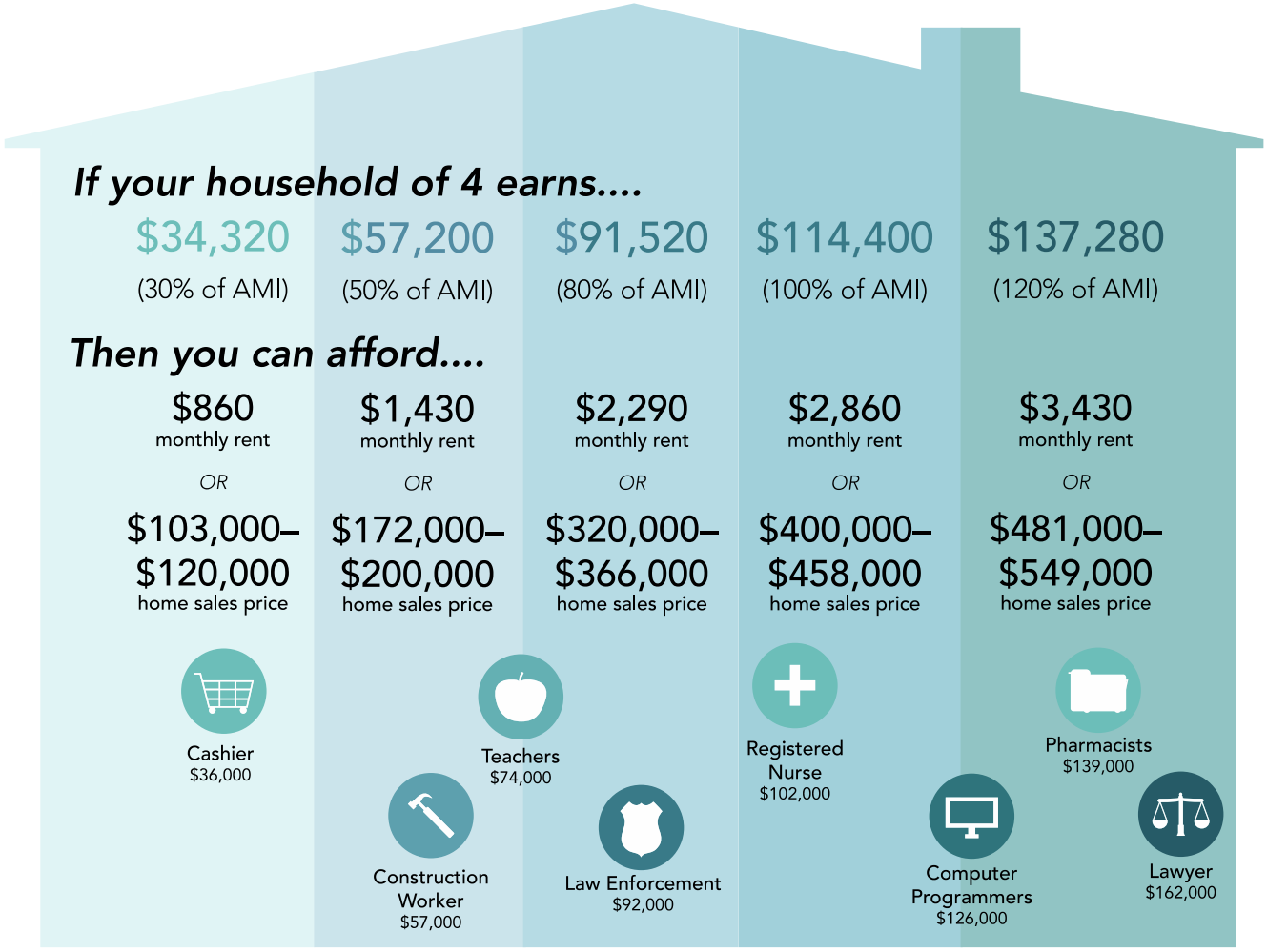
Rising housing costs also have implications for how many households are able to afford the average home. Based on HUD AMI levels in 2022, 49% of Camas households were high-income, at or above 120% of median income within the area, and an additional 18% were middle income (80-120% of AMI) (Exhibit 30). Over this period, 16% of households were considered low-income for the area (50-80% of AMI), 6% were very low income (30-50% of AMI), and 10% extremely low income (less than 30% of AMI).

Exhibit 30. Share of Households By AMI, Camas, 2022
Source: HUD, U.S. Census Bureau, 2018-2022 ACS Estimates



Compared with home sale price and rent increases in Camas, only households earning well 150% or more of AMI would be able to afford the average home in the City as of 2023. This income group generally equates with households with one or more high-earning job like pharmacists, lawyers, and computer programmers. Although rents are increasing, the average 2-bedroom apartment is still affordable to households between 50 and 80% of AMI in Camas.

Exhibit 31. Affordability by Area Median Income, 2023
Source: HUD, BLS



Projection of Future Housing Demand

Planning for future housing demand is critical to ensure that the City can meet demand driven by population growth. This section summarizes projected future housing demand for Camas to provide context for the City's housing policies.

County Comprehensive Plans and Countywide Planning Policies set population growth targets for jurisdictions within them, with current projections to 2044. Clark County is currently in the process of updating the Countywide Comprehensive Plan and growth targets. This analysis uses the County's interim population and housing allocation targets, which are anticipated to be adopted in April 2024.

Population Allocation

Exhibit 32 below demonstrates the City of Camas and Clark County's anticipated population forecast between 2023-2045. Since 2000, Camas has grown at a faster rate than the County overall with an AAGR of 5.2% in the City (including annexations), compared to the County's AAGR of 2.4% (

Exhibit 2). However, the County's estimates assume a slower growth scenario for the City in the next 22 years. With this assumption, new population growth in Camas is estimated to comprise 4.05% of growth in Clark County overall.

Exhibit 32. Population Growth Forecast, Camas and Clark County, 2023-2044
Source: Clark County Interim Population Allocations

JURISDICTION	2023 EST. POPULATION	VACANT BUILDABLE LAND MODEL CAPACITY %	2023-2045 GROWTH	2045 ESTIMATE	CHANGE (%)	AAGR
City of Camas	**29,352**	**4.26%**	**7,729** ***(4.05% of total growth)***	**37,080**	**26%**	**1.2%**
Clark County	527,400	100%	190,754 *(100% of total growth)*	718,154	36%	1.6%

Housing Allocation

The population growth forecast detailed above indicates that the City of Camas will make up 4.05 percent of new growth population in Clark County between 2023-2045 (Exhibit 32), with an AAGR of 1.2% in the City. The County's methodology also acknowledges Washington State Department of Commerce's HAPT estimates for current housing supply in Camas and allocates a number of net new units for the Urban Growth Area (UGA).

In May 2024, Clark County adopted housing allocations for jurisdictions located within county boundaries. In total, this shows an estimated **4,226 housing units** needed by 2045 in the City of Camas and its UGA.[6]

HOUSING ALLOCATIONS IN WA

In 2021, HB 1220 created a new way that communities in the state are required to plan for housing needs. This legislation requires that jurisdictions plan for sufficient land capacity for housing needs, including all economic segments of the population (moderate, low, very low and extremely low income, as well as emergency housing and permanent supportive housing).

- Since 2000, the City of Camas had an average annual growth rate of 221 new housing units per year.
- Comparatively, the City will need to add an average of 195 new housing units per year between 2024 and 2045 to reach its allocation of net new units.

[6] The Washington State Department of Commerce Housing for All Planning Tool (HAPT) provides two allocation methods for determining the share of a County's housing supply to be met by jurisdictions. Method A assumes all housing needs will be accommodated through new housing production. Method B assumes all jurisdictions will accommodate equivalent shares of the total countywide housing need at each income level, proportional to their size, in the projection year. Clark County elected to use a hybrid method of 75/25 for Camas.

The City would add about **311** new units to meet the new permanent supportive housing target and 1,766 units affordable to low-income households below 80% of AMI by 2045.

Camas currently has 143 units of housing affordable for households at or below 30% of AMI that are not Permanently Supportive Housing (PSH)[7] and 14 emergency units[8] according to the HAPT estimate. With this allocation, the City will need to accommodate 172 new units of temporary emergency housing by 2045.[9]

[7] Permanent Supportive Housing is defined as: "subsidized, leased housing with no limit on length of stay that prioritizes people who need comprehensive support services to retain tenancy and utilizes admissions practices designed to use lower barriers to entry than would be typical for other subsidized or unsubsidized rental housing, especially related to rental history, criminal history, and personal behaviors" Washington RCW 36.70A.030(31)

[8] Temporary emergency housing is defined as: "temporary indoor accommodations for individuals or families who are homeless or at imminent risk of becoming homeless that is intended to address the basic health, food, clothing, and personal hygiene needs of individuals or families. Emergency housing may or may not require occupants to enter into a lease or an occupancy agreement." – Washington RCW 36.70A.030(14)

[9] Clark County's interim allocations do not include designated temporary emergency housing units at the City level. Estimates in this section for the City of Camas are derived directly from the Department of Commerce HAPT tool.

Exhibit 33. Housing Unit Allocations by Income, Camas and Urban Growth Area, 2024-2045

Source: Washington State Department of Commerce HAPT, Clark County Interim Housing Allocations, City of Camas
Note: Current supply includes both the estimate from the HAPT with the addition of 599 additional units since its calibration in 2020.

	0-30% AMI		>30-50% AMI	>50-80% AMI	>80-100% AMI	>100-120% AMI	>120% AMI	TOTAL (PERM.)	EMERGENCY HOUSING BEDS
	Non-PSH	PSH							
2024: Current Housing Supply Estimate	143	0	458	1,874	1,182	1,965	4,201	**9,832**	14
2024-2045: New Housing Unit Allocation	564	331	811	955	516	249	799	**4,226**	172
2045: Total Target Supply	707	331	1,269	2,811	1,627	2,214	4,499	**13,459**	186

Housing for Special Needs

In addition to overall housing market trends, some populations require additional considerations to make sure that available housing meets their needs. This section covers specific housing types, including regulated affordable units, housing for older adults, and accessibility considerations.

Affordable Housing Inventory

To date, the City of Camas has 98 units of regulated affordable housing in 5 buildings as of 2020 according to data from Oregon Metro and the City of Camas. Approximately half of these units are affordable respectively for residents between 30-50% of AMI and 50-80% of AMI.

Exhibit 34. Affordable Housing Units, Camas, 2020
Source: Oregon Metro RLIS

	REGULATED AFFORDABLE UNITS				TOTAL UNITS
	<30% AMI	30-50% AMI	50-80% AMI	80-100% AMI	
City of Camas	0	45	53	0	98

About half of affordable housing units were built in the 1990's and will soon near the end of the 30-year affordability requirement for projects receiving Low-Income Housing Tax Credit (LIHTC) funding from the US Department of Housing and Urban Development. Although projects may remain affordable past this period, these older properties may be more vulnerable to increasing rents due to market pressures and redevelopment.

Exhibit 35. Affordable Housing by Property, Camas, 2020
Source: Oregon Metro RLIS

PROPERTY	REGULATED AFFORDABLE UNITS	YEAR BUILT
Clara Flats	6	2020
Camas Ridge Apartments	51	2011
Mountainview House	8	1996
940 NW 7th Ave	10	1995
1152 NE Adams St	4	1995
Crown Villa	19	1986

Housing for Older Adults

Addressing housing needs for those older adults (aged 60 and over) also requires additional considerations for housing choice. Within the group of older adults, housing needs also vary. Nationally,

the trend shows that "the 82-to-86-year-old cohort dominates the assisted living and more intensive care sector"[10] while new or near-retirees may prefer aging in place or active, age-targeted communities. Households for adults 65 years or older also typically have different financial situations than younger adults; low-income households with older adults may not have the financial resources to afford years in a nursing home and may instead choose to downsize to smaller, more affordable units. Others living nearby relatives may also choose to live in multigenerational households. Although the City of Camas has no regulated affordable housing units designated specifically for seniors, the City does have several long-term care residential facilities for older adults providing 135 units.

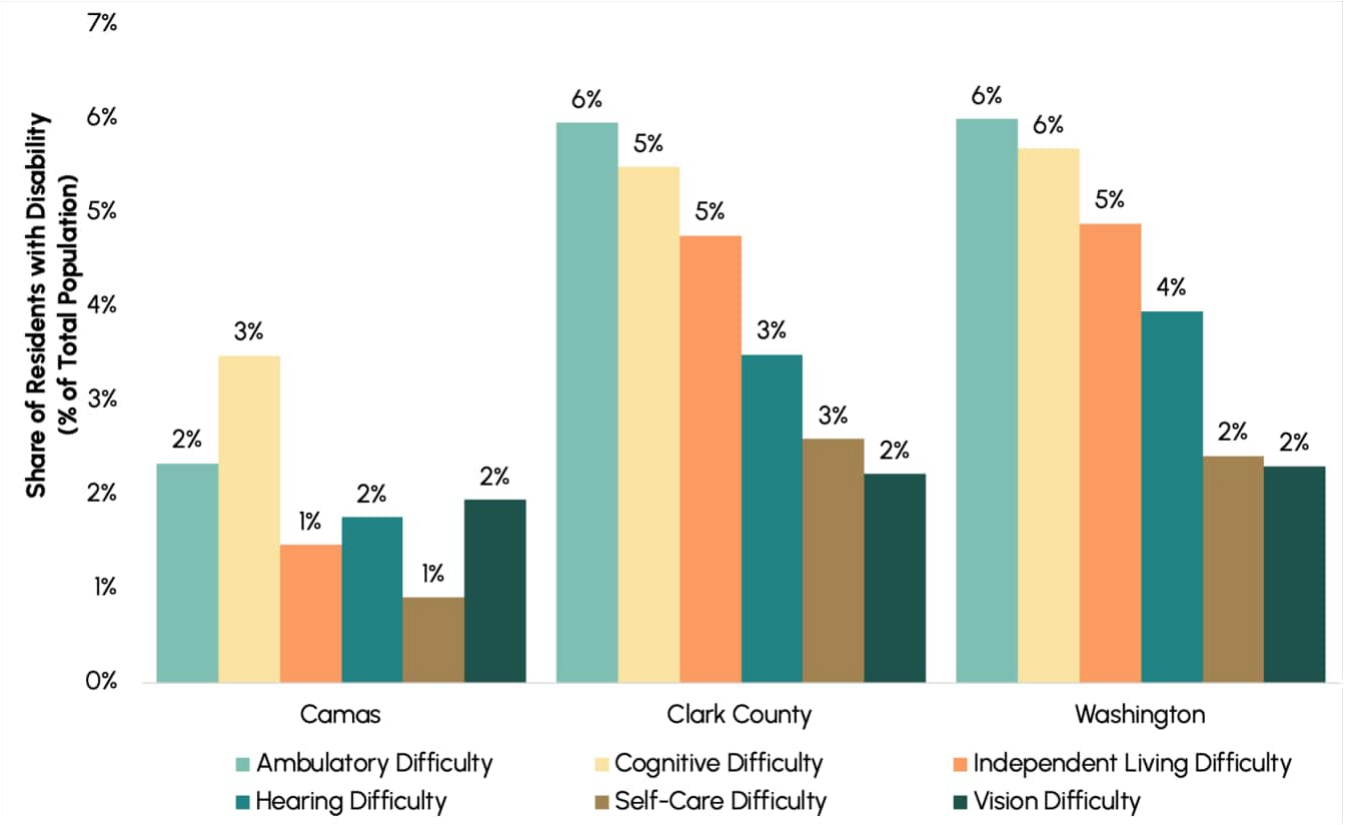
LONG TERM CARE RESIDENTIAL FACILITY	NUMBER OF FACILITIES	NUMBER OF UNITS (BEDS)
Nursing Home	1	83
Assisted Living	8	52
Total	9	135

Persons with Disabilities

Camas residents with disabilities may require additional housing features for accessibility to meet their needs. In 2018-2022, 8 percent of residents in Camas had at least one disability, as well as 13 percent in Clark County and 14 percent in Washington overall. The most common type of disability in the City was cognitive difficulties, followed by ambulatory and vision difficulties. These disabilities can require housing accommodations such as zero-step entryways, ramps, lifts, or other accessibility features.

[10] Urban Land Institute, 'Emerging Trends in Real Estate, United States and Canada,' 2018.

Exhibit 36. Share of Persons with Disability by Type, Camas, Clark County, and Washington 2018-2022
Source: U.S. Census Bureau ACS 5-Year Estimates
Note: Individual persons may experience more than one type of disability



Section 2. Existing Housing Element Goals and Policies

Vision

In the year 2035, residents of Camas continue to appreciate their safe, diverse, and welcoming community. Those raised in Camas will return for family-wage jobs and to ultimately retire here. Camas is a well-planned and connected city where residents enjoy pedestrian and bicycle paths between neighborhoods and to downtown. There is a wide variety and range of housing for all ages and income levels.

Goals and Policies

Housing goals and policies are established to ensure adequate housing is developed throughout the City to support residents of all ages and income levels. Goals and policies are presented for three housing categories:

- *Citywide – establishes a broad housing goal and sets policies to be considered throughout the City*
- *Affordable Housing – focuses on the development of affordable housing*
- *Special Needs and Senior Housing – establishes goals and policies to address the particular needs of residents with special needs and seniors*

Citywide Housing

Citywide Housing Goal

- ***H-1: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community.***

Citywide Housing Policies

- *H-1.1: Provide a range of housing options to support all ages and income levels.*
- *H-1.2: Support residential development that minimizes both impervious areas and minimizes site grading to retain the natural contours of the land. Low impact development (LID) strategies include conserving native vegetation in tracts and considering narrower streets, stormwater gardens, and other landscape practices that store and filter runoff.*
- *H-1.3: Encourage use of the optional development codes (e.g., PRD, MXPD) in order to create a variety of housing types within new developments.*

- *H-1.4: Require a percentage of newly created lots to include one or more of the following unit types (to be designated on the face of the plat):*
    - *Single-story dwellings*
    - *Barrier-free dwellings (consistent with Americans with Disabilities Act [ADA] guidelines)*
    - *ADUs, to be constructed concurrent with primary dwellings*
- *H-1.5: Ensure that housing in mixed-use buildings (or developments) will complement the commercial and retail portion of the development and increase local family-wage jobs.*
- *H-1.6: Encourage in-fill development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services, and ensure that the development is compatible with the surrounding neighborhood.*
- *H-1.7: Require all new housing developments to provide a range of housing types and sizes that are evaluated through the land use approval process and stipulated on the final plat.*

Affordable Housing

Affordable Housing Goal

- ***H-2: Create a diversified housing stock that meets the needs of all economic segments of the community through new developments, preservation, and collaborative partnerships.***

Affordable Housing Policies

- *H-2.1: Support and encourage a wide variety of housing types throughout the City to provide choice, diversity, and affordability and promote homeownership.*
- *H-2.2: Provide incentives and bonuses to encourage the development of affordable housing.*
- *H-2.3: Any comprehensive plan designation change that increases residential capacity should require a quarter (25 percent) of the new units to be affordable to households earning 50 to 80 percent of Camas' MHI at the time of development.*
- *H-2.4: All affordable housing created in the City should remain affordable for the longest possible term, whether created with public funds, through development agreements, or by regulation.*
- *H-2.5: Participate in collaborative partnerships with various local and regional public and non-profit housing groups to ensure that affordable housing is provided throughout the City.*
- *H-2.6: Provide financial assistance through collaborative partnerships to qualifying low-income residents to maintain or repair the health and safety features of their homes.*
- *H-2.7: Conduct an affordable housing study in order to determine the number of existing affordable units and assess the need for additional units. Develop policies to implement recommendations of the affordable housing study.*

Senior and Special Needs Housing

Senior and Special Needs Housing Goal

- ***H-3: Encourage and support a variety of housing opportunities for those with special needs, particularly those with challenges relating to age, health, or disability.***

Senior and Special Needs Housing Policies

- *H-3.1: Encourage special needs and senior housing to be dispersed throughout the community and close to public transportation, shopping, medical clinics, and other essential services.*
- *H-3.2: Encourage and support social and health service organizations that offer programs and facilities to help persons with special needs remain in the community.*
- *H-3.3: Treat residential structures occupied by persons with disabilities the same as residential structures occupied by a family or by non-disabled unrelated individuals.*
- *H-3.4: Support and encourage the development of smaller (less than 1,000-square foot), single-story houses through the Multi-Family Cottage Overlay or other tools.*

Appendix

Key Clark Countywide Planning Policies

Clark County is currently in the process of updating its Comprehensive Plan and its Countywide Planning Policies. The existing 20-year growth plan spans 2015-2035 and includes a Housing Element with relevant policies for jurisdictions within the County.

Key Clark County Countywide Planning Policies

- **2.1.0** *Communities, urban and rural, should contain a diversity of housing types to enable citizens from a wide range of economic levels and age groups to live within its boundaries and to ensure an adequate supply of affordable and attainable housing. Housing options available in the county include single family neighborhoods and mixed-use neighborhoods (e.g., housing above commercial storefronts, traditional grid single family neighborhoods, townhouses, multi-family developments, accessory units, boarding homes, cooperative housing and congregate housing).*
- **2.1.1** *Establish density targets with jurisdictions in the county for different types of communities, consistent with the definitions of Urban Growth Areas and Rural Centers.*
- **2.1.2** *Provide housing opportunities close to places of employment.*
- **2.1.3** *Establish maximum as well as minimum lot sizes and densities in urban areas.*
- **2.1.4** *All cities, towns and the county share the responsibility for achieving a rational and equitable distribution of affordable housing.*
- **2.1.5** *Coordinate with C-TRAN to identify and adopt appropriate densities for priority transit corridors. Ensure that the development standards for these areas are transit and pedestrian friendly. Transportation and housing strategies are to be coordinated to assure reasonable access to a variety of transportation systems and to encourage housing opportunities in locations that support development of cost effective and convenient public transportation for all segments of the population.*
- **2.1.6** *Encourage infill development that enhances the existing community character and provide a mix of housing types in all urban and rural centers. All cities and towns are to encourage infill housing as the first priority for meeting the housing needs of the community.*
- **2.1.7** *Encourage creative approaches to housing design to: accommodate higher densities attractively; increase housing affordability; ensure that infill development fits with the character of the existing neighborhood; and develop demonstration projects to assist the private sector to achieve infill goals.*
- **2.1.8** *Housing strategies are to be coordinated with availability of public facilities and services, including human services.*
- **2.1.9** *All cities, towns and the county are to provide for a variety of housing types and designs to meet the needs of people with special needs (for example those with physical, emotional, or mental disabilities), recognizing that not all housing will become accessible to special needs populations.*
- **2.1.10** *Establish a mechanism for identifying and mitigating adverse impacts on housing production and housing cost which result from adoption of new development regulations or fees.*
- **2.1.11** *Encourage and permit development of inter-generational housing, assisted living options and accessory units in order to allow people with special needs and senior citizens to live independently as possible and to reduce the need for (and cost of) social services.*
- **2.1.12** *All cities, towns and the county are to provide increased flexibility in the use of new and existing housing development to increase the potential for re-use, preservation of existing affordable housing, shared living quarters, use of accessory structures as housing, etc.*
- **2.1.13** *Housing strategies are to be coordinated with the financial community and are to be consistent with public and private financing mechanisms.*

Appendix D: Racially Disparate Impacts Memo

Racially Disparate Impacts Analysis Memo
October 2026

Introduction

In 2021, the Washington Legislature adopted House Bill 1220 (HB 1220), amending the Growth Management Act to require local governments to "plan for and accommodate" housing affordable to all income levels. This strengthened the previous goal, which was to "encourage" affordable housing. Additionally, local jurisdictions must examine racially disparate impacts, displacement, exclusion and displacement risk in housing goals, policies and regulations and adopt policies to begin to undo the impacts. This memo provides an overview of the analysis conducted to understand existing impacts, exclusions and displacement risk in Camas, review of the 2035 Comprehensive Plan goals and policies, and guidance in developing the goals, policies, and implementation actions for the 2045 Comprehensive Plan.

Key Terms

Displacement: When a household is forced to move from their community because of conditions beyond their control.

- Physical displacement: Households are directly forced to move for reasons such as eviction, foreclosure, natural disaster or deterioration in housing quality.
- Economic displacement: Households are compelled to move by rising rents, costs of home ownership like property taxes, or expiration of covenants on rent-or income-restricted housing.
- Cultural displacement: Residents are compelled to move because the people and institutions that make up their cultural community have left the area.

Displacement risk: The likelihood that a household, business or organization will be displaced from its community.

Exclusion in housing: The act or effect of shutting or keeping certain populations out of housing within a specified area, in a manner that may be intentional or unintentional, but which leads to non-inclusive impacts.

Racially disparate impacts: When policies, practices, rules or other systems result in a disproportionate impact on one or more racial groups.

Vulnerable populations: include, but are not limited to, racial or ethnic minorities and low-income populations.

Community Engagement

Engagement with the community was a top priority during the Comprehensive Plan update. The City used various communication tools, such as social media, public notices in the Camas-Washougal Post Record, updates to the project website, flyers posted around the city, and distribution through partner agency communication channels, to advertise community events and engagement activities to include underserved populations in the planning process. In Camas, these populations include community members who speak a second language, youth, people with disabilities, and low-income households. A community profile established baseline demographics of Camas, including data related to population, race, earnings, park land, employment, housing types and tenure, and commute patterns. This information informed the Public Involvement Plan and overall engagement strategies.

A citywide outreach process established the community's vision and priorities related to Camas' future via community conversations, community events, online surveys, online mapping tools, and through the project website. A community survey and interactive map gathered feedback from the community on things they like about Camas, things they would change in the future, important topics to address in the plan, and areas of opportunity or concern both downtown and in the wider Camas community.

To reach a wide spectrum of Camas community members, project staff and members of the Community Advisory Committee (CAC) facilitated community conversations with local groups, clubs, committees, and organizations in Camas. A "Community Conversation Kit" was available on the project website for anyone to download and conduct a community conversation with their own networks. Fourteen community conversations were conducted with the following groups, engaging approximately 558 community members in Camas.

- City Council
- Camas Library Board of Directors
- Columbia Ridge Assisted Living
- Chamber of Commerce
- Downtown Camas Association
- Skyridge Middle School
- Prune Hill Residents
- Camas Planning Commission
- Holly Hills Residents
- Camas City Directors
- Downtown Merchants
- Camas Parks and Recreation Commission
- Camas Lions Club
- Camas High School

Three community summits provided opportunities for the community to submit feedback for the plan update. The first summit included an open house event focused on the draft vision statement and ideas on how to achieve the community's goals. The second summit open house and online survey allowed for feedback on the draft land use alternatives, development scales, review of development concepts for downtown, and climate planning and greenhouse gas inventory. An online Story Map presented and gathered feedback on the preferred land use alternative and proposed zoning and comprehensive plan land use designation changes. The third summit spanned a three-month effort to share the draft comprehensive plan and

downtown subarea plan through online engagement and a bi-weekly "Chat with a Planner", where members of the public could engage with planning staff regarding the draft plan. A common topic discussed at multiple forums is the need for more diverse housing types in Camas as well as more housing that is affordable to a broad range of incomes.

In addition to broad engagement with the community, several advisory committees provided input during the development of the plan. The Project Advisory Committee included technical stakeholders, agency partners and service providers. The CAC represented a broad cross-section of community interests. The Climate Policy Advisory Team (CPAT) included community members providing direct feedback on the climate goals and policies. The Downtown Advisory Committee (DAC) included representatives from the Community Advisory Committee and the Downtown Camas Association. The Planning Commission and City Council were consulted during the development of the vision, goals, plan, and policies.

The CAC and CPAT were created to advise the City during the development of the plan and the new climate element. The selection of CAC and CPAT members originated from an advisory committee interest form that was distributed via citywide mailer in December 2023. The form specified that members must be residents of Camas, own or operate a business in Camas, or represent a group or organization that operates within Camas or otherwise serves Camas residents or businesses. CAC and CPAT members reviewed and commented on work products, guided public outreach and engagement eff orts, acted as liaisons to specific constituencies or interest groups, helped host public events, encouraged community members to participate in the process, and acted as champions of the project. Following the distribution of this form, the City recruited 15 members for the CAC and 17 members for the CPAT.

Camas Housing, Income and Race Data

Housing Data by Race

The Housing Analysis memo, developed by EcoNW in support of the Housing chapter of the Comprehensive Plan, includes demographic data for the City of Camas and surrounding area and is summarized here and detailed below.

- Camas is becoming more diverse
- Most Camas households own their home (80%)
- At the County level, people of color have lower rates of homeownership compared to White and Asian households
- Lacking reliable data related to income and household tenure for people of color in Camas
- Cost burden for people of color in Camas is generally higher compared to White, Non-Hispanic households

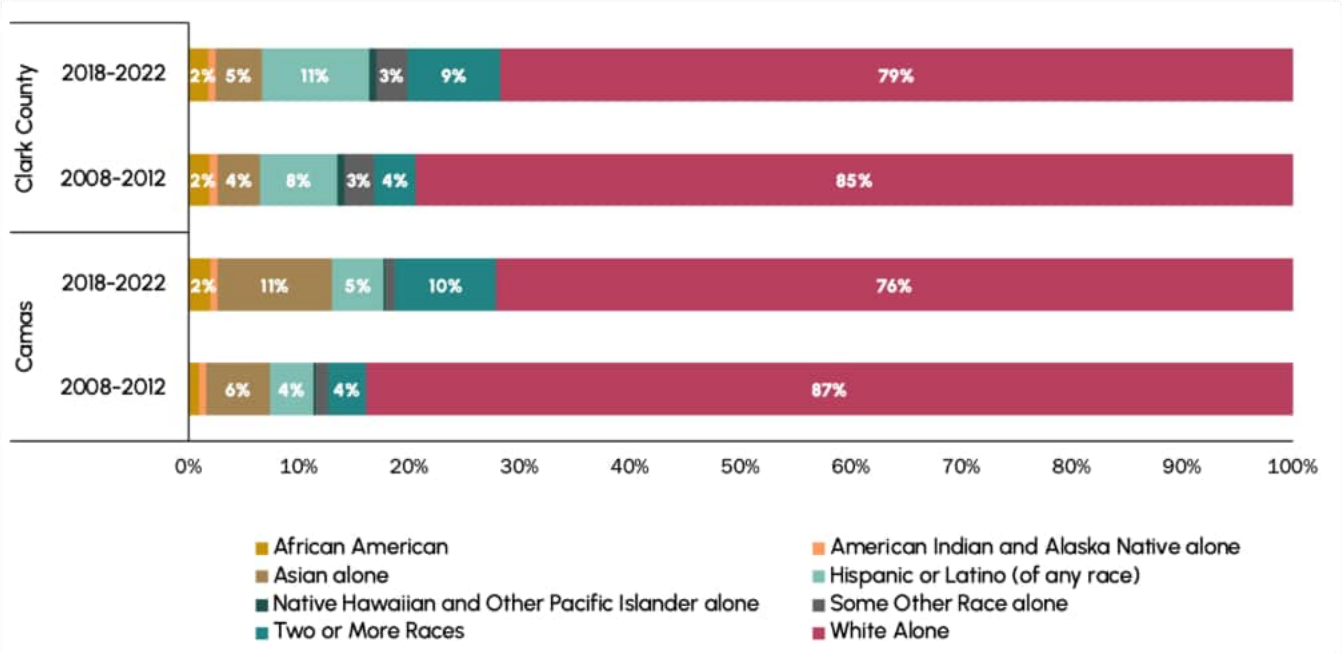
Population and Race

Since 2000, Camas had a faster rate of population growth compared to Clark County or the state, increasing by 120%. Clark County grew by 54% and the state by 38% in the same time period.

As shown in Figure 1, Camas is diversifying, with the share of people of color increasing since 2008. In 2018-2022, the share of people of color in Camas was approximately 25%, compared to 13% in 2008-2012. This is slightly higher than the county, where 21% of residents were people of color. Changes to a city's race and

ethnicity profile can indicate changing housing needs due to disparate impacts of historic and systemic discriminations faced by many people of color for accessing housing.

Figure 1 Population by Race and Ethnicity, Camas and Clark County, 2008-2012, 2018-2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



Household Tenure

Household tenure refers to the ownership status of residents in their homes, either as owners or renters of their home. In 2018-2022, 80% of households in Camas owned their homes, a higher rate than both Clark County and the state, and 20% of households rent their homes.

Homeownership rates can often vary by race and ethnicity, as many people of color face historic and systemic barriers from a legacy of discriminatory practices in the United States. In Camas today, margins of error are too high to disaggregate homeownership by race and ethnicity. Looking to County level trends indicates disparities exist for some groups, with lower rates of homeownership among households that are Black or African American, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Hispanic or Latino (of any race), two or more races, or another race not listed. Native Hawaiian or Pacific Islander, Black or African American, and Latino of any race had the lowest homeownership rates with over half renting their home. White households and Asian households both had rates of homeownership above the County average overall at 69% and 77%, respectively. On average in Clark County, 67% of households own their home (2018-2022).

Household Income

Income is a key piece in determining housing choices, influencing the type of housing and tenure. Median household income in Camas in 2018-2022 is $133,000, higher than both Clark County and the state. This holds for all groups by race and ethnicity in Camas (where data was accurate enough to be interpreted). White residents in Camas had approximately the same median income as the City overall, while Black or African American, Asian, and Hispanic or Latino residents indicated higher median income compared to white residents. Household income for those who were two or more races was the only group estimated to be

below average for the City. However, high margins of error for many groups in the City of Camas may lead to inaccuracies in this data.

At the County level, income for white households was generally in line with the overall median, while income was higher for American Indian or Alaska Native and Asian households. In Clark County, households who were Black or African American, Native Hawaiian or Pacific Islander, Hispanic or Latino, two or more races, or another race had lower median household incomes than the overall average. Considering the high margins of error for the data provided at the City level, it is possible that these disparities also exist for the same households of color in Camas.

Department of Housing and Urban Development (HUD) guidelines indicate that households paying more than 30% of their income on housing experience "cost burden" and households paying more than 50% experience "severe cost burden." Cost burden data is one indicator of how well a city is meeting its need to provide housing that is affordable to all households in a community. In 2018-2022, 24% of all households in Camas experienced cost burden, compared to 33% in the County overall. Thirty-six percent of renter households experienced cost burden compared to homeowners in 2018-2022, compared to 22% of owner households.

Cost burden is also higher in Camas for lower-income households, who are often less able to absorb changes to monthly housing costs. In 2018-2022, 100% of households earning less than $20,000 experienced severe cost burden. In comparison, 93 percent of those earning $20,000 to $34,999 per year were cost burdened or severely cost burdened. The rate of cost burden proportionately reduces for those earning higher incomes, with only 4% of those earning $75,000 or more per year experiencing any cost burden. Cost burden for people of color in Camas is generally higher compared to White, Non-Hispanic households, particularly for homeowners of color. In 2016-2020, 25 percent of homeowners of color were cost burdened, compared to 19 percent of White, Non-Hispanic homeowners.

Housing Costs

Median home sale prices in Camas and Clark County have increased over the last ten years, with Camas' average prices generally remaining higher than the County. In 2023, the average of monthly median home sale prices in the City was $704,000, increasing by 119% since 2013. In comparison, the average home sale in Camas was more expensive than the average home in the City of Portland (by $196,000) or Clark County (by $173,000) in 2023.

Prices are also increasing quickly for the average 2-bedroom multifamily rental unit. In 2024, the average 2-bedroom apartment rent was over $1,800 in Camas and over $1,700 in Clark County. This indicates over a 35% increase since 2010 in the City and County. Average 2-bedroom multifamily rents in Portland tracked closely with Camas during the 2010's, while rents in Vancouver remained lower (generally following countywide trends). Since 2020, rents in Camas have risen higher than both cities on average.

Looking at home sale price and rent increases in Camas, only households earning greater than $171,000 annually would be able to afford the average home in the City as of 2023. Although rents are increasing, the average 2-bedroom apartment is still affordable to households earning between $57,000 and $92,000 annually in Camas.

Evidence of Racially Disparate Impacts, Displacement, and Exclusion

Based on the limited income and tenure data as described above, it is unclear if Camas residents of color experience disparate impacts in accessing housing in Camas. Looking at qualitative indicators can help determine if impacts exist along with risk for displacement and exclusion.

Based on data from HUD, cost burdening affects 24% of all households in Camas. This affects renters at a higher rate than homeowners. Cost burden for people of color in Camas is generally higher compared to White, Non-Hispanic households, particularly for homeowners of color, putting those households at greater risk for displacement or potential exclusion.

There is likely exclusion to housing in Camas based on the median home sale price, though this would apply to households regardless of race. Generally, only very high earners make enough annually to purchase a home in Camas today. The median home sale price is due to a variety of factors including limited housing types available (primarily detached single family housing), code provisions, lack of funding to build low-income housing, and the dominance of single-family zoning in Camas. The Comprehensive Plan acknowledges these barriers and includes goals and policies, as well as zoning code map and text amendments to address and remove the barriers to access housing for all.

Camas has an overall relatively low risk for residential displacement, as demonstrated in the Displacement Risk Map developed by the Department of Commerce. The displacement risk analysis focuses on three factors to determine displacement risk: the social vulnerability of the residential population, evidence of demographic change, and market conditions. One area at high risk for displacement is downtown and the neighborhoods directly south and east of downtown. Additionally, an area on the west side straddling NW Pacific Rim Blvd is at moderate risk for displacement. The Comprehensive Plan includes goals and policies that aim to reduce the risk of displacement citywide.

Goals and Policies

Review 2016 Comprehensive Plan Goals and Policies

The goals and policies of the 2016 Comprehensive Plan were analyzed for evidence of actions the goals and policies support or prohibit racially disparate impacts and whether the goals and policies lead to harmful biases towards specific people and communities.

The guiding questions for evaluating the 2016 Comprehensive Plan's goals and policies are as follows:

- Does the action support existing racially disparate impacts, exclusion, or displacement?
- Does the action prohibit equal access to housing or services?
- Does the action further harmful biases?
- Is the policy effective in accommodating needed housing?
- Who benefits and who is burdened by the policy?

The Housing Chapter includes three goals intended to provide adequate housing for the community, affordable housing, and housing for seniors and those with special needs. Two of the policies and one of the goals in this chapter may have resulted in supporting exclusion and limiting the need to accommodate needed housing.

> Policy H-1.6: Encourage in-fill development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services, and ensure that the development is compatible with the surrounding neighborhood.

Policy H-1.6 may prohibit certain types of development in established neighborhoods by requiring infill development to be compatible with the surrounding neighborhood and requiring design review. Compatibility requirements can be subjective and may prevent development of higher density housing in areas that primarily have low density housing developed.

> H-2.3: Any comprehensive plan designation change that increases residential capacity should require a quarter (25 percent) of the new units to be affordable to households earning 50 to 80 percent of Camas' MHI at the time of development.

Policy H-2.3 aims to ensure housing is developed with lower income households in mind, it may also have the opposite effect of disincentivizing developers to pursue comprehensive plan designation changes due to the economic challenges associated with building affordable housing units. Developers may ultimately profit more by developing lower density residential units and altogether avoid building denser housing developments, whether affordable or market rate.

> H-2: Create a diversified housing stock that meets the needs of all economic segments of the community through new developments, preservation, and collaborative partnerships.

Goal H-2 includes seven policies that support development of housing that is affordable to a wide range of incomes. The policies associated with goal H-2 generally lack direct actions to ensure affordable housing is developed, using terms such as "support", "encourage", and "should", rather than more direct terms like "must", "will", and "ensure".

In 2024, Camas had 2,475 housing units affordable to households earning 80% AMI or less. As part of the Comprehensive Plan update, the County allocated Camas an additional 2,661 units affordable to those earning 80% AMI or less to meet housing needs by 2045, indicating a strong ongoing need for affordable housing units.

Throughout the plan, there are no references to residential displacement, nor goals or policies aimed at reducing the risk of displacement.

Revisions to Goals and Policies

When reviewing and developing the updated goals, policies, and implementation measures, the City considered the following questions:

- Is the policy effective in accommodating needed housing?
- Do the policies begin to undo racially disparate impacts, displacement and exclusion?
- Did you include anti-displacement policies to support those who are most at risk of displacement?
- What does the regulation protect or prevent?
- Who benefits from this regulation and how?
- Who is burdened by this regulation and how?
- Does the regulation perpetuate or worsen racially disparate impacts, displacement or exclusion in housing?

- Can the regulations' benefits be more widely distributed?
- Can the regulations' burdens be minimized or more widely shared?
- Does the regulation support the goals, objectives and policies in the comprehensive plan?
- Does the regulation offer alignment with the goals of GMA, countywide planning policies and other parts of the comprehensive plan?

Based on the review of the 2016 plan's goals and policies, the updated plan include goals and policies that support development of diverse types of housing, preserve existing affordable housing, prohibit discrimination, reduce the risk of displacement and reduce barriers to development of affordable housing.

Policy H-1.6 was revised by removing the requirement to ensure compatibility with the surrounding neighborhood. Policy H-2.3 was removed and replaced with policies that ensure adequate affordable housing is built for the community as a whole. Broadly, goals and policies related to development of affordable housing were revised to include clear and direct language to ensure that the City is meeting its goals of building 2,661 affordable housing units by 2045.

The plan update includes five policies to reduce the risk of displacement and identify those who are most at risk of displacement. The plan includes clear policies to address the specific risks those communities face.

The plan provides direction to develop an implementation plan to enact the goals and policies outlined in the plan, including updates to development regulations, the permitting process, fee structures and establishing an affordable housing strategy.

Appendix E: Housing Needs and Land Capacity Analysis

DATE:	October 18, 2026
TO:	Alan Peters, City of Camas
FROM:	Tyler Bump and Josie Rademacher, ECOnorthwest
SUBJECT:	Housing Needs and Land Capacity Analysis

Housing Needs and Land Capacity Analysis

Background

In 2021, the Washington State Legislature adopted House Bill 1220 (HB 1220), which amended the Growth Management Act (GMA) to strengthen requirements for how communities plan for housing. HB 1220 revised the GMA housing goal to require jurisdictions to "plan for and accommodate" housing affordable to all income levels, strengthening the previous goal of encouraging affordable housing. HB 1220 also established new requirements for how jurisdictions address housing needs through the housing elements of their comprehensive plans.

Under these requirements, jurisdictions must plan for housing affordable to all income levels, including moderate-, low-, very low-, and extremely low-income households, and demonstrate sufficient land capacity to accommodate those needs. This includes planning for a range of housing types and densities necessary to meet identified housing needs.

This memorandum documents ECOnorthwest's analysis of housing need and residential land capacity for the City of Camas and evaluates the City's ability to accommodate its identified housing needs consistent with GMA requirements.

Housing Needs and Capacity Analysis

Clark County's Housing Allocations for Camas

As part of its 2025 Comprehensive Plan Periodic Update, Clark County allocated population and housing growth to cities and urban growth areas (UGAs) through 2045. Clark County anticipates countywide population growth of 190,754 people between 2023 and 2045. Camas and its UGA were allocated 7,729 additional residents, resulting in a total projected population of 37,080 residents by 2045. The County's population allocation methodology is based in part on each jurisdiction's share of vacant and buildable housing capacity identified through the County's Vacant Buildable Lands Model (VBLM).

To accommodate projected growth and meet the requirements of HB 1220, Clark County also allocated housing need among jurisdictions. The County used the Washington State Department of Commerce's Housing for All Planning Tool (HAPT) to establish countywide housing need by income level and then allocated that need among jurisdictions using the County's housing allocation methodology. Clark County allocated a total need of 4,226 net new housing units to Camas and its UGA through 2045.

Exhibit 1. Clark County Countywide Housing Allocation by Income Level (% of Area Median Income or AMI)

Population Target=718,154		Permanent Housing Needs by Income Level (% of Area Median Income)						Emergency Housing
	Total	<80%		80 - 120%		>120%		
Camas	4,226	2,661	63%	765	18%	799	19%	172
Battle Ground	6,979	3,426	49%	1,423	20%	2,129	31%	237
La Center	2,123	1,050	49%	405	19%	667	31%	66
Ridgefield	5,815	4,136	71%	1,213	21%	466	8%	219
Vancouver	36,527	13,833	38%	6,340	17%	16,355	45%	1,405
Washougal	3,735	1,962	53%	741	20%	1,032	28%	143
Woodland	105	47	45%	22	21%	35	34%	3
Yacolt	150	23	15%	38	25%	90	60%	7
County	44,036	26,550	60%	6,857	16%	10,629	24%	1,734
Total	103,695	5,3687	52%	17,805	17%	32,202	31%	3,986

Source: Clark County, City of Camas

For purposes of the Camas Comprehensive Plan Update, the City refined the distribution of its 4,226-unit allocation by income level using HAPT, updated housing supply information, and the County's housing allocation. This refinement maintains the County-allocated total of 4,226 net new units while adjusting the distribution among income categories to reflect updated conditions in Camas. Exhibit 2 shows the housing allocation by income level used for this analysis.

Exhibit 2. Housing Unit Allocations by Income, Camas (including UGA), 2024-2045



4,226 new homes will be needed over the next 20 years in the City of Camas

In addition, there will also need to be:

172 Emergency housing beds (temporary housing)

	0-30% AMI		>30-50% AMI	>50-80% AMI	>80-100% AMI	>100-120% AMI	>120% AMI	TOTAL	EMERGENCY HOUSING BEDS
	Non-PSH	PSH							
2024: Current Housing Supply Estimate	*143*	*0*	*458*	*1,874*	*1,182*	*1,965*	*4,201*	***9,823***	*14*
2024-2045: New Housing Unit Needed for the Allocation	**564**	**331**	**811**	**955**	**516**	**249**	**799**	**4,226**	**172**
2045: Total Target (Current + Allocation)	*707*	*331*	*1,269*	*2,829*	*1,698*	*2,214*	*5,000*	***14,049***	*186*

Source: City of Camas

Housing Need

As described above, Clark County allocated a total need of 4,226 net new housing units to Camas and its UGA through 2045. For purposes of the Comprehensive Plan Update, the City refined the distribution of this housing need by income level using the Washington State Department of Commerce's Housing for All Planning Tool (HAPT), updated housing supply information, and the County's housing allocation. The resulting distribution maintains the

County-allocated total of 4,226 net new housing units while reflecting the housing needs identified in the City's proposed Housing Element.

Camas's housing need by income level as follows:

- 331 Permanent Supportive Housing (PSH) units
- 564 non-PSH units for households below 30% AMI (extremely low income)
- 811 units between 30 to 50% AMI (low income)
- 955 housing units between 50 and 80% AMI (low to moderate income)
- 516 units between 80 to 100% AMI (moderate income)
- 249 housing units between 100 to 120% AMI (moderate to high income)
- 799 housing units over 120% AMI (high income)

In addition to permanent housing needs, HAPT identifies a need for emergency housing. The City's proposed Housing Element identifies an existing supply of 14 emergency housing beds and a need for 172 additional emergency housing beds through 2045. These needs are addressed separately in the *Considerations for Emergency Housing* section of this memorandum.

Land Capacity by Zone

Exhibit 3 summarizes land capacity by zoning designation for the 2045 Comprehensive Plan Update Preferred Alternative 1. This summary includes total land area, developable land, assumed achieved densities, gross residential capacity, existing housing on developable land, and net residential capacity. This table summarizes total net residential capacity for all zoning designations.

Exhibit 3. Development Capacity by Zoning Designation, Preferred Land Use Alternative

Development Capacity by Zone						
Zoning Designation	Total Land Area (acres)	Developable Land (acres)	Assumed Achieved Density (units/acre)	Gross Residential Capacity	Existing Units	Net Residential Capacity (units)
Residential Zones						
North Shore Higher Density Residential (HD-NS)	139.1	60.6	14	849	1	848
North Shore Lower Density Residential (LD-NS)	122.0	45.5	4.9	223	20	203
Residential - 6,000 (R-6)	107.6	38.8	7.2	280	11	269
Residential - 7,500 (R-7.5)	201.8	66.7	5.8	387	77	310
Residential - 10,000 (R-10)	271.9	95.9	4.3	412	49	363
Residential - 12 (R-12)	26.9	8.2	3.6	30	0	30
Residential - 15,000 (R-15)	441.8	68.9	2.9	200	161	39
Downtown Residential (DR)	1.2	1.2	32	39	0	39
Multifamily Residential - 10 (MF-10)	93.4	63.2	8	506	3	503
Multifamily Residential - 24 (MF-24)	33.0	16.6	17	282	0	282
Mixed Use Zones						
Downtown Mixed-Use Low-Rise (DT MU-Low)	0.9	0.6	40	23	0	23
Downtown Mixed-Use Mid-Rise (DT MU-Mid)	16.1	11.3	50	566	0	566
Downtown Historic Main Street Core (HSMC)	1.1	0.8	30	24	0	24
Mixed Use (MX)	132.5	94.3	16	1,509	0	1509
North Shore Mixed-Use (MX-NS)	93.4	63.2	12.5	790	0	790

Source: City of Camas, Clark County Assessor, Clark County Community Planning VBLM, WSP, ECOnorthwest

Exhibit 4 indicates that there are 9,523 lots in Camas that are eligible for ADU development. While recent changes to the City's development regulations allow up to two ADUs on an eligible lot, the number of ADUs that is reasonably expected to be developed through 2045 is likely to be much lower than this theoretical capacity.

To estimate a more realistic level of ADU development, the project team reviewed recent ADU production trends in Camas and assumed that future production would continue at a similar rate, with an adjustment to account for the new allowance of up to two ADUs per eligible lot. Based on discussions with City staff, approximately 10 to 15 ADUs have been developed annually in recent years. Given this historical range and the expanded ADU allowances, the analysis assumes an average production rate of 15 ADUs per year through 2045. This approach recognizes that, while regulatory changes increase the potential for ADU

development, only a small share of eligible lots is likely to develop ADUs during the planning period.

Exhibit 4. ADU Development Capacity, Preferred Land Use Alternative

ADU Capacity					
ADU-Eligble Lots	Assumed ADU Production per Year	Assumed Long-Term Housing Percentage	ADU Production Long-Term Housing	ADU Production Greater than Eligible Lots?	Total ADU Capacity
9,523	15	95%	285	No	19,046

Source: City of Camas, ECOnorthwest

Affordability Levels by Zoning Designation

To estimate the affordability levels associated with housing types allowed within each zoning designation, ECOnorthwest analyzed recent market pricing and development feasibility. Rent and sales price assumptions were based on market data collected for the pro forma analyses conducted as part of the Downtown Subarea Plan and Comprehensive Plan Update. These assumptions were used to estimate the income levels, expressed as a percentage of area median income (AMI), that could afford different housing types under current market conditions. In the case of housing units in income categories below 80% AMI, there is sufficient zoned capacity in the Comprehensive Plan Update to support units at these income levels, but further subsidy will be required to reach deeper affordability levels.

Exhibit 5 summarizes the housing types allowed within each zoning designation and the estimated affordability levels associated with those housing types. While zoning establishes where different housing types may be developed, it does not guarantee that those housing types will be built or that they will be affordable at the levels shown. In particular, housing serving lower-income households may require financial subsidies or other affordability incentives in addition to sufficient zoning and land capacity. The need for additional subsidy to support below-market-rate housing is discussed later in this memorandum.

Exhibit 5. Affordability Level and Housing Type by Zoning Designation

Zoning Designation	Typical Housing Types Allowed	Assumed Affordability Level of Capacity Analysis
Residential Zones		
North Shore Higher Density Residential (HD-NS)	Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, and Cottage Courts, Small-Scale Apartments (Wood Frame), Garden-Style Apartments, and Apartments (Podium)	High Income (100% AMI - >120% AMI)
North Shore Lower Density Residential (LD-NS)	Single-family (attached/detached), Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, and Cottage Courts	High Income (100% AMI - >120% AMI)
Residential - 6,000 (R-6)	Single-family (attached/detached), Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, and Cottage Courts	High Income (100% AMI - >120% AMI)
Residential - 7,500 (R-7.5)	Single-family (attached/detached), Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, and Cottage Courts	High Income (100% AMI - >120% AMI)
Residential - 10,000 (R-10)	Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, Cottage Courts, and Small-Scale Apartments (Wood Frame)	High Income (100% AMI - >120% AMI)
Residential - 12 (R-12)	Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, Cottage Courts, and Small-Scale Apartments (Wood Frame)	High Income (100% AMI - >120% AMI)
Residential - 15,000 (R-15)	Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, Cottage Courts, and Small-Scale Apartments (Wood Frame)	High Income (100% AMI - >120% AMI)
Downtown Residential (DR)	Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, Cottage Courts, and Small-Scale Apartments (Wood Frame)	Moderate Income (>80-120% AMI)
Multifamily Residential - 10 (MF-10)	Duplexes, Triplexes, Quadplexes, 5-6 unit buildings. Townhouses, Cottage Courts, and Small-Scale Apartments (Wood Frame), Garden-Style Apartments	Low to Moderate Income (<50% AMI-80% AMI)
Multifamily Residential - 24 (MF-24)	Garden-Style Apartments, and Apartments (Podium)	Low to Moderate Income (<50% AMI-80% AMI)
ADUs (All Zone Categories)	Accessory Dwelling Units (ADUs) on Developed Residential Lots	Low to Moderate Income (<50% AMI-80% AMI)
Mixed-Use Zones		
Downtown Mixed-Use Low-Rise (DT MU-Low)	Mixed-Use (Wood Frame)	Moderate Income (>80% AMI-120% AMI)
Downtown Mixed-Use Mid-Rise (DT MU-Mid)	Mixed-Use (Podium)	Moderate Income (>80% AMI-120% AMI)
Downtown Historic Main Street Core (HSMC)	Mixed-Use (Podium)	Moderate Income (>80% AMI-120% AMI)
Mixed Use (MX)	Mixed-Use (Wood Frame), Mixed Use (Podium)	50% Low to Moderate Income (<50% AMI-80% AMI) and %50 Moderate Income (>80% AMI-120% AMI)
North Shore Mixed-Use (MX-NS)	Mixed-Use (Podium)	High Income (100->120% AMI)

Source: City of Camas, ECOnorthwest

Considerations for Emergency Housing

Emergency housing, emergency shelters, and transitional housing are allowed uses by right in all zones across Camas that allow residential and lodging uses. Changes to the zoning map and new designations create allowances for these housing types across the applicable zones that allow residential and lodging uses across Camas. Clark County identified the need for approximately 172 emergency shelter beds in Camas. The table below summarizes the total unit capacity by zone where emergency housing, emergency shelters, and transitional housing are allowed.

Exhibit 6. Zoned Capacity for Emergency Housing and Shelters by Zoning Designation

Zoning Designation	Unit Capacity
Residential Zones	
HD-NS	848
LD-NS	203
R-6	269
R-7.5	310
R-10	363
R-12	30
R-15	39
DR	39
MF-10	503
MF-24	282
Mixed-Use Zones	
DT-MU-Low	23
DT-MU-Mid	566
HSMC	24
MX	1,509
MX-NS	790
Total Housing Unit Capacity	**5,796**

Source: ECOnorthwest

Reconciling Housing Needs and Capacity by Income Level

Exhibit 7 summarizes the reconciliation of housing needs and housing capacity by income level and zoning designation. This analysis indicates the Preferred Alternative results in a net capacity surplus of 1,570 units across Camas. Additionally, the Preferred Alternative results in capacity surpluses for all income levels.

Exhibit 7. Housing Needs and Capacity by Income Level

Income Level (% AMI) and Special Housing Needs	Allocated Housing Need	Zoning Designations Serving These Needs	Aggregated Housing Need	Total Capacity	Capacity Surplus
0-30% AMI (PSH)	331	MF-10, MF-24, and MX	2,661	2,717	56
0-30% AMI (Other)	564				
>30-50% AMI	811				
>50-80% AMI	955				
>80-100% AMI	516	HD-NS, R-6, DR, DT-MU-Low, DT-MU-Mid, HSMC, and MX	765	2134	1,369
>100-120% AMI	249				
>120% AMI	799	HD-NS, LD-NS, R-6, R-7.5, R-10, R-12, R-15, and MX-NS	799	944	145
Total	**4,226**	-	**4,226**	**5,796**	**1,570**

Source: City of Camas, WSP, ECOnorthwest

Appendix F: Equity Framework

Our Camas 2045 Equity Framework

The City of Camas is updating its comprehensive plan to guide growth and development over the next 20 years. The comprehensive plan update, named Our Camas 2045, is an important tool to provide the long-term vision and policy direction for the city. The comprehensive plan addresses land use, utility and transportation infrastructure, public facilities, parks, trails, and open spaces, and climate resiliency. The comprehensive plan update is also an important opportunity to integrate equity into future planning in the city, which is why the planning process includes an equity framework.

What is an Equity Framework and why is it important?

An equity framework is a tool that can guide how equity is considered in a planning process. The Our Camas 2045 Equity Framework will be used throughout the project as a lens to identify how the plan will disperse benefits and burdens of future growth fairly across the city.

Equity Definition

In the context of Our Camas 2045, equity is defined as benefits and burdens being shared across the entire community, recognizing the unique needs and opportunities of different community members and neighborhoods. Camas recognizes that disparities have resulted from past plans and policies and the need to use an equity framework to guide the comprehensive plan update to achieve equitable outcomes for all Camas residents.

Potentially Impacted Communities

Potentially impacted communities are those that may be subject to a disproportionate "impact". This can be in the context of past planning practices, past or current policies, built environment features (ADA accessibility), or climate hazards. Chapter 70A.02 Revised Code of Washington (RCW) defines "vulnerable populations" to include without limitation:

i. Racial or ethnic minorities;

ii. Low-income populations;

iii. Populations disproportionately impacted by environmental harms; and

iv. Populations of workers experiencing environmental harms.

In the context of climate, impacted communities will be those who do not have resources to prepare for and cope with climate impacts. The Our Camas 2045 Climate Planning Action Team will help further identify groups vulnerable to natural hazards that could be exacerbated by climate change.

For the purposes of Our Camas 2045, the following communities are identified as Equity Communities:

- Black, indigenous, and people of color (BIPOC) communities
- People experiencing low incomes
- People with disabilities, including neurodivergent
- Youth and children
- Seniors and older adults
- LGBTQ+ individuals
- People without an address or experiencing homelessness
- People without access to a car
- Small business owners
- Undocumented population
- Formerly incarcerated population

A profile of current Camas residents, including population, languages spoken, and demographics is available on the Our Camas 2045 website: Our Camas 2045 | Engage Camas

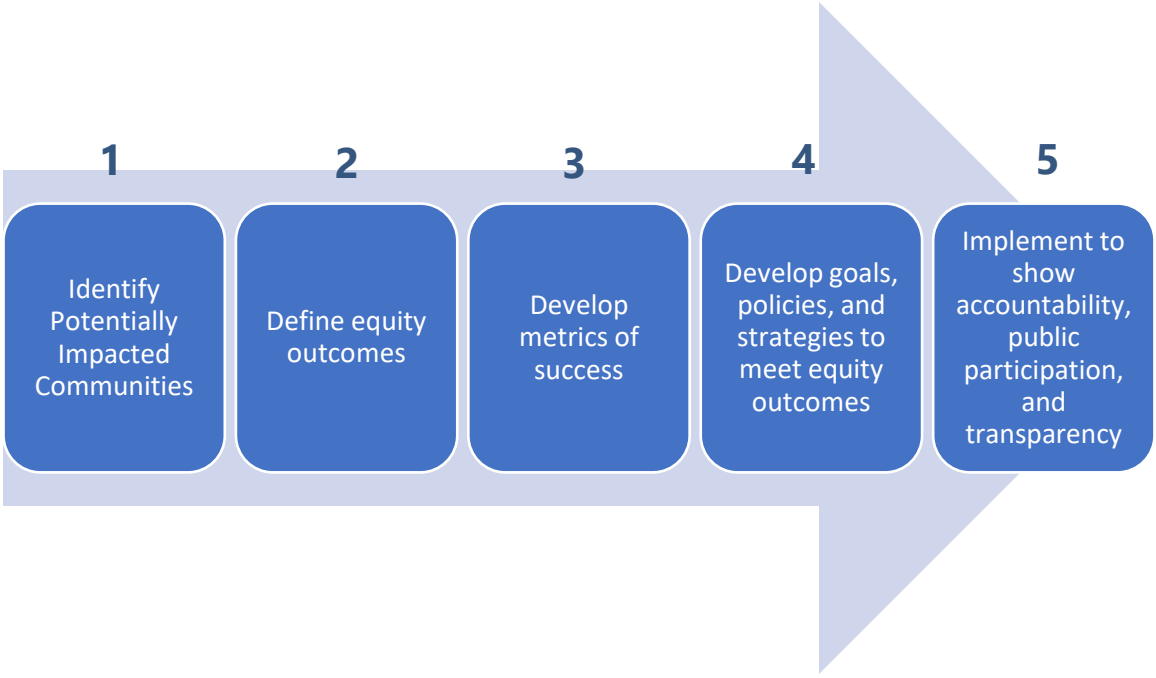
Equity Process

The Equity Process is the process that will be followed to achieve equity outcomes in the comprehensive plan update. The process can be grouped into two categories: Process Equity and Outcome Equity.

- Process Equity includes the meaningful participation and engagement of communities typically not represented in planning processes and specifically the equity communities identified above. To achieve process equity, outreach strategies can be enhanced to engage renters, youth/children, people experiencing low incomes, and other equity communities. Specific outreach strategies can include community conversations with equity communities, participation in community events that draw diverse attendance, and providing equity community groups and individuals with direct invitations to project events and meetings.
- Outcome Equity relates to the burdens and benefits of a project. In the context of the comprehensive plan, this could include goals and policies that avoid exacerbating existing disparities (e.g., lack of ADA accessibility) and provide benefits that address the unique needs of equity communities. A starting point for developing equity outcomes is establishing where and for whom inequalities exist. Camas can utilize existing housing, population, and economic data to determine which communities may be underrepresented. This step can help community members understand diversity in their community.

The equity process diagram below outlines the process that will be used to develop each comprehensive plan element to embed equity throughout the comprehensive plan.

PROCESS DIAGRAM



Step 1 – Identify potentially impacted communities. Demographics that identify potentially impacted communities are included in the Our Camas 2045 Housing Needs Assessment and Community Profile.

Steps 2 and 3 – Define equity outcomes and develop metrics of success. Equity outcomes and metrics of success will be developed with the Our Camas 2045 Community Advisory Committee and the Our Camas 2045 Climate Planning Action Team. There may be overarching outcomes and success metrics that relate to the entire comprehensive plan and specific outcomes and metrics that relate to individual comprehensive plan elements.

Step 4 – Develop goals, policies, and strategies to meet equity outcomes. With the Our Camas 2045 committees and the community, prepare goals, policies, and strategies that advance equity and bring the city closer to achieving the identified equity outcomes.

Step 5 – Implement to show accountability, public participation, and transparency. Communicate the process and outcomes with the community to show how their feedback contributed to the planning process and to the development of goals and policies to advance equity.

Appendix G: Overburdened Communities and Vulnerable Populations Memo

Overburdened Communities and Vulnerable Populations Memo

1. Introduction

Cities planning under the Growth Management Act (GMA) must include a climate change and resiliency element (climate element) in their comprehensive plans (Revised Code of Washington [RCW] 36.70A.070). As part of the plan, cities are required to prioritize actions that benefit overburdened communities and vulnerable populations in their development of goals and policies for the new climate element. The Washington Department of Commerce (Commerce) administered a series of grants to several cities, including the City of Camas (City), to prepare climate elements. Funding was available for the 2023-2025 biennium and Commerce recently distributed remaining funds to cities for the 2025-2027 biennium. As part of the recent distribution of grant funding, cities are required to submit a deliverable describing how and when overburdened communities and vulnerable populations, including tribes, were encouraged to participate in the development of climate goals and policies.

The memo is organized as follows:

1. Introduction. A brief description of overburdened communities and vulnerable populations.
2. Identification of Overburdened Communities and Vulnerable Populations. An explanation of how these geographic areas and populations were identified.
3. Public Participation Plan and Equity Framework. An overview of these two plans prepared for Camas' comprehensive plan update, which helped guide equitable engagement.
4. Community Summits. A description of the community summits held for Our Camas 2045, including outreach, content, and outcomes.
5. Climate Policy Advisory Team. An overview of the City's advisory group dedicated to developing the climate element and providing input on climate-related issues for the comprehensive plan.
6. Clark County Comprehensive Plan Community Engagement. Information about the engagement conducted for the County's plan update, which supplemented the City's engagement.
7. Conclusion. A brief recap of work to date and next steps.

The following attachments are included:

Attachment A: Public Participation Plan

Attachment B: Equity Framework

Attachment C: Community Summit Summaries

Attachment D: CPAT Meeting Summaries

Attachment E: Advisory Committee Interest Form

2. Identification of Overburdened Communities and Vulnerable Populations

The City developed a climate element consistent with House Bill 1181 and concurrent with the City's "Our Camas 2045" comprehensive plan update project. The climate element is Chapter 7 in the plan and identifies overburdened communities and vulnerable populations. Per the GMA, "overburdened community" means a geographic area where vulnerable populations face combined, multiple environmental harms and health impacts, and includes, but is not limited to, highly impacted communities as defined in RCW 19.405.020; and "vulnerable populations" includes, but is not limited to: (i) Racial or ethnic minorities; (ii) Low-income populations;

(iii) Populations disproportionately impacted by environmental harms; and (iv) Populations of workers experiencing environmental harms.

The Climate Policy Advisory Team (CPAT), one of several advisory committees for Our Camas 2045, provided key input and participated in a group activity where they shared their thoughts on areas of the city that could be considered overburdened communities and groups of people that could be considered vulnerable populations.

Based on the RCW definitions, informed by the public participation plan and equity framework (described in Section 3), and input from the CPAT (described in Section 5), overburdened communities in Camas include areas located near:

- Floodplains, such as Lacamas Lake and the Columbia River,
- Mobile sources of air pollution, such as major roadways,
- Steep slopes and steep road grades, and
- The wildland urban interface (e.g., homes adjacent to forested areas).

Vulnerable populations include people and communities in Camas and are generally described as "potentially impacted communities" in the City's equity framework. These communities include:

- Black, indigenous, and people of color (BIPOC) communities
- People experiencing low incomes
- People with disabilities, including neurodivergent
- Youth and children
- Seniors and older adults
- LGBTQ+ individuals
- People without an address or experiencing homelessness
- People without access to a car
- Small business owners
- Undocumented population
- Formerly incarcerated population

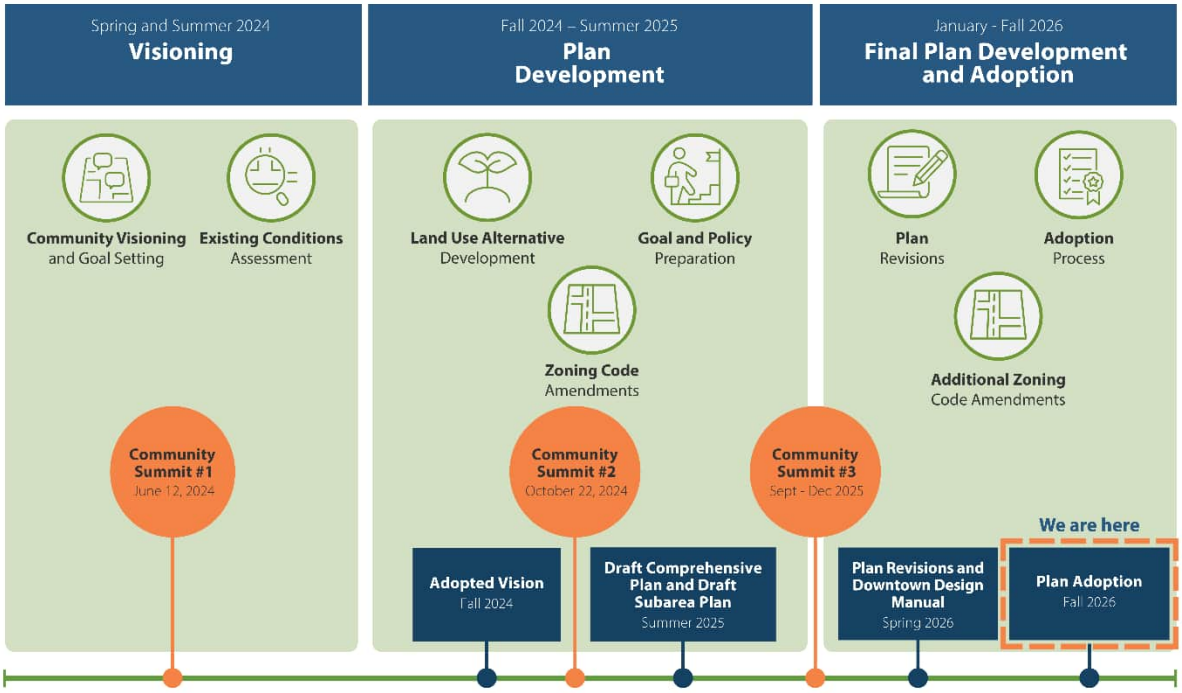
The following sections provide details on the public involvement process conducted by the City and County and their engagement with overburdened communities, vulnerable populations, and tribes.

3. Public Participation Plan and Equity Framework

Community engagement for Our Camas 2045 was guided by a public participation plan as well as an equity framework (Attachments A and B). The public participation plan outlines Census demographics, key messaging, stakeholders, engagement activities, communication tools, and a project schedule. The plan also highlights the importance of choosing engagement activities and tools that reach underserved populations, which overlap with vulnerable populations. As is further described below, the City used various communication tools to advertise community events and engagement activities to include these underserved populations in the planning process. In Camas, these populations include community members who speak a second language (about 5.9% speak Indo-European languages and 5.5% speak Pacific Islander languages), youth (Camas has a higher proportion of people 19 and under than Washington State), people with disabilities (approximately 17.3% of residents live with a disability), and low income (18% of Camas households earn less than $50,000 a year). To help reach these populations, the plan recommended translating materials in relevant languages, planning engagement activities around youth-oriented events and activities, providing hearing impairment accommodation, offering access to transportation options at events, and ensuring that citywide mailings are sent to residents regardless of housing type and tenure.

Engagement activities described in the plan are organized into advisory group meetings, interested party interviews, community conversations and events, surveys and online engagement, and community summits. Communication tools involve the use of a project website, social media, media

contacts, public information materials, and an electronic mailing list. The following project schedule outlines the community summits and key milestones for the project.



Project Schedule

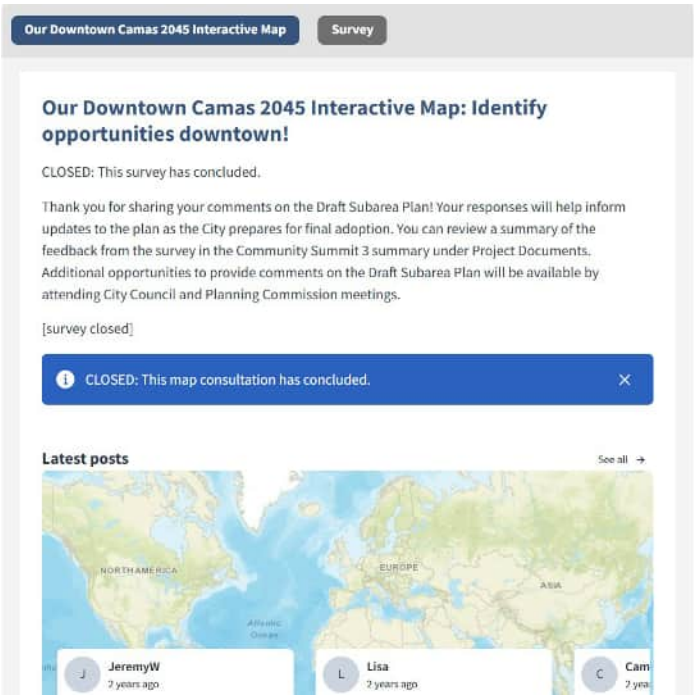
As a complement to the public participation plan, the City's equity framework serves as a guide for the planning process and provides a lens to identify how the plan will disperse benefits and burdens of future growth fairly across the city. The equity framework identifies "potentially impacted communities" as those that may be subject to a disproportionate impact, or in the context of climate planning, those who lack resources to prepare for and cope with climate impacts. As described above, these communities are considered vulnerable populations in Camas.

4. Community Summits

The City hosted three community summits to provide in-person and online engagement opportunities for Our Camas 2045 (see Attachment C). Engagement strategies from the public participation plan and equity framework helped inform the advertisement and development of engagement opportunities for the community summits. Community summits were advertised to the public through various channels, including Engage Camas, social media (Instagram and Facebook), media releases to the Camas-Washougal Post Record, and emails to people who had signed up for project notifications. Supplemental engagement opportunities included community conversation kits and tabling at events such as First Fridays, the Farmer's Market, and Camas Days. Community

conversation kits were created as a meeting facilitation tool to help Community Advisory Committee members facilitate discussions with community members. A community conversation tracking log documented when the conversation kits were used to meet with groups and organizations in Camas. Examples of these groups included the Downtown Camas Association, Middle and High School student groups, Camas View Senior Care, and Clark County Transportation Alliance.

Prior to the first community summit, an online questionnaire and interactive map (see screenshot below) were launched in February 2024, and a citywide mailer was sent to all Camas residents to announce the launch of the project and promote Engage Camas and upcoming online engagement activities.



Our Downtown Camas 2045 Interactive Map

Community summits were held in June and October 2024 as well as between September and December 2025. The first summit was an open house event that provided community members with information on a draft vision statement and goals. The second summit provided an online survey and in-person forum for community members to share feedback on the draft land use alternatives, development scales, review development concepts for downtown, and learn about the City's climate planning efforts and the greenhouse gas inventory. For the third summit, community members had the opportunity to participate in a mix of online engagement and in-person activities between September 15 and December 26, 2025, to review, ask questions, and provide feedback on each element (or chapter) of the draft comprehensive plan, including the Downtown subarea plan. The City

featured a different comprehensive plan element every two weeks by hosting an online survey and providing background information on Engage Camas. In-person engagement activities consisted of a presentation at a joint Strong Towns and Camas Earth Day Society event and a series of "Chat with a Planner" events where community members could visit City Hall and have one-on-one conversations with City staff. The climate element was highlighted alongside the natural environment element in mid-October. Feedback from these community summits and other in-person activities helped to inform the development and refinement of goals and policies for the climate element.

5. Climate Policy Advisory Team

As one of the advisory groups for Our Camas 2045, the CPAT was created to advise the City during the development of the new climate element. The selection of CPAT members originated from an advisory committee interest form that was distributed via citywide mailer in December 2023 for the Community Advisory Committee (Attachment E). The form specified that Community Advisory Committee members must be residents of Camas, own or operate a business in Camas, or represent a group or organization that operates within Camas or otherwise serves Camas residents or businesses. Residents could mark on the form whether they were interested in the climate element. Following the distribution of this form, the City recruited 17 members for the CPAT, including community members, City staff, City Council and Planning Commission liaisons, and representatives from the Port of Camas-Washougal, Clark Public Utilities, NW Natural, and the Camas School District. CPAT members held five meetings between early 2024 and early 2025. Key actions by the CPAT that contributed to a draft list of goals and policies included a mapping exercise pairing local assets with climate hazards, a review of Commerce's model climate element, identifying overburdened communities and vulnerable populations in Camas, a group discussion and activity to refine the draft resiliency and greenhouse gas reduction policies, and recommending action items for the implementation of climate policies (Attachment D).

6. Clark County Community Engagement for County Comprehensive Plan

In addition to community engagement completed for Our Camas 2045, the County completed community engagement activities for their periodic update. The County prepared a public participation plan for the Comprehensive Growth Management Plan as well as for the County's climate element. The County's public participation plan describes four phases of community engagement with various engagement activities such as presentations, tabling events, focus groups, community workshops, social media outreach, and online and in person surveys. The public participation plan outlined ways to communicate with leadership of the Cowlitz Indian Tribe, other tribes with ancestral lands and waters in or near the project area, local Native American non-governmental organizations, and indigenous community-based organizations to invite them to participate in the County's climate planning. Engagement activities were conducted by the Climate Environmental Justice Coalition (EJC), a coalition of community-based organizations, in partnership

with the Clark County Community Planning Department during the spring, summer, and fall of 2024. The EJC consists of 15 community-based organizations and serves as one of the advisory groups for the County's plan update. Another advisory group, the Community Advisory Group, consists of approximately 21 members appointed by the County Manager. These members provided comments and feedback on climate goals and policies. Both groups used community input to inform the development of countywide climate goals and policies. The County's climate goals and policies are addressed in Camas's comprehensive plan as the climate element must be consistent with the County's goals and policies.

7. Conclusion

Public involvement for Our Camas 2045 incorporated a public participation plan and an equity framework that guided engagement activities for community members during the planning process. Overburdened communities and vulnerable populations in Camas were identified by the City's planning team as well as the CPAT, and multiple opportunities for public involvement, both online and in person, were provided to overburdened communities and vulnerable populations through the broad distribution of engagement materials.

One of the final steps in the comprehensive plan update process will include adoption of the plan and the distribution of a State Environmental Policy Act (SEPA) public notice to the City's SEPA distribution list, which includes the Chinook Indian Nation and the Cultural Resource Programs for the Cowlitz Indian Tribe and Yakama Indian Nation. Following the adoption of the comprehensive plan, the City will continue to engage with state and local policies related to climate planning and will evaluate opportunities for additional outreach. As is described in this memo, the City has met the grant requirements for outreach to overburdened communities and vulnerable populations, including tribes, and will continue to evaluate opportunities for additional engagement in the City's planning process.

Attachments

City of Camas
Overburdened Communities and Vulnerable Populations Memo

October 2026

This file contains the following attachments:

- Attachment A: Public Participation Plan
- Attachment B: Equity Framework
- Attachment C: Community Summit Summaries
- Attachment D: CPAT Meeting Summaries
- Attachment E: Advisory Committee Interest Form

Camas Comprehensive Plan Update and Downtown Subarea Plan

Revised Draft Public Participation Plan

February 9, 2024

Project Overview

The City of Camas seeks to update its Comprehensive Plan and to account for 20 years of growth and remain consistent with the requirements of the Growth Management Act (GMA). Per the GMA, comprehensive plans are required to contain certain elements including land use, housing, capital facilities, utilities, transportation, economic development, and parks. New considerations stemming from recent state mandates in the GMA include housing, critical areas, and the recently released guidance on climate change. The City of Camas also seeks to create a Downtown Subarea Plan that will coincide with the Comprehensive Plan update. This plan will consider the direction for sub-districts, land use and density, connectivity and mobility systems, potential redevelopment sites, gateways, and activity centers.

To ensure the Comprehensive Plan and Downtown Subarea Plan reflect the needs of community members, a robust public involvement process that reaches a large segment of Camas's population is essential. The purpose of this document is to outline an array of tools that will be employed to reach a diverse set of Camas stakeholders who will help guide the development of the Comprehensive Plan Update and Downtown Subarea Plan.

Community Engagement Objectives

The public involvement process aims to meet the following objectives:

- Inform the community with timely, transparent, and accurate information.
- Educate community members about planning, the Growth Management Act, and decision-making processes.
- Consult and involve the community in the identification, refinement and prioritization of policy updates needed to guide growth and development in Camas over the next 20 years as well as for the Downtown Subarea Plan. Ensure community members understand how decisions are made, their concerns are heard, and they know how their feedback influenced decisions.
- Partner with city and agency representatives to ensure officials are engaged in the planning process and key decisions.
- Reach a diversity of stakeholders who reflect Camas's greater community.

Key Messages

- The City of Camas is launching *Our Camas 2045*, a citywide effort to develop a new, community-wide vision for the future and update the Camas Comprehensive Plan to reflect that vision.
- Washington requires that all cities and counties plan for managing growth over a 20-year horizon, including changes in population, demographics, housing and employment trends.
- The Comprehensive Plan is Camas's primary planning document. It articulates the city's vision for future land use, housing, capital facilities, utilities, transportation, economic development, and parks.
- The City of Camas is also launching *Our Downtown Camas 2045*, a concurrent planning process to establish a more detailed vision and action plan to preserve and enhance our historic downtown's unique sense of place.
- The City of Camas is committed to an inclusive and transparent planning process. Community engagement is crucial to understanding the community's core values and developing an equitable, representative plan.
- There will be many opportunities for community members to engage throughout the planning process, with a focus on accessible opportunities to provide feedback.
- Community members can stay engaged by visiting the project website: https://engagecamas.com/

Community Demographics

The following demographic profile helps identify priority populations and tailor outreach methods to reach the full spectrum of Camas residents and property owners. Demographic data is derived primarily from the U.S. Census American Community Survey 5-Year Data 2017-2021 Data Profile. According to Census Bureau Population Estimates, Camas's population reached 27,371 as of July 1, 2022.

Race and Ethnicity

According to 2017-2021 American Community Survey data, 78 percent of Camas residents identify as White. The remainder of residents identify as African American (1.6%), American Indian/Alaska Native (1.0%), and Asian (10.6%). 8.0 percent identify with two or more races. 3.8 percent of Camas residents identify as Hispanic or Latino.

Race/Ethnicity	City of Camas	Washington
White	78.0%	71.7%
African American	1.6%	3.9%
Asian	10.6%	9.0%
Native Hawaiian and other Pacific Islander	0.1%	0.7%
American Indian or Alaskan Native	1.0%	1.2%
Two or more races	8.0%	8.6%
Hispanic or Latino (any race)	3.8%	13.2%

Languages Spoken at Home

86.7 percent of Camas residents are English speakers. The language spoken most commonly other than English are Indo European languages (5.9%) as well as Asian and Pacific Islander languages (5.5%). Smaller portions of the population speak Spanish (1.4%).

Age

The City of Camas has a larger share of residents 19 and under (29.0%) than the State of Washington (24.4%). There is also a significant portion of those who are between 35 and 54 years old (32.0%). Consequently, there are smaller shares of residents who are between the ages of 20-34 (12.7%) and those who are 75 years and older (4.0%) than Washington (21.4% and 5.8%). Camas's other age group sizes are roughly on par with State averages.

Age	City of Camas	Washington
19 years and under	29.0%	24.4%
20 – 34 years	12.7%	21.4%
35 – 54 years	32.0%	26.0%
55 – 64 years	12.9%	12.7%
65 – 74 years	9.3%	9.6%
75 years +	4.0%	5.8%

Income

From 2017-2021, the median household income in Camas was $121,094, which is higher than the state median ($82,400). More than half of Camas households earn more than $100,000 annually, compared to the State average of 40.9%.

Income	City of Camas	Washington
<$15,000	4.9%	7.1%
$15,000-$25,000	3.8%	5.9%
$25,000-$50,000	9.3%	16.5%
$50,000-$75,000	15.0%	16.3%
$75,000-$100,000	8.9%	13.4%
$100,000+	58.1%	40.9%

People with Disabilities

Census data indicates that 17.3 percent of Camas residents live with a disability. This is lower than the Washington state average of 25.4 percent. The highest percentages of those with disabilities have a hearing (3.9%) or cognitive (3.8%) disability.

Housing

Census data indicates that more than 83 percent of Camas residents live in a single-family detached home, which is greater than the State of Washington (63.0%). Around 9.7 percent of Camas residents live in middle housing (1 to 4 attached units), 5.3 percent occupy multi-family homes (5 or more attached units), and about 1.2 percent live in a mobile home. 79.9 percent of Camas residents are

homeowners and 20.1 percent are renters. ACS 2017-2021 shows that median gross rent in Camas was $1,504.

Housing Type	City of Camas	Washington
Single-family home	83.8%	63.0%
Middle housing	9.7%	10.0%
Multi-family home	5.3%	20.9%
Mobile home	1.2%	5.9%
Homeowners	79.9%	63.6%
Renters	20.1%	36.4%

Underserved Populations

The City of Camas is committed to facilitating extensive and equitable community engagement for the Comprehensive Plan Update and Downtown Subarea Plan. To ensure full and fair participation by all potentially affected community members in the decision-making process, engagement activities and tools will focus on meeting underserved groups where they are. The following describes priority populations for this process.

Census demographic information indicates that second most spoken language besides English are Indo-European Languages (5.9) and Asian and Pacific Islander Languages (5.5%) in Camas. About 10.6 percent of the community also identified as Asian. The City may consider translation of materials in relevant languages, and hosting public activities in non-governmental, community spaces that are comfortable and welcoming to those who speak limited English.

The City of Camas is also shown to have significantly higher proportions of youth (19 and under). To reach the youth of Camas, engagement activities should be centered around youth-oriented events and activities. Local schools, after school programs, and youth groups may be considered for community conversations and surveys or notified of engagement opportunities.

While the City of Camas does have a lower proportion (17.3%) of those with disabilities than Washington (25.4%), engagement activities should be made accessible and include accommodations for people of all abilities. Among identified groups in the census, those with hearing impairments are the higher than others (3.9%). Engagement events should consider the accessibility of community spaces and venues, including provision of hearing impairment accommodations, as well as access to transportation options.

Although Camas's median household income is higher than Washington, approximately 18 percent of Camas households still earn less than $50,000 a year. Access to technology to participate in engagement activities, as well as access to transportation and childcare during engagement activities should be considered when taking an equitable approach. While the City of Camas has a lower percentage of renters and people living in multifamily housing, citywide mailings could ensure all residents regardless of housing type and tenure are informed and engaged.

Stakeholders and Partners

Community members and stakeholders will have multiple opportunities to participate in the Comprehensive Plan Update and Downtown Subarea Plan processes. This section identifies the spectrum of stakeholders and the variety of ways in which the City will engage community members in the process.

Interests	Specific Organizations
Schools/Youth	Camas School District- Citizen Advisory Committee Dorothy Fox Elementary PTA Grass Valley Elementary PTA Helen Baller Elementary PTA Lacamas Lake Elementary PALS Prune Hill Elementary PTA Woodburn Elementary PTA Middle School and High School student groups Clark College Camas Montessori C-W Parent Co-Op Preschool Tree Hill Learning Center Boys and Girls Club 4-H Programs Camas Little Leage Camas Educational Foundation (CEF)
Parks and Nature	Camas Parks & Rec Department Clark County Parks Department Lacamas Trails Advocacy Group Parks and Recreation Commission Parks Foundation Clark County Camas Parks Foundation
Industry and Businesses	Downtown Camas Association (Economic Vitality Committee; Downtown Merchants Committee) Chamber of Commerce Port of Camas-Washougal Columbia River Economic Development Council (CREDC) Franchise utility companies
Public Safety	Camas Police Department Camas-Washougal Fire Department Station 42 East County Fire and Rescue Station 91
Utilities	Waste Connection NW Natural Gas Clark Public Utilities

Interests	Specific Organizations
Developers/Property Owners	Property Owners Port of Camas-Washougal Homeowners Associations Habitat for Humanity Clark County Housing Authority Vancouver Housing Authority Building Industry Association (BIA)
Health	Legacy Medical Group-Camas Camas Center Clinic (Kalispel Tribe of Indians)
Transportation	C-Tran Clark County Transportation Alliance SW WA Regional Transportation Commission Bike Clark County
Service Non-profits	The Columbia Future Forge Camas Community Education Camas-Washougal Community Chest Camas-Washougal Wildlife League Camas Lions Club Rotary Club of C-W Inter-faith Treasure House Meals on Wheels Booster Club Vancouver NAACP
Non-native English Speakers	APANO Latino Community Resource Group (LCORG)
Arts and Culture	Clark County Arts Commission DCA Design Committee Camas Artisans Guild Camas Library Camas Library Book Clubs 411 Art Collective
State Agencies	WSDOT Clark County
Faith Based Organizations	NorthLake Church Journey Church Zion Lutheran Church Elca Northwest Gospel Church Camas United Methodist Church Camas Friends Quaker

Interests	Specific Organizations
	St. Thomas Aquinas Catholic Church Activate Church
Elected and Appointed Officials	City Council Planning Commission Boards and Commissions
Accessibility	Council for the Homeless Camas View Senior Care Forest Home Elder Care Adult Family Home Lacamas Heights Memory Care PEACE NW Stephen's Place Washington State School for the Blind (WSSB)
Environmental	Camas Washougal Community Chest Columbia Springs Columbia Land Trust

Engagement Activities

The following table summarizes primary community engagement activities, their intended audience, and partners needed to carry out the activities while using the IAP2 engagement spectrum.

The IAP2 Spectrum is an internationally recognized model developed to help clarify the role of the public in planning and decision making, and how much influence the community has over planning or decision-making processes. The model identifies 5 levels of community engagement, ordered as follows by increasing impact on decision-making: (1) inform; (2) consult; (3) involve; (4) collaborate; and (5) empower.

Engagement Tool/Activity	IAP2 Spectrum	Description	Audience
Project Advisory Committee (PAC)	Inform Consult Involve	The PAC will meet up to eight (8) times to advise on the Comprehensive Plan Update and Downtown Subarea Plan process. The PAC will consist of technical stakeholders, agency partners and service providers to work alongside the CAC. They will review project materials and advise on technical issues.	Interest Groups Technical Groups
Community Advisory Community (CAC)	Inform Consult Involve	The Community Advisory Committee (CAC) will meet up to eight (8) times. The committee will represent a broad cross-section of community interests. The CAC will review and comment on work products, guide public outreach and engagement efforts, act as liaisons to specific constituencies or interest groups, help host public events, encourage community members to participate in the	Public Interest Groups

Engagement Tool/Activity	IAP2 Spectrum	Description	Audience
		process, and act as champions of the ultimate Camas Vision, Comprehensive Plan, and Downtown Plan that emerge from this process.	
Downtown Camas Association (DCA) Meetings	Inform Consult Involve	The Consultant Team will attend up to eight (8) meetings with the Downtown Camas Association (DCA) at key project milestones. Meetings will be held with the DCA board or subcommittees.	Public Interest Groups
Interested Party Interviews	Inform Consult Involve	Up to (6) interviews with interested parties will be conducted. Interviews will help build relationships with trusted community leaders and identify important issues, challenges, and assets at the outset of the project.	Stakeholders Public
Community Conversations & Events	Inform Consult	Up to ten (10) Community Conversations will be conducted by the project team, City staff and CAC members. Community Conversations will provide community members with information about the project and engage them in discussion about what they value about Camas today and what could make it a better place to live in the future. Up to five (5) community events will involve visioning activities through an informational table/booth or intercept surveys. Visioning activities will be designed to create awareness of the project and engage youth and adults in identifying what they love about Camas today and what they would change to make Camas an even better place to live, work and play in the future. Events could include: • Little Art Camas • Camas Farmer's Market • Camas Days • First Fridays • Plant and Garden Fair	Public
Surveys & Online Engagement	Inform Consult	Four (4) online community forums or surveys to gather the general interests and positions of the public will be created. Digital surveys will be provided through Engage Camas, and paper surveys will be distributed or conducted as intercept surveys at strategic locations around the city. Surveys will coincide with each of the (4) rounds of public involvement and provide an alternative opportunity to comment for those who may not come to a meeting or	Public

Engagement Tool/Activity	IAP2 Spectrum	Description	Audience
		event or feel comfortable voicing their opinions among others.	
Community Summits	Inform Consult Involve	Four (4) Community Summits throughout the course of the project will be held. These fun and engaging community events are the main opportunities for Camas community members to engage and share ideas with their neighbors face-to-face regarding the Vision, Comprehensive Plan, and Downtown Plan. To encourage participation, snacks/beverages and activities for children will be provided.	Public

Communication Tools

In addition to the above activities, the following communication tools will provide information about events, activities, and opportunities to be involved in developing the Comprehensive Plan Update and Downtown Subarea Plan.

Communication Tools	Description
Project Website	The website page will utilize the Engage Camas platform and will function as an information and engagement hub for the project. It will be used for outreach activities such as online surveys and virtual meetings as well. A project overview, timeline, important contacts, schedules for public events, surveys, and other engagement activities, updates on the project's status, and the ability to view or download documents will be available on this webpage.
Social Media	Content will be prepared for social media platforms, such as Facebook and Instagram accounts to increase project awareness and provide multiple avenues for community input.
Media Contacts	Media releases to the Camas-Washougal Post Record and other local media outlets will be prepared for the City to distribute.
Public Information Materials	Flyers, newsletters, facts sheets and other materials to educate and inform the public will be prepared.
Electronic Mailing List	The City will maintain a database of e-mail addresses of people who express interest in the planning process. E-blasts for the City to distribute to help notify people about events and activities will be prepared. Interested parties will have several opportunities to join the mailing list, such as on the project website and at public meetings and events.

Risks and Mitigation Engagement Activities

The following table summarizes potential risks and suggested mitigations.

Risks	Mitigation	Stakeholder(s) Affected
Low attendance at public forums	Community event notices are shared through e-blasts, social media, website, at public events and in print materials, and distributed by CAC members.	General public
Low response rate for surveys	Surveys are shared through e-blasts, social media, website, at public evets and in print materials, and distributed by CAC members.	General public
Limited communication and buy-in from agency and city partners	Advisory Committee meeting summaries are shared in a timely manner with city and agency partners. Planning Commission and City Council updates occur throughout the project.	Agency partners, City, general public
Inadequate or poor media coverage	Press release published prior to each community event; Press invited to attend committee meetings and public events; Detailed and up to date information on the website.	Agency partners, City, general public
Lack of variety in stakeholders engaged	Committee meetings and public events held at a variety of venues that meet stakeholder needs. Direct outreach to stakeholder and community organizations that represent a broad cross section of the Camas community.	General public

Evaluation

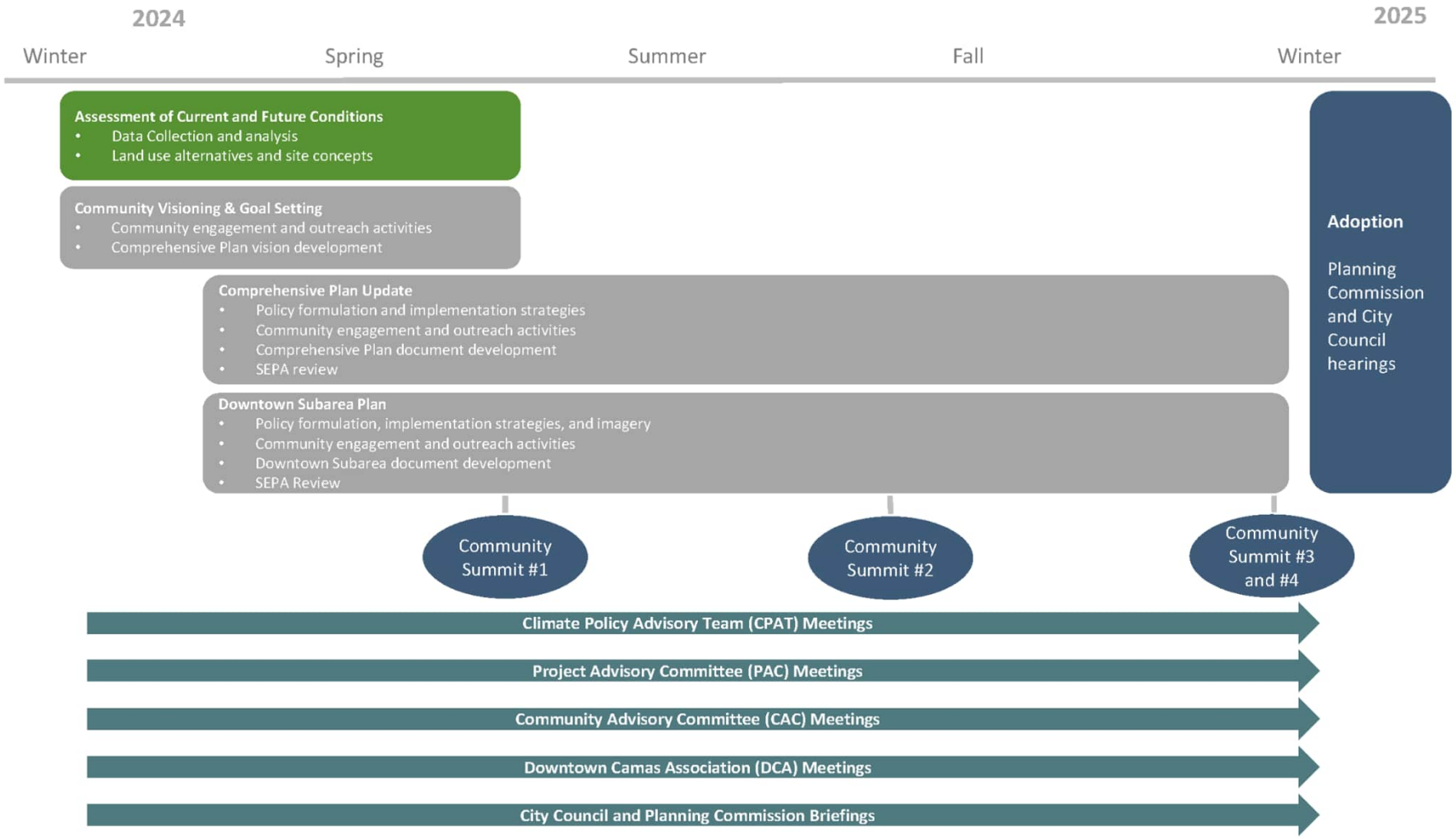
The following table describes the key metrics and processes for evaluating progress on meeting the goals set out in this public engagement plan. The project team will evaluate progress made toward meeting these goals throughout the duration of the project.

Goal	Objective	Metric	Tool
Inform: inform the community with timely, transparent and accurate information.	• Community event attendees report high satisfaction with information shared at forums • Web traffic increases throughout the process • Social media engagements increase throughout the process	• >75% attendees are satisfied with information shared • >75% attendees are satisfied with transparency of process • Increase in web traffic throughout process • Increase in social media engagement throughout process	• Online survey • Web analytics • Social media analytics • Event questionnaires and comment forms
Consult: consult and involve the community in the identification, refinement and prioritization of plan updates. Ensure community members understand how decisions are made, have their concerns heard and learn how their feedback influenced project decisions.	• Community event attendees report high satisfaction with opportunities to engage in sharing feedback • Stakeholder feedback is plentiful • Stakeholder feedback and decisions are published within a timely manner • Information is shared back with stakeholders about how their feedback influenced the plan	• >75% attendees are satisfied with opportunities to share feedback • 200+ residents respond to surveys • 50+ residents attend public events • Website includes information on feedback and how it influenced policy • CAC meeting summaries are uploaded to website within 20 days	• Online survey • Online survey analytics • Community event sign-in sheet • Web content (Project library) • Event questionnaires and comment forms

Partner: partner with city and agency representatives to ensure officials are engaged in the planning process and key decisions.	• City Council and Planning Commission are satisfied with frequency and quantity of information shared	• City Council and Planning Commission receive a planning update either in writing or through regular briefings	• City Council and Planning Commission engagement at briefings and attendance at key community events
Reach: reach a diversity of stakeholders that reflect Camas' community.	• Each stakeholder interest is represented • Community events are hosted at accessible and representative venues • Specific outreach methods are used to reach minority populations including people of color people experiencing low income, renters, and seniors.	• Community members from all interests identified in the stakeholder interest matrix are engaged at some point throughout the process • 100% of venues are ADA accessible • Venue reflects diverse interests	• Community events sign in sheets • Venue list • Mailers • Print materials

Project Schedule

This schedule outlines engagement activities and key milestones throughout the project.



Our Camas 2045 Equity Framework (DRAFT)

The City of Camas is updating its comprehensive plan to guide growth and development over the next 20 years. The comprehensive plan update, named Our Camas 2045, is an important tool to provide the long-term vision and policy direction for the city. The comprehensive plan addresses land use, utility and transportation infrastructure, public facilities, parks, trails, and open spaces, and climate resiliency. The comprehensive plan update is also an important opportunity to integrate equity into future planning in the city, which is why the planning process includes an equity framework.

What is an Equity Framework and why is it important?

An equity framework is a tool that can guide how equity is considered in a planning process. The Our Camas 2045 Equity Framework will be used throughout the project as a lens to identify how the plan will disperse benefits and burdens of future growth fairly across the city.

Equity Definition

In the context of Our Camas 2045, equity is defined as benefits and burdens being shared across the entire community, recognizing the unique needs and opportunities of different community members and neighborhoods. Camas recognizes that disparities have resulted from past plans and policies and the need to use an equity framework to guide the comprehensive plan update to achieve equitable outcomes for all Camas residents.

Potentially Impacted Communities

Potentially impacted communities are those that may be subject to a disproportionate "impact". This can be in the context of past planning practices, past or current policies, built environment features (ADA accessibility), or climate hazards. Chapter 70A.02 Revised Code of Washington (RCW) defines "vulnerable populations" to include without limitation:

i. Racial or ethnic minorities;

ii. Low-income populations;

iii. Populations disproportionately impacted by environmental harms; and

iv. Populations of workers experiencing environmental harms.

In the context of climate, impacted communities will be those who do not have resources to prepare for and cope with climate impacts. The Our Camas 2045 Climate Planning Action Team will help further identify groups vulnerable to natural hazards that could be exacerbated by climate change.

For the purposes of Our Camas 2045, the following communities are identified as Equity Communities:

- Black, indigenous, and people of color (BIPOC) communities
- People experiencing low incomes
- People with disabilities, including neurodivergent
- Youth and children
- Seniors and older adults
- LGBTQ+ individuals
- People without an address or experiencing homelessness
- People without access to a car
- Small business owners
- Undocumented population
- Formerly incarcerated population

A profile of current Camas residents, including population, languages spoken, and demographics is available on the Our Camas 2045 website: Our Camas 2045 | Engage Camas

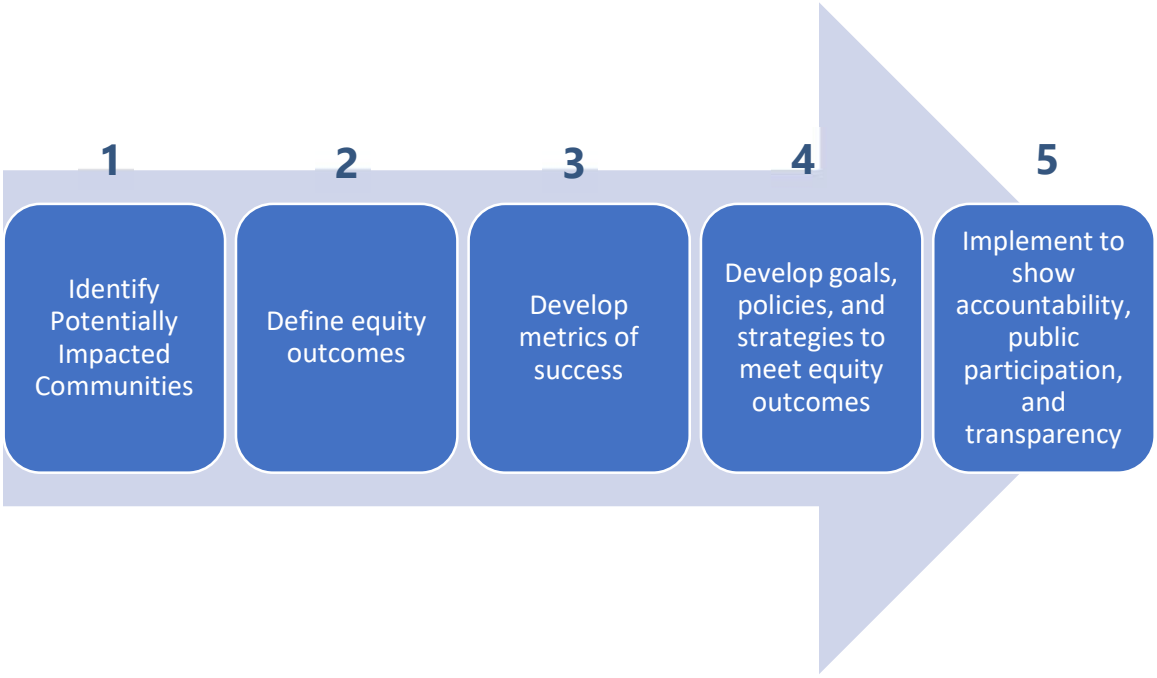
Equity Process

The Equity Process is the process that will be followed to achieve equity outcomes in the comprehensive plan update. The process can be grouped into two categories: Process Equity and Outcome Equity.

- Process Equity includes the meaningful participation and engagement of communities typically not represented in planning processes and specifically the equity communities identified above. To achieve process equity, outreach strategies can be enhanced to engage renters, youth/children, people experiencing low incomes, and other equity communities. Specific outreach strategies can include community conversations with equity communities, participation in community events that draw diverse attendance, and providing equity community groups and individuals with direct invitations to project events and meetings.
- Outcome Equity relates to the burdens and benefits of a project. In the context of the comprehensive plan, this could include goals and policies that avoid exacerbating existing disparities (e.g., lack of ADA accessibility) and provide benefits that address the unique needs of equity communities. A starting point for developing equity outcomes is establishing where and for whom inequalities exist. Camas can utilize existing housing, population, and economic data to determine which communities may be underrepresented. This step can help community members understand diversity in their community.

The equity process diagram below outlines the process that will be used to develop each comprehensive plan element to embed equity throughout the comprehensive plan.

DRAFT PROCESS DIAGRAM (TO BE FORMATTED BEFORE FINALIZED)



Step 1 – Identify potentially impacted communities. Demographics that identify potentially impacted communities are included in the Our Camas 2045 Housing Needs Assessment and Community Profile.

Steps 2 and 3 – Define equity outcomes and develop metrics of success. Equity outcomes and metrics of success will be developed with the Our Camas 2045 Community Advisory Committee and the Our Camas 2045 Climate Planning Action Team. There may be overarching outcomes and success metrics that relate to the entire comprehensive plan and specific outcomes and metrics that relate to individual comprehensive plan elements.

Step 4 – Develop goals, policies, and strategies to meet equity outcomes. With the Our Camas 2045 committees and the community, prepare goals, policies, and strategies that advance equity and bring the city closer to achieving the identified equity outcomes.

Step 5 – Implement to show accountability, public participation, and transparency. Communicate the process and outcomes with the community to show how their feedback contributed to the planning process and to the development of goals and policies to advance equity.

Our Camas 2045 Community Summit No. 1 Summary
June 14, 2024

Overview

On June 12th, 2024, the City of Camas hosted *Our Camas 2045 Community Summit #1*, an open house event for its *Our Camas 2045 Comprehensive Plan and Downtown Subarea Plan* process. The purpose of this event was to report back on the outreach and engagement activities that took place over Spring 2024, reveal the draft and ask for feedback on the *Our Camas 2045 Vision Statement and Goals*, and to identify the community's big ideas for achieving the vision and goals.

More than 40 community members participated in the event at the Lacamas Lake Lodge, where kids activities and refreshments were provided. A wide range of participants included residents, business owners, families with children, and elected officials.

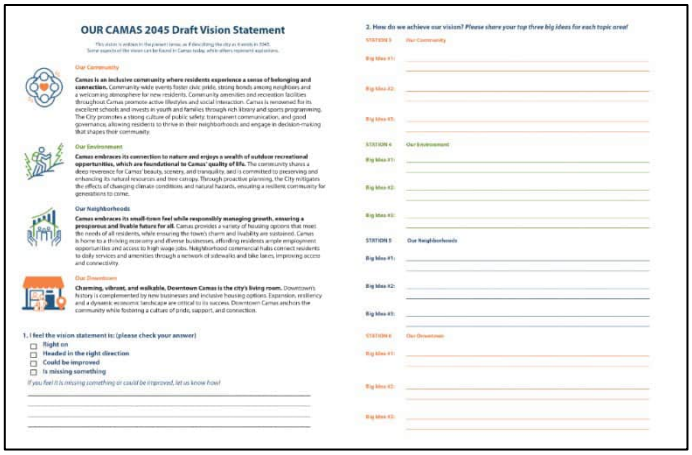
The event was organized with stations set up around the event space, those stations corresponded to each of the four themes identified in the draft Vision Statement. The four themes include: *Our Community; Our Environment; Our Neighborhoods; and Our Downtown*. Additionally, there were other stations that offered a project overview, results of the community outreach, and the draft vision statement.

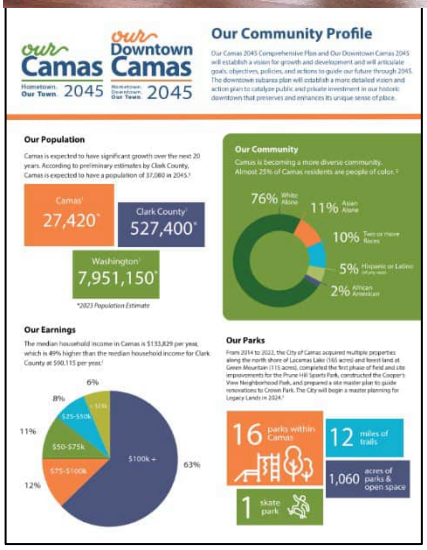
Participants were invited to review the draft vision statement and offer their feedback and share their "big ideas" for how the community can achieve the vision and the associated goals. Each station included a project team facilitator. Ideas were captured through notetaking on sticky notes on the posters, or participants could submit them in writing through a comment form. These ideas will help guide the development of goals and policies for the Comprehensive Plan.

Since the City is additionally undertaking a Downtown Subarea Plan, additional material on opportunities, constraints and background information were provided for the *Our Downtown* station.









The comment form and community profile handed out at the event.

Feedback Analysis

Discussions were robust and collaborative, resulting in many community ideas and overall feedback. Key topics of conversation included bike infrastructure, native species mitigation, tree protection, creation of neighborhood hubs, and local business support. In addition to paper comment forms, an online survey was available to complement the discussion at the event for those who could not participate in-person. A compilation of the raw notes from the

comment forms are included in Appendix A, the raw notes from the poster boards in Appendix B, and the online survey responses are captured in Appendix C.

For the Vision Statement, in response to the question "*If you feel it [Vision] is missing something or could be improved, let us know how!*" respondents felt the Vision is missing clear strategies to protect and sustain existing small businesses, including provisions for adequate parking. In addition to concrete plans to address the lack of affordable housing to retain young families and maintain school enrollment. Respondents note the vision should reflect a genuine approach to inclusivity that considers the needs of lifelong residents, addressing the impacts of high taxes and urban sprawl.

Enhanced transportation options, such as minibuses, bike rentals, and ride-sharing programs, should be proposed to reduce reliance on personal vehicles. Additionally, there is a want for a stronger emphasis on maintaining and expanding green spaces, trails, and urban farms to preserve the city's natural beauty and community health. Effective use of downtown spaces, including addressing the significant presence of church-owned properties and integrating the mill's property into the downtown planning process, is also spoken to. Finally, the vision statement should more accurately represent inclusivity based on the community's actual characteristics and needs, rather than an imposed ideal.

In response to "*How do we achieve our vision? Share your top three big ideas for each topic area!"* The following ideas were provided by Summit participants for each Vision Theme.

Our Community

Amenities for Children and Teenagers:

- Provide smaller playgrounds and indoor play facilities for younger children.
- Establish more sporting fields and advocate for an indoor swimming pool accessible to high schoolers.

Community Unity and Diversity:

- Focus on reuniting the community and fostering diversity through inclusive initiatives.

Infrastructure and Community Enhancement:

- Improve downtown infrastructure for better walkability and accessibility.
- Enhance community facilities including parks, libraries, and possibly a community indoor/outdoor pool.
- Address parking policies to support local businesses

Fiscal Responsibility and Engagement:

- Lower utility costs and taxes to attract families and retain businesses.
- Prioritize citizen engagement and accountability in city planning and policy implementation.

Cultural and Recreational Investment:

- Preserve and expand upon Camas' cultural heritage through arts and community events.
- Invest in recreational facilities like arcade and mini-golf to enhance community activities.
- Broker a deal with local entities to utilize land for a new community center.

Our Environment

Environmental Conservation and Development:

- Preserve land for wildlife and limit excessive development.
- Promote denser development in already developed areas to conserve green spaces.

Infrastructure and Transportation:

- Enhance biking infrastructure including bike rentals and connected bike paths.
- Address water and utility issues such as the current well problem and underground utility placement.

Landscaping and Tree Preservation:

- Preserve mature landscaping and save parks and green spaces.
- Protect large trees and ensure proper spacing when planting new trees.
- Consider adding Redwoods to enhance the tree canopy.

Green Spaces and Recreation:

- Develop multipurpose green spaces, especially for sports like soccer, little league, and girls' softball.
- Improve access points and public transit to Lacamas Lake.
- Create a continuous trail around Lacamas Lake and develop boardwalks to protect natural areas.

Community Cleanliness and Maintenance:

- Enhance garbage and recycling systems citywide.
- Encourage GP (Georgia Pacific) to clean up their site for improved community aesthetics and environmental health.

Community Programs and Policies:

- Implement a heritage tree program and support property owners in retrofitting for energy efficiency.
- Hold community listening sessions on evacuation routes and develop policies based on community input.

Parking and Infrastructure:

- Address parking needs, including a larger parking lot near Lacamas Heritage Trail.
- Consider paving the gravel pit near the old mill site for improved infrastructure.

Our Neighborhoods

Environmental Conservation and Development:

- Advocate for less development to preserve natural beauty and prioritize green spaces.
- Ensure developments include green space, trails, and trees.
- Regulate tree planting to avoid blocking traffic sightlines.

Infrastructure and Transportation:

- Connect neighborhoods and parks to downtown Camas with walkable sidewalks and trails.
- Prioritize bike lanes that are physically separated from car lanes for safety.
- Support dedicated bike trails that connect neighborhoods to schools and safe walking paths.

Community Safety and Quality of Life:

- Emphasize community safety, crime prevention, and support for law enforcement as the population grows.
- Address concerns about homelessness in parks and neighborhoods.

Public Transportation and Mobility Services:

- Introduce new bus routes and public transit options connecting Camas to Portland and Vancouver.
- Encourage minivan shuttle services, bike rental services, and personal ride-sharing to improve mobility options.

Urban Planning and Growth Management:

- Advocate for slower growth to allow infrastructure adjustments and maintain the small-town vibe.
- Restrict new building permits until clean water assurance for all residents and tighten residential developer permit restrictions.
- Support more neighborhood nodes and small pockets of business areas for increased walkability.
- Promote more affordable housing options such as condos and townhomes.
- Develop tools to promote affordable housing such as density bonuses for dedicated affordable housing.

Recreational Facilities and Community Amenities:

- Support amenities like playgrounds with exercise stations, sports courts (e.g., pickleball), and biking infrastructure to promote active lifestyles.
- Install doggie waste bag stations for pet owners.

Our Downtown

Urban Development and Planning:

- Support mixed-use developments over single-use buildings.
- Improve infrastructure and aesthetic appeal of downtown and overall downtown maintenance.
- Maintain small-town charm and resist further growth.
- Implement pay-to-park system to address parking shortages, potentially leading to a parking garage.
- Increase parking fines to better manage parking issues.
- Redevelop the paper mill property for mixed-use development.
- Enhance walkability downtown and prioritize pedestrians over cars.
- Expand and beautify historical downtown areas

Community and Downtown Vitality:

- Improve pedestrian safety with additional crosswalks, addressing safety concerns at block crossings.
- Maintain vital services downtown such as Post Office, Library, and affordable restaurants.
- Prioritize commercial spaces over housing in downtown areas.
- Ensure accessibility downtown, potentially implementing a shuttle service for seniors.
- Maintain the attractiveness and accessibility of downtown without significant transportation changes.
- Increase the number of retail stores and restaurants to maintain consistent business

traffic.

Cultural and Religious Concerns:

- Propose relocating churches from downtown to enhance commercial space availability and community inclusivity.
- Advocate for maintaining downtown as a commercial rather than religious hub.

Business Diversity and Ownership:

- Encourage diversity in the types of businesses and services.
- Prioritize local and small businesses over chains.

Parking and Traffic Management:

- Address the issue of available parking.
- Develop a plan to address traffic patterns at 6th Ave and Adams St.

To ensure proper implementation of the Vision and Goals, the community was asked to share ideas on how we can achieve the goals. The following key ideas were given.

Our Community

Goal: Camas' artistic and cultural heritage will be protected, enhanced, and commemorated.

- Start a community theatre with volunteer assistance.
- Renovate/restore the community center.

Goal: Community events, involvement activities, and youth-focused activities will instill a sense of belonging among residents of all ages while making Camas an ideal place to raise a family.

- Create a multicultural fair/event that includes everyone.
- Partner with schools to host a multicultural fair.

Goal: The City will promote a strong sense of community through transparent communication, outreach efforts, partnerships, and accessibility.

- Partner with the school district for regular meetings to share resources and ideas.

Goal: Public places will be valued and protected spaces, with safe and well-maintained facilities that foster a sense of community and promote physical and mental health.

- Protect city and county parks, remove invasive plants, and ensure modifications are inclusive.
- Protect and support the library.
- Establish a park/gathering space downtown.

Goal: Camas residents enjoy access to quality education and support their schools through partnerships and investments.

- Implement a Green Team at every school and promote sustainability and green practices.
- Ensure safe walking corridors and necessary facilities like internet.

Our Environment

Goal: A network of parks, trails, and open space will connect neighborhoods, wildlife corridors, and natural resources and enhance the quality of life for residents and visitors.

- Increase parking at the Heritage trailhead to accommodate growth from new housing.
- Address the capacity of park facilities with the increase in new homes.

- Create a boardwalk on the Lily fields trail to prevent damage by pedestrians.
- Pave or gravel the mill ditch to connect downtown with other paths and lakes.

Goal: Camas' infrastructure and transportation system will be able to withstand and recover quickly from extreme weather events and other hazards exacerbated by climate change.

- Bury all overhead electrical lines.
- Upgrade sewer systems before repaving roads.
- Reform storm water modeling under climate scenarios to assess infrastructure capacity and service levels.

Goal: The City will embrace clean energy technologies to promote healthy air quality for all Camas residents.

- Retrofit older buildings to meet current codes.
- Clean up the GP mill for unrestricted use and test water for contamination.
- Connect to the river/waterfront and hold pollution sources accountable.
- Install more electric car charging stations.

Goal: Camas' native landscape and tree canopy will be protected and enhanced to maintain Camas' natural beauty and promote climate resiliency.

- Maintain and implement a tree canopy plan downtown.
- Partner with and support a backyard habitat program.
- Preserve trees on public and private property, especially large trees.
- Support native plants and nature spaces in the city, including school green spaces and citywide bioswales.
- Expand the list of permissible plants in bioswales.
- Remove invasive holly and blackberry.

Our Neighborhoods

Goal: The City will provide public facilities that are resilient to climate change and meet the needs of the growing population.

- Implement a recycling center alongside garbage bins to promote recycling.
- Improve heat mitigation at the Camas farmers market with better pavers, covered structures, or coverage systems.
- Mandate new apartments to have air conditioning.

Goal: The City will plan for and accommodate population and employment projections in a way that maintains Camas' quality of life and small-town character.

- Encourage multifamily units to support walking to work, bolstered by an improved bus system.

Goal: The City will cultivate a business environment that promotes local businesses and establishes Camas as a desirable place for investment.

- Partner with CREDC to market the area and region to workers and tourists.
- Support diverse sizes of business units to accommodate various businesses.

Goal: The transportation system will accommodate anticipated growth and support the city's overall vision.

- Expand bike lanes, particularly around North Road and Lake Lacamas.
- Ensure developers include bike lanes and sidewalk easements as the city expands outward.

- Implement street elements and traffic calming on Downtown 3rd St. for pedestrian safety.

Goal: Camas neighborhoods will be vibrant, stable, and livable with a variety of housing choices that meet all stages in the life cycle, personal preferences, and a range of affordability.

- Integrate all income levels and promote infill with middle housing.
- Encourage different housing types and household mixes.

Goal: Camas will provide a setting of quality of life that attracts and retains businesses and offers a diverse range of employment opportunities.

- Improve clarity on buildable lands through mapping with the County.

Goal: The multimodal transportation system will be safe and efficient for all users, facilitate access to goods and services, connect neighborhoods, and encourage healthy lifestyle choices.

- Enhance safety on bike routes throughout the city.
- Establish designated bike lane corridors connecting to parks.
- Use community designs like Bend as a model, emphasizing sidewalks, bike lanes, and roundabouts.
- Improve sidewalk connectivity, such as in the Prune Hill area, to enable walking access to downtown.

Our Downtown

Goal: Encourage redevelopment to expand opportunities Downtown for retail, office, and residential.

- Increase downtown housing options.
- Encourage a diversity of business types, avoiding chain restaurants.
- Partner with the Port of Camas-Washougal for collaborative projects.
- Advocate for a properly cleaned-up GP Mill area to enhance downtown and waterfront appeal.

Goal: Expand on civic life and services Downtown through strategic use of city-owned property and vibrant community events.

- Support local businesses over generic chains.
- Enhance food options and food courts, improve the city's website.

Goal: Create a safe and connected transportation network that makes Downtown walkable, bikeable, and accessible to the rest of the city.

- Build a parking structure on the GP lot.
- Implement traffic calming measures on 3rd Ave, including trees and bulb outs.
- Develop bike paths around new developments and congested areas.
- Add crosswalks on Garfield and signal indicators to connect bike and pedestrian traffic safely.
- Consider closing auto traffic on 4th Street between Adams and Franklin to enhance pedestrian access.
- Improve public transportation access to downtown.
- Enhance pedestrian and bike access via major routes like 6th Street to prioritize pedestrian friendliness on 3rd Ave.

Goal: Retain Downtown's historic character and expand its charm.

- Honor hometown heroes and collaborate with local historical societies.

- Include the GP Mill in long-term planning to preserve and expand downtown charm.

Goal: Plan for a range of housing options that welcome more people to live Downtown.

- Support a straightforward permit process for ADUs near downtown, potentially with incentives or tax breaks.
- Develop live/work villages, lofts, and community spaces with gardens.

Goal: Provide the right mix of development, services, and open spaces that support ways for people to live, work, and play Downtown.

- Consider seasonal outdoor dining options and flexible spaces for small businesses.

APPENDIX A. Comment Form submissions

In response to "How do we achieve our vision? Share your top three big ideas for each topic area!"

Station 3: Our Community

- Having amenities for younger children such as smaller playgrounds, indoor play facilities, etc.
- Need for more sporting fields/indoor swimming pool for highschoolers to use
- We need to reunite our community to be supportive of everyone and encourage more diversity
- Broker a deal with GP to use the five acres where old buildings were demolished a few years ago to build a community center.
- Build a community center, arcade and mini golf.

Station 4: Our Environment

- Connect the bike infrastructure and bike rentals
- Is there a solution to the current well issue before adding more dwellings?
- We seem to be lacking mature landscaping in new construction neighborhoods, can some trees be preserved?
- Please continue including green spaces for multipurpose, especially sports rec areas for both soccer, little league, etc. (don't forget the girls softball – they have gotten the shaft when it comes to shared space) for great examples see Port of Klamath, Hazel Dells sports center and Hockinson Meadows Community Park.
- More access points to Lacamas Lake, and public transit to lake. Continuous trail around the lake.
- Encourage GP to gradually clean up the site to show they care about Camas.
- Save more parks/green spaces, keep more trees, and better garbage and recycling all over.
- How were these goals developed and how will they be used? Will there be policies that are developed as a result?
- What is a heritage tree program?
- Sometimes trees are planted too close together which makes it difficult to see oncoming traffic.
- The Port of Camas-Washougal has a program that helps property owners retrofit their buildings and improve the insulation.
- There is a coastal town in California, Los Osos, that has a walkway above marshland. There is a trail near Lacamas Lake near some lily pads and some type of boardwalk could help to stop people from walking over the lily pads.
- Parking is usually full near the trailhead for the Lacamas Heritage Trail off of NW Alexandra Lane. A larger parking lot is needed.
- Are there plans to address the well? There has been some talk about removing the well.
- The City should think about adding Redwoods to the tree canopy. They grow faster

than oak or cedar trees.
- Holding listening sessions on evacuation routes is a good idea (Steve Hogan).
- Large trees should be protected at all costs. It is difficult to replace them.
- Utilities should be placed underground.
- Has the old mill come up at all in any of the vision statements?
- The City should pave the gravel pit near the mill.

Station 5: Our Neighborhoods
- More neighborhood nodes – coffee shops etc. in the suburbs.
- Need more affordable housing options – condos/townhomes
- Regulate the distance between trees when planting them. Try driving out of Deer Creek neighborhood at Ogden Street and 16th Ave to see what I mean. Once trees mature in width they block traffic sightlines on both the left and right. I have to pull into 16th Ave to see around the, albeit gorgeous, trees.
- Small pockets of business areas so people can walk from home.
- Make efforts to move power underground in some of the older neighborhoods
- Doggie waste bag stations

Station 6: Our Downtown
- More retail/restaurants would be nice to keep consistent traffic going through businesses.
- Available parking is already an issue, and I don't think a meter maid is the real solution with downtown events.
- We need a plan for potentially addressing traffic patterns at 6th Ave and Adams St.
- More diversity on type of businesses/services and more diversity in ownership. Less church/religious stamp on downtown. No chains, keep it local/small business.

APPENDIX B. Poster Board Notes

In response to "Use a sticky note to write an idea for how we can achieve these goals." + indicates agreement by another attendee.

Station 3: Our Community

Goal: Camas' artistic and cultural heritage will be protected, enhanced, and commemorated.

- Start a community theatre – I'll help 503-270-7264
- Renovate/restore the community center

Goal: Community events, involvement activities, and youth focused activities will instill a sense of belonging among residents of all ages while making Camas an ideal place to raise a family.

- Create multicultural fair/event where everyone is included
- Partner with schools to have a multicultural fair

Goal: The City will promote a strong sense of community through transparent communication, outreach efforts, partnerships, and accessibility.

- Less chains of food and shopping, promote small business growth
- Partner with the school district and have regular meetings to share resources and ideas

Goal: Public places will be valued and protected spaces, with safe and well-maintained facilities that foster a sense of community and promote physical and mental health.

- Work with Camas Ivy League to maintain and control invasives
- Protect the city and county parks, remove invasive plants like Holly and blackberry and make sure modifications are for everyone
- Protect and support the library
- Use the grass are on 6th between Birch and Adams as a dog park. It will bring more people to downtown, and partner with Dog PAW, they run many parks including Dakota in Vancouver.
- We need a park/gathering space downtown. +1

Goal: Camas residents enjoy access to quality education and support their schools through partnerships and investments.

- Green Team at every school/sustainability and green practices at our schools
- Need safe transport walking corridors, also need facilities like internet
- Support economic development and green tech
- We need economic development as part of our overall vision! Bring in new businesses and support what's here!
- Add goal of strong economic development and partner with the DCA

Station 4: Our Environment

Goal: A network of parks, trails, and open space will connect neighborhoods, wildlife corridors, and natural resources and enhance the quality of life for residents and visitors.

- Heritage trailhead with parking is usually full and there are many more houses being

built consider more parking for access to trail.
- Consider all the growth from new homes adds to overwhelming the park facility at round at facilities to the top side of round near lilies.
- Create boardwalk on the Lily fields trail to discourage damage by pedestrians.
- Please pave or gravel the mill ditch so it connects downtown with other amazing paths and lakes.

Goal: Camas' infrastructure and transportation system will be able to withstand and recover quickly from extreme weather events and other hazards exacerbated by climate change.
- Bury all overhead electrical
- A pedestrian walkway on forest home Rd.
- Find upgrades to sewer and sewer systems before repaving
- Reform storm water modeling under climate scenarios to understand capacity of infrastructure and level of service requests

Goal: The City will embrace clean energy technologies to promote healthy air quality for all Camas residents.
- Retrofit older buildings to meet current code
- Clean up the GP mill to unrestricted use, recognize water clean up as potable, test at gallery wells for potential contamination of city drinking water
- Connect to our river/waterfront, stop and hold pollution sources responsible for water quality in lakes rivers and aquifers.
- More electric Car charging stations. +1

Goal: Camas' native landscape and tree canopy will be protected enhanced to maintain Camas' natural beauty and promote climate resiliency.
- Thank you for having a tree plan and maintaining our tree canopy downtown!
- Partner and support backyard habitat program
- Tree preservation on public and private property
- Save every big tree, you cannot get them back!
- Support native plants and nature spaces in the city, school green spaces and citywide bioswales. Expand list of permissible plants in bioswale.
- Redwoods.
- Remove invasive holly and blackberry
- Education to include out historical connection to founder of Earth day in city's motto and branding 'home of earth day'

Station 5: Our Neighborhoods
Goal: The City will provide public facilities that are resilient to climate change and meet the needs of the growing population.
- Recycling center instead of just garbage bins have opportunity for recycling bins.
- Please consider heat mitigation at the camas farmers market as it's getting so hot, better pavers? Covered structure or coverage system?
- Require new apartments to have air conditioning

Goal: The City will plan for and accommodate population and employment projections in a way that maintains Camas' quality of life and small town character.

- Multifamily units to allow people to walk to work but that requires a good bus system to get people around. +1

Goal: The City will cultivate a business environment that promotes local businesses and establishes Camas as a desirable place for investment

- Partners with CREDC to market the area and region to workers and tourists.
- Diverse sizes of business units, so many different businesses can exist. +1

Goal: the transportation system will accommodate anticipated growth and support the city's overall vision

- We need a lot more bike lanes particularly North Road around lake Lacamas
- As the city expanses outwards make sure the roads have the more bike lanes and sidewalk easements built by the developers buying the land
- Downtown 3rd St. must have Street elements, traffic calming to ensure pedestrian safety in crossing the street

Goal: Camas neighborhoods will be vibrant, stable, and livable with a variety of housing choices that meet all stages in the life cycle, personal preferences and a range of affordability.

- Seek to integrate all levels of income and find ways to mix into suitable areas of the community think infill with middle housing
- Too bad the Everett corridor is being sacrificed needlessly
- A YIMBY (yes, in my back yard) campaign needs to be established different housing types with different household types should not be ostracized young people and empty nesters need a place to live.

Goal: Camas will provide a setting of and quality of life that attract and retain businesses and will be home to a diverse range of employment opportunities

- Get much better. Clarify mapping with County as to buildable lands.

Goal: the multimodal transportation system will be safe and efficient for all users, facilitate access to goods and services, connect neighborhoods, and encourage healthy lifestyle choices.

- Safer bike routes
- Designated bike lanes corridors up to and through parks. +1
- Use community like bend as an example of sidewalks bike lanes and roundabouts. +1
- Connect sidewalks (Prune Hill area example, notable to walk to downtown)

Station 6: Our Downtown

Goal: Encourage redevelopment to expand opportunities Downtown for retail, office and residential.

- More downtown housing +1
- Encourage places to eat, see Vancouver Waterfront without chain restaurants.

- Partner with the Port of C-W
- Where is the vision for a properly cleaned up Mill? The City Plan is responsible for input to the state's cleanup. Without it out destiny is a sad downtown and waterfront.
- Diversity of business types. +1

Goal: Expand on civic life and services Downtown through strategic use of city owned property and vibrant community events.

- A community pool would be appreciated! +1
- A community recreation and senior center.
- Establish a community Theatre +1
- More food and food courts, better website.
- Support local business owners not generic chains.

Goal: Create a safe and connected transportation network that makes Downtown walkable, bikeable, and accessible to the rest of the city.

- Parking structure on the GP lot.
- Slow down traffic on 3rd Ave! Add trees and bulb outs and other traffic calming measures.
- Bike paths to circumnavigate new development and congestion.
- Add crosswalks on Garfield (4tj, 5th, and 6th) and at least one with a signal indicator to connect bike and pedestrian traffic safely to downtown (also through to trailheads behind church on 4th)
- Close down auto traffic on 4th street between Adams and Franklin +1
- Improve public transportation to downtown.
- More major traffic into 6th so 3rd is more pedestrian friendly.

Goal: Retain Downtown's historic character and expand its charm.

- Honor hometown heroes.
- Partner with 3-rivers museum and Clark County Historical Society
- Zone standards for mix use in downtown Camas.
- If you want to expand the City's charm, include the GP Mill in your 20 year planning process, its greyed out on your map.

Goal: Plan for a range of housing options that welcome more people to live Downtown.

- Support a straightforward and affordable permit process for ADU's especially within a mile of downtown possibly provide incentives, subsidies, breaks on property taxes etc. +1
- Live/workspaces villages and lofts with quality community spaces and gardens

Goal: Provide the right mix of development, services, and open spaces that support ways for people to live, work, and play Downtown.

- Please consider outdoor dining for sit down restaurant service, limit time from Memorial Day to Labor Day with balance of spaces taken up parking needs.
- Flex spaces for small businesses.

APPENDIX C. Online Survey Submissions

An online survey was live from after the event through June 17th as an additional mechanism for feedback. The online survey received 24 responses.

1. I feel the vision statement is:

- Right on. (x8)
- Headed in the right direction, but could be improved. (x7)
- Is missing something. (x9)

2. If you feel it is missing something or could be improved, let us know how!

- Protect the small businesses already here! Don't take away CRUCIAL parking for places like acorn and oak. You're effectively dooming them. The empty property for sale near them should be used for community parking!
- Natural Beauty, safe and diverse (economically, ethically, what people do for a living and politically)
- Love the emphasis on walkability which helps foster social connection and interaction, generating connectedness in the community! Wish we had an aquatics center, but I know that was shut down unfortunately. More mixed-use buildings is nice too
- Camas locals do not want growth. We don't want more housing and businesses. We want the small town feel that we used to have.
- There is no affordable housing. The school district is losing students because young families cannot afford to move here. Utilities and taxes are pricing good families out.
- Improved transportation options in the whole Camas area - mini busses or shuttles, bike rentals, ride share programs etc. -- increase connectivity while mitigating/reducing personal vehicle use as the area density increases
- Camas is NOT inclusive. The out of state newcomers have strangled the ability for life long residents who were born and raised here to live here. There is not affordable housing and the taxes and reckless spending are out of control. The arrogance stinks.
- Increased focus on how we will maintain livability for those who have lived here for generations and cannot afford the taxes, cost of housing, and devastating impacts of urban sprawl that is at the forefront of the city's apparent plans.
- Neighborhoods need to include green spaces & trails not only for human residents but for wild plant &; animal life. Environment & community need to include space for urban/suburban farms for growing food. Downtown--"expansion" should be carefully regulated.
- "Camas is a DIVERSE and inclusive community..."
- Parking is a big issue in downtown. So if you add more businesses, you have to add more parking
- Neighborhood traffic near schools (with no bus service) should have traffic improvements to naturally slow vehicles for the sake of safety.

- The environmental section should specifically mention maintaining Lacamas Park as a priority. Can you imagine Camas with a poorly maintained Lacamas Park? The city's value would markedly decrease. (I understand multiple entities are responsible for park)
- "inclusive" is given top priority in the vision statement, but it's not a primary characteristic of Camas, nor was it found in the brainstorm survey. Who added this?
- I would like to see less church owned properties right in the center of downtown. Although I respect the religious beliefs, the massive presence takes away from more amenable area for downtown activities.
- The “living room"(downtown) has a block of buildings that don't seem to be part of it. I'm not exactly sure how the church has come to own so much of the small, intimate, downtown area. It's a shame, that space could be put to better use.
- The possessive of Camas is Camas's not Camas'
- Expanding what the City calls "downtown" - the mill's property should be viewed as part of the "downtown" footprint as it represents both constraints and large opportunities IF we include it TODAY as a part of the planning process

OUR COMMUNITY

3. How do we achieve this? Share your top three big ideas!

- Adjust zoning to allow for small business to open up shop all around camas. Not just downtown or in strip malls. But true neighborhood spots in all the developments that are driving distance from other businesses
- Continue park and library improvements, rejuvenate downtown Camas’ infrastructure to improve walkability, adding a community indoor/outdoor pool would be nice, doesn’t have to be super fancy or expensive
- We need to get rid of the two hour limit on parking in downtown so we can can support local businesses. Rather than only having time for dinner OR a movie, allow free unlimited parking so you can do both without getting a ticket.
- Listen to what the citizens want. Make things happen, don't just talk about them. Take better care of our vision clearance areas especially downtown, many hazards just waiting to happen, also breaking the cities on Municipal Codes.
- Follow through on these statements is all important!
- Lower utilities and taxes to attract families. Lower the business taxes as to not lose anymore existing businesses. Do not follow the national political ideology!!
- Leave the mill alone. It is what put the city on the map. The high school admin should be ashamed of calling the mascot Makers instead of Papermakers. We should put financial caps to ensure our original citizens are protected.
- Focus on pay for teachers opposed to admin, actively reduce sprawl, stop road expansions and developments on the north shore, maintain and care for historic places, focus on infill opposed to destroying natural areas and farmland
- your goals appear to be youth & family centered. You need to be aware of aging residents, their interests and needs.

- We need an accessible and larger community center in a central location (even if it is shared with Washougal). Downtown Camas activities couldn't be better. Engagement efforts are great--council needs to listen to citizens' wants & spend conservatively.
- Prioritize community gathering spaces. Make bike lanes accessible to major hubs with bike parking. Citizens will never prioritize healthy alternative forms of transportation if endless parking is provided across the city.
- The biggest attractions are the parks, lakes, and trails of Camas. Secondly are the excellent schools. Thirdly is the small town feel. So if you add more growth. You won't have a small town feel anymore.
- Keep investing in art, attract more live music venues/events.
- Continue using buildings to display art. Create more public gathering spaces that are pedestrian/cyclist focused that include the natural environment and public art/cultural history.
- Community Events, clean streets, strong business network, support developers, tough on crime, keep out vagrants
- Less focus on the insidious WOKE attitude. Just accept everyone without the bend over backwards celebration, which results in a focus on differences regather than our commonalities.
- Maintaining a business friendly environment that encourages investment in new businesses such as restaurants. Utilizing public-private partnerships to bring small shops/restaurants at or near parks.

OUR ENVIRONMENT

4. How do we achieve this? Share your top three big ideas!

- Save at least some land for wildlife! Don't develop too much and make this just another hideous bunch of cookie cutter houses and strip malls. Also, reckless driving is increasing, especially on crown road and third.
- City should buy and maintain more preserved nature land within the area. Protect all current natural areas. Slow development in green spaces and promote more density in already developed areas.
- Improve/widen more of the sidewalks downtown camas and add more bike lanes especially to N.E. 3rd Ave up Crown Rd, don't need 4 car lanes there, continue park and infrastructure improvements, connect all trails via bike and walking paths
- Limit parking to residential passes and eliminate out of out of towners, open trails to bikes, allow park to have my bike jumps back. Stop with such environmental measures. All while stop cutting trees down m!
- Stop kicking the can down the road on maintenance of our streets. If the company fails to do the job right don't accept 1/2 ass work. Hold them accountable, also our buildings. Example Lodge building screwed up window spacing. Should have been fixed
- Follow through on these statements is all important!
- Easy. If you need to take trees down to build, then don't build there!

- Incentivize home owners to plant more trees; evaluate options for trails in residential areas and connect them to downtown; create walk/bike paths to connect Camas top to bottom, side to side - for work commute even (no cars!)
- More funding for parks. Both to improve & maintain
- Don't allow people who cut trees down to build their homes years ago to deny that same option to be afforded to others. So narcissistic. Hold Lacamas Shores accountable for their watershed issue. Leave the Everett corridor intact.
- YES! Our Camas outdoor parks/trails are un-met! YES! YES! maintain & Keep parks, trails, corridors so valuable to us all. Pls Avoid creating business/industrial developments to boost tax $$'s (which Beaverton/Hillsboro Ore did, sadly)
- Preserve open space. Preserve wildlife, wild areas, trees, agriculture, farms, not building on every available space. Trails/bike routes in connecting areas like Forest Home Road. Volunteer events to care for parks & spaces, with some kind of incentive.
- Lacamas Regional Park needs to be more responsive to trail maintenance requests and work offered by volunteers. Without volunteers the park would be overgrown and most trails would be unusable.
- Biofilter in the lakes so they are usable year-round, no more toxic algal blooms. ban harmful fertilizers
- During storms we need more snow and ice removal vehicles. Only main roads were plowed and so many people can not leave there homes if they live on streets that are not cleared
- Maintain current parks/lakes/outdoor spaces before investing in new spaces, install swales in neighborhoods to help with flooding issues, use native plantings.
- Prioritize improving collaboration between the entities that own Lacamas park AND local volunteers so that the park receives timely maintenance and enhancements. Current process excludes volunteers critical & maintenance is too delayed.
- You have a good plan here keep it up.
- By utilizing clean hydro power.
- Get the mill cleaned up; assess its risks to our drinking water; Incentivize HOAs to maintain facilities & participate more fully in our stormwater management; seek to PROTECT drinking water supplies thru sound risk planning & better wellhead protection

OUR NEIGHBORHOODS

5. How do we achieve this? Share your top three big ideas!

- Don’t overdevelop and lose all the natural beauty. Less is more
- Not sure.
- Connect all of neighborhoods and parks to downtown camas with walkable sidewalks and trails all the way to Lacamas would be great. Especially Crown Rd to NE 3rd to downtown and even to Washougal Waterfront
- I hate all of this. I want a mayor that will fight against that states growth plan. No one cares about climate change, no one wants mass transit, and especially no one wants wider roads and more round abouts. This town is getting destroyed.

- Common sense don't plant trees right beside street lights. Don't have planting areas in our sidewalks, would help with all the raised and horrible ones in neighborhoods.
- Follow through on these statements is all important!
- No public transportation in neighborhoods.
- encourage mini van shuttle services, rent a bike services, encourage personal ride sharing (co-commuting) by creating programs and digital tools for people to connect safely
- Cap taxes for people who were born here. Allow tiny homes and ADU's. Get on top of the growing homeless issue in our parks and neighborhoods.
- our goal mentions NOTHING about community Safety!! There needs to be an emphasis on crime Prevention and commitment to law enforcement, esp. if your goal is growing population.
- All developments should include green space, trails, and trees. Growth should be VERY slow, as slow as possible, to allow for adjustments to infrastructure. Less urban=more valuable and enjoyed by everyone in the long run.
- Bike lanes, playgrounds with exercise stations (think pull up and dip bars), sports courts (pickleball is the fastest growing sport in America right now)
- Add new bus routes, public transit to connect to Portland and Vancouver!!, busses to connect neighborhoods to downtown
- I think roundabouts are okay but you don’t need them everywhere. The busiest roads are Lake Road and Everett Rd.
- No new building permits until clean water is assured for all residents! Tighter restrictions on residential developer permits.
- Prioritize safe bike lanes that connect the city. By safe, I mean bike lanes that mom's & dad's feel safe using with their kids i.e. a PHYSICAL divider between car lane and bike lane for safety. This will increase # of ppl who use bikes for transportation.
- Preserve the small town vibe. Single family homes. No multi family
- Dedicated bike trails that connect neighborhoods to schools. Ensure each community has a safe walking paths that connect to parks/schools.
- TOTALLY missing the word affordable and clearly not accommodating the blue collar employees that make a City go. One only look at North Shore (Toll Brothers) and Camas Meadows (Romano) to envision what is spoken above as privileged only welcome here.

OUR DOWNTOWN

6. How do we achieve this? Share your top three big ideas!

- Another crosswalk on Garfield would be amazing
- Provide ease of development to those with a proven history of ethical growth of development.
- Needs more mixed use development, no more one story single use buildings please, yes more walkable and bikeable please, more restaurants and shopping needed, the gate to Louis Block park can be improved it looks really old, just updating downtown needed
- We don’t want to achieve this. Stop the growth, keep the small town.

- Implement pay to park in hopes of being able to get a parking garage. Parking is at a minimum now and this issue needs to be addressed ASAP. People pay to park everywhere else and they don't complain.
- Follow through on these statements is all important!
- We have enough downtown living. This keeps it clean and organized.
- Move the church from downtown to another area and use the space for businesses that actually pay tax; use that money to fund downtown upkeep;
- Increase the parking fines to better control the issue. Move the farmers market to Crown Park. Again, leave the mill alone.
- Presently, downtown Camas is NOT walkable. Each crossing of a block is a pedestrian safety matter, drivers in cars. I feel unwelcome in downtown Camas.
- Keep vital services downtown. Post Office, Library, affordable restaurants, should be prioritized over housing, wineries. New construction should be attractive, classic styles (Euro, art deco, Victorian), no big rectangles (like new apartments going in).
- Keep downtown walkable. Cars should never be a priority. If you create a beautiful downtown hub, people will come. People who walk/bike/use alternative methods of transport are more likely to spend $ at local businesses.
- Stop approving churches on the main strip. bring back a pizza by the slice place.
- I don’t know if having apartment above businesses is a good idea. Downtown is already crowded as it is. You don’t have to build on every remaining area. I often thought that downtown would be great if you made 4th street a pedestrian walkway.
- Ensure downtown remains commercial, NOT religious! A Christian church on our main street makes those of us who are not religious feel uncomfortable. A good rule - if The Satanic Temple is not welcome to do it, neither should be the Christian church.
- The historical downtown Camas St is fantastic, however it could be improved by expanding it to neighboring streets. For ex, 3rd Ave is an eyesore and not friendly to pedestrians. 5th Ave also could be developed to have a similar look & feel to 4th Ave
- Don't worry about transportation. getting to downtown is already accessible. Maybe a shuttle for seniors
- Have the church move to buildings outside the downtown area, so that the space/buildings can be used to benefit and be enjoyed by the WHOLE community.
- Redevelop the paper mill property and ensure it is safe for mixed use development.
- If you want to expand charm, start pushing to get that downtown eyesore remediated....there's nothing charming about the unseen decades of pollution there.

7. Is there anything else you would like to share about the Our Camas 2045 process?
    - It looks great and like headed in the right direction for sure with focus on physical movement, getting people out of cars and more convenience for walking and social interactions and connectedness!
    - No more selling land to large developers who want to cram in big houses on small lots, and stop with apartment complexes!!!! Our roads and schools do not want more growth. People moved to Camas to get away from people!!!!!!

- Please add more community meetings and add the results of our (public) input to the website and follow up emails when we share our address
- Love that you're doing this and I'm super inspired to live in this community. I'd love to learn how to get involved and join you on this journey of making the vision the reality!
- The City is hemorrhaging other people's money. This has got to stop. We cannot keep spending on the backs of others.
- Camas is now a place our friends, family, credit union, etc. advise us to stay away from and build our lives elsewhere. It’s a shame what greed and development have done to our home.
- Applause for city planners, involving Camas residents in 20 yr. projections! Looking fwd. to hearing milestone efforts to sustain the lovely charm & character of Camas.
- great job thanks
- When you have meetings instead of breaking off into groups you could have various informed speakers talk about plans then take questions from audience as they sit on seats so everyone can hear
- Lacamas park needs to be specifically named and goals for its enhancement specifically outlined. Goals for bike infrastructure must include bike lanes with physical barriers that protect cyclists from cars otherwise most families will not utilize them
- I have to be honest, the Vision statement is terrible. "inclusive" is not relevant to Camas, and will be harmful to strategic planning. The rest of the vision statement is vague. The environment statement is acceptable but also redundant.
- Love that you are asking for input, and hope it is discussed and considered.
- The open house hosted in the lodge was a poor way to communicate information. Slides being shown without explanation and timed so quickly that you couldn't read all the info was disappointing. The noise in the room meant nearly shouting to be heard.

Our Camas 2045 Community Summit No. 2 Summary
October 22, 2024

Overview

On October 22nd, 2024, the City of Camas hosted *Our Camas 2045 Community Summit #2*, the second open house event for its *Our Camas 2045 Comprehensive Plan and Downtown Subarea Plan* process. The purpose of this event was to have community members comment on the draft land use alternatives, provide input on development scales, review development concepts for downtown, and learn about the County's climate planning efforts and Greenhouse Gas (GHG) inventory.

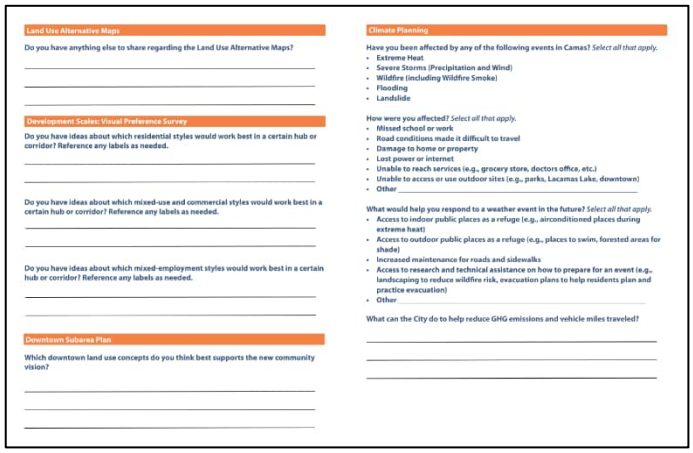
More than 45 community members participated in the event at the Camas-Washougal Fire Department Station 42, where kids activities and refreshments were provided.



The event was organized with stations set up around the room. Stations covered topics such as the *Our Camas 2045 Vision Statement and Outreach Draft Land Use Alternatives, Development Scales, Downtown Concepts, and Climate Planning.* Additional stations provided an overview of the project, and existing land use conditions for context.

Participant discussion and feedback was focused on the draft land use alternatives, a visual preference survey of development scales, and downtown redevelopment concepts. For the Draft Land Use Alternatives station, community members viewed proposed land use concepts through the lens of 'hubs' or 'corridors' and were asked if any key corridors or hubs were missing. The next station offered a visual preferences survey for different types of housing, mixed-use, commercial, and mixed-employment uses that could occur in a future land use alternative for Camas. The last station asked for community members to review several downtown redevelopment and streetscape concepts and offer their feedback. Each station included a project team facilitator, who took notes of the discussion on flipcharts and post-it notes. Comments and ideas were also captured through several sticky dot exercises (Appendix C) and in writing through a comment form (Appendix A). For people unable to attend the event, a complementary survey was available via the Engage Camas website. The results are available in Appendix B.





Land Use Alternative Maps

Do you have anything else to share regarding the Land Use Alternative Maps?

Development Scales: Visual Preference Survey

Do you have ideas about which residential styles would work best in a certain hub or corridor? Reference any labels as needed.

Do you have ideas about which mixed-use and commercial styles would work best in a certain hub or corridor? Reference any labels as needed.

Do you have ideas about which mixed-employment styles would work best in a certain hub or corridor? Reference any labels as needed.

Downtown Subarea Plan

Which downtown land use concepts do you think best supports the new community vision?

Climate Planning

Have you been affected by any of the following events in Camas? *Select all that apply.*

- Extreme Heat
- Severe Storms (Precipitation and Wind)
- Wildfire (including Wildfire Smoke)
- Flooding
- Landslide

How were you affected? *Select all that apply.*

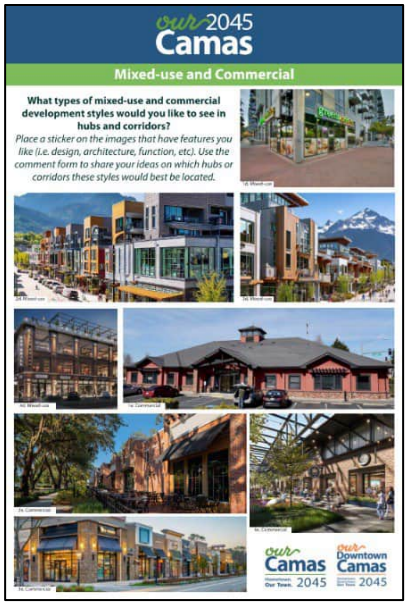
- Missed school or work
- Road conditions made it difficult to travel
- Damage to home or property
- Lost power or internet
- Unable to reach services (e.g., grocery store, doctors office, etc.)
- Unable to access or use outdoor sites (e.g., parks, Lacamas Lake, downtown)
- Other

What would help you respond to a weather event in the future? *Select all that apply.*

- Access to indoor public places as a refuge (e.g., airconditioned places during extreme heat)
- Access to outdoor public places as a refuge (e.g., places to swim, forested areas for shade)
- Increased maintenance for roads and sidewalks
- Access to research and technical assistance on how to prepare for an event (e.g., landscaping to reduce wildfire risk, evacuation plans to help residents plan and practice evacuation)
- Other

What can the City do to help reduce GHG emissions and vehicle miles traveled?

The comment form handed out at the event.



One of the Development Scales posters.

Summary of Feedback

The following sections summarize the feedback received, organized by station. This includes comments captured through discussion, comment forms and the online survey.

Draft Land Use Alternatives Station

- Most participants expressed a preference for the hub model over the corridor model. Hubs were seen as more conducive to building community, encouraging walkability, and creating spaces where residents could interact and engage in local activities. Many valued the small-town feel that hubs provide, allowing for easy access to daily needs. Some highlighted hubs as more suitable for a compact urban design, avoiding the downsides of corridor-style, car-dependent sprawl. Others noted that hubs would help concentrate community energy, drawing people to central, lively areas, which contrasts with the sprawling nature of corridors that might prioritize vehicular access and parking.
- Concerns around density varied, with some questioning whether downtown could accommodate higher-density development feasibly. North Shore residents voiced concerns about the need for a clear transition between rural/low-density areas and new, higher-density developments, with a preference for a tiered approach to prevent abrupt changes in character. Many participants expressed a desire to limit the height of downtown buildings to two stories, preserving the traditional aesthetic of the area. There was significant support for incorporating brick and other traditional materials in building façades, reinforcing Camas's historic character.
- Participants were also drawn to the idea of mixed-use developments that blend commercial and employment spaces. These were seen as essential for diversifying the local economy, creating jobs, and reducing the need for residents to shop or work outside the community. There was strong support for broadening the tax base with more commercial and retail

developments to limit the reliance on Vancouver and neighboring areas for goods and services. The potential for transforming certain underutilized properties, like the mill site, into community hubs was noted, with hopes that such projects could bring aesthetic and functional improvements to the area.

- Another priority highlighted was the importance of walkable, bike-friendly streets with green infrastructure like trees and traffic calming elements. Many participants preferred pedestrian-focused, multimodal streets with bike lanes, protected sidewalks, and transit stops that connect hubs and local neighborhoods seamlessly. Comments encouraged shifting away from auto-centric developments to form-based codes that prioritize building design and public space over specific land uses. Some attendees expressed support for removing parking minimums, which some felt hindered denser, more community-oriented development. The goal was to make hubs easily accessible on foot or by bike, fostering a community-centric lifestyle.
- Some residents advocated for single-level homes to better serve seniors and individuals with disabilities, reflecting the need for inclusive housing design. This aligns with broader suggestions that higher-density housing should be thoughtfully planned around schools and employment areas, making daily life accessible without excessive reliance on cars.
- Several residents identified specific areas that could benefit from hubs. Suggestions included developing a smaller hub at the intersection of NE Everett St and NE 15th Ave near Crown Park, enhancing the existing downtown hub, and possibly adding more hubs on Prune Hill to prevent it from being a predominantly residential area. These hubs would ideally incorporate small-scale commercial spaces, sidewalk cafes, and other community-friendly spaces. Participants noted the potential challenges of competing with Columbia Palisades but emphasized the importance of unique attractions in Camas's hubs to maintain their distinct character.

Visual Survey Development Scales Station

- ***Images of Residential Development***: The community noted the need for diverse residential options that cater to different life stages, from younger families to older adults. Brick and natural materials, paired with modern elements, are preferred for a classic look, while cottage styles were discouraged. Examples like 2a for low density and 3b for medium density (see Appendix C) — are favored in areas like North Shore, where a mix of front yards and green spaces preserve natural appeal. For central corridors like Everett, high-density options support walkability and community vibrancy without overwhelming the small-town feel. However, there's a desire to avoid towering structures near shopping areas to maintain an accessible scale. The taller buildings in Redmond, WA were cited as an undesirable style for Camas.
- ***Images of Mixed-Use and Commercial Development***: For commercial and mixed-use hubs, styles like 2d and 2e align with Camas's character by integrating small-town charm with urban functionality. Utilizing hubs in the North Shore and other regional areas are ideal for medium-density, mixed-use layouts that transition smoothly into surrounding neighborhoods. There's a strong preference for storefronts to encourage walkability and gathering spaces, as well as a

plaza near the lake, where green space and pedestrian paths promote community interaction.

- ***Images of Mixed-Employment Development***: Employment hubs should focus on smaller, adaptable buildings rather than large industrial complexes, prioritizing options like 4f and 5f with "Pacific Northwest" architectural elements. These styles align with local aesthetics by featuring sleek lines and natural materials that respect the environment, helping maintain the town's welcoming feel. Additionally, incorporating sustainable features such as green roofs or solar panels would reflect Camas's environmental values.

Downtown Sub-Area Plan Station

Land Use Concepts

- There was strong support for moderate increases in density, especially around key corridors like 3rd Avenue, where mixed-use buildings could create a lively blend of residential and commercial spaces. Many residents felt that recent apartment developments set an ideal example of density, offering a balance that complements the small-town feel. Some also embraced the idea of higher-density zones, provided they include greenspaces and plazas to support sustainability, community, and local businesses.
- Preserving the historic downtown core was a priority, with a consensus that growth around this area should retain its character. Medium-density wraps near downtown were preferred over high-rise developments, which participants felt could overshadow the town's charm. Interest in integrating the mill into plans also emerged, with suggestions to adaptively reuse the site for public and commercial spaces, such as condos, green areas, and farmers' markets, which would enrich downtown's recreational and social environment.
- Environmental considerations played a prominent role, with concerns that taller buildings could create perpetual shade, especially during winter. To maintain a pleasant downtown atmosphere, some recommended limiting taller structures to specific zones and designing south-facing facades with light-colored exteriors to reflect sunlight. Additionally, participants stressed the importance of using native plants to ensure street trees thrive in the urban landscape.

Transportation Concepts

- Transportation suggestions focused on pedestrian safety and traffic calming measures to make downtown more navigable for walkers and cyclists. The community largely opposed one-way street concepts, as these were seen as disruptive to local businesses and challenging for visitors. Instead, they advocated for improving bike connections to nearby neighborhoods and prioritizing pedestrian-friendly design, particularly on high-speed roads like NE 3rd Avenue.
- Efficient land use was a significant theme, with calls to reduce surface parking lots in favor of flexible parking solutions, allowing developers to tailor parking to actual needs. Participants felt this would improve land values, walkability, and sustainability. They also stressed the importance of greener, pedestrian-friendly streetscapes, with many favoring the Enhanced Streetscapes Option, which includes planting street trees for shade and aesthetics.

Street Enhancement & Development Studies

- Several residents specifically supported the 3rd Avenue Transformation, noting that a higher-density 3rd Avenue is preferred. Support was also shown for a Densified Downtown Street design.

Open Space Enhancements

- Community feedback revealed broad support for enhancing downtown Camas with more open and gathering spaces to create a vibrant, welcoming environment. Many participants highlighted the need for improvements to the Mill Ditch trail, which, while valued as a potential recreational asset, currently feels unsafe to some users. Residents would like to see the trail become more accessible, envisioning it as a well-lit, well-maintained pathway that connects community spaces.
- The idea of establishing a linear park along Dallas Street also received interest, as participants saw it as a way to add green space and promote walkability downtown. However, some raised concerns about the impact on on-street parking, suggesting a need to balance new open spaces with convenient access for residents, businesses, and visitors.

City Hall

- The community's feedback on Camas City Hall reflects a preference for podium parking to support a civic plaza. Residents see this as a valuable opportunity to introduce a central gathering space while maintaining essential parking capacity. The civic plaza concept received favorable feedback, especially for its potential to be located north of City Hall and offer open public seating, terraces for events, and green spaces for community gatherings.
- While most participants supported a three-story City Hall, some suggested a five-story design to maximize density without sacrificing the public plaza. The additional cost of podium construction and ensuring sufficient daylight for the northern-facing plaza were also raised. Suggestions included relocating City Hall south to 3rd Avenue to create more open space, and many community members looked to Bothell, Washington's City Hall as a model, appreciating its blend of podium parking and open public design.
- There was also a notable call for better parking options. Some people remarked that downtown currently has too much parking, while others noted the difficulty of finding parking for business employees with the existing two-hour limits. Underground parking emerged as a popular solution to both conceal and expand parking capacity, balancing the need for accessibility with the vision of a more walkable, less car-centered downtown.

<u>Climate Planning Station</u>

- There was discussion regarding stormwater management and tree canopy preservation. One resident referenced the North Shore development, expressing concern about how much of the existing tree canopy was removed. They worried that the new stormwater infrastructure, designed to direct water to an older system, may not withstand the increased flooding and extreme precipitation expected with climate change. This attendee questioned if there are any protective measures in place for existing tree canopies and restrictions on developers regarding

stormwater management to prevent overburdening outdated systems.

- Participants had questions about the building code, particularly whether it includes provisions for solar readiness or future wiring needs. Several participants asked for an update on the climate planning process, wondering if specific policies had already been drafted.
- Extreme heat, wildfires and wildfire smoke, and severe storms affected the most residents. The most common impacts were the loss of power or internet, damage to their home or property, and being unable to access or use outdoor sites. For ways that would help residents respond to a weather event, most residents noted the need for increased maintenance for roads and sidewalks, access to outdoor public places as a refuge, and access to indoor public places as a refuge.

Greenhouse Gas Inventory

- Community members emphasized increased use of electric vehicles (EVs) and suggested improving walkability to reduce dependence on car travel, particularly trips to Vancouver. Ideas included developing more mixed-use commercial spaces downtown and fostering a “shop local” culture to support area businesses and reduce transportation emissions.
- Transportation alternatives were another focal point. Residents advocated for safer pedestrian infrastructure, bike lanes, and more frequent public transit, emphasizing that these options should be of high enough quality to ensure actual usage. Many suggested connecting neighborhoods, particularly those isolated by current infrastructure limitations like Green Mountain, with safe, accessible routes to downtown. The feedback also revealed a strong interest in local job opportunities to reduce commuting. Some proposed strengthening partnerships with employers, particularly in fields like technology, to create high-quality, locally based employment options.
- Environmental initiatives were also highlighted, with suggestions for incorporating solar power in local energy strategies. One resident shared a personal account of their success with a solar roof and “power walls”, advocating for city policies that promote solar installations on rooftops and exploring biochar as a carbon sequestration tool. Others emphasized preserving existing trees, expanding green spaces, and promoting educational programs about reducing meat consumption, growing local food, and teaching young people about carbon footprints.

Natural Hazards

- Community feedback highlighted a strong interest in strategies to address the impacts of wildfire and extreme heat in Camas, with a particular focus on expanding green infrastructure. Many people expressed support for increasing shade and tree coverage, especially around schools, to mitigate heat effects on vulnerable populations.
- Participants voiced strong support for protecting Camas’s open spaces, recognizing their ecological value and the role they play in community well-being. This feedback emphasized the importance of preserving natural areas as part of Camas’s broader climate resilience efforts and integrating green infrastructure solutions across the community.

Our Camas 2045 Community Summit No. 3 Summary
January 12, 2026

Overview

Between September 15 and December 26, 2025, the City of Camas hosted *Community Summit #3* for its *Our Camas 2045 Comprehensive Plan* and *Our Downtown Camas 2045 Subarea Plan* process.

The Community Summit served as an engagement strategy to share the draft *Our Camas 2045 Comprehensive Plan* and *Our Downtown Camas 2045 Subarea Plan* with the community and help shape the next drafts and implementation actions. This summit included a mix of online engagement and in-person activities to provide community members with opportunities to review, ask questions, and provide feedback on each element (or chapter) of the draft comprehensive plan, including the Downtown subarea plan.

The City featured a different comprehensive plan element every two weeks by hosting an online survey and providing background information on the Engage Camas project websites. Summit materials (including posters, handouts, and the draft element) for each element featured during the Community Summit were available on Engage Camas. In-person engagement activities consisted of a presentation at a joint Strong Towns and Camas Earth Day Society event and a series of "Chat with a Planner" events where community members could connect with City staff.

The following figure shows the overall calendar for the summit.



Community Summit #3 Engagement Schedule

At the Strong Towns and Camas Earth Day Society event, City staff presented information on new statutory requirements for middle housing[1] (i.e., House Bills 1110 and 1337), existing zoning requirements for middle housing in Camas, and draft amendments to the City's development code and design standards (e.g., permitted unit densities, parking, dimensional standards, and unit types) to support middle housing development. Following the presentation, participants provided feedback on the following topics:

- Unit calculations and parameters for affordability;
- Accessory dwelling units (ADU), including ADU impacts to property values and proximity to neighboring properties;
- The paper mill and requirements for cleanup;
- Utility connections and fee requirements for multiple units on the same lot;
- Provisions for electric vehicles and incentives for solar technologies.

Summary of Feedback

The following sections summarize the feedback received from the online surveys hosted on the *Our Camas 2045* Engage Camas website.

Online Surveys

Each of the seven online surveys consisted of approximately 10 questions focused on actions the City could take related to goals and policies for each element. Participants were asked to review each action and consider, with the limited resources available to the City, whether it is an action the City should take. Each question included the following response options: Strongly Agree, Somewhat Agree, Neutral, Somewhat Disagree, and Strongly Disagree. Two open-ended questions also provided participants with an opportunity to share additional actions the City could consider, as well as their general thoughts on the element. The following sections summarize feedback received from each survey, organized by element. Elements with similar topics, such as Natural Environment and Climate, were administered in a combined survey and feedback covers both elements.

Community Character

Survey questions on the Community Character element were open from September 15 to September 28, and there were 36 respondents. Questions explored actions related to arts, culture, heritage, community identity, and community engagement.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
    - Provide development incentives (such as increasing lot coverage, density, or heights) for projects to protect natural topographic, geologic, vegetative, and hydrologic features and provide features such as tree-lined streets, rain gardens, and use of native landscaping.

[1] "Middle housing" refers to moderate density housing, with forms and densities that fall between single-family homes and multi-family buildings. Middle housing buildings are compatible in scale, form, and character with single-family houses but contain two or more attached, stacked, or clustered homes.

  - Develop educational and volunteer programs related to climate science and habitat conservation.
  - Develop a City education program to share information and educate the community on local government, city functions, and ways to engage with staff.

- In the open-ended questions, participants expressed an interest in promoting more community events downtown that feature arts and crafts or farmers markets. This includes offering more events in the winter and partnering with local school to establish art programs. Participants also mentioned the concept of aging in place and suggested that the City could consider pursuing BlueZone recognition. BlueZone is an organization that partners with local communities, health care providers, and cities to develop programs focused on well-being and human health. A general theme across the open responses included an interest in maintaining a small town feel and preserving open space areas and trees from development.

Housing

Survey questions on the Housing element were open from September 29 to October 12, and there were 50 respondents. Questions explored actions related to affordable housing, infill development, and zoning.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
  - Require large developments to dedicate a portion of lots/units for middle housing or ADUs as part of subdivision approval.
  - Offer financial assistance or programs to rehabilitate and repair existing housing stock.
  - Invest in existing neighborhoods to improve safety, accessibility, and livability while preserving neighborhood character.
- In the open-ended questions, participants suggested that additional actions for the City to consider could include supporting mixed-use on single family lots to increase the availability of neighborhood businesses and encouraging more infill development in existing neighborhoods to prevent sprawl and preserve natural areas. Additional suggestions for potential actions include revising the development code for ADUs to make construction and permitting more affordable. Respondents also expressed an interest in protecting rural and undeveloped areas from new subdivisions.

Natural Environment and Climate Resiliency

The joint survey on the Natural Environment and Climate Change & Resiliency elements was open from October 13 to October 26, and there were 15 respondents. Questions solicited feedback on actions related to clean water, trees, parks and recreation, trails, and climate resilience.

- The most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
  - Support cleanup efforts at the Camas Mill and other contaminated sites to protect natural resources and local water supply.
  - Develop a program (such as an Urban Forestry program) to prioritize the preservation of existing trees, develop new tree planting requirements, and support education and tree canopy data management.

  - Prepare a community wildfire protection plan that addresses wildfire prevention and requirements for fire resilient landscaping.
  - Implement targeted lake management actions to protect water quality and reduce harmful algae blooms in local waterways.

- In the open ended questions, participants suggested additional actions for the City to consider could include establishing wildlife corridors within neighborhoods, particularly at the periphery of the city, adding solar powered lights at locations throughout the city such as pedestrian crossings, involving community volunteers in environmental projects, implementing a notification system and emergency plan for wildfires , and implementing regular testing of PFAS chemicals (i.e., “forever chemicals”) in the city’s water supply. General feedback included respondents expressing interest in encouraging active modes of transportation (e.g., biking and walking), restoring native ecosystems, removing contaminants from the city’s water supply, providing space for wildlife, and preparing for wildfires.

Economic Development

Survey questions on the Economic Development element were open from October 27 to November 7, and there were 12 respondents. Questions explored actions related to local businesses, mixed-use areas, access to goods and amenities, and living-wage jobs.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
  - Partner with groups such as the Chamber of Commerce, Port of Camas-Washougal, and Columbia River Economic Development Council to proactively recruit new businesses and industries and ensure that tools and incentives are in place to attract and retain living-wage employment.
  - Launch an economic development grant program to support local business and provide incentives for new businesses and industries.
  - Encourage mixed-use zoning and neighborhood business districts to increase local access to goods and services, provide more efficient use of land, and link residents with employers and businesses.
- In the open ended questions, participants suggested that additional actions for the City to consider could include implementing incentives for small and medium-sized businesses, partnering with the Port of Camas-Washougal to provide more commercial space, revising the zoning code to not allow land zoned for commercial or industrial uses to be developed as residential uses, and providing incentives for more community spaces to allow for a meeting place for clubs and adult programs. General feedback from respondents included comments on accommodating future impacts of remote work, supporting the growth of small and medium-sized businesses, and encouraging diverse commercial and industrial uses.

Transportation and Public Facilities

Survey questions on the Transportation and Public Facilities elements were open from November 10 to November 21, and there were 8 respondents. Questions explored actions related to biking, walking, schools, utilities, and first responders.

- The top three most popular actions among participants, which included responses of Strongly

Agree or Somewhat Agree, were the following:

- Develop a Safe Routes to School program by partnering with the Camas School District to make active transportation safe and fun for children traveling to and from school.
- Incorporate sustainable design features (such as daylighting, solar, and green roofs) in existing and new public buildings.
- Update the City's Stormwater Design Standards Manual to include requirements for low-impact development or green infrastructure to reduce the amount of impervious areas in new development or redevelopment projects.

- In the open ended questions, participants shared that additional actions for the City to consider could include implementing more protected bike lanes, fixing gaps in the sidewalk infrastructure, considering policies to limit light pollution, requiring the development community to provide safe bike and pedestrian infrastructure, and protecting groundwater recharge areas. General feedback from respondents focused on either prioritizing bicycles and pedestrians or only vehicles. This contrasting feedback included respondents who are interested in expanding bike and pedestrian infrastructure as well as those who would prefer to use funding for improvements to roadway facilities to limit congestion.

Land Use

Survey questions on the Land Use element were open from November 24 to December 5, and there were 47 respondents. Questions explored actions related to housing, public services, employment and recreational uses.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
  - Update the City's development code to incorporate design standards that are sustainable and support low climate impact. Sustainable and low climate impact design standards include things like native landscaping, energy and water efficiency standards, use of non-toxic materials in construction, and site optimization to preserve green space.
  - Collaborate with partners to encourage community events, signage, and public art that celebrate the unique identities of different areas of the city.
  - Prioritize mixed use development that encourages small businesses, provides a mix of housing types, increases pedestrian and transit connections, and includes environmentally sensitive design.
- In the open ended questions, participants shared that additional actions for the City to consider could include constructing a public disc golf course, implementing parking reform, purchasing or facilitating the purchase of right of ways, acquiring easements and land transfers for bike and walking paths, providing more youth sports facilities and parks, and increasing public access near Lacamas Lake. General feedback included preserving green spaces, providing more open space, limiting growth, and aligning transportation improvements with land use plans.

Downtown Camas

Survey questions on the Downtown Camas subarea plan were open from December 8 to December 26, and there were 5 respondents. Questions focused on potential policies and incentives that could be implemented in Downtown Camas related to transportation, housing, development regulations, and

local character.

- The top three most popular actions among participants, which included responses of Strongly Agree or Somewhat Agree, were the following:
    - Partner with local artists to create public art, murals and other interactive elements in Downtown and require new developments to provide public art.
    - Require active ground floor uses (commercial or public space) and engaging street level design (pedestrian accessible) in the Historic Main Street Core area of Downtown.
    - Develop a parking management plan for Downtown to ensure there is adequate parking for Downtown businesses and residents, and explore options for shared use parking and offsite (edge of Downtown district) parking facilities that could serve as a park and ride transit facility.
- In the open-ended questions, participants suggested that additional actions for the City to consider could include improving pedestrian crossings with flashing beacons (e.g., a crosswalk at Garfield and 6th), revising parking requirements, and establishing a parking benefit district to charge for on-street parking. General feedback included an interest in creating safer pedestrian and bicycling infrastructure, preserving the small town and working-class culture of Camas, improving curb management, refining parking requirements, and keeping Camas affordable.

Conclusion

The seven online surveys recorded responses from over 150 respondents from the community on the draft comprehensive plan and Downtown subarea plan. Surveys on housing and land use gathered the most responses with general feedback focusing on preserving existing open space as well as support for actions to encourage growth in developed areas of the city such as infill and mixed-use development or ADUs. Feedback from the Community Summit will be used to inform refinement of the draft comprehensive plan and Downtown subarea plan, including potential revisions to goals and policies, and the identification of future implementation actions.

Climate Policy Advisory Team (CPAT)
Meeting Summary #1

March 14th, 2024, 5:00- 7:00 PM

Meeting Attendance
Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
Robert Carter
Morgan Van Fleet (online)
Nelson Holmberg
John Svilarich – *City Council Liaison (online)*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Steve Wall, Public Works Director
Trang Lam, Parks and Recreation Director
Madeline Sutherland, Assistant Planner

Consultant Team
Nicole McDermott, WSP
Sean McElroy, WSP

Welcome and Introductions

Alan Peters, Community Development Director, provided opening remarks. All attendees were invited to introduce themselves and share what they love about Camas and why they want to be on this committee. CPAT members shared the following opening reflections:

What do you love about Camas?

- Easy access to greenspace
- Sense of place and civic and community pride
- People invest in the community
- Downtown walkability
- Downtown main street
- Love the small-town feel, recreation opportunities, and trail system
- Parks, recreation, open space
- People know their neighbors and there are good schools

Why do you want to be on the committee?

- Civic duty
- Concerned citizen
- Importance of climate change impact in Camas
- Policy and systemic changes can make a difference
- Be a part of growth and help climate be a priority
- Desire to serve the community
- Want to lend expertise and prior experience – members shared varying past and present experiences that could benefit the committee, such as work on the Clark County Climate

Advisory Group, experience with climate vulnerability assessments, environmental and climate justice, marketing, and vehicle electrification.

- Trang Lam, Parks and Recreation Director, shared that the Parks Department is working on a Parks and Open Space Management plan and will make recommendations to this group.

Our Camas 2045 and *Our Downtown Camas 2045* Project Overview

Alan provided an overview of the City's goals and objectives for the Comprehensive Plan and Downtown Plan, touching on topics like housing, economic development, climate, and downtown. Nicole McDermott, WSP, provided an overview of the project process, describing each phase of work from the existing conditions analysis, equity framework, visioning outreach, plan development, implementation and to eventual adoption. Nicole reviewed key milestones and the overall project schedule. CPAT members asked the following clarifying questions:

- *Is the geographic scope just the city boundaries for the existing conditions?* The existing conditions analysis looks at city boundaries and the Urban Growth Area as well as nearby influence areas. Clark County is leading the charge on climate change technical analysis (GHG inventory and vehicle miles traveled per capita). Neighboring municipalities are going through the same periodic update requirement.

CPAT Roles and Responsibilities

Nicole discussed the Committee's roles and responsibilities, and described the function of other project committees, such as the Project Advisory Committee (PAC) and the Community Advisory Committee (CAC). She noted that CPAT members are expected to meet four times over the course of the next year. The meetings will cover climate planning work currently in process by the County. Meetings will also be an opportunity for committee members to provide input on goals and policies for the new climate element in the comprehensive plan and an opportunity for members to incorporate climate goals and policies into the downtown subarea plan. CPAT members had no questions or comments.

Public Participation Plan

Nicole briefly discussed the public participation plan and its objectives and stakeholders that will be engaged in the process. Attendees received a copy of the plan for review prior to the meeting. CPAT members asked the following questions:

- *Would it be possible to receive a google drive link to access the public participation plan and other documents shared with the committee?* A similar effort is being done for the CAC and a link will be provided.
- *Renters are often neglected. Have you thought about a way to engage that subgroup of people?* In the broader engagement plan, social media channels might be reaching this group. Direct mailer will reach each community member and directs residents to visit the City's website to complete a survey. The team will discuss other ways to reach this group and could include a question in future outreach asking if the resident is an owner or renter.
- *In the Northshore subarea process, there was a disconnect between requesting feedback and the City's ability to change the process or outcomes to address that feedback. Is there a way for*

the public to understand the public engagement process and what guidelines are involved? Could work on messaging to help the public understand the limitations of the City and what can be achieved through the comprehensive plan and downtown subarea plan. It's important to communicate that goals and objectives should be attainable and that will vary for each agency and across cities.

CPAT Community Conversation Kit

Nicole covered the community Conversations Kit and Tracking Log, describing the method, approach and objectives. CPAT members did not have comments or questions.

Climate Planning Overview and Group Discussion

Sean McElroy, WSP, discussed the federal and state climate planning requirements, state guidance, and local planning resources used in the current draft of the existing conditions analysis for Camas. Nicole introduced discussion questions to help attendees brainstorm which communities in Camas are vulnerable to climate hazards. The discussion questions also invited attendees to share their experience with climate hazards in Camas. CPAT members shared the following information and asked the following questions:

Climate Hazards:

- Local schools are not prepared or equipped to respond to inclement weather days, particularly extreme heat.
- The hills in Camas could be considered a hazard for individuals with limited mobility.
- Older buildings in the city often have substandard foundations and might be more vulnerable to certain climate hazards such as flooding or severe weather.
- Most of the low-income housing in the city is located at a lower elevation and could be more vulnerable to flooding.
- Multiple members recalled a recent heat dome and fire that occurred near downtown. During the heat dome there were many residents who did not have access to air conditioning, cooling centers, or air filters. Smoke from the fire impacted residents with respiratory or lung diseases such as asthma. Communication during the fire event lacked efficiency as there was no preparedness plan.
- The increasing number of heat events raises the concern of increased demand for electricity and more pressure on the local energy grid.
- Streams, lakes, and waters surround Camas and water resources and residents living in close proximity are vulnerable to flooding and drought conditions. One member mentioned observing changes in water levels at Lacamas Lake in the summer.
- In addition to heat and cold extremes, strong east winds have had an impact on the local tree canopy.

CPAT Questions:

- *Is there a similar climate element for a similar sized city in Washington that is not that old?* There is a model element from the state guidance. The project team can look into examples from cities in other states.
- *Is the University of Washington webtool publicly available?* Staff will provide a link to the

webtool.

- *What is the scope of the CPAT for dealing with hazards?* Implementation measures could arise through discussions with the CPAT. One of the priorities for the CPAT is to identify goals and policies for the climate element to address hazards. The project team involved in the Parks and Open Space Management plan will also have action items and recommendations for the climate element.
- *Are we going to be discussing whether each hazard is climate related, or will the discussion be on what we can do to prevent and adapt to each hazard?* The focus is on resiliency and the hazards likely exacerbated by climate change.

Equity Framework

Nicole discussed the intersection between equity and climate planning. Nicole provided two examples of equity frameworks from the City of Vancouver and King County that address the equity and climate nexus.

- *Will there be a metric in the framework to track success of meeting equity or climate goals?* A metric of success can be part of the equity framework that is developed. It will be important to get buy in from the community on equity priorities.
- *Will equity and climate be embedded in the comprehensive plan beyond a separate element?* This is an important question for developing the plan. Yes, the intention is to embed climate throughout the comprehensive plan and have the separate element. How this is achieved will be a topic for discussion as the project progresses.

Next Steps

Nicole reviewed next steps and general meeting logistics. The next CPAT meeting will likely be in the fall, following completion of the County's climate work. The project team will keep the group updated on the process through email. Nicole reminded CPAT members to reach out for questions and encouraged members to host community conversations.

- CPAT members agreed that the meeting day and time generally works. A zoom link would be preferable as well.
- *Can CPAT members receive a contact sheet?* Yes, the team can set up a file-sharing platform to share a contact sheet. Materials will also be posted to the EngageCamas website following the meetings.

Project staff thanked the committee for their attendance and adjourned the meeting at 7:00pm.

Climate Policy Advisory Team (CPAT)
Meeting #2 Summary

September 24th, 2024, 5:00- 6:30 PM

Meeting Attendance

Committee Members
Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
Nelson Holmberg
Diana Rutherford (online)
John Svilarich – *City Council Liaison*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Bryan Rachal, Director of Communications (online)
Madeline Sutherland, Assistant Planner

Consultant Team
Emma Johnson, WSP
Sean McElroy, WSP
Claudia Denton, Parametrix (online)

Welcome and Introductions

Alan Peters, Community Development Director, provided opening remarks. All attendees were invited to introduce themselves and share why they wanted to be on this committee. CPAT members shared the following opening reflections:

- Concerned citizen
- Importance of climate change impacts in Camas
- Policy and systemic changes can make a difference
- Want to lend expertise (background in marketing)
- Work in urban forestry
- Member of EatWell Camas
- Background in environmental consulting and environmental justice

Our Camas 2045 and *Our Downtown Camas 2045* Project Overview

Alan provided an update on the Comprehensive Plan and Downtown Subarea Plan, touching on the allocations for population, housing, and employment provided by Clark County, as well as adoption of the draft vision statement.

CPAT Roles and Responsibilities

Emma Johnson, WSP, discussed the Committee's roles and responsibilities, and described the function of other project committees, such as the Project Advisory Committee (PAC) and the Community Advisory Committee (CAC). She noted that CPAT members will meet two more times over the course

of the project. Upcoming meetings will likely cover goals and policies for the new climate element as well as future climate planning actions. CPAT members had no questions or comments.

Climate Change and Resiliency Element

Emma reviewed the purpose of the Greenhouse Gas (GHG) Emissions Reduction sub-element and Resilience sub-element, as well as supporting analysis for each. The GHG inventory report, which is complete, will support the GHG reduction sub-element. As part of the Resilience sub-element, attendees will participate in a vulnerability and risk assessment exercise to identify vulnerable assets and potential ways to improve Camas' resiliency. A focused vulnerability and risk assessment is also being prepared under the City's agreement with Clark County, which will evaluate the vulnerability of lakes and outdoor recreational areas in Camas to extreme heat. CPAT members had no questions or comments.

Camas GHG Inventory Results Presentation

Claudia Denton, Parametrix, gave a presentation on the results of a GHG emissions inventory prepared for Camas. The presentation summarized the purpose, methodology, and results of the inventory for Camas, including topics such as total, local, and imported emissions, and GHG emissions by sector. CPAT members asked the following questions:

- *Are the metrics showing total emissions or per capita emissions?* Metrics for Camas include total citywide emissions and per capita emissions, both of which include a combination of local and imported emissions (i.e., local plus imported emissions equal total emissions in Camas). There are four sectors within local and imported emissions.
- *How do emissions in Camas compare to other cities? How are we doing overall?* Some caution is recommended when comparing Camas directly to other cities, as methodologies may differ, as well as existing conditions. The best comparison will be to evaluate how emissions in Camas change over the next 3-5 years. However, generally Camas is doing well in the Building Energy sector due to the electricity grid from Clark PUD, and Goods Production emissions are slightly better than some other cities. The largest impact for GHG emissions in Camas is from large industries and refrigeration. It is recommended that communities work with local industries to reduce emissions, rather than push for them to relocate, as it is more effective to keep industries within communities that care about climate change.
- *Is the state looking into adopting a standard methodology for inventories, so that the inventories can be used to compare cities?* There are no plans at the moment, which helps avoid barriers to entry for jurisdictions or consultants wanting to conduct inventories.
- *Is the metric for solid waste based on consumption?* Actual emissions for solid waste are recorded by each landfill operator/owner and reflect the amount of methane emitted. The metric for Camas is based on the waste that is produced by Camas and transported to the landfill.
- *Some cities are requiring air conditioning for new construction. How does that counter with the policy recommendation to reduce electricity demand?* We will need to balance reducing GHG emissions with other needs, like keeping our communities safe and healthy. There are some options to reduce emissions associated with air conditioning. Heat pumps release fewer

fugitive gases and are more efficient. Supporting policies that encourage denser land uses, particularly housing, also increase energy efficiency since smaller units have smaller electricity demand.

- *Which sector includes new construction and construction vehicles?* The transportation sector includes construction vehicles. Stationary vehicles and equipment are included under the buildings and energy sector. Building materials and construction or demolition fall under the industrial processes sector.
- *Is there a breakdown of energy use by source (e.g., heating, cooling)?* No, but there are other resources and studies that can be used as a comparison to the GHG inventory data for Camas.

A copy of the Camas GHG inventory report will be sent to CPAT members following the meeting.

Climate Hazards in Camas

Emma provided an overview of the hazard rankings for climate hazards in Camas. Climate hazards with a "high" ranking include extreme heat and extreme precipitation. She also described the two maps that were prepared to visualize the location of climate hazards in Camas, but cautioned that hazards are often citywide and/or unpredictable.

Group Activity - Vulnerable Assets in Camas

Sean McElroy, WSP facilitated a group activity and discussion on vulnerable assets in Camas as part of the vulnerability and risk assessment for the Resilience sub-element. The purpose of the activity was to obtain feedback from the CPAT members about vulnerable assets in Camas that should be prioritized in the climate element. CPAT members used sticky notes to identify local assets on the climate hazard maps. The following list identifies the priority local assets/asset themes that were frequently identified:

- The lakes
- Trees (tree canopy, street trees, mature trees, native species)
- Open space (parks, trail system)
- Schools
- Emergency shelters and evacuation routes
- Power lines
- Elderly and low-income populations
- Urban development in northeast Camas

The following asset-hazard pairings and other considerations were identified on the two maps:

Map: Wildfires, Extreme Heat, & Drought

- Open space and wildfires
- Fire risk due to dead/dying vegetation
- Fire danger due to mass weed remove (fuel)
- Need for coordination with larger region fire fighters

- Fireworks
- Financial stability of schools (enrollment up and down)
- Non-point source pollution
- Private shade trees
- Tree health/canopy and heat
- Loss of native species
- Parks and loss of vegetation
- Air quality in dense neighborhoods adjacent to polluting entities
- Heat stress on low-income and elderly populations
- Heat and social networks
- Street trees, heat stress/death
- Drought and wind, resulting in large trees falling on power lines and impacting ecosystems

Map: Flooding, Landslides, & Extreme Precipitation

- Trail system and erosion
- Trees and power lines (interaction during weather events)
- Power lines and transportation
- Flooding and transportation
- Haight dam
- PFAS
- More development near the lakes – dangerous runoff
- Precipitation (snow) and tree canopy
- Snow, flood, and smoke days impact schools
- Parks and flooding
- Hills and ice
- Old/irreplaceable trees
- Trail erosion, overuse, lack of maintenance – trees dying
- Insufficient emergency shelters/backup power
- Emergency routes blocked by flooding
- Drought and wind, resulting in large trees falling on power lines and impacting ecosystems
- Financial stability of schools (enrollment up and down)
- East winds
- Stormwater overflows – erosion and pollution

Following the mapping activity, CPAT members were asked to share their top concern(s) for asset-hazard pairs and/or ideas for improving resiliency. Members shared the following:

- Flooding and extreme precipitation effects on downstream pollution and stream management
- Extreme heat and wildfire smoke effects on schools and older houses
- We need to take more steps to prevent and reduce damage from wildfires (e.g., policies to remove landscaping debris from City properties)
- Wildfire smoke effects on community health
- Extreme weather and effects on the community from a widespread power outage (a response

plan would improve our resiliency to this hazard)
- Extreme weather can/has disrupted the food distribution chain in Camas and increased food insecurity
- Extreme heat and severe weather have/will have effects on walkability and transportation access, especially for people with disabilities (e.g., hills can become inaccessible and dangerous)
- Flooding caused by the Columbia and Washougal Rivers
- Camas needs to maintain large canopy/mature trees to improve resiliency to extreme heat (need more enforcement of the City's tree plan)
- Could improve our tree canopy's resiliency to winter storms through education on tree pruning

Next Steps

Emma reviewed next steps and general meeting logistics. The project team will complete a vulnerability and risk assessment based on feedback provided during this meeting, as well as feedback from the community. The purpose of the next meeting will be to review draft policies for the climate element. Emma also reminded CPAT members of the upcoming Community Summit where attendees will have an opportunity to review land use alternatives, and the community will be asked to weigh in on climate hazards and resiliency.

Project staff thanked the committee for their attendance and adjourned the meeting at 6:30pm.

Climate Policy Advisory Team (CPAT)
Meeting #3 Summary

November 14th, 2024, 5:00- 7:00 PM

Meeting Attendance
Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
John Svilarich – *City Council Liaison*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Steve Wall, Public Works Director
Madeline Sutherland, Assistant Planner

Consultant Team
Emma Johnson, WSP
Sean McElroy, WSP

Welcome and Introductions
Alan Peters, Community Development Director, provided opening remarks. All attendees were invited to introduce themselves and participate in a short icebreaker.

Our Camas 2045 and *Our Downtown Camas 2045* Project Overview
Alan Peters provided an update on the Comprehensive Plan and Downtown Plan as well as a recap of the second Community Summit.

Community Summit #2 and Survey Results
Sean McElroy, WSP, discussed the results from an online survey, which included questions related to the impacts of natural hazards and climate resiliency and vulnerability. Community members were invited to participate in an online survey as part of the second Community Summit and provided feedback on the impact of climate hazards in their community.

Climate Resilience and GHG Reduction Goals Group Activity
Emma Johnson, WSP, reviewed the purpose of the model climate element created by the Department of Commerce (Commerce) and the role of the CPAT in reviewing, selecting, and customizing measures to reflect local conditions, values, and climate goals and targets. Clark County has shared their draft countywide planning policies, which contain the following policies related to GHG and VMT targets.

- Greenhouse gas reduction subelements shall be developed with an overall target of reaching net-zero greenhouse gas emissions by 2050 in alignment with the statewide greenhouse gas emissions reductions set forth in RCW 70A.45.020(1). Individual jurisdictions may choose to set

greenhouse gas reduction targets to achieve net-zero emissions faster than the statewide goal.

- Greenhouse gas reduction subelements shall be developed with an overall vehicle miles traveled per capita goal in alignment with the statewide vehicle miles traveled per capita goal of fifty percent reduction in annual per capita vehicle miles traveled by 2050 compared to the baseline set forth in RCW 47.01.440. Individual jurisdictions may choose to set vehicle miles traveled per capita reduction goals more ambitious than the statewide goal.

CPAT members discussed the above targets, and noted it will be difficult for a small community such as Camas to achieve. The cumulative impact on those targets would also be led by larger cities in the county such as Vancouver. The group agreed to use the statewide targets, as setting more ambitious targets would likely not be feasible.

Lead by Kim Lottig, the group reviewed each GHG reduction and resiliency goal from the model element and voted on whether the goal is a priority for the City and whether revisions are needed to tailor the goal to Camas. One key decision was to develop at least one goal to address each emissions source category from the GHG emissions inventory (Buildings & Energy, Transportation, Solid Waste and Wastewater, and Industrial Process and Product Use). CPAT members also provided notes on their worksheet for each suggested goal.

A list of the draft goals, including feedback from the meeting and potential policies, will be sent to the CPAT members following the meeting.

Climate Policy Criteria

Emma briefly reviewed the guidance recommendation for selecting GHG and resiliency policies. Most of the meeting was dedicated to reviewing the draft goals from the model element and policies will be selected once the preliminary list of goals is finalized.

Overburdened Communities Group Activity

Sean briefly discussed the state requirements and guidance for addressing climate change and environmental justice, including the definition of overburdened communities and vulnerable populations. The *Our Camas 2045* Equity Framework identifies equity communities. CPAT members were invited to share their thoughts on areas in the city that could be considered overburdened communities, and which other groups of people could be considered vulnerable populations in Camas. CPAT members identified the following as either overburdened communities or vulnerable populations:

- Oaks Park
- Housing near SR 14 and along 192nd Avenue
- Steep streets
- Lacamas Creek Post Acute
- Areas near the waterfront and mill
- Overhead utilities (e.g., power lines) near housing

- Green Mountain community

Next Steps

Emma reviewed next steps and general meeting logistics. The project team will put together a list of draft goals for the GHG and Resiliency sub-elements based on feedback provided during this meeting. The purpose of the next meeting will be to review draft policies for the climate element. Emma mentioned that the preferred land use concept will be developed based on feedback from the Community Summit and it will be reviewed by the Community Advisory Committee, Planning Commission, and City Council in late 2024/early 2025. The comprehensive plan and subarea plan will be adopted by the end of 2025, including zoning code amendments and new downtown development standards.

Project staff thanked the committee for their attendance and adjourned the meeting at 7:00pm.

Climate Policy Advisory Team (CPAT)
Meeting #4 Summary

January 23rd, 2025, 5:00- 7:30 PM

Meeting Attendance

Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
Amy Hyland
John Svilarich – *City Council Liaison*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Steve Wall, Public Works Director
Madeline Sutherland, Assistant Planner

Consultant Team
Emma Johnson, WSP
Sean McElroy, WSP

Welcome and Introductions

Alan Peters, Community Development Director, provided opening remarks.

Our Camas 2045 and Our Downtown Camas 2045 Project Updates

Alan provided a brief update on activities for the comprehensive plan, including development of the land use alternatives and upcoming activities for the Downtown Advisory Committee and Community Advisory Committee.

Climate Resilience and GHG Reduction Policies – Group Activity

Emma Johnson and Sean McElroy, WSP, facilitated a group discussion to refine and narrow down the potential list of climate goals and policies. CPAT members were provided a handout with the current list of goals and policies as well as a table organized by goal, policy, and measure type (GHG reduction or resiliency). The group was invited to review the set of policies under each goal and indicate their preference of either removing, revising, or leaving each policy as is. CPAT members could indicate their preference with a thumbs up to keep the policy as is, thumbs to the side to revise or move the policy to another goal, or thumbs down to remove the policy.

The group decided to begin with reviewing the larger set of resiliency policies (37) before reviewing the shorter list of GHG reduction policies (27).

CPAT members provided the following general feedback:

- Revise goal and policy text to be more specific to the Camas's priorities and needs. This includes removing policies or goals that could be addressed under other elements or existing City plans (e.g., RES-8 was recommended for deletion as sustainable waste practices are

already widely adopted by the community).

- Combine GHG reduction and resiliency goals and policies to reduce redundancy (e.g., combine GHG-3 and RES-4 to address the efficiency and resiliency of the transportation system).
- Some policies are better suited as potential action items to support climate policies under the same topic (e.g., renewable energy sources).
- Confirm whether some policies are already addressed in the City's code during the code audit for Camas 2045.

Project staff thanked the committee for their attendance and adjourned the meeting at 7:30pm.

Climate Policy Advisory Team (CPAT)
Meeting #5 Summary

March 27th, 2025, 5:00- 6:30 PM (Virtual)

Meeting Attendance
Kim Lottig
Cassi Marshall
Dan Davis
Kaitlin Lee
Paul Anderson
Nelson Holmberg
John Svilarich – *City Council Liaison*

City staff
Alan Peters, Community Development Director
Robert Maul, Planning Manager
Madeline Coulter, Assistant Planner

Consultant Team
Emma Johnson, WSP
Sean McElroy, WSP
Dana Hellman, CAPA Strategies

Welcome and Introductions
Alan Peters, Community Development Director, provided opening remarks. Dana Hellman introduced herself to the group.

Climate Goals & Policies – Changes since CPAT Meeting #4
Sean McElroy, WSP, provided an update on revisions to goals and policies included in the draft climate element. Following the previous CPAT meeting, a condensed list of goals and policies was created by moving some policies to other elements (e.g., transportation) and eliminating redundancies with other elements. The draft climate element now has 21 policies, which is down from 39 policies at the prior meeting. Policies in other elements that support climate goals will be flagged with a leaf symbol.

Looking ahead – Ways to keep the momentum going
Alan Peters gave a short introduction on the City's interest in continuing the CPAT group once the climate element is adopted, and some potential ideas for doing so. Following Alan's introduction, Emma Johnson, WSP, described examples of advisory groups from other Washington cities and counties that focus on climate change. Examples included:

- City of Bainbridge Island – Climate Change Advisory Committee
- City of Redmond – Environmental Sustainability Advisory Committee
- City of Port Townsend/Jefferson County – Climate Action Committee
- City of Pullman – Environmental Resilience Commission

Similar to the Camas Parks and Recreation Commission, these advisory committees are formed to advise the City on specific topics, such as GHG reduction, and key actions include annual progress

reports or work plans, GHG inventories, and developing or implementing a climate action plan. Members are typically appointed by each jurisdiction and include term limits. Members often include technical professionals with expertise in areas such as energy or climate science, as well as members of the public, and liaisons from government, agencies, and the business community. Emma also briefly described two examples of actions plans from the City of Redmond (Sustainability Action Plan) and Port of Vancouver (Climate Action Plan).

CPAT members provided the following feedback:

- The City of Vancouver has community engagement activities for climate topics. The City hosted a "climate pub" where residents could participate in trivia and a brainstorming session.
- Farmers markets could serve as a venue for future community engagement and education on climate action within Camas.
- Membership from NW Natural or Clark PUD on the advisory committee would add perspective from local utilities.
- The committee could collaborate with the library and serve as a standing committee for climate change or environmental sustainability.
- Members agreed that the formation of a climate focused advisory committee would be valuable to support City staff. If a climate action plan is explored, the advisory committee could help to encourage achieving goals associated with the plan. The advisory committee could also help staff apply policies from the climate element during development proposals and provide technical expertise during staff decisions.
- Members suggested that some immediate steps should be taken before presenting the idea to City Council. An initial step would be to identify how the advisory committee could support existing work or a future climate action plan.

Action items – GHG reduction & Resilience follow up measures

Dana Hellman, CAPA Strategies, reviewed a list of action items that could support the climate goals and policies, with a focus on actions that would improve community health and well-being. Dana also provided a list of actions based on the Vulnerability and Risk Assessment that was prepared by CAPA Strategies for Camas. The assessment focuses on the risk of extreme heat on outdoor recreation sites in Camas. One of Dana's recommendations includes adding language in CL-7.2 about "adaptive measures" such as short-term cooling amenities and community education/awareness building.

After Dana's overview of recommended action items, the group reviewed the current list of goals and policies to brainstorm additional ideas for action items. CPAT members shared the following feedback:

- There is an opportunity on private property to implement action items related to maintaining and expanding tree canopy.
- Friends of Trees is a nonprofit organization that helps private property owners plant trees. A partnership with this organization or similar organization could help homeowners in replacing dead or unhealthy trees.
- Action items could be developed specific to natural hazards and potential impacts such as

winter weather, erosion from heavy rains, snowplows, and downed trees.

- Proper pruning techniques for trees (e.g., removing tree suckers) should be encouraged, particularly when trees are covered with ice. The expertise of private property owners could be leveraged and shared within the community.
- Tree maintenance should be tailored to each tree species.
- Climate adaptive trees should be encouraged consistent with the Parks & Open Space Management Plan.
- Backup generators could be introduced at resiliency hubs.
- Permanent or temporary structures in the city could be identified for warming and cooling shelters. City Council has been discussing the potential need for emergency shelters.
- Action items should acknowledge the health aspects of impacts from natural hazards.

Next Steps

Sean reviewed next steps. The project team will review feedback from the meeting on action items and continue to revise the draft goals and policies for the climate element. Sean also mentioned that the Downtown Advisory Committee is currently reviewing the Downtown goals, policies, and design manual outline and the Community Advisory Committee will review all goals and policies in April. Other upcoming activities for the comprehensive plan update include finalizing the preferred alternative with City Council in April or May and community review of the draft comprehensive plan this summer.

Project staff thanked the committee for their attendance and adjourned the meeting at 6:30pm.

Our Camas 2045 - Advisory Committee Interest Form

The Community Advisory Committee (CAC) will support the City of Camas in the preparation of the Our Camas 2045 Comprehensive Plan and the Our Downtown Camas 2045 Subarea Plan. The City is seeking interested parties who represent a broad cross-section of community interests. CAC members will review and comment on work products, guide public outreach and engagement efforts, act as liaisons to specific constituencies or interest groups, help host public events, encourage community members to participate in the process, and act as champions of the ultimate Our Camas 2045 Vision, Our Camas 2045 Comprehensive Plan and the Our Downtown Camas 2045 Subarea Plan that emerge from this process.

Please Note: *Community Advisory Committee (CAC) members MUST be residents of the City of Camas, own or operate a business in the City of Camas, or represent a group or organization that operates within the City of Camas or otherwise serves Camas residents or businesses. The City may also use this form to appoint interested persons to the Climate Action Policy Team (CPAT) or Project Advisory Committee (PAC).*

The Community Advisory Committee Interest Form will be open through December 29, 2023.

---

1. **Name:**
2. **Email Address:**
3. **Phone Number:**
4. **Street Address:**
5. **City, State, Zip Code:**
6. **Do you live in the City of Camas?**
7. **How many years have you lived in the City of Camas?**
8. **Occupation:**
9. **If you are interested in serving to represent a particular business, community organization, or service provider in Camas, please identify what group you are representing:**

10. **Why are you interested in serving on the Community Advisory Committee?**

11. **Do you have any specific skills, knowledge, or expertise that you believe would contribute to the committee's work?**

12. **Describe any experience you have with community engagement or volunteer work:**

13. **The Comprehensive Plan includes eight elements that work together to achieve the community's vision. The City will also be working on a separate subarea plan for Downtown Camas. Please select your top areas of interest:**

    Community Character (new)
    Climate (new)
    Land Use
    Housing
    Natural Environment
    Transportation
    Public Facilities and Services
    Economic Development
    Downtown

14. **Can you commit to attending regular committee meetings and actively participating in the Our Camas 2045 process?**

Attach Resume (Optional)
Attach Letter of Interest (Optional)

Appendix H: Transportation System Plan, Volume 1

City of Camas

TRANSPORTATION SYSTEM PLAN

VOLUME 1

DRAFT OCTOBER 2026

ACKNOWLEDGMENTS

PROJECT ADVISORY COMMITTEE (PAC)

Steve Hogan, Mayor

Jon Daane, Citizen Representative

Joe Keller, Planning Commission

Jamie Howsley, Land Use Attorney

David Ripp, Port of Camas-Washougal

Jason Gibbens, WSDOT

Scott Collins, City of Washougal

Rebecca Kennedy, City of Vancouver

Ryan Lopossa, City of Vancouver

David Jardin, Clark County

Alan Peters, City of Camas

Robert Maul, City of Camas

Steve Wall, City of Camas

James Carothers, City of Camas

Allen Westersund, City of Camas

Reah Flisakowski, DKS Associates

Kevin Chewuk, DKS Associates

Laura Nowland, Camas School District

Jennifer Campos, RTC

Tayor Eidt, C-Tran

MAYOR AND CITY COUNCIL

Mayor Steve Hogan

Councilor Marilyn Boerke

Councilor Martin Elzingre

Councilor Mahsa Eshghi

Councilor Tim Hein

Councilor John Nohr

Councilor Jennifer Senescu

Councilor John Svilarich

PLANNING COMMISSION

Commissioner Troy Hull, Chair

Commissioner Geoerl Niles, Vice-Chair

Commissioner Joe Walsh

Commissioner Shawn High

Commissioner Paul Anderson

Commissioner Joe Keller

Commissioner Hannah Burak

PROJECT MANAGEMENT TEAM (PMT)

CITY OF CAMAS

James E Carothers, Engineering Manager/City Engineer, City of Camas

Scott Collins, Public Works Director, City of Camas

Alan Peters, Community Development Director, City of Camas

Robert Maul, Planning Manager, City of Camas

Allen Westersund, Engineer III, City of Camas

DKS ASSOCIATES

Reah Flisakowski, Senior Project Manager

Kevin Chewuk, Project Manager

Eileen Chai, Transportation Engineering Associate

FCS GROUP

Todd Chase, Project Manager

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CHAPTER 1.

Context for the Plan

This chapter introduces the City of Camas and describes the purpose of a Transportation System Plan (TSP) and how it was developed. The process involved a formal decision-making structure, community engagement, and a structured technical analysis.

INTRODUCTION

The City of Camas, incorporated in 1906, is located along the Columbia River in the hills of eastern Clark County. Camas is home to approximately 28,000 people and is a part of the Portland-Vancouver Metropolitan Area with a total population of approximately 2.4 million people.

Located just east of Vancouver and on the doorstep of the Columbia River Gorge, Camas is a short 30 to 40-minute drive from downtown Portland. This unique location offers diverse housing, employment and recreation opportunities. The city is home to several large, hi-tech manufacturing industries, a vibrant downtown, and many new and established neighborhoods.

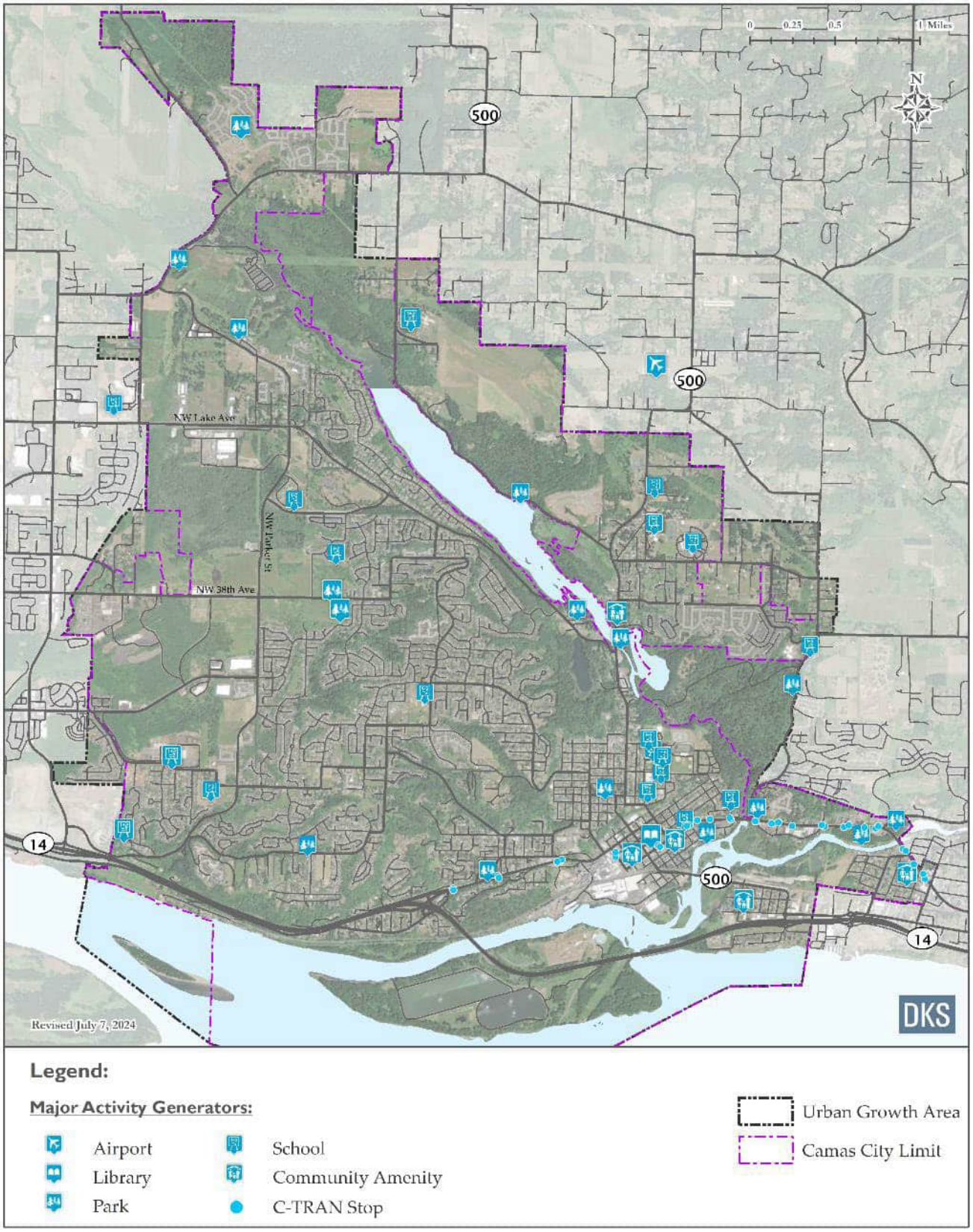
PLANNING AREA

The current City limits, shown in Figure 1, generally extends from north of NE Ingle Road and portions of NE 28th Street, to north of Lacamas Lake and NE 43rd Avenue-SE 15th Street to the Columbia River and from portions of NE Friberg-Strunk Street and east of SE 192nd Avenue to portions of SE Crown Road and Lechner Street. Beyond the current City limits, is the Urban Growth Area (UGA), also shown in Figure 1. The UGA is a land use planning tool designed to control urban expansion and promote the efficient use of land, public facilities, and services. Land inside the UGA is intended for urban development that is supported by urban services such as roads, water and sewer systems, parks, schools and fire and police protection. This boundary also supports 20-years' worth of population and employment growth, of which cities must plan for urban services within their designated UGA.

Camas is responsible for planning transportation infrastructure for all modes within its designated UGA, hereby referred to as "planning area", with the TSP being the City's tool for this effort. The City's planning area generally follows the current City limits, extending beyond that in a few locations, such as south of NE 28th Street and along portions of NW 38th Avenue, SE Payne Road, SE 15th Street and SE Crown Road (see Figure 1).

The City's planning area includes four distinct areas: 1) developed incorporated areas (i.e., in the existing City limits); 2) developed unincorporated areas; 3) undeveloped incorporated areas, such as the Northshore Subarea, which is planned for future urban development; and 4) undeveloped unincorporated areas. The TSP focuses on how to improve the existing transportation system for areas 1 and 2 noted above, and how to create a new system to serve future development in areas 3 and 4.

FIGURE 1: STUDY AREA AND KEY DESTINATIONS



OUR CAMAS 2045 COMPREHENSIVE PLAN

Our Camas 2045 is an update to the prior City of Camas comprehensive plan from 2016. It provides a roadmap for the future of the city and guides land use development and public facility investment decisions through 2045. Our Camas 2045 includes the latest land use for the City's planning area and incorporates the established visions and action plans for the recently completed North Shore subarea plan and Downtown subarea plan (i.e., Our Downtown Camas 2045) and provides the basis for the land use and growth assumptions that are planned for in the Camas TSP and its future 2045 travel forecasts.

PURPOSE OF THE TSP

The Camas TSP is a long-range plan to guide transportation investments within the City's planning area through the future horizon year of 2045. As the transportation element of the City's Comprehensive Plan, these transportation system improvements address current deficiencies and serve future local and regional needs, and align with the community's goals, objectives, and vision for the future. This TSP was developed through community and stakeholder input and is based on the City's transportation system needs, opportunities, and anticipated available funding. The State of Washington Growth Management Act (GMA) in RCW 36.70A.070 (6) requires the TSP to include:

- An inventory of transportation facilities and services.
- Adoption of multimodal levels of service standards for all locally owned arterials and active transportation facilities.
- A forecast of multimodal transportation for a minimum of 10 years including land use assumptions used in estimating travel (in this case, 25 years based on the adopted regional land-use plan).
- Identification of specific actions to bring transportation facilities and services to established multimodal levels of service.
- A list of transportation system needs to meet current and forecasted demand and implement the multimodal network.
- A finance plan that serves as the basis for the six-year transportation improvement program (TIP).

In compliance with requirements summarized above, the City of Camas created the TSP. This TSP will be used by the City to make strategic decisions about transportation system investments and will be instrumental in supporting grant applications to fund future projects, and ensuring projects are built in coordination with land use actions and future development.

SETTING DIRECTION FOR THE PLAN

A transportation vision, and set of goals, objectives, and performance measures (see Figure 2) were used to guide the project team in the development, evaluation, and prioritization of solutions that best fit the community and provided the basis for policies to support Plan implementation. They were established with guidance from the Project Advisory Committee (PAC).

Collectively, the transportation-related goals, policies, and evaluation criteria describe what the community wants the transportation system to do in the future, as summarized by a **vision statement**. A vision statement generally consists of an imaginative description of the desired condition in the future. It is important that the vision statement for transportation align with the community's core values.

Goals and objectives create manageable steppingstones through which the broad vision statement can be achieved. **Goals** are the first step down from the broader vision. They are broad statements that should focus on outcomes, describing a desired end state. Goals should be challenging, but not unreasonable.

Each goal is supported by more finite **policies**. In contrast to goals, policies should be specific and measurable. Where feasible, providing a targeted time period helps with objective prioritization and achievement. When developing policies, it is helpful to identify key issues or concerns that are related to the attainment of the goal.

The solutions recommended through the TSP must be consistent with the goals and policies. To accomplish this, **evaluation criteria** were developed based on the goals and policies. For the Camas TSP, they were used to inform the selection and prioritization of projects and policies for the plan by describing how well they support goal areas. The methodology for calculating the scores for each criterion can be found in Technical Memorandum #1b: Goals, Policies and Evaluation Criteria, included in the Appendix.

FIGURE 2: DIRECTION FOR THE PLAN



VISION FOR THE PLAN

The overall vision statement for the TSP is described below.

> IN 2040, RESIDENTS OF CAMAS CONTINUE TO APPRECIATE THEIR SAFE, DIVERSE, AND WELCOMING COMMUNITY AS A LIVABLE PLACE FOR PEOPLE OF ALL AGES. QUALITY PUBLIC FACILITIES, SERVICES, AND UTILITIES CONTRIBUTE TO THEIR HIGH QUALITY OF LIFE.

GOALS AND POLICIES FOR THE PLAN

The Camas TSP goals and policies are documented below, and are consistent with those in the 2045 City of Camas Comprehensive Plan (not in order of priority).

GOAL

TRANSPORTATION REVENUE

MAXIMIZE THE USE OF STATE AND FEDERAL FUNDS FOR TRANSPORTATION CAPITAL, OPERATING, SERVICE, AND DEMAND IMPROVEMENTS.

Policy a.	Maintain a capital improvement plan (CIP) that identifies construction and improvement priorities and funding.
Policy b.	Ensure that the transportation impact fee program responds to land use changes, supports connectivity, and requires new development to pay its proportionate share of needed capacity.
Policy c.	Support the Pavement Asset Management System and other maintenance programs to ensure cost -effective maintenance of transportation facilities and efficient use of public funds.
Policy d.	Develop equitable transportation impact fees to assess developers a fair-share contributions for any transportation improvements.
Policy e.	Prioritize transportation funding for multi -modal improvements that will enhance safety and access between infill areas, schools, and employment centers.
Policy f.	Focus transportation projects in economic development areas to act as catalysts for job growth.

GOAL

COMPLETE STREETS

STREETS WILL FUNCTION FOR ALL USERS OF ALL ABILITIES INCLUDING BICYCLISTS, PEDESTRIANS, TRANSIT USERS, AND MOTORISTS.

Policy a.	Implement the Transportation System Plan (TSP) to maintain the livability of Camas and guide decision-making for transportation-related projects, policies, and design. Ensure consistency between the TSP, the Parks, Recreation and Open Space Plan and the 6-year street plan.
Policy b.	Maintain the transportation system to enhance safety and efficiency for all users, facility aesthetics, access management measures and the overall integrity of the system.
Policy c.	Construct streets that are interconnected and avoid long cul-de-sacs or dead ends. Block lengths should be less than 1,000 feet. Include pedestrian and bicycle linkages in the construction of cul-de-sacs and other forms of dead-end streets. Existing dead-end streets should be retrofitted to provide bicycle and pedestrian linkages as practicable.
Policy d.	Develop and implement design standards that provide attractive streetscapes, encourage appropriate traffic volumes and speeds, and support multi-modal safety. Include enhanced roadway features such as roundabouts, decorative lighting, and landscaping in gateways and design overlay areas.
Policy e.	Minimize access to new development and redevelopment along City arterials and consolidate access points when spacing is insufficient.
Policy f.	Provide routes designed for active transportation to encourage mode shift for short trips. Route planning should seek shortcuts and other opportunities that provide advantages to active transportation users. Public investments should support active transportation routes such as street lighting, safe crosswalks, and protected bike lanes.
Policy g.	Coordinate with Camas School Dist rict to implement a safe routes to school program to encourage the use of alternative and active transportation.
Policy h.	Develop and implement Complete Streets design in al l new and retrofit street projects to support the use of alternative t ravel modes. Adopt engineering design standards nsistent with Complete Streets goals.
Policy i.	Increase wayfinding signage for outdoor destinations throughout the City.
Policy j.	Inventory current bicycle and pedestrian networks to identify gaps in route coverage. Support filling in network gaps as new development and redevelopment occurs to create a bicycle and pedestrian network that is safe, comfortable, and accessible to people of all ages and abilities.
Policy k.	Minimize cut and fill roadway design and, where feasible, minimize restructuring the natural contours of the land.
Policy l.	Encourage the inclusion of low impact development (LID) design features (e.g. rain gardens, grass pavers, pervious pavement) in the design of road surfaces.
Policy m.	Require LED l ights in new development and replace existing inventory that lack LED features.

GOAL
LOCAL AND REGIONAL TRANSIT

REGIONAL TRANSIT WILL PROVIDE SAFE, EFFICIENT, AND DEPENDABLE SERVICE TO THE CAMAS COMMUNITY.

Policy a.	Coordinate with local municipal ities, Washington Department of Transportation, adjacent counties, and C-TRAN to ensure that minimum roadway and multi -modal design standards are consistent.
Policy b.	Partner with C-Tran to advocate for and develop transit options that are safe, convenient, frequent, and accessible for Camas residents.

GOAL
TRAFFIC SAFETY

DESIGN AND CONSTRUCT SAFE TRANSPORTATION FACILITIES THAT MEET APPLICABLE REQUIREMENTS.

Policy a.	Encourage traffic safety through education, enforcement, and engineering. Use traffic calming, traffic diversion, and other available tools such as landscaping, trees, and art to ensure a comfortable and safe environment for all users.
Policy b.	Provide adequate access for emergency vehicles throughout the city.
Policy c.	Develop safe pedestrian and bicycle routes between residential areas, schools, and public facilities.
Policy d.	Require new development to implement designs standards using the Neighborhood Traffic Management Plan.
Policy e.	Identify high accident areas and implement specific measures to reduce accident occurrences.

GOAL
TRANSPORTATION DEMAND MANAGEMENT

TRANSPORTATION PLANNING WILL ACHIEVE THE EFFICIENT USE OF TRANSPORTATION INFRASTRUCTURE, INCREASE ITS PERSON CARRYING CAPACITY, AND ACCOMMODATE AND FACILITATE FUTURE GROWTH CONSISTENT WITH LAND USE OBJECTIVES.

Policy a.	Require large employers to implement a commute trip reduction program for employees, as mandated by state law.
Policy b.	Support intergovernmental development review.
Policy c.	Support the Regional Transportation Council (RTC) with funding and staff participation to the extent possible.

GOAL
CONCURRENCY AND LEVEL OF SERVICE

THE CITY WILL MAINTAIN THE ADOPTED LOS STANDARDS FOR ALL ARTERIAL STREETS AND TRANSIT ROUTES.

Policy a.	Encourage growth in areas with existing or planned infrastructure capacity.
Policy b.	Require new development to demonstrate that adequate person trips are available, or that multi-modal improvements to the transportation system will be made to accommodate the impacts concurrent with the development.
Policy c.	Utilize traffic impact fee studies, development traffic impact analyses, and corridor studies to identify deficiencies and plan improvements to maintain or improve LOS standards.
Policy d.	Take the following actions (in no priority order) if the probable funding falls short of meeting identified needs: 1) delay development until programs, facilities, or services can be funded; 2) obtain the revenue needed or revise the transportation plan to reflect known financial resources; or 3) change the transportation LOS standard, which is a last resort measure.

PERFORMANCE BASED PLANNING PROCESS

The TSP utilizes a performance-based planning process. The community vision is distilled into measurable goals and supporting policies. These goals and policies were used to identify evaluation criteria to help evaluate potential projects to enhance transportation system performance, and to measure long-term alignment between Camas's transportation system and the community's vision, goals, and policies. The plan process is illustrated below in Figure 3, along with the key questions that were considered during three development stages of the TSP.

FIGURE 3: PERFORMANCE BASED PLANNING PROCESS



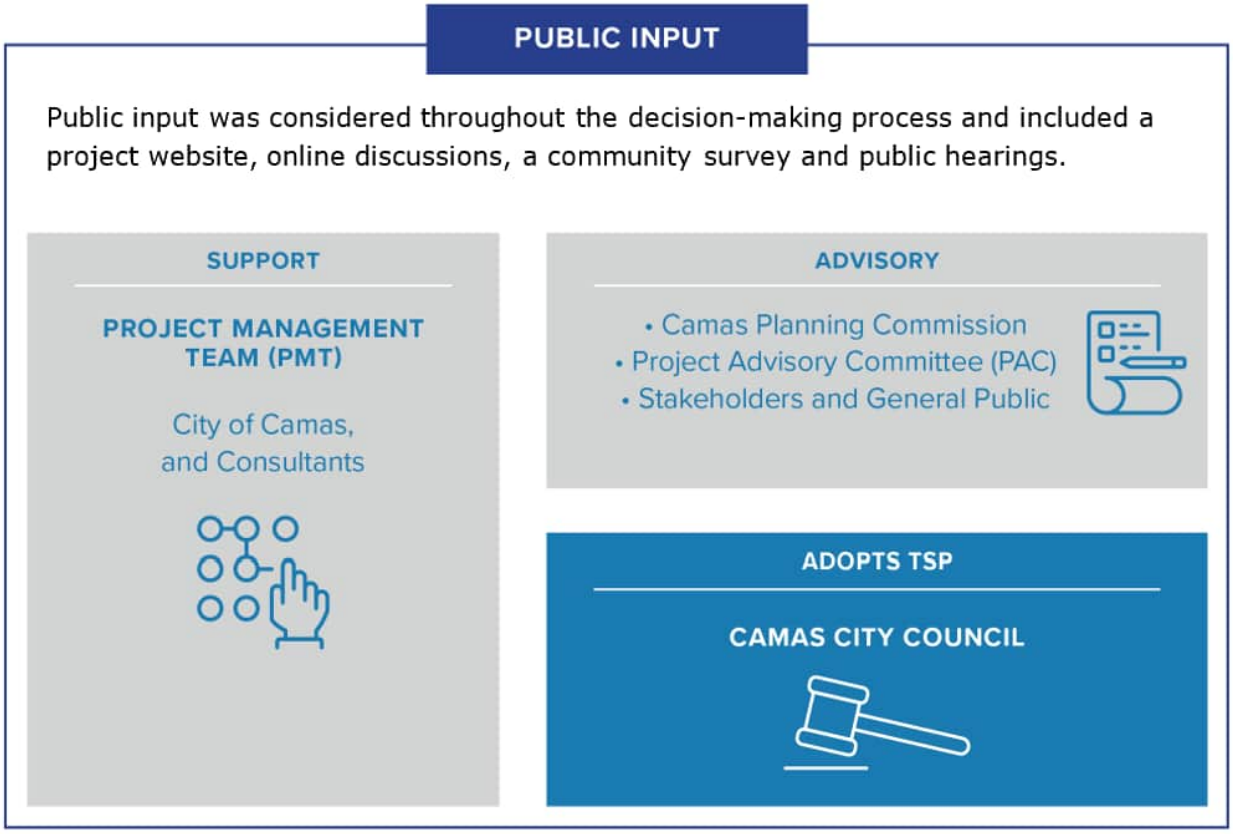
DECISION MAKING STRUCTURE

The decision-making structure for this TSP was developed to establish clear roles and responsibilities throughout the project. The decision-making structure (Figure 4) established a framework for broad-based community engagement for the project.

As the TSP was developed, the Project Management Team (PMT) worked with a Project Advisory Committee (PAC) that included local business representatives, emergency service and transit providers, and agency staff members from the City of Camas, City of Vancouver, City of Washougal, Clark County, C-Tran, Southwest Washington Regional Transportation Council (RTC) and the Washington State Department of Transportation (WSDOT). The PAC was formed to provide community-based recommendations, and informed and guided the plan by reviewing draft deliverables, providing insight into community perspectives, commenting on technical and regulatory issues, and providing recommendations for the TSP.

The City Council and Planning Commission for Camas were briefed during the development of this plan throughout the process. The PMT made recommendations to the City Council based on technical analysis and community input. The City Council made all final decisions pertaining to this TSP, including its adoption.

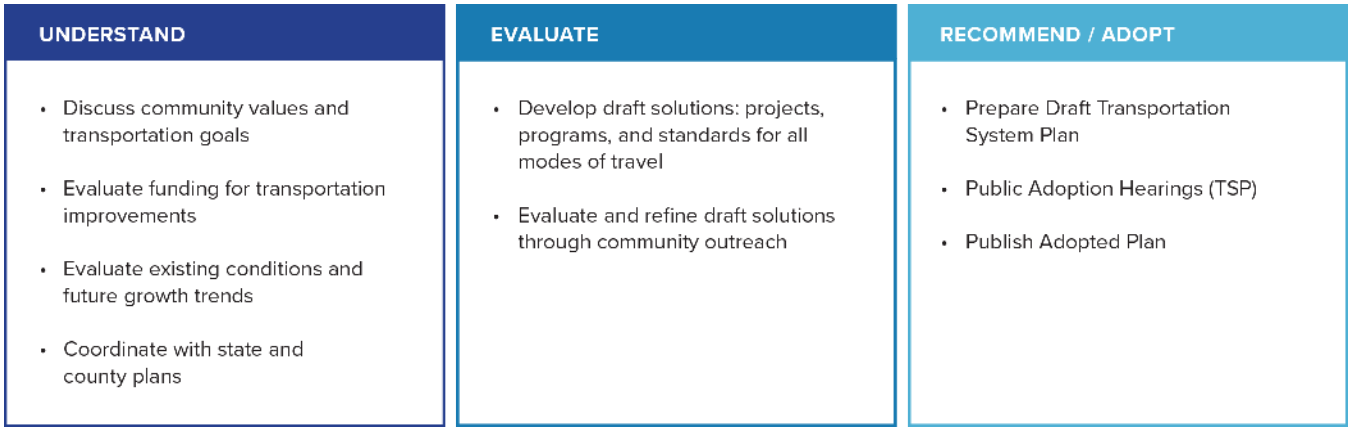
FIGURE 4: CAMAS TSP ROLES AND RESPONSIBILITIES



TECHNICAL DEVELOPMENT

Figure 5 illustrates the technical tasks involved in creating the TSP. These are categorized in three major stages: the first to understand system needs and constraints, the second to develop solutions, and the third to prepare and adopt the plan. Community input guided the TSP development through all stages.

FIGURE 5: CAMAS TSP DEVELOPMENT TECHNICAL TASKS



CHAPTER 2.

Camas Transportation System Today & Tomorrow

This chapter describes the transportation system as it exists and operates today and in the future. The assessment is used to identify community transportation needs and determine where the transportation system can be improved to better accommodate them. Needs were determined based on a comprehensive multimodal existing conditions analysis and projecting future conditions through the planning horizon (2045) based on assumed growth in households and employment, and the transportation standards from Chapter 3.

FACTORS IMPACTING TRAVEL DECISIONS

Travelers often weigh a variety of factors when deciding how to commute to or from their destination. Whether the trip will be via motor vehicle, walking, bicycle, public transportation, scooter, or other mode, the choice is often a balance between ease and convenience of travel, travel cost, and travel time.

LAND USE AND KEY DESTINATIONS

Land use is a key component of transportation system planning. Where people live and where they go to work, shop, or access services and the distance between these key destinations has a big impact on how they get around and the demands they place on the transportation system.

Many trips also occur between community amenities within the City's planning area, including parks, civic (e.g., schools, libraries, community centers), essential retail and services (e.g., grocery stores, pharmacies), and medical uses. These amenities are shown earlier in Figure 1. Most homes are located to the south of Lacamas Lake, with larger employment areas Downtown (central), and at the west end of the city. Schools are located throughout the city and most civic buildings are near Downtown. The city owns and maintains 16 parks; the majority — in number and in acreage— are located in the southern half of the city. Shopping and entertainment opportunities are generally found in the Downtown, and the southeastern part of the city. Future community amenities will also likely be built as development occurs in the Grass Valley and North Shore areas.

Those destined for a park or school generally have a higher likelihood to walk or bicycle than those going to work or shopping. The distance of that destination also plays a role in mode choice. Trips that are shorter generally present a better opportunity to walk or bicycle, and longer distance trips more often are conducive to transit or motor vehicle modes. Residents in the City's planning area who work outside of it (as well as people who work in the City's planning area but live elsewhere) are likely to commute by motor vehicle due to travel distance, commute time, and/or lack of adequate facilities. However, some commuters may choose bicycling or transit if the regional transportation system offers convenient and comfortable biking facilities or transit services between destinations.

QUALITY AND AVAILABILITY OF FACILITIES

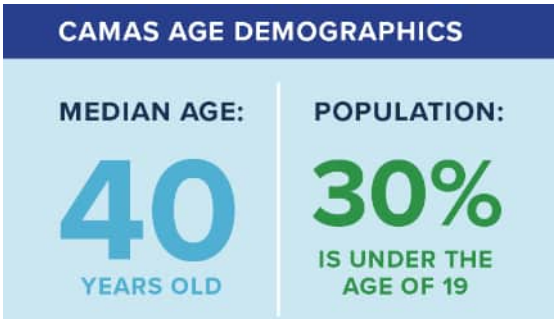
The availability of sidewalks, shared-use paths, curb ramps to provide wheelchair access, crosswalks, and bicycle facilities increases the comfort and access of those walking and biking. The lack of or poor quality of these facilities, particularly along or across higher volume or higher speed roadways, discourages people from utilizing non-motorized vehicle modes of transportation.

For transit, the distance to bus stops, frequency of service, route coverage, connections to other transportation modes, and amenities at stops are some of the factors that play a role in a user's decision to utilize it.

DEMOGRAPHICS

As shown in Table 1 and Figure 6, residents of Camas have a median age of 40, with about 30 percent of all residents within the school age range (i.e., under the age of 19) and about 13 percent of the population over the age of 65. Both age demographics are slightly different than those of the region and state, with the city accounting for 4 to 5 percent more school aged residents and 3 percent fewer residents aged over 65.

FIGURE 6: KEY DEMOGRAPHICS



As growth continues in the city, particularly in the North Shore subarea, it will likely continue to attract a high share of younger families. Overall, the city will continue to see people of all ages and abilities walking, biking, and using transit. It will also continue to see a higher share of school related trips when compared to other cities in the region given the significant share of younger families.

TABLE 1: CAMAS AGE DEMOGRAPHICS

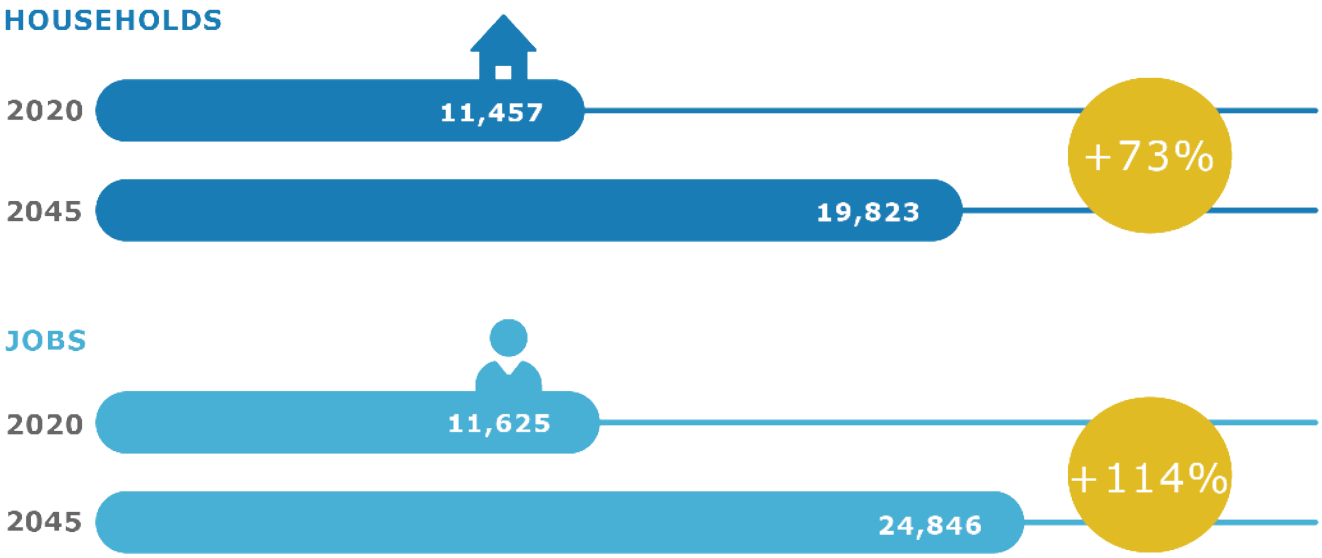
AGE	CAMAS	CLARK COUNTY	WASHINGTON
UNDER 19 YEARS	30%	25%	24%
20-34 YEARS	14%	20%	22%
35-49 YEARS	22%	20%	20%
50-64 YEARS	21%	19%	18%
65 YEARS AND OLDER	13%	16%	16%
MEDIAN AGE	**40.3**	**38.8**	**38.0**

POPULATION AND EMPLOYMENT GROWTH

As growth occurs to the year 2045, the demands on the City's transportation system will be influenced by changes in population, housing, and employment. These changes in travel demands will require better ways to manage the system, more choices for getting around, and targeted improvements to make the system safer and more efficient.

The Camas planning area is growing, and it is estimated that about 8,367 more households will live here by 2045, for a total of 19,823 (see Figure 7)[1]. There are currently about 11,625 jobs in Camas's planning area, and that total is estimated to increase to 24,846, with 13,221 more people working in the City's planning area by 2045 (see Figure 7)[2].

FIGURE 7. CAMAS PLANNING AREA HOUSEHOLD AND JOB GROWTH TRENDS



Source: RTC 2020 and 2045 Travel Demand Models; based on the Camas planning area.

TRAVEL DEMANDS AND CHARACTERISTICS

The number of people who choose to walk, bike, ride transit, or drive along with the distances they travel is important for assessing how well existing transportation facilities serve the needs of users. Available data on travel demand, travel mode choice, and trip length are used to better understand travel behavior in the community and inform the needs analysis for the transportation system. This data is largely derived from the Southwest Washington Regional Transportation Council (RTC) Travel Demand Model and the US Census Bureau. The following sections provide a summary of travel demands and characteristics in the City's planning area.

[1] These locations are based on boundaries approximated by the model TAZ boundaries and may not match current and future city limits; This analysis is consistent with City of Camas comprehensive plan (i.e., Our Camas 2045), which includes the latest land use for the City's planning area and incorporates the established visions and action plans for the recently completed North Shore subarea plan and Downtown subarea plan (i.e., Our Downtown Camas 2045).

[2] Ibid

DAILY PERSON TRIPS

The increase in the number of residents and jobs in the Camas planning area increases the overall number of person trips generated. Table 2 summarizes the total person trips (i.e., drive, walk, bike and transit trips) during an average weekday in the Camas planning area for year 2020 and 2045. The transportation network in the planning area accommodates over 123,000 person trips during an average weekday as of 2020, and that number is estimated to increase by over 127,000 through 2045, to an estimated 250,964 daily person trips if the land develops according to the land use assumptions during an average weekday. Of these daily person trips in 2020, over 11,000 were walk, bike, or transit trips, and that amount is expected to increase by nearly 102 percent through 2045, to an estimated 23,981 daily trips. This is representative of the increase in jobs available in the planning area, and corresponding increase in retail or other destinations in closer proximity to households. Drive trips (i.e., single occupant vehicle or shared rides) are expected to increase by over 115,000 through 2045 during an average weekday, which represents a slightly higher growth rate than walk, bike or transit trips, at 104 percent.

TABLE 2: PERSON TRIPS IN CAMAS PLANNING AREA

AVERAGE WEEKDAY PERSON TRIPS BY MODE	2020 DAILY PERSON TRIPS	2045 DAILY PERSON TRIPS	DAILY GROWTH (2020-2045)	DAILY GROWTH RATE (2020-2045)
DRIVE TRIPS	111,388	226,982	115,595	104%
WALK/BIKE TRIPS	10,175	19,006	8,831	87%
TRANSIT TRIPS	1,701	4,975	3,274	193%
TOTAL PERSON TRIPS	**123,264**	**250,964**	**127,700**	**104%**
TOTAL WALK, BIKE, TRANSIT TRIPS	**11,876**	**23,981**	**12,105**	**102%**

Source: 2020 and 2045 RTC travel demand models.

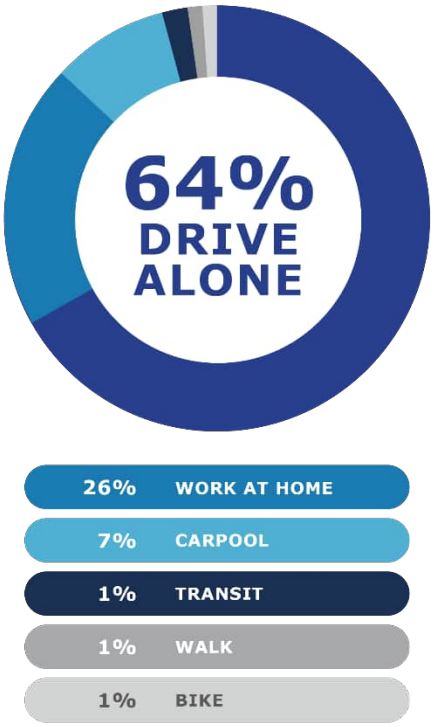
COMMUTER TRIPS

Much of the traffic in the Camas planning area, especially during the more congested weekday peak periods, is related to employment. Residents in the Camas planning area who are employed overwhelmingly commute to work outside of the planning area (87 percent), while jobs in the planning area are overwhelmingly filled by people who live outside of the planning area (84 percent)[3].

On average, almost 64 percent of employed residents in the Camas planning area commute to work using single-occupant motor vehicles. About 7 percent of residents carpool to work and the remaining 29 percent work from home, walk, bike, take transit, or use some other means of travel (see Figure 8).

About 26 percent of employed residents in the Camas planning area worked from home, which represents a 15 percent increase in the past 10 years. It seems likely that a higher percentage of workers will continue teleworking, at least part time. Any increase in the remote work share will change the demand on streets, including when and how they travel.

FIGURE 8: CAMAS PLANNING AREA COMMUTER MODE SHARE



Source: US Census Bureau, 2024 American Community Survey

QUALITY AND AVAILABILITY OF FACILITIES

To address changing transportation needs within the City's planning area though 2045, the existing and future travel conditions must be considered. The transportation system review documented the existing motor vehicle, pedestrian, bicycle and transit infrastructure. It also identified shortfalls and limitations regarding how people can travel within the City (such as lack of bike lanes or sidewalks). Solutions are identified in Chapter 4 for transportation infrastructure that is determined to not maintain acceptable service levels for residents.

STREET NETWORK

Camas streets are well connected and generally follow a grid pattern in the downtown area and nearby neighborhoods. However, the streets in the newer neighborhoods outside of these areas are more disconnected, limited at times by the topography. The major transportation routes through Camas include SR 14, SR 500, as well as a few key City roadways. SR 14 runs east-west through Camas parallel to the Columbia River. SR 14 connects Camas to Vancouver, Interstate 5 and Interstate 205 to the west, and Camas to Washougal to the east. SR 500 runs north-south through

[3] US Census Bureau, OnTheMap. Home/Work Distance/Direction Analysis, 2023.

the city connecting SR 14 south of downtown with NE Fourth Plain Boulevard north of the City. In the downtown area, it runs along portions of SE 6th Avenue, NE Dallas Street, NE 3rd Avenue and NE Garfield Street.

A few key city roadways that provide north-south access are NW Brady Road, NW Parker Street, Division Street, NW Fargo Street, NW Astor Street, NW Sierra Drive, and SE Crown Road. NW Brady Road and NW Parker Street provide a connection on the west side of Camas, Division Street, NW Fargo Street, NW Astor Street and NW Sierra Drive provide connections through the central neighborhoods of Camas, and SE Crown Road provides a connection on the east side of Camas. Key east-west city roadways include NW 6th Avenue, NE 3rd Avenue, NW Pacific Rim Boulevard, NW 38th Avenue, NW Lake Road, and NE Goodwin Road, with NW 6th Avenue and NE 3rd Avenue towards the south end of the city, NW Pacific Rim Boulevard and NW 38th Avenue centered in the middle, and NW Lake Road and NE Goodwin Road in the north end of the city.

STREET NETWORK PERFORMANCE ASSESSMENT

Congestion and safety for all modes was reviewed at intersections and streets in the City's planning area. This assessment shows how safe and efficient the street system is and provides information to identify needed improvements for the TSP.

Street Network Congestion

This assessment identified locations on the roadway network that operate above thresholds for congestion under current and future conditions. These are locations where motorists experience significant delay. These thresholds, identified in Chapter 3, provide a metric for assessing the impacts of new development on the transportation system and for identifying where capacity improvements may be needed. They are the basis for requiring improvements needed to sustain the transportation system as growth and development occur.

Figure 9 displays the results of the congestion analysis. The displayed conditions assume only transportation improvements to the current street network with secured funding through 2045. As shown, several intersections are expected to be congested by 2045 during the weekday p.m. peak hour. This includes several intersections along NW-NE 6th Avenue, which is expected to see a high amount of growth through 2045 as a primary connection between Downtown Camas and SR 14, and several intersections along NE Goodwin Road, NE 28th Street and NW Lake Road at the north end of the planning area where high growth is also expected through 2045.

The TSP includes conceptual intersection enhancements, and locations of future streets that will help to provide additional travel routes through the planning area and alleviate some of the local traffic from these major streets.

Most new Local streets will be built by new private development. When a private development project is approved, the builder or developer is required to provide a street network that complies with the standards included in Chapter 3. The connectivity standards require streets to be provided at a minimum spacing of 600 feet in most cases. These Local streets occur at more frequent intervals and are spaced closer than the larger streets (i.e., Arterial or Collector streets).

Street Network Safety

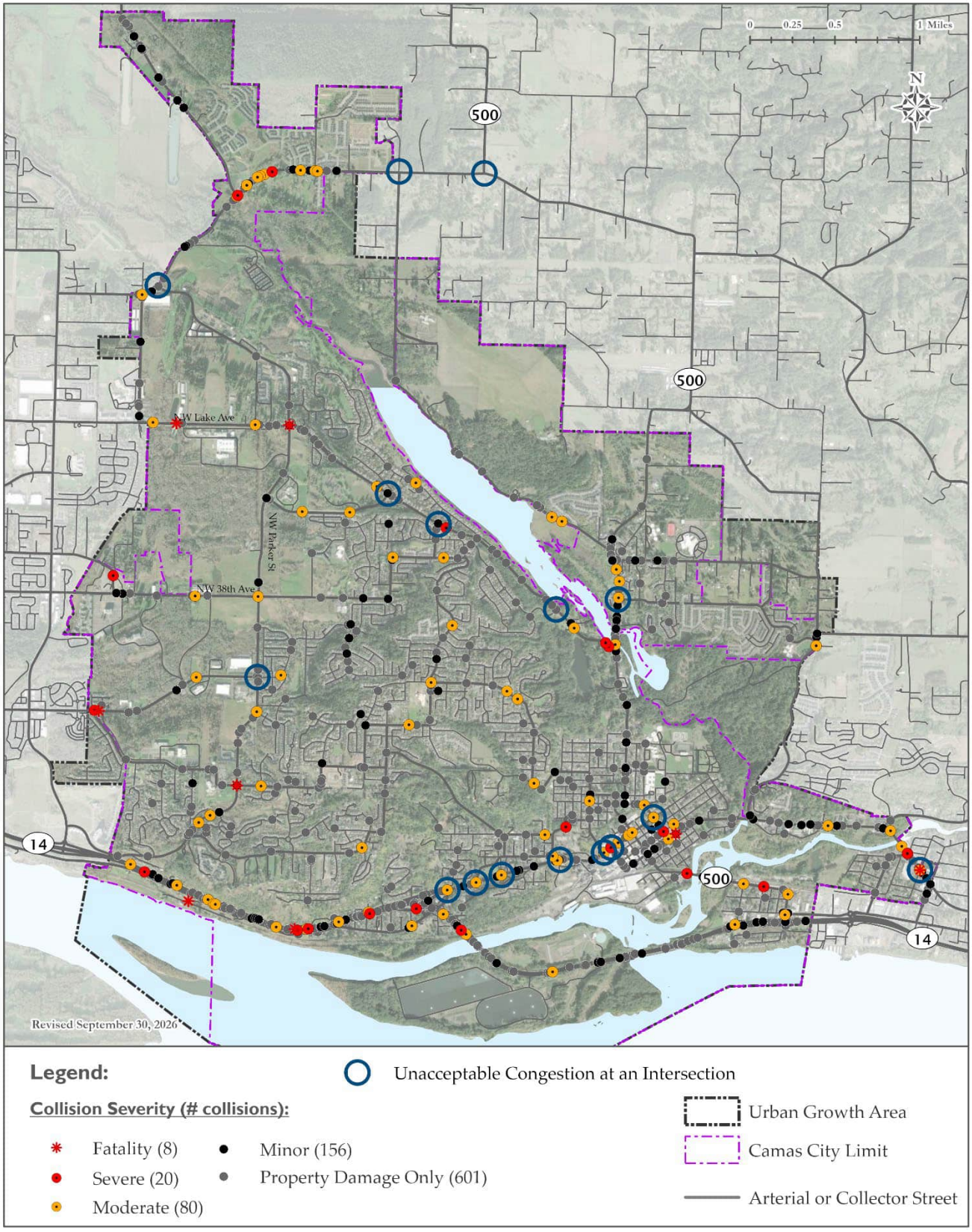
This assessment monitors the safety of travel in the planning area. It was used to track collision data over a 5-year period to provide trends related to total vehicle, pedestrian, and bicyclist collisions, fatal and severe injury collisions and total fatalities and severe injuries. Figure 9 shows data for the 5-year period, with 880 collisions occurring in the City's planning area. Of these collisions, 14 involved a pedestrian and 12 involved a bicyclist.

The pedestrian collisions occurred most frequently downtown (five crashes involving a pedestrian), and along NE 3rd Avenue between NE 4th Street and NE Weir Street (two crashes involving a pedestrian). Pedestrians sustained severe injuries in three crashes, one of which resulted in a death: at the NE 3rd Avenue / NE 4th Street, NE 3rd Avenue / NE Weir Street, and the SR 500 / NE 4th Avenue intersections. Moderate injuries to pedestrians were sustained in six of the crashes.

The majority of bicycle collisions occurred at intersections, with one at a traffic signal and six at stop-controlled locations. A cyclist sustained moderate injuries in six of the crashes. The bicycle-involved collisions occurred most often along NE 3rd Avenue between NE Sumner Court and NE Weir Street (three collisions involving a bicycle) and along SR 500 (NE Everett Street) between NE 38th Avenue and NW Lake Road (two collisions involving a bicycle).

In addition, a safety analysis was evaluated for streets in the planning area. This included an analysis of collision rates at intersections. This analysis identified the NE Ingle Road intersection with NE 28th Street as having a high collision rate, although this intersection has since been improved to include a traffic signal.

FIGURE 9: STREET NETWORK CONGESTION AND SAFETY



WALKING NETWORK

Walking supports healthy lifestyles, is an easy and economical way to travel, and is well suited for people of all ages and abilities. In this plan, "walking" and "pedestrian" are terms that include people who walk independently or use canes, wheelchairs, other walking aids, or strollers. Approximately one percent of commuters in the city walk to work, with one percent utilizing public transportation, which often includes walking at the beginning or end of the trip[4]. In addition to the work commute trips, walking trips are made to and from recreational areas, shopping areas, schools, and other key destinations in the City's planning area. Continuous and direct sidewalk connections to all key destinations and along all streets, in addition to safe crossing opportunities along major roadways, are essential to encourage walking and transit use.

PEDESTRIAN FACILITY GAPS

An inventory of the walking network in the City's planning area is provided in Technical Memorandum #2: Existing Conditions Analysis in TSP Volume 2. The pedestrian network is relatively complete within the current City limits, with most residential development having a full sidewalk system with relatively few gaps. A large part of downtown Camas was developed prior to 1950, a time in which sidewalks were incorporated into the design of neighborhoods and streets. Although most areas incorporated into Camas over the following decades have sidewalk coverage, a few areas do not have complete sidewalks on one side of the street, or even on both sides. These gaps are most significant in southwest, southeast, and northeast Camas, and on roadway segments outside the city limits.

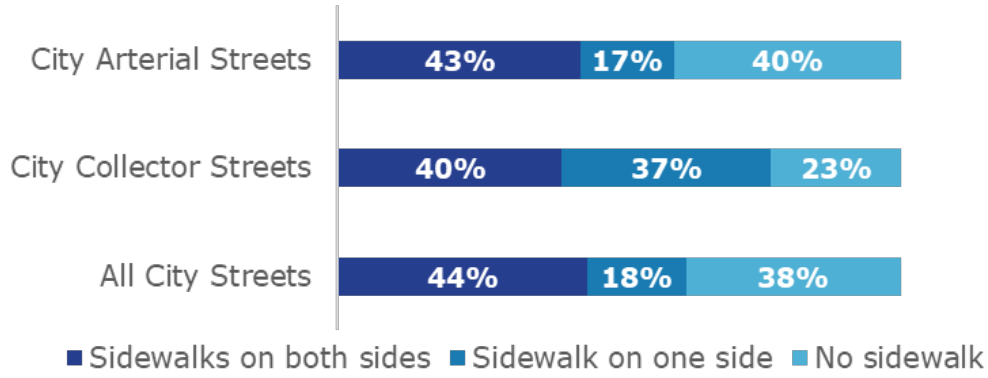
Many intersections in older parts of the city also lack ADA-compliant ramps, which provide important connections between sidewalks, making it easier to cross streets and handle the vertical drop at curbs. However, the city has been recently installing new curb ramps in many of these locations. The presence of curb ramps is fairly consistent along streets in downtown Camas, and in the newer neighborhoods in the city.

About 38 percent of street miles (including City arterial, collector and local streets) lack sidewalk coverage along one or both sides (see Figure 10). These gaps are more common along arterial streets than collector streets, at 40 and 23 percent of the street miles with no sidewalk on either side, respectively. These numbers do not incorporate off-street shared-use paths that may run alongside some roadways.

The TSP includes projects to complete the sidewalk gaps or improve existing sidewalk corridors along streets within the planning area, and many of which will be completed with new development (see Chapter 4).

[4] US Census Bureau, 2024 American Community Survey.

FIGURE 10: STREET MILES WITH SIDEWALKS WITHIN CAMAS



PEDESTRIAN LEVEL OF TRAFFIC STRESS EVALUATION

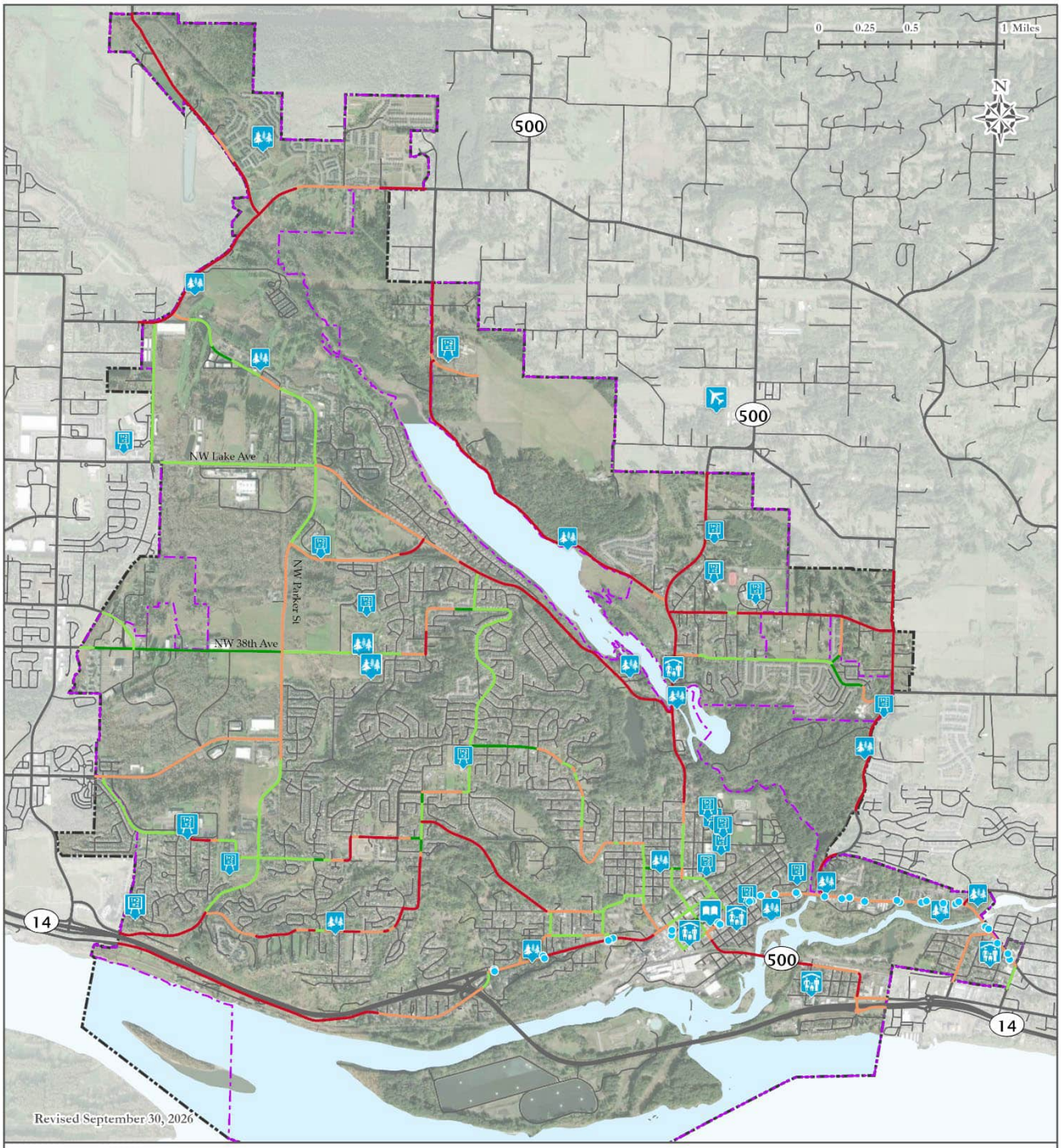
The pedestrian level of traffic stress (LTS) evaluation provides a metric to understand a multimodal user's perception of the safety and comfort of the transportation network. This method was used to understand key gaps and barriers to walking to be addressed through targeted improvements.

The LTS evaluation generates a ranking (i.e., low, moderate, high, or extreme stress) of the relative safety and comfort of a segment or intersection for pedestrians based on roadway and intersection characteristics (e.g., land use context, number of lanes, travel speed and volume, intersection control, type and width of buffer, and the presence and condition of any bicycle or pedestrian facilities). The LTS rating scale recognizes that as vehicle speeds and volumes increase, enhanced pedestrian facilities are needed to maintain a system that is accessible and comfortable for all users.

Results of the pedestrian LTS evaluation without the planned TSP projects on collector and arterial streets are summarized in Figure 11. A pedestrian walking along roughly 46 percent of these streets within the City's planning area will experience a low or moderate level of stress (i.e., LTS 1 or 2). Extreme or high level of stress (i.e., LTS 3 or 4) is experienced along 54 percent of these streets, mainly those with the highest speeds and traffic volumes or those located in high growth areas (i.e., household or employment growth) towards the edges of the city. The pedestrian network in these areas is largely unimproved due to the rural nature of the surrounding land use, but these streets are important for pedestrian travel, so this TSP places a high priority for improvement projects along them.

As redevelopment and frontage improvements occur through 2045, streets will be built to align with the standards outlined in Chapter 3 of this TSP. These standards require high-quality facilities, and an emphasis on safe, convenient, and comfortable travel in alignment with the multimodal level of traffic stress targets outlined in Chapter 3 to contribute towards a network wide lower stress pedestrian experience.

FIGURE 11: PEDESTRIAN LEVEL OF TRAFFIC STRESS



BIKING NETWORK

Bicycling is important for both transportation and recreation in the Camas planning area. This includes people who bike to work and school, recreation, or running errands. Riding bicycles also plays a key role in the transportation system's ability to support healthy and active lifestyles and provide a viable alternative to the automobile. While walking tends to be a competitive choice for trips under half a mile, bicycling tends to be suited for longer trips of three miles or longer.

This TSP includes projects to provide continuous bicycle connections between all key destinations that are essential for safe and attractive non-motorized travel options. It includes bicycle infrastructure that appeals to a wider range of people, both in age and ability. Many people want to bike, but they find riding near traffic in standard bike lanes stressful and unpleasant. This TSP includes a bicycle network of streets with facility standards designed to minimize interactions between people on bikes and car traffic (see Chapter 3 for more information). The network is designed so that everyone is within a quarter mile of one.

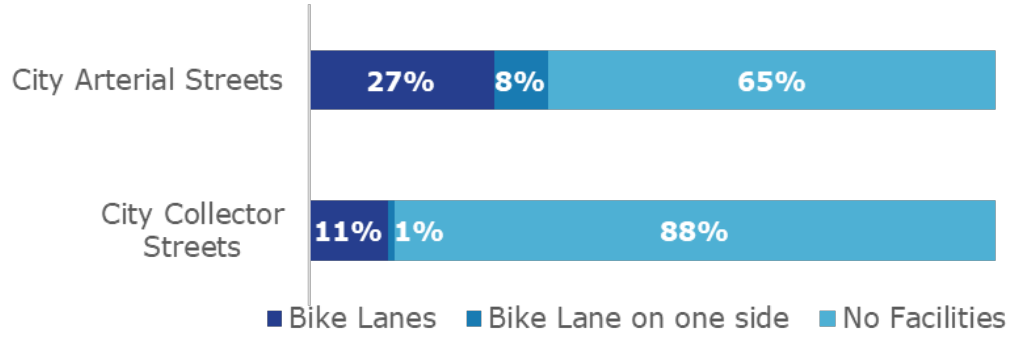
BICYCLE FACILITY GAPS

An inventory of the bicycle network in the City's planning area is provided in Technical Memorandum #2: Existing Conditions Analysis in TSP Volume 2. Significant segments of continuous bicycle lanes exist along portions of NW Lake Road, NW 38th Avenue, NW Parker Street, NW Friberg-Strunk Street, and SR 500, and paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout the residential neighborhoods.

Figure 12 shows that about 65 percent of City arterial street miles and 88 percent of City collector street miles lack bicycle facilities (bike lanes or shoulder bikeways). These gaps are more common along collector streets than arterial streets, at 89 and 73 percent of the street miles with no facilities on one or both sides, respectively. These numbers do not incorporate off-street shared-use paths that may run alongside some roadways.

The TSP includes projects to complete the bikeway gaps or improve existing bike facilities along streets within the planning area, and many of which will be completed with new development (see Chapter 4).

FIGURE 12: STREET MILES WITH BIKE FACILITIES WITHIN CAMAS



BICYCLE LEVEL OF TRAFFIC STRESS EVALUATION

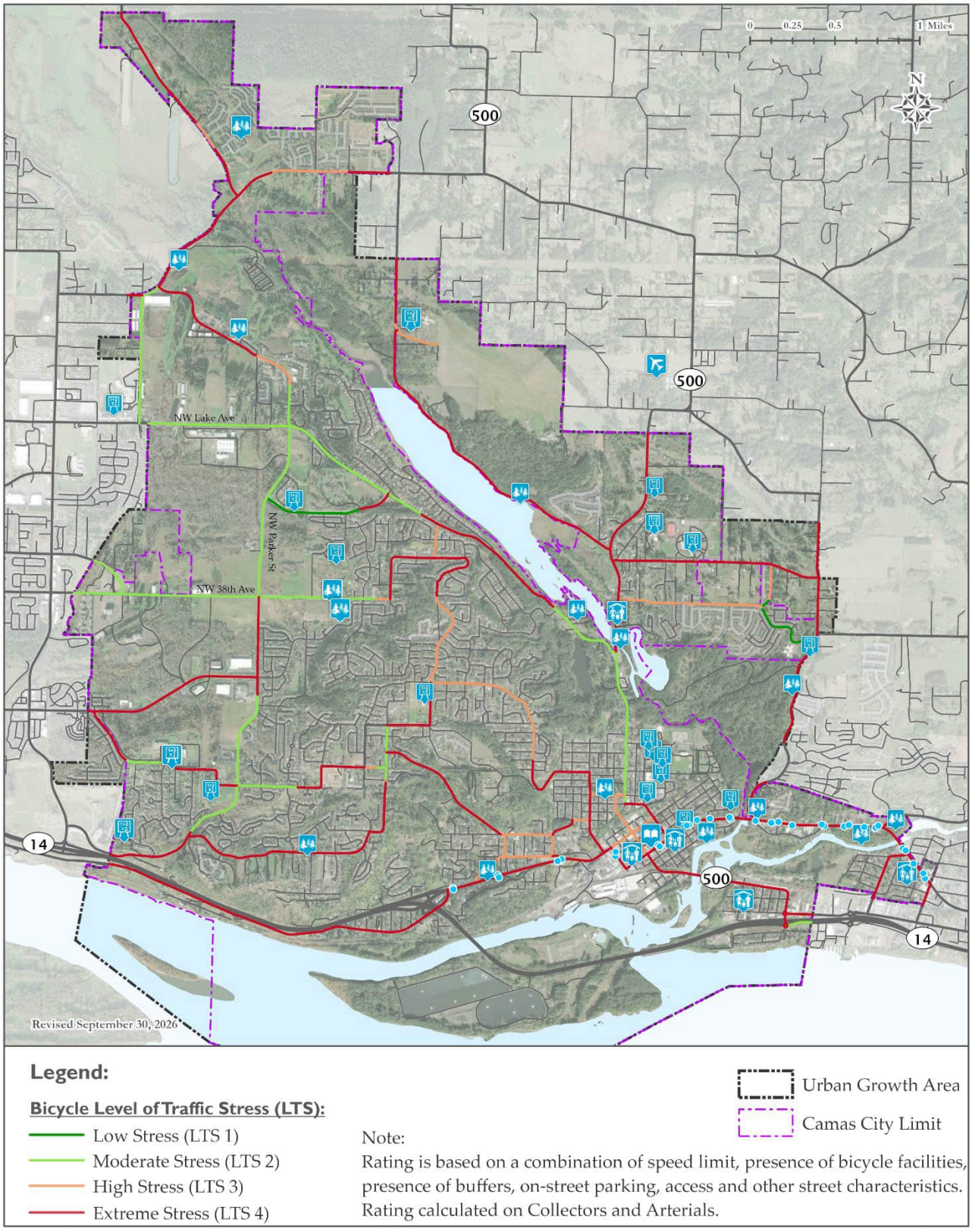
The bicycle level of traffic stress (LTS) evaluation provides a metric to understand a cyclist's perception of the safety and comfort of the transportation network. This method was used to understand key gaps and barriers to biking to be addressed through targeted improvements.

The LTS evaluation generates a ranking (i.e., low, moderate, high, or extreme stress) of the relative safety and comfort of a segment or intersection for bicyclists based on roadway and intersection characteristics (e.g., land use context, number of lanes, travel speed and volume, intersection control, type and width of buffer, and the presence and condition of any bicycle or pedestrian facilities). The LTS rating scale recognizes that as vehicle speeds and volumes increase, enhanced bicycle facilities are needed to maintain a system that is accessible and comfortable for all users.

Results of the bicycle LTS evaluation without the planned TSP projects on collector and arterial streets are summarized in Figure 13. A bicyclist riding along roughly 35 percent of these streets within the City's planning area will experience a low or moderate level of stress (i.e., LTS 1 or 2). This is generally representative of the many low volume and speed local streets, which are reasonably comfortable for bicycling today. In contrast, an extreme or high level of stress (i.e., LTS 3 or 4) is experienced along 65 percent of these streets, mainly those with the highest speeds and traffic volumes and lack of separated bicycle facilities. This includes portions of NW 6th Avenue, NE 3rd Avenue, and SR 500. These streets are important for bicycle travel, so this TSP places a high priority for improvement projects along them.

As redevelopment and frontage improvements occur through 2045, streets will be built to align with the standards outlined in Chapter 3. These standards require high-quality facilities, and an emphasis on safe, convenient, and comfortable travel, and align with the multimodal level of traffic stress targets outlined in Chapter 3 to contribute towards a network wide lower stress bicycle experience.

FIGURE 13: BICYCLE NETWORK ASSESSMENT



TRANSIT

C-TRAN provides transit service in Camas via one fixed bus route connecting the City with Vancouver and Washougal. Transit riders can transfer to other C-TRAN routes at the Fisher's Landing Transit Center in Vancouver. Figure 14 shows the route in Camas.

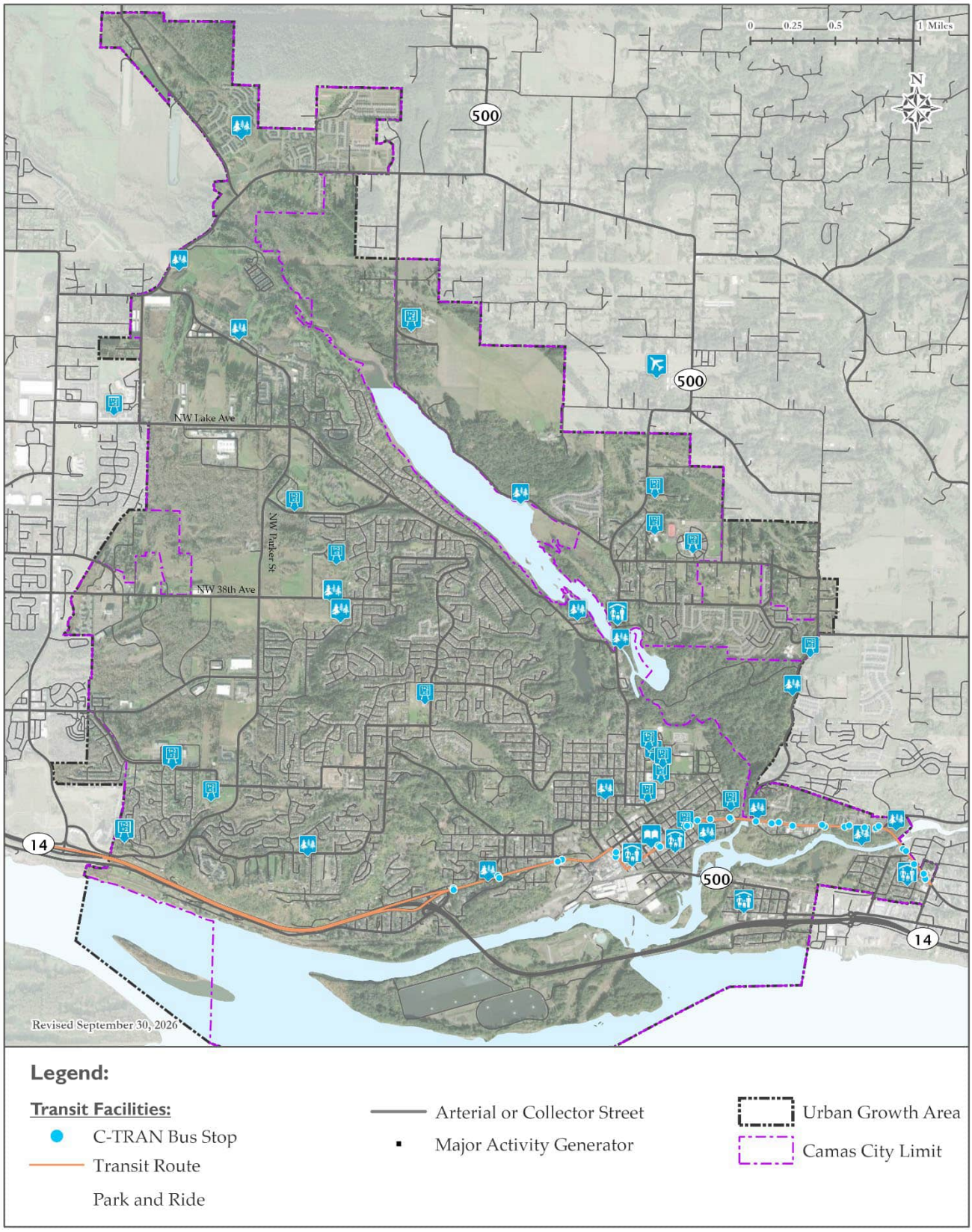
Bus stops in Camas are located along NW 6th Avenue near the SR 14 Ramps, NW Ivy Street, and NW Drake Street intersections, at the NE Adams Street / NE 5th Avenue, and along NE 3rd Avenue near the NE Franklin Street, NE Joy Street, NE 3rd Place, E. 1st Avenue, SE Crown Road, NE Summer Street, NE 3rd Loop, NE Shepherd Road, NE 2nd Avenue, NE Weir Street and NE Lechner Street intersections.

Each of the bus-stops are signed and the eastbound stop along NW 6th Avenue near the SR 14 Ramps provides a bus pull-out. The bus stop along NE 3rd Avenue at NE Franklin Street (near Camas City Hall) provides a bench and shelter. All remaining bus stops have no amenities. Most transit users in the city are more than a half-mile from a bus stop. A park-and-ride facility is located along SE Tampa Street, near the SE 8th Avenue / SE Union Street intersection. However, the park-and-ride is currently served by only the Connector service and not a fixed route.

The Camas/Washougal C-TRAN route travels through Camas eastbound and westbound approximately every half-hour to hour between 6:00 AM and 9:30 PM on weekdays. Service on weekends is provided approximatively every hour between 8:00 AM and 9:30 PM.

Key destinations along this route include Forest Home Park, Georgia Pacific, downtown Camas, Camas Municipal Center, Safeway, Louis Bloch Park, Washougal River Greenway, Camas Police Department, and the Lacamas Center. C-TRAN buses are equipped with a lift to allow for wheelchair access and include bicycle racks.

FIGURE 14: TRANSIT SYSTEM



CHAPTER 3.

Facility and Performance Standards

Camas applies transportation standards and regulations to the construction of new transportation facilities and to the operation of all facilities to ensure they are designed appropriately, and the system functions as intended. These standards enable consistent future actions that reflect the goals and policies of the City.

STREET JURISDICTION

Roadway ownership and maintenance responsibilities depend on the roadway authority. In addition, required design and operation standards for each street and intersection vary by agency.

WSDOT, the Federal Government, and RTC also classify roadways in Camas. Within Camas, SR 14 is classified by WSDOT as a Highway of Statewide Significance (HSS)[5], and SR 500 is classified as a non-HSS facility.

The federal government also has a functional classification system that is used to determine federal aid funding eligibility. Roadways federally designated as a major collector, minor arterial, principal arterial, or interstate are eligible for federal aid. Camas' functional classification system uses the similar designations as the federal government (e.g., a city designated arterial is intended to be the same as a federally designated minor arterial and a city designated collector is intended to be the same as a federally designated major collector). Future updates to the federal functional classification system should incorporate the designations reflected in the Transportation Plan along City roadways.

RTC has identified several streets in Camas as part of the regional transportation system in the Regional Transportation Plan for Clark County, including SR 14, SR 500, Lake Road - SE 1st Street, Parker Street, Pacific Rim Boulevard - 34th Street, NW 38th Avenue – SE 20th Street, NW 6th Avenue, and NE 3rd Avenue.

NETWORK CLASSIFICATIONS AND AREA DESIGNATIONS

All streets in the TSP planning area include classifications and area designations to help support the movement of all people and help to ensure the transportation system is comfortable, convenient, safe and well connected for all users (see Figure 15). These include functional classifications for vehicle travel and designations for mixed-use, residential, commercial, and industrial areas. The classifications and area designations combine to determine the minimum acceptable facility type and design requirements of different elements for each mode.

[5] Highways of Statewide Significance, WSDOT, http://www.wsdot.wa.gov/planning/HSS/

FIGURE 15: NETWORK CLASSIFICATIONS AND ROUTE DESIGNATIONS



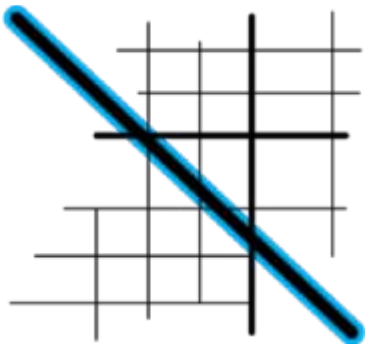
STREET FUNCTIONAL CLASSIFICATIONS

Functional classification for streets helps support the movement of vehicles and bicycles and is an important tool for managing the roadway network. The street functional classification system recognizes that individual streets do not act independently of one another but instead form a network that serves travel needs on a regional, citywide, neighborhood, and local level. By designating the management and design requirements for each roadway classification, this hierarchal system supports a network of streets that perform as desired.

The street functional classification system for roadways in the City's planning area is described below. From highest to lowest intended use, the classifications are Freeway, Arterial, Collector, Neighborhood Route, and Local Streets. The functional classification map (Figure 15) shows the designated classification for all roadways in the City's planning area, including new street extensions proposed as part of this plan (see Chapter 4). For a street cross-section, the functional classification determines the minimum number of vehicle travel way lanes, bike facility, and on-street parking requirements.

Freeway

Freeways serve as the main travel routes through the City and serve the highest volume of motor vehicle traffic. Freeways are generally for longer motor vehicle trips with limited local access. SR 14 is the only freeway in Camas.

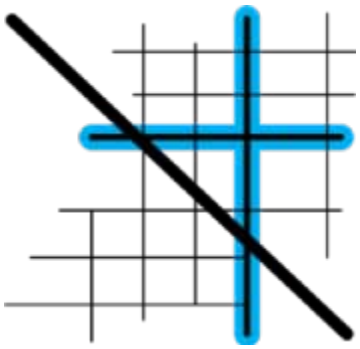


Arterial Street

Arterial Streets are primarily intended to serve regional and citywide traffic movement. Arterials provide the primary connection to other Arterial Streets or Collector Streets. They are typically spaced about one mile apart to assure accessibility and reduce the occurrence of

through traffic using collectors or local streets in lieu of a well-placed arterial street. Where an Arterial Street intersects with a Local Street, access management and/or turn restrictions may be employed to reduce traffic delay, while not adversely impacting safety and convenience for other modes. They often serve high volumes of traffic (>10,000 daily vehicles) over long distances and minimize direct access to adjacent land to support the safe and efficient movement of people and goods.

Collector Street



Collector Streets are intended to distribute traffic from Arterials Streets to streets of the same or lower classification. They provide both access and circulation within and between residential and non-residential areas. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as much access control compared to arterials, and they serve residential neighborhoods, distributing trips from the neighborhood and local street system.

Collectors generally support traffic volumes typically ranging up to 10,000 daily vehicles and speeds often managed between 25 mph and 35 mph.

Local Street



All streets not classified as Arterial or Collector are classified as Local streets. Local streets prioritize providing immediate access to adjacent land and often function as through routes for pedestrians and bicyclists. These streets should be designed to enhance the livability of neighborhoods and can generally accommodate up to 1,500 vehicles per day. A well-connected grid system of relatively short blocks can minimize excessive volumes of motor vehicles, limit out-of-direction travel, and encourage walking and biking. They should be provided at a maximum spacing of 600 feet in most cases. Speeds are not normally posted, with a statutory 25 mph speed limit in effect. Local streets are not intended to support long distance vehicular travel and are often designed to discourage through traffic without an origin or destination in the immediate area.

AREA DESIGNATIONS

To complement the street functional classifications, area designations for mixed-use, residential, commercial, and industrial areas are identified. The area designation map (Figure 15) shows the designated area type for all roadways in the City's planning area, including new street extensions proposed as part of this plan (see Chapter 4). The designations are used to determine how users of a roadway interact with the surrounding land use. Since the type and intensity of adjacent land uses and zoning directly influence the level of use by pedestrians, bicyclists and transit riders, the design of a street (including its intersections, sidewalks, and transit stops) should reflect its

surroundings. The area designations balance street functional classification, adjacent land use, zoning designation and the competing travel needs by prioritizing various design elements.

Mixed-Use Area

Mixed-use areas typically have a higher amount of pedestrian activity and are often on a transit route. These streets emphasize a variety of travel choices such as pedestrian, bicycle and transit use to complement the development along the street. Since mixed-use streets typically serve pedestrian oriented land uses, walking should receive the highest priority of all the travel modes. They should be designed with features such as wider sidewalks, pedestrian amenities, transit amenities, attractive landscaping, on-street parking, pedestrian crossing enhancements and bicycle lanes.

Residential Area

Residential areas consist mostly of households, although various small shops may be embedded within the neighborhood. These are areas that often connect to local parks, schools, and mixed-use areas. They should be designed to emphasize walking, while still accommodating the needs of bicyclists and motor vehicles. A high priority should be given to design elements such as traffic calming, landscape buffers, walkways/pathways/trails, on-street parking, and pedestrian safety enhancements.

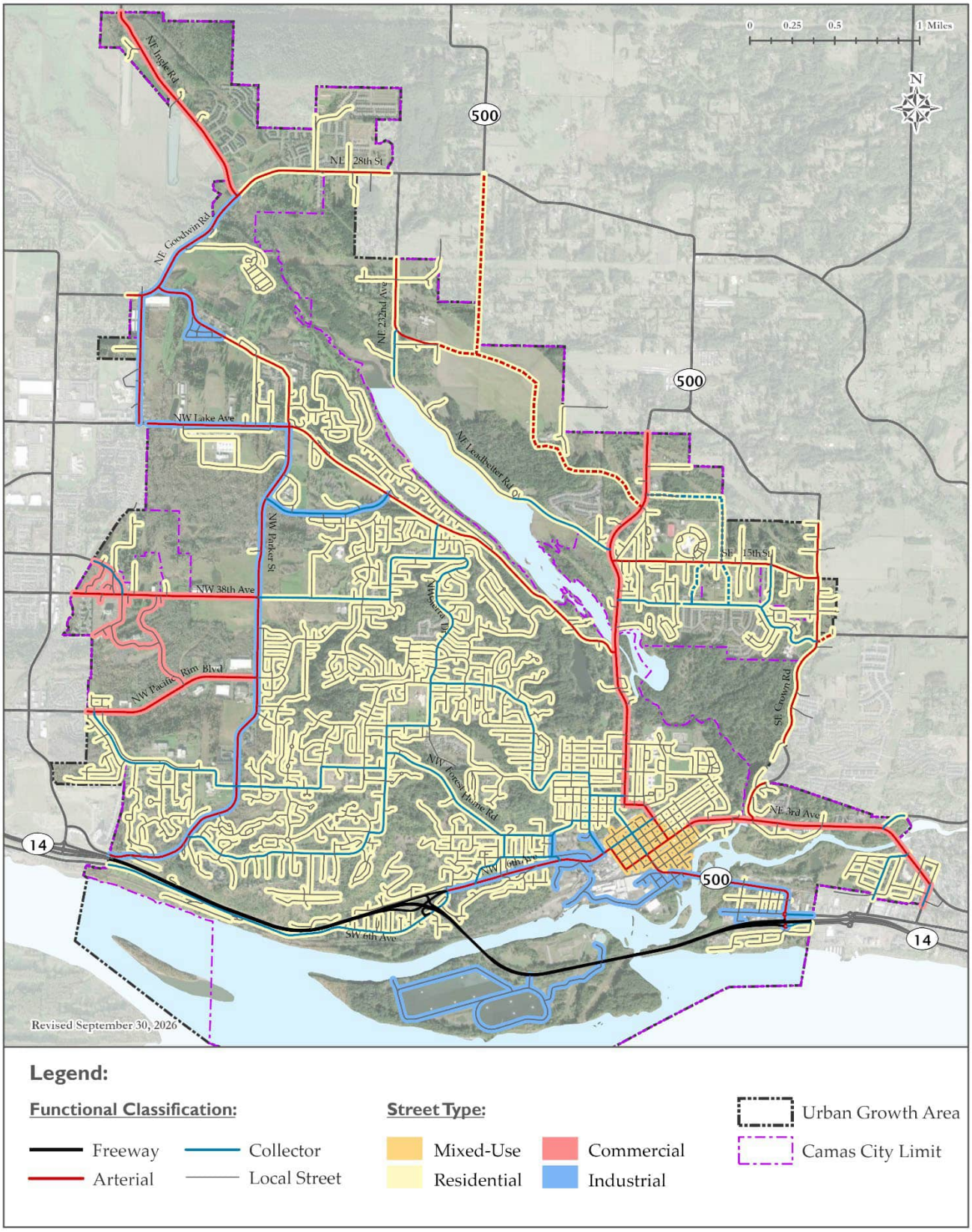
Commercial Area

Commercial areas are primarily lined with retail and large employment complexes. These uses serve customers throughout the City and region and may not have a direct relationship with nearby residential neighborhoods. These areas are somewhat more auto oriented but should still accommodate pedestrians and bicyclists safely and comfortably. Design features should include landscaped medians or a two-way left turn lane, sidewalks and bike lanes, pedestrian crossing enhancements and a buffer between the roadway and the sidewalk. On-street parking should be discouraged.

Industrial Area

Industrial areas accommodate a high volume of large vehicles such as trucks, trailers and other delivery vehicles. Pedestrians and bicyclists may be less frequent in these areas but should still be accommodated safely and comfortably. Roadway widths are typically wider to accommodate larger vehicles. On-street parking should be discouraged.

FIGURE 16: STREET FUNCTIONAL CLASSIFICATIONS AND AREA DESIGNATIONS



TYPICAL STREET CROSS-SECTIONS

The design of the streets in the City's planning area is based on the network classifications and area designation. All streets in the planning area are multimodal and include travel lanes and on-street parking for vehicles, sidewalks for pedestrians, and on-street or separated facilities for bicyclists. Accommodating these modes varies by the functional classification and area designations. These cross-section standards identify the design characteristics needed to meet the function and demand for each facility type for streets in the City's planning area. Since the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, this system allows standardization of key characteristics to provide consistency. Typical cross-section requirements are provided in Table 3, and several typical cross-sections examples have been highlighted below in Figure 17 through Figure 19.

The following method shall be used to determine the design of new streets and the reconstruction or improvement of existing streets.

Use the following steps to determine the typical standards that apply to a roadway:

1. Confirm the functional classification and area designation that apply using **Figure 16**.
2. Use **Table 3** to determine the typical cross-section requirements, based on the functional classification and area designation.
3. Combine the elements to determine the typical cross-section. Examples are provided in **Figure 17** through **Figure 19**.

TABLE 3: TYPICAL STREET CROSS-SECTION REQUIREMENTS

		AREA DESIGNATION			
		MIXED-USE	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
SIDEWALK WIDTH (ALL STREETS) *		14 ft.	12 ft.	11 ft.	11 ft.
PEDESTRIAN THROUGHWAY ZONE		*8 ft.*	*6 ft.*	*6 ft.*	*6 ft.*
FURNISHINGS/ LANDSCAPE ZONE		*4.5 ft.*	*4.5 ft.*	*4.5 ft.*	*4.5 ft.*
EDGE (CURB AND CLEARANCE)		*1.5 ft.*	*1.5 ft.*	*0.5 ft.*	*0.5 ft.*
BIKE FACILITY	Arterial Street	7 ft. Buffered Bike Lanes (includes 2 ft. buffer) **			
	Collector Street	6 ft. Bike Lanes **			
	Local Street	Shared with Travel Lane			
ON-STREET PARKING WIDTH (ALL STREETS)		8 ft	8 ft	None	None
TYPICAL THROUGH LANES (ALL STREETS)		2	2	2 to 4 ***	2 to 4 ***
TRAVEL LANE WIDTH	Arterial Street	11 ft.	11 ft.	12 ft.	12 ft.
	Collector Street	11 ft.	11 ft.	12 ft.	12 ft.
	Local Street	10 ft.	10 ft.	12 ft.	12 ft.
MEDIAN/ TURN LANE WIDTH	Arterial Street	11 ft. left turn lane at intersections	11 ft. left turn lane at intersections	14 ft. median/ center turn lane	14 ft. center turn lane
	Collector Street	None	None	12 ft. left turn lane at intersections	12 ft. center turn lane
	Local Street	None	None	None	None
TYPICAL STREET WIDTH ****	Arterial Street	52 ft	52 ft	52 to 76 ft	52 to 76 ft
	Collector Street	50 ft	50 ft	48 ft	48 ft
	Local Street	36 ft	36 ft	24 ft	24 ft
TYPICAL RIGHT OF WAY	Arterial Street	80 ft.	76 ft.	74 to 98 ft.	74 to 98 ft.
	Collector Street	78 ft.	74 ft.	70 ft.	70 ft.
	Local Street	64 ft.	60 ft.	46 ft.	46 ft.

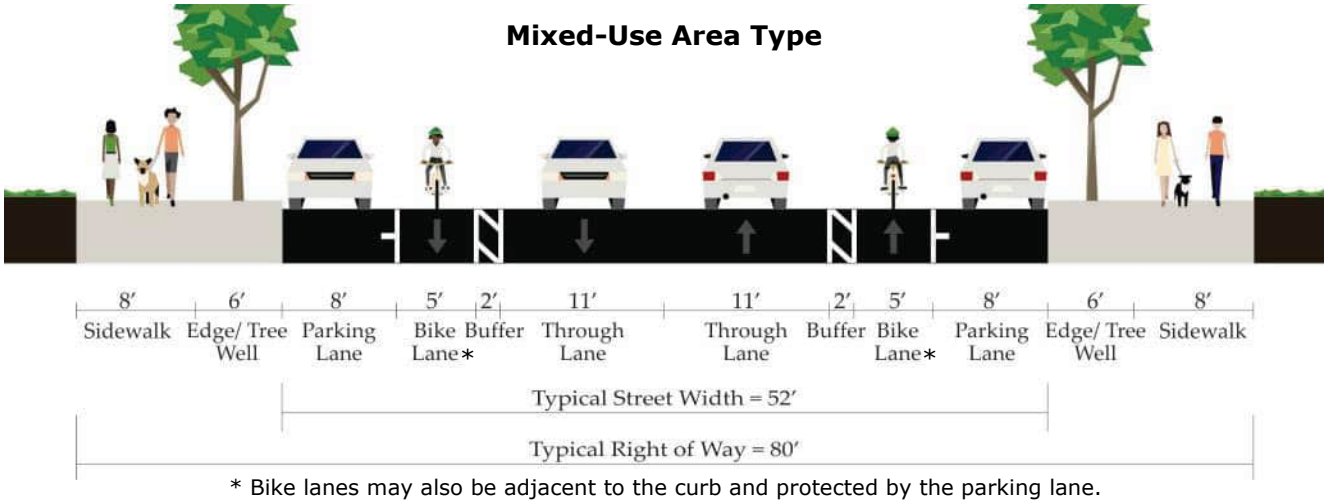
Notes: Flexibility in street sections may be allowed for development when deemed to provide overall additional public enhancements, as determined by the City Engineer or City Engineer's designee.

* Sidewalk may meander and include varying materials and/or color, and the landscape zone may need to be increased based on the types of trees that are to be installed (i.e., 4 ft. for a small tree, 6 ft. for a medium tree and 8 ft. for a large tree, as determined by the City Engineer or City Engineer's designee.

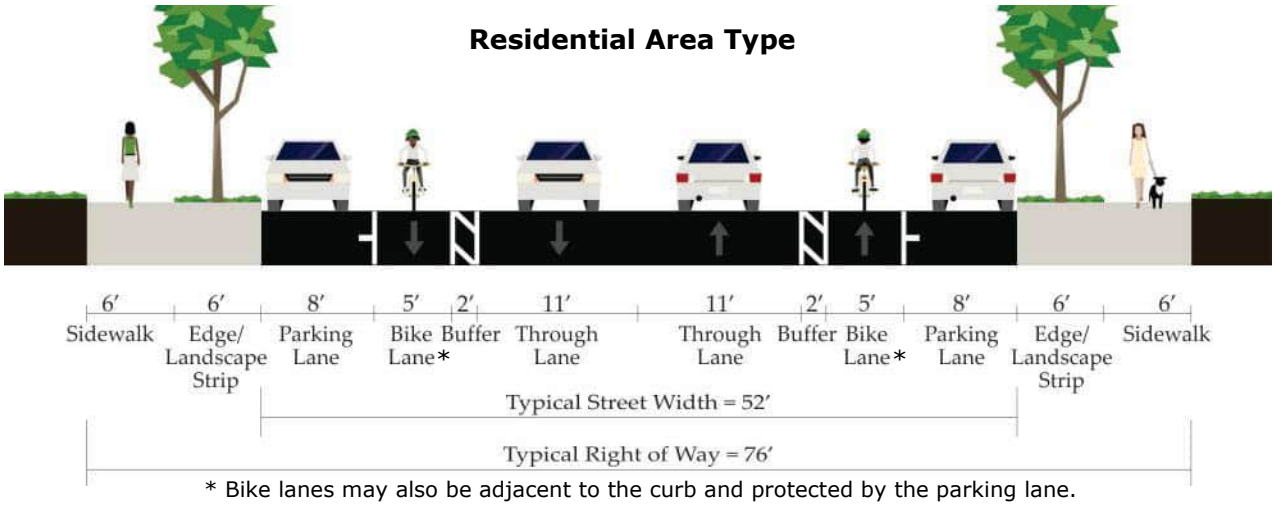
** Bike lane may also be adjacent to the curb and protected by the parking lane

*** Up to four lanes on arterial streets only in commercial and industrial areas. Any roadway exceeding three lanes must include protected bike facilities.

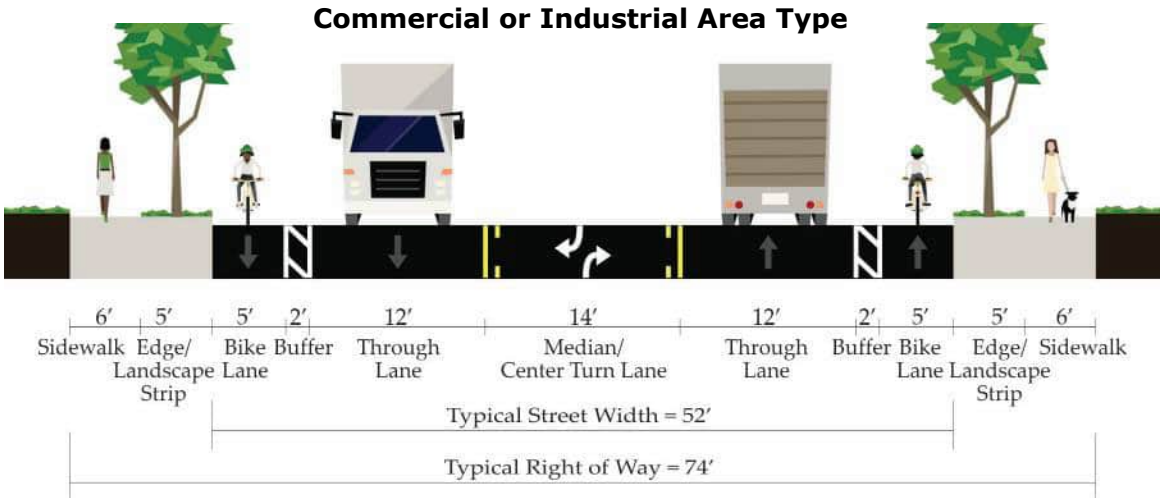
FIGURE 17: TYPICAL CROSS-SECTION FOR ARTERIAL STREET BY AREA TYPE



* Bike lanes may also be adjacent to the curb and protected by the parking lane.
Note: Any roadway exceeding three lanes must include protected bike facilities.

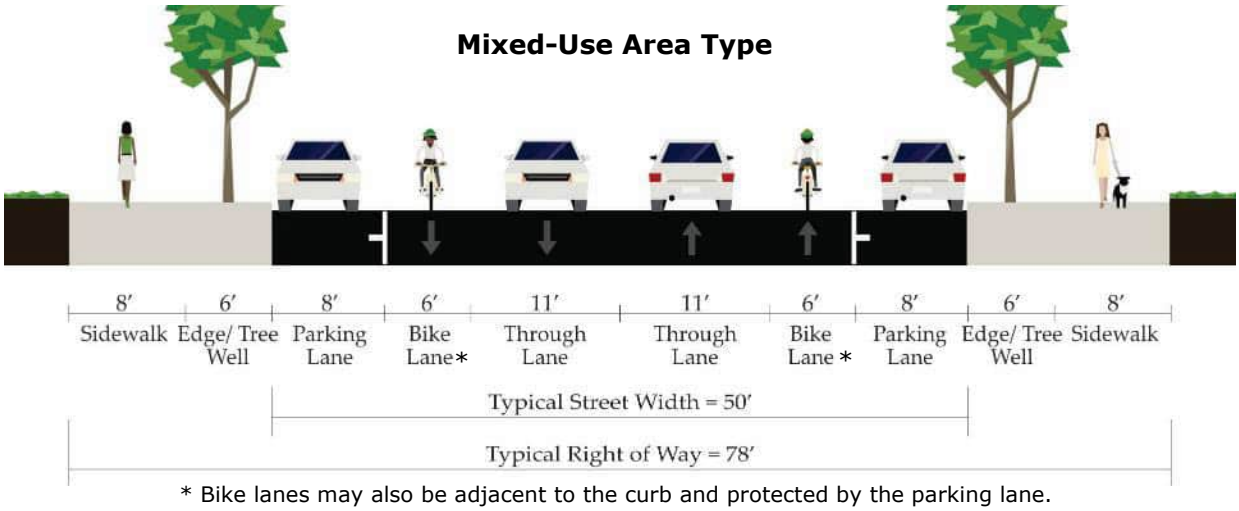


* Bike lanes may also be adjacent to the curb and protected by the parking lane.
Note: Any roadway exceeding three lanes must include protected bike facilities.

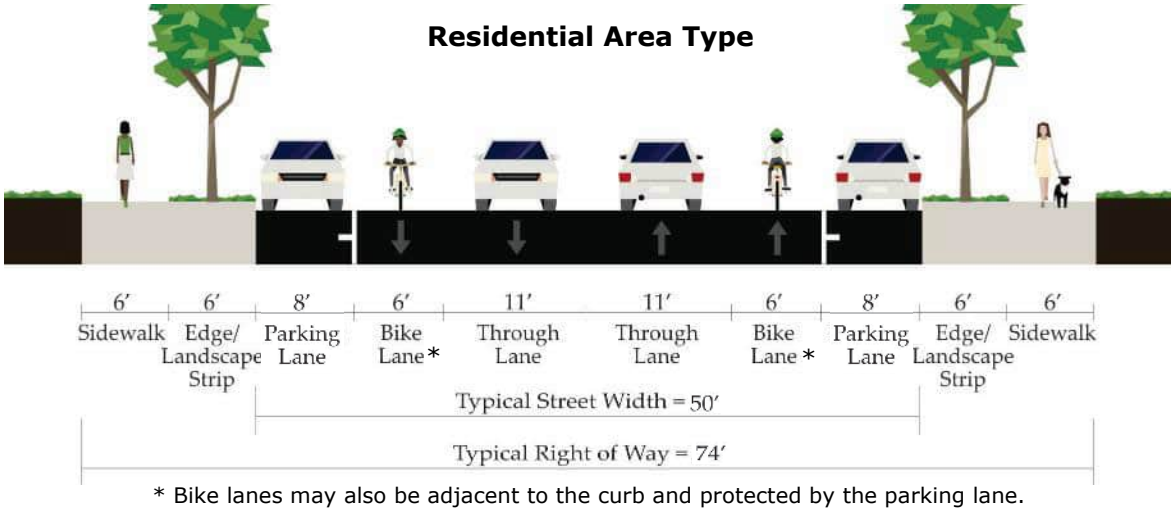


Note: Any roadway exceeding three lanes must include protected bike facilities.

FIGURE 18: TYPICAL CROSS-SECTION FOR COLLECTOR STREET BY AREA TYPE



* Bike lanes may also be adjacent to the curb and protected by the parking lane.



* Bike lanes may also be adjacent to the curb and protected by the parking lane.

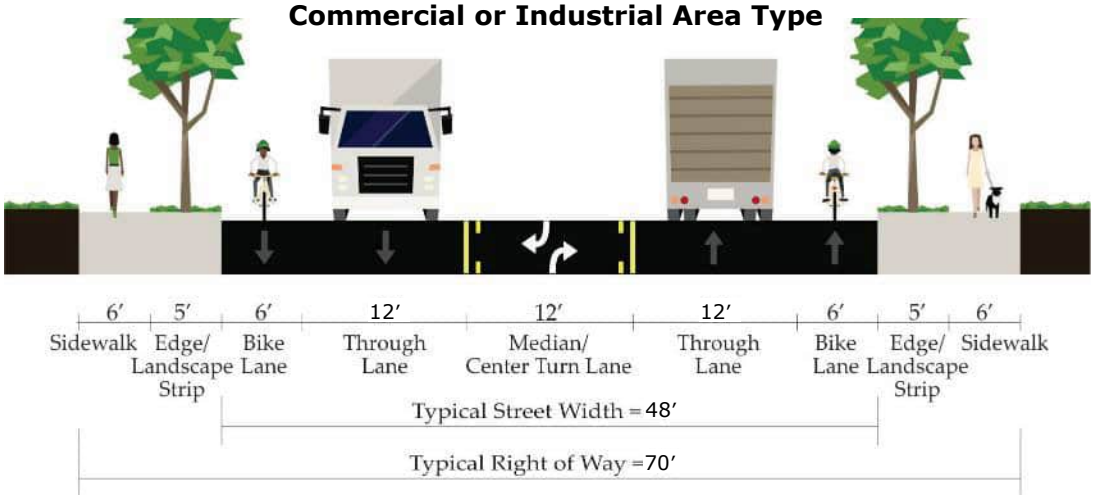
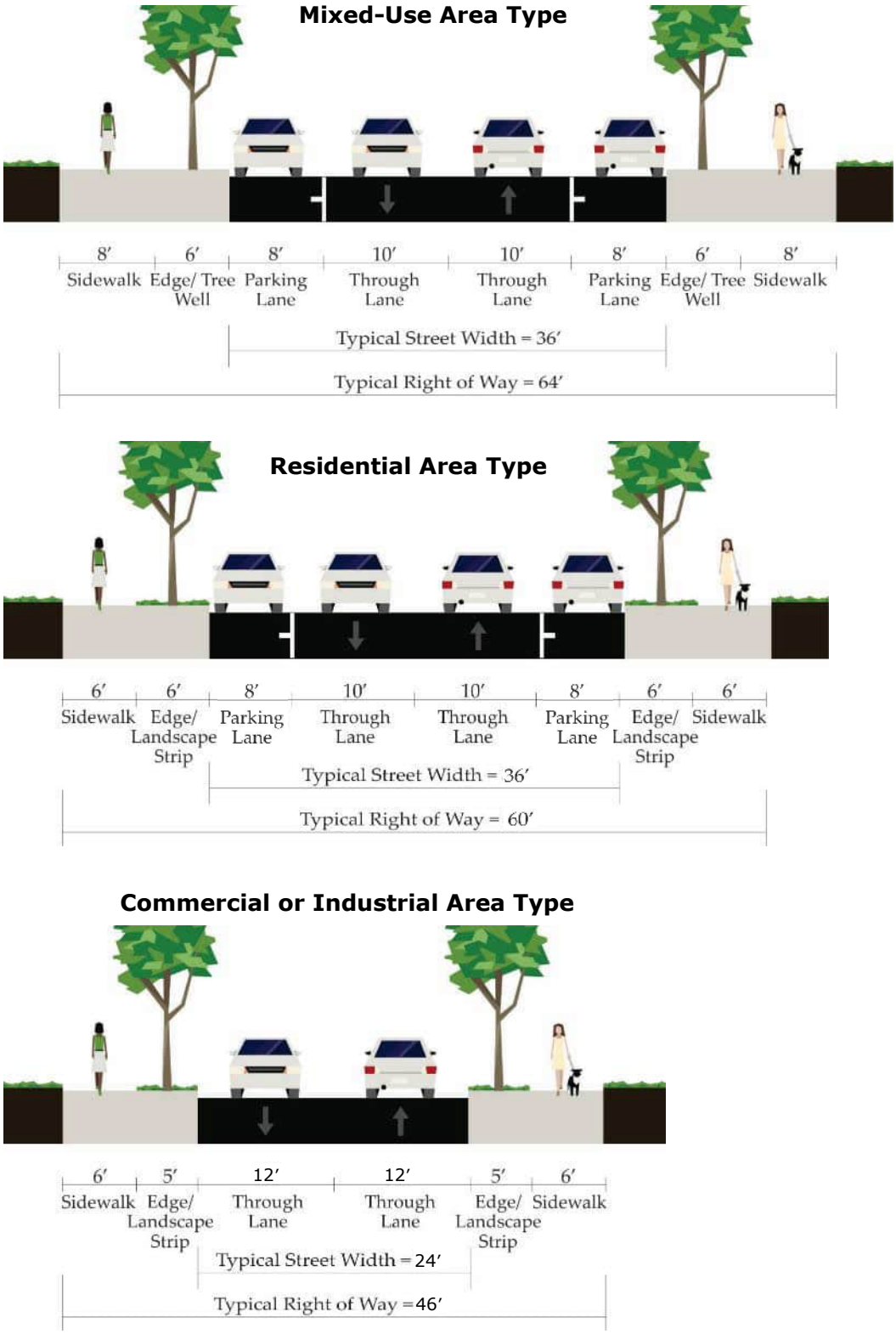


FIGURE 19: TYPICAL CROSS-SECTION FOR LOCAL STREET BY AREA TYPE



CONSTRAINED STREET CROSS-SECTIONS

The typical designs are intended to be implemented in newly developing or redeveloping areas of the City's planning area, where constrained conditions do not limit the ability to construct the typical cross-section. A variety of physical and natural constraints may prevent adherence to the multimodal network design requirements in this chapter. Typical design constraints include:

- Infill sites
- Innovative designs (e.g., roundabouts)
- Reallocation of right-of-way between modes (e.g., narrow travel lanes to accommodate wider bike lanes)
- Severe constraints presented by topography, environmental, or other resources present
- Existing developments and/or buildings that make it extremely difficult or impossible to meet the standards

A deviation to the street standards may be requested from the City Engineer or City Engineer's designee with justification of constraints to consider a constrained cross-section or other adjustments. The minimum acceptable cross-section configuration is shown in Table 4.

TABLE 4: CONSTRAINED ACCEPTABLE STREET CROSS-SECTION

	ARTERIAL STREET	COLLECTOR STREET	LOCAL STREET
SIDEWALK WIDTH (ALL AREA DESIGNATIONS)	10.5 ft.	9.5 ft.	9.5 ft.
PEDESTRIAN THROUGHWAY ZONE	*6 ft.*	*5 ft.*	*5 ft.*
FURNISHINGS/ LANDSCAPE ZONE	*4 ft.*	*4 ft.*	*4 ft.*
EDGE (CURB AND CLEARANCE)	*0.5 ft.*	*0.5 ft.*	*0.5 ft.*
BIKE FACILITY (ALL AREA DESIGNATIONS)	6 ft. Bike Lanes	5 ft. Bike Lanes; or Bikeway on Adjacent Corridor	Shared with Travel Lane
ON-STREET PARKING WIDTH (ALL AREA DESIGNATIONS)	None	None	None
TYPICAL THROUGH LANES (ALL AREA DESIGNATIONS)	2	2	2
TRAVEL LANE WIDTH (ALL AREA DESIGNATIONS)	11 ft.	10 ft.	10 ft.
MEDIAN/ TURN LANE WIDTH (ALL AREA DESIGNATIONS)	As Needed	As Needed	None

SIDEWALKS

Sidewalks provide for pedestrian movement and access, enhance connectivity, and promote walking. The requirements for pedestrian facilities in the City's planning area promote superior sidewalk design and encourage walking by making it more attractive. The area designations determine pedestrian facility design treatments along streets, including the width of the throughway for pedestrians, and the buffer between the vehicle travel way.

The sidewalk encompasses three zones (as shown in Figure 20), including the frontage, pedestrian throughway, and furnishings/ landscape. The minimum configuration for each of these zones is provided in Table 2. Wider widths may be considered as conditions warrant. For example, if a tree requires a wider area, the width of the landscape zone may be increased.

FIGURE 20: SIDEWALK ZONES



- The **frontage zone** describes the section where a pedestrian interacts with the adjacent buildings or private property and includes entryways and outdoor seating. This zone is typically between 1 and 3 feet wide in mixed-use areas (i.e., to accommodate outdoor seating in commercial areas or building access in residential areas) and ½ foot in other areas, and it may include a concrete or natural surface depending on the adjacent land use. The adjoining development may elect to expand this zone with additional space provided outside of and adjacent to the street right-of-way.

- The **pedestrian throughway zone** is the accessible zone in which pedestrians travel. It includes a minimum eight-foot-wide clear throughway in mixed-use areas, and six-feet wide clear throughway along streets with a Residential, Commercial, or Industrial area designation.

- The **furnishings/ landscape zone** is the sidewalk section located between the pedestrian throughway and the curb, and includes street furnishings or landscaping (e.g., benches, lighting, bicycle parking, tree wells, and/or plantings). If adjacent to on-street parking, it should also include a clearance distance between any curbside parking and the street furnishing area or landscape strip (i.e., so vehicles parking, or opening doors do not interfere with street furnishings and/or landscaping). Streets located along a transit route should incorporate furnishings to support transit ridership, such as transit shelters and benches,

into the furnishings/landscape strip. It should include a minimum width between 5 to 6 feet, depending on the area designation.

BICYCLE FACILITIES

Streets should be safe and comfortable for bicyclists of all ages and abilities to encourage ridership. Building high quality bicycle infrastructure can help the City work towards achieving improved safety and public health, reduced congestion, and more equitable access.

The typical bicycle facilities shown in Table 3 and Figure 17 through Figure 19**.** for each area designation are determined based on a street's design and motor vehicle traffic conditions (i.e., expected vehicle speeds and volumes). When bike facilities are routed along the lowest speed and volume streets (i.e., streets with a Local functional classification), shared streets are typical. When the bike facilities are routed on busier or faster streets (i.e., streets with an Arterial or Collector functional classification), on-street bike lanes, which may be buffered or protected from the vehicle travel way, are typical. These may be separated from the vehicle travel way by a painted buffer and include vertical or horizonal protection, like bollards, planter boxes, curbs, or parked cars. These facilities include buffered bike lanes, cycle tracks, or shared-use paths.

Table 3 and Figure 17 through Figure 19 show the minimum bicycle facilities for streets in the City's planning area. Regardless of the area designation, Arterial Streets require 7-foot buffered bike lanes (i.e., 5-foot bike lane with 2-foot buffer), Collector Streets require 6-foot bike lanes, while Local Street typically have no on-street bike facility (i.e., bikes share the travel way with vehicular traffic). The bike lane on Arterial and Collector streets may also be adjacent to the curb and protected by the parking lane.

In general, streets with motor vehicle volumes over 3,000 per day should include conventional bike lanes at a minimum. When daily motor vehicle volumes exceed 6,000, buffered or protected bike lanes are desired. In any case, if motor vehicle travel speeds exceed 35 miles per hour, buffered or protected bicycle facilities are desired. In general, facilities that are protected or separated from the vehicle travel way include a 12-foot two-way or 6-foot one-way cycle track, 12-foot shared use path, or 7-foot buffered bike lanes. Non-separated bike lanes should be a minimum of 6-feet wide, while shared streets should include shared lane markings, with vehicle speed and volume management.

SEPARATED PEDESTRIAN AND BICYCLE FACILITIES

Some pedestrian and bicycle facilities may be separated from the right-of-way of a street, and include pedestrian trails, pedestrian, and bicycle accessway paths, and shared use paths. These facilities serve a variety of recreational, and transportation needs for pedestrians and bicyclists.

PEDESTRIAN TRAIL

Pedestrian trails offer recreational opportunities for pedestrians and are typically located in parks or natural areas. They should include a minimum width of 6 feet and may include a hard or soft surface.

ACCESSWAY PATH

Accessways provide short path segments between disconnected streets or localized recreational walking and biking opportunities. To allow for both pedestrian and bicycle travel, the accessway path must be on public easements or rights-of-way and have minimum paved surface of 10 feet, with a 2-foot shoulder on each side, and 14 feet of right-of-way. For low use segments, an accessway can be as narrow as 8 feet wide, with a 2-foot shoulder on each side and a total right-of-way of 12 feet.

Narrower widths with a minimum paved surface of 5 feet, with a 2-foot shoulder on each side, and 9 feet of right-of-way are acceptable for an accessway serving pedestrian access only (i.e., no bicycles).

SHARED USE PATH

Shared-use paths provide longer distance off-roadway facilities for walking and biking. Depending on their location, they can serve both recreational and citywide circulation needs. Shared-use path designs vary in surface types and widths. Hard surfaces are generally better for bicycle travel. Widths need to provide ample space for both walking and biking and should be able to accommodate maintenance vehicles.

To allow for both pedestrian and bicycle travel a shared-use path should typically be at least 12 feet wide, with a 2-foot shoulder on each side, and 16 feet of right-of-way (see Figure 21). In areas with a low amount of walking or biking demand, the path can be 6 feet wide, with a 2-foot shoulder on each side and a total right-of-way of 10 feet (see Figure 22).

FIGURE 21: TYPICAL DESIGN FOR REGIONAL SHARED-USE PATHS

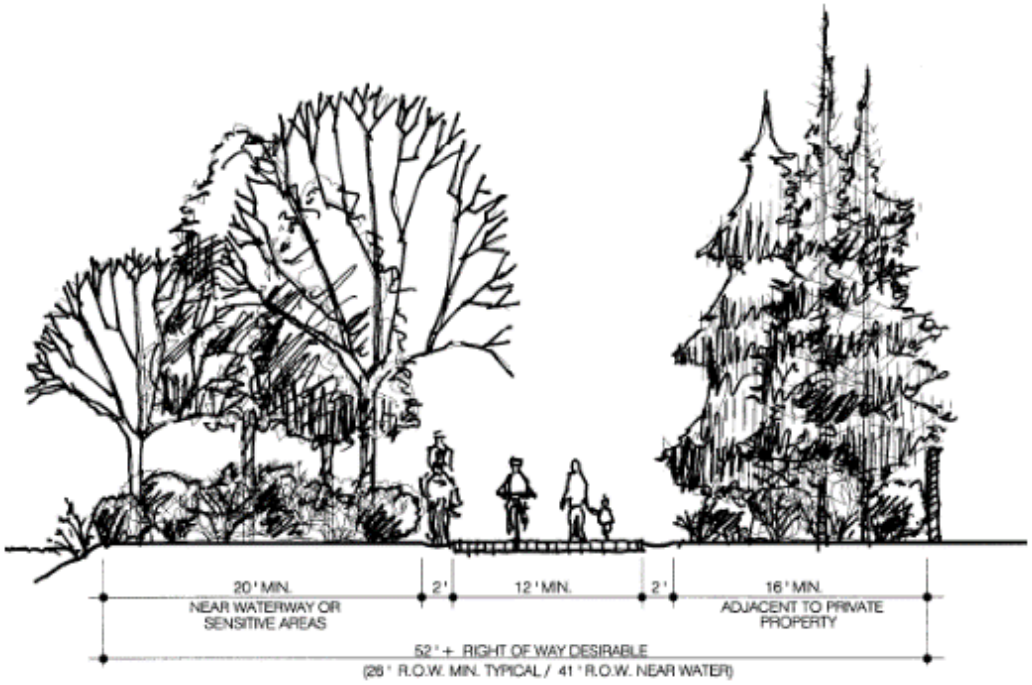
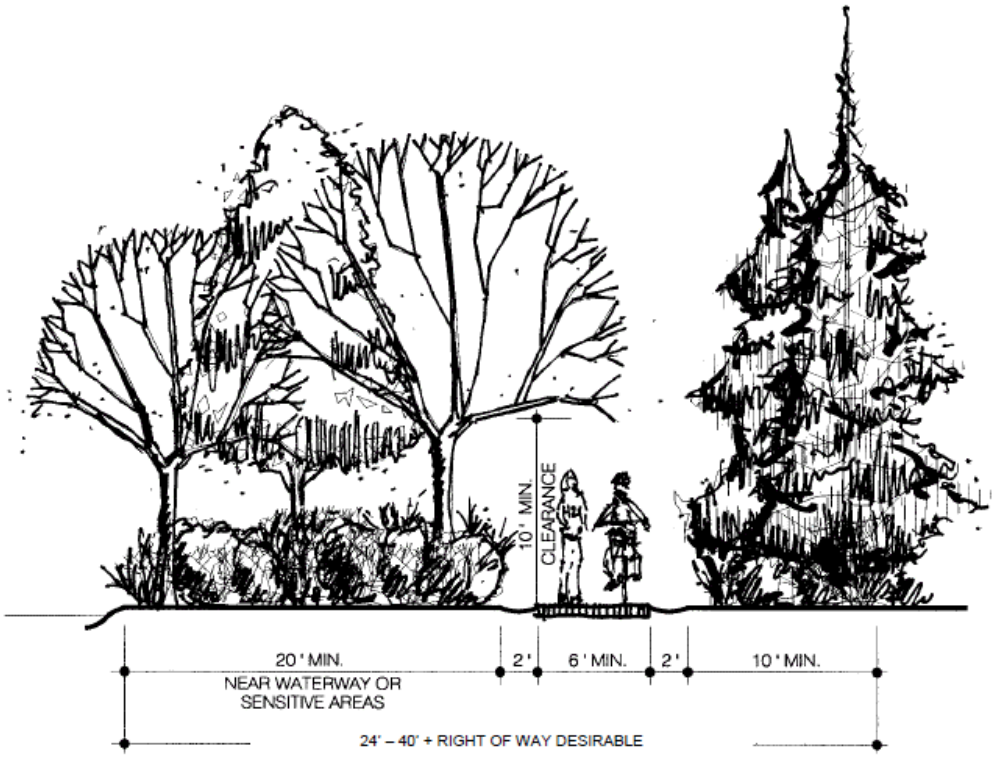


FIGURE 22: TYPICAL DESIGN FOR LOCAL SHARED-USE PATHS



PERFORMANCE STANDARDS

Performance standards are applied to the operation and design of transportation facilities to ensure that the network functions as intended. In Camas, this includes performance standards for vehicles, pedestrians, bicyclists and overall system connectivity.

VEHICLE CONGESTION THRESHOLDS

Mobility targets for streets and intersections in Camas provide a metric for assessing the impacts of new development on the existing transportation system and for identifying where capacity improvements may be needed. They are the basis for requiring improvements needed to sustain the transportation system as growth and development occur. Two methods used to gauge operational conditions for motor vehicles include volume-to-capacity (v/c) ratios and level of service (LOS).

- Volume-to-capacity (v/c) ratio: A v/c ratio is a decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00 (generally above 0.70), congestion noticeably increases, and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

- Level of service (LOS): LOS is a "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay is excessive and demand exceeds capacity, typically resulting in long queues and delays.

This TSP includes performance standards for motor vehicles. A LOS "D" and a v/c ratio not higher than 0.85 is the minimum performance standard during the highest one-hour period of the day for signalized, all-way stop and roundabout controlled intersections under City jurisdiction. These standards shall be applied to the intersection as a whole.

A LOS "E" and a v/c ratio not higher than 0.90 is the minimum performance standard during the highest one-hour period of the day for two-way stop and yield controlled intersections under City jurisdiction. These standards shall be applied to all intersection approaches serving more than 20 vehicles. Mobility standards do not apply to approaches at intersections serving 20 vehicles or fewer during the highest one-hour period of the day[6]. This mobility standard allows more flexibility

[6] When a low number of vehicles approach a stop-controlled intersection (i.e., 20 or fewer), particularly at those with high volumes on the uncontrolled major street, long delays for vehicles often result during peak periods. This can cause the intersection to operate with a peak hour v/c ratio that exceeds the adopted intersection mobility standard and can

in the tension between larger intersection and street designs that are sometimes needed to accommodate peak vehicle demands, and the desire to maintain smaller designs that encourage slower vehicle speeds and tend to be more accommodating to pedestrian and bicycle users.

Level of Service for Highways of Statewide Significance is set by the State. In Clark County, the standard is set as LOS "D" for urban areas, including SR 14. Level of Service for regional state highway facilities (not part of the HSS), including SR 500 in Camas, is set through the Southwest Washington Regional Transportation Council (RTC). The Southwest Washington RTC Board adopted LOS 'E' or better for non-HSS urban state highway facilities.

Facilities that are forecasted to exceed these vehicle congestion thresholds were identified in Chapter 2 with improvements provided in Chapter 4.

MULTIMODAL LEVEL OF TRAFFIC STRESS THRESHOLDS

Pedestrian and bicycle level of traffic stress (LTS) evaluations provide a metric to understand a multimodal user's perception of the safety and comfort of the transportation network. This method can be used to understand key gaps and barriers to walking and bicycling which can then be addressed through targeted improvements.

The LTS evaluation generates a ranking between 1 and 4 of the relative safety and comfort of a segment or intersection for bicyclists or pedestrians based on roadway and intersection characteristics (e.g., land use context, number of lanes, travel speed and volume, intersection control, type and width of buffer, and the presence and condition of any bicycle or pedestrian facilities). The LTS rating scale recognizes that as vehicle speeds and volumes increase, enhanced pedestrian and bicycle facilities are needed to maintain a system that is accessible and comfortable for all users. The following summarizes the LTS rankings:

- Low Stress (LTS 1) – represents little traffic stress and requires less attention, so is suitable for all cyclists or pedestrians of all ages and abilities. Traffic speeds are typically low (i.e., 25 mph) and there is no more than one lane in each direction. Intersections are easily crossed by children and adults. Typical locations include residential local streets, separated bike paths/cycle tracks, and sidewalks/shared use paths with a buffer between vehicles and cyclists or pedestrians.
- Moderate Stress (LTS 2) – represents little traffic stress but requires more attention than can be expected of young children and is more suitable for teen and adult pedestrians or cyclists with adequate bike handling skills. Traffic speeds are slightly higher (i.e., up to 35 mph), but speed differentials are still low, and roadways can be up to three lanes wide. Intersections are not difficult to cross for most teenagers and adults. Typical locations include collector-level streets with bike lanes or a central business district. Sidewalks are generally in good condition with limited impediments for mobility device users (i.e., adequate sidewalk widths and ramps in most locations).
- High Stress (LTS 3) – represents moderate stress and is suitable only for the most observant adult cyclists or pedestrians. Traffic speeds are typically moderate (i.e., 35 to 40

necessitate the need to expand the intersection. Therefore, stop controlled approaches with a low volume of traffic are commonly excluded from agency mobility standards.

mph) but can be on roadways up to five lanes wide, and there can be limited buffers between travel lanes and the sidewalk. Intersections are still perceived to be safe by most adults. Typical locations include lower-speed (i.e., 35 mph) arterials with bike lanes or moderate speed (i.e., 40 mph) collectors up to three lanes wide. Select segments of these roadways may be impassable to pedestrians who require a mobility device.

- Extreme Stress (LTS 4) – represents high stress and only marginally suitable for experienced and skilled cyclists or able-bodied adult pedestrians. Traffic speeds are typically moderate to high (i.e., 40 mph or more) and can be on roadways from two to over five lanes wide with limited or no pedestrian or bicycle facilities. Intersections can be complex, wide, and or high volume/speed that can be perceived as unsafe by adults and are difficult and/or dangerous to cross. Typical locations include high-speed or multilane roadways with narrow or no bike lanes and sidewalks. Roadways without sidewalks are also included in this category.

All collector and arterial streets in Camas must provide an LTS of 2 or better for pedestrian and bicycle facilities. Facilities that are forecasted to exceed this standard were identified in Chapter 2 with improvements provided in Chapter 4. The cross-section requirements for streets in the City's planning area allow for a LTS of 2 or better to be achieved for newly built or reconstructed pedestrian and bicycle facilities.

MULTIMODAL CONNECTIVITY

Transportation facility and access spacing standards include a broad set of techniques that balance the need to provide for efficient, safe, and timely multimodal travel with the ability to allow access to individual destinations. These standards help create a system of direct, continuous, and connected transportation facilities to minimize out-of-direction travel and decrease travel times for all users, while enhancing safety for people walking, biking, and driving by reducing conflict points.

Table 5 identifies maximum and minimum public roadway intersection, minimum private access, and maximum pedestrian and bicycle accessway spacing standards for streets in Camas. New streets or redeveloping properties must comply with these standards to the extent practical, as determined by the City Engineer or City Engineer designee. As the opportunity arises through redevelopment, strategies could be implemented along streets or at driveways not complying with these standards, such as shared access points, access restrictions (using a median or channelization islands), or closure of unnecessary access points, as feasible.

Street connectivity must be reviewed with all traffic studies associated with new development in the City's planning area to ensure that the multimodal objectives of the TSP are followed. Applicants will be required to provide a proposed street map as part of the development approval process.

TABLE 5: TRANSPORTATION FACILITY AND ACCESS SPACING STANDARDS

	FUNCTIONAL CLASSIFICATION		
	ARTERIAL STREET	COLLECTOR STREET	LOCAL STREET
BLOCK SIZE (SPACING BETWEEN TWO PUBLIC STREETS) *			
MAXIMUM BLOCK SIZE *	1,000 ft.	600 ft.	600 ft.
MINIMUM BLOCK SIZE	600 ft.	300 ft.	150 ft.
MAXIMUM DISTANCE OF PEDESTRIAN/ BICYCLE FROM A CONNECTING STREET OR ACCESSWAY ALONG EACH BLOCK	300 ft.	300 ft.	300 ft.
MINIMUM DRIVEWAY SPACING **			
MINIMUM SPACING BETWEEN TWO DRIVEWAYS	600 ft.***	300 ft.***	5-10 ft. ****
MINIMUM DRIVEWAY SETBACK FROM INTERSECTION, FULL ACCESS	600 ft.	300 ft.	10 ft.
MINIMUM DRIVEWAY SETBACK FROM INTERSECTION, RIGHT-IN, RIGHT-OUT ACCESS	300 ft.	150 ft.	n/a

Note: All distances measured from the edge of adjacent approaches.

* If the maximum block size standards are exceeded for full public street connections on collector or local streets, mid-block pedestrian and bicycle accessways on public easements or rights-of-way must be provided to ensure pedestrians are no more than half the street spacing distance from a connecting street along the full length of all blocks (i.e., 300 feet on collector or local streets).

  Arterial streets require mid-block pedestrian and bicycle accessways on public easements or rights-of-way to ensure pedestrians are no more than 300 feet from a connecting street or accessway along the full block length (i.e., a typical 1,000-foot block on an arterial street requires two accessways).

  If the full street connection is impractical due to topography, natural areas, inadequate sight distance, lack of supporting land use or other factors that may prevent a safe connection, the City Engineer or City Engineer Designee may approve a deviation.

** All properties are allowed one driveway, which must take access from the lowest classified street.

*** New residential access is not permitted along arterials or collectors.

**** Minimum driveway spacing along a local street is 5 feet for residential uses and 10 feet for non-residential uses.

STREET CROSSINGS

Streets with high traffic volumes and/or speeds and in areas with trail crossings, or nearby transit stops, residential uses, schools, parks, shopping, and employment destinations generally require enhanced street crossings with treatments, such as marked crosswalks, high visibility crossings, and curb extensions to improve safety and convenience. Crossing locations with higher volumes of pedestrians (either observed or projected) are also candidate locations for rectangular rapid flashing beacons or pedestrian hybrid beacons, which increase the visibility of the crossing for drivers.

Crossing opportunities along City streets should also align, where practical, with the transportation facility spacing standards shown earlier in this chapter to ensure pedestrian and bicycle accessways are connected and continuous across streets. Exceptions include where the connection is impractical due to topography, inadequate sight distance, high vehicle travel speeds, lack of supporting land use, or other factors that may prevent safe crossing, as determined by the City Engineer or City Engineer Designee.

Locations of enhanced pedestrian and bicycle crossing treatments along City streets should be determined using the National Cooperative Highway Research Program (NCHRP) Report 562, Improving Pedestrian Safety at Unsignalized Intersections[7]. These guidelines for pedestrian and bicycle crossing treatments are based on vehicle speed on the major street, pedestrian crossing distance, peak hour pedestrian volume, peak hour vehicle volume, and local parameters such as motorist compliance, pedestrian walking speed, and pedestrian start-up and clearance time. NCHRP Report 562 includes worksheets for inputting the variables above and identifying the appropriate treatment type. These guidelines should be reviewed with all traffic studies for any potential street crossing associated with new development in the City's planning area. Table 6 summarizes potential crossing treatments at intersections and mid-block locations for pedestrians and bicyclists.

[7] http://www.trb.org/Publications/Blurbs/157723.aspx

TABLE 6: CROSSING TREATMENTS FOR PEDESTRIANS AND BICYCLISTS

CROSSING TREATMENTS		CROSSING LOCATION	
		INTERSECTION	MIDBLOCK
RECTANGULAR FLASHING BEACON (RRFB)			✓
CONVENTIONAL CROSSWALK		✓	✓
BULB OUT		✓	
MEDIAN REFUGE		✓	✓
INTERSECTION CROSSING MARKINGS		✓	
BIKE BOXES		✓	
TWO STAGE QUEUE BOXES		✓	

VOLUME AND SPEED MANAGEMENT TOOLS

Volume and speed management refers to street design techniques that slow traffic and make streets safer and more pleasant for pedestrian and bicycle users and adjoining land uses without significantly changing their vehicle capacity. These design techniques encourage a more inviting environment for pedestrians and bicyclists, particularly along streets designed for shared bicycle travel.

Table 7 shows common traffic calming applications and suggests which devices may be appropriate for streets in the Camas planning area. Volume and speed management measures must balance vehicle speeds and volumes with the mobility and circulation needs of service providers, such as emergency responders. Any traffic calming project should include coordination with emergency service providers to ensure the project does not impede response times.

Volume and speed management influences driver behavior through physical and psychological means, by using one or more of the following:

- **Horizontal impediments** designed to make a driver turn the wheel and reduce the sight lines of unending pavement, which usually results in slower speeds. Examples include chicanes, roundabouts, and mini roundabouts.
- **Road narrowing** via striping, parking, or curb to reduce the drive lane widths, which slightly lower speeds. These treatments have the additional benefit of shortening pedestrian crossings, which lead to a safer multi-modal environment. Examples include curb extensions or bulbouts, or mid-block pedestrian refuge islands.
- **Closing the through road partially or fully** to disrupt travel patterns. These treatments alone may not change vehicle speeds but are effective at lowering volumes along certain streets.

TABLE 7: VOLUME AND SPEED MANAGEMENT TOOLS

TOOLS *		USE BY FUNCTIONAL CLASSIFICATION			IMPACT	
		Arterial Street	Collector Street	Local Street	Speed Reduction	Traffic Diversion
NARROWING TRAVEL LANES		✓	✓	✓	✓	
PLACING BUILDINGS, ON-STREET PARKING, AND LANDSCAPING CLOSER TO THE STREET		✓	✓	✓	✓	
CURB EXTENSIONS OR BULBOUTS		✓	✓	✓	✓	
ROUNDABOUTS		✓	✓	✓	✓	
MINI-ROUNDABOUTS			✓	✓	✓	
MEDIANS AND PEDESTRIAN ISLANDS		✓	✓	✓	✓	

TOOLS *		USE BY FUNCTIONAL CLASSIFICATION			IMPACT	
		Arterial Street	Collector Street	Local Street	Speed Reduction	Traffic Diversion
PAVEMENT TEXTURE		✓	✓	✓	✓	
RAISED INTERSECTION OR CROSSWALK				✓	✓	✓
CHOKER				✓	✓	✓
CHICANES				✓	✓	✓
DIVERTERS (WITH EMERGENCY VEHICLE PASS-THROUGH)			✓	✓	✓	✓

Note: * Any traffic calming project should include coordination with emergency service providers to ensure the project does not impede response times.

CHAPTER 4.

Projects and Priorities

This chapter describes the transportation system improvement projects identified to address the system needs discussed in Chapter 2.

PROCESS FOR DEVELOPING PROJECTS

The project team developed the recommended transportation solutions using guidance provided by the project goals and with input from three main sources:

- Stakeholders (via committee meetings, online surveys, and project website comments)
- Previous Plans (such as the Camas North Shore Subarea Plan)
- Independent Project Team Evaluation (Existing and Future Transportation Conditions and Needs Evaluation)

The full list of projects in this TSP are identified to improve the transportation network along major streets in the City's planning area, regardless of their priority or their likelihood of being funded. This TSP focuses on streets in the planning area with a functional classification of Collector or higher. Additional improvements will occur with private development in the City's planning area, including the build out of the local street network consistent with the standards in Chapter 3.

The TSP planning process screens candidate projects to set aside those that may not be feasible due to environmental or existing development limitations. The remaining projects are a combination of new and previous ideas for the transportation system that seek to address the gaps and deficiencies in the city.

PROJECT FUNDING

Each project was reviewed to consider how it might be funded through 2045. All projects were assigned a primary funding agency which includes Camas, Clark County and WSDOT. In general, the primary funding agency was assumed to be the current or future facility owner, as they are responsible for overseeing construction and long-term maintenance. In some cases, funding partnerships were identified for projects that were expected to provide mutual benefits between agencies or where there were opportunities to accelerate projects to completion. Each project was also assigned an assumed funding source, which included the Camas Street Fund (i.e., State Gas Tax, Transportation Benefit District revenues, etc.), the City Transportation Impact Fee (TIF) revenues, or partner agency funds (i.e., WSDOT, Clark County). It is important to note that these funding assumptions do not oblige any agency to commit to these projects or fund them in this manner.

Approximately $263 million is estimated to be available for locally funded improvements through 2045 (see Table 8). About $178.6 million of the total project costs are assumed to be TIF eligible improvements, with the remaining $137.9 million and $63.5 million of the total project costs assumed to be City and partner agency responsibility, respectively.

This TSP assumes an estimated $178.6 million in TIF funding through 2045 and about $20.9 million from the Camas Street Fund and $63.5 million from partner agencies to fund the portion of

projects that are not eligible to use TIF funds through 2045 (see Table 8). While there may be opportunities with other agencies to jointly fund projects, the assumed funding is not guaranteed as these decisions are ultimately up to those agencies.

TABLE 8: ESTIMATED TRANSPORTATION PROJECT FUNDING (2026 DOLLARS)

FUNDING SOURCE	TOTAL FUNDING NEED	ESTIMATED FUNDING AVAILABLE THROUGH 2045
TRANSPORTATION IMPACT FEE (TIF) *	$178,650,000	$178,650,000
CAMAS STREET FUND	$137,983,000 **	$20,900,000 ***
PARTNER AGENCY	$63,542,000 **	$63,542,000 ****
TOTAL	**$380,175,000**	**$263,092,000**

Notes: * Based on the estimated share of project costs that are eligible to use TIF funds.

** The total funding need is based on the assigned primary lead agency for each project and the share of project costs after excluding the portion that is eligible to use TIF funds. Projects assigned with a partner agency as the primary lead were assumed to have an 80 percent share of the project costs after excluding the portion that is eligible to use TIF funds, with the remaining 20 percent share assigned to the City.

*** The estimated funding available from the Camas Street Fund is based on the remaining revenue after excluding expenditures through 2045 (based on average revenues and expenditures for the fund between 2023 and 2025) and generally accounts for the portion of the fund utilized for capital projects.

**** This assumes funding from partner agencies, which may include Grants to fund future projects. While there may be opportunities with other agencies to jointly fund projects, these funding decisions are ultimately up to those agencies and outcomes of the competitive grant process.

PRIORITIZING TRANSPORTATION PROJECTS

Unless the City expands its funding options, many of the transportation projects identified are not reasonably likely to be funded by 2045 (as shown in Table 8). For this reason, projects from the transportation list were divided into three improvement packages with implementation priority horizons, referred to as Tier 1, Tier 2 and Tier 3 and shown in Table 9.

- **Tier 1:** Projects recommended for implementation within 1 to 6 years.
- **Tier 2:** Projects recommended for implementation within 6 to 12 years.
- **Tier 3:** Projects likely to be implemented beyond 12 years.

Projects in the Tier 1 and Tier 2 groups have a total construction budget that is similar to the reasonably available funding over the planning horizon without including the partner agency funding, meaning the estimated $199 million likely to be available through existing City funding sources (i.e., City TIF and Camas Street Fund).

The project priority horizons do not create an obligation to construct projects in any order, and it is recognized that these priorities may change over time. The City of Camas will use the priorities

listed in this TSP to guide investment decisions but will also regularly reassess local priorities to leverage new opportunities and reflect evolving community interests. During the short-term, most of the City's investments will occur within the current City limits. As annexation occurs over time, other projects will have the potential to be funded by the City or through private development as a condition of approval.

PLANNED TRANSPORTATION PROJECTS

The full project list includes 91 projects totaling over $380 million in total investments and is shown in Table 9 and Figure 23 to Figure 25. For the purposes of cost estimates, project design elements are identified, however, the actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City, WSDOT, Clark County, and/or other partner agency approval. The projects were assigned to one of several categories:

- **Multi-Modal Street Improvement** – these projects will improve or construct new multi-modal streets throughout the planning area, each with facilities for motorists, pedestrians, and bicyclists. A total of 27 projects are identified that, as of 2026, will cost an estimated $246.5 million to complete.
- **Intersection Improvement** – these projects will improve safety and mobility at intersections throughout the planning area. A total of 17 projects were identified to construct new or improve existing intersections that, as of 2026, will cost an estimated $55.1 million to complete.
- **Pedestrian/ Bike Improvement** – these projects include stand-alone sidewalk, path and roadway crossing improvements, and an integrated network of bicycle lanes, marked on-street routes and shared-use paths to facilitate safe and convenient travel citywide. A total of 44 pedestrian and bicycle projects were identified that, as of 2026, will cost an estimated $77.0 million to complete.
- **Demand/ System Management** – this will enhance the quality and convenience for transit passengers and encourage more efficient usage of the transportation system. Three projects were identified that, as of 2026, will cost an estimated $1.4 million.

TABLE 9: PLANNED TRANSPORTATION PROJECTS

ID ***	PROJECT DESCRIPTION**	PROJECT PURPOSE	ESTIMATED COST (2026 DOLLARS)	TIF ELIGIBLE SHARE	PRIMARY LEAD AGENCY	PRIORITY HORIZON
A	Bike Parking Program	Increase bike parking	$150,000	42%	Camas	Tier 3
	Install new bike parking throughout the City.					
B	Wayfinding Signage Program	Improve wayfinding signage	$300,000	42%	Camas	Tier 3
	Install wayfinding signage to assist pedestrians and bicyclists in choosing comfortable routes and to help visitors navigate through the City.					
T1	Facility Improvements	Enhance transit service and amenities	$1,000,000	42%	Camas	Tier 3
	Improve transit stop amenities as needed, to include sheltered stops with seating, landing pads, route information, sidewalk connections, bicycle parking and lighting.					
M1	NW Pacific Rim Boulevard reconfiguration between SE Payne Road and NW Parker Street	Safety; Bicycle facility gap	$2,600,000	42%	Camas	Tier 3
	Reconfigure the existing paved width of NW Pacific Rim Boulevard between SE Payne Road and NW Parker Street to address safety and bicycle facility gaps. Requires coordination with the City of Vancouver.					
M2	NW 6th Avenue improvements between Norwood Street and Adams Street	Motor vehicle congestion and safety; Bicycle facility gap	$7,000,000	42%	Camas	Tier 3
	Reconfigure the existing paved width of NW 6th Avenue between Norwood Street and Adams Street to address congestion at intersections, safety and bicycle facility gaps. Included in 2024 six-year Transportation Improvement Program as Priority #11.					
M3	NE 3rd Avenue reconfiguration between NE Garfield Street and 4th Street	Safety; Bicycle facility gap	$4,050,000	42%	Camas	Tier 3
	Reconfigure the existing paved width of NE 3rd Avenue between NE Garfield Street and 4th Street to address congestion at intersections, safety and bicycle facility gaps.					
M4	NE 3rd Avenue reconfiguration between 4th Street and SE Lechner Street	Pedestrian and bicycle facility gap	$1,250,000	42%	Camas	Tier 3
	Reconfigure the existing paved width of NE 3rd Avenue between 4th Street and SE Lechner Street to address congestion at intersections, safety, pedestrian and bicycle facility gaps.					
M5	NE Laurel Street extension to SE 15th Street	Street connectivity; Pedestrian and bicycle facility gap	$2,200,000	100%	Camas	Tier 2
	Extend NE Laurel Street to SE 15th Street. This street should be constructed as a Collector, with sidewalks and bike lanes.					
M6	NE Pioneer Street extension to SE 15th Street	Street connectivity; Pedestrian and bicycle facility gap	$2,650,000	100%	Camas	Tier 3
	Extend NE Pioneer Street to SE 15th Street. This street should be constructed as a Collector, with sidewalks and bike lanes.					
M7	SE 271st Avenue extension to SE 8th Street extension	Street connectivity; Pedestrian and bicycle facility gap	$7,200,000	100%	Camas	Tier 3
	Extend/Improve SE 271st Avenue from SE 15th Street to the SE 8th Street extension. This street should be constructed as a Collector, with sidewalks and bike lanes.					
M8	SE 8th Street extension between SR 500-NE Everett Street and the SE 271st Avenue extension	Street connectivity; Pedestrian and bicycle facility gap	$4,600,000	100%	Camas	Tier 1
	Extend SE 8th Street from SR 500-NE Everett Street to the SE 271st Avenue extension. This street should be constructed as a Collector, with sidewalks and bike lanes.					
M9	SR 500-NE Everett Street widening between NW Lake Road and the UGA	Safety; Pedestrian and Bicycle facility gap	$45,700,000	100%	WSDOT	Tier 1
	Widen SR 500-NE Everett Street between NW Lake Road and the UGA boundary to include pedestrian and bike facilities (i.e., assumes a shared-use path on both sides per Everett Street Corridor Analysis). Includes bridge replacement. Included in 2024 six-year Transportation Improvement Program as Priority #1.					
M10	Northshore Boulevard extension to SR 500-NE Everett Street	Street connectivity; Pedestrian and bicycle facility gap	$18,200,000	42%	Camas	Tier 1
	Extend Northshore Boulevard to SR 500-NE Everett Street/NE Everett Drive. This street should be constructed as an Arterial, with sidewalks and bike lanes. Included in 2024 six-year Transportation Improvement Program as Priority #9.					

ID ***	PROJECT DESCRIPTION**	PROJECT PURPOSE	ESTIMATED COST (2026 DOLLARS)	TIF ELIGIBLE SHARE	PRIMARY LEAD AGENCY	PRIORITY HORIZON
M11	NE 232nd Avenue widening between Northshore Boulevard and the UGA	Safety; Pedestrian and Bicycle facility gap	$5,100,000	100%	Camas	Tier 3
	Widen NE 232nd Avenue between Northshore Boulevard and the UGA boundary to include one travel lane in each direction, a center turn-lane/median, a bike lane and sidewalk on the west side and a shared-use path on the east side. PE included in 2024 six-year Transportation Improvement Program as Priority #27.					
M12	NE 242nd Avenue extension from NE 28th Street to Northshore Boulevard	Street connectivity; Pedestrian and bicycle facility gap	$9,350,000	100%	Clark County	Tier 3
	Extend NE 242nd Avenue from NE 28th Street to Northshore Boulevard. This street should be constructed as an Arterial, with sidewalks and bike lanes. PE included in 2024 six-year Transportation Improvement Program as Priority #34.					
M13	NW Lake Road / NW Leadbetter Drive intersection improvements	Motor vehicle congestion and safety	$3,950,000	42%	Camas	Tier 3
	Intersection improvements (i.e., potential installation of roundabout or traffic signal).					
M14	NW Lake Road / NW Lacamas Lane intersection improvements	Motor vehicle congestion and safety	$3,750,000	42%	Camas	Tier 3
	Intersection improvements (i.e., potential installation of roundabout or traffic signal).					
M17	Northshore Boulevard / Northshore Roadway C (east) intersection improvements	Motor vehicle congestion and safety	$3,950,000	100%	Camas	Tier 2
	Intersection improvements (i.e., potential installation of roundabout per the Northshore Subarea Plan).					
M18	Northshore Boulevard / Northshore Roadway E intersection improvements	Motor vehicle congestion and safety	$3,950,000	42%	Camas	Tier 2
	Intersection improvements (i.e., potential installation of roundabout per the Northshore Subarea Plan).					
M19	NE 28th Street widening between N Juniper Street and NE 232nd Avenue	Safety; Pedestrian and Bicycle facility gap	$5,350,000	42%	Camas	Tier 2
	Widen NE 28th Street between N Juniper Street and NE 232nd Avenue to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2024 six-year Transportation Improvement Program as Priority #8.					
M20	NE 28th Street widening between NE Ingle Road and N Juniper Street	Safety; Pedestrian and Bicycle facility gap	$9,500,000	42%	Camas	Tier 2
	Widen NE 28th Street between NE Ingle Road and N Juniper Street to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2024 six-year Transportation Improvement Program as Priority #8.					
M21	NE Goodwin Road widening between NE Ingle Road and NE 13th Street	Safety; Pedestrian and Bicycle facility gap	$12,400,000	42%	Camas	Tier 2
	Widen NE Goodwin Road between NE Ingle Road and NE 13th Street to include bike lanes and sidewalks. Included in 2024 six-year Transportation Improvement Program as Priority #8.					
M22	NE Ingle Road widening between NE 28th Street and the UGA	Safety; Pedestrian and Bicycle facility gap	$1,650,000	42%	Camas	Tier 2
	Widen NE Ingle Road between NE 28th Street and the UGA to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. PE included in 2024 six-year Transportation Improvement Program as Priority #39.					
M24	SR 500-NE Everett Street / NE 35th Avenue intersection improvements	Motor vehicle congestion and safety	$3,950,000	42%	WSDOT	Tier 3
	Intersection improvements (i.e., potential installation of roundabout).					
M25	NW 38th Avenue-NW Astor Street-NW 43rd Avenue widening between NW Dahlia Drive and NW Sierra Street	Safety; Pedestrian and Bicycle facility gap	$7,750,000	42%	Camas	Tier 2
	Widen NW 38th Avenue-NW Astor Street-NW 43rd Avenue between NW Dahlia Drive and NW Sierra Street to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. PE included in 2024 six-year Transportation Improvement Program as Priority #26.					
M26	NW 16th Avenue-NW Hood Street-NW 18th Street widening between NW Klickitat Street and NW Astor Court	Safety; Pedestrian and Bicycle facility gap	$4,450,000	42%	Camas	Tier 2
	Widen NW 16th Avenue-NW Hood Street-NW 18th Street between NW Klickitat Street and NW Astor Court to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2024 six-year Transportation Improvement Program as Priority #6 and #23.					
M27	NW 11th Avenue-NW Astor Street widening between NW McIntosh Road and NW 16th Avenue	Safety; Pedestrian and Bicycle facility gap	$5,800,000	42%	Camas	Tier 2

ID ***	PROJECT DESCRIPTION**	PROJECT PURPOSE	ESTIMATED COST (2026 DOLLARS)	TIF ELIGIBLE SHARE	PRIMARY LEAD AGENCY	PRIORITY HORIZON
	Widen NW 11th Avenue-NW Astor Street between NW McIntosh Road and NW 16th Avenue to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. PE included in 2024 six-year Transportation Improvement Program as Priority #22.					
M28	NW McIntosh Road widening between NW Brady Road and NW 11th Avenue	Safety; Pedestrian and Bicycle facility gap	$9,800,000	42%	Camas	Tier 2
	Widen NW McIntosh Road between NW Brady Road and NW 11th Avenue to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. PE included in 2024 six-year Transportation Improvement Program as Priority #28.					
M29	SE Crown Road widening between NE 3rd Avenue and NE Woodburn Drive	Safety; Pedestrian and Bicycle facility gap	$11,700,000	42%	Camas	Tier 3
	Widen SE Crown Road between NE 3rd Avenue and NE Woodburn Drive to include one travel lane in each direction, left-turn lanes at intersections and a shared-use path (per the Crown Road Corridor Study). Widen the SE Crown Road approach to NE 3rd Avenue to accommodate westbound truck turning maneuvers. Requires coordination with Washougal and Clark County. Included in 2024 six-year Transportation Improvement Program as Priority #5.					
M30	SE 283rd Avenue widening between NE Woodburn Drive and the SE 8th Street extension	Safety; Pedestrian and Bicycle facility gap	$10,800,000	42%	Camas	Tier 2
	Widen SE 283rd Avenue between NE Woodburn Drive and the SE 8th Street extension to include one travel lane in each direction, left-turn lanes at intersections and a shared-use path. Requires coordination with Clark County.					
M31	SE Lechner Street reconfiguration between NE 3rd Avenue and the UGA boundary	Safety; Pedestrian and Bicycle facility gap	$400,000	42%	Camas	Tier 3
	Reconfigure SE Lechner Street between NE 3rd Avenue and the UGA boundary to include one travel lane in each direction, a center turn-lane/median and bike lanes.					
M32	NE 6th Avenue / NE Adams Street intersection improvements	Motor vehicle congestion and safety	$4,000,000	42%	Camas	Tier 2
	Intersection improvements (e.g., Per the Camas Safety Plan this should include the installation of a roundabout and intersection lighting; retain eastbound right-turn slip lane).					
M33	NE 6th Avenue / SR 500-NE Garfield Street intersection improvements	Motor vehicle congestion	$250,000	42%	WSDOT	Tier 2
	Intersection improvements (i.e., restripe the eastbound NE 6th Avenue approach to include a separate left-turn and through/right turn lane; requires removal of on-street parking along the south side of NE 6th Avenue within 75 feet of the intersection).					
M34	SE Crown Road / SE 23rd Street-NE Woodburn Drive intersection improvements	Motor vehicle safety	$4,100,000	0%	Camas	Tier 3
	Intersection improvements (e.g., installation of a roundabout per the Crown Road Corridor Study). Realign SE 23rd Street to intersect with NE Woodburn Drive. This street should be constructed as an Arterial, with sidewalks and bike lane. Realignment included in 2024 six-year Transportation Improvement Program as Priority #29.					
M35	SR 500-NE Everett Street / NE 38th Avenue intersection improvements	Motor vehicle congestion and safety	$3,950,000	42%	WSDOT	Tier 3
	Intersection improvements (i.e., installation of roundabout or a southbound left-turn lane on SR 500-NE Everett Street).					
M36	SR 500-NE Everett Street / NE 43rd Avenue intersection improvements	Motor vehicle congestion and safety	$3,950,000	42%	WSDOT	Tier 3
	Intersection improvements (i.e., potential installation of roundabout per the Northshore Subarea Plan).					
M37	SR 500-NE Everett Street / SE Leadbetter Road intersection improvements	Motor vehicle safety	$25,000	0%	WSDOT	Tier 3
	Intersection improvements (i.e., installation of a median to limit SE Leadbetter Road access to left-in, right-in, right-out only).					
M38	SR 500-NE Everett Street / Northshore Boulevard extension intersection improvements	Motor vehicle safety	$3,950,000	0%	WSDOT	Tier 1
	Intersection improvements (e.g., potential installation of a roundabout per Northshore Subarea Plan).					
M40 *	NE 28th Street / SR 500-NE 242nd Avenue intersection improvements	Motor vehicle congestion	$3,950,000	0%	WSDOT	Tier 3
	Intersection improvements (e.g., installation of a southbound left-turn lane on SR 500-NE Everett Street, eastbound left-turn lane on NE 28th Street and traffic signal, or installation of a roundabout). Requires coordination with WSDOT and Clark County.					
M41 *	NE 232nd Avenue / NE 28th Street intersection improvements	Motor vehicle congestion	$1,850,000	0%	Clark County	Tier 3
	Intersection improvements (e.g., installation of a roundabout or traffic signal). Requires coordination with Clark County. Included in 2024 six-year Transportation Improvement Program as Priority #20.					
M42 *	NE 199th Avenue / SR 500-NE 58th Street intersection improvements	Motor vehicle congestion	$3,950,000	0%	WSDOT	Tier 3

ID ***	PROJECT DESCRIPTION**	PROJECT PURPOSE	ESTIMATED COST (2026 DOLLARS)	TIF ELIGIBLE SHARE	PRIMARY LEAD AGENCY	PRIORITY HORIZON
	Intersection improvements (e.g., installation of a westbound left-turn lane and eastbound right-turn lane on SR 500-NE 58th Street and traffic signal, or installation of a roundabout). Requires coordination with WSDOT and Clark County.					
M43	NW Camas Meadows Drive / NE Goodwin Road intersection improvements	Motor vehicle congestion	$3,950,000	42%	Camas	Tier 2
	Intersection improvements (i.e., installation of a roundabout or traffic signal). Included in 2024 six-year Transportation Improvement Program as Priority #37.					
M44	NW Lake Road / NW Sierra Street intersection improvements	Motor vehicle congestion	$3,750,000	42%	Camas	Tier 1
	Intersection improvements (i.e., installation of a roundabout or traffic signal). Included in 2024 six-year Transportation Improvement Program as Priority #2.					
M45	Pacific Rim Boulevard / NW Parker Street intersection improvements	Motor vehicle congestion	$1,700,000	42%	Camas	Tier 2
	Intersection improvements (i.e., installation of a traffic signal). Included in 2024 six-year Transportation Improvement Program as Priority #38.					
M46	NW Lake Road safety improvements from NE Everett Street to NW Leadbetter Drive	Multimodal Safety	$4,300,000	0%	Camas	Tier 1
	Implement safety improvements along NW Lake Road safety improvements from NE Everett Street to NW Leadbetter Drive. These include horizontal curve signing, profiled pavement marking and shoulder widening per the Camas Safety Plan.					
M47	SR-14 West Camas Slough Bridge widening	Motor vehicle congestion	$45,000,000	0%	WSDOT	Tier 3
	Widen the SR-14 West Camas Slough Bridge to four lanes. Included in 2024 six-year Transportation Improvement Program as Priority #7. WSDOT project.					
M48	Northshore Boulevard / Northshore Roadway A intersection improvements	Motor vehicle congestion and safety	$3,950,000	42%	Camas	Tier 2
	Intersection improvements (i.e., potential installation of roundabout per the Northshore Subarea Plan).					
P1	Pedestrian improvements on NW 7th Avenue between NW Fargo Street and NW Drake Street	Pedestrian facility gap	$1,150,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW 7th Avenue between NW Fargo Street and NW Drake Street (i.e., complete sidewalk gaps on the south side).					
P2	Pedestrian improvements on NW 10th Avenue between NW Forest Home Road and NW Elm Street	Pedestrian facility gap	$1,750,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW 10th Avenue between NW Forest Home Road and NW Elm Street (i.e., complete sidewalk gaps on the north side).					
P3	Pedestrian improvements on Division Street between NW 6th Avenue and NW 11th Avenue	Pedestrian facility gap	$1,150,000	42%	Camas	Tier 3
	Add pedestrian improvements to Division Street between NW 6th Avenue and NW 11th Avenue (i.e., complete sidewalk gaps on the west side).					
P4	Pedestrian improvements on SR 500-SE Union Street between SE 8th Avenue and SE 6th Avenue	Pedestrian facility gap	$650,000	42%	Camas	Tier 3
	Add pedestrian improvements to SR 500-SE Union Street between SE 8th Avenue and SE 6th Avenue (i.e., complete sidewalk gaps on the east side).					
P5	Pedestrian improvements on NE 2nd Avenue-NE Whitney Street between NE 3rd Avenue and SE James Street	Pedestrian facility gap	$1,400,000	42%	Camas	Tier 3
	Add pedestrian improvements to NE 2nd Avenue-NE Whitney Street between NE 3rd Avenue and SE James Street (i.e., complete sidewalk gaps on the east side).					
P6	Pedestrian improvements on SR 500-NE Everett Street between NE 23rd Avenue and Fallen Leaf Lake Park	Pedestrian facility gap	$2,000,000	42%	Camas	Tier 3
	Add pedestrian improvements to SR 500-NE Everett Street between NE 23rd Avenue and Fallen Leaf Lake Park (i.e., complete sidewalk gaps on both sides).					
P7	Pedestrian improvements on NW Lake Road between NW Lacamas Lane and the Lacamas Lake Lodge	Pedestrian facility gap	$3,600,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW Lake Road between NW Lacamas Lane and the Lacamas Lake Lodge (i.e., complete sidewalk gaps on both sides). Included in 2024 six-year Transportation Improvement Program as Priority #3.					
P8	Pedestrian improvements on NE Umatilla Street between NE Woodburn Drive and SE 15th Street	Pedestrian facility gap	$1,100,000	42%	Camas	Tier 3

ID ***	PROJECT DESCRIPTION**	PROJECT PURPOSE	ESTIMATED COST (2026 DOLLARS)	TIF ELIGIBLE SHARE	PRIMARY LEAD AGENCY	PRIORITY HORIZON
	Add pedestrian improvements to NE Umatilla Street between NE Woodburn Drive and SE 15th Street (i.e., complete sidewalk gaps on the east side). Requires right-of-way acquisition, outside current city limits, in part.					
P9	Pedestrian improvements on NE 43rd Avenue-SE 15th Street between SR 500-NE Everett Street and SE Crown Road	Pedestrian facility gap	$10,900,000	42%	Camas	Tier 2
	Add pedestrian improvements to NE 43rd Avenue-SE 15th Street between SR 500-NE Everett Street and SE Crown Road (i.e., complete sidewalk gaps on both sides). Included in 2024 six-year Transportation Improvement Program as Priority #13 and #30.					
P10	Pedestrian improvements on NW Camas Meadows Drive between NE Goodwin Road and NW Payne Street	Pedestrian facility gap	$1,150,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW Camas Meadows Drive between NE Goodwin Road and NW Payne Street (i.e., complete sidewalk gaps on the south side).					
P11	Pedestrian improvements on NW Leadbetter Drive between NW Parker Street and NW Lake Road	Pedestrian facility gap	$3,800,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW Leadbetter Drive between NW Parker Street and NW Lake Road (i.e., complete sidewalk gaps on both sides). Included in 2024 six-year Transportation Improvement Program as Priority #19.					
P12	Pedestrian improvements on NW Parker Street between NW Leadbetter Drive and NW 38th Avenue	Pedestrian facility gap	$2,300,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW Parker Street between NW Leadbetter Drive and NW 38th Avenue (i.e., complete sidewalk gaps on the west side).					
P14	Pedestrian improvements on NW Fargo Street between NW Kent Street and NW Fargo Loop	Pedestrian facility gap	$2,250,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW Fargo Street between NW Kent Street and NW Fargo Loop (i.e., complete sidewalk gaps on the north/east side).					
P15	Pedestrian improvements on NW 23rd Avenue between NW Astor Street and NW Tanner Street	Pedestrian facility gap	$600,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW 23rd Avenue between NW Astor Street and NW Tanner Street (i.e., complete sidewalk gaps on both sides). Included in 2024 six-year Transportation Improvement Program as Priority #17.					
P17	Pedestrian improvements on NW 10th Avenue west of NW Norwood Street	Pedestrian facility gap	$600,000	42%	Camas	Tier 3
	Add pedestrian improvements to NW 10th Avenue west of NW Norwood Street (i.e., complete sidewalk gaps on the south side).					
B1	Bicycle improvements on NW Ivy Street-NW 7th Avenue from NW 6th Avenue to NW Drake Street	Bicycle facility gap	$550,000	42%	Camas	Tier 3
	Add bicycle improvements to NW Ivy Street-NW 7th Avenue from NW 6th Avenue to NW Drake Street (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B2	Bicycle improvements on NW Drake Street between NW 7th Avenue and NW 12th Avenue	Bicycle facility gap	$400,000	42%	Camas	Tier 3
	Add bicycle improvements to NW Drake Street between NW 7th Avenue and NW 12th Avenue (i.e., restripe with bike lanes).					
B3	Bicycle improvements on NW 12th Avenue-Division Street-NE 15th Avenue-NE 18th Avenue-NE 21st Avenue between NW Drake Street and SR 500-NE Everett Street	Bicycle facility gap	$1,350,000	42%	Camas	Tier 3
	Add bicycle improvements to NW 12th Avenue-Division Street-NE 15th Avenue-NE 18th Avenue-NE 21st Avenue between NW Drake Street and SR 500-NE Everett Street (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B4	Bicycle improvements on NE 22nd Avenue-NE Ione Street-NE 19th Avenue-NE Oak Street-NE 6th Avenue between SR 500-NE Everett Street and NE Joy Street	Bicycle facility gap	$1,100,000	42%	Camas	Tier 3
	Add bicycle improvements to NE 22nd Avenue-NE Ione Street-NE 19th Avenue-NE Oak Street-NE 6th Avenue between SR 500-NE Everett Street and SR 500-NE Joy Street (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B5	Bicycle improvements on NE 6th Avenue-NE Dallas Street-NE Joy Street between NE Adams Street and NE 3rd Avenue	Bicycle facility gap	$1,000,000	42%	Camas	Tier 3
	Add bicycle improvements to NE 6th Avenue-NE Dallas Street-NE Joy Street between NE Adams Street and NE 3rd Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B6	Bicycle improvements on NE Woodburn Drive between Laurel Street and the NE Umatilla Street	Bicycle facility gap	$3,000,000	42%	Camas	Tier 3

ID ***	PROJECT DESCRIPTION**	PROJECT PURPOSE	ESTIMATED COST (2026 DOLLARS)	TIF ELIGIBLE SHARE	PRIMARY LEAD AGENCY	PRIORITY HORIZON
	Add bicycle improvements to NE Woodburn Drive between Laurel Street and the NE Umatilla Street (i.e., widen for bike lanes).					
B7	Bicycle improvements on NE Umatilla Street between NE Woodburn Drive and SE 15th Street	Bicycle facility gap	$1,850,000	42%	Camas	Tier 3
	Add bicycle improvements to NE Umatilla Street between NE Woodburn Drive and SE 15th Street (i.e., widen for bike lanes).					
B8	Bicycle improvements on NE 43rd Avenue-SE 15th Street between SR 500-NE Everett Street and SE Crown Road	Bicycle facility gap	$7,750,000	42%	Camas	Tier 2
	Add bicycle improvements to NE 43rd Avenue-SE 15th Street between SR 500-NE Everett Street and SE Crown Road (i.e., widen for bike lanes). Included in 2024 six-year Transportation Improvement Program as Priority #13 and #30.					
B10	Bicycle improvements on NW Leadbetter Drive between NW Fremont Street and NW Lake Road	Bicycle facility gap	$250,000	42%	Camas	Tier 3
	Add bicycle improvements to NW Leadbetter Drive between NW Fremont Street and NW Lake Road (i.e., restripe with bike lanes).					
B11	Bicycle improvements on NW Sierra Street between NW Lake Road and NW 43rd Avenue	Bicycle facility gap	$300,000	42%	Camas	Tier 3
	Add bicycle improvements to NW Sierra Street between NW Lake Road and NW 43rd Avenue (i.e., restripe with bike lanes; requires removal of left-turn lane to NW 44th Avenue; at the NW Lake Road intersection stripe with a southbound bike lane and shared northbound left and right turn-lanes).					
B12	Bicycle improvements on NE Fremont Street-NW Leadbetter Parkway-NW Dahlia Drive-NW 29th Avenue-NW Valley Street-NW Utah Street between NW Leadbetter Drive and NW 28th Avenue	Bicycle facility gap	$2,050,000	42%	Camas	Tier 3
	Add bicycle improvements to NE Fremont Street-NW Leadbetter Parkway-NW Dahlia Drive-NW 29th Avenue-NW Valley Street-NW Utah Street between NW Leadbetter Drive and NW 28th Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B13	Bicycle improvements on NW 44th Avenue-NW Bass Street-NW 45th Avenue-NW 44th Avenue-NW Lacamas Lane-NW 35th Avenue-NW 34th Avenue-NW Norwood Street between NW Dahlia Drive and NW 28th Avenue	Bicycle facility gap	$2,900,000	42%	Camas	Tier 3
	Add bicycle improvements to NW 44th Avenue-NW Bass Street-NW 45th Avenue-NW 44th Avenue-NW Lacamas Lane-NW 35th Avenue-NW 34th Avenue-NW Norwood Street between NW Dahlia Drive and NW 28th Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B14	Bicycle improvements on NW 28th Avenue-NW Fargo Street between NW Sierra Street and NW 18th Avenue	Bicycle facility gap	$1,250,000	42%	Camas	Tier 3
	Add bicycle improvements to NW 28th Avenue-NW Fargo Street between NW Sierra Street and NW 18th Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B15	Bicycle improvements on NW 18th Loop between NW 18th Avenue and NW Couch Street	Bicycle facility gap	$400,000	42%	Camas	Tier 3
	Add bicycle improvements to NW 18th Loop between NW 18th Avenue and NW Couch Street (i.e., restripe with a bike lane on the uphill side).					
B16	Bicycle improvements on NW Sierra Street between NW 28th Avenue and NW 23rd Avenue	Bicycle facility gap	$350,000	42%	Camas	Tier 3
	Add bicycle improvements to NW Sierra Street between NW 28th Avenue and NW 23rd Avenue (i.e., restripe with bike lanes).					
B17	Bicycle improvements on NW 23rd Avenue between NW Astor Street and NW Sierra Street	Bicycle facility gap	$1,000,000	42%	Camas	Tier 3
	Add bicycle improvements to NW 23rd Avenue between NW Astor Street and NW Sierra Street (i.e., widen for bike lanes). Included in 2024 six-year Transportation Improvement Program as Priority #17.					
B18	Bicycle improvements on NW Pacific Rim Drive-NW Endicott Street-NW 37th Avenue between NW Parker Street and NW Dahlia Drive	Bicycle facility gap	$1,150,000	42%	Camas	Tier 3
	Add bicycle improvements to NW Pacific Rim Drive-NW Endicott Street-NW 37th Avenue between NW Parker Street and NW Dahlia Drive (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B19	Bicycle improvements on NW Julia Street-NW 26th Avenue-NW Maryland Street-NW Larkspur Street-NW Klickitat Street between NW Pacific Rim Drive and NW 16th Avenue	Bicycle facility gap	$1,400,000	42%	Camas	Tier 3

ID ***	PROJECT DESCRIPTION**	PROJECT PURPOSE	ESTIMATED COST (2026 DOLLARS)	TIF ELIGIBLE SHARE	PRIMARY LEAD AGENCY	PRIORITY HORIZON
	Add bicycle improvements to NW Julia Street-NW 26th Avenue-NW Maryland Street-NW Larkspur Street-NW Klickitat Street between NW Pacific Rim Drive and NW 16th Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B20	Bicycle improvements on NW Klickitat Street between NW 16th Avenue and NW McIntosh Road	Bicycle facility gap	$500,000	42%	Camas	Tier 3
	Add bicycle improvements to NW Klickitat Street between NW 16th Avenue and NW McIntosh Road (i.e., pavement markings/ signage designating it as a shared street for bikes).					
B21	Bicycle improvements on SE Payne Road-NW 18th Avenue-NW Tidland Street-NW 16th Avenue between NW Pacific Rim Boulevard and NW Brady Road	Bicycle facility gap	$6,600,000	42%	Camas	Tier 3
	Add bicycle improvements to SE Payne Road-NW 18th Avenue-NW Tidland Street-NW 16th Avenue between NW Pacific Rim Boulevard and NW Brady Road (i.e., widen for bike lanes). Included in 2024 six-year Transportation Improvement Program as Priority #24 and #25.					
B22	Bicycle improvements on NW 10th Avenue between NW 10th Place and NW Drake Street	Bicycle facility gap	$850,000	42%	Camas	Tier 3
	Add bicycle improvements to NW 10th Avenue between NW 10th Place and NW Drake Street (i.e., pavement markings/ signage designating it as a shared street for bikes).					
S1	Shared-use path on NW Brady Road between the City limits and NW McIntosh Road	Pedestrian and bicycle facility gap	$1,350,000	42%	Camas	Tier 3
	Create a shared-use path connection along the north side of NW Brady Road between the City limits and NW McIntosh Road. Included in 2024 six-year Transportation Improvement Program as Priority #21.					
S2	Shared-use path between NW 11th Avenue and NW 10th Avenue	Pedestrian and bicycle facility gap	$450,000	42%	Camas	Tier 3
	Create a shared-use path connection between NW 11th Avenue and NW 10th Avenue. Will require grading, switchbacks and/or stairs to navigate the steep slopes.					
S4	Fallen Leaf Lake Park Crossing	Pedestrian and bicycle facility gap	$50,000	42%	Camas	Tier 3
	Install a pedestrian and bicycle crossing on SR 500-NE Everett Street at Fallen Leaf Lake Park. This improvement includes a continental crossing, a median refuge island and pedestrian crosswalk signs.					
S5	Shared-use path on NE Leadbetter Road between SR 500-NE Everett Street and the Lacamas Lake boat ramp	Pedestrian and bicycle facility gap	$800,000	42%	Camas	Tier 3
	Create a shared-use path connection along the north side of NE Leadbetter Road between SR 500-NE Everett Street and the Lacamas Lake boat ramp.					
S6	Shared-use path on NE Leadbetter Road between the Lacamas Lake boat ramp and NE 232nd Avenue-Northshore Boulevard	Pedestrian and bicycle facility gap	$2,100,000	42%	Camas	Tier 3
	Close NE Leadbetter Road to motor vehicle traffic (except emergency services) between the Lacamas Lake boat ramp and NE 232nd Avenue-Northshore Boulevard and convert the roadway surface to a shared-use path.					
S7	Lacamas Trail SE Crown Road Crossing	Pedestrian and bicycle facility gap	$1,800,000	42%	Camas	Tier 3
	Install a pedestrian and bicycle crossing on Crown Road at the Lacamas Trail. As part of this project, extend the sidewalk along the west side of SE Crown Road from Woodburn Elementary to the Lacamas Trail. This improvement includes a continental crossing, a median refuge island and pedestrian crosswalk signs.					
S8	E 1st Avenue Crossing	Pedestrian and bicycle facility gap	$50,000	42%	Camas	Tier 3
	Install a pedestrian and bicycle crossing on NE 3rd Avenue at E 1st Avenue. This improvement includes a continental crossing, a median refuge island and pedestrian crosswalk signs.					
S9	NE Weir Street Crossing	Pedestrian and bicycle facility gap	$50,000	42%	Camas	Tier 3
	Install a pedestrian and bicycle crossing on NE 3rd Avenue at NE Weir Street. This improvement includes a continental crossing, a median refuge island and pedestrian crosswalk signs.					

Note: * Project (or a portion of the alignment) is located outside the UGA and is shown for future planning purposes only.

** The project design elements depicted are identified for planning purposes. The actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to agency approval.

*** Some projects were omitted or relabeled from the draft project list, with ID's M15, M16, M23, M39, P13, P16, B9 and S3 missing from the final project list.

FIGURE 23: PLANNED ROADWAY AND INTERSECTION PROJECTS

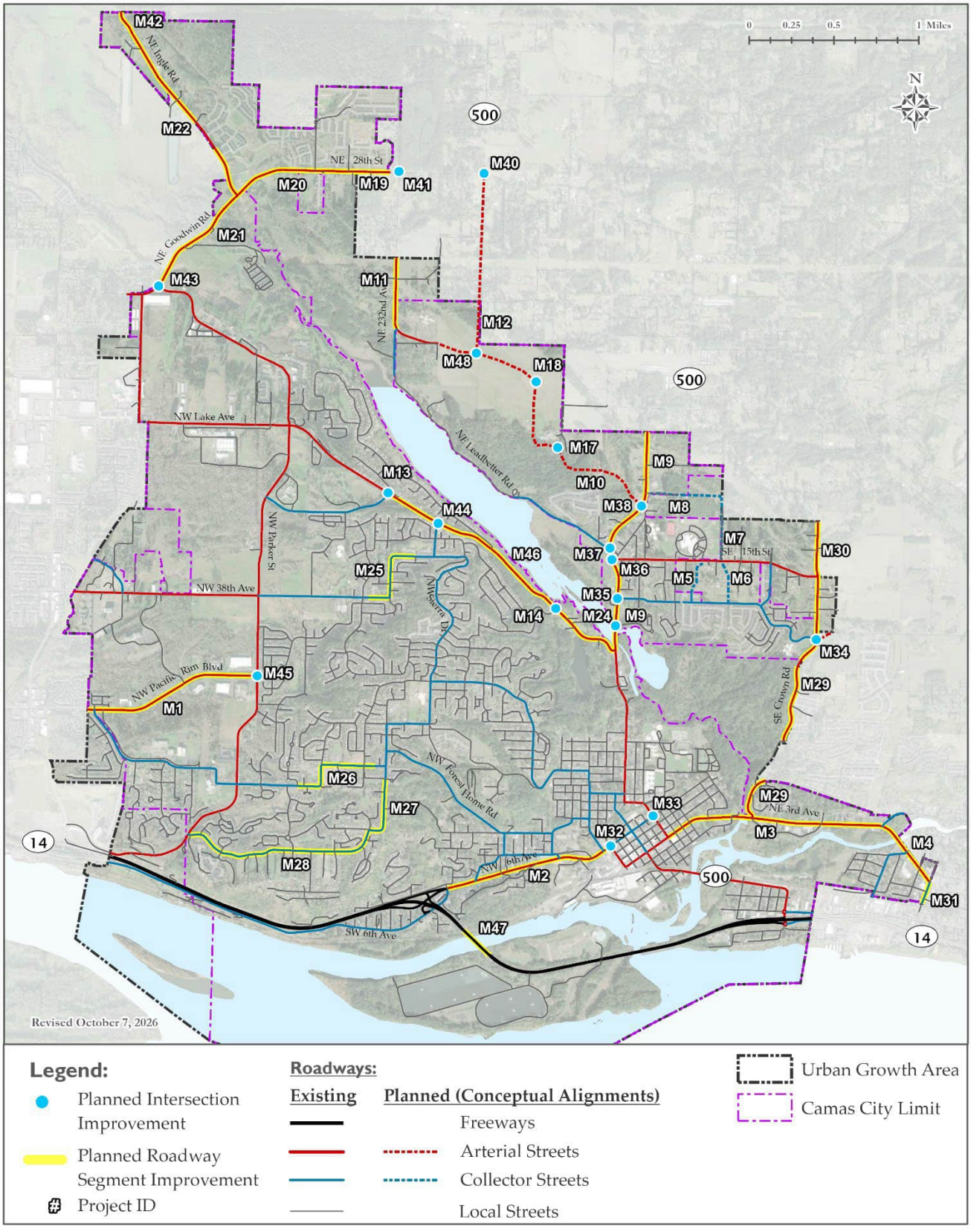


FIGURE 24: PLANNED PEDESTRIAN PROJECTS

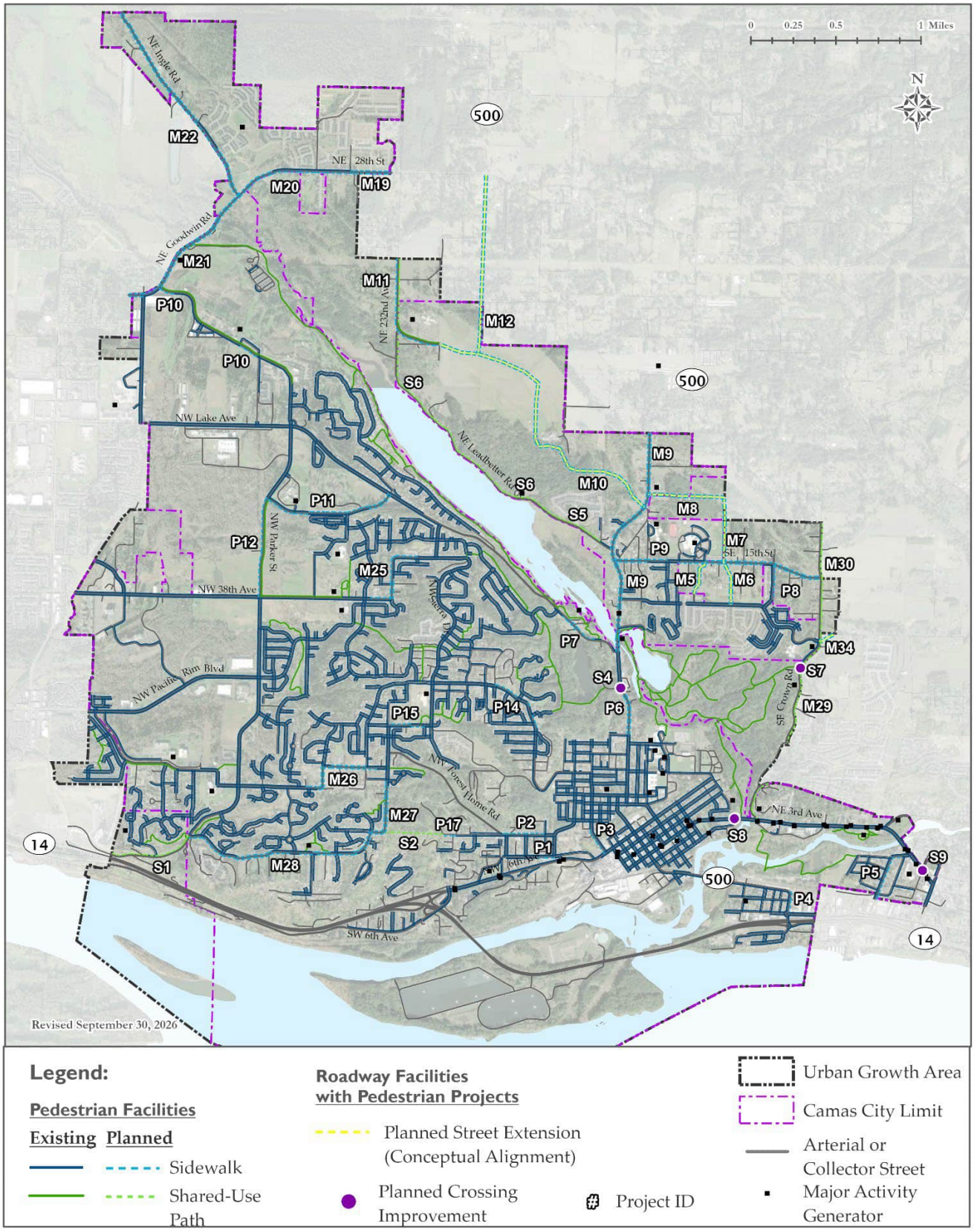
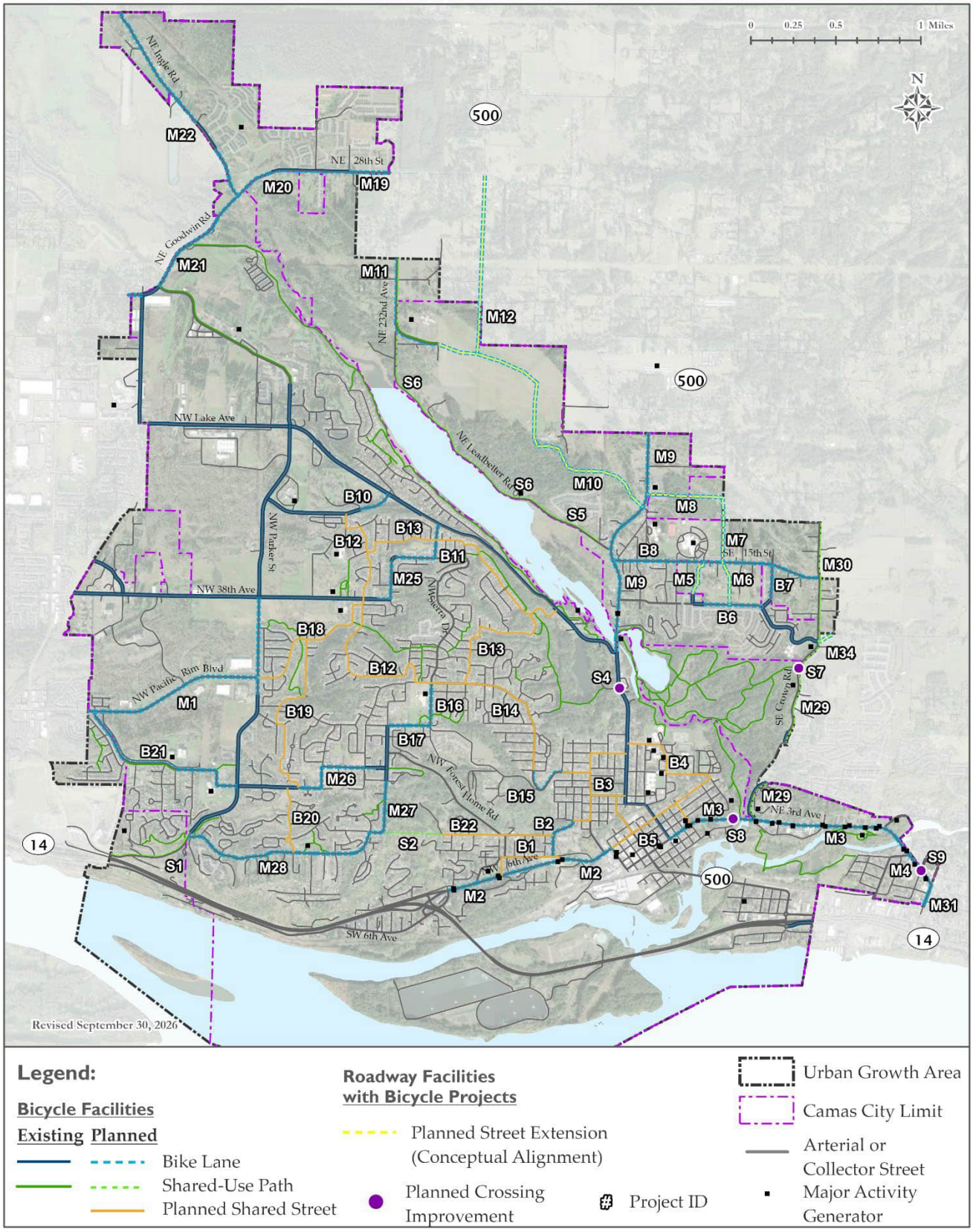


FIGURE 25: PLANNED BICYCLE PROJECTS



CHAPTER 5.

Implementation and On-Going Strategies

The following chapter summarizes system performance outcomes and provides transportation strategies and policy considerations for plan implementation and monitoring. Some are emerging issues to be monitored, and others are ongoing but need greater emphasis or attention. Addressing these will take the City time to evaluate, and they may require future decisions from the City Council.

SYSTEM PERFORMANCE OUTCOMES

This TSP uses system performance measures to support the City's transportation planning and decision-making process. The performance measures serve as the link between TSP goals and plan implementation by enabling the City to measure the degree to which the TSP investments support City-wide priorities through 2045. While the performance assessment does not represent the complete picture, it does offer a baseline against which to assess how the policies, investments, and planning decisions made in this plan may affect the future.

The three TSP performance measures include: 1) Pedestrian Level of Traffic Stress; 2) Bicycle Level of Traffic Stress; and 3) Vehicle Congestion. The current TSP system performance assessment is based on the existing motor vehicle, pedestrian and bicycle facilities and highlights changes in 2045 both without and with the planned TSP projects identified in Chapter 4 along all collector and arterial street segments in the Camas planning area.

PEDESTRIAN AND BICYCLE LEVEL OF TRAFFIC STRESS OUTCOMES

The pedestrian and bicycle LTS evaluation provides a quantitative metric to understand a multimodal user's perception of the safety and comfort of the transportation network and was used by the TSP to understand key gaps and barriers to walking and biking in the City's planning area.

Results of the pedestrian and bicycle LTS evaluations are summarized in Table 10. All collector and arterial streets in Camas must provide an LTS of 2 or better for pedestrian and bicycle facilities, of which an estimated 60 percent of these streets (or about 57 total miles) are forecasted to exceed that threshold by 2045 without any improvements (see Table 10). This TSP includes an estimated $77 million in targeted improvements to address gaps in the walking and biking networks in the City's planning area through 2045. Table 10 shows that these projects will improve about 20 miles of pedestrian facilities (or about 79 percent of the LTS 3 or 4 miles) and 23 miles of bicycle facilities (or around 73 percent of the LTS 3 or 4 miles) that were forecasted to exceed the LTS threshold by 2045.

This TSP addresses all feasible gaps in the walking and biking networks on collector and arterial streets in the City's planning area through 2045. An estimated 5 miles of pedestrian facilities and 8 miles of bicycle facilities along these streets (see Table 10) were deemed infeasible due to physical and natural constraints that prevent adherence to the multimodal network design requirements. However, there was typically a sidewalk available on one side of the street along these segments or a parallel bike route identified in the TSP to serve users of these facilities.

TABLE 10: MULTIMODAL LEVEL OF TRAFFIC STRESS IN CAMAS PLANNING AREA

MULTIMODAL LEVEL OF TRAFFIC STRESS	PEDESTRIAN NETWORK				BICYCLE NETWORK			
	2045 WITHOUT TSP PROJECTS		2045 WITH TSP PROJECTS		2045 WITHOUT TSP PROJECTS		2045 WITH TSP PROJECTS	
	TOTAL MILES	SHARE OF TOTAL MILES	TOTAL MILES	SHARE OF TOTAL MILES	TOTAL MILES	SHARE OF TOTAL MILES	TOTAL MILES	SHARE OF TOTAL MILES
EXTREME STRESS MILES (LTS 4)	5.15	11%	11.09	23%	4.77	10%	9.13	19%
HIGH STRESS MILES (LTS 3)	16.58	35%	31.08	65%	11.94	25%	30.26	64%
MODERATE STRESS MILES (LTS 2)	10.56	22%	2.41	5%	7.03	15%	1.71	4%
LOW STRESS MILES (LTS 1)	15.31	32%	3.02	6%	23.85	50%	6.50	14%
TOTAL MILES*	47.60	100%	47.60	100%	47.60	100%	47.60	100%
TOTAL MILES OVER LTS 2	25.87	54%	5.43 **	11%	30.89	65%	8.21 **	17%
CHANGE (WITH PROJECTS - WITHOUT PROJECTS)			-20.44	-79%		**CHANGE**	-22.67	-73%

Source: Based on existing pedestrian and bicycle facilities in 2024 and planned TSP projects along all collector and arterial street segments in the Camas planning area.

*Total miles include the length of all collector and arterial street segments in the Camas planning area.

**An estimated 5 miles of pedestrian facilities and 8 miles of bicycle facilities along collector and arterial streets were deemed infeasible due to physical and natural constraints that prevent adherence to the multimodal network design requirements. However, there was typically a sidewalk available on one side of the street along these segments or a parallel bike route identified in the TSP to serve users of these facilities.

VEHICLE CONGESTION OUTCOMES

Mobility targets for intersections in the City's planning area provide a metric for assessing the impacts of new development on the existing transportation system and for identifying where capacity improvements may be needed.

Results of the vehicle congestion evaluation are summarized in Table 11. This TSP includes performance standards for motor vehicles, of which 16 of the 50 key intersections in Camas (i.e., intersections of two collector and/or arterial streets) are forecasted to exceed that threshold by 2045 without any improvements (see Table 11). The TSP includes conceptual intersection enhancements, and locations of future collector and arterial streets that will help to provide additional travel routes and alleviate some of the local traffic from streets in the Camas planning area through 2045. Table 11 shows that these projects will improve the 16 substandard intersections that were forecasted to exceed the vehicle congestion threshold by 2045.

TABLE 11: VEHICLE CONGESTION IN CAMAS PLANNING AREA

ID	STUDY INTERSECTION	EXISTING TRAFFIC CONTROL	2045 WITHOUT TSP PROJECT			RECOMMENDED TSP IMPROVEMENT	2045 WITH TSP PROJECT		
			DELAY	LOS	V/C		DELAY	LOS	V/C
1	NW Grand Ridge Drive at NW Brady Road	Two-Way Stop Control	9/20	A/C	0.42/0.24	n/a	-	-	-
2	NW Brady Road at NW McIntosh Road	Two-Way Stop Control	9/36	A/E	0.26/0.45	n/a	-	-	-
3	NW Brady Road at NW 16th Avenue	Traffic Signal	20	B	0.79	n/a	-	-	-
4	Pacific Rim Boulevard at Payne Road	Traffic Signal	13	B	0.47	n/a	-	-	-
5	Pacific Rim Boulevard at Fisher Creek Drive	Two-Way Stop Control	8/22	A/C	0.10/0.76	n/a	-	-	-
6	Pacific Rim Boulevard at NW Parker Street	All-Way Stop Control	36	**F**	**1.02**	Intersection improvements*	15	B	0.48
7	NW 38th Avenue at NW Parker Street	Traffic Signal	25	C	0.78	n/a	-	-	-
8	SE Bybee Road at SE 20th Street	Traffic Signal	24	C	0.73	n/a	-	-	-
9	NW Leadbetter Drive at NW Parker Street	Two-Way Stop Control	9/43	A/E	0.26/0.57	n/a	-	-	-
10	Lake Road at NW Parker Street	Traffic Signal	22	C	0.67	n/a	-	-	-
11	NW Payne Street at NW Lake Road	Two-Way Stop Control	10/38	A/E	0.27/0.59	n/a	-	-	-
12	NW Friberg-Strunk Street at Lake Road	Traffic Signal	23	C	0.80	n/a	-	-	-
13	NW Friberg-Strunk Street at Union High	Two-Way Stop Control	8/14	A/B	0.16/0.12	n/a	-	-	-
14	NE 13th Street at NW Friberg-Strunk Street	Traffic Signal	19	B	0.80	n/a	-	-	-
15	NW Camas Meadows Drive at NE Goodwin Road	Two-Way Stop Control	11/294	**B/F**	**0.41/1.25**	Intersection improvements*	15	B	0.76
16	NE Ingle Road at NE 28th Street	Traffic Signal	17	B	0.74	n/a	-	-	-
17	NE 232nd Avenue at NE 28th Street	Two-Way Stop Control	9/237	**A/F**	**0.16/1.40**	Intersection improvements*	16	B	0.78

ID	STUDY INTERSECTION	EXISTING TRAFFIC CONTROL	2045 WITHOUT TSP PROJECT			RECOMMENDED TSP IMPROVEMENT	2045 WITH TSP PROJECT		
			DELAY	LOS	V/C		DELAY	LOS	V/C
18	NE 28th Street at SR 500-NE 242nd Avenue	Two-Way Stop Control	9/124	**A/F**	**0.27/1.13**	Intersection improvements*	9	A	0.61
19	NE 199th Avenue at SR 500-NE 58th Street	Two-Way Stop Control	9/356	**A/F**	**0.19/1.70**	Intersection improvements*	11	B	0.62
20	SR 500 at NE 3rd Street	Roundabout	6	A	0.37	n/a	-	-	-
21	SR 500-NE Everett Street at SE Leadbetter Road	Two-Way Stop Control	9/20	A/C	0.28/0.29	n/a	-	-	-
22	SR 500-NE Everett Street at NE 43rd Avenue	Traffic Signal	11	B	0.55	n/a	-	-	-
23	SR 500-NE Everett Street at NE 38th Avenue	Two-Way Stop Control	10/69	**B/F**	0.45/0.56	Intersection improvements*	8	A	0.69
24	SR 500-NE Everett Street at NW Lake Road	Roundabout	11	B	0.66	n/a	-	-	-
25	NW Lake Road at NW Lacamas Lane	Two-Way Stop Control	11/62	**B/F**	0.42/0.22	Intersection improvements*	6	A	0.62
26	NW Lake Road at NW Sierra Street	Two-Way Stop Control	12/735	**B/F**	**0.31/2.29**	Intersection improvements*	11	B	0.66
27	NW Lake Road at NW Leadbetter Drive	Two-Way Stop Control	10/166	**A/F**	**0.32/1.14**	Intersection improvements*	14	B	0.64
28	NW Sierra Street at NW 45th Avenue	Two-Way Stop Control	8/18	A/C	0.22/0.13	n/a	-	-	-
29	NW Dahlia Drive at NW 38th Avenue	Two-Way Stop Control	9/47	A/E	0.15/0.67	n/a	-	-	-
30	NW Utah Street at NW 28th Avenue	Two-Way Stop Control	8/12	A/B	0.09/0.22	n/a	-	-	-
31	NW Sierra Drive at NW 28th Avenue	All-Way Stop Control	10	B	0.30	n/a	-	-	-
32	NW Astor Street at NW Forest Home Road	Two-Way Stop Control	8/11	A/B	0.08/0.24	n/a	-	-	-
33	NW Astor Street at NW 18th Avenue	Two-Way Stop Control	8/11	A/B	0.07/0.15	n/a	-	-	-
34	NW Forest Home Road at NW 10th Avenue	Two-Way Stop Control	8/11	A/B	0.07/0.22	n/a	-	-	-
35	Division Street at NW 18th Avenue	Two-Way Stop Control	8/12	A/B	0.22/0.32	n/a	-	-	-
36	NW 6th Avenue at SR 14 Ramps	Roundabout	74	**F**	**1.24**	Corridor Improvements**	14	B	0.61
37	NW 6th Avenue at NW Logan Street	Two-Way Stop Control	11/35	B/E	0.74/0.29	n/a	-	-	-
38	NW 6th Avenue at NW Ivy Street	Two-Way Stop Control	10/115	**B/F**	0.45/0.25	Corridor Improvements**	4	A	0.47
39	NW 6th Avenue at Drake Street	Two-Way Stop Control	11/221	**B/F**	**0.42/1.18**	Corridor Improvements**	5	A	0.49
40	NE 6th Avenue at NE Division Street	Two-Way Stop Control	12/154	**B/F**	0.56/0.56	Corridor Improvements**	4	A	0.59
41	NE 6th Avenue at NE Adams Street	Two-Way Stop Control	291	**F**	**2.09**	Corridor Improvements**	10	A	0.66
42	NE 6th Avenue at SR 500-NE Garfield Street	Two-Way Stop Control	9/93	**A/F**	0.29/0.88	Intersection improvements*	6	A	0.48
43	NE 3rd Avenue at SR 500-NE Garfield Street	Traffic Signal	18	B	0.68	n/a	-	-	-

ID	STUDY INTERSECTION	EXISTING TRAFFIC CONTROL	2045 WITHOUT TSP PROJECT			RECOMMENDED TSP IMPROVEMENT	2045 WITH TSP PROJECT		
			DELAY	LOS	V/C		DELAY	LOS	V/C
44	NE 3rd Avenue at SR 500-NE Dallas Street	Traffic Signal	16	B	0.77	n/a	-	-	-
45	Crown Street at 3rd Avenue	Traffic Signal	20	B	0.69	n/a	-	-	-
46	Shephard Road at NE 3rd Avenue	Traffic Signal	11	B	0.42	n/a	-	-	-
47	NE 3rd Avenue at NE 4th Street	Traffic Signal	6	A	0.40	n/a	-	-	-
48	Weir Road at NE 3rd Avenue	Two-Way Stop Control	10/106	**A/F**	**0.14/1.00**	Corridor Improvements***	7	A	0.38
49	SE 283rd Avenue at SE 23rd Street	Two-Way Stop Control	8/13	A/B	0.23/0.21	n/a	-	-	-
50	SE 283rd Avenue at SE 15th Street	Two-Way Stop Control	8/13	A/B	0.16/0.26	n/a	-	-	-

Notes: **Red shading** indicates an intersection with two-way stop control that exceeds the vehicle congestion threshold of LOS "E" or v/c 0.90, or an intersection with traffic signal, roundabout or all-way stop control that exceeds the vehicle congestion threshold of LOS "D" or v/c 0.85.

Intersection operations are reported for the entire intersection at traffic signals, roundabouts or all-way stop control intersections, and for the worst major street movement/worst minor street movement at two-way stop control intersections.

* Intersection improvements to be confirmed through future design and may include the potential installation of roundabout or traffic signal.

** Corridor wide improvements to NW/NE 6th Avenue between Norwood Street and Adams Street to be confirmed through future design to address congestion at intersections, safety and bicycle facility gaps and may include the potential installation of a traffic signal.

*** Corridor wide improvements to NE 3rd Avenue between NE Garfield Street and SE Lechner Street to be confirmed through future design to address congestion at intersections, safety and bicycle facility gaps and may include the potential installation of a traffic signal.

STEPS TO SUPPORT PLAN IMPLEMENTATION

Chapter 3 of the TSP includes several updated transportation standards and regulations. These apply to the construction of new transportation facilities and to the operation of all facilities to ensure they are designed appropriately, and that the system functions as intended. These standards and regulations will need to be added by reference or incorporated into the City's Municipal Code and/or Development Code:

ACTION: Amend the Camas Municipal Code to:

- Update references to adopted vehicle functional classifications, as well as area designations, consistent with the TSP.
- Update references to minimum street cross-section and facility widths, consistent with the TSP.
- Update references to vehicle mobility standards and new pedestrian and bicycle level of traffic stress targets for City streets, consistent with the TSP.
- Update references for transportation facility and access spacing standards identified the TSP for City streets.

Appendix I: Transportation System Plan, Volume 2

City of Camas

TRANSPORTATION SYSTEM PLAN

VOLUME 2

DRAFT OCTOBER 2026

TSP VOLUME 2: APPENDIX

Volume 2 of the Camas Transportation System Plan includes all background memoranda, and technical data that were the basis for its development. The contents of Volume 2 represent an iterative process in the development of the TSP. Refinements to various plan elements occurred throughout the process as new information was obtained. In all cases, the contents of Volume 1 supersede those in Volume 2.

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APPENDIX A. BACKGROUND PLANS, POLICIES AND TRAFFIC IMPACT FEE SUMMARY

MEMORANDUM

720 SW Washington St.
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DATE: May 15 2024

TO: Curleigh Carothers, City of Camas
Steve Wall, City of Camas

FROM: Reah Flisakowski, DKS Associates
Kevin Chewuk, DKS Associates
Veronica Sullivan, DKS Associates

SUBJECT: Camas Transportation Plan
Technical Memo #1a – Background Plans, Policies and Traffic Impact Fee Summary

P18039-000

This memorandum summarizes recent planning documents, policies and regulations that are applicable to the City of Camas Transportation Plan and Traffic Impact Fee (TIF) program. The transportation element of the City's current Comprehensive Plan will serve as the foundation for this process, upon which new information obtained from system analysis and stakeholder input will be applied to address changing transportation needs through the year 2040. As new strategies for addressing transportation needs are proposed, compliance and coordination with the plans, policies, and regulations described in this document will be required.

Note that this document does not include the full list of projects recommended from these plans. The list of previously recommended projects will be provided in Technical Memorandum #5 - Solutions Identification and Evaluation.

Planning Context

Growth Management Act (1990)

The Growth Management Act (GMA) was adopted in 1990 and includes both a set of high-level goals and a set of statutes and administrative codes that implement those goals. The two goals most relevant to transportation planning are Goal 2 and Goal 12:

- **Goal 2** – Transportation. Encourage efficient multimodal transportation systems.
- **Goal 12** – Public facilities and services. Ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the

development is available for occupancy and use without decreasing current service levels below locally established minimum standards.

The provisions of the GMA govern the transportation element of comprehensive plans through two sections of statute and one section of administrative code:

- RCW 36.70A.070 Comprehensive plans – Mandatory elements
- RCW 36.70A.108, Transportation element – Multimodal transportation improvements and strategies
- WAC 365-196-430, Transportation element

The Department of Commerce's Growth Management Services Division provides a useful and comprehensive checklist to help guide jurisdictions to update any element of the Comprehensive Plan to ensure compliance with the GMA. The checklist was last updated in 2014 and integrates all planning requirements defined in state statute or administrative code under the GMA.

The checklist summarizes the mandatory requirements under the GMA. Table 1 provides an overview of the topics addressed in the checklist and a summary of the mandatory elements related to each topic.

Table 1: Summary of Transportation Element Requirements of the GMA

Topic	Requirement(s)
Transportation inventory	Include an inventory of for all air, water, and ground transportation facilities.
Level of service standards	Plan must be regionally coordinated and must include standards for arterials, transit routes, and state highways.
Concurrency	Provide specific actions for bringing locally-owned facilities into compliance when below LOS standard.
Forecasting	Include a forecast of at least 10-years that provides information on the location and timing of capacity needs on the state and local system. The forecast must be based on growth assumptions in the Land Use Element.
Bicycle and pedestrian planning	Include a bicycle and pedestrian component.
Transportation Demand Management	Describe existing and planned TDM strategies. Camas is required to implement a Commute Trip Reduction (CTR) Program under the 2006 CTR Efficiency Act.
Funding	Include a multi-year financing plan that includes 6-year Transportation Improvement Program; Assess needs relative to funding sources; If funding is insufficient, identify how additional funds will be raised or modifications to land use assumptions to ensure LOS standards will be met.
Consistency and Coordination	Discuss intergovernmental coordination; Identify impact on adjacent jurisdiction; Demonstrate consistency with the regional transportation plan.

What this means for the Camas Transportation Plan: The GMA regulates both the process and content of the Transportation Element of comprehensive plans. The requirements of the GMA should be reviewed throughout development of the Transportation Plan.

WSDOT Highway System Plan (2007-2026)

The WSDOT (Washington State Department of Transportation) Highway System Plan is the element of the 2006 Washington's Transportation Plan (WTP) that identifies current and forecasted state highway needs based on the investment options identified in the WTP. The Plan identifies all the needs consistent with the WTP and provides strategies and performance measures to address those needs. This plan is based on the goals established in the WTP and supports the state's transportation policy goals contained in the RCW 47.04.280:

1. **Preservation:** to maintain, preserve and extend the life and utility of prior investments in transportation systems and services;
2. **Safety:** to provide for and improve the safety and security of transportation customers and the transportation system;
3. **Mobility:** to improve the predictable movement of goods and people throughout Washington state;
4. **Environment:** to enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities and protect the environment; and
5. **Stewardship:** to continuously improve the quality, effectiveness and efficiency of the transportation system.

What this means for the Camas Transportation Plan: The Plan will ensure consistency with the Highway System Plan. It will identify needs for SR 14 and SR 500 in Camas to ensure that the state's transportation network functions safely, efficiently, reliably and cost effectively.

Regional Transportation Plan for Clark County (2014)

Washington State's Growth Management Act approved the Regional Transportation Planning Program which created a formal mechanism for local governments and the state to coordinate transportation planning for regional transportation facilities. The Growth Management Act authorized the creation of Regional Transportation Planning Organizations (RTPOs) by units of local government. Southwest Washington Regional Transportation Council (RTC) is the designated RTPO for the three-county area of Clark, Skamania and Klickitat.

The duties of the RTPO include:

- Designation of the regional transportation system.
- Development of a six-year Transportation Improvement Program (TIP) to include regionally-significant city road projects, county road projects, transit capital projects and WSDOT transportation projects. The TIP must include a financial plan.
- Development of a Regional Transportation Plan (RTP) to include a regional transportation strategy, identification of existing and planned facilities and programs, Level of Service standards, a financial plan, assessment of regional development patterns and capital investment using a regional transportation approach. The Plan should also establish the relationship of High Capacity Transit to other public transportation providers. The concept of least cost planning is to be used in development of the RTP.
- Review of the Regional Transportation Plan at least every two years to ensure that it is current.
- Establish guidelines and principles for development and evaluation of local comprehensive plan transportation elements and certify that the transportation elements meet the requirements of the GMA and are consistent with the RTP.
- Develop a regional Level of Service (LOS) standard for the regional system as required by the LOS Bill.

Clark County's Regional Transportation Plan (RTP) is the region's long-range transportation planning document with a 2035 horizon. It is consistent with Federal and State requirements and builds upon strategies identified by State and local agencies to address short-, mid-, and long-term needs.

Sections relevant to Camas include:

- **Regional Transportation System:** The RTP focuses on the regional transportation system and identifies several streets in Camas as part of the system, including SR 14, SR 500, Lake Road - SE 1st Street, Parker Street, Pacific Rim Boulevard - 34th Street, NW 38th Avenue – SE 20th Street, NW 6th Avenue, and NE 3rd Avenue.

- **Highways of Statewide Significance (HSS):** SR 14 in Camas is designated as a highway facility of Statewide Significance. The State must give higher priority to correcting identified deficiencies on transportation facilities of statewide significance.
- **Level of service standards:** Level of Service for Highways of Statewide Significance is set by the State. In Clark County, the standard is set as LOS "D" for urban areas, including SR 14. Level of Service for regional state highway facilities (not part of the HSS), including SR 500 in Camas, is set through a Regional Transportation Planning Organization (RTPO). The RTC Board adopted LOS 'E' or better for non-HSS urban state highway facilities and LOS 'C' or better on rural non-HSS facilities.
- **Regional Transportation System Improvements: The RTP identifies improvements necessary to meet the transportation needs within and through the region over the next 20-plus years on the** RTP's Designated Regional Transportation System.

What this means for the Camas Transportation Plan: The Plan will ensure consistency with the RTP, it will adopt the LOS standard for Highways of Statewide Significance and regionally significant roadways, and will identify capital projects for the Regional Transportation System in Camas.

2035 Camas Comprehensive Plan

The Camas Comprehensive Plan, adopted in 2016, includes the City's transportation goals and policies. Comprehensive Plan Chapter 4, Transportation, provides the policy framework for the development and maintenance of the City's streets, bicycle and pedestrian ways and transit facilities, low-impact development, safety, traffic calming, and transportation demand management.

Overall, there are 41 policies in the chapter on transportation, categorized by the transportation-related topics listed below

- **Street Goal:** Streets will function for all users including bicyclists, pedestrians, transit users and motorists. Policies T-1.1 to T-1.7.
- **Walking, Bicycling and ADA Mobility Goal:** The needs of bicyclists, pedestrians, transit users and accessibility (ADA-compliant) will be considered in all street improvements and will be integrated in all collector and arterial roadways projects, including regular safe street crossings. Policies T-2.1 to T-2.7.

- **Local and Regional Transit:** Regional Transit will provide safe, efficient, and dependable service to our community. Policies T-3.1 to T-3.2.
- **Design and Low-Impact Development:** The transportation system will be designed to support community character and environmental policies. Policies T-4.1 to T-4.4.
- **Safety and Traffic Calming:** Design and construct safe transportation facilities that meet applicable requirements. Policies T-5.1 to T-5.6.
- **Transportation Demand Management:** Transportation planning will achieve the efficient use of transportation infrastructure, increase its person-carrying capacity and accommodate and facilitate future growth consistent with land use objectives. Policies T-6.1 to T-6.4.
- **Concurrency and Level of Service:** The City will maintain the adopted LOS standards for all arterials, transit routes and highways. Policies T-7.1 to T-7.5.
- **Transportation Revenue:** Maximize the use of state and federal funds for transportation capital operating service and demand improvements. Policies T-8.1 to T-8.6.

The Transportation Comprehensive Plan Map provides a summary of existing and proposed transportation facilities in the City, including the number of travel lanes.

What this means for the Camas Transportation Plan: The TSP update process will provide an opportunity to review transportation policies, as well as supporting sections of the Comprehensive Plan transportation element, to better represent current state and local practices and objectives. Potential policy changes may reflect issues such as strategies to optimize transportation management and maximizing the efficiency of the existing transportation system, and the role the transportation system plays in human health. Particular attention will be given to ensuring that the TSP will be consistent with existing City policies.

Other Background Information for the Transportation Plan

The following sections summarize additional background information or guidance documents that will be used in for the Camas Transportation Plan.

SR-500/ 6th Avenue Corridor Analysis

The SR 500/ 6th Avenue Corridor Analysis identifies travel conditions for motor vehicles and future needs for pedestrians, bicycles and transit. The corridor was divided into six segments and improvement alternatives were identified and evaluated between the NW 6th Avenue/NW Norwood Street intersection to approximately 500 feet south of the SR 500/NE 3rd Street intersection.

> **What this means for the Camas Transportation Plan: The project list for the SR-500/ 6th Avenue Corridor Analysis potentially will need to be updated to reflect outcomes of the Transportation Plan process.**

North Urban Growth Area Traffic Analysis

The North Urban Growth Area Traffic Analysis evaluates the potential lane configuration and roadway cross-section configuration for an arterial connection through this area. The North Urban Growth Area study area lies to the north of Lacamas Lake between NE 232nd Avenue and NE Everett Street (SR 500).

> **What this means for the Camas Transportation Plan: The findings for the North Urban Growth Area Traffic Analysis will be reviewed and updated if needed during the development of the Plan.**

Crown Road Corridor Plan

PLACEHOLDER- The Crown Road Corridor Plan has not been completed.

Clark County Transportation Capital Facilities Plan (2016-2035)

The Clark County Transportation Capital Facilities Plan provides the County with a guide for transportation system improvements to meet existing and future travel needs while setting forth supporting goals and policies. The plan focuses on roadway facilities within the County that are outside of City limits, so there are no identified projects within Camas.

What this means for the Camas Transportation Plan: The Transportation Plan should be consistent with all relevant provisions of the County Transportation Capital Facilities Plan.

Clark County Bicycle and Pedestrian Plan (2010)

The Clark County Bicycle and Pedestrian Plan is a 20-year vision and implementation strategy that was developed to increase the number of people walking and bicycling while improving pedestrian and bicycling safety throughout the county. Clark County recognizes the importance of walkable, bikeable neighborhoods which can make a community more livable, attractive, healthier and increase spending on local goods and services. The Plan's recommendations focus on walkways, bikeways and trials that connect key destinations in Clark County.

The plan focuses on bicycle and pedestrian facilities within the County that are outside of City limits, so there are no newly identified projects within Camas. However, the plan's appendix provides a summary of existing, partially constructed and previously planned shared-use paths in Camas.

What this means for the Camas Transportation Plan: The Transportation Plan should be consistent with all relevant provisions of the County Bicycle and Pedestrian Plan.

Clark County Arterial Atlas with 2017 Amendments

The Clark County Arterial Atlas is a supporting document to Clark County's Comprehensive Growth Management Plan that outlines future growth and unites the long-range roadway system with land use plans. The Arterial Atlas provides guidance for developing a roadway system that will help fulfill the objectives of the comprehensive plan. The County's arterial functional classification system and the cross-sections for non-local roadways in the County's jurisdiction are provided in the adopted Arterial Atlas.

The relevant classifications in Camas are:

- **State Routes: SR-14 and** SR-500
- **Primary Arterials:** Lake Road, 6th Avenue, Adams Street, and 3rd Avenue
- Arterial Roadways: **Pacific Rim Blvd,** Brady Road, **NW Parker St, NW 38th Ave, Astor St, 43rd Ave, Sierra St, Cascade St, NW 23rd Ave, 18th St, NW Fargo St, Leadbetter Rd, Crown Rd, Division St, and** Whitney St

What this means for the Camas Transportation Plan: The functional classification system for the City will be revisited for the Transportation Plan. The Plan should be consistent with the Clark County classifications.

Vancouver Transportation Plan (2004)

The Vancouver Transportation Plan is the transportation element of the Vancouver Comprehensive Plan. The purpose of this transportation plan is to identify policies, objectives, programs and projects that will support future growth and development of Vancouver, as directed by the Vancouver Comprehensive Plan.

The plan identifies transportation improvements within the City of Vancouver. Some of these projects, specifically those that are in the portions of the City of Vancouver adjacent to Camas, may need to be integrated into the Camas Transportation Plan to ensure consistency among the transportation networks of the two cities.

What this means for the Camas Transportation Plan: The Transportation Plan will consider the projects in the Vancouver Transportation Plan that are adjacent to the City of Camas that will enhance regional connectivity.

Vancouver Transportation Improvement Program (2018-2023)

The Vancouver Six-Year Transportation Improvement Program identifies projects that are funded and expected to be constructed between the years 2018-2023.

The plan identifies transportation improvements within the City of Vancouver. Some of these projects, specifically those that are in the portions of the City of Vancouver adjacent to Camas, may need to be integrated into the Camas Transportation Plan to ensure consistency among the transportation networks of the two cities.

What this means for the Camas Transportation Plan: The Transportation Plan will consider the projects in the Vancouver Transportation Improvement Program that are adjacent to the City of Camas to ensure consistency.

Washougal Transportation Capital Facilities Plan (2016)

The Washougal Transportation Capital Facilities Plan provides the City of Washougal with a guide for transportation system improvements to meet existing and future travel needs while setting forth supporting goals and policies.

The plan identifies transportation improvements within the City of Washougal. Some of these projects, specifically those that are in the portions of the City of Washougal adjacent to Camas, may need to be integrated into the Camas Transportation Plan to ensure consistency among the transportation networks of the two cities.

> **What this means for the Camas Transportation Plan: The Transportation Plan will consider the projects in the Washougal Transportation Capital Facilities Plan that are adjacent to the City of Camas that will enhance regional connectivity.**

Federal Functional Classifications

The federal government also has a functional classification system that is used to determine federal aid funding eligibility. Roadways federally designated as a major collector, minor arterial, principal arterial, or freeway/ expressway/ interstate are eligible for federal aid.

The following federal classifications apply to roadways in Camas:

- **Freeway/ expressway:** SR 14
- **Principal arterials:** NW 6th Avenue, NE Adams Street and NE 3rd Avenue
- **Minor arterials:** SR 500, NW 7th Avenue, NW Ivy Street, NW Forest Home Road, NW Astor Street, NW 18th Avenue, NW 16th Avenue, Brady Road, NW 18th Avenue, SE Payne Road, NW Pacific Rim Boulevard, NW Parker Street, NW 38th Avenue, NW 43rd Avenue, SW Sierra Street, NW Lake Road, NW Camas Meadows Drive, NW Friberg Street, NE Goodwin Road, NE Leadbetter Road and SE Crown Road
- **Major collectors:** SW 6th Avenue, Division Street, NW 18th Avenue, NW Fargo Street, NW Sierra Street, NW 23rd Avenue, NW Astor Street, NW 11th Avenue, NW McIntosh Road, NW Cascade Street, and NE 43rd Avenue

What this means for the Camas Transportation Plan: The functional classification system for the City will be revisited for the Transportation Plan. The Plan should be consistent with the Federal classifications.

Camas Transportation Impact Fee Summary

The TIF for the City of Camas (City) was most recently updated in May 2012 by DKS Associates. The TIF uses 2005 through 2035 as the analysis period for the TIF calculation. Total project costs in the TIF calculation equal $135.9M and resulting TIF-eligible project costs were $79.6M. The TIF also includes a $3.0M bond reimbursement cost basis.

Project costs are allocated to one of two districts (save for one project, which is allocated by District proportionally): North District (roughly north of Lacamas Lake) and South District. The North District pays a larger TIF than the South District.

The memo uses a 60% reduction factor to the final calculated TIF to arrive at the net rate charged on development. Though it is unclear where this reduction factor is calculated, the 2012 update references previous work in determining the 60% reduction. The TIF update documents a 3.9% per year index factor. It appears that the City has indexed the TIF annually since the 2012 update.

The City charges the TIF per P.M. Peak Hour Trip basis. The charge for a given development is based on the latest edition of the Institute of Transportation Engineer's *Trip Generation Handbook*.

What this means for the Camas Transportation Plan: The Transportation Impact Fee will be updated as needed and incorporated into the Transportation Plan funding strategy.

APPENDIX B. GOALS, POLICIES AND EVALUATION CRITERIA

MEMORANDUM

720 SW Washington St.
Suite 500
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DATE: May 15, 2024

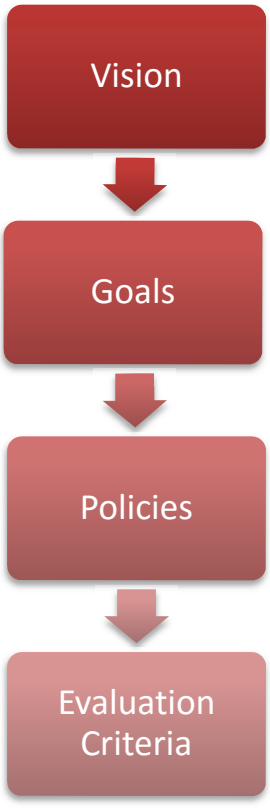
TO: Curleigh Carothers, City of Camas
Steve Wall, City of Camas

FROM: Reah Flisakowski, DKS Associates
Kevin Chewuk, DKS Associates

SUBJECT: Camas Transportation Plan
Technical Memo #1b – Goals, Policies and Evaluation Criteria P18039-000

The purpose of this memorandum is to initiate the process of developing the transportation-related vision, goals, policies, and evaluation criteria that will help guide the development of the Camas Transportation Plan (TP), and future investment decisions. This effort will continue through the planning process, shaped by input received from the Stakeholder Advisory Committee, Economic Development Committee and the general public.

Setting Direction for Transportation Planning



Collectively, the transportation-related goals, policies, and evaluation criteria describe what the community wants the transportation system to do in the future, as summarized by a **vision statement**. A vision statement generally consists of an imaginative description of the desired condition in the future. It is important that the vision statement for transportation align with the community's core values.

Goals and policies create manageable stepping stones through which the broad vision statement can be achieved. **Goals** are the first step down from the broader vision. They are broad statements that should focus on outcomes, describing a desired end state. Goals should be challenging, but not unreasonable.

Each goal must be supported by more finite **policies**. In contrast to goals, policies should be specific and measurable. Where feasible, providing a targeted time period helps with policy prioritization and achievement. When developing policies, it is helpful to identify key issues or concerns that are related to the attainment of the goal.

The solutions recommended through the TP must be consistent with the goals and objectives. To accomplish this, measurable **evaluation criteria** that are based on the goals and objectives will be developed. For the Camas TP, they will be used to inform the selection and prioritization of projects and policies for the plan by describing how well the alternatives considered support goal areas.

Developing Goals and Policies

The Camas 2035 Comprehensive Plan (adopted in June 2016) will provide the transportation vision, goals and policies for the Camas TP. The policies from the Camas 2035 Comprehensive Plan that set transportation standards were omitted from this memorandum. They will be reviewed with other transportation standards later in the planning process.

Transportation Vision Statement

In 2035, residents of Camas continue to appreciate their safe, diverse, and welcoming community as a livable place for people of all ages. Quality public facilities, services, and utilities contribute to their high quality of life.

Transportation Goals and Policies

Streets

Goal

Streets will function for all users including bicyclists, pedestrians, transit users, and motorists.

Policies

- Maintain the livability of Camas through proper location and design of transportation facilities, consistent with the Camas Transportation Plan map and 6-year street plan.
- Support the need for regular street maintenance, safety and efficiency improvements, and access management measures.
- Construct streets that are interconnected and avoid long cul-de-sacs or dead ends. Block lengths should be less than 1,000 feet.
- Maintain the transportation system at a level that preserves user safety, facility aesthetics, and the overall integrity of the system.
- Provide attractive streetscapes through design standards that encourage appropriate traffic volumes, speeds, and multi-modal safety.
- Minimize access to new development and redevelopment along the City's arterials, and consolidate access points when spacing is insufficient.
- Include enhanced roadway features such as roundabouts, decorative lighting, and landscaping for gateways.

Walking, Bicycling, and ADA Mobility

Goal

The needs of bicyclists, pedestrians, transit users, and accessibility (ADA-compliant) will be considered in all street improvements and will be integrated in all collector and arterial roadway projects, including regular safe street crossings.

Policies

- Enhance travel choices and provide pedestrian and bicycle routes designed especially for them, not simply along routes designed for cars. Route planning should seek shortcuts and other opportunities that give walking or biking advantages over the automobile.
- Support opportunities to increase participation of school-age children in walking or biking to school to improve their health and reduce traffic congestion.
- Include pedestrian and bicycle linkages in the construction of cul-de-sacs and other forms of dead-end streets. Existing dead-end streets should be retrofitted to provide bicycle and pedestrian linkages as practicable.
- Recognize and support Complete Street implementation in all new and retrofit development to better the health of the community.
- Coordinate with schools and the community to designate safe pedestrian and bicycle routes between residential areas, schools, and public facilities.
- Increase wayfinding signage for outdoor destinations throughout the City.
- Support enhanced pedestrian improvements in the downtown and other economic development areas.

Local and Regional Transit

Goal

Regional transit will provide safe, efficient, and dependable service to our community.

Policies

- Coordinate with local municipalities, the Washington State Department of Transportation, adjacent counties, and C-TRAN to ensure that minimum roadway and multi-modal design standards are consistent.
- Continue to advocate for quality regional transit services and an increase to service availability.

Design and Low-Impact Development

Goal

The transportation system will be designed to support community character and environmental policies.

Policies

- Provide attractive streetscapes through design standards that encourage appropriate traffic volumes, speeds, robust landscaping, and safety for pedestrians and bicyclists.
- Minimize cut and fill in roadway design and minimize restructuring the natural contours of the land.
- Encourage the inclusion of LID design features (e.g., rain gardens, grass pavers, pervious pavement) in the design of private driveways, parking lots, and other road surfaces.
- Continue implementing new strategies such as LED lights as a standard for new development and replacing existing inventory.

Safety and Traffic Calming

Goal

Design and construct safe transportation facilities that meet applicable requirements.

Policies

- Encourage traffic safety through education, enforcement, and engineering.
- Ensure that adequate access for emergency services vehicles is provided throughout the City.
- Provide design standards that encourage appropriate traffic volumes, speeds, and pedestrian safety.
- Incorporate safe pedestrian and bicycle routes between residential areas, schools, and public facilities in development.
- Require new developments to implement design standards using the Neighborhood Traffic Management Plan.
- Identify high accident areas, and implement specific measures to reduce their occurrence.

Transportation Demand Management

Goal

Transportation planning will achieve the efficient use of transportation infrastructure, increase its person carrying capacity, and accommodate and facilitate future growth consistent with land use objectives.

Policies

- Require large employers to implement a commute trip reduction program for employees, as mandated by the state's Commute Trip Reduction law.
- Develop Complete Street design that is supportive of the use of alternative modes of travel and adopt engineering design standards consistent with these goals.
- Support intergovernmental development review.
- Support RTC with funding and staff participation to the extent possible.

Concurrency and Level of Service

Goal

- The City will maintain the adopted LOS standards for all arterials, transit routes, and highways.

Policies

- Encourage growth in areas with existing or planned infrastructure capacity.
- Require new development to demonstrate that adequate person trips are available, or that multi-modal improvements to the transportation system are made to accommodate the impacts concurrent with the development.
- Utilize traffic impact fee studies, development traffic impact analyses, and corridor studies to identify deficiencies and plan improvements to maintain or improve level-of-service standards.
- Take the following actions (not in priority order) if probable funding falls short of meeting identified needs:
    - Delay development until programs, facilities, or services can be funded;
    - Obtain needed revenue or revise the transportation plan to reflect known financial resources.
    - As a last choice, change the transportation LOS standard.

Transportation Revenue

Goal

Maximize the use of state and federal funds for transportation capital, operating, service, and demand improvements.

Policies

- Maintain a capital improvement plan that identifies construction and improvement priorities and funding.
- Ensure that the transportation impact fee program responds to land use changes, so that connectivity occurs and new development pays its proportionate share of needed capacity.
- Support the Pavement Management System to ensure cost-effective maintenance of transportation facilities and efficient use of public funds.
- Develop equitable transportation impact fees by which land developers are assessed fair-share contributions for any transportation improvements.
- Direct transportation funding primarily toward multi-modal improvements that will enhance safety and circulation within and between infill areas, schools, and employment centers within City limits.
- Focus transportation projects in economic development areas to act as catalysts for job growth.

Developing Evaluation Criteria

As transportation improvement alternatives are developed, many of the policies will be used as evaluation criteria to assess the relative value of each project considered for inclusion in the TP. This will include criteria that are both qualitative and quantitative in nature. While some goals include more policies than others, all goals will be weighted equally unless the project team decides that some are more important than others. Using the evaluation criteria, considered projects will be rated and categorized as high, medium, or low priorities according to their ability to meet a broad range of community objectives.

APPENDIX C. EXISTING CONDITIONS ANALYSIS

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MEMORANDUM

DATE: May 15, 2024

TO: Curleigh Carothers, City of Camas
Steve Wall, City of Camas

FROM: Reah Flisakowski, DKS Associates
Kevin Chewuk, DKS Associates

SUBJECT: Camas Transportation Plan
Technical Memo 2 – Existing Conditions Analysis P18039-000

This memorandum summarizes the existing transportation conditions in Camas. Included is a summary of where people travel, why they travel there, how they get there, what transportation infrastructure is available along those routes, and how the existing transportation system is operating for pedestrian, bicyclists, transit riders, and motor vehicles.

Introduction

The City of Camas, incorporated in 1906, is located along the Columbia River in the hills of eastern Clark County. Camas is home to approximately 23,000 people and is a part of the Portland-Vancouver Metropolitan Area with a total population of approximately 2.4 million people.

Located just east of Vancouver and on the door-step of the Columbia River Gorge, Camas is a short 30 to 40-minute drive from downtown Portland. This unique location offers diverse housing, employment and recreation opportunities. The city is home to several large, hi-tech manufacturing industries, a vibrant downtown, and many new and established neighborhoods.

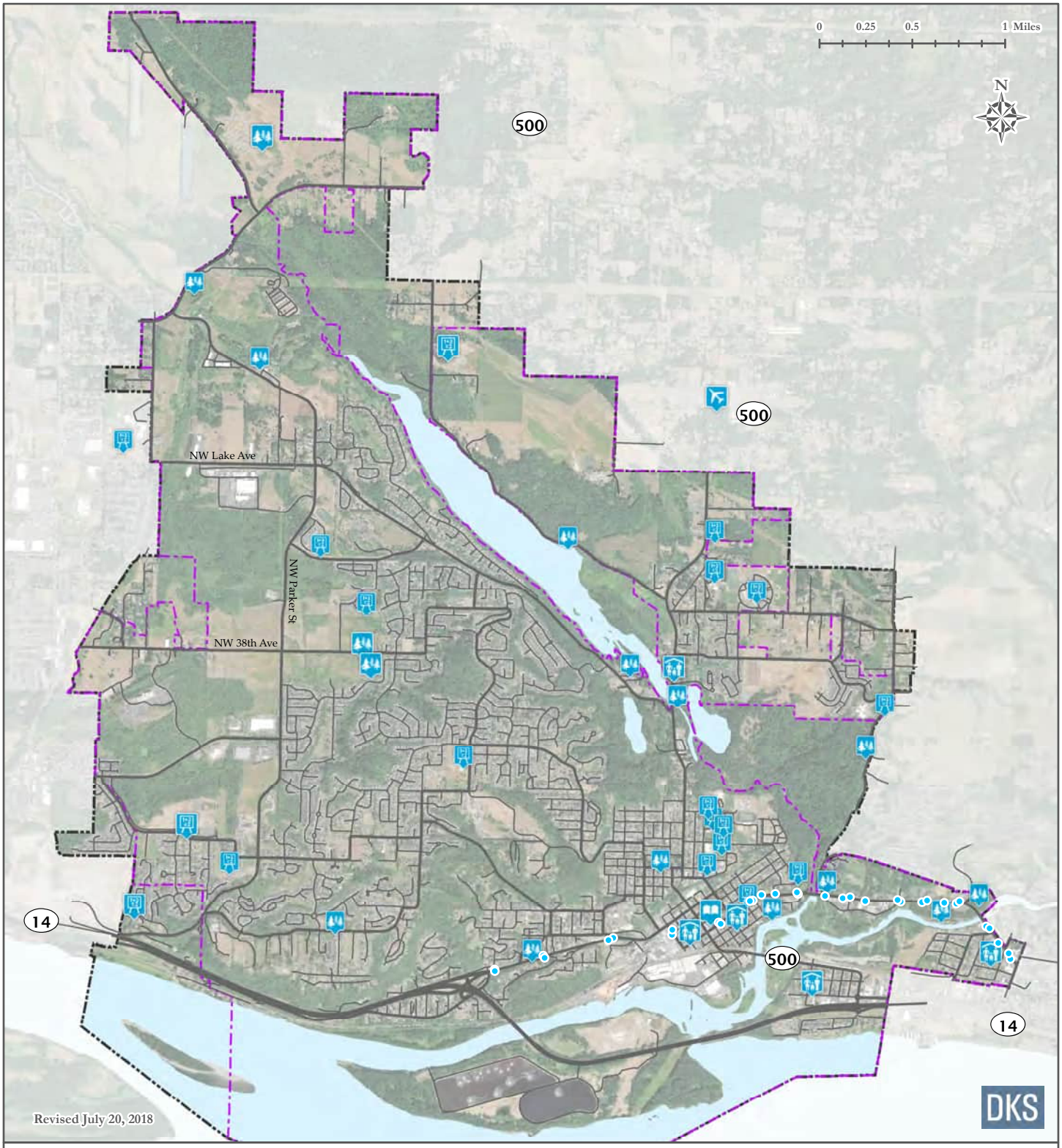
Key Destinations

The first step in planning an effective transportation system is understanding the key destinations throughout the city. These destinations, also called 'activity generators', typically fall into the categories of residential areas, employment, shopping, schools, civic buildings, recreation, and entertainment.

Within the City

Key activity generators in Camas are mapped in Figure 1. Most homes are located to the south of Lacamas Lake, with larger employment areas in the downtown (central), and the west. The elementary, middle, and high schools are located throughout the city and most civic buildings are near downtown. The city owns and maintains 16 parks; the majority — in number and in acreage— are located in the southern half of the city. Shopping and entertainment opportunities are generally found in the downtown, and the southeastern part of the city.

I Key Destinations



Legend:

Major Activity Generators:

- Airport
- Library
- Park
- School
- Community Amenity
- C-TRAN Stop

- Urban Growth Area
- Camas City Limit

Outside of the City

Having safe and efficient access to areas outside of the city is critical for many people who either live or work outside of Camas. Much of the traffic in Camas, especially during the more congested weekday peak periods, is related to employment. As shown in Table 1, more than 80 percent of the workers in Camas live in another city that is located more than three miles away. Residents of Camas also contribute to travel between cities, as shown in Table 2. Nearly 90 percent of workers living in Camas commute to employment locations at least three miles outside of the city.

Table 1: Where Camas Workers Live

Camas workers who:	Percent of Camas Residents	Distance from Camas
Live in Camas	17%	-
Live outside Camas	83%	-
Live in Vancouver	*24%*	*5+ miles*
Live in Washougal	*8%*	*3+ miles*
Live in Portland	*5%*	*15+ miles*
Live in Battle Ground	*2%*	*20+ miles*
Live in Other Places	*44%*	*10+ miles*

Source: Home Destination Report, On The Map, US Census Bureau, 2015

Table 2: Where Camas Residents Work

Camas residents who:	Percent of Camas Workers	Distance from Camas
Work in Camas	13%	-
Work outside Camas	87%	-
Work in Vancouver	*28%*	*5+ miles*
Work in Portland	*20%*	*15+ miles*
Work in Washougal	*3%*	*3+ miles*
Work in Beaverton or Hillsboro	*3%*	*28+ miles*
Work in Gresham	*2%*	*20+ miles*
Work in Other Places	*31%*	*10+ miles*

Source: Work Destination Report, On The Map, US Census Bureau, 2015

What Factors Affect How People Travel?

Travelers often weigh a variety of factors when deciding how to commute to their destination. Whether the trip will be via motor vehicle, walking, bicycle, or public transportation, the choice is often a balance between ease and convenience of travel, travel cost, and travel time.

Where are you going? Whether you are going to work, school, shopping, or to a park, your trip type (or your destination point) often determines your mode of transportation. Those destined for a park or school generally have a higher likelihood to walk or bicycle than those going to work or shopping. The distance of that destination plays a role in mode choice. Trips that are shorter generally present a better opportunity to walk or bicycle; longer distance trips more often require transit or motor vehicle modes.

Will you have to cross a busy road or walk or bike along a road without comfortable facilities? The availability of sidewalks, shared-use paths, curb ramps to provide wheelchair access, crosswalks, and bicycle lanes increases the comfort and access of walking and biking. The lack of or poor quality of these facilities, particularly on higher volume or higher speed roadways, discourages people from utilizing non-motorized vehicle modes of transportation.

Where you work and how long it takes you to get there. Camas residents who work outside of the city (as well as people who work in Camas but live elsewhere) are likely to commute by motor vehicle due to travel distance and commute time. However, some commuters may choose to bike or use transit if the regional transportation system offers convenient and comfortable biking facilities or transit services between cities.

What public transportation service is available? Distance to bus stops, frequency of service, route coverage, connections to other transportation options, and amenities at stops are some of the factors that play a role in a user's decision to utilize public transportation. For those who cannot afford or are unable to drive, transit is an attractive option for making longer trips.

Age and income. Demographic characteristics, such as age and income, play a key role in selecting a mode of transportation. Camas residents with lower incomes, as well as the youngest and oldest residents, often account for more trips via walking, biking, and public transportation.

As seen in Table 3, the central and southeast/Downtown part of the city has the lowest median household income, and accounts for some of the highest proportion of residents over 65. This may be an area of the city where transit enhancements could be focused.

About 37 percent of Camas residents living in the northwest part of the city are school-age children. The north-central part of Camas has the highest median household income (over $125,000), which is up to $55,000 more than the income of households located in other sections of Camas.

Table 3: Key Demographics in Camas

Demographic	Northwest Camas	Northeast Camas	Southwest Camas	North-Central Camas	Central Camas	Southeast Camas / Downtown
Age (by percent of residents)						
School-Aged (Under 18)	37%	31%	32%	33%	28%	23%
College-Aged (18-24)	2%	6%	4%	4%	6%	3%
Middle-Aged (25 to 64)	49%	49%	53%	52%	54%	59%
Retired-Aged (65+)	12%	14%	10%	11%	12%	15%
Median Household Income	$103,214	$76,222	$97,738	$125,430	$68,475	$70,729

Source: US Census Bureau, 2012-2016 American Community Survey

Is it cold or raining? Weather plays a role in determining how trips are made. Camas experiences cool, rainy winters, with mild and generally dry summers. According to the Oregon Climate Service, average temperatures in the winter months (December to February) are around 42 degrees Fahrenheit, with measurable rainfall occurring about 18 days each winter month. The spring and fall months (March to May, and September to November) are slightly warmer and dryer, with average temperatures around 52 degrees Fahrenheit, and about 14 days of measurable rainfall. The summer months (June to August) are typically very pleasant, with average temperatures around 67 degrees Fahrenheit, and less than 4 days of measurable rainfall each month[1]. Cold, rainy weather can make walking and biking trips less attractive, encouraging users to make a trip by motor vehicle.

How are People Choosing to Travel?

The number of people who choose to walk, bike, ride transit or drive is important for assessing how well existing transportation facilities serve the needs of users. Available data on commuter travel mode choices and peak hour travel demand is used to better understand travel behavior in the community and inform the needs analysis for the existing transportation system.

[1] Climate Summary for Vancouver (no data was available for Camas), Oregon Climate Service.

Commute Mode of Camas Residents

Most Camas residents commuted to work between the years 2012 and 2016 by single-occupant motor vehicles (about 75 percent). About three percent of residents walked and biked to work, and approximately three percent used public transportation.

The commute mode choices of Camas residents are compared with other cities in the region in Table 4. The single-occupant motor vehicle commute share in Camas was lower than that of Washougal, and comparable to that of Vancouver. The walking and biking commute share in Camas was similar to that of Vancouver and Washougal, and much lower than that of Portland. Commuting to work via public transportation was not common in most of these cities (three percent or less)[2].

Table 4: Transportation Modes Used by Employees to Commute to Work

	Percent of Commuters			
Transportation Mode	Camas	Vancouver	Washougal	Portland
Workers over 16 years	10,202	78,689	6,758	325,341
Motor Vehicle- Single Occupant	75%	76%	80%	58%
Motor Vehicle- Carpool	8%	11%	9%	9%
Walked	2%	3%	3%	6%
Biked	1%	0%	0%	7%
Public Transportation	3%	3%	2%	12%
Worked at Home	11%	5%	5%	8%
Other	1%	1%	2%	1%

Source: US Census Bureau, 2012-2016 American Community Survey

Commute Mode of Camas Employees

The travel choices of those who work in Camas, including people who live outside of the city, are important community considerations for economic reasons as well as quality of life. Over 80 percent of the commuters destined for jobs in northeast, and central Camas commute to work by single-occupant motor vehicle (see Table 5). This is slightly higher than the shares of single-occupant motor

[2] Although the US Census Bureau is a valuable source of information for work-related commute patterns, it does not truly represent the full range of travel within Camas. Non-motorized vehicle transportation modes are likely higher in Camas for other types of travel including trips to school, recreation, or access to transit.

vehicle commuters destined for jobs in southwest, north-central, and southeast/Downtown Camas, which are around 75 percent. Walking and biking to work is more common in southeast/Downtown Camas (6 percent). The highest usage of public transportation for commuting occurs in central Camas (5 percent).

Table 5: Transportation Modes Used by Employees to Commute to Work in Camas

	Percent of Commuters					
Transportation Mode	Northwest Camas	Northeast Camas	Southwest Camas	North-Central Camas	Central Camas	Southeast Camas / Downtown
Motor Vehicle- Single Occupant	66%	85%	75%	77%	81%	77%
Motor Vehicle- Carpool	11%	7%	8%	10%	5%	7%
Walked	1%	1%	2%	0%	1%	6%
Biked	0%	0%	1%	1%	1%	0%
Public Transportation	1%	1%	3%	1%	5%	1%
Worked at Home	19%	6%	10%	11%	6%	8%
Other	2%	1%	2%	0%	2%	1%

Source: US Census Bureau, 2012-2016 American Community Survey

Transportation Demand by Mode

Pedestrian, bicycle, and motor vehicle traffic counts were conducted at key intersections throughout Camas on typical weekdays[3]. This information indicates where and when travel demand is highest for each mode of travel. It also provides a basis for assessing how well existing transportation facilities are able to meet the needs of users during peak demand periods.

- **Pedestrian volumes** during the PM peak hour are generally highest near downtown Camas, including along NE 3rd Avenue and NE Adams Street (the traffic count summary is included in the appendix). The highest hourly pedestrian activity during the evening peak occurred at the NW Sierra Drive intersection with NW 28th Avenue, with 30 pedestrian crossings in the one-hour period. Other study intersections with more than 15 pedestrian crossings during the one-

[3] Based on counts conducted in April of 2018.

hour period included NE 6th Avenue at NE Adams Street, NE 3rd Avenue at NE Dallas Street, NE 3rd Avenue at NE 4th Street, and Weir Road at NE 3rd Avenue.

- **Bicycle volumes** indicate limited biking, with the highest volumes along NW Lake Road, and NW Sierra Street (the traffic count summary is included in the appendix). During the evening peak hour, 20 of the 50 study intersections had no observed bicyclists during the one-hour period. The NW Lake Road at SR 500, NW Lake Road at NW Sierra Street, NW Lake Road at NW Leadbetter Drive, NW Sierra Street at NW 45th Avenue, and NE 6th Avenue at NE Garfield Street intersections had the highest observed bicycle volumes, with 4 or more bicyclists counted during the single hour at each of the intersections.
- **Motor vehicle volumes** on the roadways in Camas (the traffic count summary is included in the appendix) most commonly peak during weekday evenings between 4:50 p.m. and 5:50 p.m. The highest hourly motor vehicle volumes during the evening peak occurred along the NW 6th Avenue corridor between the SR 14 ramps and NE Adams Street, with more than 1,300 trips during the one-hour period. The NW Lake Road at NE Everett Street, and NW 6th Avenue at SR 14 Ramps intersections had the highest observed volumes, with more than 1,800 entering vehicle trips during the single hour at each of the intersections.

What transportation infrastructure is available?

Existing transportation infrastructure includes a range of facilities for people who drive, walk, ride bikes, or use transit. The following sections summarize the existing infrastructure for the pedestrian, bicycle, transit, and roadway systems.

Pedestrian System

Walking plays a key role in Camas' transportation network. Planning for pedestrians not only helps the city provide a complete, multi-modal transportation system, it supports healthy lifestyles and addresses a social equity issue, ensuring that the young, the elderly, and those not financially able to afford motorized transport have access to goods, services, employment, and education. Approximately two percent of commuters in the city walk to work, with another three percent utilizing public transportation to get to work, which generally includes a walking trip at the beginning or end. In addition to the work commute trips, walking trips are made to and from recreational or shopping areas, schools, or other activity generators. Continuous sidewalk connections between all activity generators and arterial/collector roadways are desirable to allow for safe and attractive non-motorized travel options.

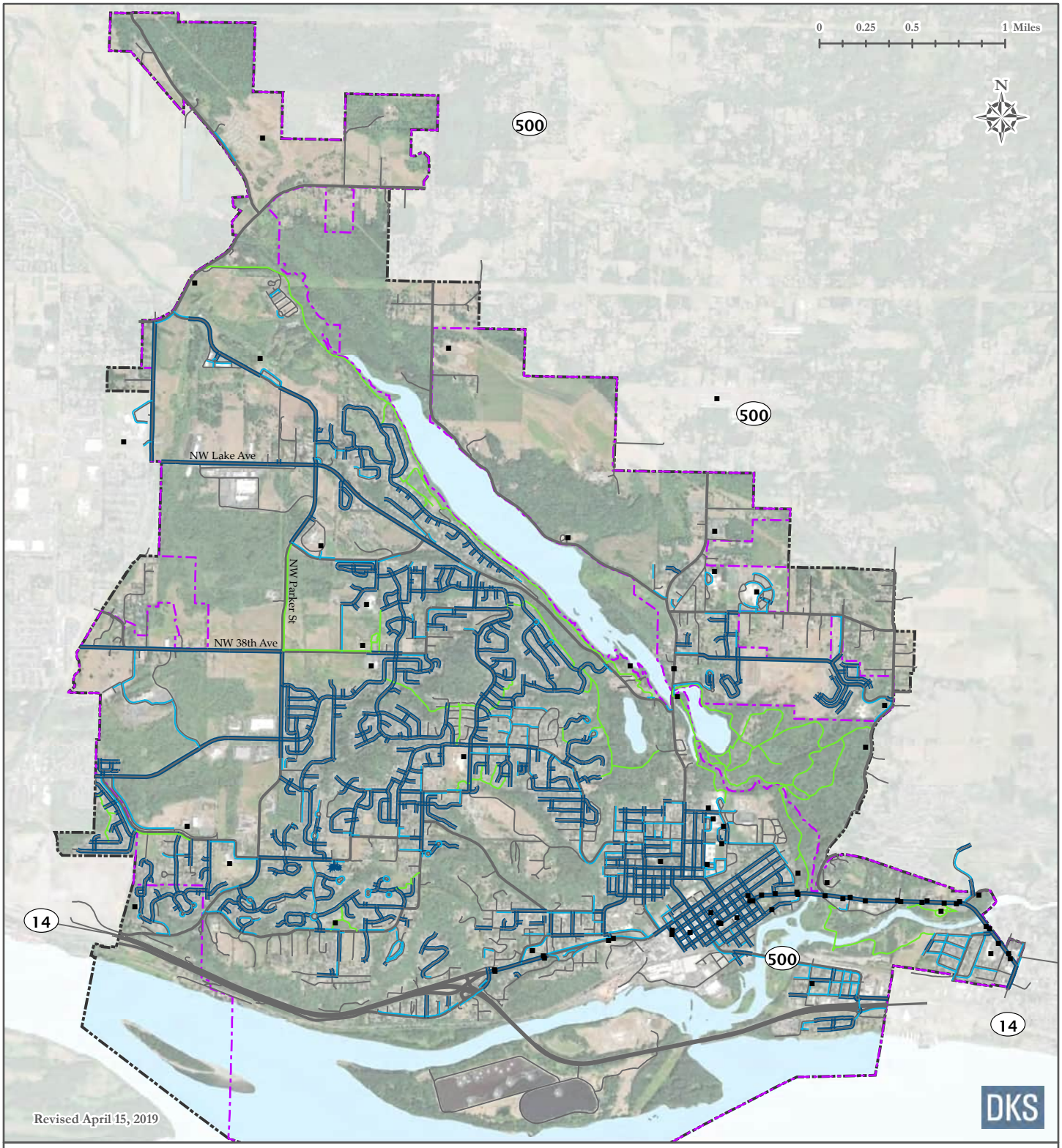
The walking network in Camas, shown in Figure 2, is composed of sidewalks, and shared-use paths, and is fairly well developed. A large part of downtown Camas was developed prior to 1950, a time in

which sidewalks were incorporated into the design of neighborhoods and streets. Although most areas incorporated into Camas over the following decades have sidewalk coverage, a few areas do not have complete sidewalks on one side of the street, or even on both sides. These gaps are most significant in southwest, southeast, and northeast Camas, and on roadway segments outside the city limits.

Paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout the residential neighborhoods. Unpaved pedestrian only trails are located throughout the city.

Many intersections in older parts of the city lack ADA-compliant ramps, which provide important connections between sidewalks, making it easier to cross streets and handle the vertical drop at curbs. However, the city has been recently installing new curb ramps in many of these locations. The presence of curb ramps is fairly consistent along streets in downtown Camas, and in the newer neighborhoods in the city.

2 Pedestrian System



Legend:

Pedestrian Facilities

- Sidewalk on Both Sides
- Sidewalk on One Side
- Trails
- Arterial or Collector Street
- Major Activity Generator
- Urban Growth Area
- Camas City Limit

Bicycle System

The bicycle system provides a non-motorized travel option for trips that are longer than a comfortable walking distance. A well-developed bicycle system promotes a healthy and active lifestyle for the residents, and visitors of Camas. Approximately one percent of commuters in the city bicycle to work. In addition to the work commute trips, bicycle trips are made to and from recreational or shopping areas, schools, or other activity generators. Continuous bicycle connections between all activity generators and arterial/collector roadways are desirable to allow for safe and attractive non-motorized travel options.

The bicycle network in Camas, shown in Figure 3, is composed of bike lanes, roadway shoulders, shared roadways, and shared-use paths.

- **Bike lanes** are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. Standard width for a bicycle lane is six feet. The minimum width of a bicycle lane against a curb or adjacent to a parking lane is five feet. A bicycle lane may be as narrow as four feet, but only in very constrained situations. Bike lanes are most appropriate on arterials and collectors, where high traffic volumes and speeds warrant greater separation of the travel modes. Significant segments of continuous bicycle lanes exist along portions of NW Lake Road, NW 38th Avenue, NW Parker Street, NW Friberg-Strunk Street, and SR 500.

- **Shoulder bikeways** are paved with striped shoulders wide enough for bicycle travel. A six-foot paved shoulder is desired to adequately provide for bicyclists, with a four-foot minimum width in constrained areas. Roadways with shoulders less than four feet are considered shared roadways. Some shoulder bikeways are signed to alert motorists to expect bicycle travel along the roadway.

- **Shared roadways** include those on which bicyclists and motorists share the same travel lane. The most suitable roadways for shared bicycle use are those with low speeds (25 mph or less) and low traffic volumes (3,000 vehicles of fewer per day). Shared roadways, often signed as bicycle routes, serve to provide continuity to other bicycle facilities (e.g., bicycle lanes) or can be designated as a preferred route through the community. Common practice is to sign a route with standard Manual on Uniform Traffic Control Devices (MUTCD) green bicycle route signs with directional arrows and/or pavement markings. Shared roadways can have signs that highlight a special route or provide directional information in bicycling minutes or distance. Most local roadways in the city are considered shared roadways, but do not have signs or pavement markings.

- **Shared-use paths** provide off-street travel for bicyclists and pedestrians, and are wider than an average sidewalk (e.g., 10 – 14 feet). Shared-use paths are typically paved (asphalt or concrete),

but may also consist of an unpaved smooth surface as long as it meets Americans with Disabilities Act (ADA) standards. Paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout the residential neighborhoods.

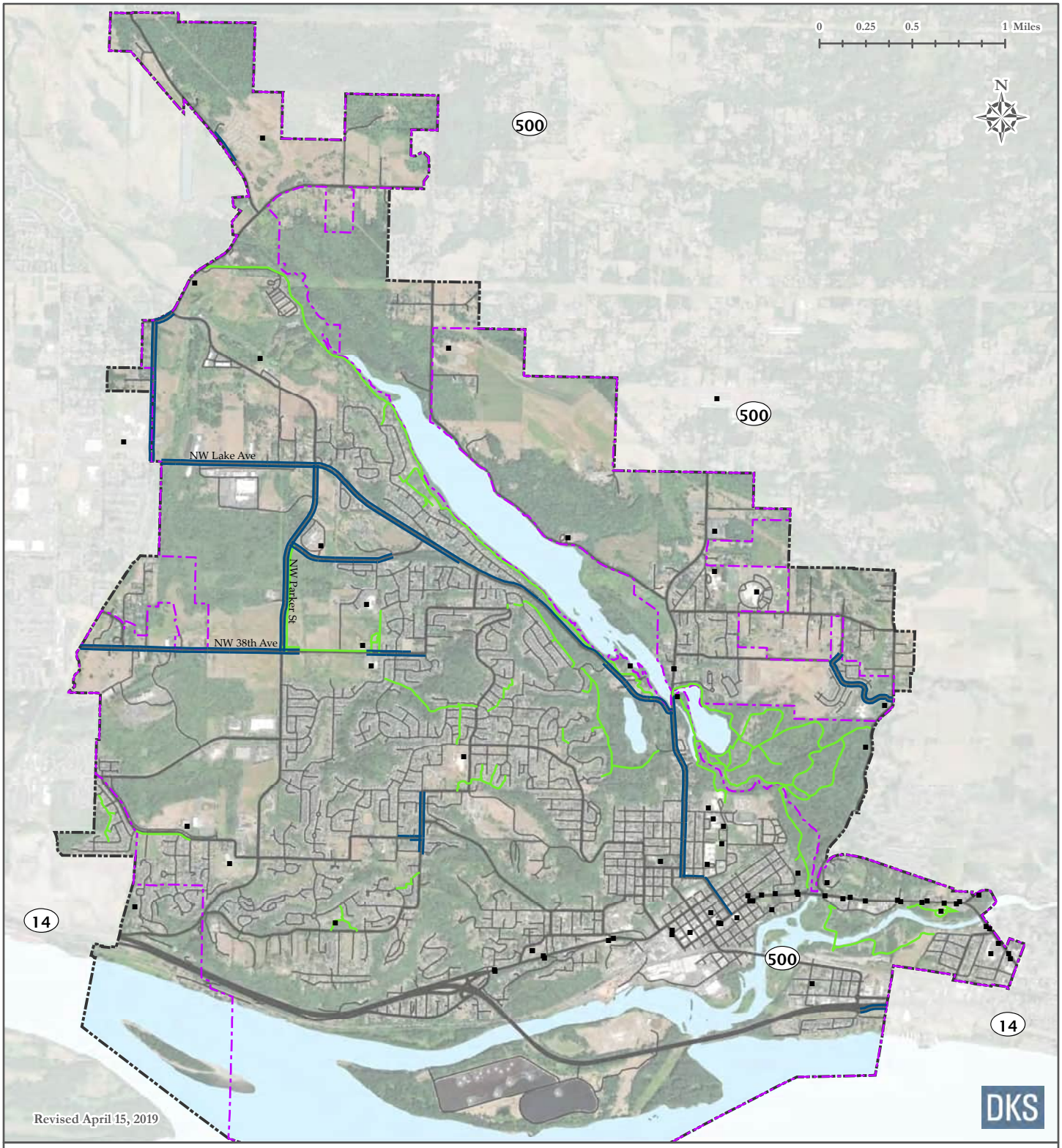
Bicycle Parking

End-of-trip bicycle facilities are a fundamental component of a bicycle network. Lack of safe and secure facilities for either short-term or long-term parking can be an obstacle to promoting bicycle riding.

Short-term parking accommodates visitors, customers, and others expecting to depart within two hours. It requires a standard rack, appropriate location and placement, and weather protection.

Long-term parking accommodates employees, students, residents, commuters, and others who park for more than two hours. This parking requires a secure, weather-protected manner and location.

3 Bicycle System



Legend:

Bicycle Facilities

- Bike Lane
- Trails
- Arterial or Collector Street
- Major Activity Generator
- Urban Growth Area
- Camas City Limit

Transit System

C-TRAN provides transit service in Camas via one fixed bus route connecting the city with Vancouver and Washougal. Transit riders can transfer to other C-TRAN routes at the Fisher's Landing Transit Center in Vancouver. Figure 4 shows the routes in Camas.

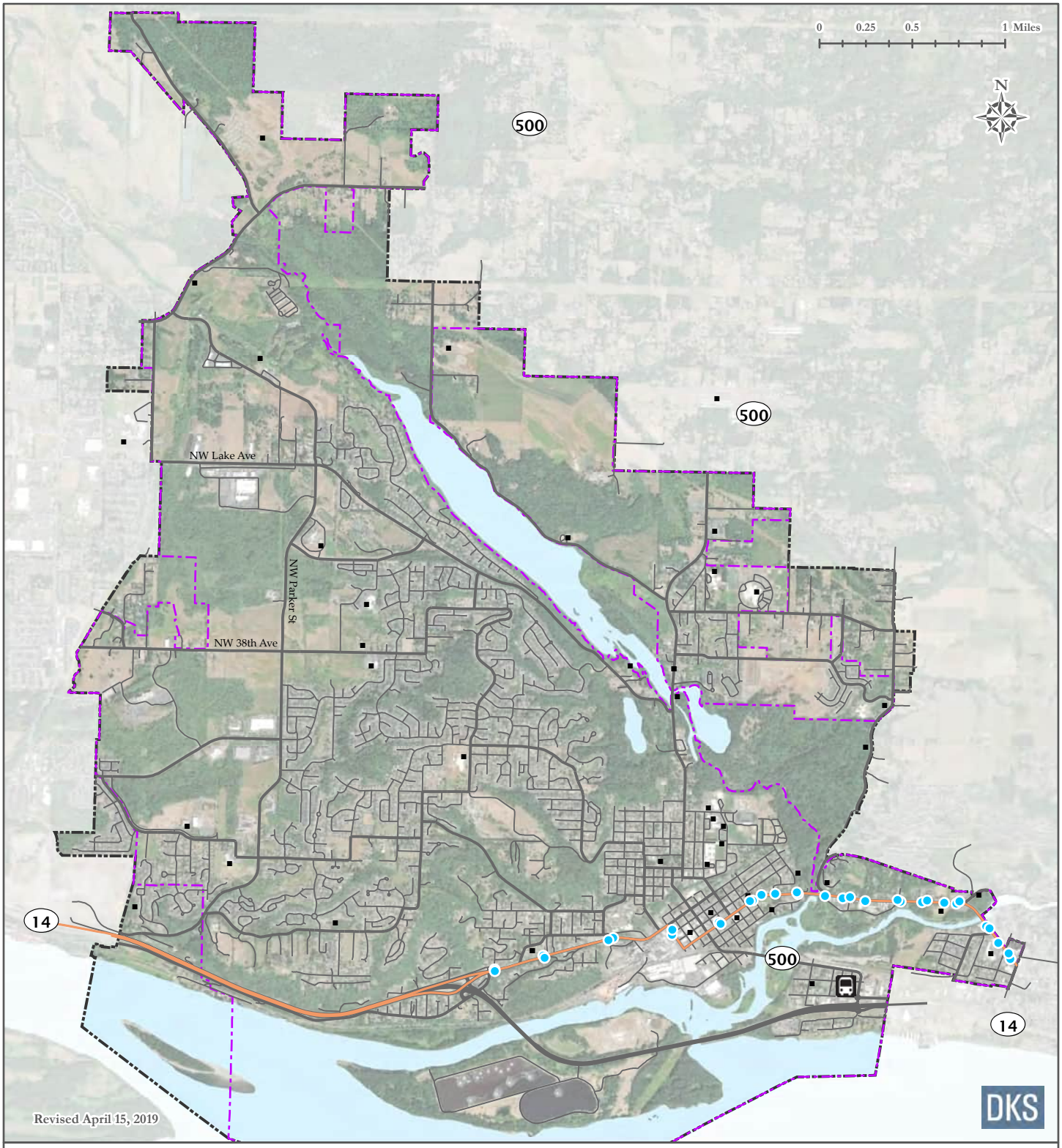
Bus stops in Camas are located along NW 6th Avenue near the SR 14 Ramps, NW Ivy Street, and NW Drake Street intersections, at the NE Adams Street / NE 5th Avenue, and along NE 3rd Avenue near the NE Franklin Street, NE Joy Street, NE 3rd Place, E. 1st Avenue, SE Crown Road, NE Summer Street, NE 3rd Loop, NE Shepherd Road, NE 2nd Avenue, NE Weir Street and NE Lechner Street intersections.

Each of the bus-stops are signed and the eastbound stop along NW 6th Avenue near the SR 14 Ramps provides a bus pull-out. The bus stop along NE 3rd Avenue at NE Franklin Street (near Camas City Hall) provides a bench and shelter. All remaining bus stops have no amenities. Most transit users in the city are more than a half-mile from a bus stop. A park-and-ride facility is located along SE Tampa Street, near the SE 8th Avenue / SE Union Street intersection. However, the park-and-ride is currently served by only the Connector service and not a fixed route.

The Camas/Washougal C-TRAN route travels through Camas eastbound and westbound approximately every half-hour between 6:00 AM and 7:30 PM on weekdays. Service on Saturday is provided approximatively every half-hour between 8:00 AM and 7:30 PM, and approximatively every hour between 8:00 AM and 6:00 PM on Sunday.

Key destinations along this route include Forest Home Park, Georgia Pacific, downtown Camas, Camas Municipal Center, Safeway, Louis Bloch Park, Washougal River Greenway, Camas Police Department, and the Lacamas Center. C-TRAN buses are equipped with a lift to allow for wheelchair access and include bicycle racks.

4 Transit System



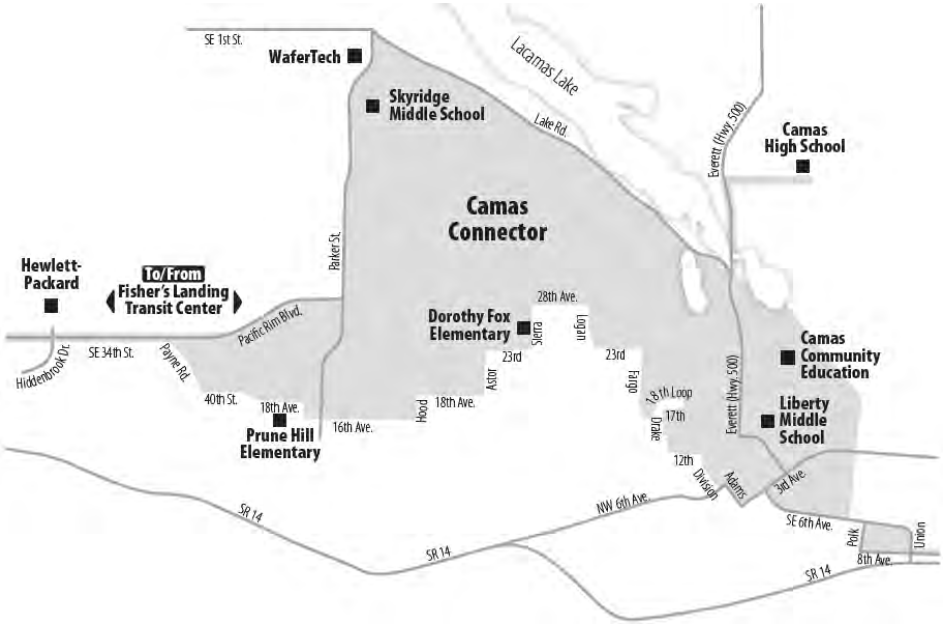
Legend:

Transit Facilities:

- C-TRAN Bus Stop
- Transit Route
- Park and Ride
- Arterial or Collector Street
- Major Activity Generator
- Urban Growth Area
- Camas City Limit

C-TRAN's "Connector" service provides Camas with fully accessible dial-a-ride (reservation based service) and scheduled stop service (no reservation required) at designated stops within the service area. Connector fixed route service is provided from the Fisher's Landing Transit Center in Vancouver to near the SE 34th Street / SE Hiddenbrook Drive intersection just to the west of Camas. The route provides scheduled service four times daily each weekday. Connector reservation based service is available within the service area from 5:30 AM to 9:15 AM and 2:00 PM to 7:00 PM each weekday. The Connector service area in Camas is shown in Figure 5. The Connector bus service is not available on weekends.

Figure 5: Connector Bus Service



Roadway System

Camas streets are well connected and generally follow a grid pattern in the downtown area and nearby neighborhoods. However, the streets in the newer neighborhoods outside of these areas are more disconnected, limited at times by the topography. The major transportation routes through Camas include SR 14, SR 500, as well as a few key city roadways. SR 14 runs east-west through Camas parallel to the Columbia River. SR 14 connects Camas to Vancouver, Interstate 5 and Interstate 205 to the west, and Camas to Washougal to the east. SR 500 runs north-south through the city connecting SR 14 south of downtown with NE Fourth Plain Boulevard north of the city. In the downtown area, it runs along portions of SE 6th Avenue, NE Dallas Street, NE 3rd Avenue and NE Garfield Street.

A few key city roadways that provide north-south access are NW Brady Road, NW Parker Street, Division Street, NW Fargo Street, NW Astor Street, NW Sierra Drive, and SE Crown Road. NW Brady Road and NW Parker Street provide a connection on the west side of Camas, Division Street, NW Fargo Street, NW Astor Street and NW Sierra Drive provide connections through the central neighborhoods of Camas, and SE Crown Road provides a connection on the east side of Camas. Key east-west city roadways include NW 6th Avenue, NE 3rd Avenue, NW Pacific Rim Boulevard, NW 38th Avenue, NW Lake Road, and NE Goodwin Road, with NW 6th Avenue and NE 3rd Avenue towards

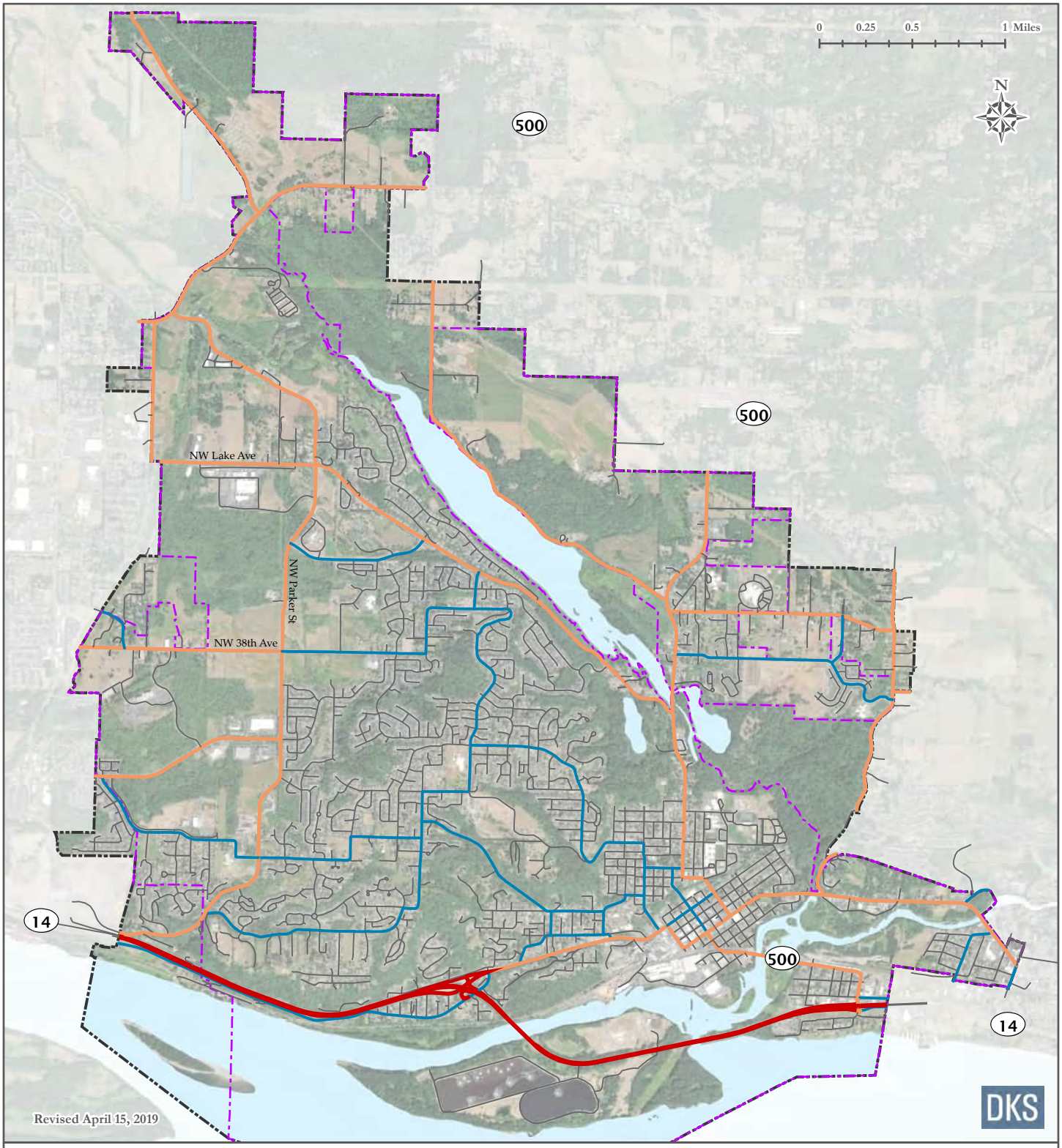
the south end of the city, NW Pacific Rim Boulevard and NW 38th Avenue centered in the middle, and NW Lake Road and NE Goodwin Road in the north end of the city.

Functional Classification

To manage the street network, the city classified the streets based on a hierarchy according to the intended purpose of each (as shown in Figure 6). From highest to lowest intended usage, the classifications are principal arterial, arterial, collector, and local streets. Streets with higher intended usage generally limit access to adjacent property in favor of more efficient motor vehicle traffic movement (i.e., mobility). Local roadways with lower intended usage have more driveway access and intersections, and generally accommodate shorter trips to nearby destinations.

- **Principal Arterials** serve as the main travel routes through the city and serve the highest volume of motor vehicle traffic. SR 14 is the only principal arterial in Camas. Principal arterials are generally for longer motor vehicle trips with limited local access. The posted speed limit on SR 14 is 60 miles per hour.
- **Arterials** connect many parts of the city and often serve traffic traveling to and from principal arterials. These roadways provide greater accessibility to neighborhoods, connect to major activity generators, and provide efficient through movement for local traffic. In Camas, portions of SR 500, NW Lake Road, NW Brady Road, NW Parker Street, NW 6th Avenue and NE 3rd Avenue are examples of arterials. Posted speeds on arterial streets in Camas typically range between 25 (in residential areas) and 50 miles per hour (in rural areas).
- **Collectors** connect neighborhoods to arterials. These streets serve as major neighborhood routes and generally provide more direct property access or driveways than arterial streets. In Camas, portions of Division Street, NW Forest Home Road, NW Fargo Street, NW Sierra Drive, and SE Payne Road are examples of collector streets. Posted speeds on collector streets in Camas typically range between 25 and 35 miles per hour.
- **Local Streets** provide more direct access to residences without serving through travel in Camas. These roadways generally are lined with residences and are designed to serve lower volumes of traffic with a speed limit of 25 miles per hour.

6 Roadway System



Legend:

Functional Classification:

- Principal Arterial
- Arterial
- Collector
- Local Streets

- Urban Growth Area
- Camas City Limit

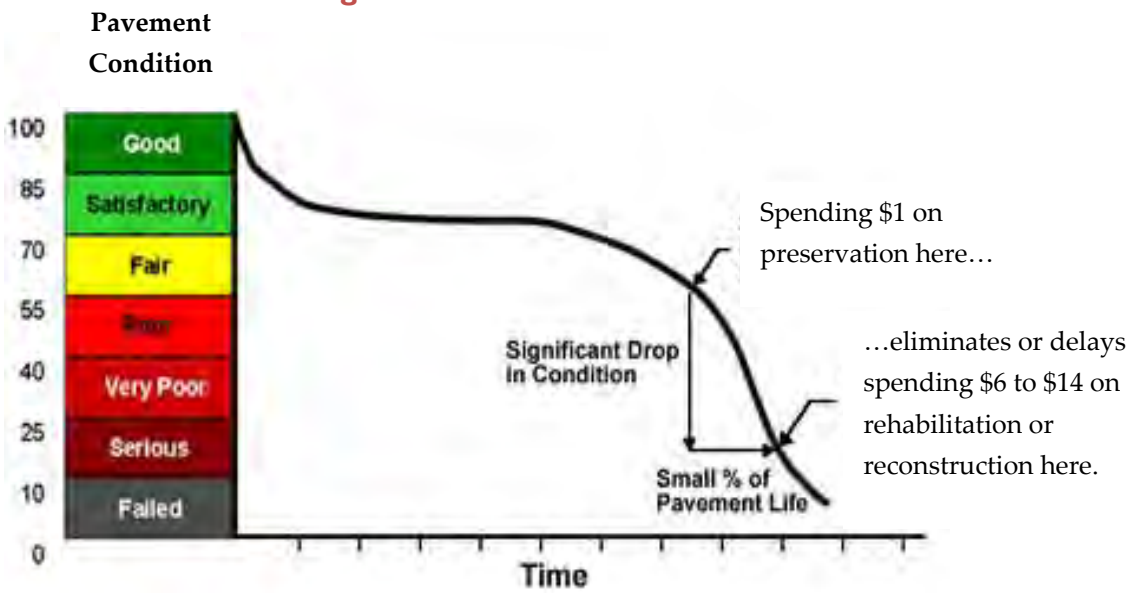
The Washington State Department of Transportation (WSDOT) and the Southwest Washington Regional Transportation Council (RTC) also classify roadways in Camas. Within Camas, SR 14 is classified by WSDOT as a Highway of Statewide Significance (HSS)[4], and SR 500 is classified as a non-HSS facility.

RTC has identified several streets in Camas as part of the regional transportation system in the Regional Transportation Plan for Clark County, including SR 14, SR 500, Lake Road - SE 1st Street, Parker Street, Pacific Rim Boulevard - 34th Street, NW 38th Avenue – SE 20th Street, NW 6th Avenue, and NE 3rd Avenue.

Pavement Quality

The Pavement Condition Index (PCI) is a numerical index between 0 and 100 which is used to indicate the general condition of pavement. Deferring necessary repair and preservation means spending much more to fix the same roadways later, and repair costs rise exponentially as roadways are left unmaintained (see Figure 7). Every $1 spent to keep a roadway in good condition avoids $6 to $14 needed later to rebuild the same roadway once it has deteriorated significantly[5]. Figure 8 displays the PCI ratings of roadways in Camas. About 75 percent of the roadway miles in Camas have pavement in good or satisfactory condition, 13 percent in fair condition, six percent in poor condition, and six percent in very poor or worse condition.

Figure 7: Pavement Condition Index



[4] Highways of Statewide Significance, WSDOT, http://www.wsdot.wa.gov/planning/HSS/

[5] Smart Growth America, Repair Priorities 2014, American Association of State Highway Officials (AASHTO)

Figure 8: Pavement Quality of Roadways in Camas (by percent of roadway miles)



Bridges

There are 15 bridges within the Camas Urban Growth Area, with eight along state facilities and seven along city or county facilities, as shown in Figure 9. Seven bridges are flagged as functionally obsolete[6], including:

- The bridge along SW 6th Avenue over SR 14.
- The bridge along SR 500 over the Washougal River.
- The bridge along SR 500 over Lacamas Lake.
- The bridge along NE 3rd Avenue over the Washougal River. This bridge is scheduled for seismic upgrades in 2020.
- The bridge along NE Goodwin Road over Lacamas Creek.
- The bridge along Division Street over Mill Ditch.
- The bridge along NE Dallas Street over Mill Ditch.

[6] Functionally obsolete bridges are those that do not have adequate lane widths, shoulder widths, or vertical clearances to serve current traffic demand, or those that may be occasionally flooded.

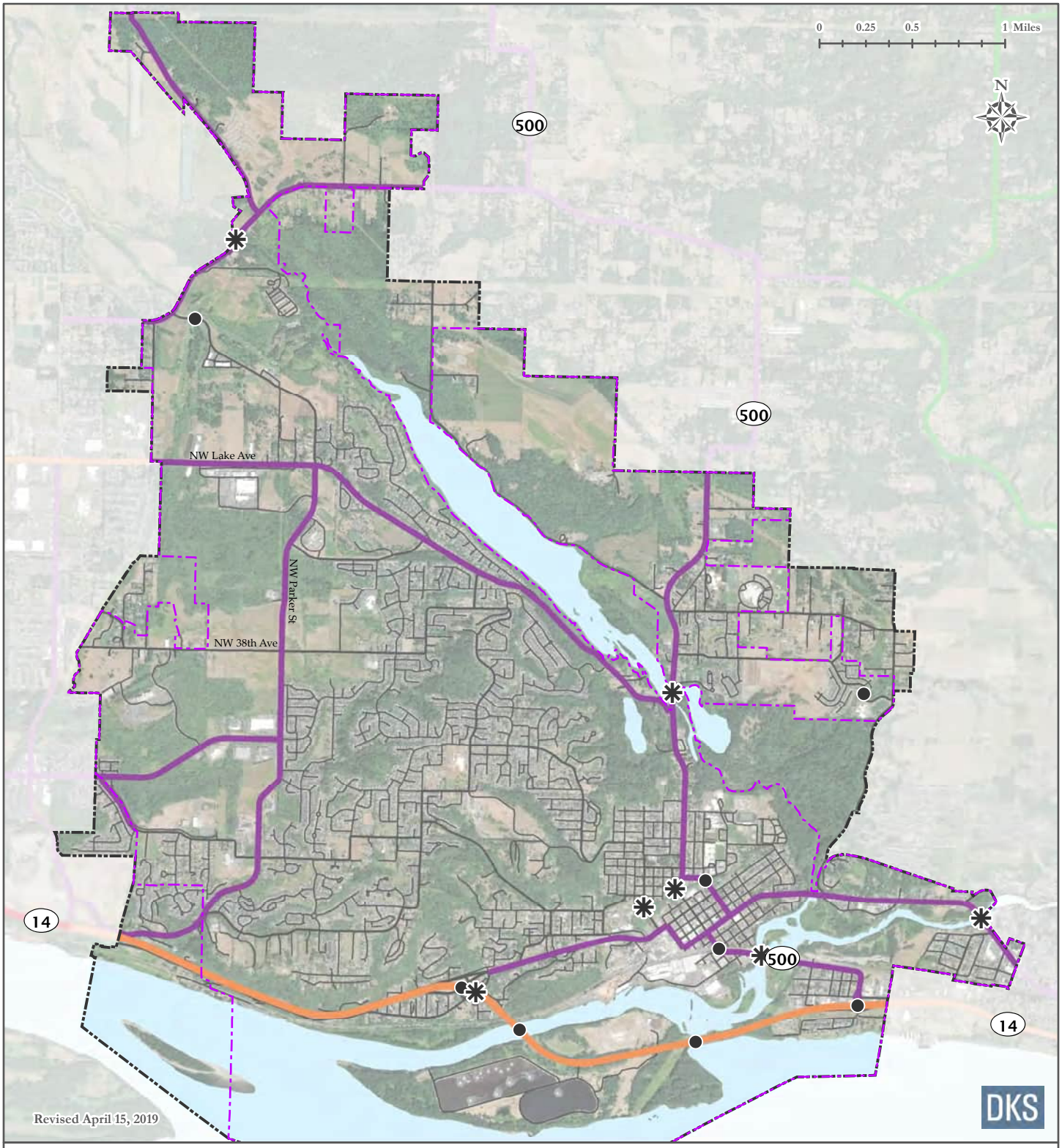
Freight

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The designation of through truck routes provides for this efficient movement, while maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. The Washington State Freight and Goods Transportation System (FGTS) tonnage classification system identifies different categories of freight corridors based on annual freight tonnage moved. It defines tonnage thresholds and identifies heavily used truck freight corridors within the state. Washington State FGTS truck freight corridors are classified into five categories, T-1 through T-5, based on annual gross truck tonnage. The following corridors are identified in Camas (see Figure 9).

- **T-1:** more than 10 million tons per year. There are no T-1 corridors in Camas.
- **T-2:** 4 million to 10 million tons per year. SR 14 is the only T-2 corridor in Camas.
- **T-3:** 300,000 to 4 million tons per year. In Camas, portions of NW 6th Avenue, NE Adams Street, NE 3rd Avenue, SR 500, NW Lake Road, NW Parker Street, NW Brady Road, NW Pacific Rim Boulevard, NE Goodwin Road, NE 28th Street, and NE Ingle Road are T-3 corridors.
- **T-4:** 100,000 to 300,000 tons per year. There are no T-4 corridors in Camas.
- **T-5:** at least 20,000 tons in 60 days and less than 100,000 tons per year. There are no T-5 corridors in Camas.

Heavy vehicles account for approximately four percent of the traffic on NE 3rd Street, three percent on SR 500, NW Pacific Rim Boulevard and Lake Road, two percent on NW 6th Avenue and NE Goodwin Road, and one percent on NW Brady Road and NW Parker Street through Camas during an average weekday. Traffic count data including heavy vehicle percentages is summarized in the appendix.

9 Freight Corridors and Bridge Conditions



Legend:

Bridge Condition:

- Not Deficient
- Functionally Obsolete

Freight Corridors

- T-2 Truck Freight Corridor
- T-3 Truck Freight Corridor

- Urban Growth Area
- Camas City Limit
- Arterial or Collector St

Rail

Freight rail service is provided to Camas by the BNSF Railway (see Figure 10). The main line enters the city from the west between the Columbia River and SR 14, before crossing under SR 14 north of the Camas Slough near SW 6th Avenue. The line parallels the Camas Slough before crossing under SR 500 and over the Washougal River, before running east into Washougal north of SR 14.

The BNSF Railway through Camas serves up to 40 trains each day. Within Camas there are a total of eight rail crossings, with three of the crossings public and five private. The public crossings are all grade separated and the private crossings are all stop controlled.

Amtrak passenger service is available in Vancouver, less than 15 miles away. Connections to the Amtrak depot in Vancouver can be made via C-TRAN.

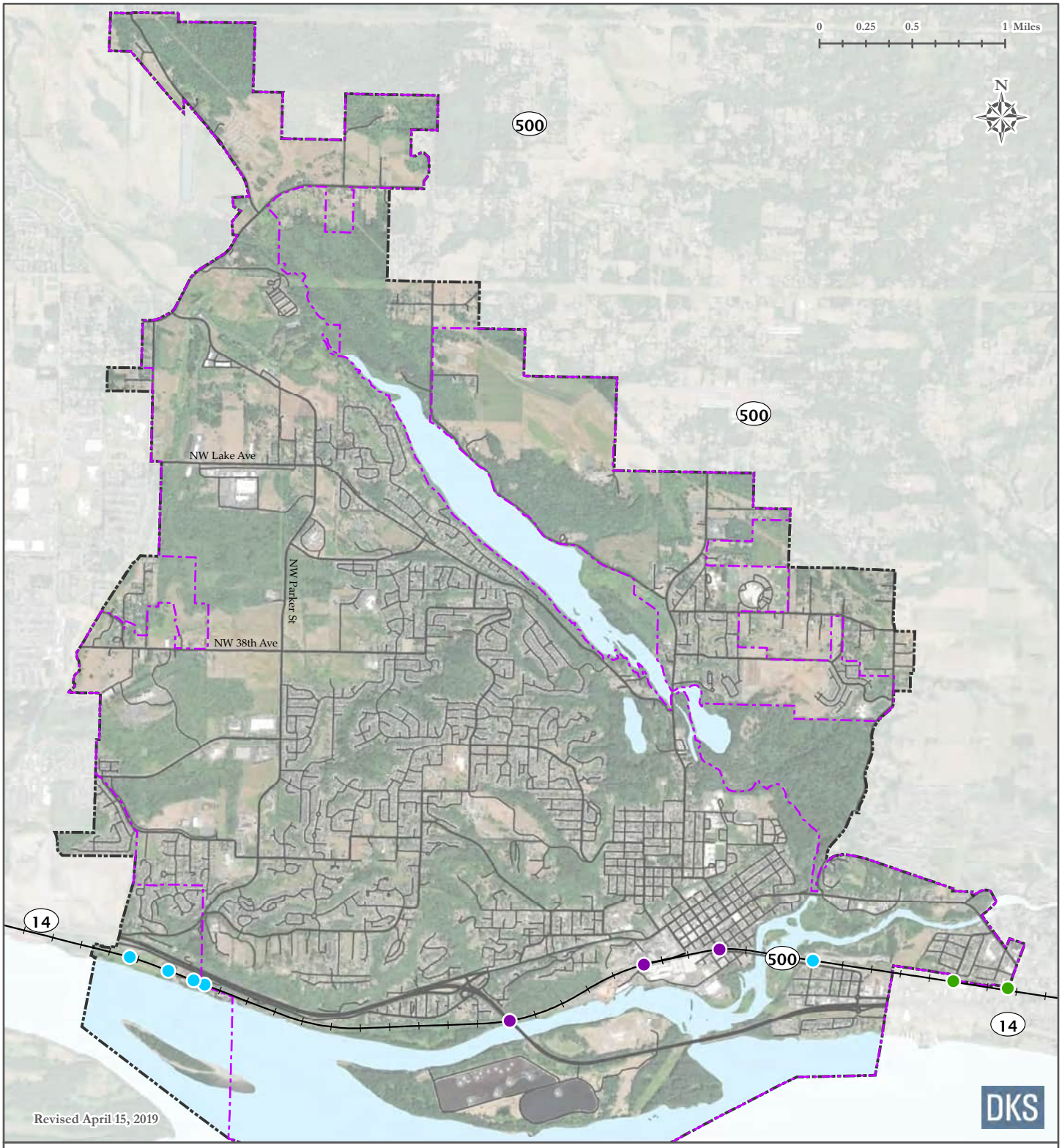
Air

Grove Field, owned and operated by the Port of Camas-Washougal, is a public use airport located along SR 500, about four miles from downtown. The airport is a local general aviation facility, which primarily supports single engine, general aviation aircraft, but is capable of accommodating smaller twin-engine general aviation aircraft. It also supports local air transportation needs and special use aviation activities. The airport provides support to 51 based aircraft. Services and facilities available include: hangar storage, tie-downs, fixed base operator services and training facilities, aircraft rental, aircraft maintenance, and fueling. The airport has one runway, and serves 9,800 annual operations (i.e., take-offs or landings).

Regional and international air service for passengers and freight is provided via Portland International Airport (PDX). The airport is located approximately 12 miles (or under 20 minutes) to the west of Camas and is connected via SR-14 and I-205.

The current Airport master plan calls for construction of additional hangar storage.

10 Rail Lines and Crossings



Legend:

Rail:

- At-Grade Crossing, gated
- At-Grade Crossing, ungated
- Grade Separated Crossing
- Railroad
- Urban Growth Area
- Camas City Limit
- Arterial or Collector St

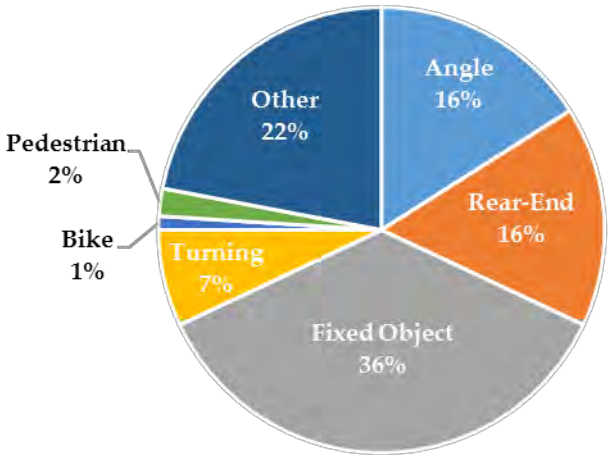
What is the Condition of the Existing Transportation System?

The transportation system in Camas is managed with a variety of measures designed to ensure that the transportation infrastructure in the city maintains acceptable quality and performance. Performance is evaluated based on the history of crashes and various measures of the pedestrian, bicycle, and motor vehicle transportation system.

Safety Evaluation

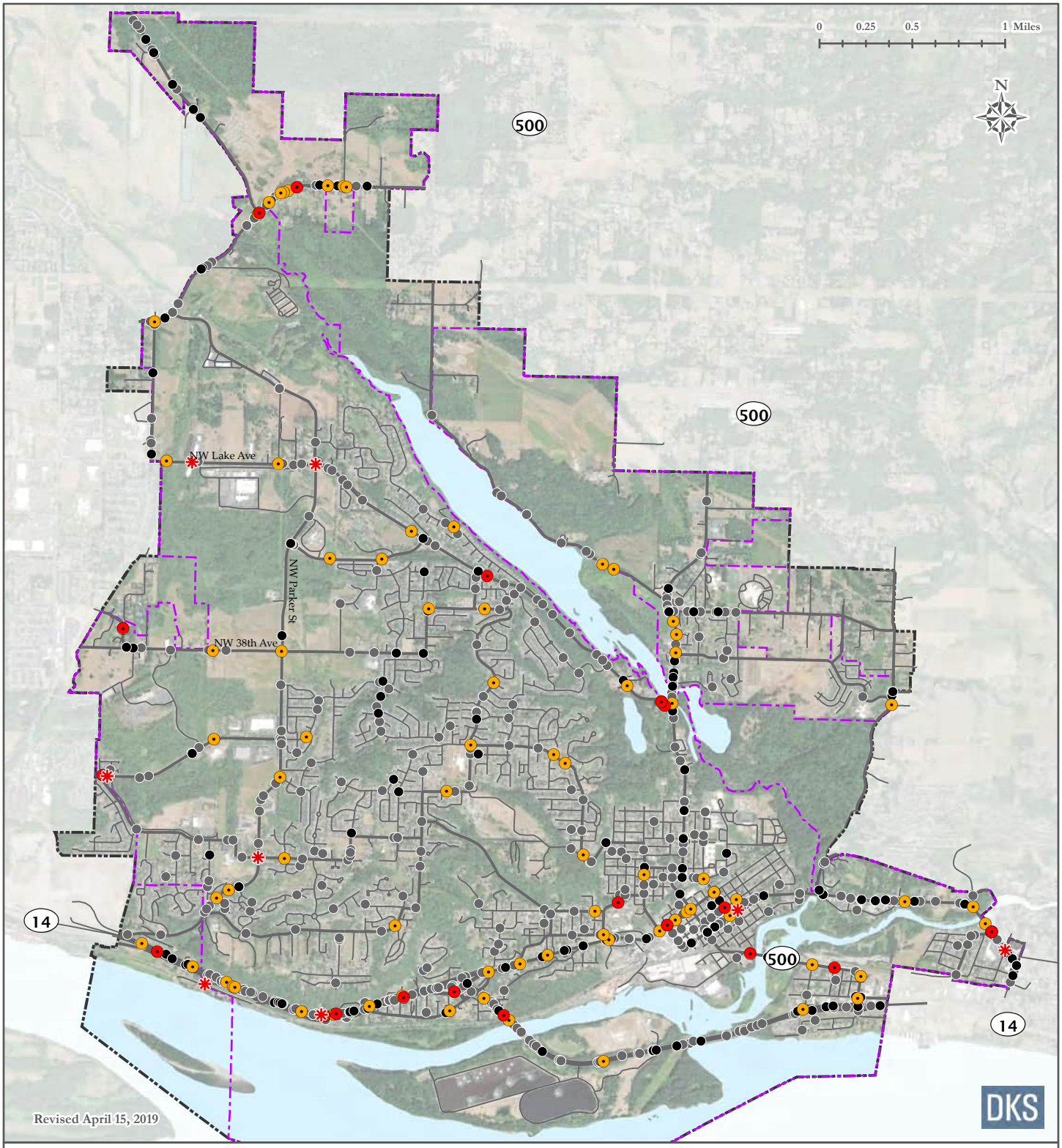
A review of available crash data identified patterns of motor vehicle, pedestrian, and bicyclist crashes. WSDOT's crash data from January 2013 through January 2018 (the most recent five years of available data) for all roadways within the Urban Growth Area of Camas showed a total of 880 crashes (an average of 176 crashes a year). A majority of these (about 75 percent) were either rear-end, turning, angle, or fixed-object type crashes (see Figure 11). Two percent of the crashes (about three per year) involved pedestrians and one percent (about two per year) involved bicycles. Figure 12 shows the high crash locations within the Urban Growth Area.

Figure 11: Crash Types (2013-2018)



Eight crashes resulted in deaths during this period, and an additional 20 crashes caused serious injuries. The high-severity crashes are a small portion of all crashes, making up only 11 percent of all reported crashes. However, the overall severity of crashes in Camas over the past five years is generally low, with 88 percent involving only property damage (no injuries) or minor injuries.

12 Crash Locations



Legend:

Collision Severity:

- Fatality
- Severe
- Moderate
- Minor
- Property Damage Only

- Urban Growth Area
- Camas City Limit
- Arterial or Collector St

Causes of Crashes

The City of Camas, Clark County and WSDOT strive to provide roads that are engineered to be as safe as possible. However, engineering is only one part of the road safety equation. Education and enforcement are critical elements in promoting safe driver behavior. The five most common driver errors are responsible for nearly 60 percent of all crashes in Camas.

- Inattention (29 percent)
- Did Not Yield Right-of-Way (13 percent)
- Followed Too Closely (10 percent)
- Disregarded Traffic Signal or Stop Sign (3 percent)
- Operating Defective Equipment (3 percent)

Risky behavior choices not only contribute to a substantial number of crashes in Camas, they generally lead to more severe outcomes for the people involved. Alcohol and/or drug use was involved in 79 crashes, including seven serious injuries. This represents around nine percent of all crashes and 25 percent of high-severity crashes. Speeding or driving too fast for conditions, was involved in 123 crashes (14 percent of all crashes), 10 of which were high-severity, including three deaths (36 percent of high-severity crashes).

Pedestrian Safety

There were 14 pedestrian-involved crashes over the past five years. They occurred most frequently downtown (five crashes involving a pedestrian), and along NE 3rd Avenue between NE 4th Street and NE Weir Street (two crashes involving a pedestrian).

Pedestrians sustained severe injuries in three crashes, one of which resulted in a death; at the NE 3rd Avenue / NE 4th Street, NE 3rd Avenue / NE Weir Street, and the SR 500 / NE 4th Avenue intersections. Moderate injuries to pedestrians were sustained in six of the crashes.

The majority of pedestrian-involved crashes (79 percent) were caused by drivers failing to yield the right of way to a pedestrian in a crosswalk or on a sidewalk. All of the pedestrian-involved crashes occurred during the day or at night in a location with street lighting.

The dominant trends observed in the crash data for pedestrian-involved crashes indicate that actions aimed at improving driver yield rates for pedestrians would be valuable in reducing the number of pedestrian-involved crashes. Engineering countermeasures to achieve this include: ensuring adequate signing indicating pedestrian crossing locations and state laws on yielding, providing and enhancing

lighting at crossings and locations with high pedestrian traffic, modifying traffic signal phasing to reduce pedestrian conflict opportunities, or improving roadside pedestrian visibility.

The data also indicates that actions focusing on motorist behaviors may be effective, including targeted enforcement and education efforts in the downtown area. These could include actions such as police enforcement of crosswalk laws through staged crossings, or efforts to increase general compliance with red lights and stop signs.

Bicycle Safety

There were 12 bicycle-involved crashes over the past five years. The majority of the bicycle-involved crashes occurred at intersections, with one at a traffic signal and six at stop controlled locations. A cyclist sustained moderate injuries in six of the crashes. The bicycle-involved collisions occurred most often along NE 3rd Avenue between NE Sumner Court and NE Weir Street (three collisions involving a bicycle) and along SR 500 (NE Everett Street) between NE 38th Avenue and NW Lake Road (two collisions involving a bicycle).

Most of the crashes involving a bicyclist were caused by drivers failing to yield the right of way when turning (58 percent). About 17 percent of the crashes were caused by either a bicycle or motorist failing to obey traffic control devices. The vast majority of bicycle crashes occurred during the day.

The dominant trends observed in the crash data for bicycle-involved crashes indicate that actions aimed at improving driver yield rates at intersections, specifically while turning, would be valuable in reducing the number of bicycle-involved crashes. Engineering countermeasures to achieve this include actions to increase the visibility of bicycling and encourage drivers to expect bikes at intersections, such as by providing highly visible space for bicycles and signing. Other engineering approaches include reducing conflict opportunities at intersections, such as through bike boxes or bike-specific signal phasing.

Ensuring a comprehensive bicycle network, including crossing opportunities, can also reduce conflicts between bicycles and motor vehicles. Effective bicycle detection at signals, and an evaluation of stop-controlled intersections along popular biking routes, may promote bicyclist adherence to traffic control devices.

The data also indicates that actions focusing on motorist and bicyclist behaviors may be effective, including targeted enforcement and education efforts along portions of SR 500 and NE 3rd Avenue.

Intersection Safety

Crash rates provide an additional perspective on intersection safety and identify locations where people have a higher risk of being involved in a crash. Crash frequencies (the number of crashes in a period of time) tend to increase with higher vehicle traffic. With more exposure to vehicles, there are

more opportunities for crashes to occur. Crash rates consider the amount of crashes relative to the traffic volume at the intersection, and are expressed in units of crashes per million entering vehicles (MEV). Where an intersection's crash rate is at or greater than 1.0 MEV, it is an indication that a problem might exist and that further study is warranted.

There was one intersection, NE Ingle Road at NE 28th Street, with a crash rate that exceeded 1.0 MEV as shown in Table 6. This table also includes the other nine intersections with the highest crash rates in the city. The crash rates for all study intersections are provided in the appendix.

Table 6: Study Intersections with Highest Crash Rates

	Intersection	Total Collisions (2013 to 2018)	Collision Type				Collision Severity		Collision Rate per MEV*
			Rear-end	Angle	Pedestrian / Bike	Other	Property Damage Only	Injury	
14	NE 13th Street at NW Friberg-Strunk Street	7	3	0	1	3	5	2	0.42
16	NE Ingle Road at NE 28th Street	15	5	2	0	8	10	5	1.03
17	NE 232nd Avenue at NE 28th Street	5	0	1	0	4	5	0	0.48
19	NE 199th Avenue at SR 500-NE 58th Street	7	0	5	0	2	5	2	0.46
20	SR 500 at NE 3rd Street	4	0	0	0	4	3	1	0.43
31	NW Sierra Drive at NW 28th Avenue	4	0	3	0	1	3	1	0.40
42	NE 6th Avenue at SR 500-NE Garfield Street	11	2	7	0	2	7	4	0.60
43	NE 3rd Avenue at SR 500-NE Garfield Street	13	3	2	2	6	8	5	0.49
44	NE 3rd Avenue at SR 500-NE Dallas Street	11	3	2	0	6	8	3	0.52
49	SE 283rd Avenue at SE 23rd Street	4	0	1	0	3	2	2	0.68

Note: * Per MEV = Crashes per million entering vehicles

The study intersections with the highest crash rates are discussed below.

- **NE 13th Street / NW Friberg-Strunk Street (signalized):** Rear-end crashes were most prominent here, caused primarily by inattention and following too close between vehicles traveling on NE 13th Street-Goodwin Road going eastbound or westbound. Less than a third of the crashes resulted in injuries (2 of 7).
- **NE Ingle Road / NE 28th Street-Goodwin Road (stop controlled):** This three-leg intersection with stop control on NE Ingle Road, had 15 collisions. Rear-end and fixed object crashes were the most prominent here. The majority of the rear-end crashes were on NE 28th Street-Goodwin Road traveling north-eastbound, while a majority of the fixed object crashes were on NE Ingle Road traveling south-eastbound. Following too close and driver inattention were the leading causes of crashes at this location. A third of the crashes resulted in injuries (5 of 15).
- **NE 232nd Avenue / NE 28th Street (stop controlled):** This is a three-leg intersection with stop control on NE 232nd Avenue (the north leg of the intersection is a private driveway). Turning movement crashes were most common here, caused by drivers failing to yield or making improper turns. None of the crashes resulted in injuries.
- **NE 199th Avenue at NE 58th Street-SR 500 (stop controlled):** This is a three-leg intersection with stop control on NE 199th Avenue. Angle crashes were most prominent here, caused by drivers failing to yield. Less than a third of the crashes resulted in injuries (2 of 7).
- **SR 500 at NE 3rd Street (stop controlled):** Fixed object crashes were the most prominent here. The intersection is within a curve along SR 500. Speeding was the most common cause of crashes. A quarter of the crashes resulted in injuries (1 of 4).
- **NW Sierra Drive at NW 28th Avenue (all-way stop):** Angle crashes were most prominent here, caused by drivers passing the stop sign or failing to yield. A quarter of the crashes resulted in injuries (1 of 4).
- **NE 6th Avenue at SR 500-NE Garfield Street (stop controlled):** This is a four-leg intersection with stop control on NE 6th Avenue. Angle crashes were most prominent here, caused by drivers passing the stop sign or failing to yield. Less than a third of the crashes resulted in injuries (4 of 11).
- **NE 3rd Avenue at SR 500-NE Garfield Street (signalized):** Turning and angle crashes were the most prominent here. The intersection has a permitted left turn on the eastbound NE 3rd Avenue approach. Disregarding traffic controls and failure to yield were the most common causes of crashes, possibly related to the permissive turn phasing**.** There were two pedestrian

crashes caused by a driver failing to yield when making a left turn from NE Garfield Street to eastbound NE 3rd Avenue. Less than a third of the crashes resulted in injuries (5 of 13).

- **NE 3rd Avenue at SR 500-NE Dallas Street (signalized):** Turning and angle crashes were the most prominent here. The intersection has permitted left turn lanes on all approaches. Disregarding traffic controls and failure to yield were the most common causes of crashes, possibly related to the permissive turn phasing. More than a quarter of the crashes resulted in injuries (3 of 11).
- **SE 283rd Avenue at SE 23rd Street (stop controlled):** This is a three-leg intersection with stop control on SE 23rd Street. Fixed object crashes were the most prominent here. The majority of the fixed object crashes were on SE 283rd Avenue traveling northbound or southbound. Speeding and driver inattention were the leading causes of crashes at this location. Half of the crashes resulted in injuries (2 of 4).

Walking and Bicycle Network Conditions

To assess the pedestrian and bicycle network conditions within the study area, a high-level qualitative evaluation was conducted. The quality and availability of various characteristics are rated system-wide as "Excellent", "Good", "Fair", or "Poor". The intent of the analysis is to show the extent to which the pedestrian and bicycle network provides a level of comfort and safety for users. The analysis will be used to inform, create, and confirm recommendations for pedestrian and bicycle projects.

Qualitative Pedestrian Network Assessment

For the pedestrian network evaluation, consideration is given to the presence of a sidewalk or path, a buffer zone (i.e., bike lane, shoulder, landscape strip, or on-street parking) and street lighting, and traffic volumes, number of travel lanes and travel speeds along the adjacent roadway.

In Camas, an "Excellent" rating requires sidewalks on both sides of the roadway, along with a desirable buffer zone given the roadway characteristics. A "Good" rating requires sidewalks on both sides of the roadway and a buffer zone, but without the desirable features or widths given the roadway characteristics. A "Fair" rating is given to a roadway with sidewalks on both sides, but without an adequate buffer zone. A "Poor" rating denotes gaps within the pedestrian facilities along that corridor.

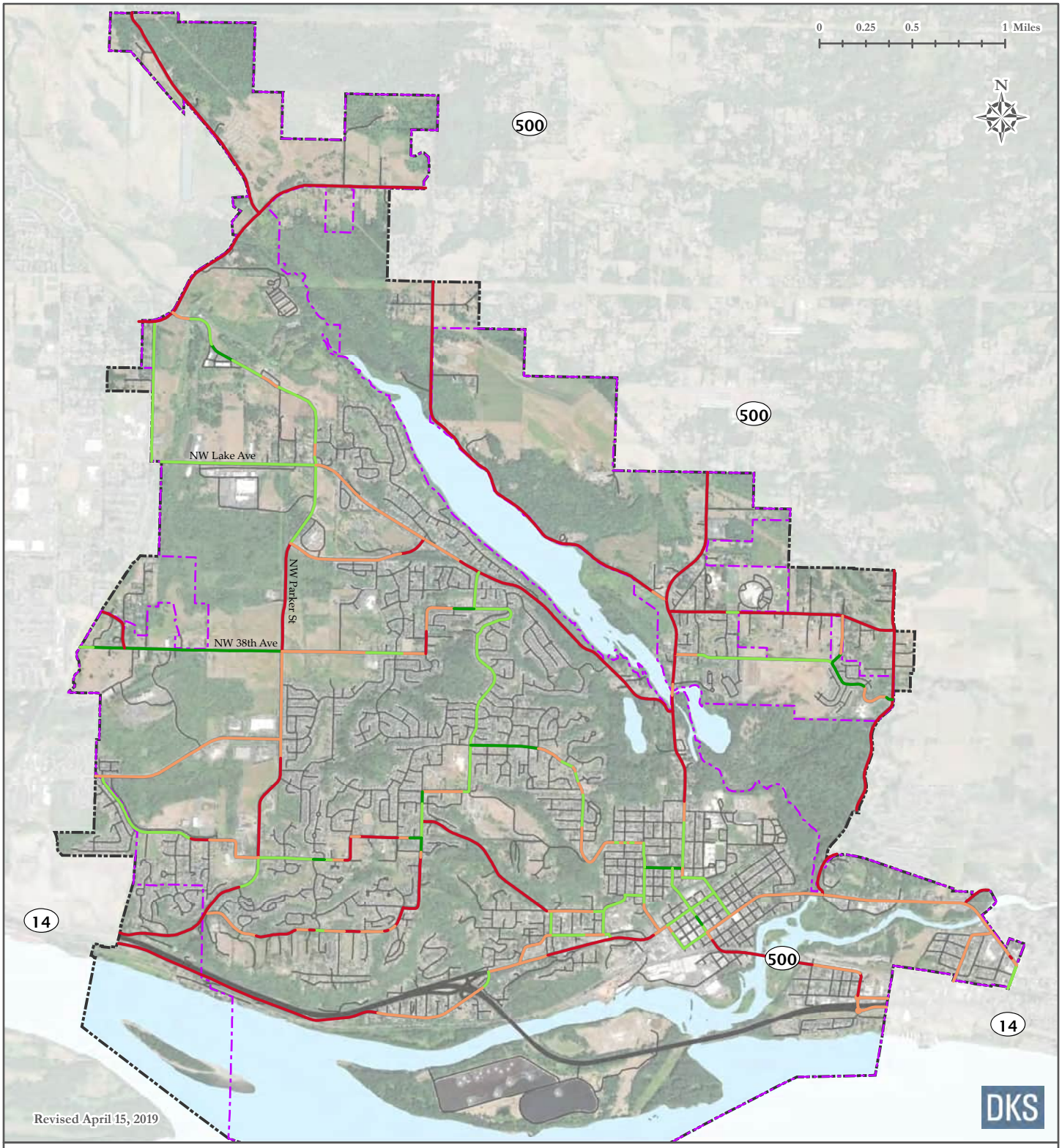
Figure 13 summarizes the pedestrian network conditions in Camas. Overall, the network rates relatively high near downtown, and poor towards the edges of the city.

Qualitative Bicycle Network Assessment

For the bicycle network evaluation, consideration is given to the presence and width of bike facilities (i.e., bike lane, shoulder, path, shared roadway), grade and pavement conditions of the roadway, and the number of travel lanes, motor vehicle volumes, and travel speeds along the adjacent roadway. In Camas, an "Excellent" rating requires separated bicycle facilities. A "Good" rating requires adequate bicycle facilities and width given the segment characteristics. A "Fair" rating is given to a roadway with bicycle facilities, but without the preferred facility type or width given the segment characteristics. A "Poor" rating denotes gaps within the bike network along that corridor.

Figure 14 summarizes the bicycle network conditions in Camas. This analysis shows that the arterial and collector streets in Camas rate relatively high on the northwest side of the city, and poor on the south and east side. The streets with the lowest ratings are the streets important for local and regional through travel (i.e., portions of NW 6th Avenue, NE 3rd Avenue, and SR 500), where most businesses and services are located. These streets rate low due to the relatively high motor vehicle traffic volumes and speeds and lack of separated bicycle facilities.

13 Pedestrian Network Assessment



Legend:

Qualitative Pedestrian Network Assessment:

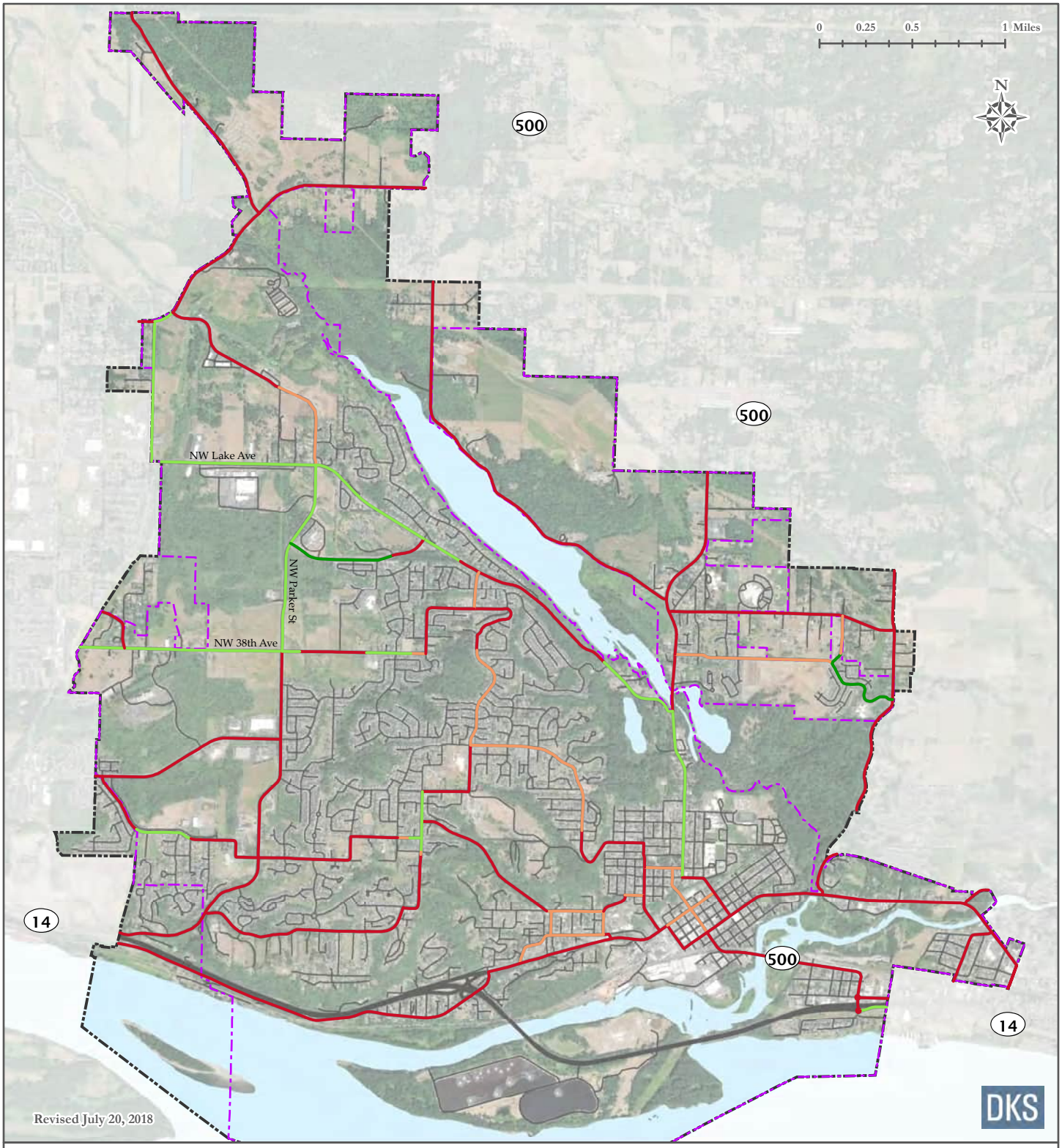
- Excellent
- Good
- Fair
- Poor

Urban Growth Area

Camas City Limit

Note:
Rating is based on a combination of sidewalk presence, speed limit, presence of buffers, roadway volume, number of lanes, shoulder widths and presence of lighting. Rating calculated on Collectors and Arterials.

14 Bicycle Network Assessment



Legend:

Qualitative Bicycle Network Assessment:

- Excellent
- Good
- Fair
- Poor

Urban Growth Area

Camas City Limit

Note:
Rating is based on a combination of speed limit, presence of bicycle facilities, presence of buffers, on-street parking, access and other street characteristics. Rating calculated on Collectors and Arterials.

Roadway Network Conditions

The Transportation Plan compares intersections in Camas to mobility standards intended to maintain a minimum level of efficiency for motor vehicle travel. Two methods to gauge intersection operations include volume-to-capacity (v/c) ratios and level of service (LOS).

- **Volume-to-capacity (v/c) ratio:** A decimal representation (between 0.00 and 1.00) of the proportion of occupied capacity (capacity defined as the theoretical maximum vehicle throughput in a given time frame) at a turn movement, approach leg, or intersection. It is the peak hour traffic volume divided by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. A ratio approaching 1.00 indicates increased congestion and reduced performance. A ratio greater than 1.00 indicates the turn movement, approach leg, or intersection is oversaturated, which usually results in excessive queues and long delays.
- **Level of service (LOS):** A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and traffic is highly congested.

Intersection mobility targets vary by jurisdiction of the roadways. Level of Service for Highways of Statewide Significance is set by the State. In Clark County, the standard is set as LOS "D" for urban areas, including SR 14. Level of Service for regional state highway facilities (not part of the HSS), including SR 500 in Camas, is set through the Southwest Washington Regional Transportation Council (RTC). The Southwest Washington RTC Board adopted LOS 'E' or better for non-HSS urban state highway facilities.

A LOS "D" is the minimum performance standard during the peak-hour for intersections along arterial and collector roadways under city jurisdiction. At roundabout intersections, v/c ratio of 0.90 also applies along arterial roadways and a v/c ratio of 0.85 along collector roadways.

The applicable mobility standards at each study intersection in the city are identified in the appendix. Study intersections that do not meet the mobility standards shown may require mitigation strategies to be identified in the Transportation Plan.

Intersection Operations

Table 7 shows the study intersections that do not meet mobility standards under the existing (2018) p.m. peak hour. A complete listing of operating conditions at study intersections is provided in the appendix. Of the 50 study intersections, four city locations do not meet their respective mobility standard under existing p.m. peak hour conditions.

Table 7: Study Intersections That Do Not Meet Mobility Standards (2018 PM Peak)

	Intersection	Mobility Target	Delay	Level of Service	Volume / Capacity
4	Pacific Rim Boulevard at Payne Road	LOS D	103.5	F	0.98
38	NW 6th Avenue at NW Ivy Street	LOS D	39.0	E	0.13
39	NW 6th Avenue at Drake Street	LOS D	41.7	E	0.50
40	NE 6th Avenue at NE Division Street	LOS D	61.1	F	0.31

Signalized intersections:
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection

Stop Controlled intersections:
LOS = Level of Service of Worst Movement
V/C = Volume-to-Capacity Ratio of Worst Movement

Summary of Key Findings

Below is a summary of key findings from the analysis of existing transportation conditions that helps establish a baseline for system performance.

Pedestrian Network

- Traveling by foot is far more common near downtown.
- Gaps in the sidewalk system are more common in southwest, southeast, and northeast Camas, and on roadway segments outside the city limits.
- Most crashes involving pedestrians occur downtown, and along NE 3rd Avenue between NE 4th Street and NE Weir Street.
- The vast majority of pedestrian-involved crashes (79 percent) were caused by drivers failing to yield the right of way to a pedestrian in a crosswalk or along a sidewalk.
- Overall, the walking network rates relatively high near downtown, and poor towards the edges of the city.

Bicycle Network

- Traveling by bicycle is more common along NW Lake Road, and NW Sierra Street.
- Significant segments of continuous bicycle lanes exist along portions of NW Lake Road, NW 38th Avenue, NW Parker Street, NW Friberg-Strunk Street, and SR 500.
- Most crashes involving bicycles occur at intersections.
- Most of the crashes involving a bicyclist were caused by drivers failing to yield the right of way when turning.
- The arterial and collector streets in Camas rate relatively high on the northwest side of the city, and poor on the south and east side. The streets with the lowest ratings are the streets important for local and regional through travel, where most businesses and services are located.

Transit System

- C-TRAN provides transit service in Camas via one fixed bus route connecting the city with Vancouver and Washougal. Transit riders can transfer to other C-TRAN routes at the Fisher's Landing Transit Center in Vancouver.
- Bus stops in Camas are located along NW 6th Avenue near the SR 14 Ramps, NW Ivy Street, and NW Drake Street intersections, at the NE Adams Street / NE 5th Avenue, and along NE 3rd

Avenue near the NE Franklin Street, NE Joy Street, NE 3rd Place, E. 1st Avenue, SE Crown Road, NE Summer Street, NE 3rd Loop, NE Shepherd Road, NE 2nd Avenue, NE Weir Street and NE Lechner Street intersections.

- Each of the bus-stops are signed and the eastbound stop along NW 6th Avenue near the SR 14 Ramps provides a bus pull-out. The bus stop along NE 3rd Avenue at NE Franklin Street (near Camas City Hall) provides a bench and shelter.
- All remaining bus stops have no amenities.
- C-TRAN's "Connector" service provides Camas with fully accessible dial-a-ride and scheduled stop service at designated stops within the service area.
- Most transit users in the city are more than a half-mile from a bus stop.

Roadway Network

- More than half of the workers in Camas live in another city that is located more than ten miles away, creating many long commute trips and encouraging travel by motor vehicle.
- Motor vehicle volumes on the roadways in Camas most commonly peak during weekday evenings between 4:50 p.m. and 5:50 p.m.
- Camas experiences an average of around 176 crashes a year, though the severity of most crashes is generally low, with 88 percent involving only property damage or minor injuries.
- The NE Ingle Road at NE 28th Street intersection in Camas was noted as having a high rate of crashes.
- The five most common driver errors are responsible for nearly 60 percent of all crashes in Camas.

    1. Inattention (29 percent)
    2. Did Not Yield Right-of-Way (13 percent)
    3. Followed Too Closely (10 percent)
    4. Disregarded Traffic Signal or Stop Sign (3 percent)
    5. Operating Defective Equipment (3 percent)

- Of the 50 study intersections, four city locations do not meet their respective mobility standard under existing p.m. peak hour conditions, including Pacific Rim Boulevard at Payne Road, NW

6th Avenue at NW Ivy Street, NW 6th Avenue at Drake Street, and NE 6th Avenue at NE Division Street.

- About 75 percent of the roadway miles in Camas have pavement in good or satisfactory condition, 13 percent in fair condition, six percent in poor condition, and six percent in very poor or worse condition.

Other Modes of Travel

- Seven bridges are flagged as functionally obsolete, including along SW 6th Avenue over SR 14, along SR 500 over the Washougal River, along SR 500 over Lacamas Lake, along NE 3rd Avenue over the Washougal River (this bridge is scheduled for seismic upgrades in 2020), along NE Goodwin Road over Lacamas Creek, along Division Street over Mill Ditch, and along NE Dallas Street over Mill Ditch.
- Within Camas, SR 14 is classified as a T-2 truck freight corridor, while portions of NW 6th Avenue, NE Adams Street, NE 3rd Avenue, SR 500, NW Lake Road, NW Parker Street, NW Brady Road, NW Pacific Rim Boulevard, NE Goodwin Road, NE 28th Street, and NE Ingle Road are T-3 corridors.
- Freight rail service is provided to Camas by the BNSF Railway.
- Grove Field serves 9,800 annual operations (i.e., take-offs or landings).
- Regional and international air service for passengers and freight is provided via Portland International Airport (PDX).

APPENDIX D. FUTURE BASELINE CONDITIONS ANALYSIS

MEMORANDUM

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DATE: May 15, 2024

TO: Curleigh Carothers, City of Camas
Steve Wall, City of Camas

FROM: Reah Flisakowski, DKS Associates
Kevin Chewuk, DKS Associates

SUBJECT: Camas Transportation Plan
Technical Memo 3 – Future Baseline Conditions Analysis P18039-000

The condition of Camas' future transportation system depends on the growth in population and employment, future travel patterns (e.g., choice of modes, routes, and frequency of trips), and community investment decisions. Growth in population and the number of jobs is forecast based on trends and knowledge of the city and region. Future travel patterns are more difficult to predict as the community's investment decisions and the economy can have significant effect on choice of modes and routes. The objective of the transportation planning process is to generate information necessary for making decisions that will result in safe and efficient travel options through 2040.

Methodology for Estimating Future Travel

The 2040 transportation conditions in Camas were forecasted based on trips that new growth will generate, assuming no new investments in infrastructure beyond what is funded for construction already. It describes where the transportation system will perform satisfactorily and areas of the network likely to be congested or in need of investments to function adequately in the future. Subsequent memos will explore potential solutions for addressing future transportation system needs.

Future Estimates of Walking, Biking, and Transit

Methodology for determining future needs for walking, biking, and transit in Camas begins with an assessment of who is walking, biking, and taking transit now and where they are traveling. Technical Memorandum #2 (Existing Conditions Analysis) answers these questions for pedestrians, bicyclists and transit riders and details existing conditions of the infrastructure.

The existing facilities were then compared to major growth areas of the city, and in proximity to key destinations, such as schools, parks, transit stops, shopping and employment. A review of the city shows that the walking and biking infrastructure is inadequate in anticipated major growth areas and

near key destinations, which have the potential to attract significant walking and biking trips. The inadequate walking and biking infrastructure further hinders transit riders, as these users typically utilize these facilities at the beginning and end of their trip.

Baseline Street Network Performance

The baseline condition reflects the street network performance for motor vehicles, assuming only transportation projects with secured funding will be built. Other identified TIF projects that are not fully funded will be evaluated as potential solutions in Technical Memorandum #5 to validate their need in the future.

The following motor vehicle capacity projects have been completed or have funding identified in the Camas Transportation Plan study area through 2040:

- Eastbound left-turn pocket added to NW Brady Road at the NW Grand Ridge Drive intersection (study intersection #1)
- Traffic signal installed at the **NW Brady Road intersection with NW 16th Avenue** and left-turn pockets for all approaches (study intersection #3)
- Traffic signal installed at the **Pacific Rim Boulevard intersection with Payne Road** and left-turn pockets for the northbound and southbound approaches (study intersection #4)
- Traffic signal installed at **SE 20th Street/38th Avenue intersection with SE Bybee Road/NW Fisher Creek Drive** and realign SE Bybee Road so that is intersects with NW Fisher Creek Drive (study intersection #8)
- Traffic signal installed at the **NE Ingle Road intersection with NE 28th Street-NE Goodwin Road** (study intersection #16)
- Install a roundabout at the **SR 500 (NE Everett Street) intersection with NE 3rd Street** (study intersection #20)
- Roundabout installed at the **SR 500 (NE Everett Street) intersection with NE Lake Road** (study intersection #24)
- **Larkspur Street** improved between NW Lake Road and NW Camas Meadows Drive, including sidewalks and bike lanes
- **NW Brady Road** improved between NW 16th Avenue and NW Pacific Rim Boulevard, including sidewalks and bike lanes
- Improve NW 38th Avenue between NW Parker Street and Grass Valley Park

Camas 2040

Future land use changes and growth in population, housing, and employment within Camas' urban growth area (UGA) will have a significant impact on the existing transportation system and will create new travel demands. These growth projections and how they translate to new trips on the transportation network are key elements of the future conditions and performance analysis.

The Southwest Washington Regional Transportation Council (RTC) travel demand model is the primary tool used to determine future traffic volumes in Camas and the surrounding region. The RTC model forecasts travel changes in response to future land use and transportation scenarios. This model translates estimated land uses into person trips, selects travel modes and assigns motor vehicle trips to the roadway network. It is an informational tool to assist with decision making, providing objective and quantitative information exploring the potential impacts of alternative transportation system investments.

Forecasted Population and Employment Growth

Understanding the influence of area land uses on the transportation system is a key factor in transportation system planning. The amount of land that is to be developed, the types of land uses, and their proximity to each other have a direct relationship to expected demands on the transportation system.

The RTC model includes forecasted land uses for the Camas Transportation Plan study area. The land uses reflect Camas' Comprehensive Plan and growth assumptions identified for the year 2040. Complete land use data sets are developed for both the 2015 base year and 2040 future year. The land use information has been coordinated with all the other jurisdictions in the RTC travel area. A sub-area level model was also created for the Camas planning area that included a 2040 planning horizon. Local land uses were developed for 2040 with input from City staff. Future year land use and trips were adjusted based on the adopted changes from the Camas Northshore Subarea Plan.

Table 1 summarizes baseline and projected future totals for households and employment within the Camas Transportation Plan study area, from which traffic growth estimates were made. These values indicate that growth in employment is expected to outpace residential development, both overall and as a percentage increase. Most household growth is assumed to occur in the north area of the city, while employment growth is generally assumed to occur in the southwest and northeast.

Table 1: Land Use Assumptions for Camas

Camas Transportation Plan Study Area*	2015	2040	Change (2040-2015)	Percent Increase (2040-2015)
RTC Model Households	9,580	15,220	5,640	59%
RTC Model Employment	8,947	21,243	12,296	137%
Northshore Plan Household Updates**	-	+1,918	-	-
Northshore Plan Employment Updates**	-	-2,508	-	-
Total Households (with Northshore Plan Updates)	9,580	17,138	7,558	79%
Total Employment (with Northshore Plan Updates)	8,947	18,735	9,788	109%

* These locations are based on boundaries approximated by the model TAZ boundaries and may not match current and future city limits.
** This reflects the difference between the 2040 land use included in the RTC model for the Northshore Subarea Plan area (i.e., 2,232 households and 4,476 jobs) and the 2040 land use from adopted changes from the Northshore Subarea Plan (i.e., 4,150 households and 1,968 jobs).

Future Travel Growth

With more jobs, residents, and through travel, the street network in Camas must accommodate about 9,000 additional motor vehicle trip ends during the weekday evening peak hour. Today, the Camas street network is generally able to handle the evening peak hour trips; however, the evening peak hour motor vehicle trips are likely to increase significantly by the end of 2040.

Forecasted 2040 motor vehicle volumes for peak hour conditions were utilized to determine areas on the baseline roadway network that will be congested and may require future investments to accommodate forecasted growth. The 2040 baseline motor vehicle volumes for study intersections in the appendix show volumes are anticipated to be highest along major roadways that connect the surrounding region to the employment areas in Camas, including NW Pacific Rim Boulevard, NW 38th Avenue, NW Parker Street, NW Lake Road, SR 500-NE Everett Street, NW 6th Avenue and NE 3rd Avenue. Other roadways expected to experience significant traffic increases include NE Goodwin Road, NE Ingle Road and NE 28th Street. Each of these roadways connects a major residential and/or employment growth area in the City.

Where Transportation Improvements May be Needed

Review of the expected growth throughout the city and existing gaps and deficiencies of the transportation system identified the following locations as possible candidates for improvements.

Walking Network Needs

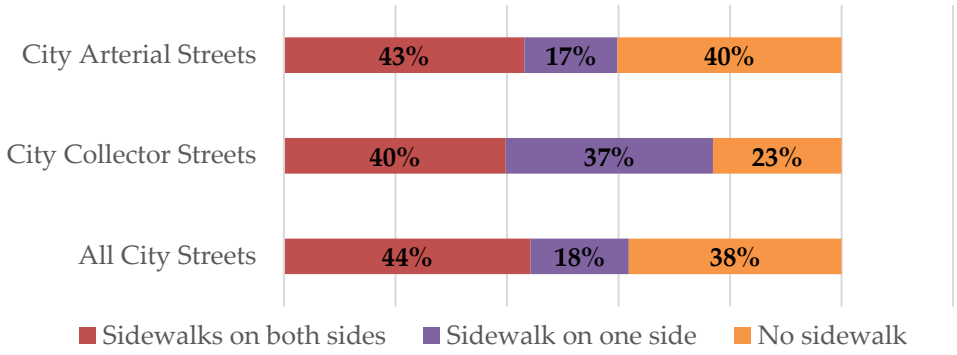
The following section describes the walking network needs identified for the 2040 Baseline street network.

Future Walking Network

The percent of roadways with sidewalks (see Figure 1) will improve slightly from existing conditions. About 56 percent of City street miles (including City arterial, collector and local streets) lack sidewalk coverage along one or both sides. With a few projects currently committed for funding, the 2040 Baseline pedestrian network is similar to today's conditions. These numbers do not incorporate off-street shared-use paths that may run alongside some roadways.

Any future streets constructed in association with development projects will be required to construct sidewalks as well, increasing the overall sidewalk supply.

Figure 1: Street Miles with Sidewalks within Camas



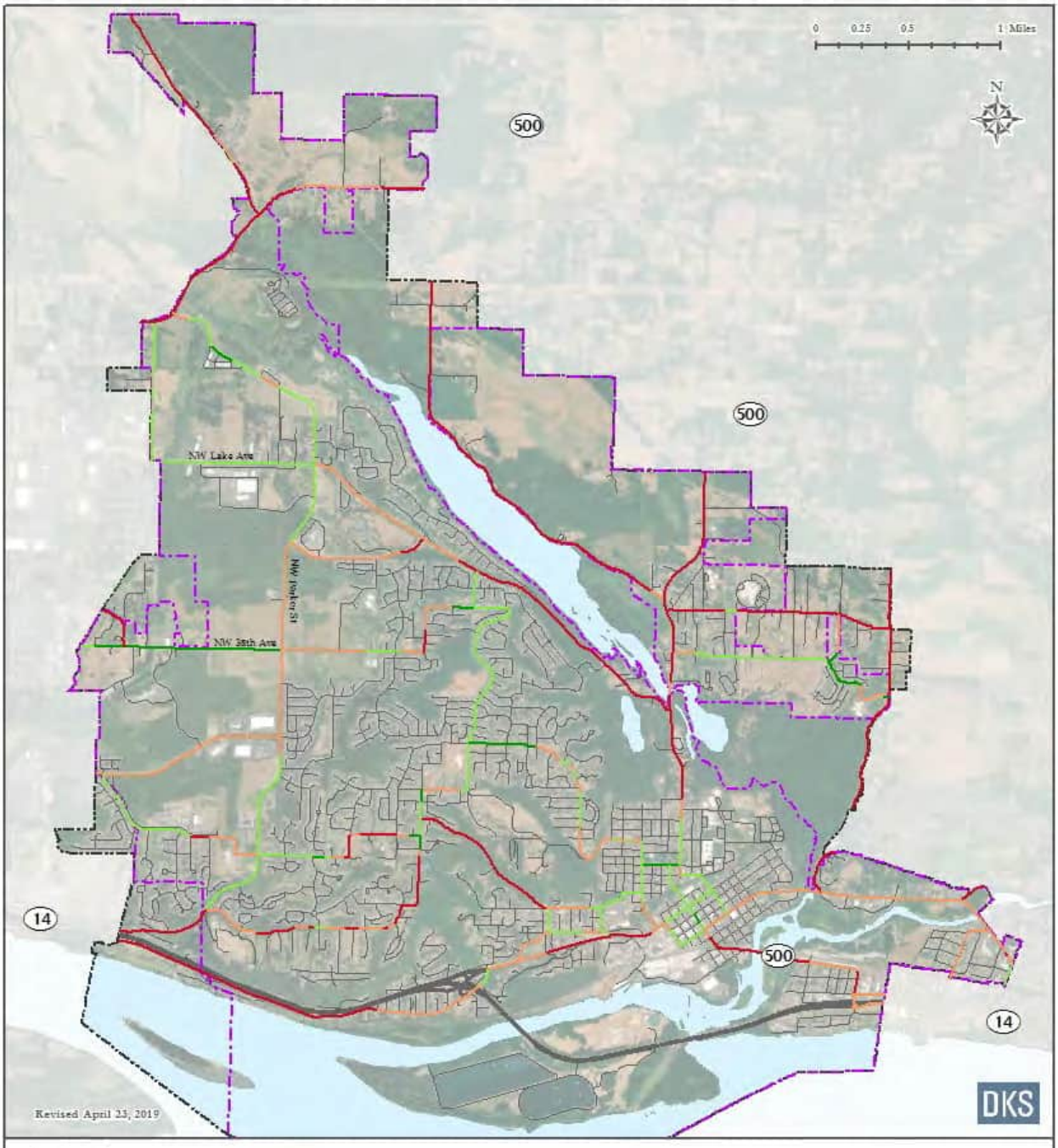
Future Qualitative Pedestrian Assessment

The Qualitative Pedestrian Network Assessment shows the extent to which the walking network on collector and arterial streets provides a level of comfort and safety for users. The assessment method and conditions of the pedestrian network are summarized in a previous memo[1]. Since traffic volume is the only input factor anticipated to change significantly under future conditions, there were no significant changes made to the street segment quality ratings identified in existing conditions (see Figure 2).

About 30 percent of the collector and arterial street miles' in Camas rate "good" or "excellent" for pedestrians. However, over 35 percent of the collector and arterial street miles' rate poorly. Most of the street miles' rated "poor" are located in high growth areas (i.e., household or employment growth). The pedestrian network in these areas is largely unimproved due to the rural nature of the surrounding land use but will likely be improved as future development occurs. Overall, the pedestrian network continues to rate relatively high near downtown, and poor towards the edges of the City.

[1] See Technical Memorandum #2: Existing Conditions Analysis, July 20, 2018

2 Future Pedestrian Network Assessment



Walking Facility Gaps

Despite the high level of sidewalk coverage towards downtown, parts of the City experience sidewalk gaps. These gaps are predominately concentrated on the edge of the City. However, there are segments along streets near downtown, and other segments that provide important connections that lack sidewalks on one or both sides of the street.

Missing segments in developed areas include:

- NW Brady Road, south of NW McIntosh Road
- NW McIntosh Road, east of NW Brady Road
- NW Lake Road, west of SR 500-NE Everett Street
- SR 500-NE Everett Street, south of NW Lake Road

Segments in undeveloped areas where future development will require sidewalks include:

- NW Parker Street, north of NW Pacific Rim Boulevard
- NE Goodwin Road-NE 28th Street, east of NW Friberg-Strunk Street
- NE Ingle Road, north of NE Goodwin Road
- NE 232nd Avenue-NE Leadbetter Road, west of SR 500-NE Everett Street (note that this segment to eventually be partially closed to motorist traffic and made into a trail)
- NE 43rd Avenue-SE 15th Street, east of SR 500-NE Everett Street
- SR 500-NE Everett Street, north of NW Lake Road

In addition to the areas where these gaps already exist, future pedestrian infrastructure needs can be identified based on anticipated growth. Higher densities and more people require more pedestrian infrastructure to accommodate demand. Where growth is anticipated, street segments with "poor" or "fair" pedestrian network qualitative assessment scores will need enhancements in order to improve their conditions. These segments include:

- NW 38th Avenue, east of NW Parker Street (note that multimodal improvements are being constructed on NW 38th Avenue between NW Parker Street and Grass Valley Park in 2024).
- NW Pacific Rim Boulevard, west of NW Parker Street
- NW 6th Avenue, west of NE Adams Street

Methodology to Address Deficiencies

A list of potential pedestrian network improvement projects will be developed in Technical Memorandum #5 based on streets with pedestrian deficiencies. A street is considered deficient for walking if it meets one or more of the following conditions:

- Arterial or collector street without pedestrian facilities
- "Poor" qualitative pedestrian assessment rating
- Qualitative pedestrian assessment rating less than "good" in close proximity to parks, schools, transit stops, or other important destinations

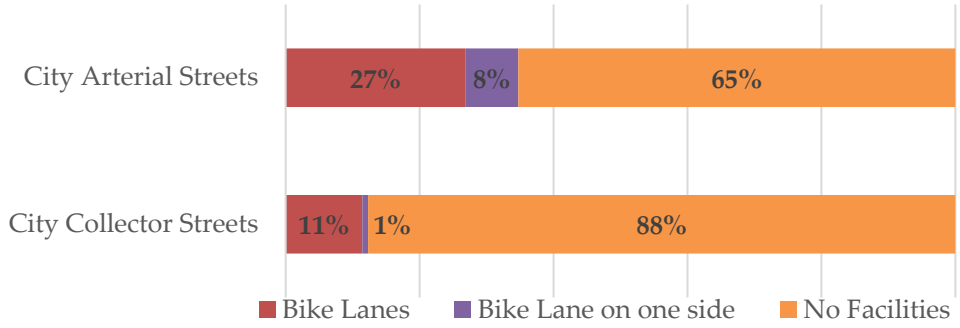
Bicycle Network Needs

The following section describes the bicycle network needs identified for the 2040 Baseline street network.

Future Bicycle Network

Little is expected to change from the existing bicycle network (see Figure 3). About 65 percent of City arterial street miles and 88 percent of City collector street miles lack bicycle facilities (bike lanes or shoulder bikeways). With a few projects currently committed for funding, the 2040 Baseline bicycle network is similar to today's conditions. These numbers do not incorporate off-street shared-use paths that may run alongside some roadways.

Figure 3: Street Miles with Bike Facilities within Camas



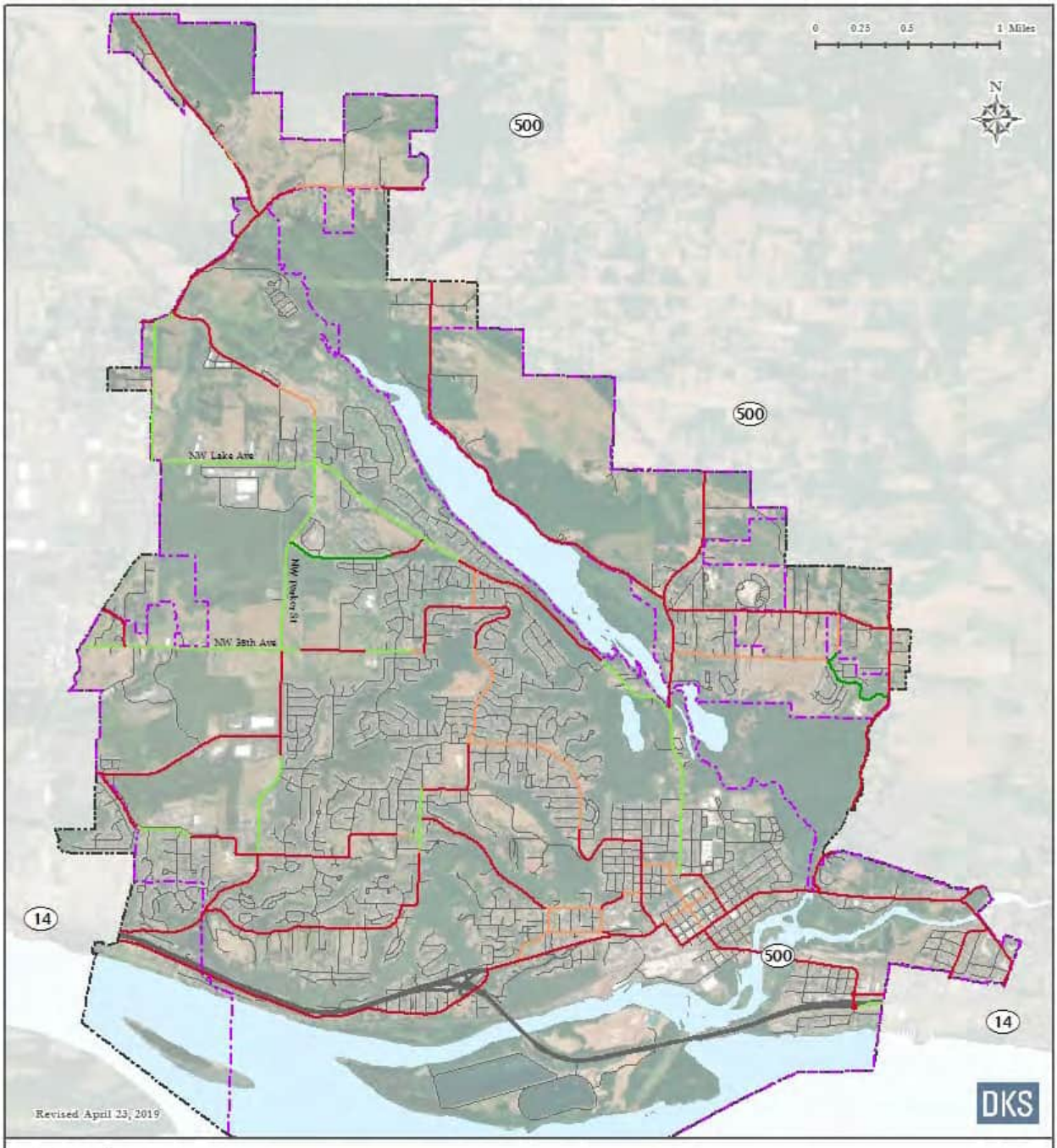
Future Qualitative Bicycle Assessment

The Qualitative Bicycle Network Assessment shows the extent to which the bicycle network on collector and arterial streets provides a level of comfort and safety for users. The assessment method and conditions of the bicycle network are summarized in a previous memo[2]. Since traffic volume is the only input factor anticipated to change significantly under future conditions, there were no significant changes made to the street segment quality ratings identified in existing conditions (see Figure 4).

About 20 percent of the collector and arterial street miles' in Camas rate "good" or "excellent" for bicyclists. However, about 65 percent of the collector and arterial street miles' rate poorly for bicyclists. Overall, the bicycle network continues to rate relatively high on the northwest side of the city and poor on the south and east side. The streets with the lowest ratings are the streets important for local and regional through travel (i.e., portions of NW 6th Avenue, NE 3rd Avenue, and SR 500), where most businesses and services are located. These streets rate low due to the relatively high motor vehicle traffic volumes and speeds and lack of separated bicycle facilities.

[2] See Technical Memorandum #2: Existing Conditions Analysis, July 20, 2018

4 Future Bicycle Network Assessment



Bicycle Facility Gaps

Bicycle network gaps are spread throughout the City. These gaps are predominately located on segments of streets in undeveloped areas, or on segments of streets that have no on-street bike facilities that would better connect the bicycle network. Some of these segments include:

- NW Brady Road-NW Parker Street, south of NW 38th Avenue
- NW Pacific Rim Boulevard, west of NW Parker Street
- NW 38th Avenue, east of NW Parker Street (note that multimodal improvements are being constructed on NW 38th Avenue between NW Parker Street and Grass Valley Park in 2024).
- NW Lake Road, west of Sierra Street to Lacamas Lane (eastbound only)
- NE Goodwin Road-NE 28th Street, east of NW Friberg-Strunk Street
- SR 500-NE Everett Street, north of NW Lake Road
- SE 6th Avenue, south of NE 3rd Avenue
- NE 3rd Avenue, east of NE Adams Street
- NE Adams Street, between NE 3rd Avenue and NW 6th Avenue
- NW 6th Avenue, west of NE Adams Street

In addition to these missing segments, future bicycle needs can be identified based on where growth is expected to occur. The areas with the greatest increase in employment and population densities are listed below. As most of these areas are undeveloped, future bicycle infrastructure is likely to be provided or enhanced through development of the local street system.

- In north Camas, north of NW Lake Road
- In southwest Camas, west of NW Brady Road-NW Parker Street
- In northeast Camas, east of NW 232nd Avenue

Major street segments with "poor" bicycle network qualitative assessment scores include:

- NW Brady Road-NW Parker Street, south of NW 38th Avenue
- NE Ingle Road, north of NE Goodwin Road
- NW Lake Road, between NW Sierra Street and NW Lacamas Lane (eastbound only)
- SR 500-NE Everett Street, north of NW Lake Road
- SE 6th Avenue, south of NE 3rd Avenue
- NE 3rd Avenue, east of NE Adams Street

- NW 6th Avenue, west of NE Adams Street

Generally, improvements are needed if the City prioritizes more bicycle friendly streets for novice riders. Such improvements would focus on improving the density and connectivity of low-stress bike routes, and in some cases identified bicycle deficiencies and gaps can be addressed by providing accommodations on nearby streets.

Other Bicycle Needs

Other bicycle needs identified through field observations and transportation analysis include enhancing bicycle connections to key destinations and expanding low stress bicycle routes. Not all of the roadways lacking bicycle facilities will be able to accommodate bike lanes due to right-of-way constraints, limited funding, and/or fewer constraints on parallel corridors. A network of low stress bikeways will be considered to relieve some of the right-of-way constraints posed on streets where bikeways are rated poor, but space does not permit consideration of bike lanes or buffered bike lanes.

As mitigations for motor vehicle travel are considered for intersections and along roadway segments, innovative designs may be considered to avoid undesirable impacts on bicycle safety and connectivity.

Methodology to Address Deficiencies

A list of potential bicycle network improvement projects will be developed in Technical Memorandum #5 based on streets with bicycle deficiencies. A street is considered deficient if it meets one or more of the following conditions:

- Arterial or collector street without bicycle facilities or adjacent corridor with bicycle facilities
- "Poor" qualitative bicycle assessment rating
- Qualitative bicycle assessment rating less than "good" in close proximity to parks, schools, transit stops, or other important destinations

Motor Vehicle Network Needs

An increase in motor vehicle travel leads to an increase in congestion. Travel activity, as reflected by evening peak hour motor vehicle trips beginning or ending in Camas, is expected to increase significantly through 2040. Through trips (i.e., trips that neither begin nor end in Camas) are also expected to increase through 2040 and are generally representative of increased growth in statewide travel and in neighboring cities such as Vancouver and Washougal.

Study intersection operations were analyzed in the same manner as was done for existing conditions[3]. Forecasted intersection capacity and level of service were compared to applicable agency mobility standards to identify where significant congestion is likely to occur. Table 2 shows the study intersections that do not meet mobility standards under the 2040 peak hour conditions. A complete listing of operating conditions at study intersections is provided in the appendix.

Of the 50 study intersections, 16 would not meet their respective mobility standard during the 2040 peak hour conditions. Three of these intersections also did not meet the mobility targets under existing p.m. peak hour conditions (NW 6th Avenue at NW Ivy Street, NW 6th Avenue at Drake Street and NE 6th Avenue at NE Division Street). Four of the substandard intersections are along SR 500.

Table 2: Study Intersections That Do Not Meet Mobility Standards (2040 PM Peak)

	Intersection	Mobility Target*	Delay	Level of Service	Volume / Capacity
6	Pacific Rim Boulevard at NW Parker Street	LOS D; v/c 0.85	42	E	0.84
17	NE 232nd Avenue at NE 28th Street	LOS E; v/c 0.90	>300	F	>2.0
18	NE 28th Street at SR 500-NE 242nd Avenue	LOS E	>300	F	>2.0
19	NE 199th Avenue at SR 500-NE 58th Street	LOS E	>300	F	1.96
23	SR 500-NE Everett Street at NE 38th Ave	LOS E	98	F	0.67
25	NW Lake Road at NW Lacamas Lane	LOS E; v/c 0.90	63	F	0.38
26	NW Lake Road at NW Sierra Street	LOS E; v/c 0.90	>300	F	1.77
27	NW Lake Road at NW Leadbetter Drive	LOS E; v/c 0.90	106	F	0.92
29	NW Dahlia Drive at NW 38th Avenue	LOS E; v/c 0.90	56	F	0.72
36	NW 6th Avenue at NW Norwood Street	LOS D	44	E	1.08

[3] Technical Memorandum #2: Existing Conditions Analysis, July 20, 2018

Table 2: Study Intersections That Do Not Meet Mobility Standards (2040 PM Peak)

	Intersection	Mobility Target*	Delay	Level of Service	Volume / Capacity
38	NW 6th Avenue at NW Ivy Street	LOS E; v/c 0.90	100	F	0.26
39	NW 6th Avenue at Drake Street	LOS E; v/c 0.90	99	F	0.73
40	NE 6th Avenue at NE Division Street	LOS E; v/c 0.90	207	F	0.68
41	NE 6th Avenue at NW Adams Street	LOS E; v/c 0.90	55	F	0.98
42	NE 6th Avenue at SR 500-NE Garfield St	LOS E	66	F	0.78
48	NE Weir Street at NE 3rd Avenue	LOS E; v/c 0.90	110	F	1.02

*Recommended mobility targets for City intersections

Signalized intersections:
LOS = Level of Service of Intersection
V/C = Volume-to-Capacity Ratio of Intersection

Stop Controlled intersections:
LOS = Level of Service of Worst Movement
V/C = Volume-to-Capacity Ratio of Worst Movement

Corridor Needs

With projected population and employment growth in Camas, a few roadway segments are expected to be deficient by 2040 during the evening peak period. In addition, a few major corridors lack adequate walking or biking facilities. With growing traffic volumes through 2040, these problematic areas will likely persist and may even become progressively worse. These corridors include:

- SR 500-NE Everett Street between NE 23rd Avenue and SE Leadbetter Road
- NW 6th Avenue between Norwood Street and Adams Street
- NE 3rd Avenue between NE Dallas Street and SE Lechner Street

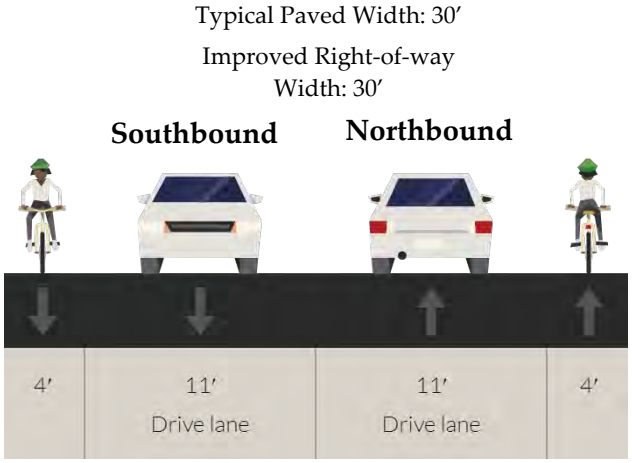
The following sections summarize the evaluation of improvement options to provide early direction in developing recommended solutions for these street segments. The options consider the available right-of way and environmental constraints to ease implementation. These design options are preliminary and are subject to change. Community input and further technical analysis will ultimately lead to a recommended solution to be included in the Transportation Plan.

Segment 1: SR 500-NE Everett Street between NE 23rd Avenue and NW Lake Road

The segment of SR 500-NE Everett Street between NE 23rd Avenue and NW Lake Road includes two travel lanes and four-foot bike lanes. It lacks adequate pedestrian facilities. This segment also lacks an adequate pedestrian and bicycle crossing between the trails in Fallen Leaf Lake Park on the west side and Lacamas Park on the east side of SR 500. There is approximately 60 feet of right-of-way at the north end of the corridor and 80 to 100 feet of right-of-way at the south end. Long segments of the corridor are constrained with adjacent steep slopes or drainage areas that limit the ability to widen the corridor. Five design options were evaluated along this segment. These options are:

Option 1a: Do Nothing

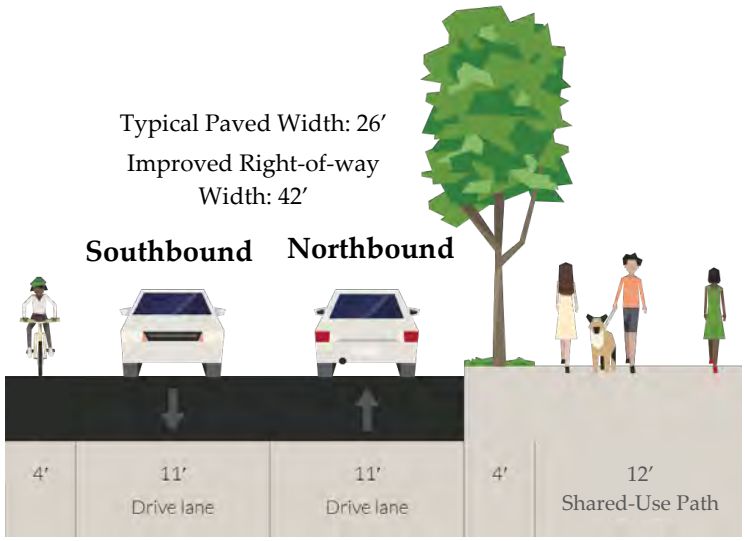
SR 500-NE Everett Street would retain two travel lanes with no pedestrian facilities and substandard bike lanes.



Option 1a: Do Nothing

Option 1b: Widen to include an adjacent shared-use path

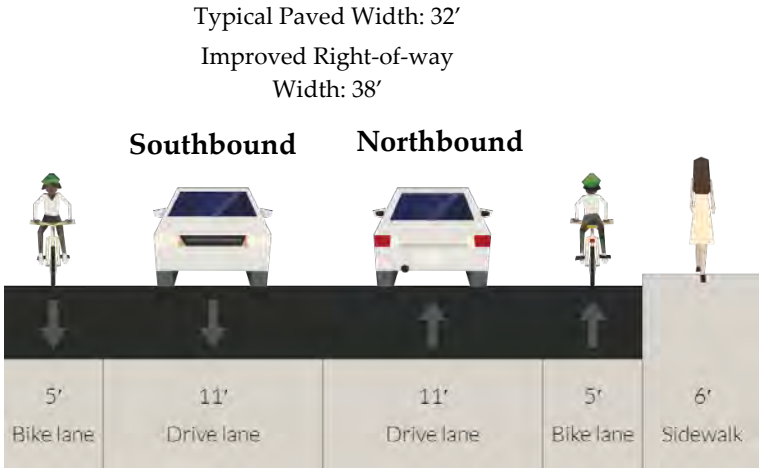
SR 500-NE Everett Street would retain one travel lane in each direction. The segment would include a shared-use path on the east side. A buffer would be between the roadway and shared-use path. This option fits within the existing right-of-way and would require no roadway widening but would require construction of a buffer and shared-use path on the east side. This option does not provide pedestrian access on both sides.



Option 1b: Add a shared-use path

Option 1c: Widen to include bike lanes and a sidewalk

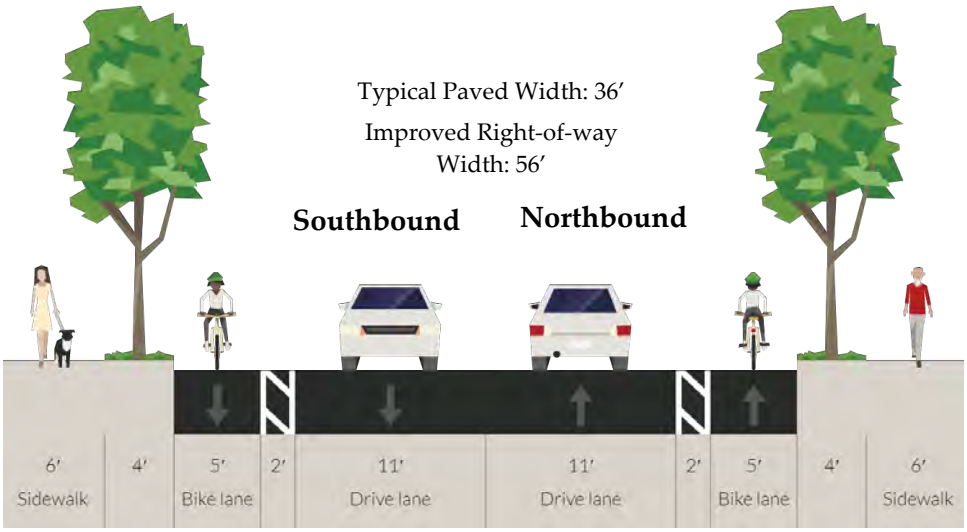
SR 500-NE Everett Street would be widened to provide standard width bike lanes in both directions and a sidewalk on one side of the street. This option fits within the existing right-of-way but would require some roadway widening and construction of a sidewalk and drainage system on the east side. This option does not provide pedestrian access on both sides.



Option 1c: Widen to include bike lanes and a sidewalk

Option 1d: Widen to include buffered bike lanes and a sidewalk on both sides

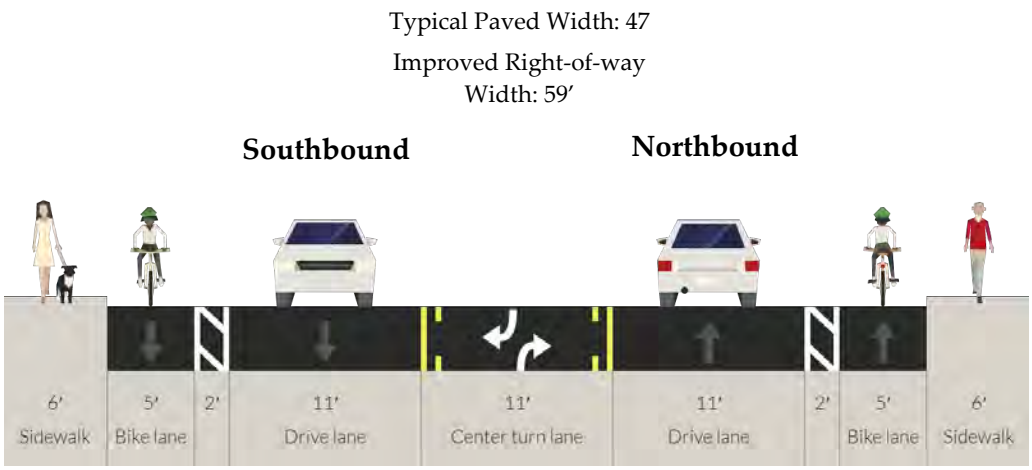
SR 500-NE Everett Street would be widened to provide bike lanes and striped buffers between the bike lane and travel lane. A buffer and sidewalk would also be added to both sides of the street. This option would require roadway widening and construction of a sidewalk and drainage system on both sides. In addition, it may not fit within the existing right-of-way given the steep driveways on the west side requiring severe elevation change.



Option 1d: Widen to include buffered bike lanes and a sidewalk on both sides

Option 1e: Widen to include a center turn lane, buffered bike lanes and a sidewalk on both sides

SR 500-NE Everett Street would be widened to provide a center turn lane, bike lanes and striped buffers between the bike lane and travel lane, and sidewalks on both sides of the street. This option would require roadway widening and construction of a sidewalk and drainage system on both sides. In addition, it may not fit within the existing right-of-way given the steep driveways on the west side requiring severe elevation change.



Option 1e: Widen to include a center turn lane, buffered bike lanes and a sidewalk on both sides

Evaluation of Design Options:

The evaluation summary of key criteria is shown in Table 3. Option 1b to 1e have the greatest likelihood to address the identified gaps and deficiencies since Option 1a (Do Nothing) does not provide adequate pedestrian or bicycle facilities. Most options will fit within the existing right-of-way along the segment, but Options 1d and 1e will require the most significant widening.

Table 3: SR 500-NE Everett Street (NE 23rd Avenue and NW Lake Road) Design Options Evaluation

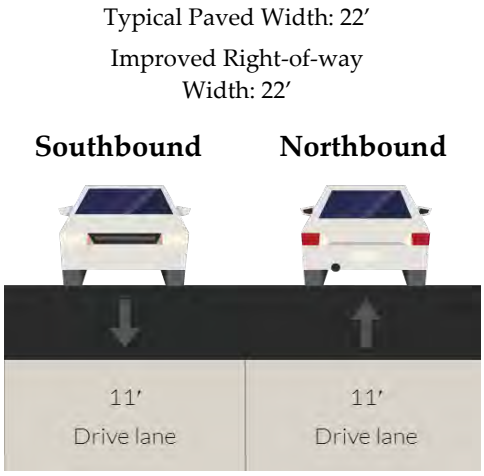
Design Options	Fits in Existing Right-of-way	Improves Pedestrian and Bicycle Facilities	Improves Safety	Impact to Motor Vehicle Operations	Expected Cost
Option 1a	🙂	☹	☹	😐	N/A
Option 1b	🙂	😐	🙂	😐	$$$
Option 1c	🙂	😐	🙂	😐	$$$$
Option 1d	☹	🙂	🙂	😐	$$$$$
Option 1e	☹	🙂	🙂	🙂	$$$$$

Segment 2: SR 500-NE Everett Street between NE 35th Avenue and SE Leadbetter Road

The segment of SR 500-NE Everett Street between NE 35th Avenue and SE Leadbetter Road includes two travel lanes. It lacks adequate pedestrian or bicycle facilities. There is at least 60 feet of right-of-way along this segment. Three design options were evaluated along this segment. These options are:

Option 2a: Do Nothing

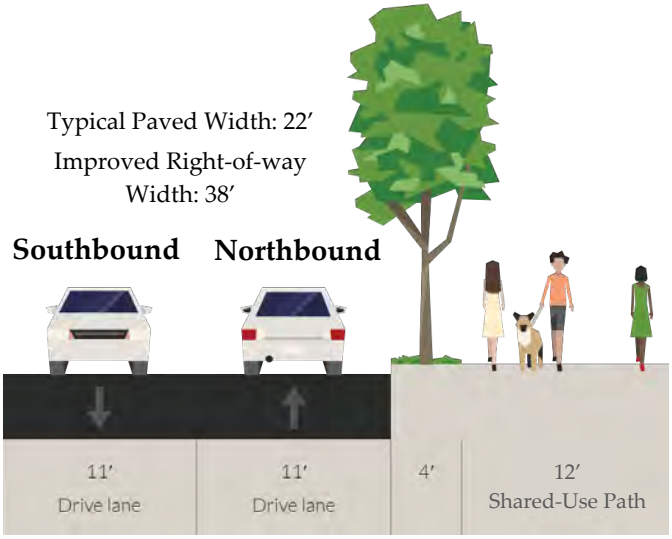
SR 500-NE Everett Street would retain two travel lanes with no pedestrian or bicycle facilities.



Option 2a: Do Nothing

Option 2b: Widen to include an adjacent shared-use path

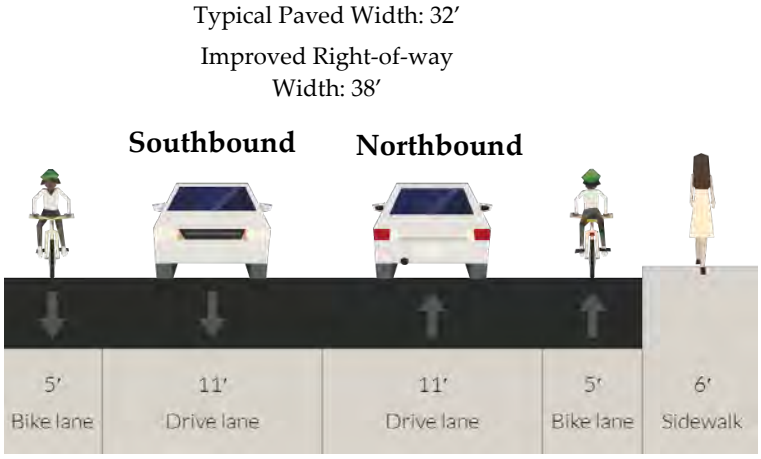
SR 500-NE Everett Street would retain one travel lane in each direction. The segment would include a shared-use path on the east side. A buffer would be between the roadway and shared-use path. This option fits within the existing right-of-way and would require no roadway widening but would require construction of a buffer and shared-use path on the east side.



Option 2b: Add a shared-use path

Option 2c: Widen to include bike lanes and a sidewalk

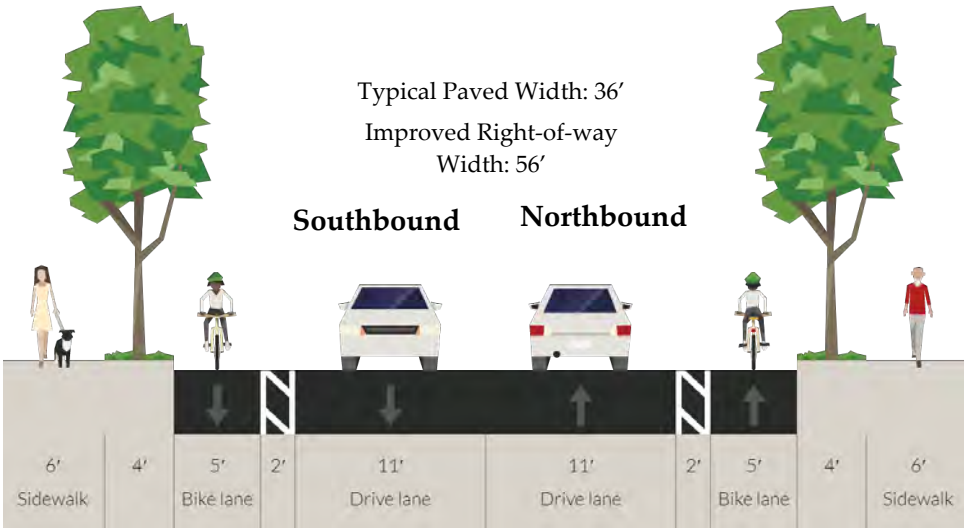
SR 500-NE Everett Street would be widened to provide bike lanes and a sidewalk on one side of the street. This option fits within the existing right-of-way but would require some roadway widening and construction of a sidewalk on the east side.



Option 2c: Widen to include bike lanes and a sidewalk

Option 2d: Widen to include buffered bike lanes and a sidewalk on both sides

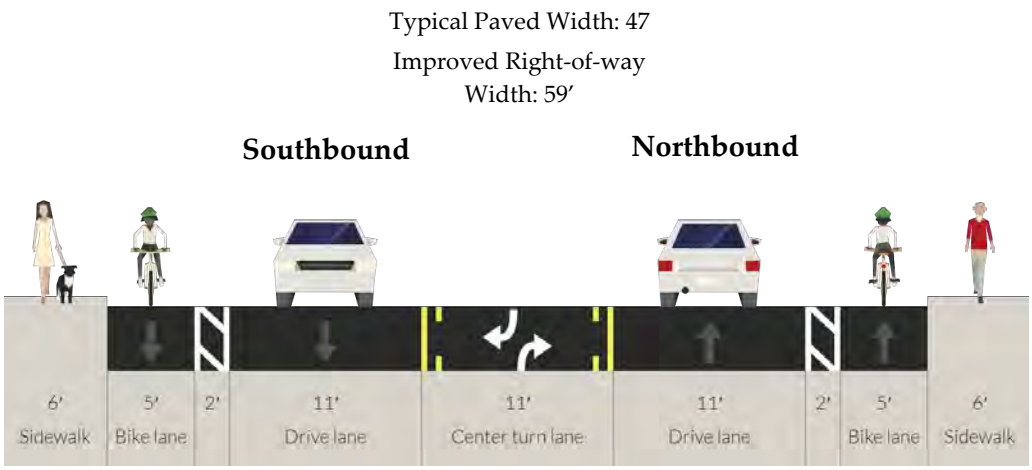
SR 500-NE Everett Street would be widened to provide bike lanes and striped buffers between the bike lane and travel lane. A buffer and sidewalk would also be added to both sides of the street. This option fits within the existing right-of-way but would require roadway widening and construction of a sidewalk and drainage system on both sides.



Option 2d: Widen to include buffered bike lanes and a sidewalk on both sides

Option 2e: Widen to include a center turn lane, buffered bike lanes and a sidewalk on both sides

SR 500-NE Everett Street would be widened to provide a center turn lane, bike lanes and striped buffers between the bike lane and travel lane, and sidewalks on both sides of the street. This option fits within the existing right-of-way but would require roadway widening and construction of a sidewalk and drainage system on both sides.



Option 2e: Widen to include a center turn lane, buffered bike lanes and a sidewalk on both sides

Evaluation of Design Options: The evaluation summary of key criteria is shown in Table 4. Options 2b to 2e have the greatest likelihood to address the identified gaps and deficiencies since Option 2a (Do Nothing) does not provide adequate pedestrian or bicycle facilities. All options will fit within the existing right-of-way along the segment, but Options 2d and 2e will require the most significant widening.

Table 4: SR 500-NE Everett Street (NE 35th Avenue and SE Leadbetter Road) Design Options Evaluation

Design Options	Fits in Existing Right-of-way	Improves Pedestrian and Bicycle Facilities	Improves Safety	Impact to Motor Vehicle Operations	Expected Cost
Option 2a	🙂	☹	☹	😐	N/A
Option 2b	🙂	🙂	🙂	😐	$$$
Option 2c	🙂	🙂	🙂	😐	$$$
Option 2d	🙂	🙂	🙂	😐	$$$$$
Option 2e	🙂	🙂	🙂	🙂	$$$$$

Segment 3: NW 6th Avenue between Norwood Street and Adams Street

The segment of NW 6th Avenue between Norwood Street and Adams Street includes four travel lanes and a sidewalk on the north side, and a sidewalk on the south side west of NW Ivy Street. It lacks adequate bicycle facilities. This segment has several driveway and street connections to NW 6th Avenue and lacks a center turn lane for decelerating left turning vehicles to move out of the path of through traffic. Keeping those vehicles out of the mainline could prevent rear-end collisions. This segment has bus stops on both sides and there is at least 80 feet of right-of-way. Four design options were evaluated along this segment.

Option 3a: Do Nothing

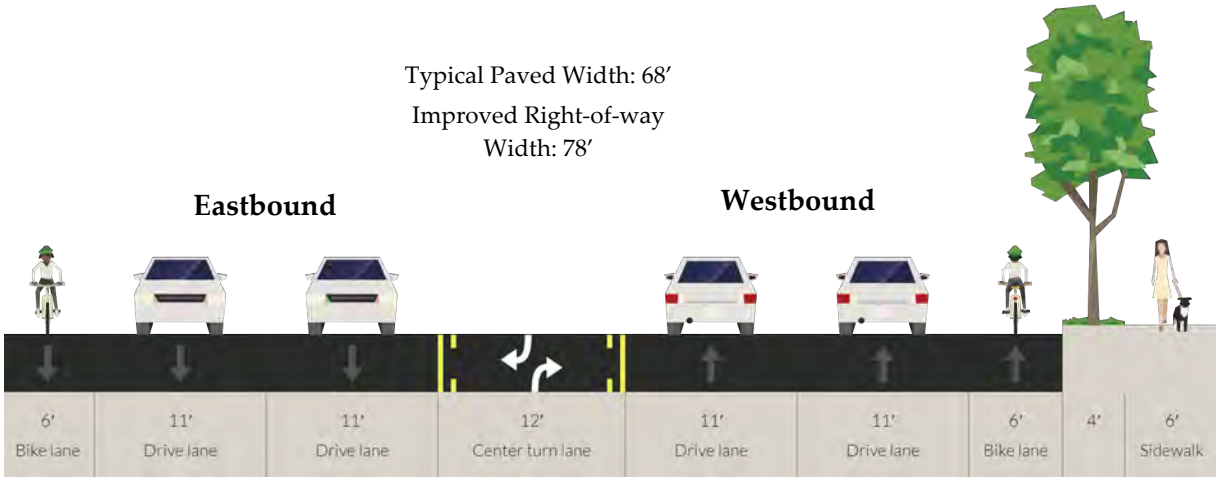
NW 6th Avenue would retain four travel lanes with a roadway adjacent sidewalk and no bike facilities.



Option 3a: Do Nothing

Option 3b: Widen to five lanes, with a sidewalk and bike lanes

NW 6th Avenue would be widened to provide five lanes (two travel lanes in each direction and a center turn lane), in addition to bike lanes and a sidewalk. The segment would include a buffer and sidewalk on only the north side. This option would not fit within existing buildable right-of-way due to slopes on the south side and could impact adjacent development to the north side. The addition of a center-turn lane would provide a safety benefit.



Option 3b: Widen to five lanes, with a sidewalk and bike lanes

Option 3c: Reconfigure to three lanes and bike lanes

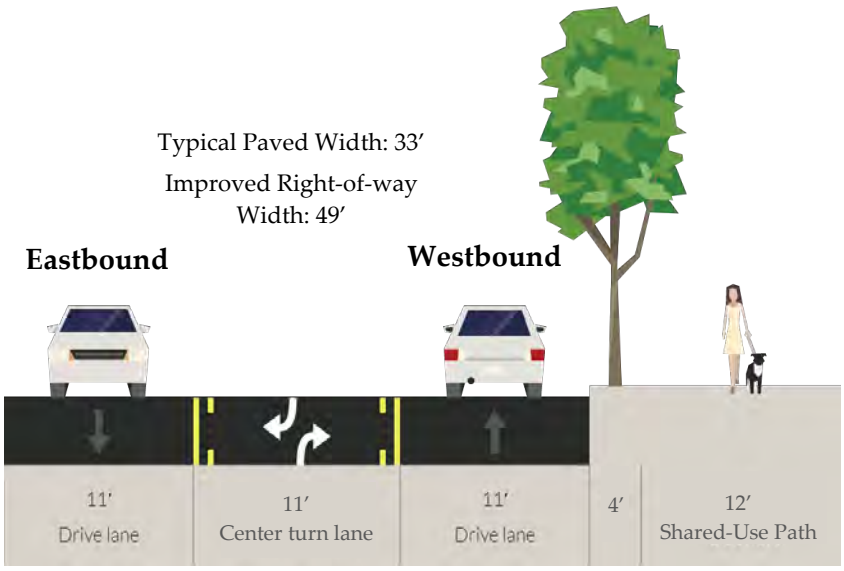
NW 6th Avenue would drop one travel lane in each direction and add bike lanes. The segment would include the existing sidewalks. The elimination of travel lanes for motor vehicles would increase congestion somewhat; however, future traffic demand on this segment is below the capacity of a three-lane roadway, and the resulting operation would be similar to the three-lane section of NW 6th Avenue near Norwood Street. This option would eliminate the existing motor vehicle passing opportunities along NW 6th Avenue. The addition of a center-turn lane would provide a safety benefit. This option fits within the existing right-of-way and would require no widening.



Option 3c: Reconfigure to three lanes and bike lanes

Option 3d: Reconfigure to three lanes and an adjacent shared-use path

NW 6th Avenue would drop one travel lane in each direction. The segment would include a shared-use path on the north side. A buffer would be between the roadway and shared-use path. The elimination of travel lanes for motor vehicles could increase congestion somewhat; however, future traffic demand on this segment is below the capacity of a three-lane roadway, and the resulting operation would be similar to the three-lane section of NW 6th Avenue near Norwood Street. This option would



Option 3d: Reconfigure to three lanes and a shared-use path

eliminate the existing motor vehicle passing opportunities along NW 6th Avenue. The addition of a center-turn lane would provide a safety benefit. This option fits within the existing right-of-way and would require no roadway widening but would require reconstruction on the north side to include a buffer and shared-use path.

Option 3e: Reconfigure to three lanes with buffered bike lanes and a sidewalk on both sides

NW 6th Avenue would drop one travel lane in each direction. The segment would include bike lanes and striped buffers between the bike lane and travel lane, and sidewalks on both sides of the street. The elimination of travel lanes for motor vehicles could increase congestion somewhat; however, future traffic demand on this segment is below the capacity of a three-lane roadway, and the resulting operation would be similar to the three-lane section of NW 6th Avenue near Norwood Street. This option would eliminate the existing motor vehicle passing opportunities along NW 6th Avenue. The addition of a center-turn lane would provide a safety benefit. This option fits within the existing right-of-way and would but require roadway widening and a retaining wall on the south side.



Option 3e: Reconfigure to three lanes with buffered bike lanes and a sidewalk on both sides

Evaluation of Design Options: The evaluation summary of key criteria is shown in Table 5. Options 3c, 3d and 3e have the greatest likelihood to address the identified gaps and deficiencies along the segment. Option 3a (Do Nothing) does not provide adequate bicycle facilities or improve safety along the segment. Options 3b and 3e will require the most significant widening and will not fit within existing buildable right-of-way. Options 3c and 3d can fit within existing paved roadway width but will eliminate travel lanes to accommodate the center turn lane and pedestrian and bicycle facilities.

Table 5: NW 6th Avenue Design Options Evaluation

Design Options	Fits in Existing Right-of-way	Improves Pedestrian and Bicycle Facilities	Improves Safety	Impact to Motor Vehicle Operations	Expected Cost
Option 3a					N/A
Option 3b					$$$$$
Option 3c					$
Option 3d					$$$
Option 3e					$$$$

Segment 4: NE 3rd Avenue between NE Garfield Street and SE Crown Road

The segment of NE 3rd Avenue between NE Garfield Street and SE Crown Road generally includes four travel lanes and roadway adjacent sidewalks (the street section along this segment varies some). It lacks adequate bicycle facilities. This segment has several driveway and street connections to NE 3rd Avenue and lacks a center turn lane for decelerating left turning vehicles to move out of the path of through traffic. Keeping those vehicles out of the through travel lane could prevent rear-end collisions. There is about 70 feet of right-of-way along this segment. Three design options were evaluated.

Option 4a: Do Nothing

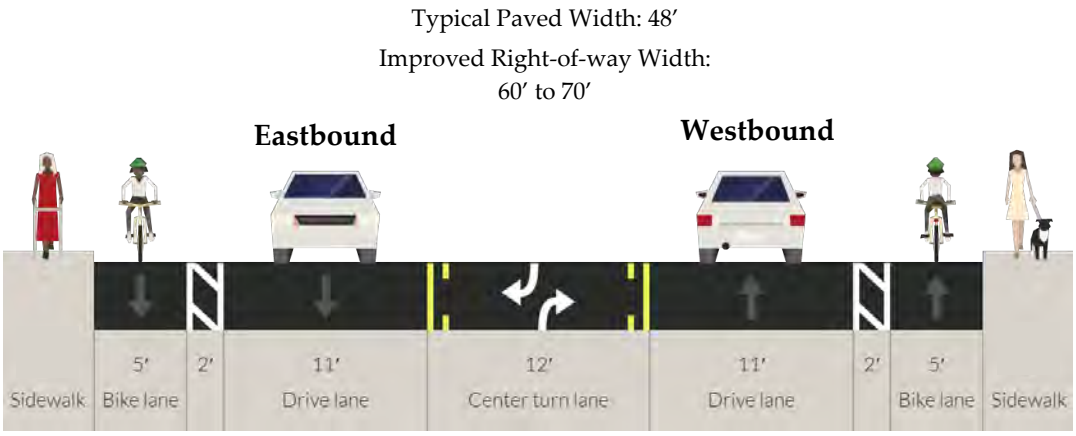
NE 3rd Avenue would retain four travel lanes with roadway adjacent sidewalks and no bike facilities.



Option 4a: Do Nothing

Option 4b: Reconfigure to three lanes, buffered bike lanes and wider sidewalks

NE 3rd Avenue would drop one travel lane in each direction and add bike lanes and striped buffers between the bike lane and travel lane. The existing sidewalks would be widened. The elimination of travel lanes for motor vehicles could increase congestion somewhat; however, future traffic demand for this segment is below the capacity of a three-lane roadway, and the resulting congestion would be similar to the three-lane section east of SE Lechner Street. The addition of a center-turn lane would provide a safety benefit.



Option 4b: Reconfigure to three lanes, buffered bike lanes and wider sidewalks

Option 4c: Reconfigure to two lanes with bike lanes, parking and wider sidewalks

NE 3rd Avenue would drop one travel lane in each direction and add bike lanes and on-street parking. The existing sidewalks would be widened. The elimination of travel lanes for motor vehicles could increase congestion somewhat; however, future traffic demand on this segment is below the capacity of a two-lane roadway, and the resulting congestion would be similar to the two-lane section west of NE Dallas Street.



Option 4c: Reconfigure to two lanes, with bike lanes, parking and wider sidewalks

Evaluation of Design Options: The evaluation summary of key criteria is shown in Table 6. Options 4b and 4c have the greatest likelihood to address the identified gaps and deficiencies along the segment. Option 4a (Do Nothing) does not provide adequate bicycle facilities or improve safety along the segment. Options 4b and 4c can fit within the existing paved roadway width but will eliminate travel lanes to accommodate the center turn lane and bicycle facilities.

Table 6: NE 3rd Avenue (NE Dallas Street to SE Crown Road) Design Options Evaluation

Design Options	Fits in Existing Right-of-way	Improves Pedestrian and Bicycle Facilities	Improves Safety	Impact to Motor Vehicle Operations	Expected Cost
Option 4a					N/A
Option 4b					$
Option 4c					$

Segment 5: NE 3rd Avenue between SE Crown Road and SE Lechner Street

The segment of NE 3rd Avenue between SE Crown Road and SE Lechner Street includes four to five travel lanes and roadway adjacent sidewalks. It lacks adequate bicycle facilities. There were several pedestrian and bicycle involved collisions along this segment over the previous five years. There is at least 90 feet of right-of-way along this segment. Three design options were evaluated.

Option 5a: Do Nothing

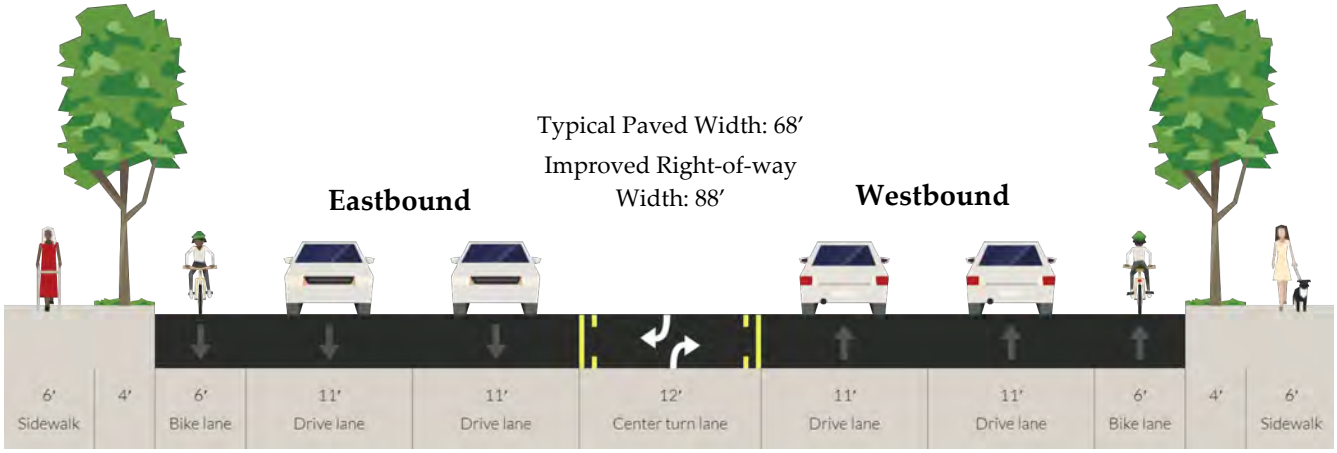
NE 3rd Avenue would retain four to five travel lanes with roadway adjacent sidewalks and no bike facilities. The existing five-lane section is shown below.



Option 5a: Do Nothing

Option 5b: Widen to five lanes, with sidewalks and bike lanes

NE 3rd Avenue would be widened to provide five lanes (two travel lanes in each direction and a center turn lane), in addition to the bike lanes. The segment would include a buffer and sidewalk on

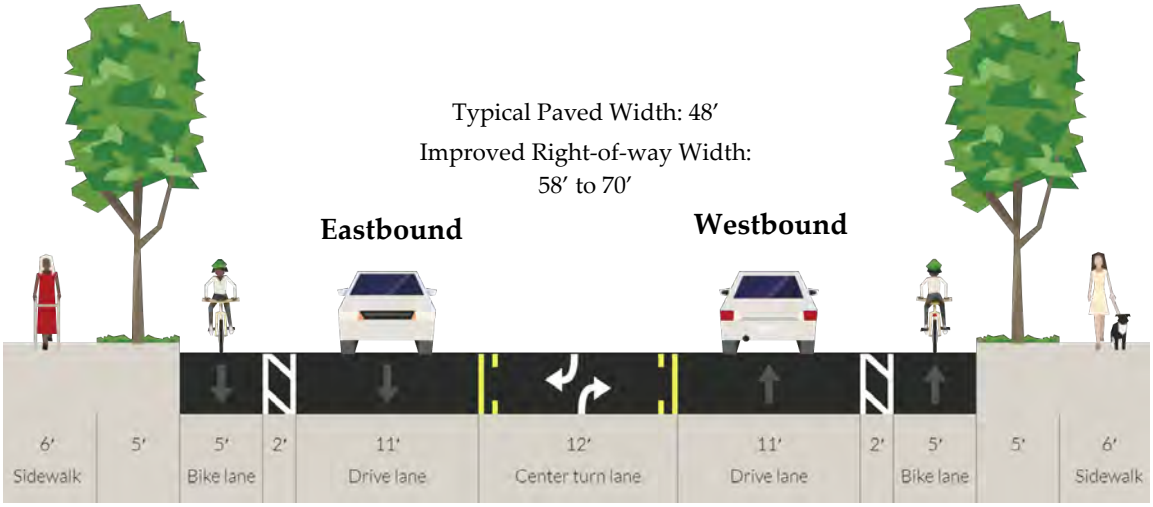


Option 5b: Widen to five lanes, with sidewalks and bike lanes

both sides. This option would fit within existing buildable right-of-way, but would require significant widening and could impact adjacent development.

Option 5c: Reconfigure to three lanes and buffered bike lanes

NE 3rd Avenue would drop one travel lane in each direction and add bike lanes and striped buffers between the bike lane and travel lane. No changes would be made to the existing sidewalks along the four lane segments. However, they would be reconstruced along the five-lane segment to include wider sidewalks and a buffer. The elimination of travel lanes for motor vehicles could increase congestion somewhat; however, future traffic demand on this segment is below the capacity of a three-lane roadway, and the resulting congestion would be similar to the three-lane section east of SE Lechner Street.



Option 5c: Reconfigure to three lanes and buffered bike lanes

Evaluation of Design Options: The evaluation summary of key criteria is shown in Table 7. Options 5b and 5c have the greatest likelihood to address the identified gaps and deficiencies along the segment. Option 5a (Do Nothing) does not provide adequate bicycle facilities or improve safety along the segment. Option 5c can fit within the existing paved roadway width but will eliminate travel lanes to accommodate the center turn lane and bicycle facilities. Option 5b does not improve safety as much as Option 5c due to the width of the roadway creating longer crossings for pedestrians and bicyclists.

Table 7: NE 3rd Avenue (SE Crown Road and SE Lechner Street) Design Options Evaluation

Design Options	Fits in Existing Right-of-way	Improves Pedestrian and Bicycle Facilities	Improves Safety	Impact to Motor Vehicle Operations	Expected Cost
Option 5a					N/A
Option 5b					$$$$$
Option 5c					$

Safety Needs

A few locations were identified in Technical Memorandum #2 as high collision locations. With growing traffic volumes, these problematic areas likely will persist, and may even become progressively worse. There are no additional safety needs identified for future conditions other than those previously identified in Technical Memorandum #2.

Freight Needs

With growing traffic volumes from existing conditions, 17 intersections along Washington State Freight corridors would not meet their respective mobility targets during the 2040 design hour conditions.

Other Needs

Technical Memorandum #2 identified existing transit, bridge, rail and air needs. There are no additional needs identified for future conditions other than those previously identified in Technical Memorandum #2.

Next Steps

The system needs identified in this memorandum will be revised based on input received from City staff and the Transportation Plan Project Advisory Committee to develop a preliminary project list in Technical Memo 5 – Solutions Identification and Evaluation.

APPENDIX E. RECOMMENDED TRANSPORTATION STANDARDS

MEMORANDUM

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DATE: May 15, 2024

TO: Curleigh Carothers, City of Camas
Steve Wall, City of Camas

FROM: Reah Flisakowski, DKS Associates
Kevin Chewuk, DKS Associates

SUBJECT: Camas Transportation Plan
Technical Memo 4 – Recommended Transportation Standards P18039-000

This document provides an overview of the transportation system standards recommended for adoption as part of the Transportation Plan for Camas. Included is a detail of the roadway functional classification system, typical designs for roadways and shared use paths, special route designations, access spacing and mobility standards, and guidance for Traffic Impact Analysis requirements. Together, these standards will help ensure future facilities are designed appropriately and that all facilities are managed to serve their intended purpose.

Multi-Modal Street System

Traditional roadway designs focus on the safety and flow of motor vehicle traffic. The one size fits all design approach is less effective at integrating the roadway with the character of the surrounding area and addressing the needs of other users of a roadway. For instance, the design of an arterial roadway through a commercial area has often traditionally been the same as one through a residential neighborhood, both primarily focused on the movement of motor vehicles.

In Camas, all roadways are proposed to be multi-modal or "complete streets", with each street serving the needs of the various travel modes. Streets in the city will not all be designed the same. It is recommended that Camas classify the street system into a hierarchy organized by functional classification and street type (representative of their places). These classifications ensure that the streets reflect the neighborhood through which they pass, consisting of a scale and design appropriate to the character of the abutting properties and land uses. The classifications also provide for and balance the needs of all travel modes including pedestrians, bicyclists, transit riders, motor vehicles and freight. Within these street classifications, context sensitive design may result in alternative cross-sections.

Functional Classification

Traditionally, roadways are classified based on the type of vehicular travel they are intended to serve (local versus through traffic). In Camas, the functional classification of a roadway (shown in Figure 1) is recommended to determine the level of mobility for all travel modes, level of access, and use. The roadway functional classification system recognizes that individual roadways do not act independently, but instead form a network that serves travel needs on a local and regional level. From highest to lowest intended use, the recommended classifications are freeway, arterial, collector and local streets. Streets with higher intended usage generally limit access to adjacent property in favor of more efficient motor vehicle traffic movement (i.e., mobility). Local roadways with lower intended usage have more driveway access and intersections, and generally accommodate shorter trips to nearby destinations.

Functional Classification Designations

Table 1 shows the recommended changes to the existing functional classifications of roadways in Camas to better reflect their intended use. Since SR 14 serves regional travel through the city, it is recommended to be a freeway. Roadways providing primary access to SR 14 are recommended to be arterials. Roadways providing primary access to neighborhoods and activity generators in Camas are recommended to be collectors. All other roadways are recommended to be classified as local streets. The Camas Multi-Modal Street System map (Figure 1) shows the recommended designations of roadways within the Urban Growth Area (UGA) only; refer to the county plan for designations of other roadways outside of the UGA.

- **Freeways** serve as the main travel routes through the city and serve the highest volume of motor vehicle traffic. SR 14 is the only freeway in Camas. Freeways are generally for longer motor vehicle trips with limited local access. The posted speed limit on SR 14 is 60 miles per hour.

- **Arterials** connect many parts of the city and often serve traffic traveling to and from freeways. These roadways provide greater accessibility to neighborhoods, connect to major activity generators, and provide efficient through movement for local traffic. In Camas, portions of SR 500, NW Lake Road, NW Brady Road, NW Parker Street, NW 6th Avenue and NE 3rd Avenue are examples of arterials. Posted speeds on arterial streets in Camas typically range between 25 (in residential areas) and 50 miles per hour (in rural areas).

- **Collectors** connect neighborhoods to arterials. These streets serve as major neighborhood routes and generally provide more direct property access or driveways than arterial streets. In Camas, portions of Division Street, NW Forest Home Road, NW Fargo Street, and NW Sierra

Drive are examples of collector streets. Posted speeds on collector streets in Camas typically range between 25 and 35 miles per hour.

- **Local Streets** provide more direct access to residences without serving through travel in Camas. These roadways generally are lined with residences and are designed to serve lower volumes of traffic with a speed limit of 25 miles per hour.

Table 1: Recommended Functional Classification Changes

Roadway	From	To	Change from Prior Functional Classification*
N Shepherd Road	NE 3rd Avenue	UGB	Upgrade from Local Street to Collector
NE 2nd Avenue	NE 3rd Avenue	NE Whitney Street	Upgrade from Local Street to Collector
NE 15th Avenue	Division Street	NE Everett Street	Upgrade from Local Street to Collector
NE Dallas Street	NE 15th Avenue	NE 6th Avenue	Upgrade from Local Street to Collector
NE Goodwin Road	NW Friberg-Strunk Street	NW Alexandra Lane	Upgrade from Local Street to Arterial
NE Ingle Road	NE Goodwin Road	UGB	Upgrade from Collector to Arterial
NE Leadbetter Road	NE 9th Street	NE Everett Street	Upgrade from Local Street to Arterial
NE Whitney Street	NE 2nd Avenue	UGB	Upgrade from Local Street to Collector
NW 7th Avenue	NW Ivy Street	NW Drake Street	Upgrade from Local Street to Collector
NW 12th Avenue	NW Benton Street	Division Street	Upgrade from Local Street to Collector
NW 23rd Avenue	NW Cascade Street	NW Astor Street	Downgrade from Collector to Local Street
NW 26th Avenue	NW Julia Street	NW Maryland Street	Downgrade from Collector to Local Street
NW 28th Avenue	NW Cascade Street	NW Sierra Street	Downgrade from Collector to Local Street
NW 29th Avenue	NW Dahlia Drive	NW Valley Street	Downgrade from Collector to Local Street
NW 37th Avenue	NW Endicott Street	NW Dahlia Drive	Downgrade from Collector to Local Street
NW Benton Street	NW Drake Street	NW 12th Avenue	Upgrade from Local Street to Collector
NW Cascade Street	NW 18th Avenue	NW 28th Avenue	Downgrade from Collector to Local Street
NW Dahlia Drive	NW 38th Avenue	NW 29th Avenue	Downgrade from Collector to Local Street
NW Endicott Street	NW Pacific Rim Drive	NW 37th Avenue	Downgrade from Collector to Local Street
NW Fremont Street	NW Grass Valley Drive	NW Leadbetter Drive	Downgrade from Collector to Local Street
NW Grass Valley Drive	NW Inglewood Street	NW Fremont Street	Downgrade from Collector to Local Street
NW Inglewood Street	NW 38th Avenue	NW Grass Valley Drive	Downgrade from Collector to Local Street
NW Ivy Street	NW 6th Avenue	NW 7th Avenue	Downgrade from Collector to Local Street

Table 1: Recommended Functional Classification Changes

Roadway	From	To	Change from Prior Functional Classification*
NW Julia Street	NW Pacific Rim Drive	NW 26th Avenue	Downgrade from Collector to Local Street
NW Logan Street	NW 6th Avenue	NW 7th Avenue	Upgrade from Local Street to Collector
NW Maryland Street	NW 26th Avenue	Southern terminus	Downgrade from Collector to Local Street
NW Ogden Street	NW 16th Avenue	Northern terminus	Downgrade from Collector to Local Street
NW Pacific Rim Drive	NW Parker Street	NW Endicott Street	Downgrade from Collector to Local Street
NW Utah Street	NW Valley Street	NW 28th Avenue	Downgrade from Collector to Local Street
NW Valley Street	NW 29th Avenue	NW Utah Street	Downgrade from Collector to Local Street
SE 23rd Street	SE 283rd Avenue	UGB	Upgrade from Collector to Arterial
SE Lechner Street	NE 3rd Avenue	UGB	Upgrade from Local Street to Collector

* Existing functional classifications as shown in the Camas Transportation Comprehensive Plan Map

The Washington State Department of Transportation (WSDOT), Federal Government, and the Southwest Washington Regional Transportation Council (RTC) also classify roadways in Camas. Within Camas, SR 14 is classified by WSDOT as a Highway of Statewide Significance (HSS)[1], and SR 500 is classified as a non-HSS facility.

The federal government also has a functional classification system that is used to determine federal aid funding eligibility. Roadways federally designated as a major collector, minor arterial, principal arterial, or interstate are eligible for federal aid. Camas' functional classification system uses the similar designations as the federal government (e.g., a city designated arterial is intended to be the same as a federally designated minor arterial and a city designated collector is intended to be the same as a federally designated major collector). Future updates to the federal functional classification system should incorporate the designations reflected in the Transportation Plan along city roadways.

RTC has identified several streets in Camas as part of the regional transportation system in the Regional Transportation Plan for Clark County, including SR 14, SR 500, Lake Road - SE 1st Street, Parker Street, Pacific Rim Boulevard - 34th Street, NW 38th Avenue – SE 20th Street, NW 6th Avenue, and NE 3rd Avenue.

[1] Highways of Statewide Significance, WSDOT, http://www.wsdot.wa.gov/planning/HSS/

Multi-Modal Street Type

It is recommended that Camas further classify the roadways within the city based on the neighborhood it serves and the intended function for pedestrians, bicyclists and transit riders in that specific area. Within the context of Camas' recommended "complete street" system that serves all modes, the street type of a roadway defines its cross-section characteristics and determines how users of a roadway interact with the surrounding land use. Since the type and intensity of adjacent land uses and zoning directly influence the level of use by pedestrians, bicyclists and transit riders, the design of a street (including its intersections, sidewalks, and transit stops) should reflect its surroundings.

The street types attempt to strike a balance between street functional classification, adjacent land use, zoning designation and the competing travel needs by prioritizing various design elements. Four street types are recommended and described below for Camas:

- **Mixed-Use Streets** typically have a higher amount of pedestrian activity and are often on a transit route. These streets should emphasize a variety of travel choices such as pedestrian, bicycle and transit use to complement the development along the street. Since mixed-use streets typically serve pedestrian oriented land uses, walking should receive the highest priority of all the travel modes. They should be designed with features such as wider sidewalks, pedestrian amenities, transit amenities, attractive landscaping, on-street parking, pedestrian crossing enhancements and bicycle lanes.

- **Residential Streets** are generally surrounded by residential uses, although various small shops may be embedded within the neighborhood. These streets often connect neighborhoods to local parks, schools and mixed-use areas. They should be designed to emphasize walking, while still accommodating the needs of bicyclists and motor vehicles. A high priority should be given to design elements such as traffic calming, landscaped buffers, walkways/pathways/trails, on-street parking and pedestrian safety enhancements.

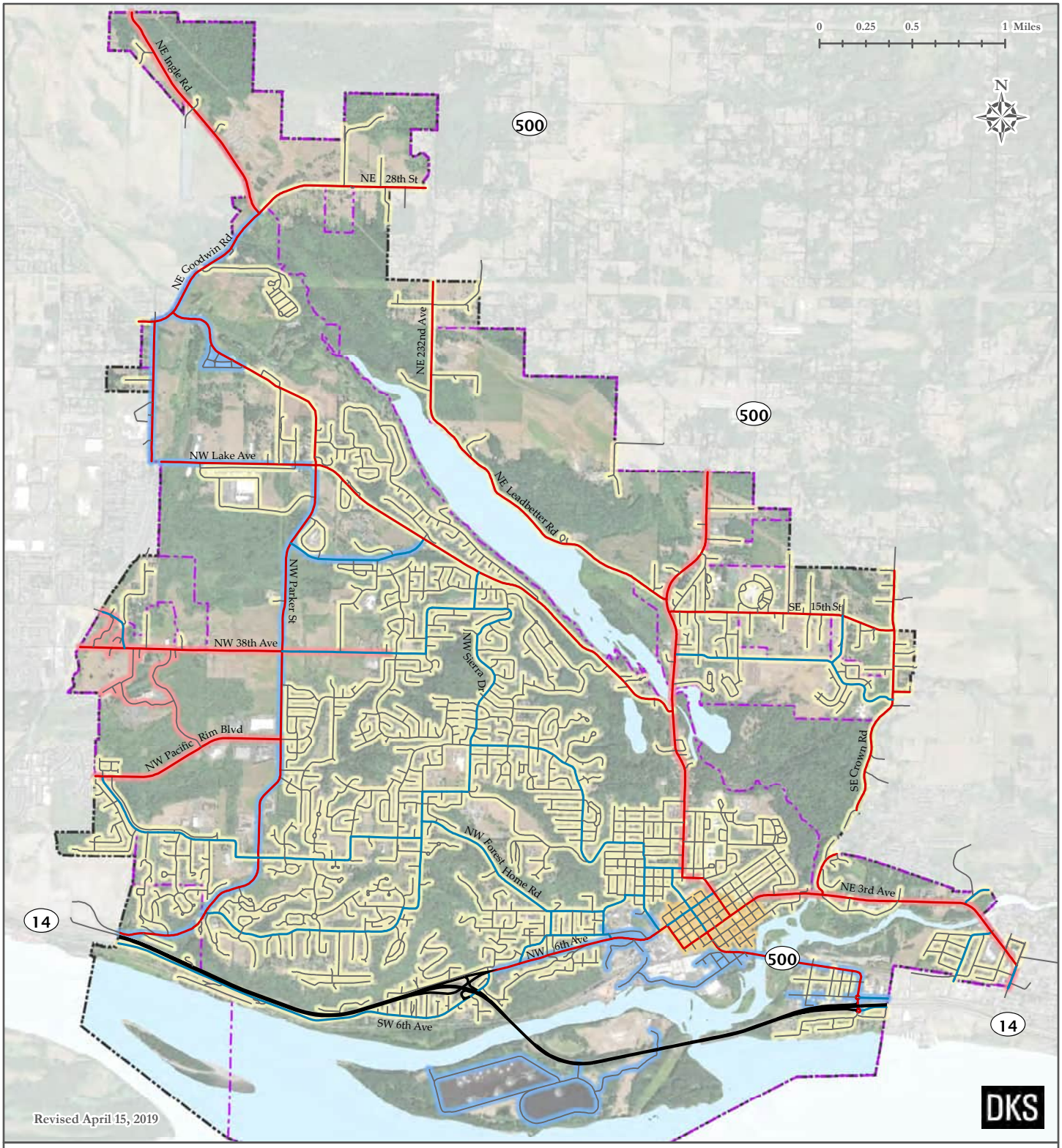
- **Commercial Streets** are primarily lined with retail and large employment complexes. These uses serve customers throughout the city and region and may not have a direct relationship with nearby residential neighborhoods. These streets are somewhat more auto-oriented but should still accommodate pedestrians and bicyclists safely and comfortably. Design features should include landscaped medians or a two-way left turn lane, sidewalks and bike lanes, pedestrian crossing enhancements and a buffer between the roadway and the sidewalk. On-street parking should be discouraged.

- **Industrial Streets** serve industrial areas. These streets are designed to accommodate a high volume of large vehicles such as trucks, trailers and other delivery vehicles. Pedestrians and

bicyclists may be less frequent in these areas but should still be accommodated safely and comfortably. Roadway widths are typically wider to accommodate larger vehicles. On-street parking should be discouraged.

The Camas Multi-Modal Street System map (Figure 1) shows the recommended street types of roadways within the UGA.

I Multi-Modal Street System



Legend:

Functional Classification:

- Freeway
- Arterial
- Collector
- Local Street

Street Type:

- Mixed-Use
- Residential
- Commercial
- Industrial

- Urban Growth Area
- Camas City Limit

Design Types of Streets

The recommended design of the streets in Camas requires attention to many elements of the public right-of-way and considers how the street interacts with the adjoining properties. The four zones that are recommended to comprise the cross-section of streets in Camas, include the context zone, walking zone, biking/on-street parking zone and driving zone, are shown in Figure 2.

- **Context Zone:** The context zone is the point at which the sidewalk interacts with the adjacent buildings or private property. The purpose of this zone is to provide a buffer between land use adjacent to the street and to ensure that all street users have safe interactions. This zone is typically outside of the public right-of-way.

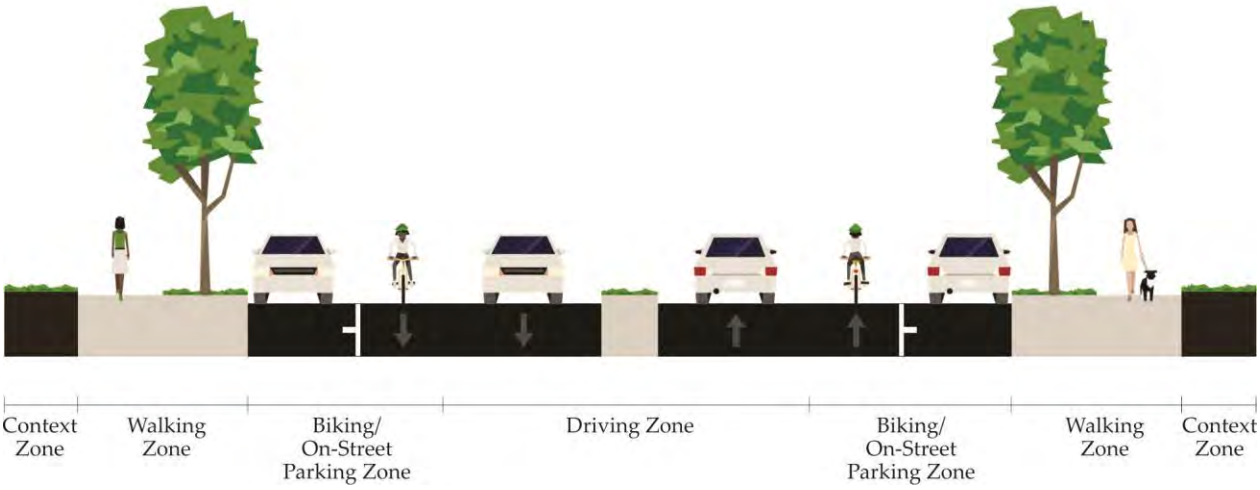
- **Walking Zone:** This is the zone in which pedestrians travel. The walking zone is determined by the street type and should be a high priority in mixed-use and residential areas. It includes a minimum six-foot clear throughway for walking, an area for street furnishings or landscaping (e.g. benches, transit stops and/or plantings) and a clearance distance between curbside on-street parking and the street furnishing area or landscape strip (so parking vehicles or opening doors do not interfere with street furnishings and/or landscaping). Streets located along a transit route should incorporate furnishings to support transit ridership, such as transit shelters and benches, into the furnishings/landscape strip adjacent to the biking/on-street parking zone.

- **Biking/On-Street Parking Zone:** This is the zone for biking and on-street parking and is the location where users will access transit. It should include minimum 6-foot bike lanes. The biking/on-street parking zone is determined by the street type and in some cases the functional classification and should be a high priority in mixed-use and residential areas. Mixed use and residential areas should include a minimum 6-foot striped bike lane with on-street parking. Streets in commercial or industrial areas should include minimum 6-foot bike lanes, with no on-street parking.

- **Driving Zone:** This is the throughway zone for drivers, including cars, buses and trucks and should be a high priority in commercial/employment and industrial areas. The functional classification of the street generally determines the number of through lanes, lane widths, and median and left-turn lane requirements. However, the route designations (such as transit street or freight route) take presentence when determining the appropriate lane width in spite of the functional classification. Wider lanes (between 13 to 14 feet) should only be used for short distances as needed to help buses and trucks negotiate right-turns without encroaching into adjacent or opposing travel lanes. Streets that require a raised median should include a minimum 6-foot-wide pedestrian refuge at marked crossings. Otherwise, the median can be

reduced to a minimum of 4 feet at midblock locations, before widening at intersections for left-turn lanes (where required or needed).

Figure 2: Components of Camas Streets



The design of these zones varies based on the functional classification and street type. Overall, there are 12 different design types recommended for streets, ranging from mixed-use arterial to industrial local street. Note that a design type is not available for limited access roadways classified as freeways (e.g., SR 14).

The typical roadway cross-section standards recommended for streets can be seen in Figures 3 through 5 and Tables 2 through 4. Arterial roadways are recommended to include buffered bike lanes (5-foot bike lane with a 2-foot buffer) since they have higher traffic volumes and speeds. Arterial roadways in mixed-used areas are recommended to include wider sidewalks (8 feet versus 6 feet in the current standard) to complement the street side environment. Those in mixed-use and residential areas are recommended to have narrower travel lanes (11 feet versus 12 feet in the current standard) to encourage slower travel speeds. Collector roadways are recommended to include narrower through travel lanes (11 feet versus 12 feet in the current standard) in favor of wider bike lanes (6 feet versus 5 feet in the current standard). Local streets are recommended to include narrower travel lanes in favor of wider sidewalks (6 feet versus 5 feet in the current standard).

A center turn lane/median is recommended on arterial and collector streets in commercial and industrial areas since they have more trucks and turning maneuvers into driveways when compared to mixed-use and residential areas. Two lanes are recommended in mixed-use and residential areas to encourage narrow streets and a more pedestrian friendly environment. Parking is recommended to be allowed on mixed-use and residential streets, but not along commercial or industrial streets.

Narrower parking lanes are recommended on collector and local streets in residential areas (7 feet versus 8 feet in the current standard).

The Transportation Plan does not modify the design standards for SR 14, the city's only freeway.

Figure 3a: Mixed-Use Arterial

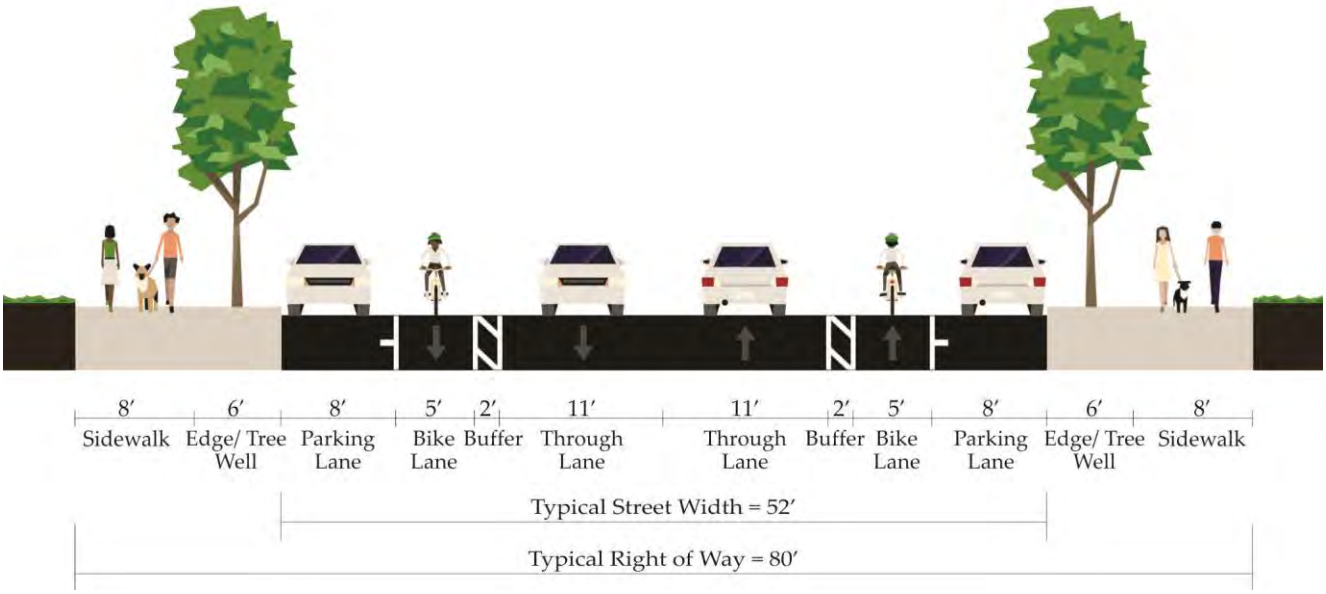


Figure 3b: Residential Arterial

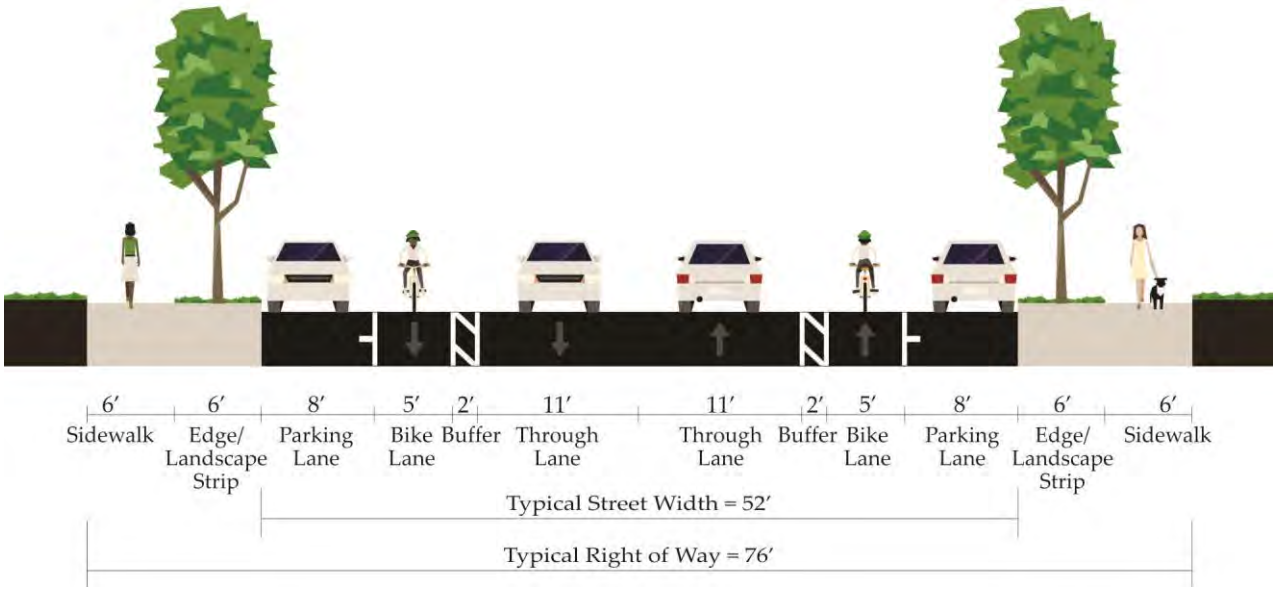


Figure 3c: Commercial Arterial

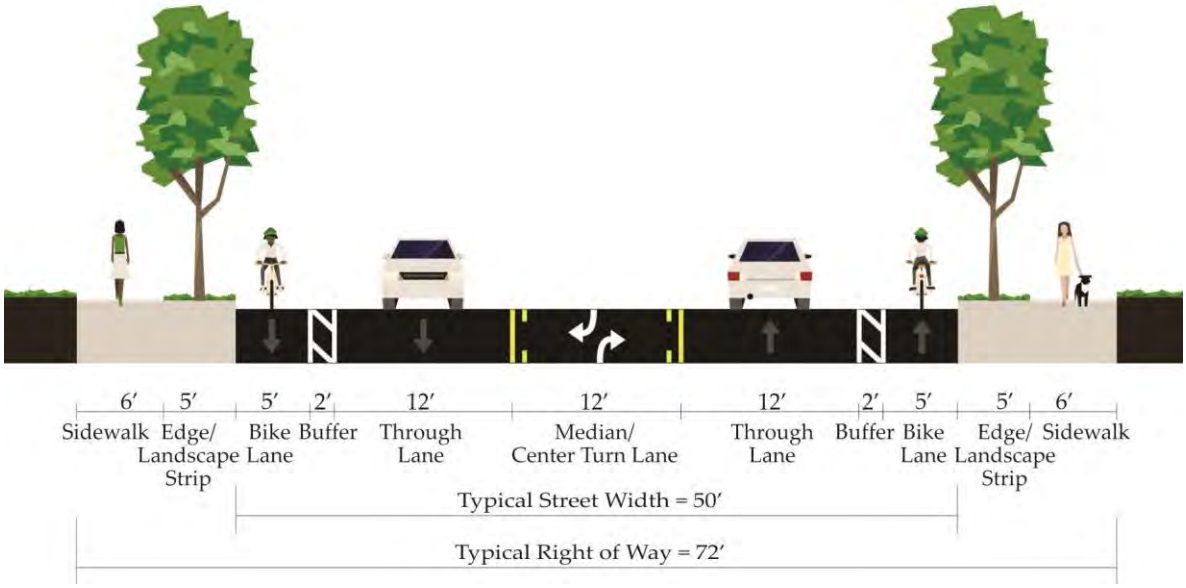


Figure 3d: Industrial Arterial

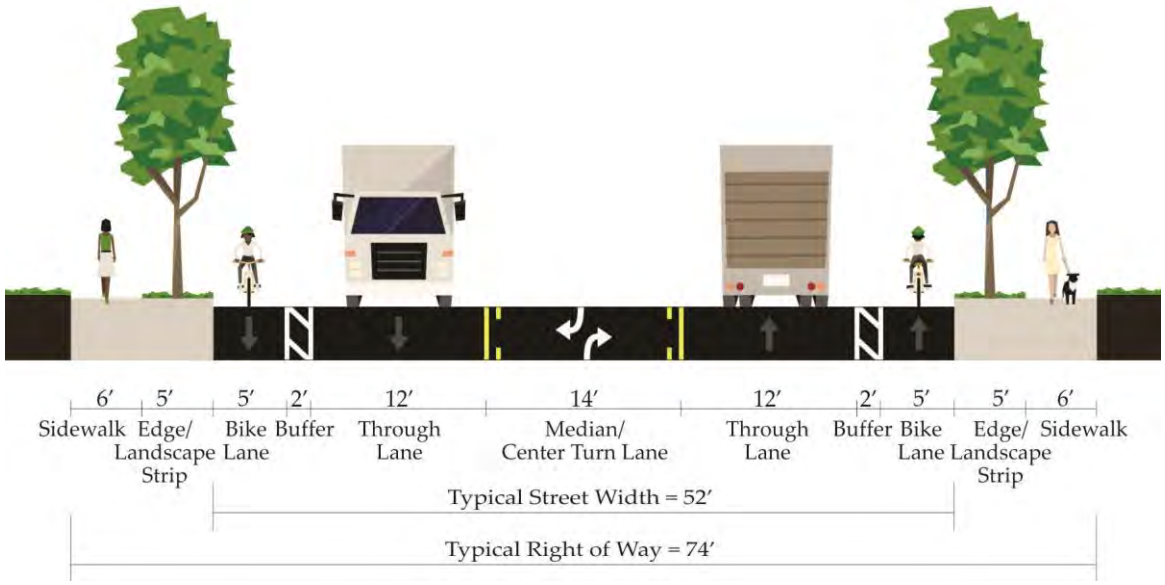


Table 2: Recommended Typical Roadway Cross-section Standards for Arterials

	Mixed-Use	Residential	Commercial	Industrial
Walking Zone				
Minimum Walkway Width	14 ft.	12 ft.	11 ft.	11 ft.
Walkway Type (throughway)	8 ft. sidewalk	6 ft. sidewalk	6 ft. sidewalk	6 ft. sidewalk
Minimum Furnishings/ Landscape Strip Width	4.5 ft. tree well	4.5 ft. landscape strip	4.5 ft. landscape strip	4.5 ft. landscape strip
Edge (Curb and Clearance between Furnishings/ Landscape Strip)	1.5 ft.	1.5 ft.	0.5 ft.	0.5 ft.
Biking / On-Street Parking Zone				
Biking Facility	7 ft. Buffered Bike Lanes (includes 2 ft. buffer)	7 ft. Buffered Bike Lanes (includes 2 ft. buffer)	7 ft. Buffered Bike Lanes (includes 2 ft. buffer)	7 ft. Buffered Bike Lanes (includes 2 ft. buffer)
Minimum On-Street Parking Width	8 ft.	8 ft.	None	None
Driving Zone				
Through Lanes	2	2	2 to 4	2 to 4
Minimum Lane Width	11 ft.	11 ft.	12 ft.	12 to 14 ft.
Median/ Turn Lane	Required 11 ft. left turn lane at intersections	Required 11 ft. left turn lane at intersections	Required 12 ft. median/ center turn lane	Required 14 ft. center turn lane
Street Width and Right of Way				
Typical Street Width	52 ft	52 ft	50 to 74 ft	52 to 76 ft
Typical Right of Way	80 ft.	76 ft.	72 to 96 ft.	74 to 98 ft.

Figure 4a: Mixed-Use Collector

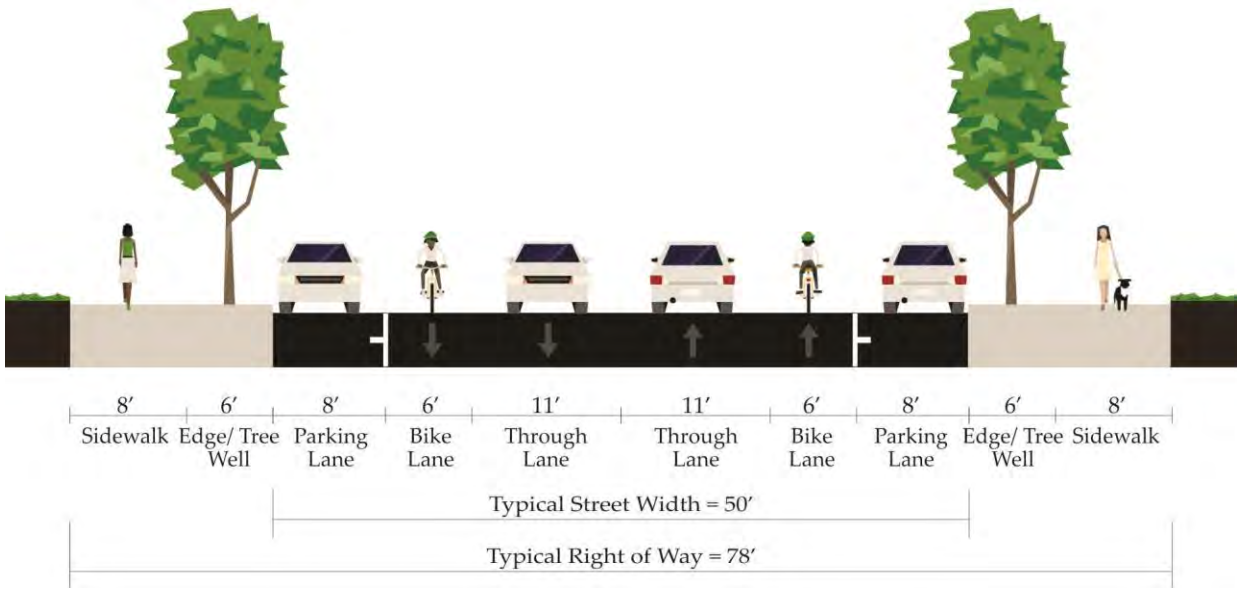


Figure 4b: Residential Collector

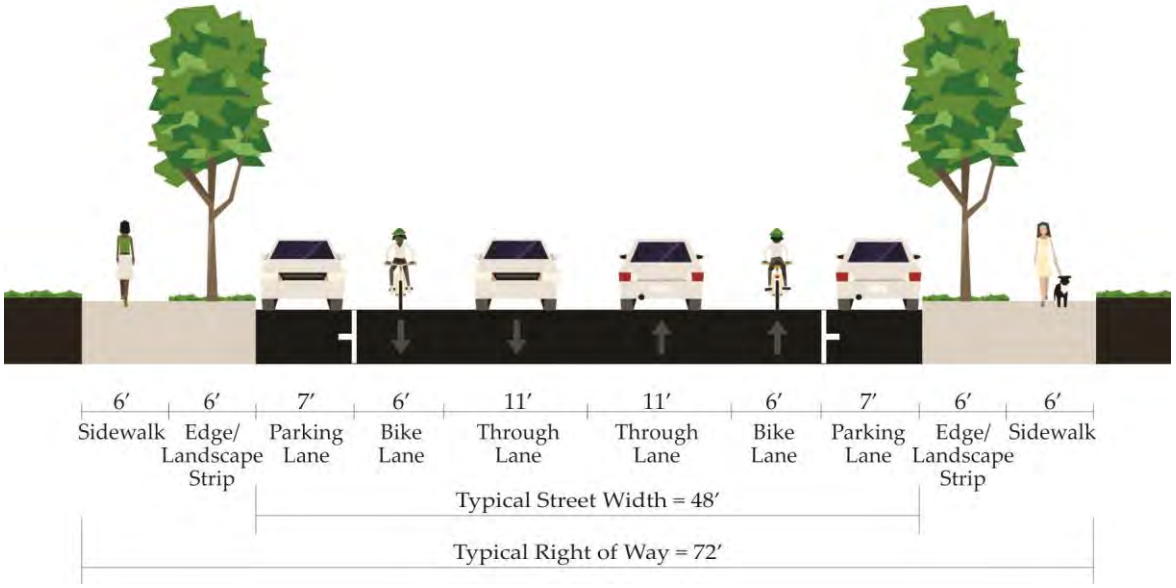


Figure 4c: Commercial Collector

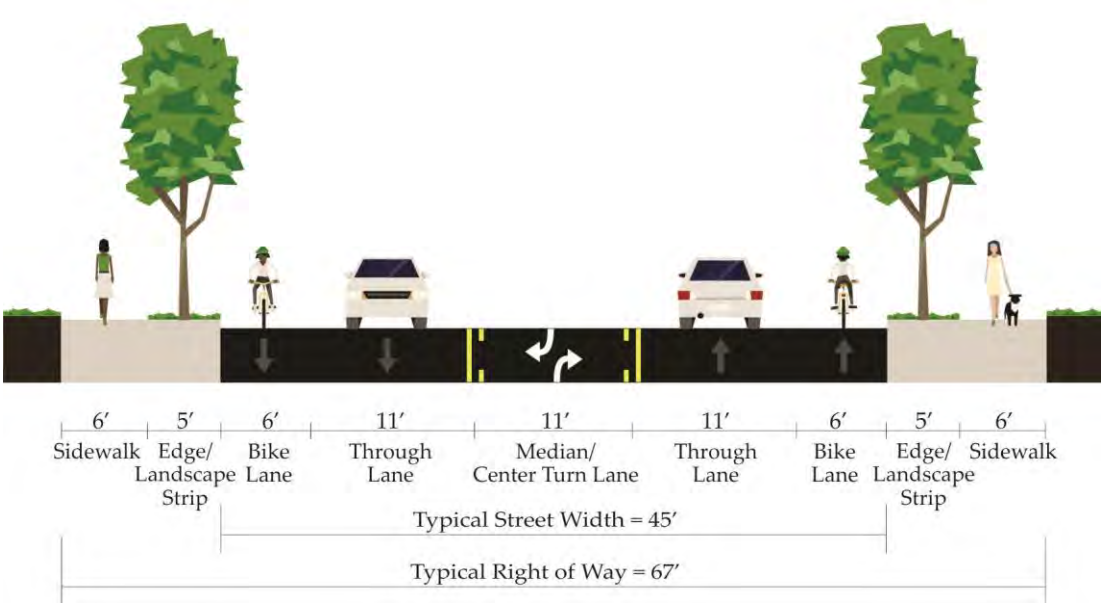


Figure 4d: Industrial Collector

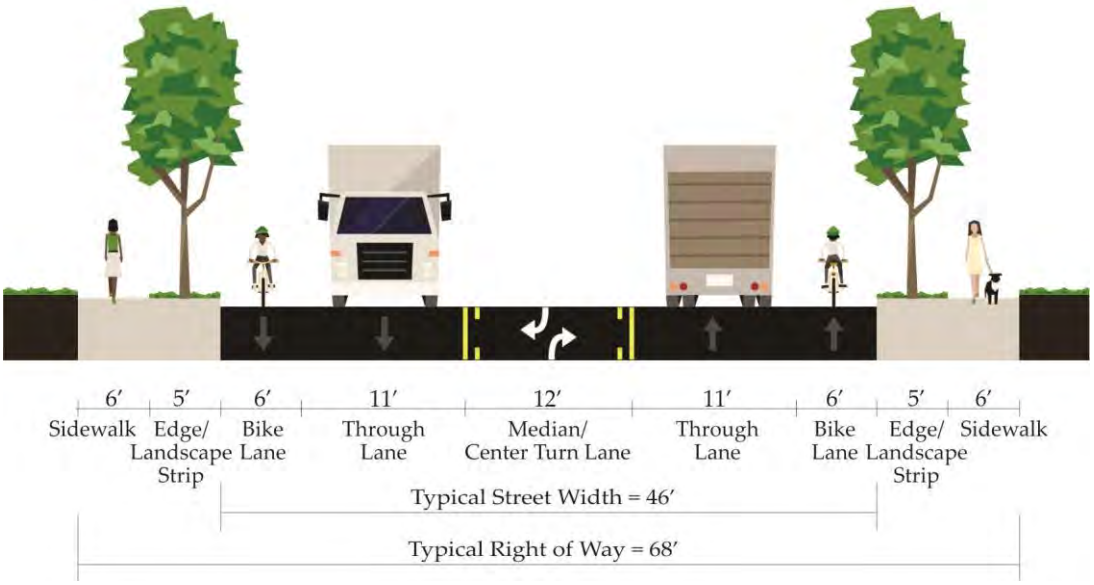


Table 3: Recommended Typical Roadway Cross-section Standards for Collectors

	Mixed-Use	Residential	Commercial	Industrial
Walking Zone				
Minimum Walkway Width	14 ft.	12 ft.	11 ft.	11 ft.
Walkway Type (throughway)	8 ft. sidewalk	6 ft. sidewalk	6 ft. sidewalk	6 ft. sidewalk
Minimum Furnishings/ Landscape Strip Width	4.5 ft. tree well	4.5 ft. landscape strip	4.5 ft. landscape strip	4.5 ft. landscape strip
Edge (Curb and Clearance between Furnishings/ Landscape Strip)	1.5 ft.	1.5 ft.	0.5 ft.	0.5 ft.
Biking / On-Street Parking Zone				
Biking Facility	6 ft. Bike Lanes	6 ft. Bike Lanes	6 ft. Bike Lanes	6 ft. Bike Lanes
Minimum On-Street Parking Width	8 ft.	7 ft.	None	None
Driving Zone				
Through Lanes	2	2	2	2
Minimum Lane Width	11 ft.	11 ft.	11 ft.	11 to 12 ft.
Median/ Turn Lane	None	None	Required 11 ft. left turn lane at intersections	Required 12 ft. center turn lane
Street Width and Right of Way				
Typical Street Width	50 ft	48 ft	45 ft	46 ft
Typical Right of Way	78 ft.	72 ft.	67 ft.	68 ft.

Figure 5a: Mixed-Use Local

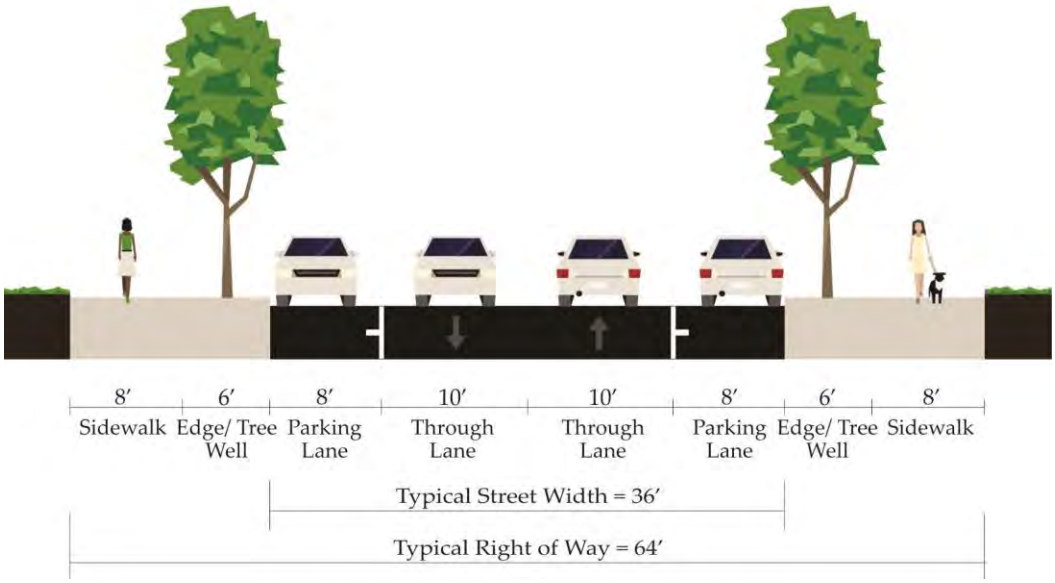


Figure 5b: Residential Local

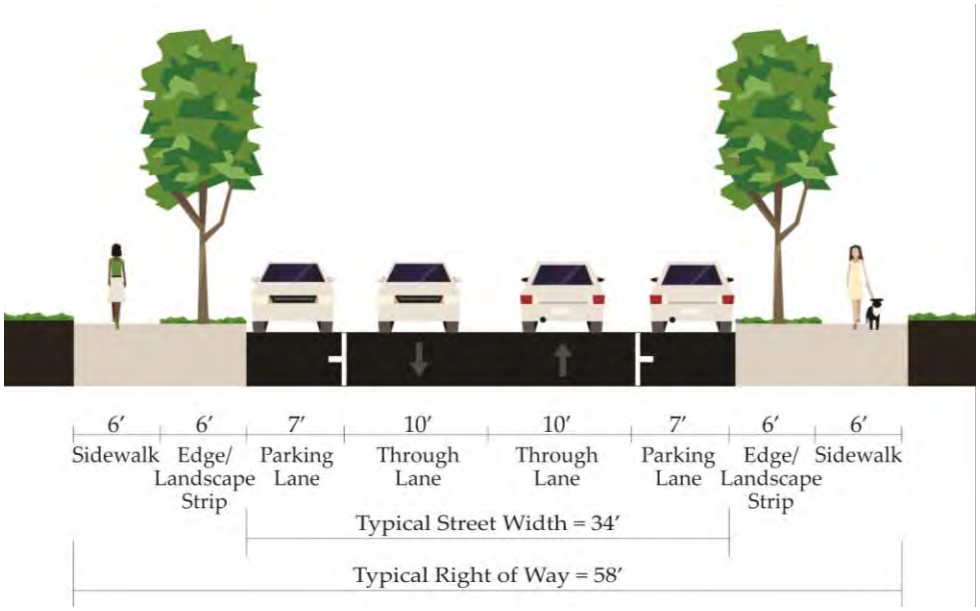


Figure 5c: Commercial Local

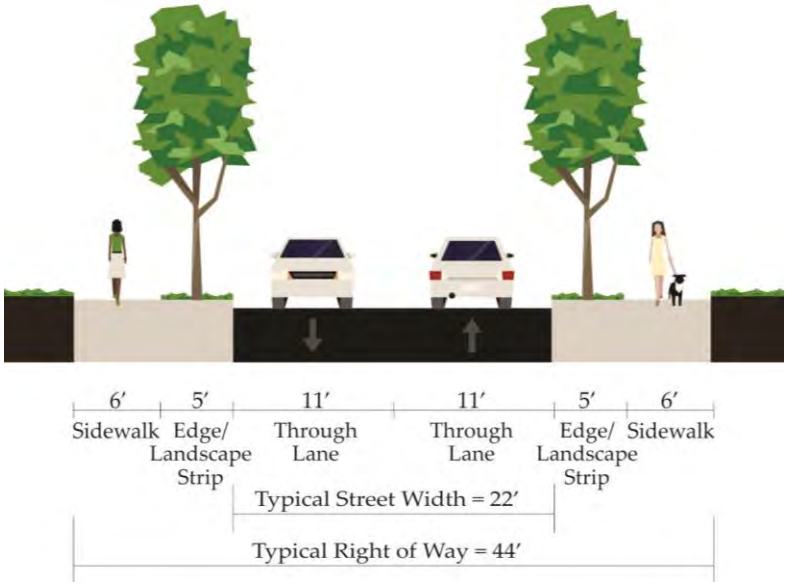


Figure 5d: Industrial Local

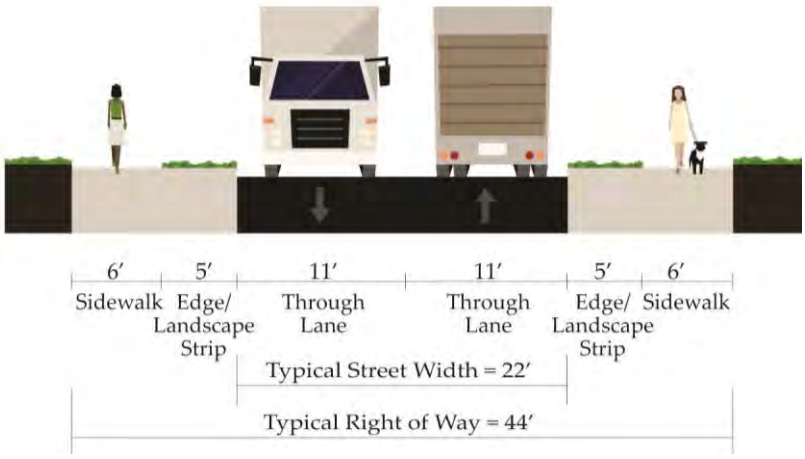


Table 4: Recommended Typical Roadway Cross-section Standards for Local Streets

	Mixed-Use	Residential	Commercial	Industrial
Walking Zone				
Minimum Walkway Width	14 ft.	12 ft.	11 ft.	11 ft.
Walkway Type (throughway)	8 ft. sidewalk	6 ft. sidewalk	6 ft. sidewalk	6 ft. sidewalk
Minimum Furnishings/ Landscape Strip Width	4.5 ft. tree well	4.5 ft. landscape strip	4.5 ft. landscape strip	4.5 ft. landscape strip
Edge (Curb and Clearance between Furnishings/ Landscape Strip)	1.5 ft.	1.5 ft.	0.5 ft.	0.5 ft.
Biking / On-Street Parking Zone				
Biking Facility	Shared Lanes	Shared Lanes	Shared Lanes	Shared Lanes
Minimum On-Street Parking Width	8 ft.	7 ft.	None	None
Driving Zone				
Through Lanes	2	2	2	2
Minimum Lane Width	10 ft.	10 ft.	11 ft.	11 to 12 ft.
Median/ Turn Lane	None	None	None	None
Street Width and Right of Way				
Typical Street Width	36 ft	34 ft	22 ft	22 ft
Typical Right of Way	64 ft.	58 ft.	44 ft.	44 ft.

Constrained Roadway Option

Constrained Streets are generally those where the construction may be challenging due to topography or environmentally sensitive, historic, or developed areas. These streets may require modified designs that may not be to scale with the adjacent land use to allow for reasonable construction costs. Constrained elements may include narrower or limited travel lanes, and pedestrian and bicycle facilities, or accommodations that generally match those provided by the surrounding developed land uses. Recommended guidance for modifications to the standard designs is provided in Table 5. Any modification of a standard design requires approval of a deviation prior to construction.

Table 5: Recommended Constrained Roadway Options

	Arterials	Collectors	Local Streets
Walking Zone			
Minimum Walkway Width	9.5 ft.	8.5 ft.	8.5 ft.
Walkway Type (throughway)	6 ft. sidewalk	5 ft. sidewalk	5 ft. sidewalk
Minimum Furnishings/ Landscape Strip Width	3 ft.	3 ft.	3 ft.
Edge (Curb and Clearance between Furnishings/ Landscape Strip)	0.5 ft.	0.5 ft.	0.5 ft.
Biking / On-Street Parking Zone			
Biking Facility	6 ft. Bike Lanes	5 ft. Bike Lanes; or Bikeway on Adjacent Corridor	None
Minimum On-Street Parking Width	None	None	None
Driving Zone			
Through Lanes	2	2	2
Minimum Lane Width	11 ft.	10 ft.	10 ft.
Median/ Turn Lane	As Needed	As Needed	None

Freight and Truck Routes

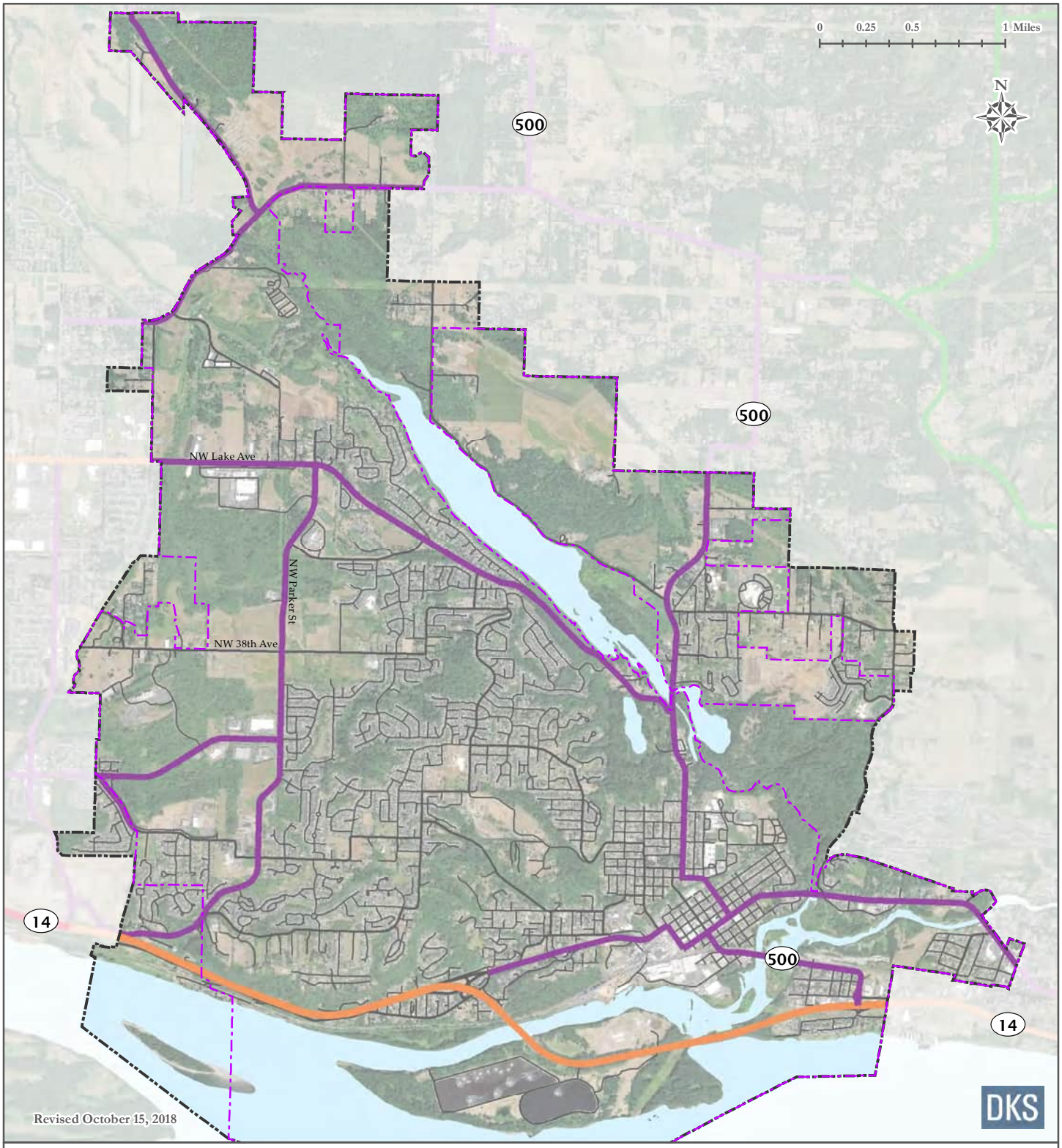
Figure 6 shows roadways designated to help ensure trucks can efficiently travel through and access major destinations in Camas. These routes play a vital role in the economical movement of raw materials and finished products, while maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system.

The Washington State Freight and Goods Transportation System (FGTS) tonnage classification system identifies different categories of freight corridors based on annual freight tonnage moved. It defines tonnage thresholds and identifies heavily used truck freight corridors within the state. Washington State FGTS truck freight corridors are classified into five categories, T-1 through T-5, based on annual gross truck tonnage. The following corridors are identified in Camas (see Figure 2).

- **T-1:** more than 10 million tons per year. There are no T-1 corridors in Camas.
- **T-2:** 4 million to 10 million tons per year. SR 14 is the only T-2 corridor in Camas.
- **T-3:** 300,000 to 4 million tons per year. In Camas, portions of NW 6th Avenue, NE Adams Street, NE 3rd Avenue, SR 500, NW Lake Road, NW Parker Street, NW Brady Road, NW Pacific Rim Boulevard, NE Goodwin Road, NE 28th Street, and NE Ingle Road are T-3 corridors.
- **T-4:** 100,000 to 300,000 tons per year. There are no T-4 corridors in Camas.
- **T-5:** at least 20,000 tons in 60 days and less than 100,000 tons per year. There are no T-5 corridors in Camas.

The Transportation Plan has not changed the Washington FGTS designations.

6 Freight and Truck Routes



Legend:

Freight Corridors

- T-2 Truck Freight Corridor
- T-3 Truck Freight Corridor
- Urban Growth Area
- Camas City Limit
- Arterial or Collector St

Walking and Biking Design Standards

The following sections detail various walking and biking standards and treatment guidelines.

Walking and Biking Facilities

As shown in Figures 3 to 5, the existing city roadway design standards are recommended to be modified to require buffered bike lanes along arterial roadways and wider bike lanes along collector roadways. Local streets are also recommended to require wider sidewalks in mixed-use, residential and commercial areas. Newly constructed roadways are recommended to provide accommodations to walking users via a 8-foot sidewalk in mixed-use areas and a six-foot sidewalk in residential, commercial and industrial areas. Biking users are recommended to be accommodated with a five-foot bike lane with 2-foot buffer along arterial roadways and a six-foot bike lane along collector roadways. Shared streets for bikes are also recommended to be designated throughout the city and should include pavement markings/ signage.

Shared-Use Paths

Shared-use paths provide off-roadway facilities for walking and biking travel. Depending on their location, they can serve both recreational and transportation needs. Shared-use path designs vary in surface types and widths. Hard surfaces are generally better for bicycle travel. Widths need to provide ample space for both walking and biking and should be able to accommodate maintenance vehicles.

The design standards from the Camas Parks, Recreation and Open Space Comprehensive Plan (PROS) are recommended in the Transportation Plan. A paved regional shared-use path should be at least 12 feet wide (see Figure 7). A paved local shared-use path should be at least 10 feet wide in areas with significant walking or biking demand; otherwise, it should be a minimum 6 feet wide (see Figure 8).

Figure 7: Typical Design for Regional Shared-Use Paths

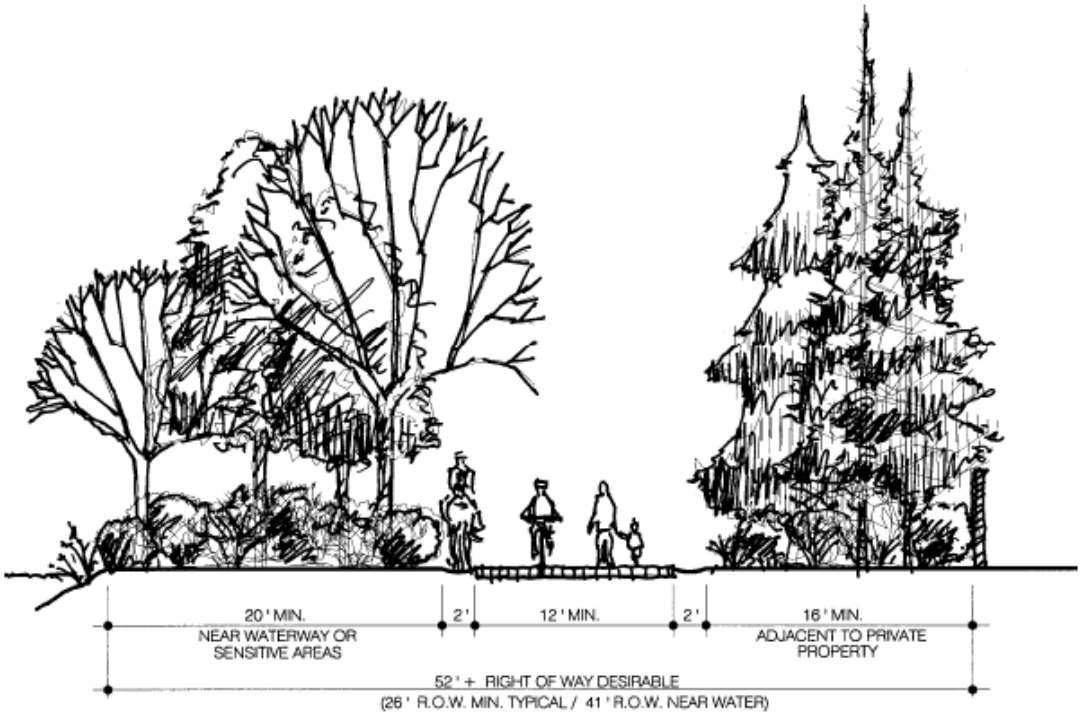
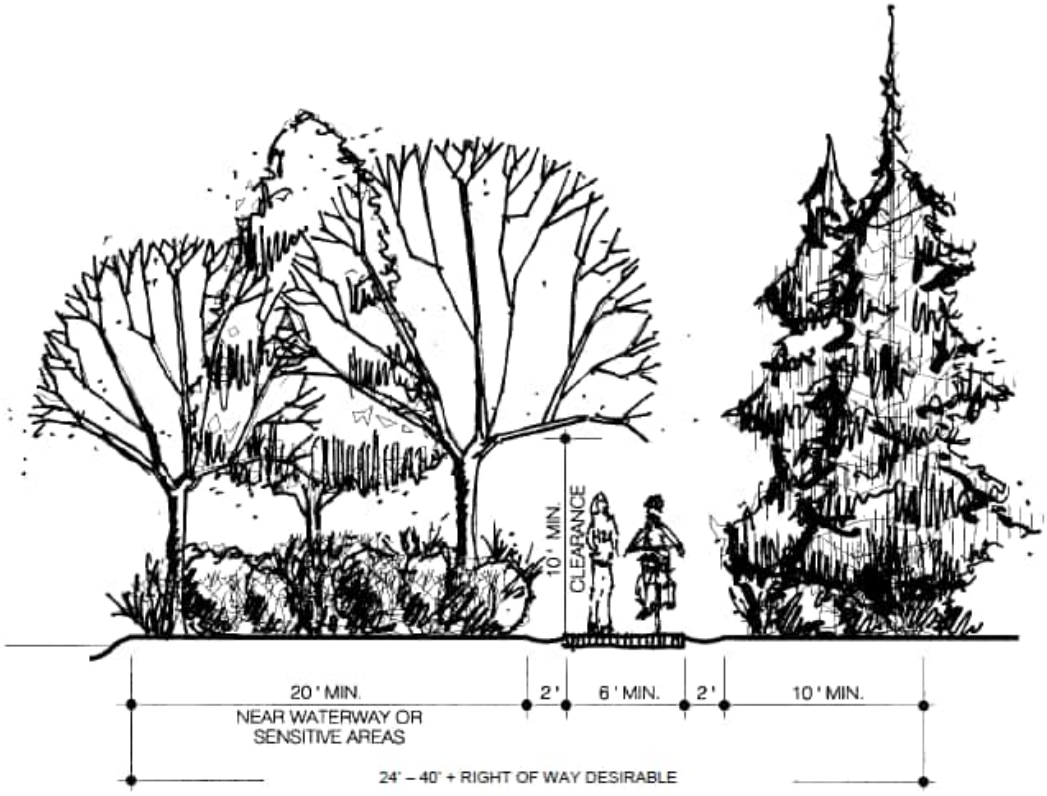


Figure 8: Typical Design for Local Shared-Use Paths



Street Crossings

Roadways with high traffic volumes and/or speeds in areas with nearby transit stops, residential uses, schools, parks, shopping and employment destinations generally require enhanced street crossings with treatments, such as marked crosswalks, high visibility crossings, and curb extensions to improve the safety and convenience. Crossings should be consistent with the recommended block spacing standards shown in Table 6 and mid-block pedestrian and bicycle accessways are recommended to be provided at spacing no more than 330 feet. Exceptions include where the connection is impractical due to topography, inadequate sight distance, high vehicle travel speeds, lack of supporting land use or other factors that may prevent safe crossing (as determined by the city).

Roadway and Access Spacing Standards

Access management is a broad set of techniques that balance the need to provide for efficient, safe, and timely travel with the ability to allow access to individual destinations. Appropriate access management standards and techniques can reduce congestion and accident rates and may lessen the need for construction of additional roadway capacity.

Table 6 identifies recommended maximum and minimum public roadway intersection, minimum private access, and maximum pedestrian and bicycle accessway spacing standards for roadways in Camas. The only recommended change is a new minimum spacing standard for right-in, right-out driveways from adjacent intersections. New roadways or redeveloping properties must comply with these standards to the extent practical, as determined by the city. As the opportunity arises through redevelopment, roadways not complying with these standards could improve with strategies such as shared access points, access restrictions (through the use of a median or channelization islands), or closure of unnecessary access points, as feasible.

Table 6: Roadway and Access Spacing Standards

	Arterials	Collectors	Local Streets
Maximum Block Size (Public Street to Public Street)	1,000 ft.	600 ft.	600 ft.
Minimum Block Size (Public Street to Public Street)	660 ft.	330 ft.	110 ft.
Minimum Driveway Spacing (Public Street to Driveway and Driveway to Driveway)	660 ft.**	330 ft.**	110 ft.
Minimum Full-access Driveway Setback from Intersection	300 ft.	110 ft.	n/a
Minimum Right-in, Right-out Driveway Setback from Intersection	150 ft.	55 ft.	n/a
Maximum Distance between Pedestrian/ Bicycle Accessways (Public Street to Public Street, Public Street to Accessway or Accessway to Accessway) *	330 ft.	330 ft.	330 ft.

Note: all distances measured from the edge of adjacent approaches.

* Mid-block pedestrian and bicycle accessways on public easements or rights-of-way must be provided at spacing no more than 330 feet, unless the connection is impractical due to existing development, topography, environmental constraints, lack of supporting land use or other factors (as determined by the city).

** New residential accesses are not permitted along arterials or collectors

Mobility Standards

Mobility standards for streets and intersections in Camas provide a metric for assessing the impacts of new development on the existing transportation system and for identifying where capacity improvements may be needed. They are the basis for requiring improvements needed to sustain the transportation system as growth and development occur. Two methods used to gauge operational conditions for motor vehicles include volume-to-capacity (v/c) ratios and level of service (LOS).

- **Volume-to-capacity (v/c) ratio:** A v/c ratio is a decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. The ratio is the peak hour traffic volume divided by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. A ratio approaching 1.00 indicates increased congestion and reduced performance.
- **Level of service (LOS):** LOS is a "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic

moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay is excessive, and demand exceeds capacity, typically resulting in long queues and delays.

The Transportation Plan recommends separate mobility standards, one that applies to signalized, all-way stop and roundabout controlled intersections and another that applies to two-way stop and yield controlled intersections under city jurisdiction. A new v/c standard is also recommended to be applied to intersections.

A LOS "D" and a v/c ratio not higher than 0.85 is the minimum recommended performance standard during the peak-hour for signalized, all-way stop and roundabout controlled intersections under city jurisdiction. These standards are recommended to be applied to the intersection as a whole.

A LOS "E" and a v/c ratio not higher than 0.90 is the minimum recommended performance standard during the peak-hour for two-way stop and yield controlled intersections under city jurisdiction. These standards are recommended to be applied to all intersection approaches serving more than 20 vehicles. Mobility standards are recommended to not apply to approaches at intersections serving 20 vehicles or fewer during the peak hour.

Level of Service for Highways of Statewide Significance is set by the State. In Clark County, the standard is set as LOS "D" for urban areas, including SR 14. Level of Service for regional state highway facilities (not part of the HSS), including SR 500 in Camas, is set through the Southwest Washington Regional Transportation Council (RTC). The Southwest Washington RTC Board adopted LOS 'E' or better for non-HSS urban state highway facilities.

Traffic Calming

Traffic calming (primarily in residential and mixed-use areas) refers to street design techniques that slow traffic and make streets safer and more pleasant for users and adjoining land uses without significantly changing their vehicle capacity.

Table 7 lists common traffic calming applications and suggests which devices may be appropriate for streets in Camas. Traffic calming measures must balance vehicle speeds and volumes with mobility, circulation, and function. Any traffic calming project should include coordination with emergency service providers to ensure the project does not impede response.

Traffic calming influences driver behavior through physical and psychological means, by using one or more of the following:

- Narrowing of the street by providing curb extensions or bulbouts, or mid-block pedestrian refuge islands

- Deflecting the vehicle path vertically by installing speed humps, speed tables, or raised intersections
- Deflecting the vehicle path horizontally with chicanes, roundabouts, and mini-roundabouts
- Providing visual cues such as placing buildings, street trees, on-street parking, and landscaping next to the street to create a sense of enclosure that prompts drivers to reduce vehicle speeds

Table 7: Traffic Calming Measures by Street Functional Classification

	Arterials	Collectors	Local Streets
Narrowing travel lanes	Yes	Yes	Most calming measures are generally appropriate on local streets that connect to two or more streets and are infrequent emergency response routes.
Placing buildings, street trees, on-street parking, and landscaping next to the street	Yes	Yes	
Curb Extensions or Bulbouts	Yes	Yes	
Roundabouts	Yes	Yes	
Mini-Roundabouts	No	Yes	
Medians and Pedestrian Islands	Yes	Yes	
Pavement Texture	Yes	Yes	
Speed Hump or Speed Table	No	No	
Raised Intersection or Crosswalk	No	No	
Speed Cushion (provides fire apparatus pass-through with no vertical deflection)	No	Yes	
Choker	No	No	
Traffic Circle	No	No	
Diverter (with emergency vehicle pass through)	No	Yes	
Chicanes	No	No	

APPENDIX F. SOLUTIONS IDENTIFICATION AND EVALUATION

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MEMORANDUM

DATE: May 16, 2024

TO: Curleigh Carothers, City of Camas
Steve Wall, City of Camas

FROM: Reah Flisakowski, DKS Associates
Kevin Chewuk, DKS Associates

SUBJECT: Camas Transportation Plan
Technical Memo 5 – Solutions Identification and Evaluation P18039-000

This document details the transportation system investments recommended to serve travel in Camas. Included is a summary of the process utilized to develop and analyze the solutions and a description of the projects identified to improve the transportation system in the City.

Transportation Vision Statement

Before developing projects, we must first talk about the ideal transportation system for the City. The following vision statement was developed to provide direction for the future of the transportation system.

> *In 2040, residents of Camas continue to appreciate their safe, diverse, and welcoming community as a livable place for people of all ages. Quality public facilities, services, and utilities contribute to their high quality of life.*

The vision statement and eight associated goals (see Technical Memorandum #1b: Goals, Policies and Evaluation Criteria) describe the desires of the City for their transportation system. The eight transportation goals also help set priorities for transportation solutions. It is not the expectation that the City must fully achieve this vision, but instead that it act as a guide for developing and prioritizing projects within the transportation plan.

Approach to Developing Project

Camas' approach to developing transportation projects included consideration of a wide range of options that:

- Preserve the function of the system through cost-effective management practices such as improved traffic signal operations, encouraging alternative modes of travel, and implementation of new policies and standards.
- Improve existing facility efficiency through minor enhancement projects that upgrade roads to desired standards, fill important system connectivity gaps, or include safety improvements to intersections and corridors.
- Add capacity to the system by widening, constructing major improvements to existing roadways, or extending existing roadways to create parallel routes to congested corridors.
- Add capacity to the system by constructing new facilities.

The project team recommended solution types to address identified needs based on a projects cost-effectiveness, ability to support the transportation goals of the City, and community input. This process allows the City to maximize use of available funds, minimize impacts to the natural and built environments, and balance investments across all modes of travel.

Each goal included policies that act as measurable evaluation criteria (see Technical Memorandum #1b: Goals, Policies and Evaluation Criteria). These will be used to screen and prioritize the preliminary transportation solutions. Projects deemed to contribute more towards achieving the transportation goals of Camas will be ranked higher, and the plan will assign higher priority to their implementation (see Figure 1). Recommended projects will be consistent with the community goals and policies.

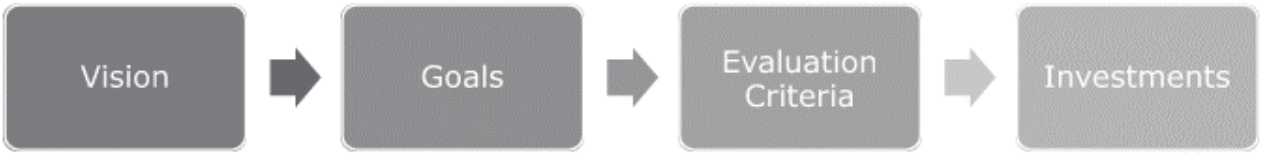


Figure 1: Project Prioritization Process

This memorandum presents the preliminary project list to address all of the identified City transportation needs, regardless of the ability to fund them. The complete list of projects, shown in Table 1, is referred to as Aspirational Projects. The list will be refined based on input received from the Project Advisory Committee and the public to indicate the highest priority projects and anticipated funding potential. Figures 2 through 4 illustrate the preliminary motor vehicle, pedestrian and bicycle projects in Camas.

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
Demand and System Management Projects			
A	Bike Parking Program	Install new bike parking throughout the City.	Increase bike parking
B	Wayfinding Signage Program	Install wayfinding signage to assist pedestrians and bicyclists in choosing comfortable routes and to help visitors navigate through the City.	Improve wayfinding signage
Transit Projects			
T1	Facility Improvements	Improve transit stop amenities as needed, to include sheltered stops with seating, landing pads, route information, sidewalk connections, bicycle parking and lighting.	Enhance transit service and amenities
Motor Vehicle Projects			
M1	NW Pacific Rim Boulevard reconfiguration between SE Payne Road and NW Parker Street	Reconfigure the existing paved width of NW Pacific Rim Boulevard between SE Payne Road and NW Parker Street to address safety and bicycle facility gaps. Requires coordination with the City of Vancouver.	Safety; Bicycle facility gap
M2	NE 6th Avenue reconfiguration between Norwood Street and Adams Street	Reconfigure the existing paved width of NE 6th Avenue between Norwood Street and Adams Street to address safety and bicycle facility gaps. Included in 2023 six-year Transportation Improvement Program as Priority #12.	Safety; Bicycle facility gap
M3	NE 3rd Avenue reconfiguration between NE Garfield Street and 4th Street	Reconfigure the existing paved width of NE 3rd Avenue between NE Garfield Street and 4th Street to address safety and bicycle facility gaps.	Safety; Bicycle facility gap
M4	NE 3rd Avenue reconfiguration between 4th Street and SE Lechner Street	Reconfigure the existing paved width of NE 3rd Avenue between 4th Street and SE Lechner Street to address safety, pedestrian and bicycle facility gaps.	Pedestrian and bicycle facility gap
M5	NE Laurel Street extension to SE 15th Street	Extend NE Laurel Street to SE 15th Street. This street should be constructed as a Collector, with sidewalks and bike lanes.	Street connectivity; Pedestrian and bicycle facility gap
M6	NE Pioneer Street extension to SE 15th Street	Extend NE Pioneer Street to SE 15th Street. This street should be constructed as a Collector, with sidewalks and bike lanes.	Street connectivity; Pedestrian and bicycle facility gap
M7	NE Pioneer Street extension to SE 8th Street extension	Extend NE Pioneer Street from SE 15th Street to the SE 8th Street extension. This street should be constructed as a Collector, with sidewalks and bike lanes.	Street connectivity; Pedestrian and bicycle facility gap

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
M8	NE Umatilla Street extension to SE 8th Street extension	Extend NE Umatilla Street from SE 15th Street to the SE 8th Street extension. This street should be constructed as a Collector, with sidewalks and bike lanes.	Street connectivity; Pedestrian and bicycle facility gap
M9	SE 8th Street extension between SR 500-NE Everett Street and SE 283rd Avenue	Extend SE 8th Street from SR 500-NE Everett Street to SE 283rd Avenue. This street should be constructed as a Collector, with sidewalks and bike lanes.	Street connectivity; Pedestrian and bicycle facility gap
M10	SR 500-NE Everett Street widening between NW Lake Road and the UGA	Widen SR 500-NE Everett Street between NW Lake Road and the UGA boundary to include bike lanes and sidewalks. Includes bridge replacement. Included in 2023 six-year Transportation Improvement Program as Priority #2.	Safety; Pedestrian and Bicycle facility gap
M11	SE 8th Avenue extension (Roadway C) to Northshore Subarea Roadway D	Extend SE 8th Avenue (Northshore Subarea Roadway C) from SR 500-NE Everett Street to Northshore Subarea Roadway D. This street should be constructed as a Collector, with sidewalks and bike lanes. Alignment based on Northshore subarea plan Option B, Roadway C.	Street connectivity; Pedestrian and bicycle facility gap
M12	SE 8th Avenue extension (Roadway C) to Northshore Boulevard	Extend SE 8th Avenue (Northshore Subarea Roadway C) from Northshore Subarea Roadway D to Northshore Boulevard. This street should be constructed as a Collector, with sidewalks and bike lanes. Alignment based on Northshore subarea plan Option B, Roadway C.	Street connectivity; Pedestrian and bicycle facility gap
M13	Northshore Boulevard extension to NE 3rd Street-Northshore Subarea Roadway D	Extend Northshore Boulevard to NE 3rd Street-Northshore Subarea Roadway D. This street should be constructed as an Arterial, with sidewalks and bike lanes. Included in 2023 six-year Transportation Improvement Program as Priority #10.	Street connectivity; Pedestrian and bicycle facility gap
M14	NE 232nd Avenue widening between Northshore Boulevard and the UGA	Widen NE 232nd Avenue between Northshore Boulevard and the UGA boundary to include one travel lane in each direction, a center turn-lane/median, a bike lane and sidewalk on the west side and a shared-use path on the east side. Included in 2023 six-year Transportation Improvement Program as Priority #28.	Safety; Pedestrian and Bicycle facility gap
M15	Northshore Subarea Roadway D from SE 8th Avenue (Northshore Subarea Roadway C) to Northshore Subarea Roadway A	Construct a new street between SE 8th Avenue (Northshore Subarea Roadway C) and Northshore Subarea Roadway A. This street should be constructed as a Collector, with sidewalks and bike lanes. Alignment based on Northshore subarea plan Option B, Roadway D.	Street connectivity; walking and biking facility gap
M16	Northshore Subarea Roadway E from Northshore Subarea Roadway D to the SE 8th Avenue extension (Northshore Subarea Roadway C)	Construct a new street between Northshore Subarea Roadway D and the SE 8th Avenue extension (Northshore Subarea Roadway C). This street should be constructed as a Collector, with sidewalks and bike lanes. Alignment based on Northshore subarea plan Option B, Roadway E.	Street connectivity; walking and biking facility gap

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
M17	Northshore Subarea Roadway A from NE 242nd Avenue-NE 14th Street to the Leadbetter House	Construct a new street between NE 242nd Avenue-NE 14th Street and the Leadbetter House. This street should be constructed as a Collector, with sidewalks and bike lanes. Alignment based on Northshore subarea plan Option B, Roadway A.	Street connectivity; Pedestrian and bicycle facility gap
M18	Northshore Boulevard intersection improvements	Intersection improvements at Northshore Subarea Roadway E and Northshore Subarea Roadway A (e.g., installation of a roundabout). Based on Northshore subarea plan Option B.	Motor vehicle congestion and safety
M19	NE 28th Street widening between N Juniper Street and NE 232nd Avenue	Widen NE 28th Street between N Juniper Street and NE 232nd Avenue to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks.	Safety; Pedestrian and Bicycle facility gap
M20	NE 28th Street widening between NE Ingle Road and N Juniper Street	Widen NE 28th Street between NE Ingle Road and N Juniper Street to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks.	Safety; Pedestrian and Bicycle facility gap
M21	NE Goodwin Road widening between NE Ingle Road and NE 13th Street	Widen NE Goodwin Road between NE Ingle Road and NE 13th Street to include bike lanes and sidewalks. Included in 2023 six-year Transportation Improvement Program as Priority #9.	Safety; Pedestrian and Bicycle facility gap
M22	NE Ingle Road widening between NE 28th Street and the UGA	Widen NE Ingle Road between NE 28th Street and the UGA to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2023 six-year Transportation Improvement Program as Priority #40.	Safety; Pedestrian and Bicycle facility gap
M23	SE Bybee Road realignment to NW Fisher Creek Drive	Realign SE Bybee Road to intersect with NW 38th Avenue at NW Fisher Creek Drive. This street should be constructed as a Collector, with sidewalks and bike lanes. Included in 2023 six-year Transportation Improvement Program as Priority #13.	Street connectivity; Pedestrian and bicycle facility gap
M24	NW 38th Avenue widening between NW Parker Street and Grass Valley Park	Widen NW 38th Avenue between NW Parker Street and Grass Valley Park to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2023 six-year Transportation Improvement Program as Priority #1.	Safety; Pedestrian and Bicycle facility gap
M25	NW 38th Avenue-NW Astor Street-NW 43rd Avenue widening between NW Dahlia Drive and NW Sierra Street	Widen NW 38th Avenue-NW Astor Street-NW 43rd Avenue between NW Dahlia Drive and NW Sierra Street to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2023 six-year Transportation Improvement Program as Priority #27.	Safety; Pedestrian and Bicycle facility gap
M26	NW 16th Avenue-NW Hood Street-NW 18th Street widening between NW Klickitat Street and NW Astor Court	Widen NW 16th Avenue-NW Hood Street-NW 18th Street between NW Klickitat Street and NW Astor Court to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2023 six-year Transportation Improvement Program as Priority #7 and #24.	Safety; Pedestrian and Bicycle facility gap

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
M27	NW 11th Avenue-NW Astor Street widening between NW McIntosh Road and NW 16th Avenue	Widen NW 11th Avenue-NW Astor Street between NW McIntosh Road and NW 16th Avenue to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2023 six-year Transportation Improvement Program as Priority #23.	Safety; Pedestrian and Bicycle facility gap
M28	NW McIntosh Road widening between NW Brady Road and NW 11th Avenue	Widen NW McIntosh Road between NW Brady Road and NW 11th Avenue to include one travel lane in each direction, a center turn-lane/median, bike lanes and sidewalks. Included in 2023 six-year Transportation Improvement Program as Priority #29.	Safety; Pedestrian and Bicycle facility gap
M29	SE Crown Road widening between NE 3rd Avenue and NE Woodburn Drive	Widen SE Crown Road between NE 3rd Avenue and NE Woodburn Drive to include one travel lane in each direction, left-turn lanes at intersections and a shared-use path (per the Crown Road Corridor Study). Widen the SE Crown Road approach to NE 3rd Avenue to accommodate westbound truck turning maneuvers. Requires coordination with Washougal and Clark County. Included in 2023 six-year Transportation Improvement Program as Priority #6.	Safety; Pedestrian and Bicycle facility gap
M30	SE 283rd Avenue widening between NE Woodburn Drive and the SE 8th Street extension	Widen SE 283rd Avenue between NE Woodburn Drive and the SE 8th Street extension to include one travel lane in each direction, left-turn lanes at intersections and a shared-use path. Requires coordination with Clark County.	Safety; Pedestrian and Bicycle facility gap
M31	SE Lechner Street reconfiguration between NE 3rd Avenue and the UGA boundary	Reconfigure SE Lechner Street between NE 3rd Avenue and the UGA boundary to include one travel lane in each direction, a center turn-lane/median and bike lanes.	Safety; Pedestrian and Bicycle facility gap
M32	NE 6th Avenue / NE Adams Street intersection improvements	Intersection improvements (e.g., Per the Camas Safety Plan this should include the installation of a roundabout and intersection lighting; retain eastbound right-turn slip lane).	Motor vehicle congestion and safety
M33	NE 6th Avenue / SR 500-NE Garfield Street intersection improvements	Intersection improvements (i.e., restripe the eastbound NE 6th Avenue approach to include a separate left-turn and through/right turn lane; requires removal of on-street parking along the south side of NE 6th Avenue within 75 feet of the intersection).	Motor vehicle congestion
M34	SE Crown Road / SE 23rd Street-NE Woodburn Drive intersection improvements	Intersection improvements (e.g., installation of a roundabout per the Crown Road Corridor Study). Realign SE 23rd Street to intersect with NE Woodburn Drive. This street should be constructed as an Arterial, with sidewalks and bike lane. Realignment included in 2023 six-year Transportation Improvement Program as Priority #30.	Motor vehicle safety
M35	SR 500-NE Everett Street / NE 38th Avenue intersection improvements	Intersection improvements (i.e., installation of roundabout or a southbound left-turn lane on SR 500-NE Everett Street).	Motor vehicle congestion and safety

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
M36	SR 500-NE Everett Street / NE 43rd Avenue intersection improvements	Intersection improvements (i.e., potential installation of roundabout per the Northshore Subarea Plan).	Motor vehicle congestion and safety
M37	SR 500-NE Everett Street / SE Leadbetter Road intersection improvements	Intersection improvements (i.e., installation of a median to limit SE Leadbetter Road access to left-in, right-in, right-out only).	Motor vehicle safety
M38	SR 500-NE Everett Street / SE 8th Street intersection improvements	Intersection improvements (e.g., potential installation of a roundabout per Northshore Subarea Plan).	Motor vehicle safety
M39 *	SR 500-NE Everett Street / SE NE 3rd Street / NE Robinson Road intersection improvements	Intersection improvements (e.g., installation of a roundabout). Requires coordination with WSDOT and Clark County.	Motor vehicle safety
M40 *	NE 28th Street / SR 500-NE 242nd Avenue intersection improvements	Intersection improvements (e.g., installation of a southbound left-turn lane on SR 500-NE Everett Street, eastbound left-turn lane on NE 28th Street and traffic signal, or installation of a roundabout). Requires coordination with WSDOT and Clark County.	Motor vehicle congestion
M41 *	NE 232nd Avenue / NE 28th Street intersection improvements	Intersection improvements (e.g., installation of a roundabout or traffic signal). Requires coordination with Clark County. Included in 2023 six-year Transportation Improvement Program as Priority #21.	Motor vehicle congestion
M42 *	NE 199th Avenue / SR 500-NE 58th Street intersection improvements	Intersection improvements (e.g., installation of a westbound left-turn lane and eastbound right-turn lane on SR 500-NE 58th Street and traffic signal, or installation of a roundabout). Requires coordination with WSDOT and Clark County.	Motor vehicle congestion
M43	NW Camas Meadows Drive / NE Goodwin Road intersection improvements	Intersection improvements (i.e., installation of a roundabout or traffic signal). Included in 2023 six-year Transportation Improvement Program as Priority #38.	Motor vehicle congestion
M44	NW Lake Road / NW Sierra Street intersection improvements	Intersection improvements (i.e., installation of a roundabout). Included in 2023 six-year Transportation Improvement Program as Priority #3.	Motor vehicle congestion
M45	Pacific Rim Boulevard / NW Parker Street intersection improvements	Intersection improvements (i.e., installation of a traffic signal). Included in 2023 six-year Transportation Improvement Program as Priority #39.	Motor vehicle congestion
M46	NW Lake Road safety improvements from NE Everett Street to NW Leadbetter Drive	Implement safety improvements along NW Lake Road safety improvements from NE Everett Street to NW Leadbetter Drive. These include horizontal curve signing, profiled pavement marking and shoulder widening per the Camas Safety Plan.	Multimodal Safety
~~M47~~	~~NE Goodwin Road / NE Ingle Road intersection improvements~~	~~Intersection improvements (i.e., installation of a traffic signal). Project has been completed.~~	~~Motor vehicle congestion~~

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
M48	SR-14 West Camas Slough Bridge widening	Widen the SR-14 West Camas Slough Bridge to four lanes. Included in 2023 six-year Transportation Improvement Program as Priority #8. WSDOT project.	Motor vehicle congestion
Pedestrian Projects			
P1	Pedestrian improvements on NW 7th Avenue between NW Fargo Street and NW Drake Street	Add pedestrian improvements to NW 7th Avenue between NW Fargo Street and NW Drake Street (i.e., complete sidewalk gaps on the south side).	Pedestrian facility gap
P2	Pedestrian improvements on NW 10th Avenue between NW Forest Home Road and NW Elm Street	Add pedestrian improvements to NW 10th Avenue between NW Forest Home Road and NW Elm Street (i.e., complete sidewalk gaps on the north side).	Pedestrian facility gap
P3	Pedestrian improvements on Division Street between NW 6th Avenue and NW 11th Avenue	Add pedestrian improvements to Division Street between NW 6th Avenue and NW 11th Avenue (i.e., complete sidewalk gaps on the west side).	Pedestrian facility gap
P4	Pedestrian improvements on SR 500-SE Union Street between SE 8th Avenue and SE 6th Avenue	Add pedestrian improvements to SR 500-SE Union Street between SE 8th Avenue and SE 6th Avenue (i.e., complete sidewalk gaps on the east side).	Pedestrian facility gap
P5	Pedestrian improvements on NE 2nd Avenue-NE Whitney Street between NE 3rd Avenue and SE James Street	Add pedestrian improvements to NE 2nd Avenue-NE Whitney Street between NE 3rd Avenue and SE James Street (i.e., complete sidewalk gaps on the east side).	Pedestrian facility gap
P6	Pedestrian improvements on SR 500-NE Everett Street between NE 23rd Avenue and Fallen Leaf Lake Park	Add pedestrian improvements to SR 500-NE Everett Street between NE 23rd Avenue and Fallen Leaf Lake Park (i.e., complete sidewalk gaps on both sides).	Pedestrian facility gap
P7	Pedestrian improvements on NW Lake Road between NW Lacamas Lane and the Lacamas Lake Lodge	Add pedestrian improvements to NW Lake Road between NW Lacamas Lane and the Lacamas Lake Lodge (i.e., complete sidewalk gaps on both sides). Included in 2023 six-year Transportation Improvement Program as Priority #4.	Pedestrian facility gap
P8	Pedestrian improvements on NE Umatilla Street between NE Woodburn Drive and SE 15th Street	Add pedestrian improvements to NE Umatilla Street between NE Woodburn Drive and SE 15th Street (i.e., complete sidewalk gaps on the east side). Requires right-of-way acquisition, outside current city limits, in part.	Pedestrian facility gap
P9	Pedestrian improvements on NE 43rd Avenue-SE 15th Street between SR 500-NE Everett Street and SE Crown Road	Add pedestrian improvements to NE 43rd Avenue-SE 15th Street between SR 500-NE Everett Street and SE Crown Road (i.e., complete sidewalk gaps on both sides). Included in 2023 six-year Transportation Improvement Program as Priority #14 and #31.	Pedestrian facility gap

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
P10	Pedestrian improvements on NW Camas Meadows Drive between NE Goodwin Road and NW Payne Street	Add pedestrian improvements to NW Camas Meadows Drive between NE Goodwin Road and NW Payne Street (i.e., complete sidewalk gaps on the south side).	Pedestrian facility gap
P11	Pedestrian improvements on NW Leadbetter Drive between NW Parker Street and NW Lake Road	Add pedestrian improvements to NW Leadbetter Drive between NW Parker Street and NW Lake Road (i.e., complete sidewalk gaps on both sides). Included in 2023 six-year Transportation Improvement Program as Priority #20.	Pedestrian facility gap
P12	Pedestrian improvements on NW Parker Street between NW Leadbetter Drive and NW 38th Avenue	Add pedestrian improvements to NW Parker Street between NW Leadbetter Drive and NW 38th Avenue (i.e., complete sidewalk gaps on the west side).	Pedestrian facility gap
P13	Pedestrian improvements on SE Bybee Road between SE 196th Avenue and the SE Bybee Road realignment	Add pedestrian improvements to SE Bybee Road between SE 196th Avenue and the SE Bybee Road realignment (i.e., complete sidewalk gaps on both sides).	Pedestrian facility gap
P14	Pedestrian improvements on NW Fargo Street between NW Kent Street and NW Fargo Loop	Add pedestrian improvements to NW Fargo Street between NW Kent Street and NW Fargo Loop (i.e., complete sidewalk gaps on the north/east side).	Pedestrian facility gap
P15	Pedestrian improvements on NW 23rd Avenue between NW Astor Street and NW Tanner Street	Add pedestrian improvements to NW 23rd Avenue between NW Astor Street and NW Tanner Street (i.e., complete sidewalk gaps on both sides). Included in 2023 six-year Transportation Improvement Program as Priority #18.	Pedestrian facility gap
P16	Pedestrian improvements on NW 18th Avenue-NW Tidland Street-NW 16th Avenue between NW Whitman Street and NW Brady Road	Add pedestrian improvements to NW 18th Avenue-NW Tidland Street-NW 16th Avenue between NW Whitman Street and NW Brady Road (i.e., complete sidewalk gaps on north/east side). Included in 2023 six-year Transportation Improvement Program as Priority #25 and #26.	Pedestrian facility gap
P17	Pedestrian improvements on NW 10th Avenue west of NW NW Norwood Street	Add pedestrian improvements to NW 10th Avenue west of NW Norwood Street (i.e., complete sidewalk gaps on the south side).	Pedestrian facility gap
Bicycle Projects			
B1	Bicycle improvements on NW Ivy Street-NW 7th Avenue from NW 6th Avenue to NW Drake Street	Add bicycle improvements to NW Ivy Street-NW 7th Avenue from NW 6th Avenue to NW Drake Street (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B2	Bicycle improvements on NW Drake Street between NW 7th Avenue and NW 12th Avenue	Add bicycle improvements to NW Drake Street between NW 7th Avenue and NW 12th Avenue (i.e., restripe with bike lanes).	Bicycle facility gap

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
B3	Bicycle improvements on NW 12th Avenue-Division Street-NE 15th Avenue-NE 18th Avenue-NE 21st Avenue between NW Drake Street and SR 500-NE Everett Street	Add bicycle improvements to NW 12th Avenue-Division Street-NE 15th Avenue-NE 18th Avenue-NE 21st Avenue between NW Drake Street and SR 500-NE Everett Street (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B4	Bicycle improvements on NE 22nd Avenue-NE Ione Street-NE 19th Avenue-NE Oak Street-NE 6th Avenue between SR 500-NE Everett Street and NE Joy Street	Add bicycle improvements to NE 22nd Avenue-NE Ione Street-NE 19th Avenue-NE Oak Street-NE 6th Avenue between SR 500-NE Everett Street and SR 500-NE Joy Street (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B5	Bicycle improvements on NE 6th Avenue-NE Dallas Street-NE Joy Street between NE Adams Street and NE 3rd Avenue	Add bicycle improvements to NE 6th Avenue-NE Dallas Street-NE Joy Street between NE Adams Street and NE 3rd Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B6	Bicycle improvements on NE Woodburn Drive between Laurel Street and the NE Umatilla Street	Add bicycle improvements to NE Woodburn Drive between Laurel Street and the NE Umatilla Street (i.e., widen for bike lanes).	Bicycle facility gap
B7	Bicycle improvements on NE Umatilla Street between NE Woodburn Drive and SE 15th Street	Add bicycle improvements to NE Umatilla Street between NE Woodburn Drive and SE 15th Street (i.e., widen for bike lanes).	Bicycle facility gap
B8	Bicycle improvements on NE 43rd Avenue-SE 15th Street between SR 500-NE Everett Street and SE Crown Road	Add bicycle improvements to NE 43rd Avenue-SE 15th Street between SR 500-NE Everett Street and SE Crown Road (i.e., widen for bike lanes). Included in 2023 six-year Transportation Improvement Program as Priority #14 and #31.	Bicycle facility gap
B9	Bicycle improvements on SE Bybee Road between SE 196th Avenue and the SE Bybee Road realignment	Add bicycle improvements to SE Bybee Road between SE 196th Avenue and the SE Bybee Road realignment (i.e., widen for bike lanes).	Bicycle facility gap
B10	Bicycle improvements on NW Leadbetter Drive between NW Fremont Street and NW Lake Road	Add bicycle improvements to NW Leadbetter Drive between NW Fremont Street and NW Lake Road (i.e., restripe with bike lanes).	Bicycle facility gap
B11	Bicycle improvements on NW Sierra Street between NW Lake Road and NW 43rd Avenue	Add bicycle improvements to NW Sierra Street between NW Lake Road and NW 43rd Avenue (i.e., restripe with bike lanes; requires removal of left-turn lane to NW 44th Avenue; at the NW Lake Road intersection stripe with a southbound bike lane and shared northbound left and right turn-lanes).	Bicycle facility gap

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
B12	Bicycle improvements on NE Fremont Street-NW Leadbetter Parkway-NW Dahlia Drive-NW 29th Avenue-NW Valley Street-NW Utah Street between NW Leadbetter Drive and NW 28th Avenue	Add bicycle improvements to NE Fremont Street-NW Leadbetter Parkway-NW Dahlia Drive-NW 29th Avenue-NW Valley Street-NW Utah Street between NW Leadbetter Drive and NW 28th Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B13	Bicycle improvements on NW 44th Avenue-NW Bass Street-NW 45th Avenue-NW 44th Avenue-NW Lacamas Lane-NW 35th Avenue-NW 34th Avenue-NW Norwood Street between NW Dahlia Drive and NW 28th Avenue	Add bicycle improvements to NW 44th Avenue-NW Bass Street-NW 45th Avenue-NW 44th Avenue-NW Lacamas Lane-NW 35th Avenue-NW 34th Avenue-NW Norwood Street between NW Dahlia Drive and NW 28th Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B14	Bicycle improvements on NW 28th Avenue-NW Fargo Street between NW Sierra Street and NW 18th Avenue	Add bicycle improvements to NW 28th Avenue-NW Fargo Street between NW Sierra Street and NW 18th Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B15	Bicycle improvements on NW 18th Loop between NW 18th Avenue and NW Couch Street	Add bicycle improvements to NW 18th Loop between NW 18th Avenue and NW Couch Street (i.e., restripe with a bike lane on the uphill side).	Bicycle facility gap
B16	Bicycle improvements on NW Sierra Street between NW 28th Avenue and NW 23rd Avenue	Add bicycle improvements to NW Sierra Street between NW 28th Avenue and NW 23rd Avenue (i.e., restripe with bike lanes).	Bicycle facility gap
B17	Bicycle improvements on NW 23rd Avenue between NW Astor Street and NW Sierra Street	Add bicycle improvements to NW 23rd Avenue between NW Astor Street and NW Sierra Street (i.e., widen for bike lanes). Included in 2023 six-year Transportation Improvement Program as Priority #18.	Bicycle facility gap
B18	Bicycle improvements on NW Pacific Rim Drive-NW Endicott Street-NW 37th Avenue between NW Parker Street and NW Dahlia Drive	Add bicycle improvements to NW Pacific Rim Drive-NW Endicott Street-NW 37th Avenue between NW Parker Street and NW Dahlia Drive (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B19	Bicycle improvements on NW Julia Street-NW 26th Avenue-NW Maryland Street-NW Larkspur Street-NW Klickitat Street between NW Pacific Rim Drive and NW 16th Avenue	Add bicycle improvements to NW Julia Street-NW 26th Avenue-NW Maryland Street-NW Larkspur Street-NW Klickitat Street between NW Pacific Rim Drive and NW 16th Avenue (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap

Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
B20	Bicycle improvements on NW Klickitat Street between NW 16th Avenue and NW McIntosh Road	Add bicycle improvements to NW Klickitat Street between NW 16th Avenue and NW McIntosh Road (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
B21	Bicycle improvements on SE Payne Road-NW 18th Avenue-NW Tidland Street-NW 16th Avenue between NW Pacific Rim Boulevard and NW Brady Road	Add bicycle improvements to SE Payne Road-NW 18th Avenue-NW Tidland Street-NW 16th Avenue between NW Pacific Rim Boulevard and NW Brady Road (i.e., widen for bike lanes). Included in 2023 six-year Transportation Improvement Program as Priority #25 and #26.	Bicycle facility gap
B22	Bicycle improvements on NW 10th Avenue between NW 10th Place and NW Drake Street	Add bicycle improvements to NW 10th Avenue between NW 10th Place and NW Drake Street (i.e., pavement markings/ signage designating it as a shared street for bikes).	Bicycle facility gap
Shared Pedestrian and Bicycle Projects			
S1	Shared-use path on NW Brady Road between the City limits and NW McIntosh Road	Create a shared-use path connection along the north side of NW Brady Road between the City limits and NW McIntosh Road. Included in 2023 six-year Transportation Improvement Program as Priority #22.	Pedestrian and bicycle facility gap
S2	Shared-use path between NW 11th Avenue and NW 10th Avenue	Create a shared-use path connection between NW 11th Avenue and NW 10th Avenue. Will require grading, switchbacks and/or stairs to navigate the steep slopes.	Pedestrian and bicycle facility gap
S3	Shared-use path between NW 18th Avenue and NW Brady Road	Create a shared-use path connection between NW 18th Avenue and NW Brady Road.	Pedestrian and bicycle facility gap
S4	Fallen Leaf Lake Park Crossing	Install a pedestrian and bicycle crossing on SR 500-NE Everett Street at Fallen Leaf Lake Park. This improvement includes a continental crossing, a median refuge island and pedestrian crosswalk signs.	Pedestrian and bicycle facility gap
S5	Shared-use path on NE Leadbetter Road between SR 500-NE Everett Street and the Lacamas Lake boat ramp	Create a shared-use path connection along the north side of NE Leadbetter Road between SR 500-NE Everett Street and the Lacamas Lake boat ramp.	Pedestrian and bicycle facility gap
S6	Shared-use path on NE Leadbetter Road between the Lacamas Lake boat ramp and NE 232nd Avenue-Northshore Boulevard	Close NE Leadbetter Road to motor vehicle traffic (except emergency services) between the Lacamas Lake boat ramp and NE 232nd Avenue-Northshore Boulevard and convert the roadway surface to a shared-use path.	Pedestrian and bicycle facility gap
S7	Lacamas Trail SE Crown Road Crossing	Install a pedestrian and bicycle crossing on Crown Road at the Lacamas Trail. As part of this project, extend the sidewalk along the west side of SE Crown Road from Woodburn Elementary to the Lacamas Trail. This improvement includes a continental crossing, a median refuge island and pedestrian crosswalk signs.	Pedestrian and bicycle facility gap

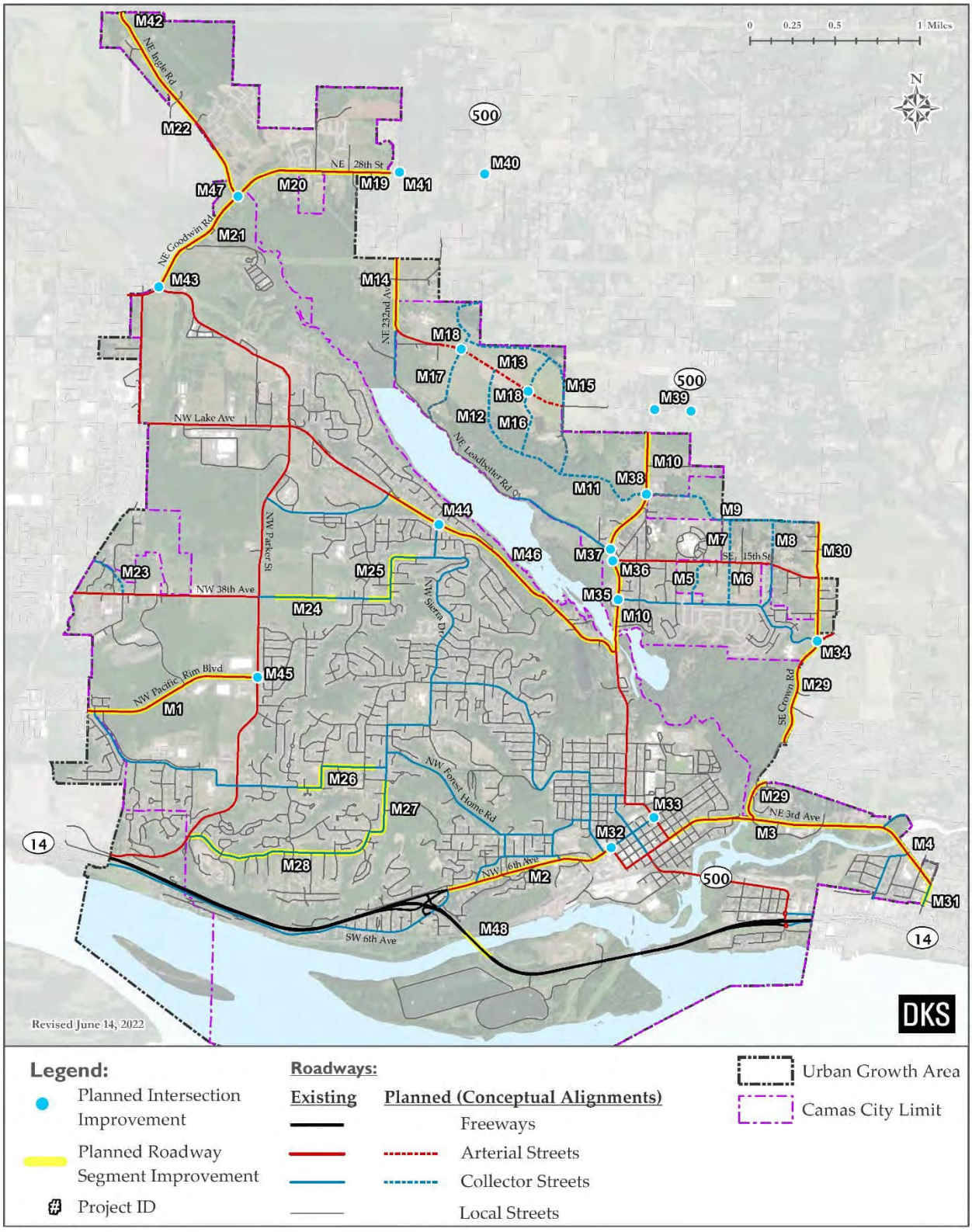
Table 1: Aspirational Project List

ID	Project Description	Project Elements**	Project Purpose
S8	E 1st Avenue Crossing	Install a pedestrian and bicycle crossing on NE 3rd Avenue at E 1st Avenue. This improvement includes a continental crossing, a median refuge island and pedestrian crosswalk signs.	Pedestrian and bicycle facility gap
S9	NE Weir Street Crossing	Install a pedestrian and bicycle crossing on NE 3rd Avenue at NE Weir Street. This improvement includes a continental crossing, a median refuge island and pedestrian crosswalk signs.	Pedestrian and bicycle facility gap

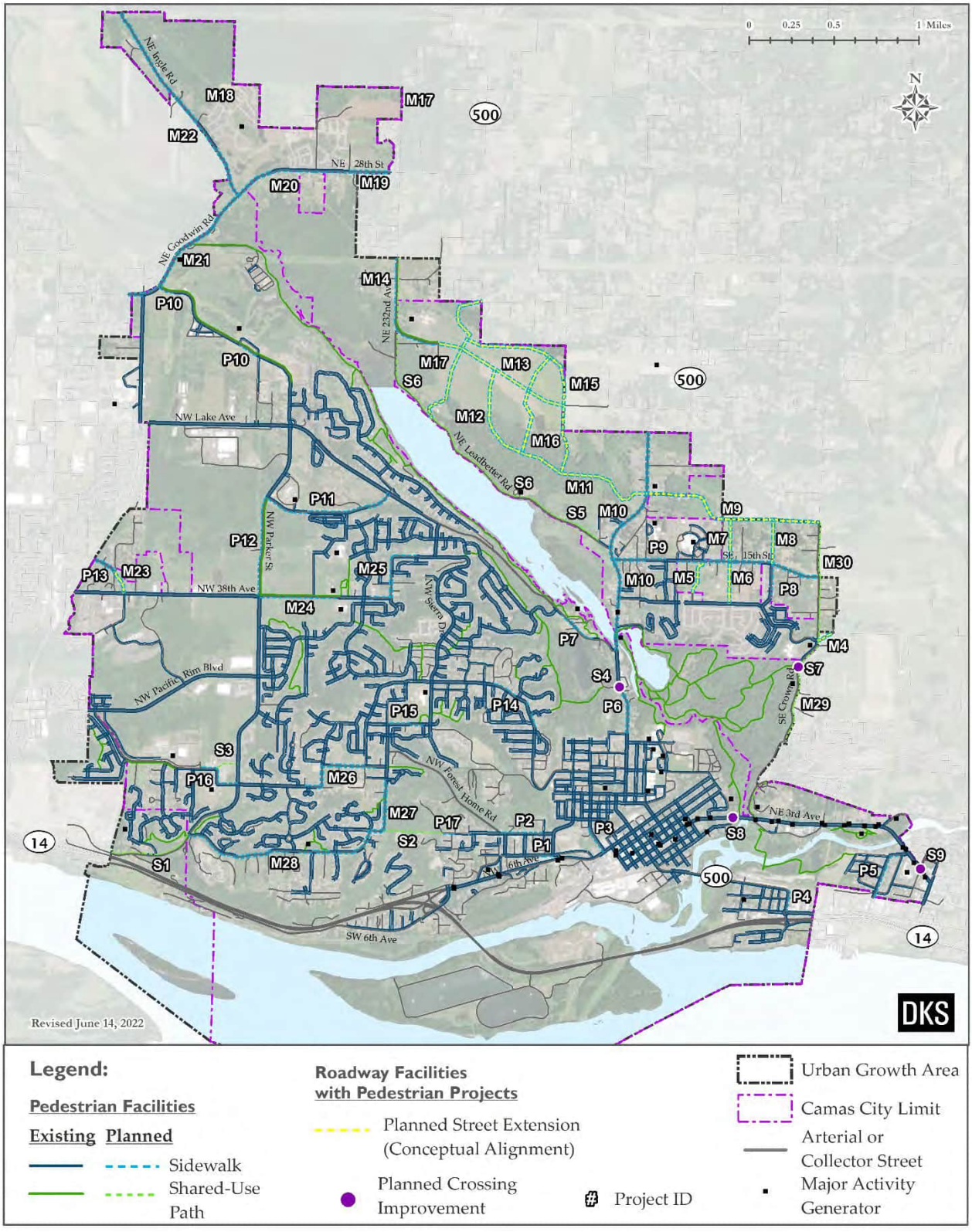
Note: * Project (or a portion of the alignment) is located outside the UGA and is shown for future planning purposes only.

** The project design elements depicted are identified for planning purposes. The actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City and/or WSDOT approval.

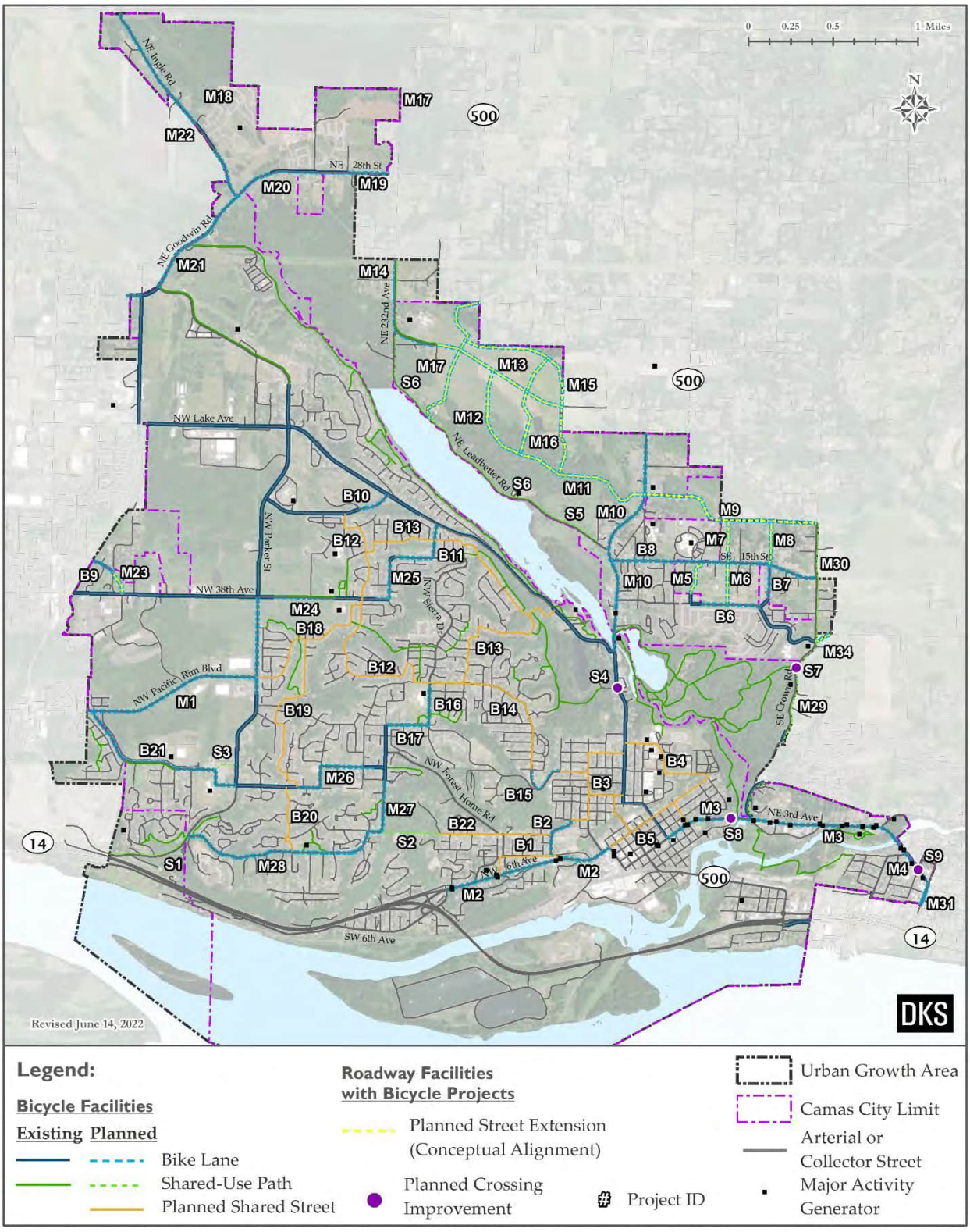
2 Motor Vehicle Projects



3 Pedestrian Projects



4 Bicycle Projects



APPENDIX G. TRAFFIC IMPACT FEE STUDY

City of Camas

Traffic Impact Fee Study

Draft Methodology Report

March 2025

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PURPOSE

The purpose of this memorandum is to describe the Camas Traffic Impact Fee (TIF) methodology that has been developed during the 2024 Transportation System Plan (TSP) update by DKS Associates. This methodology provides a fee update calculated using the prior/current TIF methodology (assuming that there are two districts that will serve the City of Camas) and a new alternative (which considers a citywide fee) with expected levels of trip growth rates and project costs, as described below.

BACKGROUND

An impact fee is a one-time fee paid at the time of development, intended to represent the share of system capacity that will serve growth. Traffic impact fees are authorized under Washington law (RCW 82.02) to promote orderly growth and development. The Washington Growth Management Act allows cities, counties and towns to establish standards, by ordinance, which requires new growth and development to pay a share of the cost of the new facilities needed to serve growth and development. This share of the cost, herein called the "private share," is collected at the time of new development and is one source of funding for the transportation capital improvement program.

The TIF project list provided in **Appendix A** was developed to meet the long-range land use growth goals articulated in the *Camas TSP (Amended 2025).*

Additionally, per RCW 82.02.050, "impact fees (a) can be imposed for system improvements that are reasonably related to the new development; (b) cannot exceed a proportionate share of the costs of system improvements that are reasonably related to the new development, and (c) should be used for system improvements that will reasonably benefit the new development."

The law also provides for "the imposition of an impact fee for system improvement costs previously incurred by a county, city, or town to the extent that new growth and development will be served by the previously constructed improvements provided such fee shall not be imposed to make up for any system improvement deficiencies." If applicable, an existing capacity component of the fee would be made up of the cost of available, unused capacity in the existing system, with possible adjustments for grant-funded and contributed infrastructure. This TIF update is consistent with the prior adopted methodology in that it does not include any additional fees for the existing remaining capacity in the transportation system.

RCW 82.02.070 further requires that impact fee receipts should be earmarked specifically and retained in special interest-bearing accounts, and, absent a compelling reason, must be expended or encumbered for permissible use within ten years of receipt.

The existing Camas transportation impact fee administrative procedures are described in Chapter 3.88 of the Camas Municipal Code. In general, Traffic Impact Fees are calculated using the following formula:

$$\mathbf{TIF = T \times (1\text{-}B\text{-}D) \times C \times A}$$

Whereas:

"TIF" means the traffic impact component of the total development impact fee.

"T" means the average PM peak hour vehicle trip ends for each use, estimated by the current edition of the ITE Trip Generation Manual, computed by taking the size of the development times the PM peak hour trip generation rate.

"B" is the reduction for bypass trips for ITE land use codes in the 800s and 900s estimated by the current edition of the ITE Trip Generation Handbook.

"D" is the reduction for diverted linked trips for ITE land use codes in the 800s and 900s estimated by the current edition of the ITE Trip Generation Handbook.

"C" is the cost per PM peak hour trip end.

"A" is an adjustment to the cost of public facilities within the curb-to-curb section of project capacity improvements for past or future payments made or reasonably anticipated to be made in the form of user fees, debt service payments, taxes, or other payments earmarked for or pro-ratable to traffic system improvements contained in the capital facilities plan. This adjustment is determined to be 10 percent so that "A" equals 90 percent.

RCW 82.02.060 requires that "an adjustment to the cost of the public facilities for past and future payments made or reasonably anticipated to be made by new development to pay for particular system improvements in the form of user fees, debt service payments, taxes, or other payments earmarked for or pro-ratable to the particular system improvement" must be made to the total cost basis. Therefore, additional funding sources such as sales tax revenues, transfers from the general fund etc. must be prorated between the existing population and projected growth. This requirement is met through the TIF adjustment described above in the formula variable "A."

This report provides a traffic impact fee methodology that is consistent with the current Camas TIF program formula which splits the city into north and south service areas as well as an alternative methodology that calculates the fee on a citywide basis.

The recommended maximum Traffic Impact Fee is calculated per PM Peak Hour Vehicle Trip (PHVT) generated, which is calculated by estimating the net cost of applicable improvements and dividing by the estimated number of new trips expected between 2025 and 2045.

The city council may decide to implement the new TIF rate upon adoption of this Technical Document or could instruct city staff to phase-in the new TIF rate over time. A phase-in approach would result in foregone local transportation revenue that would need to be funded by alternative funding sources, such as General Funds or Local Improvement Districts.

GROWTH IN TRIPS

Before determining the total cost of TIF eligible capital projects, the level of future trip growth must be determined. **Exhibit 1** shows the projected growth in PM Peak Hour Vehicle Trips (PHVT), the basis for determining the portion of total costs to be included in the TIF. The amount of PHVT is estimated for 2015, 2025 and forecasted for 2045. The 2025-2045 growth forecast serves as the denominator in the TIF calculation.

Citywide trip growth is assumed to equal 7,129 net new trips by 2045. It is projected that 3,472 of those new trips will be generated in the North District, a 76% growth share. In the more built out South District 3,657 trips are expected to be added which represents a 29% growth share. The overall citywide growth share is estimated at 41%.

Exhibit 1: Projected Trip Growth, City of Camas

Area	Trip-Ends in 2015	Trip Ends in 2040	2015-2040 AGR	Trip Ends 2025 est.	Trip Ends 2045 proj.	New Trip Ends from 2025 to 2045	Average Growth Share
North District	530	3,185	7.43%	1,086	4,558	3,472	76%
South District	7,745	11,786	1.69%	9,162	12,819	3,657	29%
Total	8,276	14,971	2.40%	10,248	17,377	7,129	41%

Source: DKS Associates, 2015-2040 forecast, extrapolated to 2045.

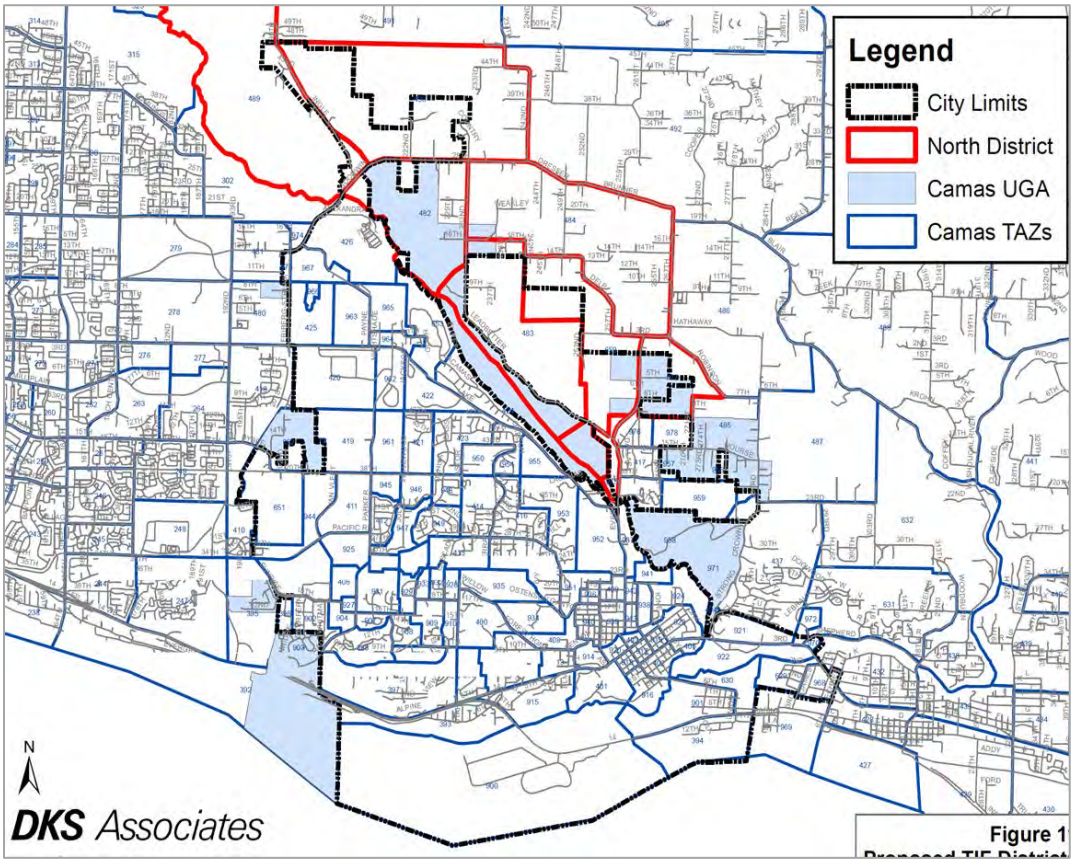

Figure 1

TIF COST BASIS

RCW 82.02.050 specifies that transportation impact fees are to be spent on "system improvements." System improvements can include physical changes to existing roadways, as well as new roadway connections that are built to benefit projected needs of the transportation system. Each project listed in **Appendix A** meets these requirements and are required to meet future growth needs.

The portion of each project facility that is TIF-eligible is calculated by dividing the total capital costs of the identified improvement projects by the projected increase in demand (measured in terms of vehicle trips).

TIFs are collected to pay for a portion of the transportation improvements needed to accommodate traffic resulting from new development. TIFs are paid only for new development or redevelopment which would add trips compared to its current use. The fee is assessed by examining the number of trips expected to be generated from that development. The fees collected can be used to expand existing transportation facilities and to build new facilities.

During the TIF update process, updated cost estimates (in Year 2024 dollars) were developed for facilities needed to address future transportation needs. Some improvements are eligible for TIF funds, while others are not.

TIF eligible projects were determined using the following criteria:

- ✓ Roads classified as principal or minor arterials, and State Highways.
- ✓ Roads that serve primarily citywide trips, regional trips or trips over multiple land uses that serve the majority of trips to and from Camas.
- ✓ Roads that serve to reduce impacts on adjacent facilities.

Frontage improvements and right-of-way outside the curb-to-curb section, including landscaping and sidewalks are not included in TIF calculation. In most instances, the costs of frontage improvements will be borne by the adjacent development.

The TIF eligible cost basis for each cost category listed in **Appendix A** accounts for the total capital cost of the project less safety related project elements, and non-TIF eligible (private share) elements.

In theory, a new collector or arterial roadway that is explicitly needed to serve future growth within the City could be 100% TIF cost eligible (before fee adjustments or credits).

The maximum TIF related 'growth share' for an upgrade to an existing transportation facility, based on **Exhibit 1**, is the percentage of total trips in 2045 that can be attributed to future growth. As discussed above, this is calculated as the net change in trips from 2025 to 2045 divided by future trips in year 2045. This equates to 41% citywide; or 76% in the North District, and 29% in the South District. These figures represent the maximum TIF share that would be used for an add capacity to an existing transportation facility.

Most upgrades to existing transportation facilities will result in significantly less TIF eligible funding. However, the determination of the TIF eligible cost shares and creditable private improvements usually vary from project to project.

City staff compiled the CIP with estimates of total transportation project costs after accounting for improvements that are planned to be constructed between 2025 and 2045 at a total cost of $187.3 million (**Exhibit 2**).

Exhibit 2: Summary of Camas Transportation Projects: 2025-2045

Project Type	Count	Total Cost
Bike	22	$ 21,425,000
DSM	2	$ 450,000
Intermodal	19	$ 64,200,000
Motor Vehicle	29	$ 71,700,000
Pedestrian	17	$ 16,125,000
Shared	9	$ 5,400,000
Transit	1	$ 1,000,000
Total (2024$)	99	$ 180,300,000
Total (2025$)		$ 187,330,000

Source: DKS Associates, Sept. 28, 2024.

TSDC OVERLAY METHODOLOGY

The updated TIF methodology is calculated by determining the City's cost share of the capacity-increasing improvements, which are estimated at $41.7 M in the North District and $48.2 M in the South District) and removing for existing TIF fund balances: estimated at $1.1 M in the North District, and$2.9 M in the South District.

As shown in **Exhibit 3**, the adjusted TIF cost basis for each district is divided by the projected trip growth between 2025 and 2045 (3,472 in the North District, 3,657 in the South District). After accounting for the TIF reduction factor of 10%, the resulting net TIF equates to $10,518 per PHVT in the North District and $11,142 per PHVT in the South District.

Exhibit 3: Camas TIF Calculation: Alt. 1 Two Districts

	North District	*South District*	*Citywide*
Total Capital Facility Costs	$ 76,916,865	$ 110,414,835	$ 187,331,700
Less Non-Capacity Related Facility Costs	$ (35,209,563)	$ (62,248,392)	$ (97,457,955)
Unadjusted Future TIF Project Cost Basis	$ 41,707,302	$ 48,166,443	$ 89,873,745
Less Estimated TIF Fund Balance	$ (1,136,561)	$ (2,895,232)	$ (4,031,793)
Total Current TIF Cost Basis	$ 40,570,741	$ 45,271,211	$ 85,841,952
Growth in Trips	3,472	3,657	7,129
Unadjusted TIF per PM peak hour vehicle trip end	$11,686	$12,379	$12,042
Reduction Factor*	10.0%	10.0%	10.0%
Calculated TIF per PM peak hour vehicle trip end	$10,518	$11,142	$10,838

**Reduction factor reflects estimated additional share of capacity projects (curb-to-curb sections only) funded by non-TIF and/or private sources.*

This calculation represents the maximum defensible impact fees that the City of Camas may adopt in part or in full.

A summary of the maximum defensible TIF for selected land use development types is shown in **Exhibit 4**.

Exhibit 4: Camas TIF for Selected Land Use Type: Alt. 1

Camas TIF Update, Updated Fee Calculations for Selected Development Types (before credits)

Type	Unit	Existing North Fee	Existing South Fee	Updated North Fee	Updated South Fee
Single-family Detached	Dwelling Unit	$10,633	$4,102	$9,293	$9,845
Apartments	Dwelling Unit	$5,972	$2,273	$3,856	$4,084
Duplexes/Townhomes	Dwelling Unit	$6,391	$2,433	$5,042	$5,341
ADU (Internal)*	Dwelling Unit	$2,593	$987	$3,233	$3,425
ADU (External)**	Dwelling Unit	$3,630	$1,382	$4,554	$4,824
Commercial	PM Peak Hour Trip	$10,633	$4,102	$10,518	$11,142

**Calculated based on a 0.71 factor applied to ITE Code 223 per 11th Edition of Trip Generation*
***Calculated based on current city policy ratio of 0.41 x SFD trip rate; also applies to affordable housing units*
Note: TIF charges may be exempted by council policy for ADUs and affordable housing units.

TSDC CITYWIDE METHODOLOGY

The citywide alternative TIF methodology is calculated by determining the City's cost share of the capacity improvements ($89.9 M) and removing for existing TIF fund balance ($4 M). As shown in **Exhibit 5**, the adjusted TIF cost basis is divided by the projected trip growth between 2025 and 2045 (7,129). The resulting net TIF equates to $10,838 per PHVT citywide.

Exhibit 5: Citywide Camas Transportation Impact Fee Calculation: Alt. 2

		Single District
Total Capital Facility Costs	$	187,331,700
Less Non-Capacity Related Facility Costs	$	(97,457,955)
Unadjusted Future Project Cost Basis	$	89,873,745
Less Estimated TIF Fund Balance	$	(4,031,793)
Updated Future TIF Cost Basis	$	85,841,952
(a) Unadusted Future TIF cost basis share of total cost		*48.0%*
(b) Recent Avg. City Share of Future Curb-to-Curb Cost		*46.3%*
Total Current TIF Cost Basis	**$**	**85,841,953**
Growth in Trips (PMPHVT)		**7,129**
Unadjusted TIF per PM peak hour vehicle trip end	$	12,041.83
Reduction Factor*		10.0%
Reduction Amount	$	(1,204.18)
Calculated TIF per PM peak hour vehicle trip end	**$**	**10,837.65**

**Reduction factor reflects estimated additional share of capacity projects (curb-to-curb sections only) funded by non-TIF and/or private sources.*

This calculation represents the maximum defensible impact fees that the City of Camas may adopt in part or in full.

A summary of the maximum defensible TIF for selected land use development types is shown in **Exhibit 6,** with amounts rounded to the nearest dollar.

Exhibit 6: Camas TIF for Selected Land Uses: Alt. 2 One Service District

Camas TIF Update, Updated Fee Calculations for Selected Development Types (before credits)

Type	Unit	Existing North Fee	Existing South Fee	Updated Citywide Fee
Single-family Detached	Dwelling Unit	$10,633	$4,102	$10,187
Apartments (low rise)	Dwelling Unit	$6,122	$2,362	$5,196
Duplexes/Townhomes	Dwelling Unit	$6,551	$2,527	$5,196
ADU (Internal)*	Dwelling Unit	$2,658	$1,025	$3,544
ADU (External)**	Dwelling Unit	$3,721	$1,436	$4,992
Commercial	PM Peak Hour Trip	$10,740	$4,143	$10,838

**Calculated based on a 0.71 factor applied to ITE Code 223 per 11th Edition of Trip Generation*
***Calculated based on current city policy ratio of 0.41 x SFD trip rate; also applies to affordable housing units*
Note: TIF charges may be exempted by council policy for ADUs and affordable housing units.

FEES BY HOME SIZE

New Washington State law requires a scaling impact fee schedule for impact fees charged to residential dwelling units. This is discussed in RCW 82.02.060(1), which states that the schedule for TIFs "shall reflect the proportionate impact of new housing units… based on the square footage, number of bedrooms, or trips generated." Per the same code section, this scaling requirement is intended "to produce a proportionally lower impact fee for smaller housing units." This requirement is not just for single-family dwelling units, but also for multi-family dwelling units.

One approach for scaling the TIF is to estimate the smallest dwelling unit size (inclusive of single-family and multi-family dwelling units) necessary to accommodate one resident in Camas, and thereby calculate the TIF per dwelling unit as a per square foot charge. The Census Bureau's statistics from the American Community Survey state that the average occupancy per dwelling unit in Camas in 2020 was 2.78. Per Clark County Assessor's data, the City's estimated average dwelling unit size (inclusive of both single-family and multi-family dwelling units) is 2,277 square feet. That means that, on average, 738 square feet accommodates one resident, and 1 square foot will accommodate 0.0014 residents.

American Housing Survey data for the Portland Metro Area shows that, to a point, house size is positively correlated with the number of occupants. After about 2,605 square feet, that correlation dissipates. Therefore, we recommend that the City scale its transportation impact fee for residential developments up to a maximum of 2,605 square feet. Using the citywide approach detailed below as an example, scaling would set a minimum TIF of $2,625 for dwelling units at 738 square feet or less, and a maximum TIF of $9,265 at 2,605 square feet or more. Each intermediate square foot would increase the TIF by $3.56. The approach for each scenario is summarized in **Exhibit 7** below.

Exhibit 7: Scaled Residential TIF Calculations

Needs to be updated

North Area Aproach

TIF Schedule for a Single-Family Home	Square Feet	Residents	TIF
TIF per resident	738	1.0000	$4,534
TIF per square foot of single-family residence	1	0.0014	$6.14
Maximum SDC per single-family residence	2,605	3.5294	$16,001

South Area Aproach

TIF Schedule for a Single-Family Home	Square Feet	Residents	TIF
TIF per resident	738	1.0000	$1,132
TIF per square foot of single-family residence	1	0.0014	$1.53
Maximum SDC per single-family residence	2,605	3.5294	$3,994

Citywide Aproach

TIF Schedule for a Single-Family Home	Square Feet	Residents	TIF
TIF per resident	738	1.0000	$2,625
TIF per square foot of single-family residence	1	0.0014	$3.56
Maximum SDC per single-family residence	2,605	3.5294	$9,265

Source: ITE Manual, 11th Edition, and U.S. Census, American Community Survey, Portland-Vancouver MSA

The City can use the summary provided in **Exhibit 8** to generate a TIF schedule to be applied to both single-family and multi-family residential units based on their total square footage (SF). **Exhibit 8** provides an example of such a schedule where housing units are sorted into different SF ranges, with each range being assigned a SF for the purpose of calculating the TIF.

Exhibit 8: Scaled Single Family Residential TIF Schedule

Needs to be updated

Dwelling Floor Area (Sq. Ft.)	Uniform Citywide Alt.	Two District Alt.	
		North District	South District
< 1,000	$3,002	$5,184	$1,294
1,000-2,000	$4,890	$8,445	$2,108
2,001 to 2,605	$8,317	$14,364	$3,585
>2,606	$9,265	$16,001	$3,994

Source: Previous Tables

In addition to requirements for scaling laid out in RCW 82.02.060(1), state law also puts restrictions on the impact fees that can be charged to accessory dwelling units (ADUs). Per RCW 36.70A.681(a), the city may not assess impact fees on ADUs that are greater than 50 percent of the charge assessed to the principal or standard size dwelling unit. Therefore, if the City implements a scaling schedule as laid out in **Exhibit 8**, the City should also ensure that its code limits the charge for an ADU to 50 percent of the charge assessed to the principal dwelling unit.

APPENDIX A – PROJECT CAPACITY SHARE PERCENTAGES CALCULATED BY TRIP DISTRIBUTION

Needs to be updated

APPENDIX B – PROPOSED TIF RATE SCHEDULE: FY 2026

APPENDIX C - WASHINGTON REQUIREMENTS FOR FEES BY HOME SIZE

RCW 82.02.060

Impact fees—Local ordinances—Required provisions—Exemptions.

The local ordinance by which impact fees are imposed:

(1) Shall include a schedule of impact fees which shall be adopted for each type of development activity that is subject to impact fees, specifying the amount of the impact fee to be imposed for each type of system improvement. The schedule shall be based upon a formula or other method of calculating such impact fees. The schedule shall reflect the proportionate impact of new housing units, including multifamily and condominium units, based on the square footage, number of bedrooms, or trips generated, in the housing unit in order to produce a proportionally lower impact fee for smaller housing units. In determining proportionate share, the formula or other method of calculating impact fees shall incorporate, among other things, the following:

(a) The cost of public facilities necessitated by new development;

(b) An adjustment to the cost of the public facilities for past or future payments made or reasonably anticipated to be made by new development to pay for particular system improvements in the form of user fees, debt service payments, taxes, or other payments earmarked for or proratable to the particular system improvement;

(c) The availability of other means of funding public facility improvements;

(d) The cost of existing public facilities improvements; and

(e) The methods by which public facilities improvements were financed;

(2) May provide an exemption for low-income housing, and other development activities with broad public purposes, including development of an early learning facility, from these impact fees, provided that the impact fees for such development activity shall be paid from public funds other than impact fee accounts;

(3)(a) May not impose an impact fee on development activities of an early learning facility greater than that imposed on commercial retail or commercial office development activities that generate a similar number, volume, type, and duration of vehicle trips;

(b) When a facility or development has more than one use, the limitations in this subsection (3) or the exemption applicable to an early learning facility in subsections (2) and (4) of this section only apply to that portion that is developed as an early learning facility. The impact fee assessed on an early learning facility in such a development or facility may not exceed the least of the impact fees assessed on comparable businesses in the facility or development;

(4) May provide an exemption from impact fees for low-income housing or for early learning facilities. Local governments that grant exemptions for low-income housing or for early learning facilities under this subsection (4) may either: Grant a partial exemption of not more than eighty percent of impact fees, in which case there is no explicit requirement to pay the exempted portion of the fee from public funds other than impact fee accounts; or provide a full waiver, in which case the

remaining percentage of the exempted fee must be paid from public funds other than impact fee accounts, except as provided in (b) of this subsection. These exemptions are subject to the following requirements:

(a) An exemption for low-income housing granted under subsection (2) of this section or this subsection (4) must be conditioned upon requiring the developer to record a covenant that, except as provided otherwise by this subsection, prohibits using the property for any purpose other than for low-income housing. At a minimum, the covenant must address price restrictions and household income limits for the low-income housing, and that if the property is converted to a use other than for low-income housing, the property owner must pay the applicable impact fees in effect at the time of conversion;

(b) An exemption for early learning facilities granted under subsection (2) of this section or this subsection (4) may be a full waiver without an explicit requirement to pay the exempted portion of the fee from public funds other than impact fee accounts if the local government requires the developer to record a covenant that requires that at least 25 percent of the children and families using the early learning facility qualify for state subsidized child care, including early childhood education and assistance under chapter 43.216 RCW, and that provides that if the property is converted to a use other than for an early learning facility, the property owner must pay the applicable impact fees in effect at the time of conversion, and that also provides that if at no point during a calendar year does the early learning facility achieve the required percentage of children and families qualified for state subsidized child care using the early learning facility, the property owner must pay 20 percent of the impact fee that would have been imposed on the development had there not been an exemption within 90 days of the local government notifying the property owner of the breach, and any balance remaining thereafter shall be a lien on the property; and

(c) Covenants required by (a) and (b) of this subsection must be recorded with the applicable county auditor or recording officer. A local government granting an exemption under subsection (2) of this section or this subsection (4) for low-income housing or an early learning facility may not collect revenue lost through granting an exemption by increasing impact fees unrelated to the exemption. A school district who receives school impact fees must approve any exemption under subsection (2) of this section or this subsection (4);

(5) Shall provide a credit for the value of any dedication of land for, improvement to, or new construction of any system improvements provided by the developer, to facilities that are identified in the capital facilities plan and that are required by the county, city, or town as a condition of approving the development activity;

(6) Shall allow the county, city, or town imposing the impact fees to adjust the standard impact fee at the time the fee is imposed to consider unusual circumstances in specific cases to ensure that impact fees are imposed fairly;

(7) Shall include a provision for calculating the amount of the fee to be imposed on a particular development that permits consideration of studies and data submitted by the developer to adjust the amount of the fee;

(8) Shall establish one or more reasonable service areas within which it shall calculate and impose impact fees for various land use categories per unit of development;

(9) May provide for the imposition of an impact fee for system improvement costs previously incurred by a county, city, or town to the extent that new growth and development will be served by the previously constructed improvements provided such fee shall not be imposed to make up for any system improvement deficiencies; and

(10) Must adopt or amend by ordinance, and incorporate into their development regulations, zoning regulations, and other official controls the requirements of this section to take effect six months after the jurisdiction's next periodic comprehensive plan update required under RCW 36.70A.130.

For purposes of this section, "low-income housing" means housing with a monthly housing expense, that is no greater than thirty percent of eighty percent of the median family income adjusted for family size, for the county where the project is located, as reported by the United States department of housing and urban development.

For the purposes of this section, "early learning facility" has the same meaning as in RCW 43.31.565.

Appendix J: Facility Conditions Assessment, Volume 1

City of Camas

Facility Condition Assessment

Volume 1: Executive Summary Report

Prepared by MENG Analysis

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Executive Summary

Introduction

In 2021, the City of Camas, Washington engaged MENG Analysis to complete a comprehensive facility condition assessment (FCA). The purpose of this assessment is to assist City staff in organizing & prioritizing maintenance backlog needs while supporting future-focused proactive facility management. Proactive facility management includes but is not limited to, planning and budgeting for short-term correction of Observed Deficiencies (ODs), and long-term major maintenance, referred to in this report as Predicted Renewals (PRs).

The surveyed facilities included 17 buildings on 11 sites. The total square footage of the surveyed buildings is just under 276,000 SF.

FCA Stats

Number of Surveyed Buildings 17	**Total SF Surveyed** 276K
Total Replacement Value of Facilities (2022 dollars) $61M	**Long-term Needs 2028-2041** $18M
2022-2027 Deficiencies $17M	**Priority[1] Needs 6 Years** $6.3M

Report Organization

This Executive Summary Report (Volume 1) presents an introduction and overview to the Facility Condition assessment process as well as summary findings across all facilities. The Facility Detail Report (Volume 2) contains the database-generated subsystem level reports.

Terminology and Abbreviations

To aid in understanding the data and concepts presented in this report, the following list includes definitions of common terms and abbreviations related to the FCA process.

Facility Condition Assessment (FCA): A structured process to document the conditions of site infrastructure and building systems. FCAs are typically performed by a multi-disciplinary team of architects, engineers, construction, and cost specialists. Facility information and condition data should be maintained in a database for ease of updating and reporting. The data should be renewed over time.

[1] Priority needs include life-safety and code issue deficiencies

Facility Condition Index (FCI): A benchmark used to compare relative condition of facilities within a portfolio of assets; derived by the following formula:

Note: There are a number of different methods used by various organizations to calculate that backlog. For this reason, using FCIs to compare City of Camas facilities to other organizations may not represent accurate equivalency.

$$FCI = \frac{\text{Backlog of Maintenance \& Repair (BMAR)}}{\text{Current Replacement Value (CRV)}}$$

This assessment uses a parametric method that calculates BMAR based on the assessed condition scores. The statistical basis is a study conducted by NASA on over 10,000 surveyed facilities that evaluated the backlog of repair items relative to qualitative condition scores 1 through 5. The parametric backlog for each system is calculated based on a statistical theoretical percentage of that system that would need repair or replacement for each of the qualitative condition scores. The costs of those systems are the facility use cost models customized for Camas. It should also be noted that we continually update our cost models based on current market conditions, so the CRV values in this report will differ from those presented in earlier reports.

Predicted Renewal Model: A theoretical forecast of when building systems will exceed their typical lifespan and funding will be required for renewals.

Remaining Useful Life: An estimate of the years that a facility system may remain serviceable or in operation before failure; which would then require system renewal or replacement.

Subsystem: The term subsystem in this report refers to a Uniformat Level 3 building systems category (e.g., B3010 - Roof Coverings; or B3020 – Roof Opening; or B3030 – Projections).

System: The term system in this report refers to a Uniformat Level 2 building system category (e.g., B30 – Roofing)

Commonly Used Abbreviations

AC = Asphalt concrete
ACT = Acoustic ceiling tile
A/V = Audio/video
AHU = Air handling unit
ASHRAE = American Society of Heating, Refrigeration, & Air Conditioning Engineers
BUR = Built-up roofing
CCTV = Closed circuit television
CFH = Cubic feet per hour (of natural gas)
CFL = Compact fluorescent
CI = Cast iron
CMU = Concrete masonry unit
CO2 = Carbon dioxide
CU = Condensing unit
Cx = Commissioning
DDC = Direct digital control
DHW = Domestic hot water
Dx = Direct expansion
EA = Each (measurable unit)
EF = Exhaust fan
EFIS = Exterior insulation finishing system
FRP = Fiber reinforced plastic
GI = Grease interceptor
GSHP = Ground-source heat pump
HID = High intensity discharge (lamps)
HM = Hollow metal
HVAC = Heating, ventilating, and air conditioning
IT = Information technology
LF = Linear feet (measurable unit)
LED = Light emitting diode
LS = Lump sum (measurable unit)

MDF = Main distribution frame
OWS = Oil/water separator
PA = Public address
P-lam = Plastic laminate
PRV = Pressure regulating valve
PTAC = Packaged terminal air conditioning
Psig = Pounds per square inch (pressure)
SS = Stainless Steel
PVC = Polyvinyl chloride
RTU = Roof top unit
RPBP = Reduced pressure backflow preventer
SF = Square feet (measurable unit)
UPS = Uninterruptible power supply
VAV = Variable air volume
VCT = Vinyl composite tile
VWC = Vinyl wall covering
VOIP = Voice over internet protocol
WAP = Wireless access point
WD = Wood

List of Surveyed Facilities

Table 1 lists the facilities surveyed during this project.

Table 1. List of Surveyed Facilities

Site	Facility	Address	Bldg Area (sf)
Fire Station 42	Fire Station 42	4321 NW Parker Street Camas, WA 98607	12,069
Police Station	Police Station	2100 NE 3rd Ave Camas, WA 98607	23,100
City Hall - Station 41	City Hall - Station 41	616 NE 4th Ave Camas, WA 98607	28,080
City Hall Annex	City Hall Annex	528 NE 4th Ave Camas, WA 98607	10,000
Public Works Operations Center	Public Works Operations Center	1620 SE 8th Ave Camas, WA 98607	21,190
Public Works Operations Center	Mobile Office	1620 SE 8th Ave Camas, WA 98607	
Community Center	Community Center	1718 SE 7th Ave Camas, WA 98607	21,420
Library	Library	625 NE 4th Ave Camas, WA 98607	36,500
Wastewater Treatment Plant	Equipment Building	1129 SE Polk Street Camas, WA 98607	4,250
Wastewater Treatment Plant	Bio-solids Dryer Building	1129 SE Polk Street Camas, WA 98607	3,670
Wastewater Treatment Plant	Digester Building	1129 SE Polk Street Camas, WA 98607	3,420
Wastewater Treatment Plant	Control Building	1129 SE Polk Street Camas, WA 98607	1,630
Wastewater Treatment Plant	Main Office	1129 SE Polk Street Camas, WA 98607	1,770

Site	Facility	Address	Bldg Area (sf)
Wastewater Treatment Plant	UV Building	1129 SE Polk Street Camas, WA 98607	3,360
Fire Station 43	Fire Station 43	1400 A St. Washougal, WA 98671	8,496
Scout Hall	Scout Hall	621 NE 15th Ave Camas, WA 98607	1,200
Lacamas Lake Lodge	Lacamas Lake Lodge	227 NW Lake Road Camas, WA 98607	4,615

Condition Summary

Methodology

The field survey team included architects & engineers with expertise in building assessment who reviewed civil, structural, architectural, mechanical, electrical, plumbing, and site infrastructure systems to a Uniformat Level 3 detail[2]. These descriptions and scores are the basis for generating the Facility Condition Index (FCI), and Weighted Average Condition Score (WACS). Costs were developed by an experienced cost estimator familiar with the regional construction market & construction practices. The costs shown in this report are based on market rates, and not on prevailing wage requirements from the State of Washington.

Facility Condition Index (FCI)

A Facility Condition Index (FCI) is an industry standard used for benchmarking and evaluating a portfolio of facility assets over time[3]. The FCI is the ratio between a facility's Backlog of Maintenance and Repair (BMAR) and the Current Replacement Value (CRV) of the facility. Therefore, the lower the FCI, the lower the cost of maintenance backlog in relation to the cost of a full building replacement.

Common industry practice is to create a scale for interpreting the FCI as a way to prioritize facility needs. Most organizations adjust their classifications of FCI to relate to their own unique criteria. For this project, we suggest the following FCI breakdown to support decision making.

- Excellent = 0.00 – 0.05 (5%)
- Good = 0.06 – 0.10 (6% – 10%)
- Fair = 0.11 – 0.20 (11% – 20%)
- Poor = 0.21 – 0.25 (21% – 25%)
- Critical = 0.26 (26% or greater)

Weighted Average Condition Score (WACS)

Every surveyed building is broken down into Uniformat categories, systems, and subsystems. The surveyors use standard criteria for scoring each subsystem from 1 to 5, where 1 is Excellent, and 5

[2] http://www.uniformat.com/index.php/classification-of-building-elements

[3] Since 1999 GASB 34 has required government agencies to improve Basic Financial Statements, including periodic Condition Assessment of capital assets; subsequent protocols were developed by GSA, NASA, States, NCUBO and others with most sharing similar definitions of BMAR, CRV & FCI.

is Unsatisfactory[4]. These subsystem scores are combined to a weighted average (based on importance) to the system level. A similar weighed calculation is performed at the category level, resulting in a 1-5 score for the building as a whole. This is called the Weighted Average Condition Score (WACS).

For both WACS and FCI, the lower the number, the better the condition, or relative condition.

Table 2. FCI and WACS

Facility	FCI	WACS
City Hall / Station 41	0.20	3.15
City Hall Annex	0.26	3.43
Community Center	0.26	3.45
Fire Station 42	0.13	2.78
Fire Station 43	0.13	2.83
Lacamas Lake Lodge	0.07	2.21
Library	0.12	2.68
Police Station	0.11	2.53
Mobile Office	0.16	3.11
Public Works Operations Center	0.13	2.76
Scout Hall	0.20	3.54
Wastewater Treatment Plant		
Bio-solids Dryer Building	0.07	2.52
Control Building	0.05	3.04
Digester Building	0.06	2.38
Equipment Building	0.17	3.24
Main Office	0.11	2.69
UV Building	0.09	2.71

Cost Overview

Estimated costs are *calculated* for short-term Observed Deficiencies (ODs) and *modeled* for long-term Predicted Renewals (PRs). The deficiency costs in the Facility Details Report show direct costs plus typical construction markups as well as project development markups (design, management, etc.).

Table 3 shows the total deficiencies and predicted renewals for each facility.

[4] A full description of the scoring metrics for all subsystems can be provided upon request.

Table 3. Total ODs and PRs by Facility

Facility	Predicted Renewals 2028-2041	Observed Deficiency 2022-2027
City Hall / Station 41	$3,518,800	$2,804,000
City Hall Annex	$809,600	$1,102,000
Community Center	$991,600	$2,653,000
Fire Station 42	$1,494,000	$572,000
Fire Station 43	$1,958,400	$448,000
Lacamas Lake Lodge	$420,500	$184,000
Library	$4,232,600	$1,763,000
Police Station	$2,464,800	$538,000
Mobile Office	$45,300	$51,000
Public Works Operations Center	$1,227,300	$898,000
Scout Hall	$121,200	$259,000
Bio-solids Dryer Building	$75,200	$101,000
Control Building	$46,600	$228,000
Digester Building	$73,100	$135,000
Equipment Building	$94,400	$968,000
Main Office	$142,600	$155,000
UV Building	$62,800	$1,215,000

Observed Deficiencies

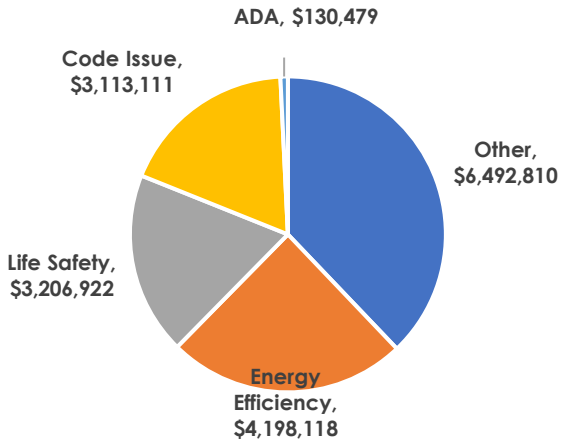
For a notable issue to be considered an Observed Deficiency (OD), the surveyor must think that the issue needs to be addressed within the next 5-year period, with an expected direct cost of $5,000 or greater. Each deficiency is assigned an action type to help prioritize the order in which it should be addressed. The following pie chart shows the ODs broken out by action type.

For the 2021 FCA, ODs total approximately $17M.

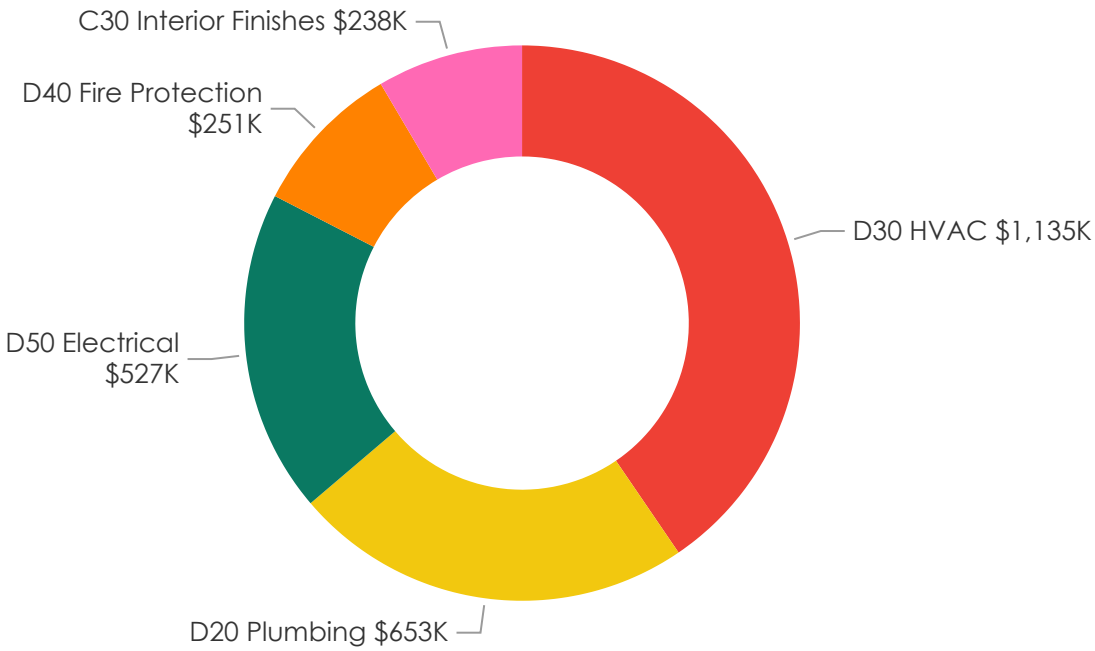
Priority ODs are those in the "Life Safety" and "Code Issue" categories, which total approximately $6.3M. Detailed descriptions, photos, and cost estimates of these deficiencies can be found in the Facility Details Report (Volume 2).

Pages 7 to 15 show a graphic representation of the ODs by Site, broken out to Uniformat Level 2 Systems. These graphics can be viewed in greater detail in the Microsoft BI Dashboard that accompanies this report.

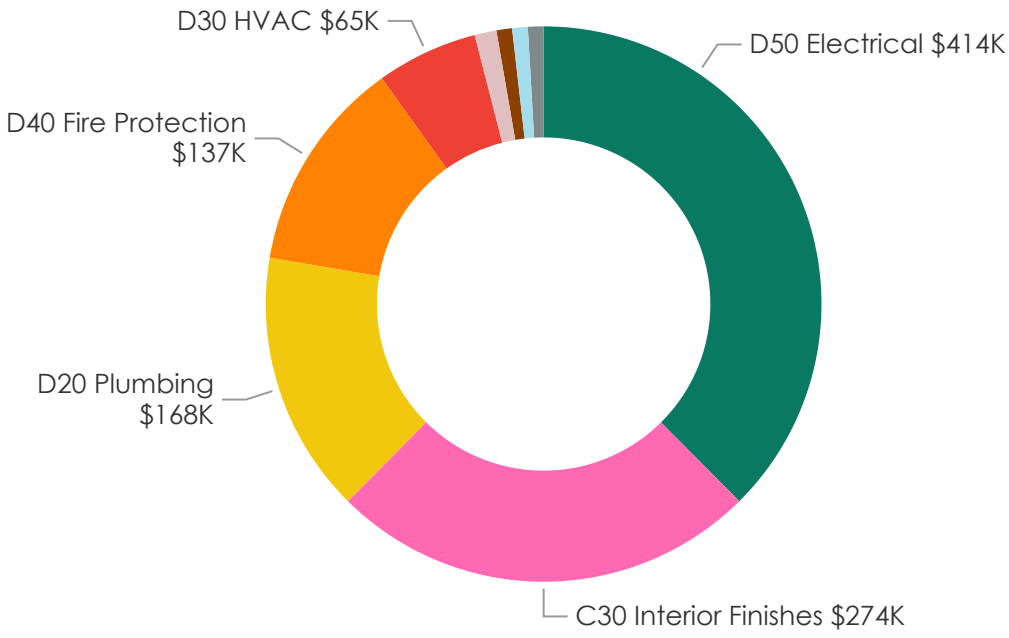
Figure 1. Deficiencies by Action Type



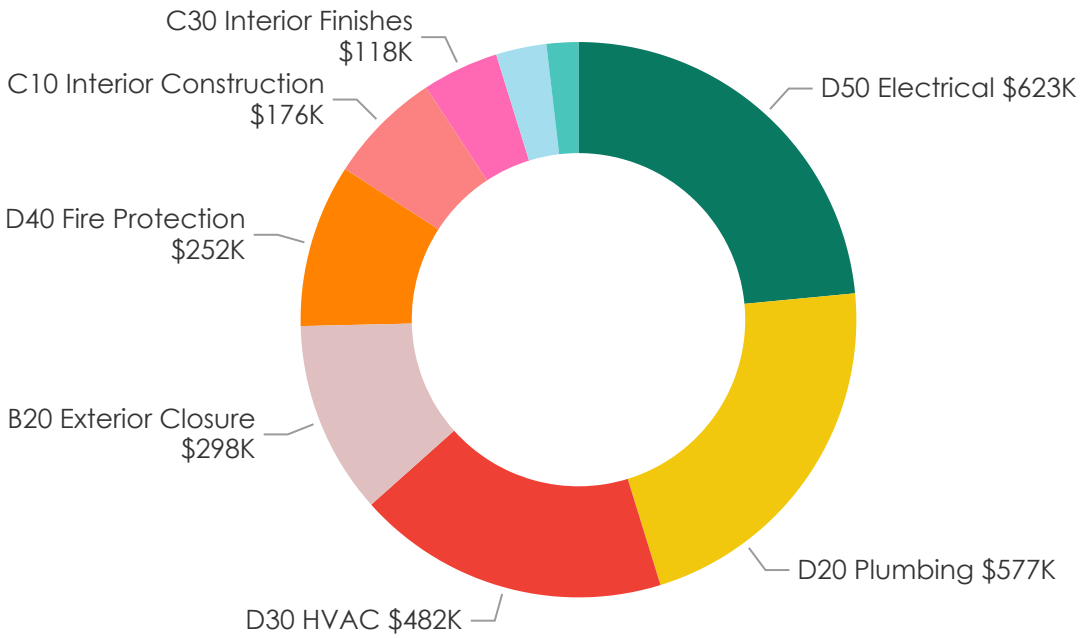
City Hall / Station 41



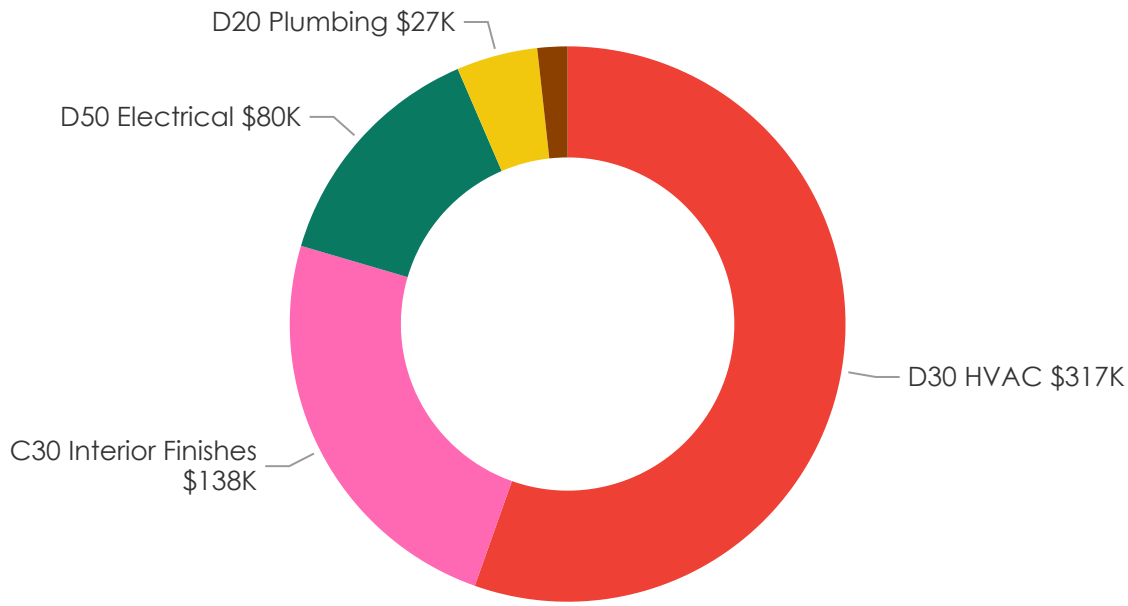
City Hall Annex



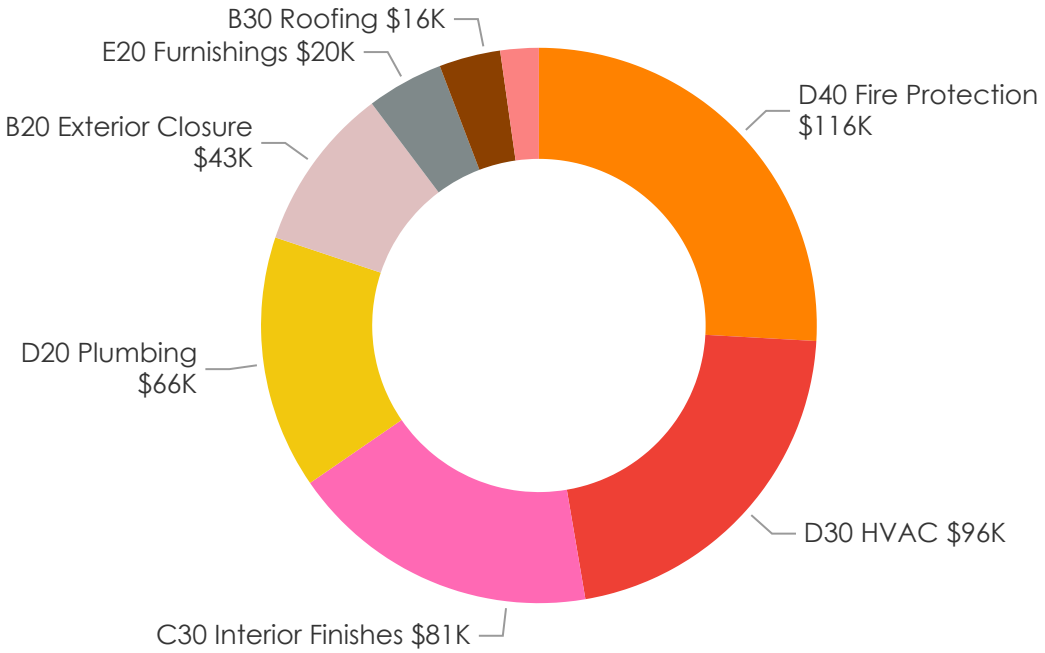
Community Center



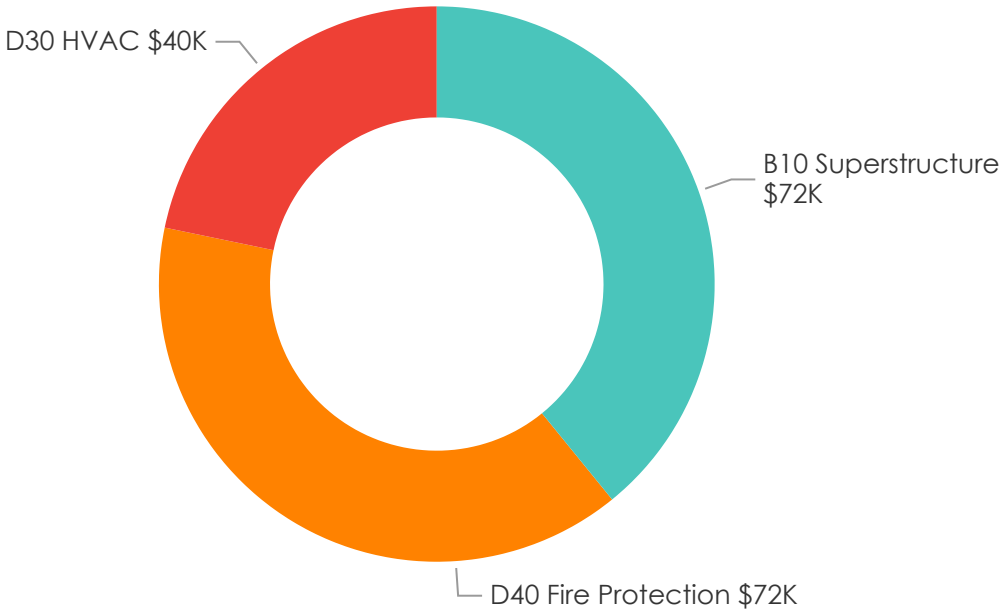
Fire Station 42



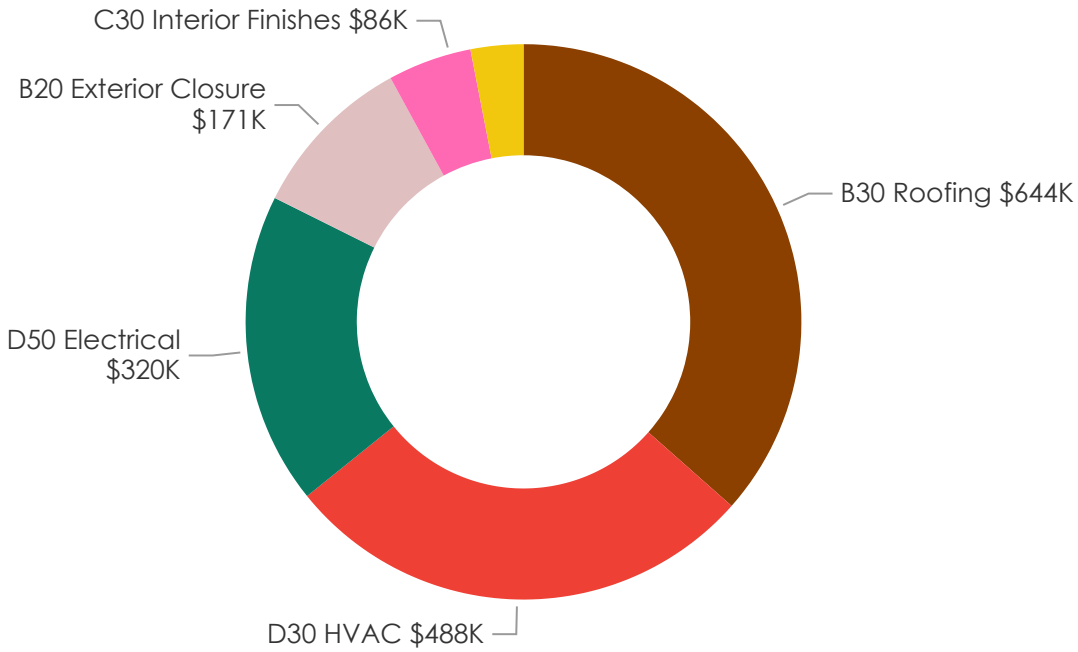
Fire Station 43



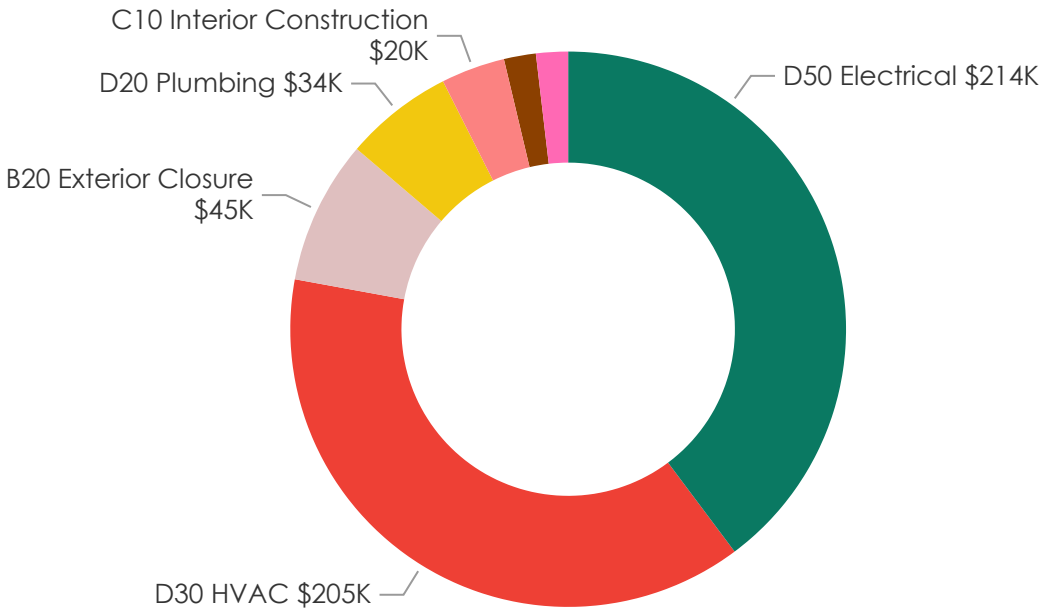
Lackamas Lake Lodge



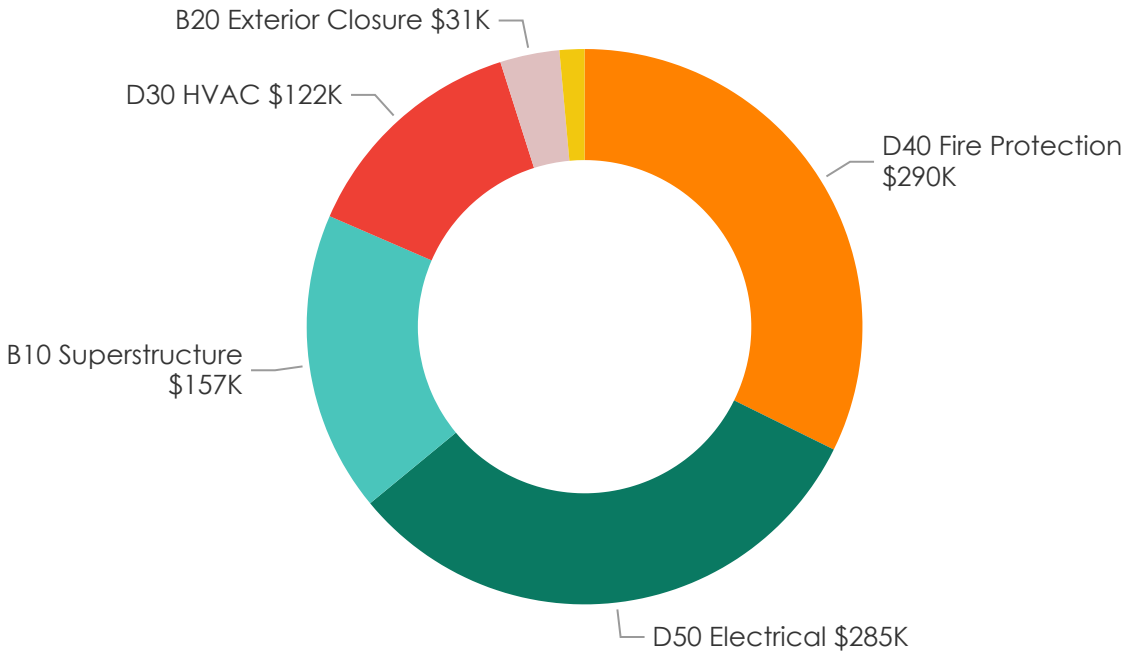
Library



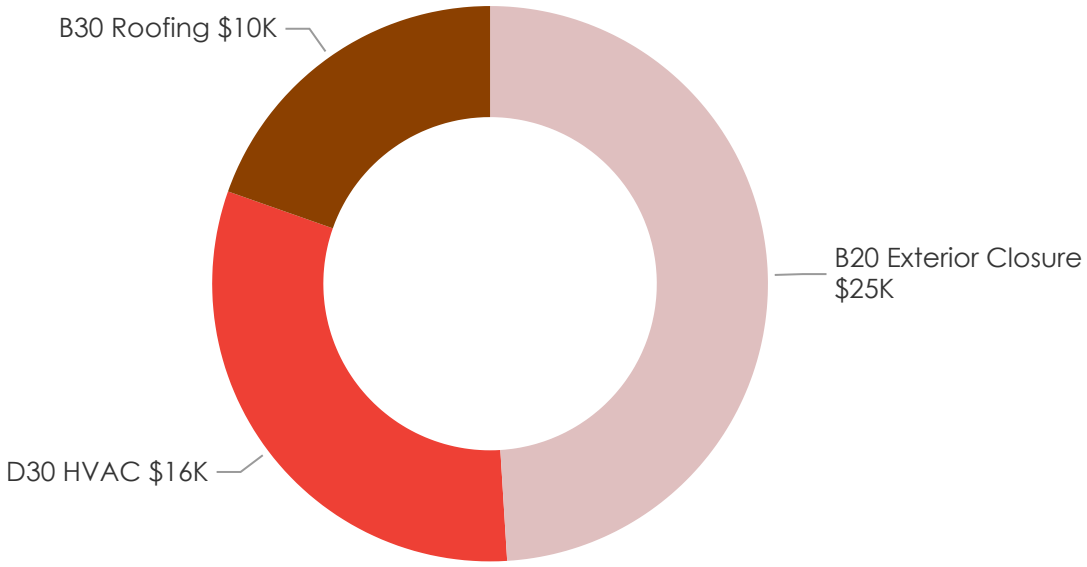
Police Station



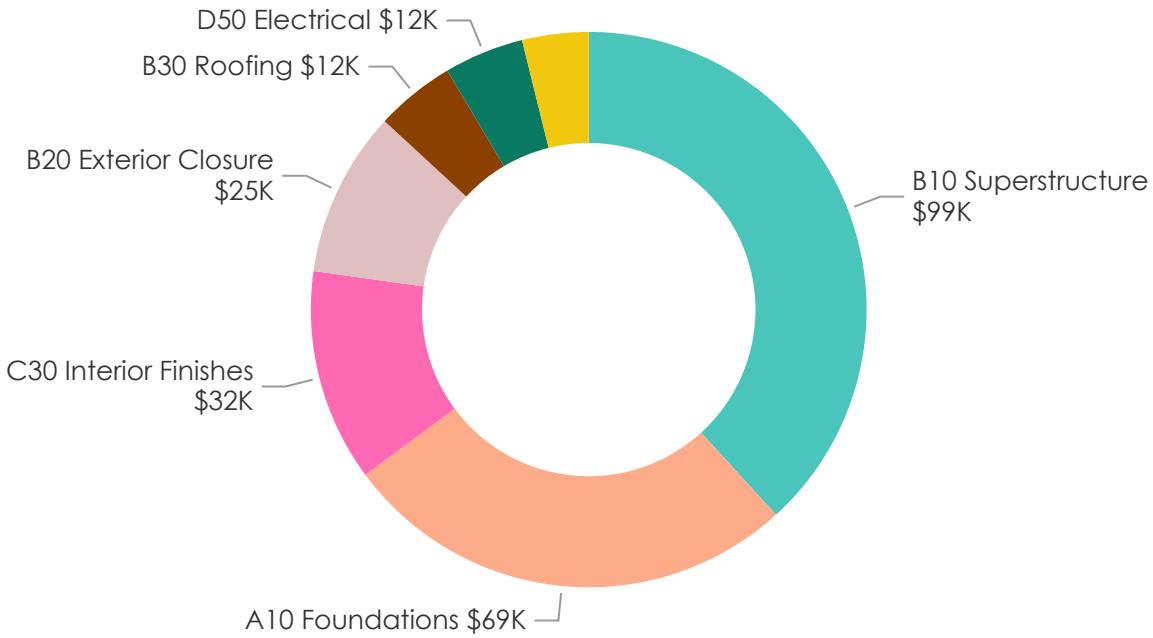
Public Works Operations Center



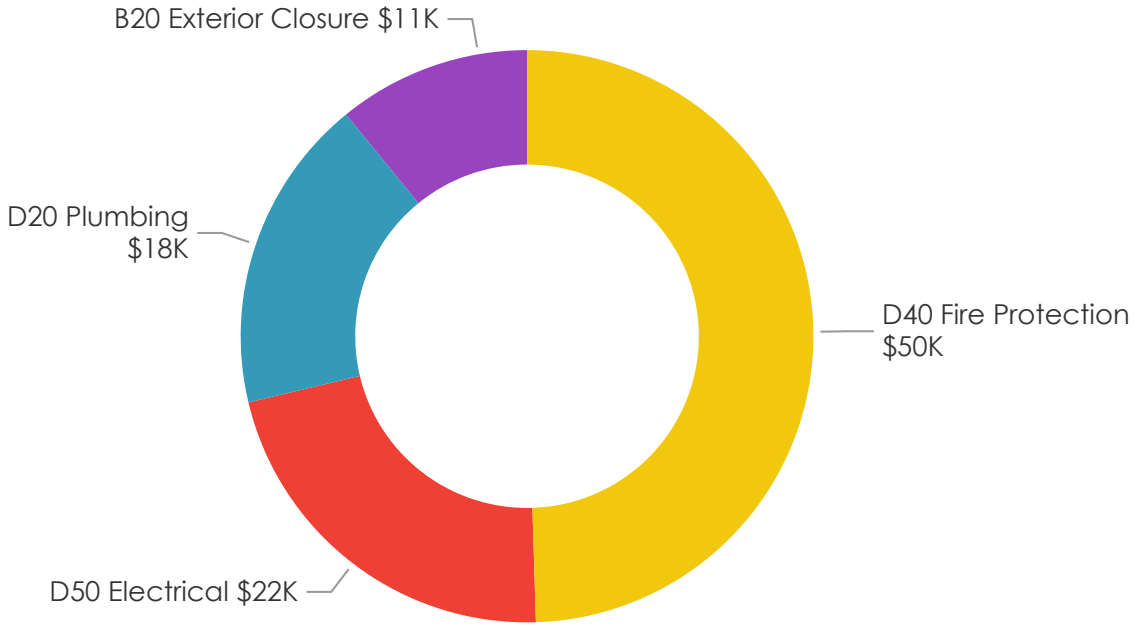
Public Works Operations Center Mobile Office



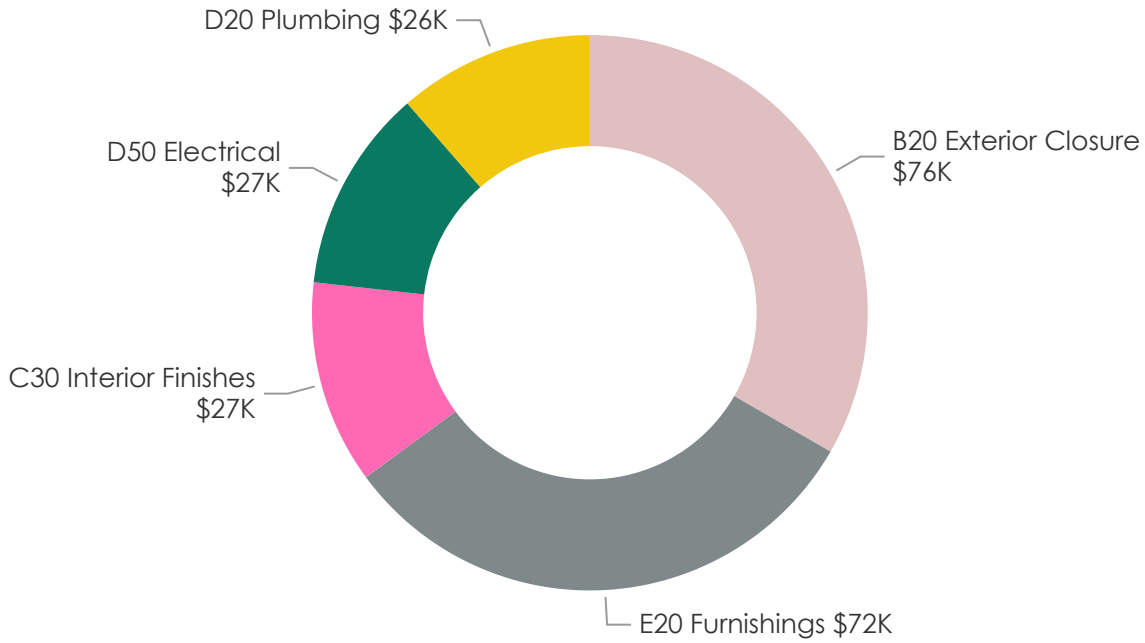
Scout Hall



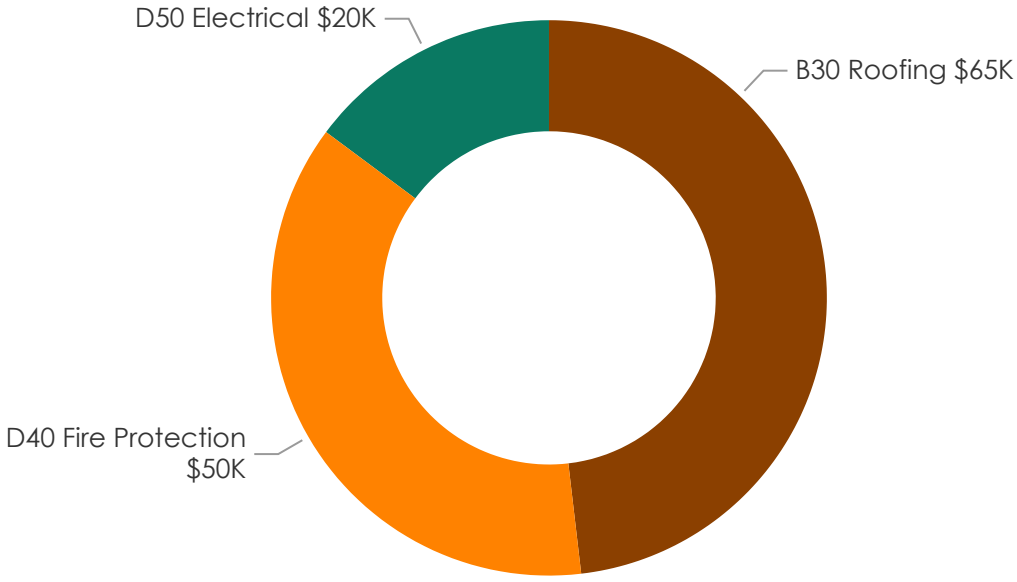
Wastewater Treatment Plant
Bio-solids Dryer Building



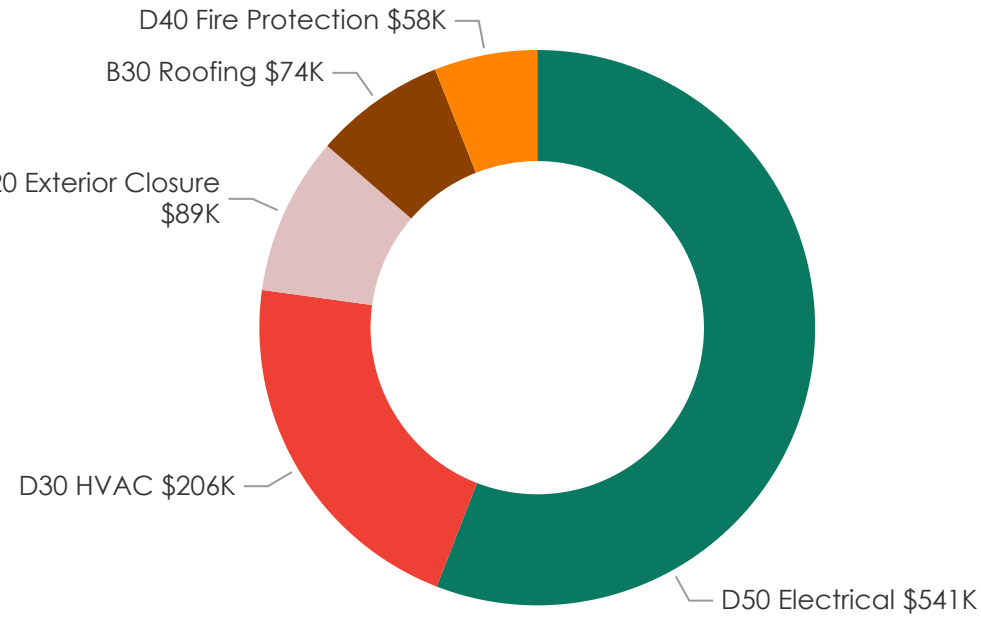
Wastewater Treatment Plant Control Building



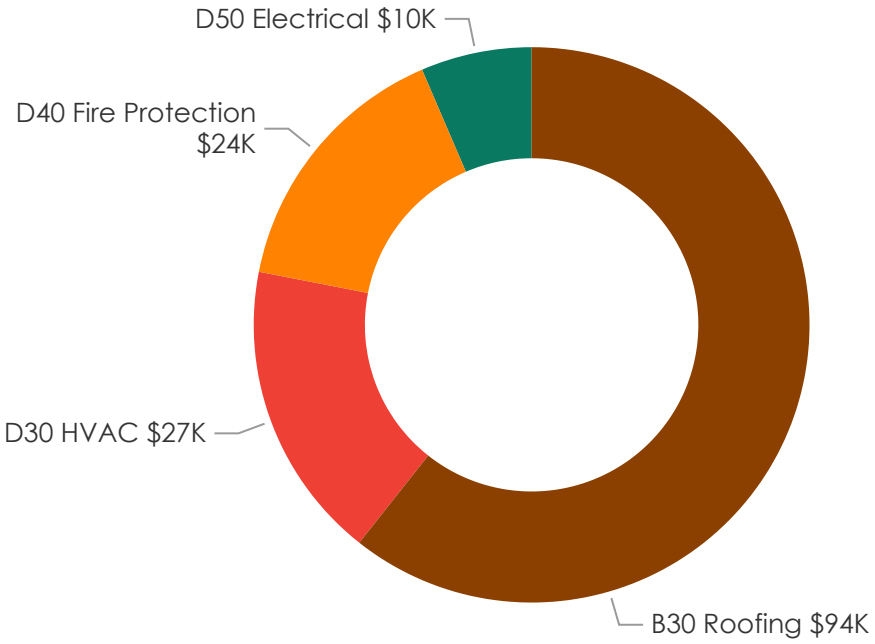
Wastewater Treatment Plant Digester Building



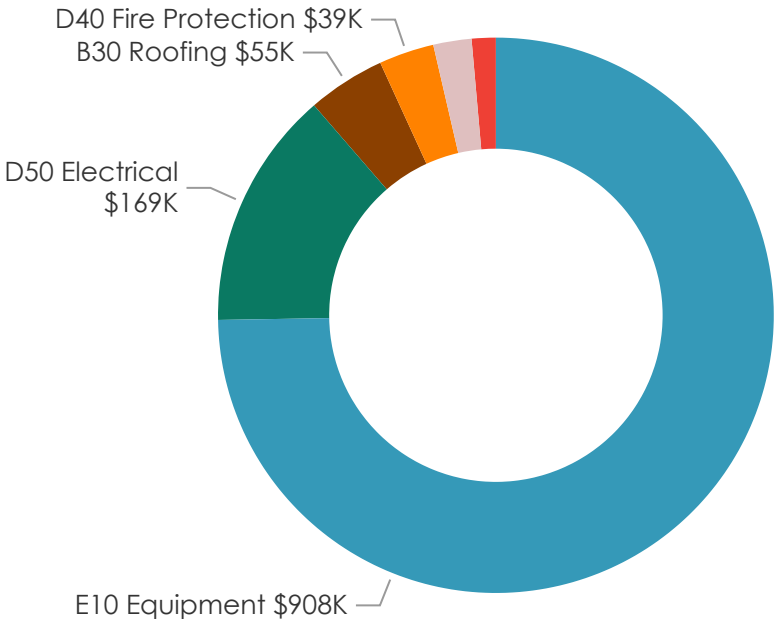
Wastewater Treatment Plant Equipment Building



Wastewater Treatment Plant Main Office



Wastewater Treatment Plant
UV Building

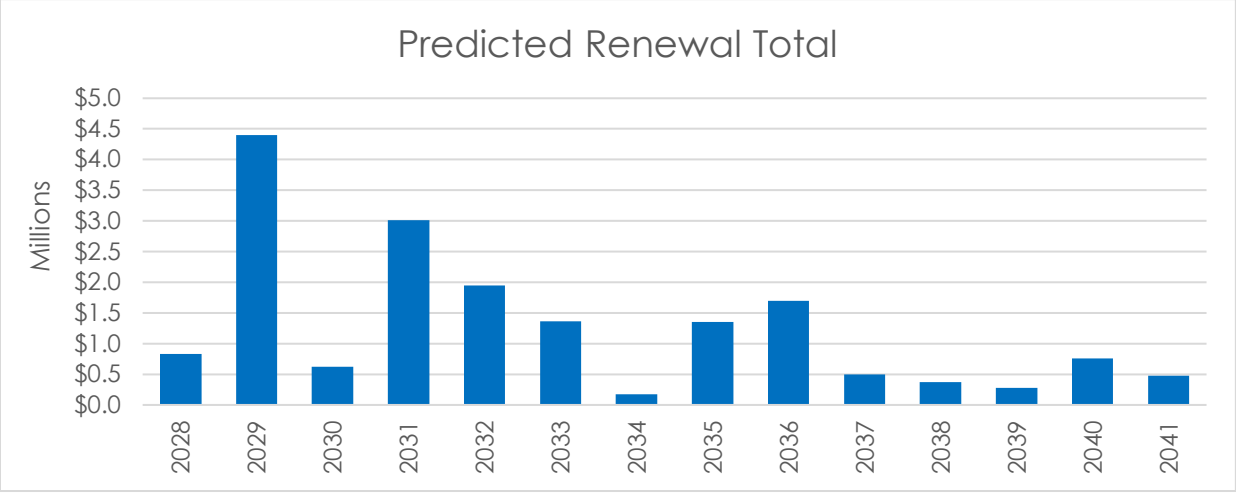


Predicted Renewals

Predicted Renewals (PRs) are modeled for the years 2028 – 2041, based on the system type, age, current condition, expected useful life, and anticipated replacement cost. These costs are based on predictive models, and therefore should be used as high-level long-term planning tool. Some systems may fail sooner or last longer than the model predicts based on maintenance practices, intensity of use, or extreme weather events.

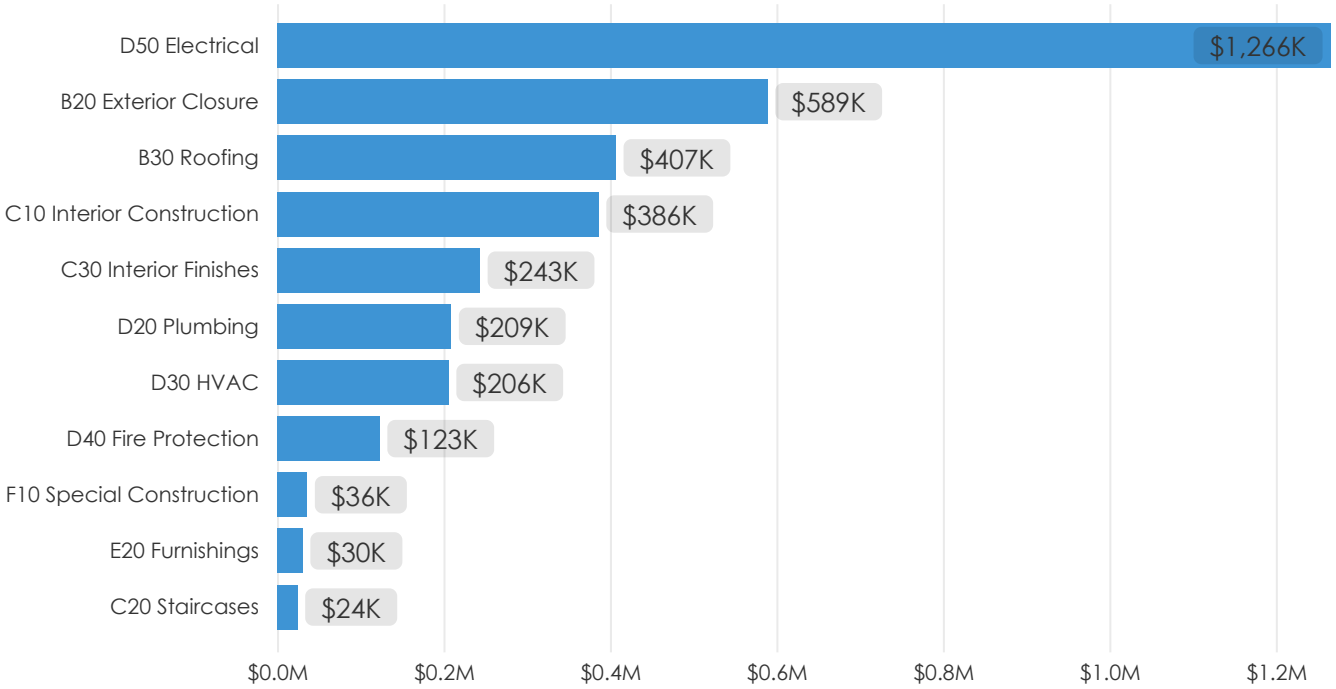
For the time period of 2028 – 2041, the estimated PR cost is approximately $18M The highest cost year is expected to be 2029 at just under $4.5M. The detailed PR table included in the Appendix shows these PRs broken out by facility, subsystem, and year.

Figure 2. Predicted Renewal Totals by Year

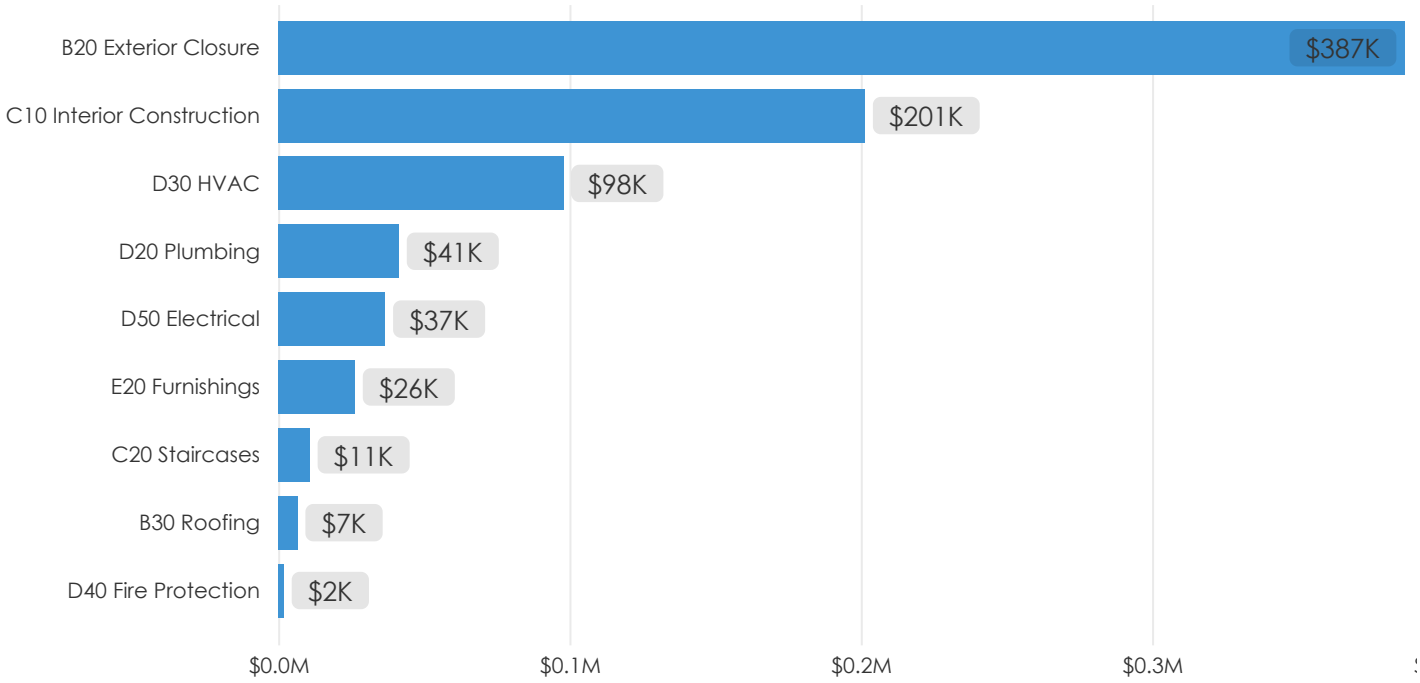


Pages 17 to 25 show a graphic representation of the total predicted renewals by site, broken out by Uniformat Level 2 categories.

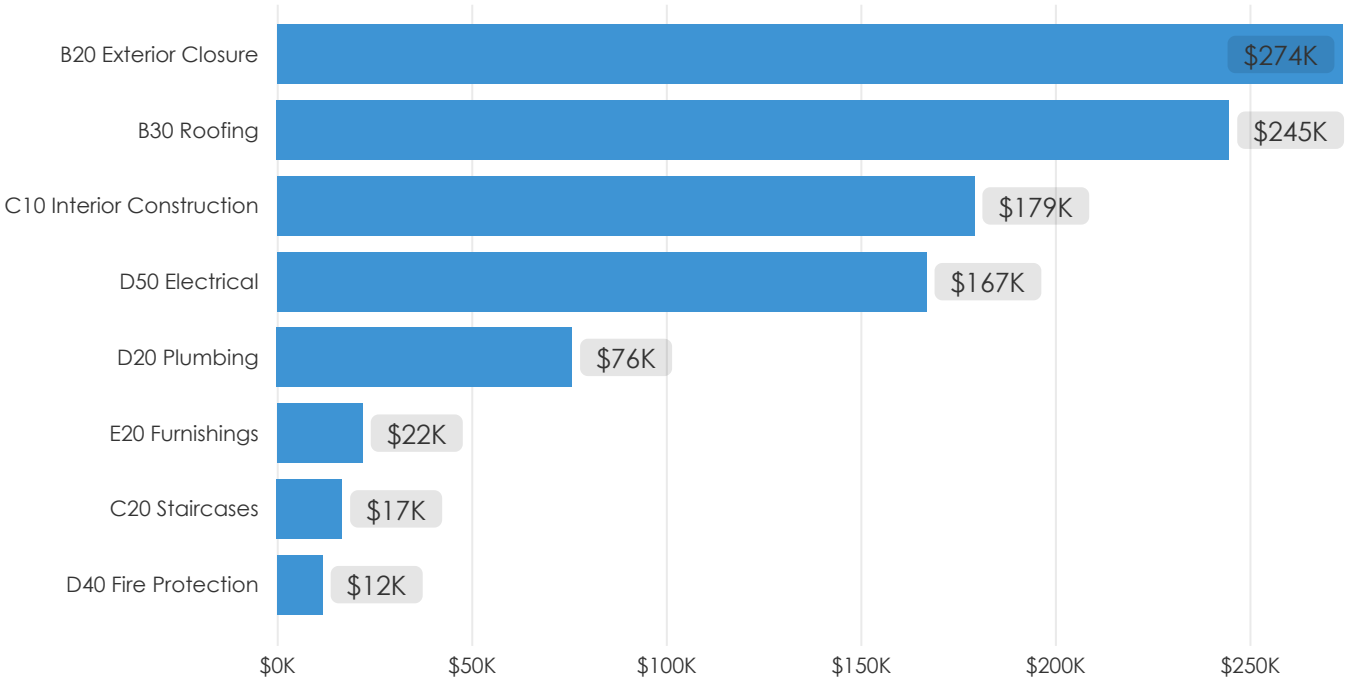
City Hall / Station 41



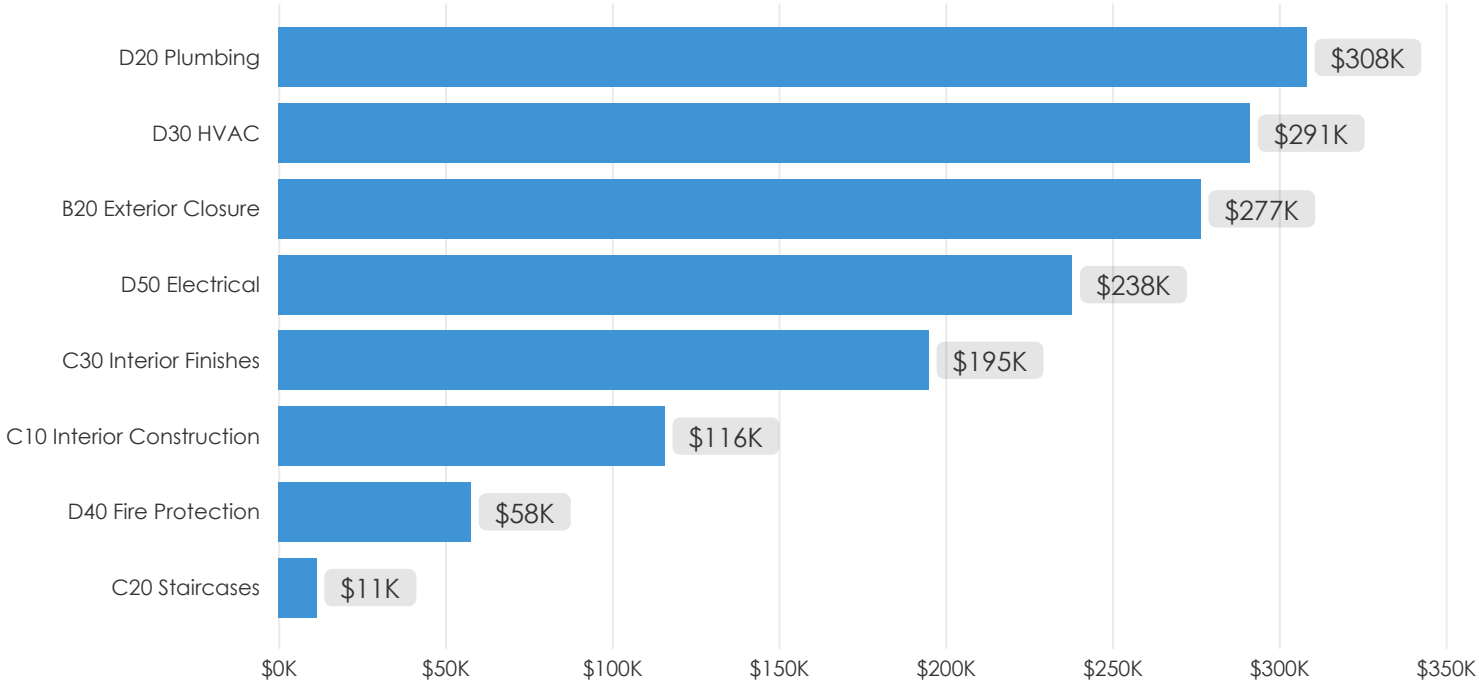
City Hall Annex



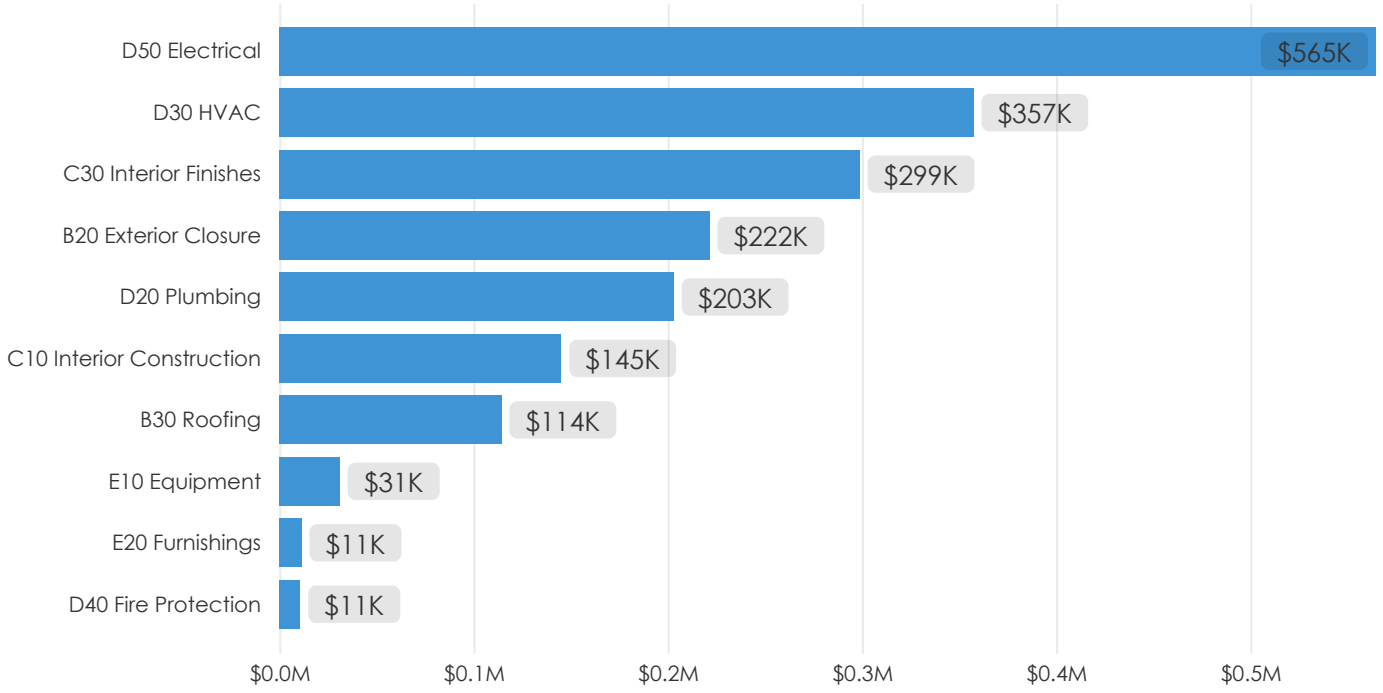
Community Center



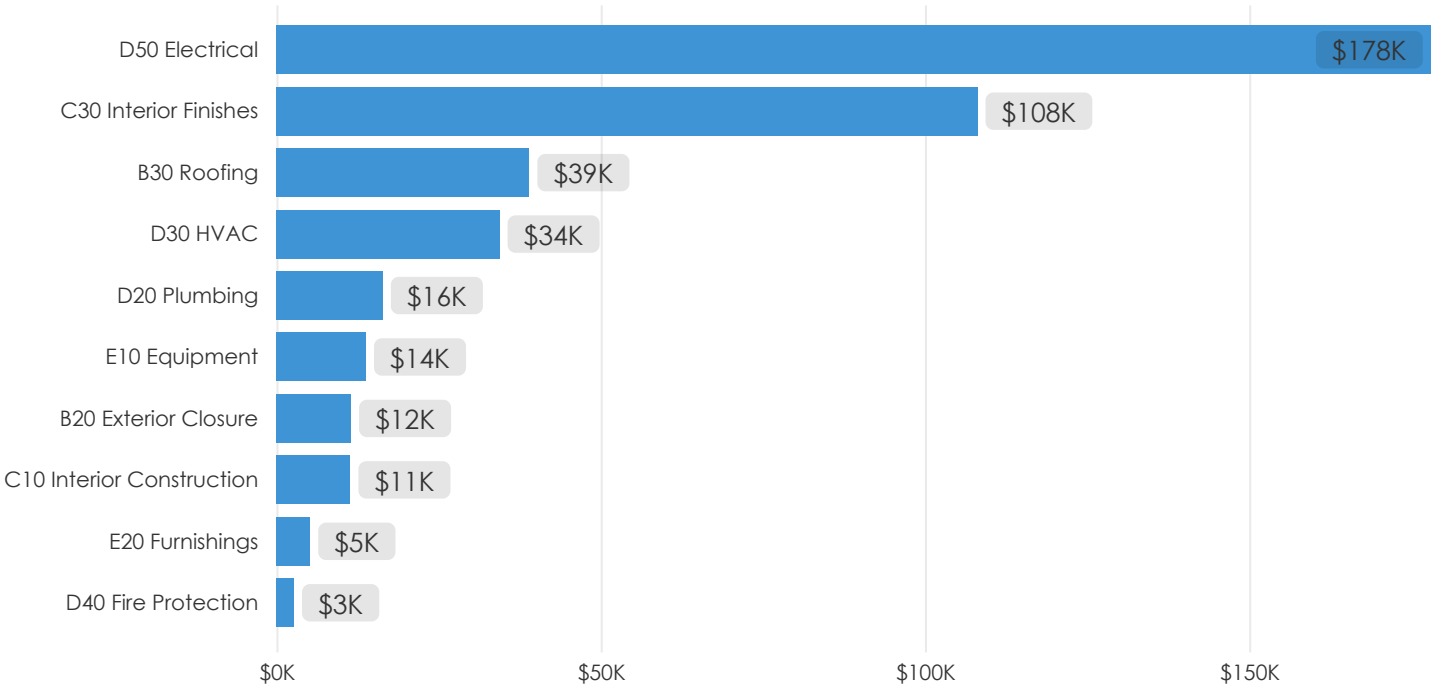
Fire Station 42



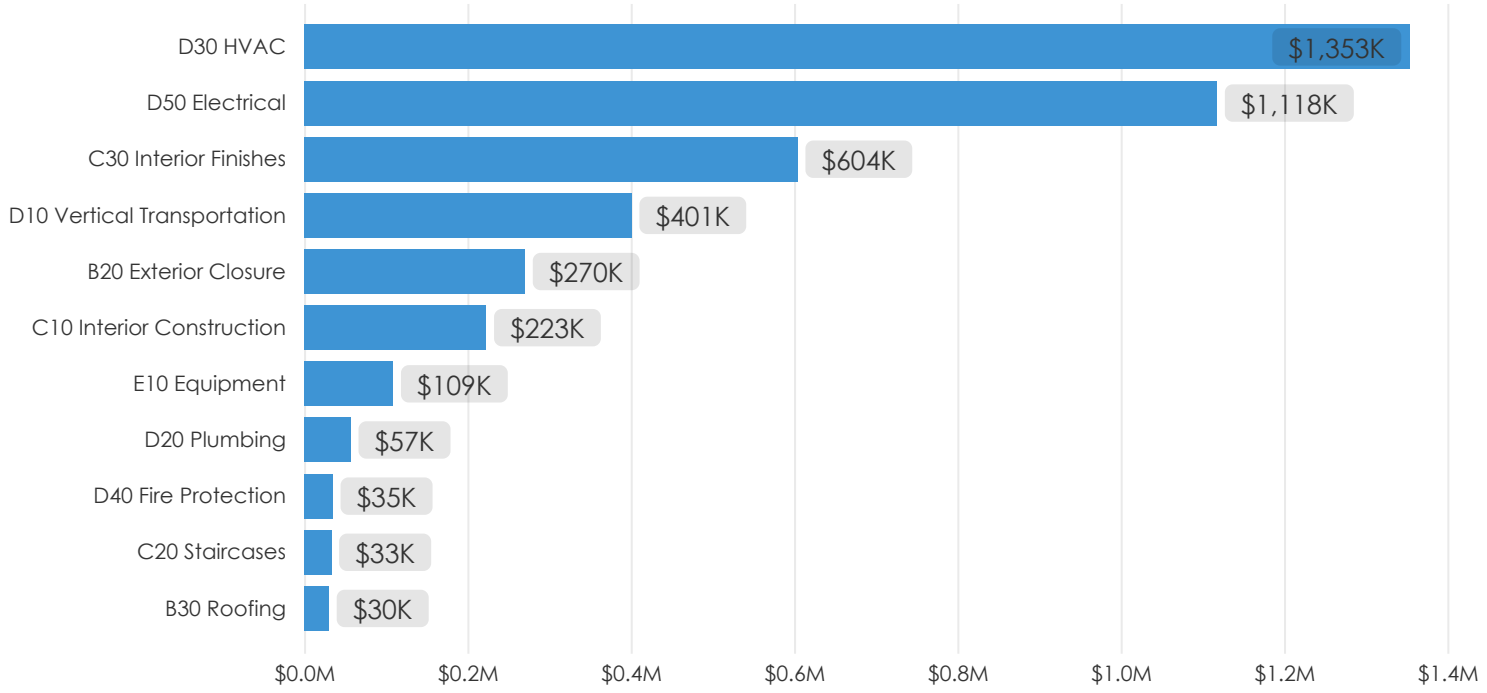
Fire Station 43



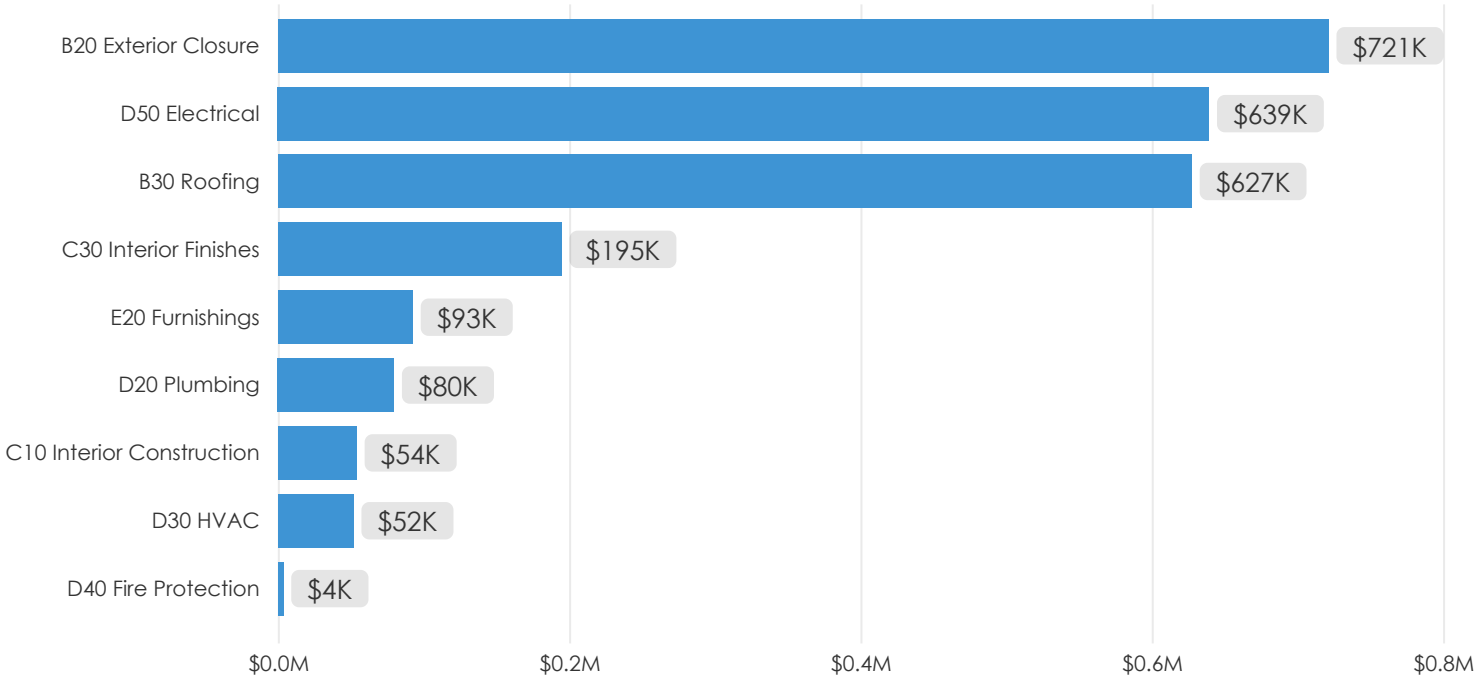
Lackamas Lake Lodge



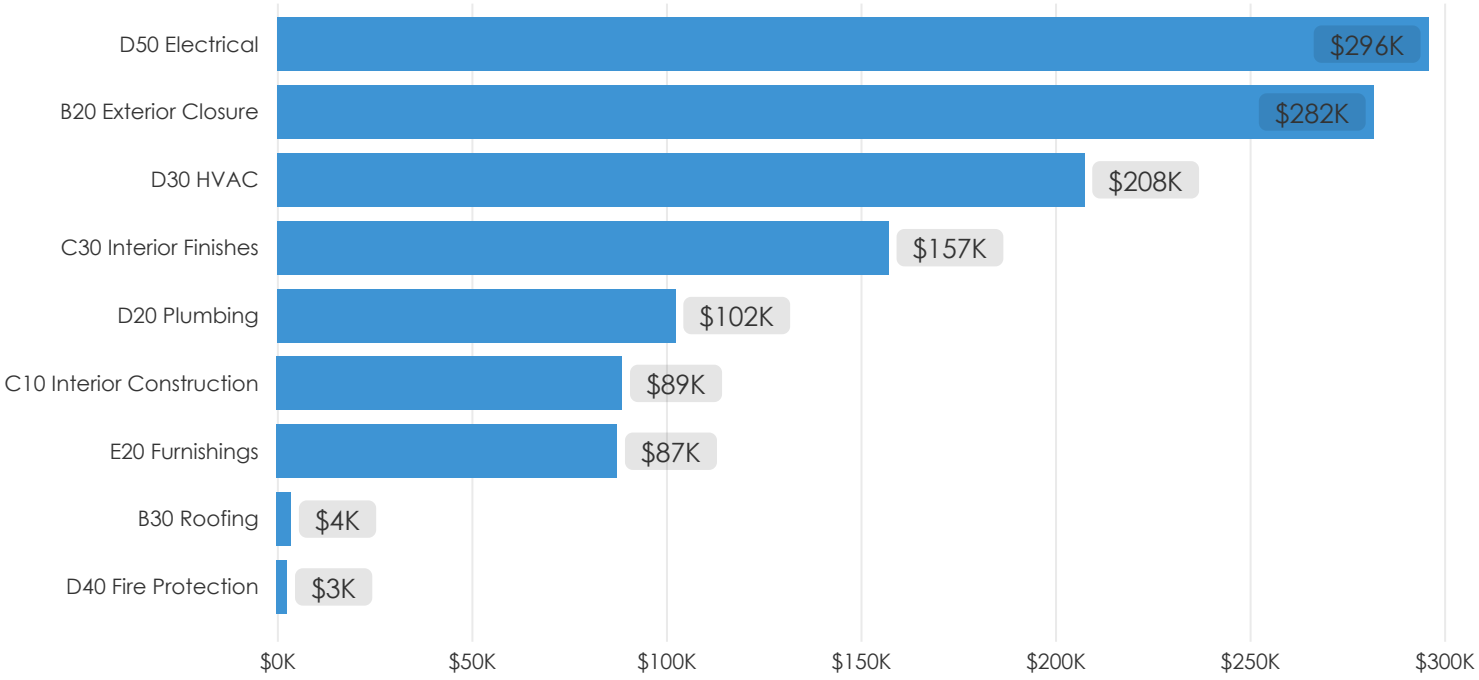
Library



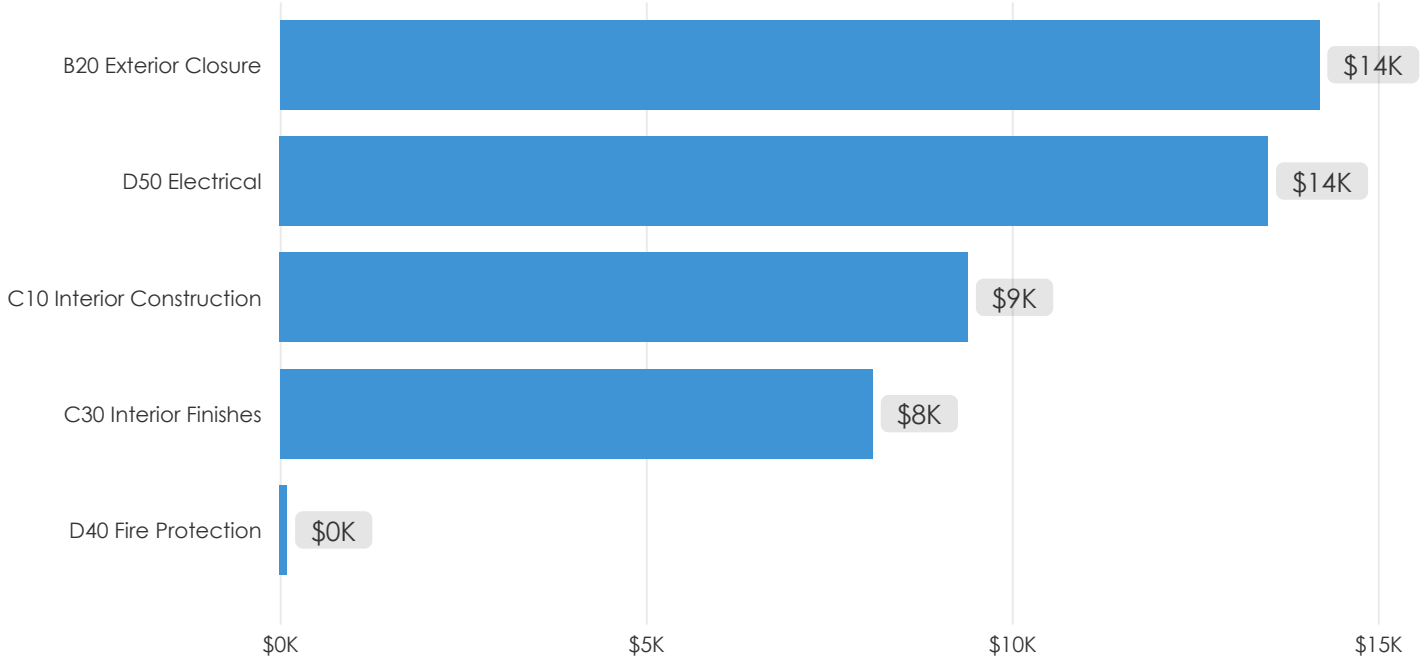
Police Station



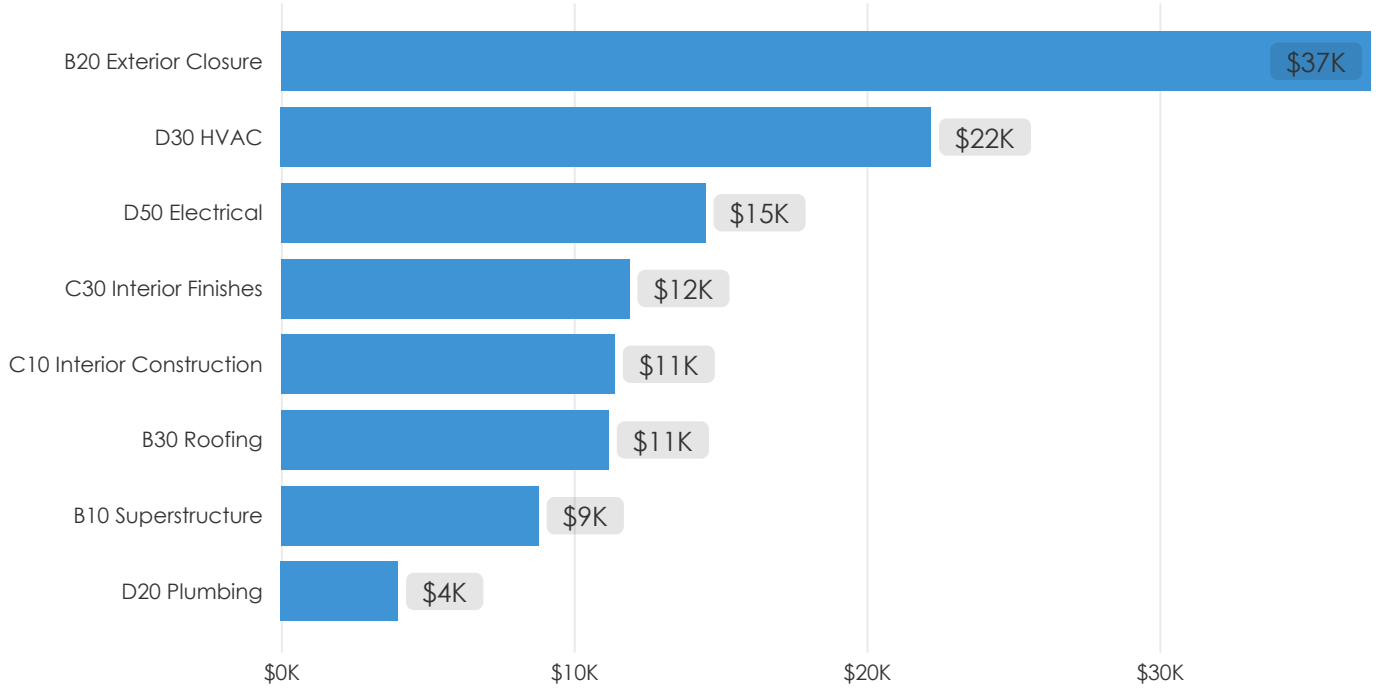
Public Works Operations Center



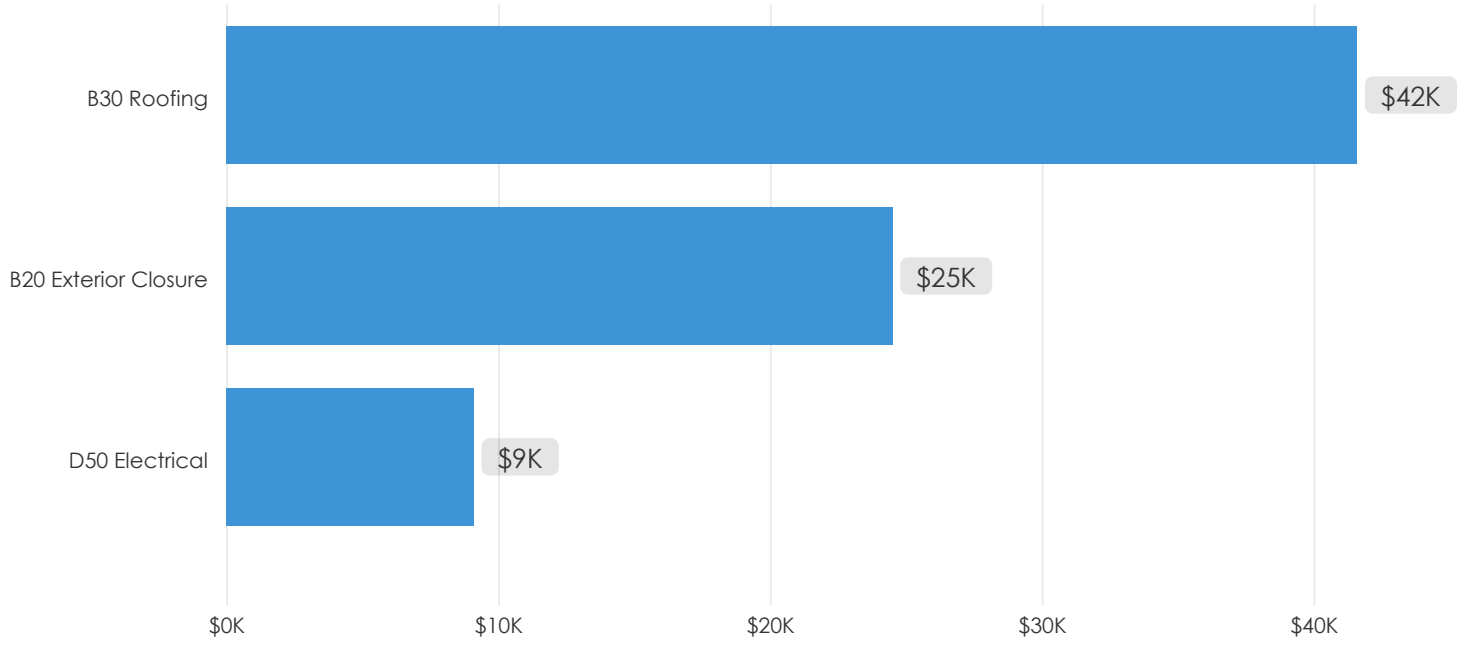
Public Works Operations Center Mobile Office



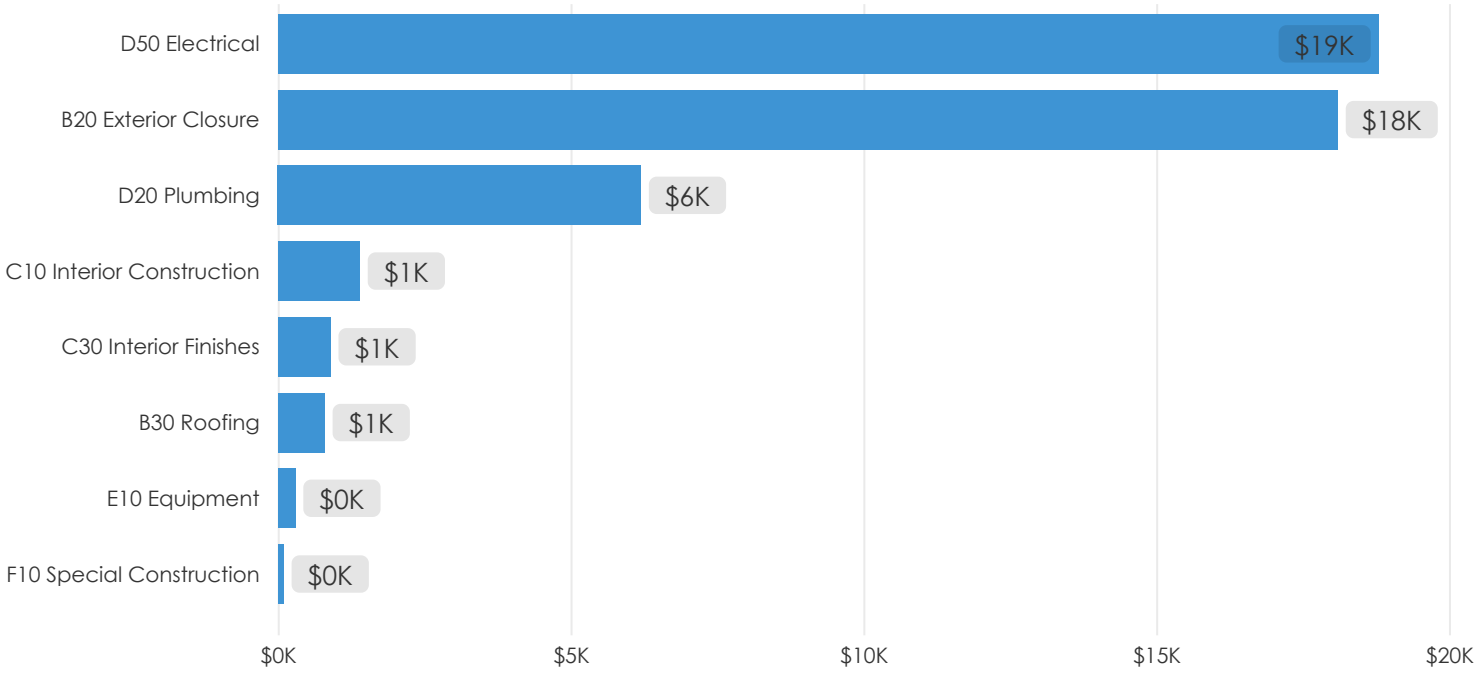
Scout Hall



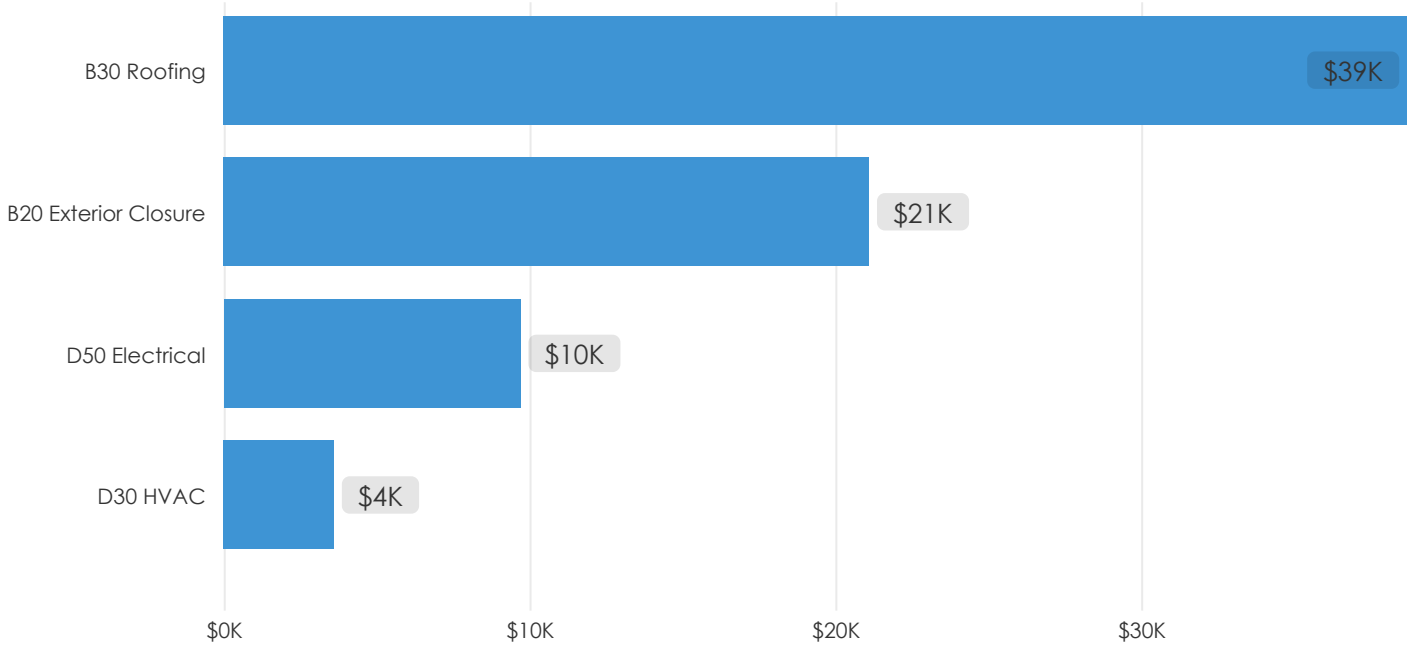
Wastewater Treatment Plant
Bio-solids Dryer Building



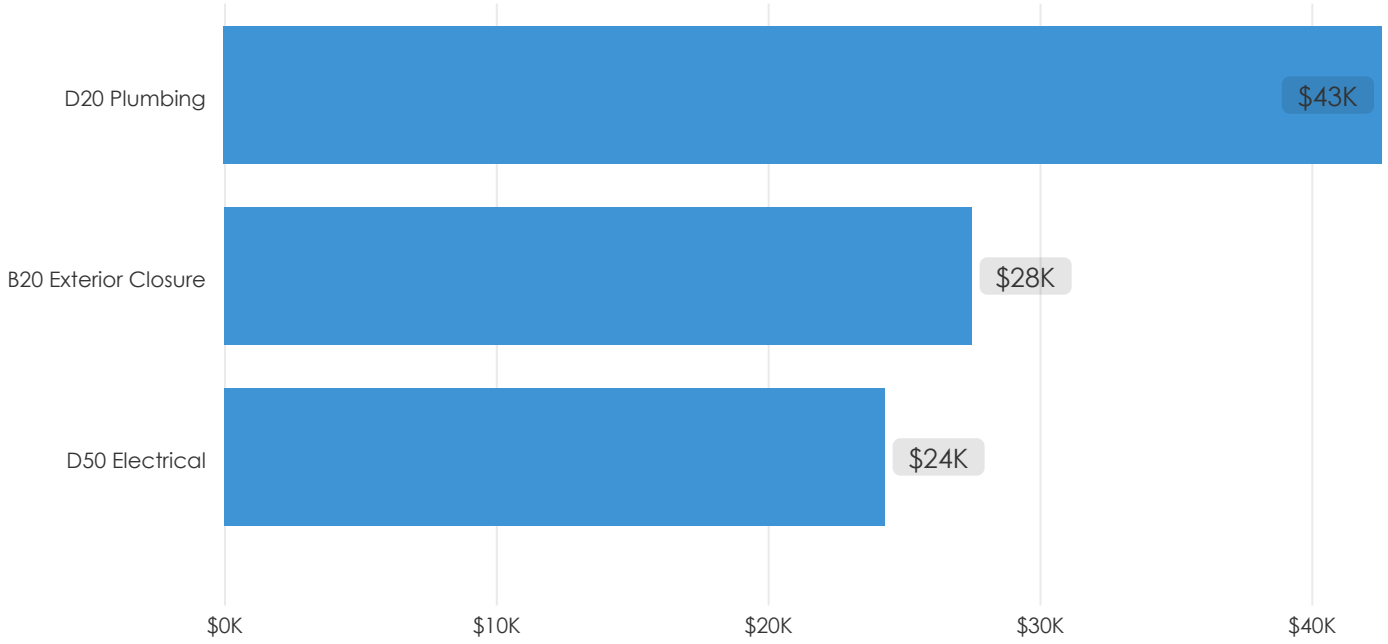
Wastewater Treatment Plant Control Building



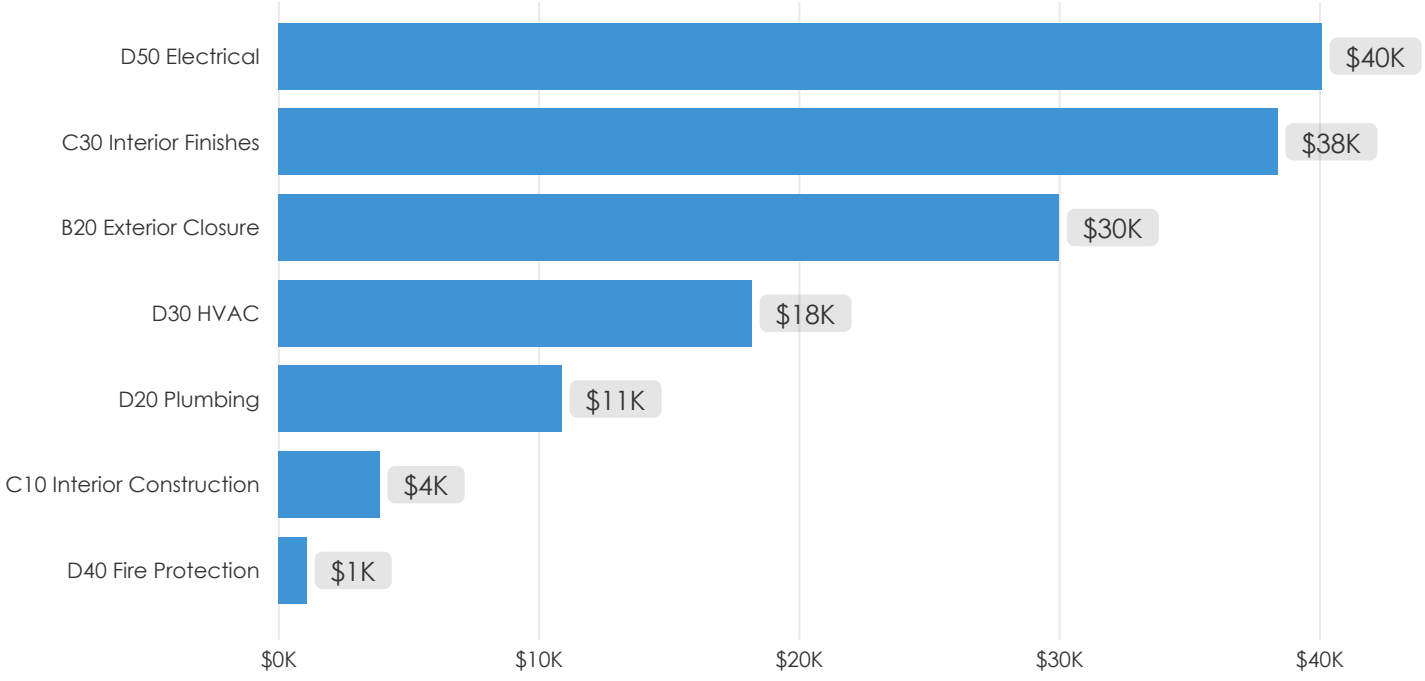
Wastewater Treatment Plant Digester Building



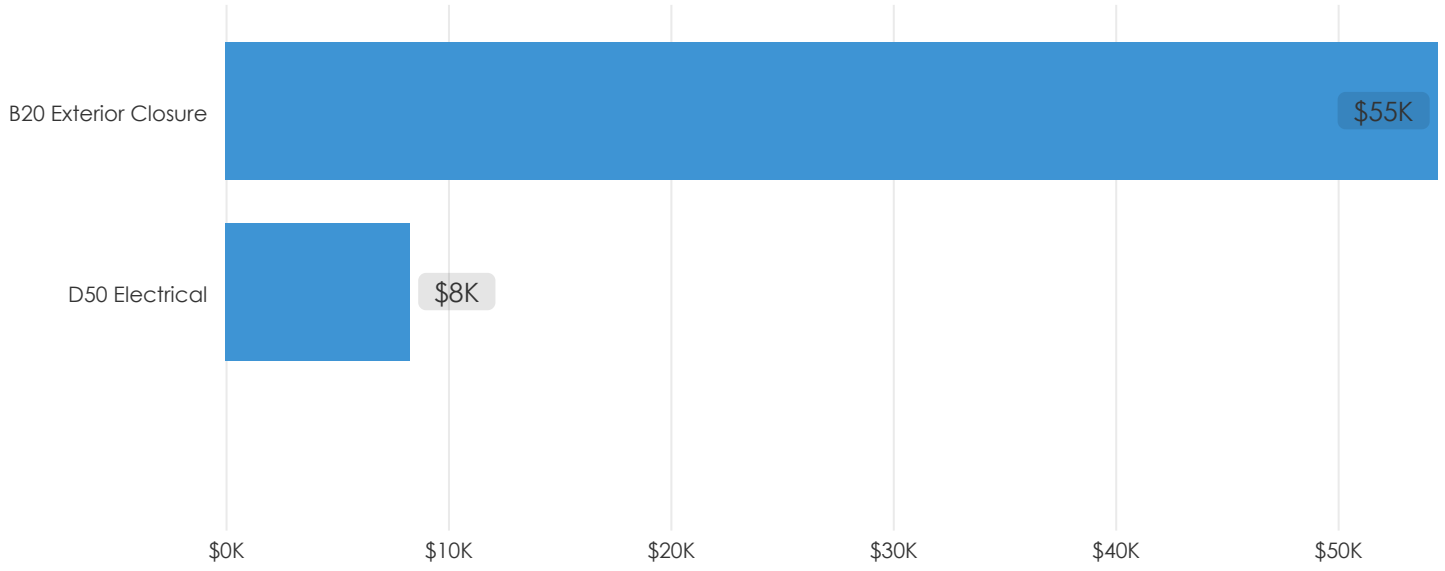
Wastewater Treatment Plant Equipment Building



Wastewater Treatment Plant Main Office



Wastewater Treatment Plant
UV Building



Appendix K: Facilities Conditions Assessment, Volume 2

City of Camas

Facility Condition Assessment

Volume 2: Detailed Facility Report

Prepared by MENG Analysis

Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Size - Gross S.F.	28,080
Year Of Original Construction	1967
Facility Use Type	Community Center
Construction Type	Heavy
# of Floors	2
Energy Source	Gas
Year Of Last Renovation	1967
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**3.2**			
Facility Condition Index (FCI)	0.20	**Predicted Renewal Budget 2028 - 2041**	$3,048,000	$3,519,000
Current Replacement Value (CRV)	$10,371,000	**Observed Deficiencies 2022 - 2027**	$2,743,000	$2,804,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$3,693,000	N/A

Facility Condition Summary

The building houses City Hall, administrative functions, Fire Station 41, and the permitting and land use offices. The building is a two-story concrete structure with an additional basement (a former firing range, now used for records storage). The roofing is a 2017 membrane roof, exterior walls are a combination of mid-century modern patterned precast concrete panels, and cast concrete, windows are a mix of the original mid-century tall single-pane and aluminum frame fenestrations, and other newer (1995 and 2001) insulated aluminum and vinyl windows.

HVAC is distributed water-source heat pump with separate ventilation air systems for most regularly occupied spaces. The apparatus bays and hose tower have gas-fired unit heaters. Most sub-basement spaces are not heated, but some have ventilation. Most of the HVAC system is at end of life. Similarly, much of the plumbing piping is at end of life, with multiple aged fixtures; however, the hot water heaters are relatively new. Fire sprinkler is provided in the station house (living and office) area and portions of the basement, but not the apparatus bays, City Hall offices, or City Hall garage; however, relatively modern fire alarm is provided for most areas, except for City Hall main floor. Power is modern 208V three-phase, with obsolete and under-capacity standby generator power. Lighting is mostly lay-in type with mostly aged fluorescent lamps but some upgraded to LED; many spaces include occupancy sensor lighting control. High-speed fiber-optic data is provided, including WiFi service in many regularly occupied spaces; other low-voltage systems are a mix of mostly older and some newer.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**3.0**			
A10 Foundations						
A1010 Standard Foundations	1967	1967	3	TRB	12/01/21	Standard concrete footings and foundations assumed, no issues reported.
A1030 Slab On Grade	1967	1967	3	TRB	12/01/21	Concrete slab on grade, concerns voiced by staff about radon. A past radon vent system has been installed; reportedly tested yearly and radon levels are reported below thresholds of concern.
A20 Basements						
A2020 Basement Walls	1967	1967	3	TRB	12/01/21	Concrete masonry, no issues observed.
B Shell			**2.9**			
B10 Superstructure						
B1010 Floor Construction	1967	1967	3	TRB	12/01/21	Concrete floor on concrete beams, no issues reported or observed.
B1020 Roof Construction	1967	1967	3	TRB	12/01/21	Rigid insulation on a mix of systems: tongue and groove car deck on heavy timber and glulam, and steel on metal joists. No issues reported.
B20 Exterior Closure						
B2010 Exterior Walls	1967	1967	3	TRB	12/01/21	Painted concrete (a combination of precast units on the east, south, and west areas), and cast concrete on the south area housing fire and permitting.
B2020 Exterior Windows	1967	1990	3	TRB	12/01/21	A mix of window systems, areas of original uninsulated single-pane glass, some units replaced in 1995 and 2001 with thermal units in aluminum, and vinyl windows at the fire station living quarters.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**2.9**			
B20 Exterior Closure						
B2030 Exterior Doors	1967	1995	3	TRB	12/01/21	Aluminum storefront. Metal overhead doors at the fire station. Reportedly, the operating mechanisms and tracks often require maintenance and adjustment (especially considering the amount of use they receive).
B30 Roofing						
B3010 Roof Coverings	1967	2017	2	TRB	12/01/21	2017 white membrane roofing. Existing roof drains from the perimeter gutters are inadequately sized for the volume and roof area (see D2040 Rain Water Drainage).
B3020 Roof Openings	1967	1995	3	TRB	12/01/21	Roof access hatch from access ladder with cage (recommend installing safety extension post at hatch). Solatube-type skylights over the fire house. Nine acrylic bubble skylights over the main entry canopy that are in need of cleaning.
B3030 Projections	1967	1967	3	TRB	12/01/21	Freestanding entry canopy at the main entrance, and a fabric canopy over the permit center walk ramp and entrance. Hose drying tower (still used for drying hoses).
C Interiors			**3.2**			
C10 Interior Construction						
C1010 Partitions	1967	1967	3	TRB	12/01/21	Gypsum on wood studs. Concrete masonry unit walls in ground and basement level areas. Toilet partitions are painted metal.
C1020 Interior Doors	1967	1967	3	TRB	12/01/21	Wood doors and frames, most accessible doors have ADA-compliant hardware, but some utility-type doors with knob hardware. Some doors with wire glass.

Copyright MENG Analysis 2022

Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**3.2**			
C10 Interior Construction						
C1030 Fittings	1967	1967	3	TRB	12/01/21	Chair rail and wainscot wood paneling in council chambers. Miscellaneous fire station storage and equipment fittings. One stair railing loose.
C20 Staircases						
C2010 Stair Construction	1967	1967	3	TRB	12/01/21	Concrete stairs typical, no issues reported. Metal stairs from the fire house down to the apparatus bays.
C2020 Stair Finishes	1967	1980	3	TRB	12/01/21	Carpet at lower level permitting offices is worn and torn and is a trip hazard (replace with general carpet flooring). West stair has cast non-slip treads with vinyl risers. Other stairs are exposed concrete.
C30 Interior Finishes						
C3010 Wall Finishes	1967	2000	3	TRB	12/01/21	Painted finishes.
C3020 Floor Finishes	1967	1995	4	TRB	12/01/21	Carpet in administrative and permitting areas is worn and nearing end of life.
C3030 Ceiling Finishes	1967	1995	3	TRB	12/01/21	Suspended acoustic 2x4 ceiling tiles. Some water stains and some tiles need to be replaced. Based on assumed age, the track and suspension system likely does not meet modern seismic standards.
D Services			**3.3**			
D10 Vertical Transportation						
D1090 Other Conveying Systems	1967	1967	3	DCS	12/01/21	Hose hoist and rack system at hose tower. The hose tower includes a gas-fired unit heater and exhaust fan to assist with hose drying and ventilation of the adjacent apparatus bay.

Copyright MENG Analysis 2022

Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.3**			
D20 Plumbing						
D2010 Plumbing Fixtures	1967	1967	3	DCS	12/01/21	Mix of older and newer fixtures, with variety of fixture types and trim (faucets and flush valves), but with no automatic trim observed. Both original rough-concrete block and newer one-piece fiberglass showers. Minimal support for decontamination, and no safety showers and/or eyewash observed throughout. Only single-height (non-ADA) drinking fountains observed. Bottled water stations set up in multiple locations.
D2020 Domestic Water Distribution	1967	1967	4	DCS	12/01/21	Mostly original galvanized water piping with low flow to some fixtures and increasing problems from rust and other particulate fouling plumbing fixture trim. Discolored water at less frequently used fixtures. Use of bottled water throughout. At least three newer domestic hot water theaters - two electric tank-type and one tankless gas-fired serving the remodeled station house area. No apparent submetering between City Hall and Fire Station 41. No apparent deduct meter for cooling tower make-up.
D2030 Sanitary Waste	1967	1967	4	DCS	12/01/21	Mostly original cast iron drain, waste, & vent (DW&V) piping, and some newer cast iron and non-metallic where observed. Many tested fixtures are slow to drain or flush. Reports of increasing frequency of back-ups and overflows. Original galvanized pipe to trap primers with uncertain performance.
D2040 Rain Water Drainage	1967	1967	4	DCS	12/01/21	Low-sloped roof to perimeter metal gutters, then down to exterior metal downspouts, in turn down to storm to north and to grade to south, with frequent back-ups and water intrusion into the building, damaging finishes and disrupting occupant work.
D2090 Other Plumbing Systems	1967	1967	3	DCS	12/01/21	Sump pump in pit at basement mechanical room. Newer air compressor in apparatus bay storage room.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems		Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services				**3.3**			
D30	**HVAC**						
D3010	**Energy Supply**	1967	1967	3	DCS	12/01/21	Rusty gas piping on roof; no submetering; minor maintenance to address either separately.
D3020	**Heat Generating Systems**	1967	1995	3	DCS	12/01/21	One Laars gas-fired boiler serving the water-source heat pump (WSHP) condenser water loop, with assumed recirculation pump internal to the boiler. Two gas-fired unit heaters in the apparatus bays - one older, one newer.
D3030	**Cooling Generating Systems**	1967	1985	4	DCS	12/01/21	Aging cooling tower in poor location, but with newer water chemistry control system. Dedicated condensing unit for data center cooling.
D3040	**HVAC Distribution Systems**	1967	1967	4	DCS	12/01/21	Distributed water-source heat pump (WSHP) system with condenser water loop including two 7.5-hp constant speed condenser water pumps, expansion tank and head tank. Dedicated outside air system (DOAS) ventilation with no apparent heat recovery for City Hall area with rooftop gas-pack type unit at grade to south between City Hall and Saw Shop buildings. Separate DOAS with heat recovery for the FS-41 station house area. Ductwork is a mix of sheet metal mains and sub-mains, open plenum return and factory-insulated flex-duct. While there are no operable windows for the City Hall area; many FS-41 offices and living areas do have operable windows. City Hall lobby restroom exhaust fans are reportedly not operable - minor maintenance to repair or replace.
D3050	**Terminal and Package Units**	1967	1967	4	DCS	12/01/21	Four new water-source heat pumps in City Hall finance area; otherwise reportedly all original.
D3060	**Controls and Instrumentation**	1967	1967	4	DCS	12/01/21	Standalone thermostats for each water-source heat pump, unit heater, and similar. Original relay control of central plant condenser water. No networked controls.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems		Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services				**3.3**			
D30	**HVAC**						
D3090	**Other HVAC Systems and Equipment**	1967	1995	3	DCS	12/01/21	Three apparatus bay make-up air louvers, with exhaust air up and out via one side-wall propeller fan in the hose tower. The louvers are partially blocked by stored material and/or bunker gear - minor maintenance to clear airflow paths. No separate bunker gear drying room. No vehicle engine exhaust system. No carbon monoxide (CO) and/or nitrogen oxides (NOx) control or monitoring. Somewhat newer below basement slab radon gas extraction system. Original basement shooting range exhaust system - abandoned in place. Apparent floor sweep collection exhaust system, with discharge to top of the hose tower - also abandoned in place. Garage exhaust for City Hall parking garage, partially blocked by storage and no apparent make-up air system, such as screened louvers.
D40	**Fire Protection**						
D4010	**Fire Protection Sprinkler Systems**	2009	2009	3	DCS	12/01/21	Six-inch service to four-inch riser in sub-basement, with four-inch fire department connection, with 2.5-inch main serving several basement areas, and four-inch main serving the station house (office and living) areas - all in good condition. No fire sprinkler for City Hall offices or parking garage and no fire sprinkler for apparatus bays.
D4020	**Stand-Pipe and Hose Systems**	1967	1967	4	DCS	12/01/21	Original fire hose cabinets with hoses removed and replaced with fire extinguishers; assume galvanized pipe in poor condition, same as the potable water system.
D4030	**Fire Protection Specialties**	1967	1995	2	DCS	12/01/21	Fire extinguishers in cabinets and on hooks; AED in cabinet; first aid kits; special extinguishers in data center area.
D50	**Electrical**						
D5010	**Electrical Service and Distribution**	1967	1967	3	DCS	12/01/21	Square D 208V, 600A main distribution panel, supplying Panels A, B, C, D, & G, plus automatic transfer switch (ATS) via breakers; and Panels E, F, and other devices via gutter system. No renewable energy system.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.3**			
D50 Electrical						
D5020 Lighting and Branch Wiring	1967	1995	3	DCS	12/01/21	Mostly lay-in 2x4 fluorescent fixtures, many with occupancy sensor control, and with 20% estimated upgraded to LED lamps.
D5032 Low Voltage Communication	1967	2008	3	DCS	12/01/21	2008 voice over internet protocol (VOIP) telephone handsets; A/V in conference rooms; special A/V, including basic video broadcast in Council Chamber; Ring doorbell at main entry; radio systems at fire station. Apparent abandoned siren on top of the hose tower roof - minor maintenance to remove if no longer needed.
D5037 Low Voltage Fire Alarm	1967	2009	3	DCS	12/01/21	2009 fire alarm system in remodeled fire station areas, but little or no coverage in City Hall office areas.
D5038 Low Voltage Security	1967	1995	3	DCS	12/01/21	Mix of older, increasingly obsolete cipher door locks and newer card-key access devices; CCTV monitoring of some areas; unclear intrusion detection.
D5039 Low Voltage Data	1967	2010	3	DCS	12/01/21	City data center in basement; hardwired data drops in most office areas, plus multiple WiFi wireless access points (WAPs).
D5090 Other Electrical Systems	1967	1967	4	DCS	12/01/21	1967 Onan gasoline-fired 40-kW standby generator in City Hall garage, retrofitted to dual-fuel gas or natural gas, with original Onan automatic transfer switch in the main electrical room. No apparent emergency lighting systems other than the generator and some lighted exit signs with unclear battery back-up.
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1010 Commercial Equipment	1967	1995	3	DCS	12/01/21	Mix of older and somewhat newer kitchen appliances and office equipment.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall / Station 41

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1020 Institutional Equipment	1967	1967	3	DCS	12/01/21	Heavy files; high-security vaults; exercise equipment; other specialties.
E1030 Vehicular Equipment	1967	1967	3	DCS	12/01/21	Garage door openers for four apparatus bay doors and one roll-up door at the City Hall garage.
E20 Furnishings						
E2010 Fixed Furnishings	1967	1995	3	TRB	12/01/21	Main level reception counters and the Council Chambers desks are in good condition, as are many of the break room casework elements from the 1995 remodel. There are areas of original 1967 casework (northwest ground level break room) that is chipped, tired, and dated. Window blinds are in generally fair condition.
F Special Construction			**3.0**			
F10 Special Construction						
F1010 Special Structures	1967	1967	3	DCS	12/01/21	Hose tower structure with no issues reported.
F1050 Special Controls and Instrumentation	1967	2009	3	DCS	12/01/21	Fire station tone alarm system, and related specialty radio systems; multiple antennas on the roof.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

C3020 Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10,000	$12.00	SF	$120,000	$235,008

Deficient Material: **Carpet**

Broadloom carpet is at end of life and showing wear patterns and thinning in traffic areas. Carpet on lower level stair is also torn and worn and is a trip hazard. Replace star finish with floor refinishing.



Remedial Action:

Replace carpet (consider replacing with carpet tiles in lieu of broadloom).

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D2010 Plumbing Fixtures	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	7	$2,500.00	EA	$17,500	$34,272

Deficient Material: **Fixtures**

Several original, old, inefficient, obsolete fixtures remain, such as concrete block showers and high-water-use flushing fixtures.

Remedial Action:

Replace aged original fixtures with modern fixtures and trim.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D2020 Domestic Water Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	28,080	$5.00	SF	$140,400	$274,959

Deficient Material: **Domestic water**

Mostly original galvanized steel pipe, with increasing rust and other particulate fouling plumbing fixture trim. Bottled water in use throughout by occupants.



Remedial Action:

Replace all galvanized piping with new copper and/or PEX tubing.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D2030 Sanitary Waste	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	28,080	$5.00	SF	$140,400	$274,959

Deficient Material: **DW&V piping**

Aged cast iron drain, waste, and vent (DW&V) piping with increasing back-ups and overflows.



Remedial Action:

Replace original DW&V piping.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: City Hall / Station 41

Facility: City Hall / Station 41

D2040 Rain Water Drainage	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	28,080	$1.00	SF	$28,080	$54,992

Deficient Material: **Gutter & downspouts**

Gutter and downspouts frequently plug and flood into the occupied space; only half the downspouts are piped to storm.

Remedial Action:

Clean, flash, and seal sources of water intrusion into conditioned space. Add more downspouts to gutters and pipe to storm to north; pipe all un-piped downspouts to storm; install leaf guards at north gutter, adjacent to large trees.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3020 Heat Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2026	1	$60,000.00	LS	$60,000	$117,504

Deficient Material: **Boiler**

Boiler is aging; assume installed in 1995.



Remedial Action:

Budget to replace upon failure.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3020 Heat Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	1	$8,500.00	LS	$8,500	$16,646

Deficient Material: **Unit heater**
Aging gas-fired unit heater.

Remedial Action:
Budget to replace upon failure.

Action Type:
Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$7,500.00	LS	$7,500	$14,688

Deficient Material: **Condensing unit**

The data center split-Dx outside condensing unit is nearing end-of-life.



Remedial Action:

Install new purpose-built data center cooling system.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	1	$125,000.00	LS	$125,000	$244,800

Deficient Material: **Cooling Tower**

Aging cooling tower with signs of damage and sounds of leakage. The tower is wedged between City Hall to north and the saw shop to south.



Remedial Action:

Replace and relocate the cooling tower to the roof.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	1	$50,000.00	LS	$50,000	$97,920

Deficient Material: **HVAC system**

City Hall dedicated outside air system (DOAS) gas-pack unit, aged with poor outside air intake location between buildings; failed return/exhaust fan.

Remedial Action:

Replace and relocate the City Hall DOAS unit to the roof for improved indoor air quality and maintenance access.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	28,080	$2.00	SF	$56,160	$109,984

Deficient Material: **Test, Adjust, and Balance (TAB) & Commissioning**

Uneven temperature and ventilation air flow throughout most areas; unclear return air path for many smaller and some larger spaces.



Remedial Action:

Test, adjust, and balance and retrocommission the HVAC system.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3050 Terminal and Package Units	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	16	$8,500.00	EA	$136,000	$266,342

Deficient Material: **WSHPs**

Original 1967 water-source heat pumps (WSHPs) may fail at any time.

Remedial Action:

Budget to replace upon failure.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3060 Controls and Instrumentation	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	3	2021	2024	28,080	$4.00	SF	$112,320	$219,967

Deficient Material: **Controls**
Obsolete, non-networked HVAC controls.

Remedial Action:
Install networked direct digital control (DDC) HVAC control system.

Action Type:
Energy Efficiency



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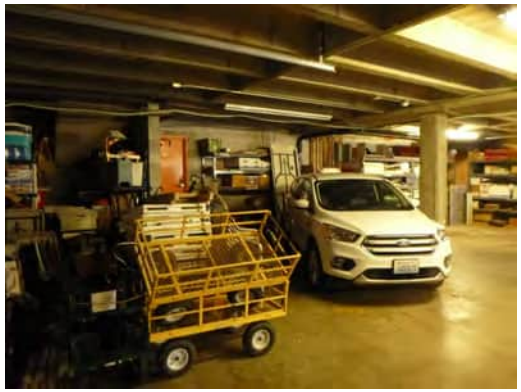
Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D3090 Other HVAC Systems and Equipment	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	2	$3,000.00	EA	$6,000	$11,750

Deficient Material: **Industrial ventilation**

No carbon monoxide (CO) and/or nitrogen oxides (NOx) monitoring, alarm, or control for apparatus bays or City Hall parking garage spaces.



Remedial Action:

Install CO and/or NOx monitoring, alarm, or control.

Action Type:

Code Issue

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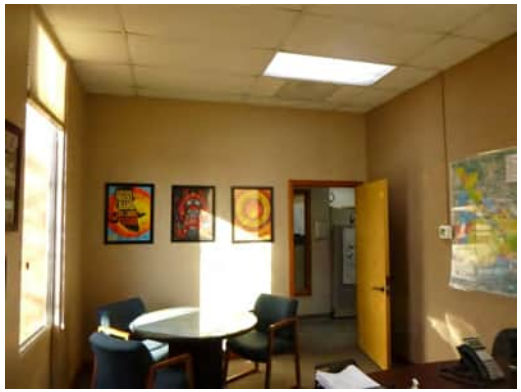
Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	20,000	$6.00	SF	$120,000	$235,008

Deficient Material: **Fire Sprinkler**

No fire sprinkler for City Hall offices and parking garage; no fire sprinkler for apparatus bays.



Remedial Action:

Extend fire sprinkler to protect the entire building.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D4020 Stand-Pipe and Hose Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	8	$1,000.00	EA	$8,000	$15,667

Deficient Material: **Hose cabinet piping**
Original galvanized steel piping assumed to current abandoned hose cabinets.



Remedial Action:
Replace with code-approved piping, if hose cabinet function is to be retained.

Action Type:
Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D5010 Electrical Service and Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	1	$70,000.00	LS	$70,000	$137,088

Deficient Material: **Electrical distribution**

Insufficient main distribution panel capacity for loads; hence use of gutter system to directly feed additional panels via disconnect switches.

Remedial Action:

Replace original 1967 600A main distribution panel (MDP) with 800A MDP capacity, assuming all lighting will be upgraded to LED in the near future.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	15,000	$3.00	SF	$45,000	$88,128

Deficient Material: **Fire alarm**

No apparent fire alarm protection for City Hall office area.



Remedial Action:

Extend fire alarm system to cover the entire City Hall and fire station areas.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall / Station 41

D5090 Other Electrical Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$150,000.00	LS	$150,000	$293,760

Deficient Material: **Generator**

Obsolete and undersized standby generator and automatic transfer switch (ATS).



Remedial Action:

Replace with larger, say 250 kW, diesel generator and new bumpless transfer ATS.

Action Type:

Life Safety

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Facility Summary

City of Camas
City Hall / Station 41
City Hall Infrastructure

616 NE 4th Ave
Camas, WA 98607

Facility Condition Summary

The property is fully developed, housing the combined City Hall and Fire Station 41 building, and a small asphalt parking lot on the southeast corner. There is also a small landscape zone with a picnic table and flag pole on the northwest corner of the property.

City water and fire sprinkler service, but no observed or reported irrigation. City sewer with failing side sewer connections due to age and tree root intrusion. Some piped and mostly surface sheet flow storm south to City street storm drainage. Northwest Natural gas, Clark County PUD 208V three-phase power, and high-speed fiber-optic data, plus plain old telephone service (POTS) for legacy systems.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall Infrastructure

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1967	1967	3	TRB	12/01/21	Concrete apparatus approach is broken and failing at one bay, and another will be in the future. Two bay concrete approaches replaced (one recently).
G2020 Parking Lots	1967	2000	3	TRB	12/01/21	Asphalt parking lot on the southeast corner for staff and the public. Lot is in fair condition but there are some cracks and alligatoring, and the lot is tight. No public ADA parking to access permitting.
G2030 Pedestrian Paving	1967	1967	3	TRB	12/01/21	Pedestrian paving is generally limited to public sidewalks, an ADA ramp and stair to the main entry, and an asphalt built-up ramp to the concrete landing step at the permit center. Significant street tree root upheaval is causing significant inconsistency in sidewalk surface, trip hazards, and ADA access issues. Ongoing maintenance is replacing sections and grinding off differential to prevent trip hazards. West egress concrete stair is experiencing concrete failure.
G2040 Site Development	1967	1967	3	TRB	12/01/21	Flag pole, picnic bench, minor areas of chain link fencing.
G2050 Landscaping	1967	1967	3	TRB	12/01/21	Mature landscaping with no irrigation system. Street trees are causing significant damage to sidewalks and causing ADA and trip hazards (see pedestrian paving section). Cut all landscaping material away from the face of the facility.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall Infrastructure

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1967	1967	3	DCS	12/01/21	The original approximately two-inch water service enters from north to basement City water meter; the original meter at the sidewalk may be abandoned in place; piping is original galvanized where observed. A 2009 fire sprinkler six-inch service enters from the east side of the site, with backflow preventer in the sub-basement, and fire department connection at the street. Pressure is 130 psig observed at the riser base. No irrigation was system was reported or observed.
G3020 Sanitary Sewer	1967	1967	3	DCS	12/01/21	The side sewer to the City sewer at the street is reported to have been recently inspected and found in acceptable condition, but may need replacement in five to ten years due to age.
G3030 Storm Sewer	1967	1967	3	DCS	12/01/21	Some roof drains and several catch basins and apparatus bay apron trench drains, are piped to the City storm system at street to south. The parking lot to south mostly sheet flows downhill to the street to south. Most observed catch basins and trench drains are mostly blocked by leaves - minor maintenance to clean. No oil/water separator observed.
G3060 Fuel Distribution	1967	1967	3	DCS	12/01/21	Northwest Natural Gas meter No. 1091017 with 1,000 cfh capacity, includes seismic shut-off valve and four branch lines assumed to serve: 1) City Hall gas-fired furnace, 2) Building water-source heat pump condenser water loop boiler, 3) Apparatus bay unit heaters, and 4) Station house domestic hot water heater.
G40 Site Electrical utilities						
G4010 Electrical Distribution	1967	1967	3	DCS	12/01/21	Overhead power to utility pole-mounted pot-type transformers at pole to west, then down and underground to the main electrical room, with Clark PUD meter No. 81-464-091 nearly hidden in the small alcove between the south center of the City Hall building and the northeast corner of the private saw shop.

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Facility Summary

City of Camas
City Hall / Station 41
City Hall Infrastructure

616 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G40 Site Electrical utilities						
G4020 Site Lighting	1967	1967	4	DCS	12/01/21	Variety of light fixtures unevenly distributed around building perimeter, with most toward the apparatus bay outside apron and the City parking lot to southeast.
G4030 Site Communications and Security	1967	2010	3	DCS	12/01/21	Newer high-speed fiber-optic data from overhead lines at street to west, then overhead to the building, with support cable scraping the new membrane roof - minor maintenance to raise. Recent overhead fiber-optic sub-fed to City Hall Annex to west, reportedly as semi-temporary service. Multiple apparent past plain old telephone service (POTS) and cable; some may be still be in service for legacy systems. Several exterior CCTV cameras, no issues reported.
G90 Other Site Construction						
G9010 Service and Pedestrian Tunnels	1967	1967	4	DCS	12/01/21	Window and HVAC wells at building perimeter, dirty and/or intentionally blocked or modified, allowing storm water intrusion and/or reduce airflow - minor maintenance to clean and restore full function and protect from storm water.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall Infrastructure

G2010 Roadways	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	800	$15.00	SF	$12,000	$23,501

Deficient Material: **Concrete Pavement**

Concrete apparatus approach is broken and failing at one bay, and another will be in the future.



Remedial Action:

Demo concrete drive and repour. Recommend doing two at once if possible.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall Infrastructure

G2020 Parking Lots	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2026	10,000	$4.00	SF	$40,000	$78,336

Deficient Material: **Asphalt Paving**

Some alligatoring and cracks in asphalt. No ADA parking provided.



Remedial Action:

Topcoat recommended to extend the life of the parking lot, restripe, and include ADA parking.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall Infrastructure

G2030 Pedestrian Paving	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	1,200	$15.00	SF	$18,000	$35,251

Deficient Material: **Concrete Sidewalk**

Significant street tree root upheaval is causing significant inconsistency in sidewalk surface, trip hazards, and ADA access issues.

Remedial Action:

Demo sidewalks at trees and repour sidewalks. Consider incorporation of tree root grate systems, and even tree removal and replacement.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall Infrastructure

G2030 Pedestrian Paving	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$12,000.00	LS	$12,000	$23,501

Deficient Material: **Concrete Stairs**

West egress concrete stair is experiencing concrete failure, the concrete has significant spalling and cracking running along the outside edge of the system. The guard rail system is also significantly corroded. Moisture intrusion appears to also be occurring.



Remedial Action:

Remove and replace concrete stair and metal guard rail.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall Infrastructure

G3010 Water Supply	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Water Service**

Aged 1967 water service with reports of rust, corrosion, and debris in the potable water system. There is no apparent backflow prevention.



Remedial Action:

Replace the City water service entry and add backflow prevention.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$7,500.00	LS	$7,500	$14,688

Deficient Material: **Oil/water separator**

No oil/water separator for apparatus bay outside apron trench drains.

Remedial Action:

Install oil/water separator.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall Infrastructure

G4020 Site Lighting	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	18	$750.00	EA	$13,500	$26,438

Deficient Material: **Outside lighting**

Inconsistent and unreliable perimeter lighting, with fixtures and lamps failing regularly with unclear control.

Remedial Action:

Replace all with modern LED lighting and central control system.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall / Station 41
Facility: City Hall Infrastructure

G4030 Site Communications and Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$10,000.00	LS	$10,000	$19,584

Deficient Material: **Fiber-optic**

Mission-critical fiber-optic data to City Hall and/or Annex via semi-temporary overhead lines.



Remedial Action:

Permanent underground fiber-optic service.

Action Type:

Other

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: City Hall / Station 41

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
City Hall / Station 41	C30 Interior Finishes	$120,000	$24,000	$28,800	$62,208	$235,008	$238,480
	D20 Plumbing	$326,380	$65,276	$78,331	$169,195	$639,183	$653,265
	D30 HVAC	$561,480	$112,296	$134,755	$291,071	$1,099,602	$1,133,710
	D40 Fire Protection	$128,000	$25,600	$30,720	$66,355	$250,675	$251,141
	D50 Electrical	$265,000	$53,000	$63,600	$137,376	$518,976	$527,399
	Facility Total	**$1,400,860**	**$280,172**	**$336,206**	**$726,206**	**$2,743,444**	**$2,803,996**
City Hall Infrastructure	G20 Site Improvements	$82,000	$16,400	$19,680	$42,509	$160,589	$165,322
	G30 Site Civil / Mechanical Utilities	$12,500	$2,500	$3,000	$6,480	$24,480	$24,842
	G40 Site Electrical utilities	$23,500	$4,700	$5,640	$12,182	$46,022	$47,100
	Facility Total	**$118,000**	**$23,600**	**$28,320**	**$61,171**	**$231,091**	**$237,264**
	Site Total	**$1,518,860**	**$303,772**	**$364,526**	**$787,377**	**$2,974,535**	**$3,041,260**

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Opportunity Summary By Subsystem

City of Camas

Site: City Hall / Station 41

Total Site Opportunity Cost: $1,923,580

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**City Hall / Station 41**						
System:	**Exterior Closure**	**Total Cost: $45,000**					
B2020	**Exterior Windows**						
		Original energy inefficient single-pane windows in original aluminum frames with added storm.	Replace existing with new high performance windows.	15.00	$3,000.00	EA	$45,000
Facility:	**City Hall / Station 41**						
System:	**Roofing**	**Total Cost: $30,000**					
B3010	**Roof Coverings**						
		No fall restraint system.	Install a fall restraint system for safety and security of maintenance and subcontractors.	1.00	$30,000.00	LS	$30,000
Facility:	**City Hall / Station 41**						
System:	**Vertical Transportation**	**Total Cost: $150,000**					
D1010	**Elevators and Lifts**						
		No elevator, lift, or dumbwaiter.	Install elevator between all levels, especially from main floor City Hall area to basement archives area.	1.00	$150,000.00	LS	$150,000
Facility:	**City Hall / Station 41**						
System:	**Plumbing**	**Total Cost: $33,250**					
D2010	**Plumbing Fixtures**						
		Several makeshift kitchenettes observed.	Install additional kitchenettes such that each major department has a dedicated kitchenette.	2.00	$8,000.00	LS	$16,000
		All manual plumbing fixture trim (faucets and flush valves).	Upgrade to automatic (infrared) trim to reduce water use and improve infection control.	24.00	$500.00	EA	$12,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: City Hall / Station 41

Total Site Opportunity Cost: $1,923,580

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
D2020	Domestic Water Distribution	No submetering between City Hall and fire station use; no apparent deduct meter for the cooling tower.	Install submeters and/or deduct meter to facilitate water conservation and/or reduce water bill.	3.00	$1,750.00	EA	$5,250
Facility:	City Hall / Station 41						
System:	HVAC	Total Cost: $1,042,800					
D3040	HVAC Distribution Systems						
		Increasingly obsolete water-source heat pump system without heat recovery dedicated outside air system (DOAS) for City Hall areas.	Replace HVAC with modern variable refrigerant flow (VRF) system with heat recovery DOAS.	28,080.00	$35.00	SF	$982,800
D3090	Other HVAC Systems and Equipment						
		No apparatus bay vehicle engine exhaust system.	Install engine exhaust system.	4.00	$15,000.00	EA	$60,000
Facility:	City Hall / Station 41						
System:	Fire Protection	Total Cost: $15,000					
D4090	Other Fire Protection Systems						
		No automatic fire protection for the mission critical City data center.	Provide automatic fire protection system for the data center, such as pre-action fire sprinkler or gaseous fire suppression.	1.00	$15,000.00	LS	$15,000
Facility:	City Hall / Station 41						
System:	Electrical	Total Cost: $569,530					
D5010	Electrical Service and Distribution						
		Flat roof with good southern exposure.	Install 50 kW rooftop photovoltaic (PV) system.	50.00	$7,500.00	EA	$375,000
D5020	Lighting and Branch Wiring						
		Approximately 80% of light fixtures with fluorescent lamps; 20% LED.	Upgrade remaining 80% of fixtures to LED.	22,500.00	$2.50	SF	$56,250

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: City Hall / Station 41

Total Site Opportunity Cost: $1,923,580

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
D5032	Low Voltage Communication	Increasingly obsolete 2008 voice over internet protocol (VOIP) telephone system, without video.	Upgrade to modern VOIP telephone system, including video and advanced phone management.	28,080.00	$1.50	SF	$42,120
D5038	Low Voltage Security						
		Only partial card-key access control, with limited CCTV and unclear intrusion detection.	Upgrade to full suite of electronic security.	28,080.00	$1.25	SF	$35,100
D5039	Low Voltage Data						
		Makeshift data center, with unclear Up-time Institute Tier-rating.	Upgrade to appropriately rated data center tier to improve performance, reliability, and data security; including dedicated uninterruptible power supply (UPS).	1.00	$40,000.00	LS	$40,000
D5090	Other Electrical Systems						
		Minimal emergency lighting.	Install combination bug-eye egress and exit signs with on-board battery back-up.	28,080.00	$0.75	SF	$21,060
Facility:	**City Hall Infrastructure**						
System:	**Site Improvements**	**Total Cost: $18,000**					
G2050	Landscaping						
		Aging street trees (maple) are causing significant damage to sidewalks and causing ADA concerns and trip hazards.	Remove and replace street trees with a more urban friendly and appropriate native species.	9.00	$2,000.00	EA	$18,000
Facility:	**City Hall Infrastructure**						
System:	**Site Electrical utilities**	**Total Cost: $10,000**					
G4030	Site Communications and Security						
		Minimal CCTV coverage at building perimeter and parking lot; no blue light system.	Install full CCTV coverage and install blue light system for parking lot area.	2.00	$5,000.00	EA	$10,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: City Hall / Station 41 **Total Site Opportunity Cost: $1,923,580**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**City Hall Infrastructure**						
System:	**Other Site Construction**	**Total Cost: $10,000**					
G9090	**Other Site Systems**						
		Minimal City of Camas celebratory features at City Hall, other than a few interpretive signs and marked time capsule location.	Commission and install public art to celebrate City of Camas community and values.	1.00	$10,000.00	LS	$10,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
City Hall Annex
City Hall Annex

528 NE 4th Ave
Camas, WA 98607

Facility Size - Gross S.F.	10,000
Year Of Original Construction	1960
Facility Use Type	Admin - Low rise
Construction Type	Medium
# of Floors	2
Energy Source	Gas
Year Of Last Renovation	1960
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**3.4**			
Facility Condition Index (FCI)	0.26	**Predicted Renewal Budget 2028 - 2041**	$942,000	$810,000
Current Replacement Value (CRV)	$4,352,000	**Observed Deficiencies 2022 - 2027**	$1,091,000	$1,100,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$294,000	N/A

Facility Condition Summary

Formerly a bank constructed in 1960, with a drive-through teller addition in 1974. The design is an excellent example of mid-century modern bank architecture constructed of brick, with linear canopy overhang leading to the main entry. It is a single-story building with a full basement. Older built-up roofing with ongoing minor leak issues being addressed by maintenance. The facade is brick and exterior windows were replaced with thermally glazed units in a bronze anodized aluminum storefront. Interior finishes are generally in poor condition, and ceilings and floors contain asbestos, including ductwork.

Two HVAC systems; larger to east with air handling equipment in basement and condensing unit on roof, and smaller packaged gas-pack unit to west. Aged plumbing fixtures, and failing potable water and sewer systems. No fire sprinkler or fire alarm. Power is modern three-phase, but may be undersized at 208V, 400A. Lighting is increasingly obsolete fluorescent. Low voltage systems are a mix of mostly older and some newer.

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Facility Summary

City of Camas
City Hall Annex
City Hall Annex

528 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**3.0**			
A10 Foundations						
A1010 Standard Foundations	1960	1960	3	TRB	12/01/21	Assumed to be standard concrete footings and stem walls.
A1030 Slab On Grade	1960	1960	3	TRB	12/01/21	Concrete slab on grade. No issues noted.
A20 Basements						
A2020 Basement Walls	1960	1960	3	TRB	12/01/21	Concrete and CMU, no issues noted.
B Shell			**3.0**			
B10 Superstructure						
B1010 Floor Construction	1960	1960	3	TRB	12/01/21	Concrete floor and structure.
B1020 Roof Construction	1960	1960	3	TRB	12/01/21	Wood deck, on wood structure with batt insulation.
B20 Exterior Closure						
B2010 Exterior Walls	1960	1960	3	TRB	12/01/21	Brick masonry walls.
B2020 Exterior Windows	1960	1990	3	TRB	12/01/21	Thermally glazed glass in bronze aluminum storefront (no date evident for replacement).
B2030 Exterior Doors	1960	1990	3	TRB	12/01/21	Aluminum storefront at main entries (assumed replaced around 1990). Steel door at basement well.

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Facility Summary

City of Camas
City Hall Annex
City Hall Annex

528 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**3.0**			
B30 Roofing						
B3010 Roof Coverings	1960	2000	3	TRB	12/01/21	Older built-up roof, assume approaching end of life. Numerous leak issues occurring, but being addressed by maintenance. Standing water and debris (where the roof had been designed to slope to a prior drain now blocked off). Active leaks in an internal roof drain at the east lower roof.
B3030 Projections	1960	1974	3	TRB	12/01/21	Original canopy over frontage and entry, 1974 addition of a covered drive-up teller. South entry door missing canopy fabric (minor maintenance to replace).
C Interiors			**3.6**			
C10 Interior Construction						
C1010 Partitions	1960	1960	3	TRB	12/01/21	A mix of gypsum board on studs and concrete walls.
C1020 Interior Doors	1960	1960	3	TRB	12/01/21	A mix of aluminum storefront to IT and the former bank teller area, wood doors, and two steel vault doors (one on the main level, and one on the basement level).
C1030 Fittings	1960	1960	3	TRB	12/01/21	Minimal rubber base, storage shelving, hand rails, built-in counters.
C20 Staircases						
C2010 Stair Construction	1960	1960	3	TRB	12/01/21	Concrete stairs.
C2020 Stair Finishes	1960	1960	4	TRB	12/01/21	Carpet at end of life (assumed asbestos as other tested carpet adhesive also contains asbestos).
C30 Interior Finishes						
C3010 Wall Finishes	1960	2000	3	TRB	12/01/21	Paint.

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Facility Summary

City of Camas
City Hall Annex
City Hall Annex

528 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**3.6**			
C30 Interior Finishes						
C3020 Floor Finishes	1960	2000	5	TRB	12/01/21	Carpet finishes are in a variety of conditions and ages, however, adhesives have tested positive for asbestos. Basement level toilet rooms have vintage mid-century ceramic tile. Other areas of exposed concrete in basement.
C3030 Ceiling Finishes	1960	1960	5	TRB	12/01/21	12" square glue-up acoustic tile has tested positive for asbestos.
D Services			**3.8**			
D20 Plumbing						
D2010 Plumbing Fixtures	1960	1960	4	DCS	12/01/21	Mix of mostly older and some newer; many are stained by rust in the water distribution system.
D2020 Domestic Water Distribution	1960	1960	4	DCS	12/01/21	Mostly original galvanized with discolored water, but somewhat newer electric tank-type domestic hot water heater; heater is missing expansion tank - minor maintenance to install.
D2030 Sanitary Waste	1960	1960	3	DCS	12/01/21	Mix of original and newer cast iron; some tested fixtures are slow to drain.
D2040 Rain Water Drainage	1960	1960	4	DCS	12/01/21	Few and undersized roof drains with roof ponding and flooding into the building during heavy rain.
D2090 Other Plumbing Systems	1960	1960	3	DCS	12/01/21	Sump with assumed sump pump at basement main mechanical room; no issues reported.
D30 HVAC						
D3010 Energy Supply	1960	1960	3	DCS	12/01/21	Natural gas piping to furnaces; piping on roof is rusty - minor maintenance to replace.

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Facility Summary

City of Camas
City Hall Annex
City Hall Annex

528 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.8**			
D30 HVAC						
D3020 Heat Generating Systems	1960	2009	2	DCS	12/01/21	Two 2009 Trane high-efficiency gas-fired furnaces at basement air handling unit.
D3030 Cooling Generating Systems	1960	2009	3	DCS	12/01/21	2009 rooftop ten-ton condensing unit serving the basement air handing system.
D3040 HVAC Distribution Systems	1960	1960	3	DCS	12/01/21	Mostly original sheet metal duct in ceiling and wall space; excepting 2009 ductwork in basement mechanical room. Airflow balance unclear throughout. Several rooftop and ceiling exhaust fans.
D3050 Terminal and Package Units	1960	1960	4	DCS	12/01/21	One older rooftop gas-pack unit, with no apparent ventilation.
D3060 Controls and Instrumentation	1960	2009	3	DCS	12/01/21	Newer, but not networked controls.
D3090 Other HVAC Systems and Equipment	1960	1960	4	DCS	12/01/21	Abandoned basement incinerator and chimney up to roof - minor maintenance to demolish incinerator as needed.
D40 Fire Protection						
D4030 Fire Protection Specialties	1960	1960	3	DCS	12/01/21	Fire extinguishers in cabinets.
D50 Electrical						
D5010 Electrical Service and Distribution	1960	1960	4	DCS	12/01/21	Aged and obsolete 208V, three-phase, 400A.
D5020 Lighting and Branch Wiring	1960	1960	4	DCS	12/01/21	Old surface-mount fluorescent with relatively poor performance.
D5032 Low Voltage Communication	1960	1960	4	DCS	12/01/21	The original plain-old-telephone service (POTS) is largely abandoned; other legacy commercial bank communication systems are of little use to the City Hall Annex.

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Facility Summary

City of Camas
City Hall Annex
City Hall Annex

528 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.8**			
D50 Electrical						
D5038 Low Voltage Security	1960	1960	4	DCS	12/01/21	No apparent card-key access, minimal CCTV, no apparent intrusion detection.
D5039 Low Voltage Data	1960	2020	3	DCS	12/01/21	Mix of abandoned and some newer, including new IDF for west IT office area, but no coverage elsewhere. However, there is modern high-speed fiber-optic service sub-fed from City Hall across the street to east, via temporary overhead line (see G4030 for details).
D5090 Other Electrical Systems	1960	1960	4	DCS	12/01/21	Minimal emergency lighting, no standby generator or uninterruptible power supply (UPS).
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1010 Commercial Equipment	1960	1960	3	DCS	12/01/21	Kitchenette appliances; some office equipment.
E1020 Institutional Equipment	1960	1960	3	DCS	12/01/21	Bank vault on main floor; document vault at basement; teller equipment at teller/drive-through.
E1030 Vehicular Equipment	1960	1960	4	DCS	12/01/21	Teller window drive-through.
E20 Furnishings						
E2010 Fixed Furnishings	1960	1960	3	TRB	12/01/21	Limited built-in furnishings. 1974 era teller casework (assumed will need to be demolished). Excellently preserved time capsule of a mid-century modern kitchen break room integral sink, fridge cook top, and oven with matching upper metal cabinets (if not desired to retain, salvage to preserve).

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$7,000.00	LS	$7,000	$13,709

Deficient Material: **Exterior Doors**

Stormwater from the sidewalk runs into the front entry (currently lined with sandbags).



Remedial Action:

Sawcut slab and install a trench drain/walk-off grate.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	2	$2,500.00	EA	$5,000	$9,792

Deficient Material: **Roof Drains**

Standing water where roof drain was abandoned. Lower roof internal drain undersized and leaking, now abandoned.

Remedial Action:

Reinstall and connect roof drain. Seal internal drain.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

C2020 Stair Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	1	$5,000.00	EA	$5,000	$9,792

Deficient Material: **Stair Finish**

Carpet at end of life (assumed asbestos as other tested carpet adhesive also contains

Remedial Action:

Remove carpet, abate any asbestos, install new finish.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

C3020 Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	5,000	$14.00	SF	$70,000	$137,088

Deficient Material: **Carpet**

Carpet finishes are in a variety of conditions and ages, however, adhesives have tested positive for asbestos.

Remedial Action:

Remove carpet, abate asbestos, reinstall floor finishes.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

C3030 Ceiling Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	7,000	$10.00	SF	$70,000	$137,088

Deficient Material: **Acoustic Ceiling Tile**

12" square glue-up acoustic tile has tested positive for asbestos.

Remedial Action:

Remove and abate ceiling tile, install new acoustic ceiling material.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D2010 Plumbing Fixtures	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10	$2,000.00	EA	$20,000	$39,168

Deficient Material: **Fixtures**
Original damaged, stained, and inefficient fixtures.

Remedial Action:
Replace original fixtures with modern type.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D2020 Domestic Water Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	10,000	$3.00	SF	$30,000	$58,752

Deficient Material: **Galvanized pipe**

Original galvanized pipe is failing with heavily discolored water at some fixtures, low water pressure at others, and bottled water needed.

Remedial Action:

Replace galvanized piping with copper and/or PEX tubing.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D2030 Sanitary Waste	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10,000	$2.00	SF	$20,000	$39,168

Deficient Material: **DW&V piping**

Some fixtures slow to drain and flush.



Remedial Action:

Clean, test, inspect, and repair or replace original cast iron drain, waste, and vent piping.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D2040 Rain Water Drainage	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	10,000	$1.50	SF	$15,000	$29,376

Deficient Material: **Roof drains**

Few and undersized roof drains with roof ponding and flooding into the building during heavy rain.

Remedial Action:

Install new, larger roof drains.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10,000	$1.50	SF	$15,000	$29,376

Deficient Material: **Test, Adjust, and Balance (TAB) & Commissioning**

Uneven and inconsistent air flows throughout.



Remedial Action:

Conduct Re-TAB (test, adjust, and balance) to measure air flows and restore intended design performance.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D3050 Terminal and Package Units	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$17,500.00	LS	$17,500	$34,272

Deficient Material: **Roof Top Unit**

Rooftop gas-pack unit serving the main floor west is approaching end of life and has no apparent outside air, leaving the served space unventilated, unless the operable windows are opened.



Remedial Action:

Replace rooftop gas-pack with new unit includes full economizer for ventilation and energy efficiency.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	10,000	$7.00	SF	$70,000	$137,088

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D5010 Electrical Service and Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	10,000	$7.00	SF	$70,000	$137,088

Deficient Material: **Electrical distribution**
Obsolete Coast electrical panels.

Remedial Action:
Replace.

Action Type:
Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D5020 Lighting and Branch Wiring	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10,000	$7.00	SF	$70,000	$137,088

Deficient Material: **Lighting**

Poor lighting from aged fixtures with increasingly obsolete fluorescent lamps.



Remedial Action:

Replace with modern LED fixtures.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D5032 Low Voltage Communication	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10,000	$1.50	SF	$15,000	$29,376

Deficient Material: **Communications**

Obsolete and abandoned communications systems including telephone, intercom, and unclear public address.

Remedial Action:

Modernize communication systems throughout to meet City standard.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	10,000	$2.00	SF	$20,000	$39,168

Deficient Material: **Fire alarm**
No fire alarm.

Remedial Action:
Install fire alarm.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D5038 Low Voltage Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10,000	$1.75	SF	$17,500	$34,272

Deficient Material: **Security**

No apparent card-key access or intrusion detection; minimal CCTV coverage.

Remedial Action:

Install modern electronic security system per City standards.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

D5039 Low Voltage Data	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	7,500	$2.00	SF	$15,000	$29,376

Deficient Material: **Data System**

Newer IDF and cabling serving the main floor IT area to west, but otherwise little or no data service to basement and east spaces; prior data cabling cut and abandoned in place.



Remedial Action:

Renew data service throughout the basement and east work areas to City standards.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex

E2010 Fixed Furnishings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$5,000.00	EA	$5,000	$9,792

Deficient Material: **Casework**

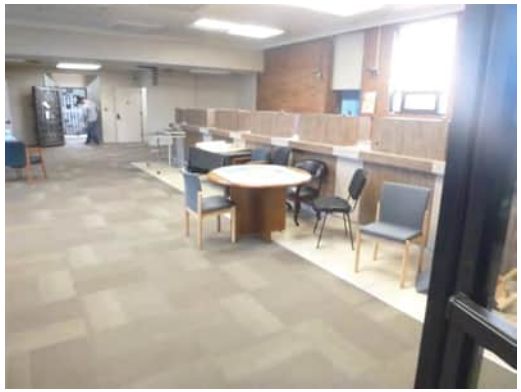
1974 era teller casework (assumed will need to be demolished).

Remedial Action:

Demo teller station casework.

Action Type:

ADA



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Facility Summary

City of Camas
City Hall Annex
City Hall Annex Infrastructure

528 NE 4th Ave
Camas, WA 98607

Facility Condition Summary

The fully developed site houses a former bank building with a drive-through teller, in addition to a parking lot on the south half of the property, and minimal landscaping.

City water, with irrigation appearing sub-fed from city water; no fire sprinkler; City sewer failing due to tree root intrusion; utility natural gas; modern 208V, three-phase power from Clark PUD. High-speed fiber-optic data extended from City Hall to east via semi-temporary overhead line.

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Facility Summary

City of Camas
City Hall Annex
City Hall Annex Infrastructure

528 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1960	1995	3	TRB	12/01/21	Asphalt drive lanes behind building through former drive-through bank teller.
G2020 Parking Lots	1960	1995	3	TRB	12/01/21	Asphalt lots, cracks developing.
G2030 Pedestrian Paving	1960	1960	3	TRB	12/01/21	Primarily only City public sidewalks. Some past (ongoing) street tree root upheaval that has been addressed by regular maintenance.
G2050 Landscaping	1960	1960	3	TRB	12/01/21	Minimal planters street side, some perimeter shrubs, and parking island trees and shrubs.
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1960	1960	4	DCS	12/01/21	Original City water service; no fire sprinkler; the minimal irrigation system appears sub-fed from the building potable water system.
G3020 Sanitary Sewer	1960	1960	4	DCS	12/01/21	The original sanitary side sewer is failing, with back-ups, reportedly from tree root damage.
G3030 Storm Sewer	1960	1960	3	DCS	12/01/21	Several catch basins and assumed roof drain piped to City storm at street to south.
G3060 Fuel Distribution	1960	2009	2	DCS	12/01/21	NW Natural gas meter No. 1147432 with 630 cfh capacity, but no seismic shut-off valve - minor maintenance to install.

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Facility Summary

City of Camas
City Hall Annex
City Hall Annex Infrastructure

528 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G40 Site Electrical utilities						
G4010 Electrical Distribution	1960	1960	3	DCS	12/01/21	Power underground from PUD to basement main electrical room service entry with Clark PUD meter No. 76-076-3311 delivered at 208V, three-phase. No standby power or renewable energy.
G4020 Site Lighting	1960	1960	4	DCS	12/01/21	Mostly older building fixtures, and older pole fixtures at the parking lot.
G4030 Site Communications and Security	1960	2020	3	DCS	12/01/21	Semi-temporary fiber-optic data overhead from City Hall to east. No site electronic security other than several CCTV cameras.
G90 Other Site Construction						
G9010 Service and Pedestrian Tunnels	1960	1960	3	DCS	12/01/21	Two basement exit stairwells - one enclosed to east and one exposed to west.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex Infrastructure

G2020 Parking Lots	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	14,000	$4.00	SF	$56,000	$109,670

Deficient Material: **Asphalt**
Cracks and moss/weed growth starting.

Remedial Action:
Seal cracks, sealcoat, and restripe lot.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex Infrastructure

G3020 Sanitary Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$6,500.00	LS	$6,500	$12,730

Deficient Material: **Sanitary Sewer**

The original sanitary side sewer is failing, with back-ups, reportedly from tree root damage.



Remedial Action:

Replace side sewer piping and connections.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: City Hall Annex
Facility: City Hall Annex Infrastructure

G4030 Site Communications and Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Fiber-optic service**

Semi-temporary fiber-optic data service overhead from City Hall to Annex via poles.



Remedial Action:

Install permanent underground fiber-optic data service to City Hall Annex.

Action Type:

Other

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: City Hall Annex

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
City Hall Annex	B20 Exterior Closure	$7,000	$1,400	$1,680	$3,629	$13,709	$13,709
	B30 Roofing	$5,000	$1,000	$1,200	$2,592	$9,792	$9,792
	C20 Staircases	$5,000	$1,000	$1,200	$2,592	$9,792	$9,792
	C30 Interior Finishes	$140,000	$28,000	$33,600	$72,576	$274,176	$274,176
	D20 Plumbing	$85,000	$17,000	$20,400	$44,064	$166,464	$167,623
	D30 HVAC	$32,500	$6,500	$7,800	$16,848	$63,648	$64,590
	D40 Fire Protection	$70,000	$14,000	$16,800	$36,288	$137,088	$137,088
	D50 Electrical	$207,500	$41,500	$49,800	$107,568	$406,368	$413,851
	E20 Furnishings	$5,000	$1,000	$1,200	$2,592	$9,792	$9,792
	Facility Total	**$557,000**	**$111,400**	**$133,680**	**$288,749**	**$1,090,829**	**$1,100,413**
City Hall Annex Infrastructure	G20 Site Improvements	$56,000	$11,200	$13,440	$29,030	$109,670	$111,292
	G30 Site Civil / Mechanical Utilities	$6,500	$1,300	$1,560	$3,370	$12,730	$12,730
	G40 Site Electrical utilities	$5,000	$1,000	$1,200	$2,592	$9,792	$10,084
	Facility Total	**$67,500**	**$13,500**	**$16,200**	**$34,992**	**$132,192**	**$134,105**
	Site Total	**$624,500**	**$124,900**	**$149,880**	**$323,741**	**$1,223,021**	**$1,234,519**

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Opportunity Summary By Subsystem

City of Camas

Site: City Hall Annex

Total Site Opportunity Cost: $159,000

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**City Hall Annex**						
System:	**Roofing**	**Total Cost: $30,000**					
B3010	**Roof Coverings**						
		No fall restraint system.	Install a fall restraint system for safety and security of maintenance and subcontractors.	1.00	$30,000.00	LS	$30,000
Facility:	**City Hall Annex**						
System:	**Vertical Transportation**	**Total Cost: $100,000**					
D1010	**Elevators and Lifts**						
		No elevator to basement.	Install two-stop elevator.	1.00	$100,000.00	LS	$100,000
Facility:	**City Hall Annex**						
System:	**HVAC**	**Total Cost: $20,000**					
D3060	**Controls and Instrumentation**						
		Standalone controls.	Networked controls.	10,000.00	$2.00	SF	$20,000
Facility:	**City Hall Annex Infrastructure**						
System:	**Site Improvements**	**Total Cost: $9,000**					
G2050	**Landscaping**						
		The aging street trees are causing sidewalk damage and roof debris damage as the trees overhang the building. Sidewalk root upheaval is a constant problem for maintenance and with root upheaval of walking services causes tripping and ADA hazards.	Remove old trees and plant urban environment appropriate native species trees.	3.00	$3,000.00	EA	$9,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Community Center
Community Center

1718 SE 7th Ave
Camas, WA 98607

Facility Size - Gross S.F.	21,420
Year Of Original Construction	1916
Facility Use Type	Community Center
Construction Type	Medium
# of Floors	2
Energy Source	Electric
Year Of Last Renovation	1916
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**3.4**			
Facility Condition Index (FCI)	0.26	**Predicted Renewal Budget 2028 - 2041**	$974,000	$992,000
Current Replacement Value (CRV)	$7,534,000	**Observed Deficiencies 2022 - 2027**	$2,622,000	$2,652,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$985,000	N/A

Facility Condition Summary

The current community center is repurposed from a 1916 school building. The two-story structure (the ground floor is actually a daylight basement) is constructed of timber and wood on brick or concrete walls covered in cement plaster. There was an addition to the length of the south facade of about 12' now housing a kitchen (remodeled in 1995), bathrooms, and offices. The basement level is largely unfinished (and contains an abandoned mechanical room) and is currently used as storage for the City and other community organizations. The upper floor contains large meeting and banquet rooms and a large ball room, as well as small toilet rooms and offices.

The building is functionally inadequate for use as a proper community center. The configuration and spaces make this difficult to house parks and rec and community events, classes, and other functions. It has limited space utilization but is used by groups such as the VFA. The current toilet rooms are a large concern for these user groups, and although there is a kitchen, it is not a commercial kitchen to support functions.

Based on the age of the facility and observed structural construction details, it does not appear that this building has received any seismic safety upgrades. A seismic and structural safety evaluation should be conducted to assess the conditions, and provide recommendations for structural improvements.

HVAC is forced-air heating and cooling on the main floor (upper level) with inefficient electric resistance heat and old split-Dx cooling. There is no apparent ventilation from the mechanical system. Ventilation appears intended from operable windows, some of which are no longer operable - this may be a code violation, especially for a community center, and particularly with ongoing COVID-19 pandemic risk - further investigation is suggested prior to increased public use. The basement (lower level) has no HVAC service, excepting two electric resistance unit heaters in the two spaces at the far west end. Basement areas cannot be used for human occupancy without meeting basic code-required heat and ventilation requirements.

Plumbing is mostly original or older, with undersized children's fixtures for elementary school use; one observed domestic hot water heater; some support for the residential-type kitchen. No fire sprinkler or fire alarm, other than fire pull-stations with unclear functionality. Obsolete residential-style 120/240V, single-phase power. Aged fluorescent lighting. Minimal low voltage systems, but with apparent high-speed fiber-optic data sub-fed from the Public Works site one block to south.

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Facility Summary

City of Camas
Community Center
Community Center

1718 SE 7th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**3.0**			
A10 Foundations						
A1010 Standard Foundations	1916	1916	3	TRB	12/02/21	Unknown construction, but no substantial settlement observed or reported, and they have stood the test of time. See B1010 Floor Construction for comments about needed full seismic evaluation.
A1030 Slab On Grade	1916	1916	3	TRB	12/02/21	Basement level slab on grade, no major issues noted, but radon testing advised.
A20 Basements						
A2020 Basement Walls	1916	1916	3	TRB	12/02/21	Plaster on masonry or concrete, no issues observed. See B1010 Floor Construction for comments about needed full seismic evaluation.
B Shell			**3.0**			
B10 Superstructure						
B1010 Floor Construction	1916	1916	3	TRB	12/02/21	Wood on wood joists, on heavy timber, on heavy timber columns. Based on the age of the facility and observed structural construction details, it does not appear that this building has received any seismic safety upgrades. A seismic and structural safety evaluation should be conducted to assess the conditions and provide recommendations for structural improvements.
B1020 Roof Construction	1916	1916	3	TRB	12/02/21	Existing roof structure was not observed, but based on the era, quality of construction, and observation of exposed eave rafters, is expected to be wood framed joist members on timbers. No significant out of plane sagging observed. See B1010 Floor Construction for comments about needed full seismic evaluation.

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Facility Summary

City of Camas
Community Center
Community Center

1718 SE 7th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**3.0**			
B20 Exterior Closure						
B2010 Exterior Walls	1916	1916	3	TRB	12/02/21	Cement plaster on concrete or masonry walls in the original structure in fair condition. Wood lap siding on wood framed construction on the south side addition in poor condition. See B1010 Floor Construction for comments about needed full seismic evaluation.
B2020 Exterior Windows	1916	1995	4	TRB	12/02/21	Some large original wood units in poor condition, many large windows replaced with thermal units with operable sections in aluminum frames (1995) at the ballroom and banquet room, and a mix of other older aluminum and vinyl replacement windows in poor condition elsewhere.
B2030 Exterior Doors	1916	1995	3	TRB	12/02/21	Aluminum storefront replacement doors in original fenestrations, and garage overhead door in fair condition. A mix of other original exterior doors with old egress hardware.
B30 Roofing						
B3010 Roof Coverings	1916	2010	2	TRB	12/02/21	Composite shingle roofing.
B3030 Projections	1916	1916	3	TRB	12/02/21	Covered entries and painted extended eaves.
C Interiors			**3.3**			
C10 Interior Construction						
C1010 Partitions	1916	1916	3	TRB	12/02/21	Plaster on lath, on wood studs. In good condition on the upper floor. Basement level is in a variety of conditions from fair to poor.
C1020 Interior Doors	1916	1916	4	TRB	12/02/21	Wood doors and frames, worn from years of service and long past expected useful life.
C1030 Fittings	1916	1916	3	TRB	12/02/21	Miscellaneous base, display cabinets, picture rails.

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Facility Summary

City of Camas
Community Center
Community Center

1718 SE 7th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**3.3**			
C20 Staircases						
C2010 Stair Construction	1916	1916	4	TRB	12/02/21	Wood stair to basement, worn treads, rails, and posts, not code-compliant, and no ADA access.
C2020 Stair Finishes	1916	1990	4	TRB	12/02/21	Non-slip tread surface worn, minor maintenance to replace.
C30 Interior Finishes						
C3010 Wall Finishes	1916	2009	3	TRB	12/02/21	Upper level paint in fair condition. See C1010 Partitions for issues at basement level. Note, based on age lead-based paint is expected.
C3020 Floor Finishes	1916	2004	3	TRB	12/02/21	Carpet and ballroom hardwood replaced in 2004 and in fair condition with some areas of torn and worn carpet. Basement level a combination of exposed concrete, and very poor condition wood floor in west wing classroom.
C3030 Ceiling Finishes	1916	1995	4	TRB	12/02/21	Upper floor textured plaster on gypsum ceilings in good condition. Roughly 60% of ceilings in poor condition; cracked gypsum in office addition and unfinished gypsum in basement level.
D Services			**3.9**			
D20 Plumbing						
D2010 Plumbing Fixtures	1916	1916	4	DCS	12/02/21	Many original and some newer, but children's fixtures; some newer fixtures, but most aged and inefficient.
D2020 Domestic Water Distribution	1916	1916	4	DCS	12/02/21	Mix of older lead and galvanized steel, and some newer copper and PEX tubing; one abandoned hot water heater and one aging operating hot water heater. Reported pipe leaks in several locations.

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Facility Summary

City of Camas
Community Center
Community Center

1718 SE 7th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.9**			
D20 Plumbing						
D2030 Sanitary Waste	1916	1916	3	DCS	12/02/21	Mix of older cast iron and newer ABS drain, waste, and vent piping; most tested fixtures on the upper floor flush and drain well; fixtures on the lower level were not operable.
D2040 Rain Water Drainage	1916	2010	2	DCS	12/02/21	Newer metal gutter and downspout to grade; however, some downspouts are damaged - minor maintenance to repair.
D2090 Other Plumbing Systems	1916	1916	4	DCS	12/02/21	Sump pump in basement mechanical room appears failed - minor maintenance to replace.
D30 HVAC						
D3010 Energy Supply	1916	1916	5	DCS	12/02/21	Abandoned fuel oil piping - minor maintenance to demolish and remediate as needed.
D3020 Heat Generating Systems	1916	1916	4	DCS	12/02/21	Abandoned steam boiler in basement. Three electric resistance heat furnaces; two on main floor, one in attic with difficult access.
D3030 Cooling Generating Systems	1985	1990	4	DCS	12/02/21	Three aged outside condensing units and inside evaporator cooling coils.
D3040 HVAC Distribution Systems	1916	1916	4	DCS	12/02/21	Forced-air heating and cooling for upper level with no ventilation air and mostly fixed windows; unclear supply and return paths and balance. No HVAC service for lower level (basement), except for two unit heaters to west.
D3050 Terminal and Package Units	1916	1916	4	DCS	12/02/21	Several aged electric wall heaters at upper level corridors and some offices; two aging electric resistance unit heaters at west end of basement (lower level) area.

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Facility Summary

City of Camas
Community Center
Community Center

1718 SE 7th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.9**			
D30 HVAC						
D3060 Controls and Instrumentation	1916	1916	4	DCS	12/02/21	Standalone controls; mix of older and somewhat newer - minor maintenance to replace upon failure or with associated equipment replacement.
D3090 Other HVAC Systems and Equipment	1916	1916	4	DCS	12/02/21	Kitchen exhaust is failing - minor maintenance to replace.
D40 Fire Protection						
D4030 Fire Protection Specialties	1916	1995	3	DCS	12/02/21	Fire extinguishers on hooks and AED in cabinet.
D50 Electrical						
D5010 Electrical Service and Distribution	1916	1916	4	DCS	12/02/21	Obsolete single-phase 120/240V power with several panels in basement.
D5020 Lighting and Branch Wiring	1916	1916	4	DCS	12/02/21	Aged wiring and older fluorescent lighting.
D5032 Low Voltage Communication	1916	2008	3	DCS	12/02/21	Aging voice over internet protocol (VOIP) telephone. Opportunity to upgrade to City standard as minor maintenance. Newer audio system in ballroom.
D5037 Low Voltage Fire Alarm	1916	1916	4	DCS	12/02/21	Pull-stations with unclear operability.
D5038 Low Voltage Security	1916	1916	4	DCS	12/02/21	Minimal electronic security.
D5039 Low Voltage Data	1916	2015	3	DCS	12/02/21	Somewhat newer data; assume minor maintenance to expand, especially WiFi service for guest use.
D5090 Other Electrical Systems	1916	1916	4	DCS	12/02/21	Minimal emergency lighting; no standby generator; some emergency lighting fixtures damaged. Minor maintenance to repair, replace, or add several emergency lighting fixtures.

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Facility Summary

City of Camas
Community Center
Community Center

1718 SE 7th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1010 Commercial Equipment	1916	1916	3	DCS	12/02/21	Aging kitchen appliance and office equipment.
E20 Furnishings						
E2010 Fixed Furnishings	1916	1995	3	TRB	12/02/21	Miscellaneous built-in window seats with cushions, window curtains, window blinds, kitchen casework (1995), and other built-ins on upper floor in good condition. Basement level remaining elements in poor condition (but minor maintenance to demolish).

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

B1010 Floor Construction	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	1	$25,000.00	LS	$25,000	$48,960

Deficient Material: **Structural Evaluation**

Based on the age of the facility and observed structural construction details, it does not appear that this building has received any seismic safety upgrades.

Remedial Action:

A seismic and structural safety evaluation should be conducted for the entire structure to assess the conditions, and provide recommendations for structural improvements.

Estimate provided is for structural evaluation and design only. Actual construction work to provide seismic and structural upgrades cannot be quantified at this time, but likely will be substantial.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

B2010 Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	4,000	$18.00	SF	$72,000	$141,005

Deficient Material: **Wood Siding**

Wood lap siding on wood framed construction on the south side addition: peeling paint exposing weathered lap siding, some known to be rotten. Note, based on age lead-based paint is expected.

Remedial Action:

Test for lead, remove lap siding, install new flashings and building wrap, install new cladding, prime, and paint.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

B2020 Exterior Windows	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	18	$4,000.00	EA	$72,000	$141,005

Deficient Material: **Exterior Windows**

A mix of original large windows in poor condition, and a mix of other older aluminum and vinyl replacement windows in poor condition.



Remedial Action:

Replace existing older window frames and glass with new thermal units with historic-looking frames, mullions, and muntin grids (consider fiberglass for efficiency, longevity, blend, and paintability).

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	2	$3,000.00	EA	$6,000	$11,750

Deficient Material: **Doors and Frames**

A mix of other original exterior doors with old egress hardware out of ballroom and basement.



Remedial Action:

Replace door frames, doors, and hardware with modern code-compliant doors.

Action Type:

Life Safety

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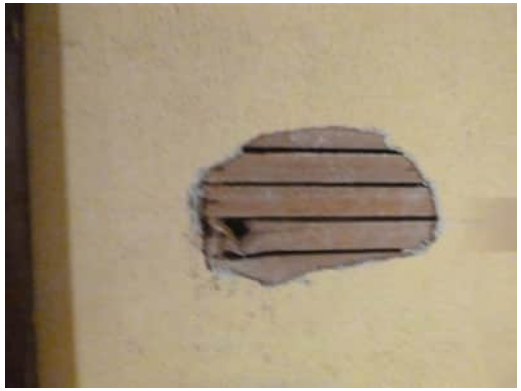
Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

C1010 Partitions	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$50,000.00	LS	$50,000	$97,920

Deficient Material: **Gypsum**

Basement level is in a variety of conditions from fair to poor and some areas of exposed lath.



Remedial Action:

Install gypsum, prime and paint, and repaint other walls.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

C1020 Interior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	20	$2,000.00	EA	$40,000	$78,336

Deficient Material: **Doors and Frames**

Wood doors and frames, worn from years of service and long past expected useful life.



Remedial Action:

Refinish or replace all doors, frames, and hardware.

Action Type:

ADA

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

C2010 Stair Construction	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$40,000.00	EA	$40,000	$78,336

Deficient Material: **Stair**

Wood stair to basement, worn treads, rails, and posts, not code-compliant, and no ADA access. Head height clearance not compliant with current code.

Remedial Action:

Replace stair and treads and add code-compliant handrails. Remove recently added "head knocker" gypsum assembly at base of stairs.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

C3030 Ceiling Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	12,000	$5.00	SF	$60,000	$117,504

Deficient Material: **Ceiling Finishes**

Roughly 60% of ceilings in poor condition; cracked gypsum in office addition and unfinished gypsum in basement level.



Remedial Action:

Finish unfinished ceilings.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D2010 Plumbing Fixtures	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	21,420	$6.00	SF	$128,520	$251,694

Deficient Material: **Fixtures**
Many aged and obsolete plumbing fixtures.

Remedial Action:
Replace and add per code.

Action Type:
Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D2010 Plumbing Fixtures	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Fixtures**
No handwash sink in kitchen.

Remedial Action:
Install sink per health code.

Action Type:
Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D2020 Domestic Water Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	21,420	$5.00	SF	$107,100	$209,745

Deficient Material: **Domestic water**

Older lead and galvanized piping; aging water heater.



Remedial Action:

Replace all older piping with modern copper and/or PEX; replace aged hot water heater.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D2030 Sanitary Waste	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10,000	$5.00	SF	$50,000	$97,920

Deficient Material: **DW&V piping**

Aged drain, waste, and vent (DW&V) piping at lower level.



Remedial Action:

Replace DW&V piping.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D3020 Heat Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$10,000.00	LS	$10,000	$19,584

Deficient Material: **Boiler**

Abandoned steam boiler in basement.



Remedial Action:

Demolish boiler and remediate any hazardous materials.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D3020 Heat Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	3	$13,500.00	EA	$40,500	$79,315

Deficient Material: **Furnace**

Aged and inefficient electric resistance heat furnace.



Remedial Action:

Replace with heat pump heat.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	3	$7,500.00	EA	$22,500	$44,064

Deficient Material: **Condensing unit**
Aged condensing units.

Remedial Action:
Replace upon failure.

Action Type:
Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	11,000	$15.00	SF	$165,000	$323,136

Deficient Material: **Ductwork**

No apparent mechanical ventilation (outside air); no economizer (free cooling); apparent unbalanced air flows with uneven heating and cooling.

Remedial Action:

Re-engineer and modernize the HVAC air supply and return system, including adding outside air with economizer.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D3050 Terminal and Package Units	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	7	$850.00	EA	$5,950	$11,652

Deficient Material: **Unit Heaters**
Aging and aged electric resistance unit heaters.

Remedial Action:
Replace upon failure.

Action Type:
Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	21,420	$6.00	SF	$128,520	$251,694

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D5010 Electrical Service and Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	21,420	$4.00	SF	$85,680	$167,796

Deficient Material: **Electrical distribution**
Obsolete single-phase power.

Remedial Action:
Install modern three-phase 208V power system.

Action Type:
Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D5020 Lighting and Branch Wiring	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	21,420	$7.00	SF	$149,940	$293,643

Deficient Material: **Light fixtures and branch wiring**
Aged circuiting and older fluorescent light fixtures.



Remedial Action:
Modernize wiring and fixtures.

Action Type:
Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	21,420	$2.50	SF	$53,550	$104,872

Deficient Material: **Fire alarm**

No fire alarm system, excepting several pull-stations with unclear operability.

Remedial Action:

Install modern fire alarm system.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center

D5038 Low Voltage Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	21,420	$1.00	SF	$21,420	$41,949

Deficient Material: **Security**
Minimal electronic security.

Remedial Action:
Upgrade to City standard.

Action Type:
Life Safety



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Facility Summary

City of Camas
Community Center
Community Center Infrastructure

1718 SE 7th Ave
Camas, WA 98607

Facility Condition Summary

Roughly half of the property houses a community center building, and the southern side is comprised of a tight parking lot with tree island geometry that makes maintenance difficult. The landscaping around the west and north of the building is overgrown. An ADA ramp was constructed on the south side in 2008. There is an adjacent gravel overflow lot across the street to the west that is in need to vegetation removal.

City water and sewer, but no fire sprinkler or apparent irrigation. Clark PUD power, but no natural gas to this all-electric building. High-speed fiber-optic data appears sub-fed from Public Works Operations Center to south. Apparent abandoned underground fuel oil storage tank in yard to southeast.

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Facility Summary

City of Camas
Community Center
Community Center Infrastructure

1718 SE 7th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1916	1916	4	TRB	12/02/21	Concrete curb cut aprons are cracked and broken.
G2020 Parking Lots	1916	1990	3	TRB	12/02/21	Asphalt lot, including ADA stalls, but no access isle striping, and missing one sign, including van stall. Some cracking, settlement, and surface weathering observed. Adjacent overflow gravel lot is under-maintained with significant vegetative growth.
G2030 Pedestrian Paving	1916	2008	3	TRB	12/02/21	2008 concrete ADA ramp and stairs to parking lot in good condition. Original front entry plaza and monument stairs in fair to poor condition with areas of breakage and settlement. East wood emergency egress stair is rotting.
G2040 Site Development	1916	1916	4	TRB	12/02/21	Monument sign. Concrete retaining wall to lower level garage is collapsing. Former play equipment has been removed.
G2050 Landscaping	1916	1916	4	TRB	12/02/21	Tree canopy encroaching roof. Other landscaping is overgrown and creating maintenance and safety and security issues (see crime prevention through environmental design (CPTED) standards). Landscaping in the parking islands is overgrown, making adjacent stalls unusable. Lawn surfaces are uneven with mole holes.
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1916	1916	3	DCS	12/02/21	City water with no issues reported; no fire service; no apparent irrigation system.
G3020 Sanitary Sewer	1916	1916	3	DCS	12/02/21	City sewer with no issues reported.

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Facility Summary

City of Camas
Community Center
Community Center Infrastructure

1718 SE 7th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3030 Storm Sewer	1916	1916	4	DCS	12/02/21	Sheet flow to street from parking lot; roof drain discharge to grade at building foundation.
G3060 Fuel Distribution	1916	1916	4	DCS	12/02/21	Signs of underground fuel oil storage tank outside the abandoned basement boiler room.
G40 Site Electrical utilities						
G4010 Electrical Distribution	1916	1916	4	DCS	12/02/21	Obsolete 120/240V, overhead residential-type single-phase 120/240V power with Clark PUD meter No. 81-464-067.
G4020 Site Lighting	1916	1916	4	DCS	12/02/21	Minimal site lighting - minor maintenance to install several additional building-mounted LED fixtures.
G4030 Site Communications and Security	1916	2015	3	DCS	12/02/21	Apparent newer fiber-optic high-speed data from public works facility one block south; aged plain-old-telephone service (POTS) with unclear operability; minimal site electronic security.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center Infrastructure

G2010 Roadways	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	2	$5,000.00	EA	$10,000	$19,584

Deficient Material: **Concrete Pavement**

Concrete curb cut aprons are cracked and broken.



Remedial Action:

Demo and repour driveway entrances.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center Infrastructure

G2020 Parking Lots	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	10,000	$4.00	SF	$40,000	$78,336

Deficient Material: **AC Paving**

Cracks in asphalt, dirt, moss growth.



Remedial Action:

Seal cracks. Sealcoat recommended to preserve and extend lot life, restripe and provide code-compliant ADA parking striping and signage.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center Infrastructure

G2030 Pedestrian Paving	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	800	$25.00	SF	$20,000	$39,168

Deficient Material: **Concrete Paving**

Original front entry plaza and monument stairs in fair to poor condition with areas of breakage and settlement.

Remedial Action:

Demo, re-compact, and repave entry plaza flatwork. Demo, re-compact, and repour new concrete entry stairs. Consider also adding ADA ramp in a revised design.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center Infrastructure

G2030 Pedestrian Paving	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	1	$10,000.00	EA	$10,000	$19,584

Deficient Material: **Wood Stairs**

East emergency egress landing and stairs are rotting.

Remedial Action:

Remove and replace egress stairs.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center Infrastructure

G2040 Site Development	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	40	$250.00	LF	$10,000	$19,584

Deficient Material: **Retaining Walls**

Concrete retaining wall to lower level garage is collapsing.

Remedial Action:

Remove and replace retaining walls to garage.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Community Center

Facility: Community Center Infrastructure

G2050 Landscaping	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	1	$8,000.00	LS	$8,000	$15,667

Deficient Material: **Landscaping**

Landscaping is overgrown and creating maintenance and safety and security issues (numerous hiding places with evidence of human activity). Lawn surfaces are uneven with mole holes.

Remedial Action:

Prune trees away from building. Remove large overgrown shrubs around building perimeter and plant with new landscaping. Smooth lawn areas and reseed or plant with alternative ground cover.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$15,000.00	LS	$15,000	$29,376

Deficient Material: **Storm**

No site storm drain connection to roof drains.



Remedial Action:

Install storm drain system to collect roof drains and convey away from the building.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center Infrastructure

G3060 Fuel Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$10,000.00	LS	$10,000	$19,584

Deficient Material: **Underground fuel oil tank**
Signs of abandoned underground fuel oil storage tank.

Remedial Action:
Remove or decommission the underground fuel oil storage tank.

Action Type:
Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Community Center
Facility: Community Center Infrastructure

G4010 Electrical Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	1	$15,000.00	LS	$15,000	$29,376

Deficient Material: **Electrical service**
Obsolete overhead residential type single-phase power service.

Remedial Action:
Install modern 208V, three-phase underground power service.

Action Type:
Energy Efficiency



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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Community Center

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Community Center	B10 Superstructure	$25,000	$5,000	$6,000	$12,960	$48,960	$48,960
	B20 Exterior Closure	$150,000	$30,000	$36,000	$77,760	$293,760	$297,959
	C10 Interior Construction	$90,000	$18,000	$21,600	$46,656	$176,256	$176,256
	C20 Staircases	$40,000	$8,000	$9,600	$20,736	$78,336	$78,336
	C30 Interior Finishes	$60,000	$12,000	$14,400	$31,104	$117,504	$117,504
	D20 Plumbing	$290,620	$58,124	$69,749	$150,657	$569,150	$577,562
	D30 HVAC	$243,950	$48,790	$58,548	$126,464	$477,752	$481,402
	D40 Fire Protection	$128,520	$25,704	$30,845	$66,625	$251,694	$251,694
	D50 Electrical	$310,590	$62,118	$74,542	$161,010	$608,259	$622,618
	Facility Total	**$1,338,680**	**$267,736**	**$321,283**	**$693,972**	**$2,621,671**	**$2,652,291**
Community Center Infrastructure	G20 Site Improvements	$98,000	$19,600	$23,520	$50,803	$191,923	$194,546
	G30 Site Civil / Mechanical Utilities	$25,000	$5,000	$6,000	$12,960	$48,960	$49,685
	G40 Site Electrical utilities	$15,000	$3,000	$3,600	$7,776	$29,376	$30,251
	Facility Total	**$138,000**	**$27,600**	**$33,120**	**$71,539**	**$270,259**	**$274,482**
	Site Total	**$1,476,680**	**$295,336**	**$354,403**	**$765,511**	**$2,891,930**	**$2,926,772**

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Opportunity Summary By Subsystem

City of Camas

Site: Community Center

Total Site Opportunity Cost: $991,340

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Community Center**						
System:	**Vertical Transportation**	**Total Cost: $35,000**					
D1010	**Elevators and Lifts**						
		No elevator, lift, or dumbwaiter between upper and lower levels.	Install lift.	1.00	$35,000.00	LS	$35,000
Facility:	**Community Center**						
System:	**HVAC**	**Total Cost: $342,840**					
D3040	**HVAC Distribution Systems**						
		No HVAC for most the basement (lower level) area.	Install HVAC service for basement.	10,000.00	$30.00	SF	$300,000
D3060	**Controls and Instrumentation**						
		No networked controls.	Install networked controls per City standard.	21,420.00	$2.00	SF	$42,840
Facility:	**Community Center**						
System:	**Equipment**	**Total Cost: $125,000**					
E1010	**Commercial Equipment**						
		Light-duty kitchen without grease hood, limiting the types of events at this community center.	Upgrade to commercial kitchen appliances, hoods, grease interceptor, and related.	1.00	$125,000.00	LS	$125,000
Facility:	**Community Center Infrastructure**						
System:	**Site Improvements**	**Total Cost: $40,000**					
G2040	**Site Development**						
		Former play equipment was removed due to age and safety concerns.	Redevelop play equipment area and install modern play equipment.	1.00	$40,000.00	LS	$40,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Community Center

Total Site Opportunity Cost: $991,340

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Community Center Infrastructure**						
System:	**Site Civil / Mechanical Utilities**	**Total Cost: $22,500**					
G3010	**Water Supply**						
		No observed irrigation system.	Install irrigation system.	1.00	$15,000.00	LS	$15,000
G3060	**Fuel Distribution**						
		All electric building, with natural gas presumed available in the vicinity.	Install natural gas service for building use.	1.00	$7,500.00	LS	$7,500
Facility:	**Community Center Infrastructure**						
System:	**Site Electrical utilities**	**Total Cost: $426,000**					
G4010	**Electrical Distribution**						
		No electric vehicle (EV) charging stations.	Install two EV double charging stations with rough-in for two more.	2.00	$8,000.00	EA	$16,000
		South-facing roof with good solar access.	Install 50 kW photovoltaic (PV) system.	50.00	$8,000.00	EA	$400,000
G4030	**Site Communications and Security**						
		Minimal site electronic security.	Upgrade to City standard.	1.00	$10,000.00	LS	$10,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42

4321 NW Parker Street
Camas, WA 98607

Facility Size - Gross S.F.	12,069
Year Of Original Construction	2001
Facility Use Type	Fire Station
Construction Type	Light
# of Floors	1
Energy Source	
Year Of Last Renovation	2001
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.8**			
Facility Condition Index (FCI)	0.13	**Predicted Renewal Budget 2028 - 2041**	$1,301,000	$1,494,000
Current Replacement Value (CRV)	$4,868,000	**Observed Deficiencies 2022 - 2027**	$558,000	$572,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$773,000	N/A

Facility Condition Summary

Single-story fire station (with a small mezzanine for storage, MDF, self-contained breathing apparatus (SCBA) tank room, and workout equipment), offices, a large Emergency Operation Center/training/conference room, and a three-bay pull-through apparatus bay. The building is generally in good condition. The roofing is standing seam on pitched wood trusses. Exterior walls are brick veneer base and cement lap siding above on gable ends on wood frame exterior walls. Windows are thermal glazed units in aluminum frames.

HVAC includes three gas furnaces with split-Dx cooling for station house, and overhead gas-fired infrared heat for the apparatus bays. Plumbing is conventional with support for apparatus bay equipment. Fire sprinkler and alarm throughout. Power is 208V, three-phase to the separate generator building, then underground to the main fire station building. Lighting is increasingly obsolete fluorescent with all manual control. Low voltage systems are minimal and aging.

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42

4321 NW Parker Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.6**			
A10 Foundations						
A1010 Standard Foundations	2001	2001	3	TRB	11/05/21	Assumed to be standard concrete footings and stem walls. No issues reported.
A1030 Slab On Grade	2001	2001	2	TRB	11/05/21	Standard slab on grade, no issues reported.
B Shell			**2.6**			
B10 Superstructure						
B1010 Floor Construction	2001	2001	2	TRB	11/05/21	Plywood on wood frame at mezzanine.
B1020 Roof Construction	2001	2001	3	TRB	11/05/21	Plywood on wood trusses, no issues noted, although some reoccurring minor past roof leaks have been reported.
B20 Exterior Closure						
B2010 Exterior Walls	2001	2001	3	TRB	11/05/21	Brick veneer base walls in good condition, with painted cement composite plank siding at gable and dormer elements.
B2020 Exterior Windows	2001	2001	3	TRB	11/05/21	Thermally glazed low-emissivity operable windows in aluminum frames.
B2030 Exterior Doors	2001	2001	3	TRB	11/05/21	Aluminum storefront at vestibule entry. Painted hollow metal door and frames at other person doors. Aluminum sliders at outdoor BBQ area. Overhead high-bay roll-up doors at apparatus bays (original doors, but lifters, rails, and rollers have been replaced). Metal doors and frames are fading with some paint pealing on western exposure doors.

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42

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Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**2.6**			
B30 Roofing						
B3010 Roof Coverings	2001	2001	3	TRB	11/05/21	Standing seam metal roof, generally in fair condition, however, flashing at dormers was incorrectly installed and is a source of ongoing intermittent leaks, especially during east wind events. Significant repairs over training room dormer have occurred, however, other area leaks persist.
B3030 Projections	2001	2001	2	TRB	11/05/21	Vented metal soffits. Radio tower.
C Interiors			**2.9**			
C10 Interior Construction						
C1010 Partitions	2001	2001	3	TRB	11/05/21	Gypsum on wood stud walls (one office wall was installed and does not provide acoustical separation). CMU at apparatus bay separation. Plastic laminate toilet partitions. Movable stacking dividing wall at the conference/training room.
C1020 Interior Doors	2001	2001	2	TRB	11/05/21	Wood doors in light gauge metal frames.
C1030 Fittings	2001	2001	3	TRB	11/05/21	Misc. storage racks for fire department gear and equipment. Blackout shades at bedrooms, regular blinds elsewhere with some wear and tear.
C20 Staircases						
C2010 Stair Construction	2001	2001	2	TRB	11/05/21	Small wood stair to mezzanine.
C2020 Stair Finishes	2001	2001	3	TRB	11/05/21	Rubber treads and risers.
C30 Interior Finishes						
C3010 Wall Finishes	2001	2001	2	TRB	11/05/21	Paint.

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42

4321 NW Parker Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**2.9**			
C30 Interior Finishes						
C3020 Floor Finishes	2001	2001	4	TRB	11/05/21	Original broadloom carpet is nearing end of life with wear and stains. Restroom and shower sheet good flooring is delaminating near showers and staining under urinals. Kitchen flooring has deep gouges. Entry hall quarry tile finish is blistering uneven (either original fired glaze is wearing off or wax finish issue). Strip and refinish entry.
C3030 Ceiling Finishes	2001	2001	3	TRB	11/05/21	Suspended 2x4 acoustic tile. Some minor areas of water stained tile from roof leaks. Some areas of gypsum.
D Services			**2.8**			
D20 Plumbing						
D2010 Plumbing Fixtures	2001	2001	3	DCS	11/05/21	Restrooms with tank-type water closets, flush valve urinals, and manual faucet lavatories; bathrooms with same plus one-piece fiberglass showers; janitor closet with mop sink; stainless steel kitchen sinks with disposals, and dual-height drinking fountain. Water closets nearly all flush slowly, suspected due to gravity tank-type operation. All manual plumbing fixture trim (faucets and flush valves).
D2020 Domestic Water Distribution	2001	2001	3	DCS	11/05/21	City water to 1.5-inch reduced pressure backflow preventer (RPBP) to copper distribution to station house and apparatus bays; including hose reels in apparatus bays, and exterior utility wall hydrants. One gas-fired domestic hot water heater with recirculation pump on the apparatus bay mezzanine. Multiple filtered water dispensers assumed due to poor water quality. While there are reports of poor water quality fouling plumbing fixture trim, the piping itself shows minimal signs of corrosion and premature failure - hence assume ten to fifteen years remaining useful life for domestic water distribution system.

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42

4321 NW Parker Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.8**			
D20 Plumbing						
D2030 Sanitary Waste	2001	2001	3	DCS	11/05/21	Cast iron drain, waste, and vent (DW&V) piping where observed. Most tested flushing fixtures are slow to flush, assume mostly due to fixtures, not the DW&V piping. Two apparatus bay trench drains, assumed to drain to the exterior oil/water separator with no issues reported.
D2040 Rain Water Drainage	2001	2001	3	DCS	11/05/21	Metal gutter and downspout pipe to cast iron storm where observed; no issues reported, however, cast iron storm drainage is typically problematic - expect shortened life, compared to modern non-metallic storm drain piping; see G3030 for opportunity to collect roof rain water for drill use.
D2090 Other Plumbing Systems	2001	2001	2	DCS	11/05/21	Self-contained breathing apparatus (SCBA) charging with interconnecting high-pressure piping; apparatus and shop air compressor with refrigerated air drier and distribution; equipment is on the apparatus bay mezzanine.
D30 HVAC						
D3010 Energy Supply	2001	2001	2	DCS	11/05/21	Natural gas piping to station house furnaces, apparatus bay infrared heaters and mezzanine domestic hot water heater, kitchen range, and patio BBQ; opportunity to submeter; solenoid shut-off valve(s) interlocked with the station tone alarm call system.
D3020 Heat Generating Systems	2001	2001	3	DCS	11/05/21	Apparatus bay overhead gas-fired low-intensity infrared heaters - aging but functional; expect five to ten years remaining life with continued good maintenance. Combustion air is from the apparatus bay area, exhaust if via B-vent flue up to roof via attic space. Aging Lennox station house high-efficiency, condensing gas-fired furnaces.

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42

4321 NW Parker Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.8**			
D30 HVAC						
D3030 Cooling Generating Systems	2001	2001	3	DCS	11/05/21	Aging station house Lennox condensing units; one 4-ton and two 5-ton units; all with increasingly obsolete R-22 refrigerant.. Dedicated through-wall packaged terminal air conditioning (PTAC) unit for the for main distribution frame (MDF) room on the apparatus bay mezzanine; this unit rejects heat directly to the mezzanine space.
D3040 HVAC Distribution Systems	2001	2001	3	DCS	11/05/21	Apparent uneven air distribution, based on occupant reports and many portable heaters and fans in use. No apparent access to attic space to service HVAC distribution ductwork, variable air flow dampers, and associated controls. No high/low exhaust in apparatus bay, with unclear make-up air. With the station house HVAC system approaching end-of-life, consider upgrading to a variable refrigerant flow (VRF) system with heat recovery dedicated outside air system (DOAS) ventilation.
D3050 Terminal and Package Units	2001	2001	3	DCS	11/05/21	Aging electric wall heaters with five to ten years remaining life with continued good maintenance. Portable HEPA filters for COVID-19 - ensure HEPA filter media is replaced as recommended by manufacturer.
D3060 Controls and Instrumentation	2001	2001	4	DCS	11/05/21	Aged, obsolete, and unclear controls. Signs of uncomfortable occupants throughout, with observed thermostat programming bypassed in manual "hold" override temperature control mode, and portable heaters and fans in multiple spaces. No apparent nitrogen oxides (NOx) monitoring or control in the apparatus bays.
D3090 Other HVAC Systems and Equipment	2001	2001	3	DCS	11/05/21	Apparatus ventilation unclear, but some appears present. No vehicle engine exhaust system.
D40 Fire Protection						
D4010 Fire Protection Sprinkler Systems	2001	2001	3	DCS	11/05/21	Wet and dry risers in station house main corridor - investigate high pressures ASAP; otherwise no issues reported.

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42

4321 NW Parker Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.8**			
D40 Fire Protection						
D4030 Fire Protection Specialties	2001	2010	2	DCS	11/05/21	Extinguishers, AED, and first aid kits.
D50 Electrical						
D5010 Electrical Service and Distribution	2001	2001	2	DCS	11/05/21	Power underground from the site main distribution panel (MDP) at the generator building to three Siemens 208V, 400A panels in the main entry corridor, with all spaces full; no submetering; no transient voltage surge suppression (TVSS). At least one additional smaller panel at the apparatus bay mezzanine.
D5020 Lighting and Branch Wiring	2001	2001	3	DCS	11/05/21	Original fixtures with increasingly obsolete T8 fluorescent lighting and all-manual control.
D5032 Low Voltage Communication	2001	2001	3	DCS	11/05/21	Apparent older plain-old-telephone system (POTS) or aged voice-over-internet-protocol (VOIP) handsets. Station public address (PA) system. Need intercom at main entry with remote control door latch - minor maintenance to install. Radio systems.
D5037 Low Voltage Fire Alarm	2001	2001	4	DCS	11/05/21	Old fire alarm control panel (FACP); no direct detection in occupied spaces.
D5039 Low Voltage Data	2001	2010	3	DCS	11/05/21	Main distribution frame (MDF) at mezzanine, with high-speed fiber; but no WiFi, and not connected to City network.
D5090 Other Electrical Systems	2001	2001	3	DCS	11/05/21	Back-up power from remote generator and automatic transfer switch (ATS), but most tested egress and exit sign batteries are weak or dead - minor maintenance to replace.
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1010 Commercial Equipment	2001	2001	3	DCS	11/05/21	Aging appliances and office equipment.

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Facility Summary

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Fire Station 42
Fire Station 42

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Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1020 Institutional Equipment	2001	2001	3	DCS	11/05/21	SCBA, bunker-gear drying racks, etc.; all with no issues reported.
E1030 Vehicular Equipment	2001	2001	3	DCS	11/05/21	Two newer and four older garage door openers; while older garage door openers are aging, they should have five to ten years remaining life with continued good maintenance,
F Special Construction			**3.0**			
F10 Special Construction						
F1050 Special Controls and Instrumentation	2001	2001	3	DCS	11/05/21	Tone alarm programmable logic controller (PLC) for building call response - appears much better than reported. Consider City-wide standard and upgrade throughout all stations.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Roof Flashings**

Ongoing leaks attributed to poor flashing conditions at dormers.



Remedial Action:

Remove and repair flashing at roof transitions and dormers.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

C3020 Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	5,000	$11.00	SF	$55,000	$107,712

Deficient Material: **Carpet**

Original broadloom carpet is nearing end of life with wear and stains.



Remedial Action:

Remove and replace carpet (consider carpet tile in lieu of broadloom).

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

C3020 Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1,000	$13.00	SF	$13,000	$25,459

Deficient Material: **Sheet Goods**

Sheet goods at restrooms stained and delaminating at shower areas. Deep gouges at kitchen/dining.

Remedial Action:

Remove and replace sheet goods with new seam welded sheet goods.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D2010 Plumbing Fixtures	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10	$700.00	EA	$7,000	$13,709

Deficient Material: **Water closets**

Nearly all water closets are slow to flush, with signs of regular back-ups.



Remedial Action:

Replace with pressure-assist-type water closets.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D2020 Domestic Water Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	1	$6,500.00	EA	$6,500	$12,730

Deficient Material: **Domestic Hot Water Heater**

Aging domestic hot water heater.



Remedial Action:

Budget to replace upon failure.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D3020 Heat Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	3	$12,500.00	EA	$37,500	$73,440

Deficient Material: **Furnace**
Aging gas-fired station house furnaces.

Remedial Action:
Budget to replace upon failure.

Action Type:
Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	3	$8,000.00	EA	$24,000	$47,002

Deficient Material: **Condensing unit**

Aging condensing units with increasingly obsolete R-22 refrigerant.

Remedial Action:

Replace upon failure with modern high-efficiency condensing units.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	3	$4,500.00	EA	$13,500	$26,438

Deficient Material: **Air distribution**

Apparent uneven air distribution and dirty ductwork, based on significant use of portable heaters and fans, and dirty ceiling supply air grilles.

Remedial Action:

Clean ductwork, then retest, adjust, and balance (TAB) the HVAC distribution system, ideally in conjunction with replacement of associated furnaces and controls.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Attic HVAC access**

No apparent access to HVAC ductwork and equipment in the station house attic.



Remedial Action:

Develop station house attic access to allow HVAC ductwork, equipment, and controls to be maintained and operated.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	4,400	$10.00	SF	$44,000	$86,170

Deficient Material: **Industrial ventilation**

No high-low general exhaust for apparatus bays; only high exhaust.



Remedial Action:

Retrofit modern code high-low exhaust, and ensure adequate interlocked make-up air.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D3060 Controls and Instrumentation	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	11,422	$3.00	SF	$34,266	$67,107

Deficient Material: **Controls**

Aged control system with observed thermostats manually bypassed in "hold" mode; portable heaters and fans in use throughout; no apparent NOx monitoring or control in apparatus bay space. No apparent communication with City-wide network.

Remedial Action:

Replace apparent standalone controls with modern networked controls; ideally in conjunction with HVAC equipment renewal. Add NOx monitoring and/or control to apparatus bay space.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D5032 Low Voltage Communication	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	10,000	$1.50	SF	$15,000	$29,376

Deficient Material: **Telephone system**

Aging plain-old-telephone system (POTS) or voice-over-internet-protocol (VOIP) telephone handsets.



Remedial Action:

Upgrade to modern VOIP phone system and handsets.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	10,000	$2.50	SF	$25,000	$48,960

Deficient Material: **Fire alarm**

Old apparent analog fire alarm control panel with minimal detection.



Remedial Action:

Upgrade to modern addressable fire alarm system, including detection in most spaces.

Action Type:

Life Safety

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42 Infrastructure

4321 NW Parker Street
Camas, WA 98607

Facility Condition Summary

The property houses Fire Station 42, parking for private vehicles, approach aprons for fire fighting apparatus, and a large paved training area which houses a multi-story concrete fire training tower, and yard for practicing vehicular fire and rescue activities. Storm water treatment is a concern as it does not appear to meet modern standards for storm water containment and treatment before being released.

City water, irrigation, and fire; City sewer but via on-site septic tank with pump station to forced main to street. Utility power and natural gas, including a site-wide diesel generator in separate building. Newer high-speed fiber data and communications, plus older plain-old-telephone service (POTS) for legacy systems. Site lighting recently upgraded to LED. No site electronic security. The Camus Fire Department training tower and pumper truck drafting station is at this site, but the tower is excluded from the 2021 FCA scope. Domestic water quality is causing a variety of problems with plumbing piping, valves, and fixtures. The aging septic system is of increasing concern, despite recent pump replacement. The storm water system provides marginal drainage for several landscape areas and has lost integrity for spill containment. The generator building is overly full of combustible, flammable, and/or hazardous material, requiring removal ASAP.

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42 Infrastructure

4321 NW Parker Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	2001	2001	3	TRB	11/05/21	Entry concrete curb cut and small length of asphalt drive into parking area. Concrete apron at apparatus bay. Minor cracking at asphalt drive.
G2020 Parking Lots	2001	2001	3	TRB	11/05/21	Minor alligator cracks. Sheet flow of runoff bypasses storm water quality treatment into pond, which is especially problematic at the training yard where contaminants from training on vehicles and burning can potentially enter water system.
G2030 Pedestrian Paving	2001	2001	3	TRB	11/05/21	Concrete sidewalks. Reseal joint at sidewalk adjacent to northeast corner of building.
G2040 Site Development	2001	2001	3	TRB	11/05/21	Flag pole and monument sign. Small brick enclosed patio with BBQ, smoker, brick storage room, and picnic table. Other picnic tables under awning adjacent to training room.
G2050 Landscaping	2001	2001	3	TRB	11/05/21	Mature landscaping, generally well maintained, but does need to be cut away where overgrowing bicycle rack and cut all plant materials away from building facade a minimum of twelve inches and cut tree limbs off roof (eliminate potential for pest vectors). Irrigation system is original, some spray heads are buried in the landscape and according to users, irrigation system appears to be over irrigating, creating marshy conditions in lawn and perimeter of building. Vaults are full of mud.

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Facility Summary

City of Camas
Fire Station 42
Fire Station 42 Infrastructure

4321 NW Parker Street
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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	2001	2001	3	DCS	11/05/21	City water includes separate domestic and irrigation water services with estimated 1.5-inch meter for domestic and 1-inch for irrigation; irrigation backflow preventer (BP) in hand-vault outside, domestic BP inside apparatus bay. Reportedly poor City water quality is damaging piping, valves, equipment, and fixtures. Site fire loop with multiple hydrants, with fire sprinkler service to building via an in-ground vault with double-detector check valve assembly (DDCVA) and fire department connection (FDC) adjacent to vault. The vault includes a sump pump. A large underground fire truck pump test drafting vault is present north of the generator building with no issues reported; assume drafting vault make-up water is from the fire loop. Irrigation controller is in the meeting room storage closet - needs work.
G3020 Sanitary Sewer	2001	2001	3	DCS	11/05/21	Building sewer to septic tank to south; the tank is pumped via force-main to City sewer at the street. Reportedly, the system is original other than one of the pumps that was recently replaced. The control panel appears deteriorated. An oil/water separator is located at the apparatus bay south apron and assumed to serve the two apparatus bay trench drains, and further assumed to drain to the septic system.
G3030 Storm Sewer	2001	2001	3	DCS	11/05/21	Several paved area catch basins assume to drain to one of the bioswales, in turn draining to one of the three on-site storm water ponds, which in turn appear to flow to the larger City vicinity storm water pond north of the site. Significant portions of the paved areas sheet flow to swales via curb cuts. The vehicle fueling area appears to include a containment area draining to a treatment system, but this is currently blocked; the fire training fixture and car fire training areas drain to the triangular storm water pond via curb cuts, which have been blocked with apparent oil-absorbent rolls, but nearly all appear saturated.

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Facility Summary

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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3060 Fuel Distribution	2001	2001	3	DCS	11/05/21	Convault double-contained 1,000-gallon diesel fuel oil storage tank adjacent to the generator building, including fuel dispenser and Gasboy meter - all well aged. NW Natural gas meter No. 1154821 with 630 cfh capacity and including seismic shut-off valve adjacent to station house BBQ patio.
G40 Site Electrical utilities						
G4010 Electrical Distribution	2001	2001	2	DCS	11/05/21	Clark PUD power underground from street to utility pad-mounted 208V three-phase transformer adjacent to the generator building, with meter No. 83-580-267, with 208V power to the main distribution panel (MDP) inside the generator building via a 600A disconnect to a Generac automatic transfer switch (ATS), then to the Square D 208V, 600A-rated MDP, with 400A breaker supplying power to the main building Panels A, B & C, and smaller breakers supplying smaller site loads and out-buildings. The Generac 100 kW diesel generator is located in the generator building, with 350A breaker supplying standby power to the ATS; generator fuel is drawn from the site Convault storage tank via a fuel oil day tank with transfer pump inside the generator building. The generator building generator room has excessive combustible, flammable, or hazardous materials - minor maintenance to remove this material ASAP (reported to on-site fire station staff during field survey).
G4020 Site Lighting	2001	2001	2	DCS	11/05/21	Original pole lights upgraded to LED heads. Station staff complain of exterior lighting illuminating dormitory rooms through the windows.
G4030 Site Communications and Security	2001	2001	3	DCS	11/05/21	Newer high-speed fiber-optic data and older plain-old-telephone service (POTS) for legacy systems; radio antennas on fire station for tone alarm and radio communications. No site electronic security.

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Facility Summary

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Fire Station 42
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Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G90 Other Site Construction						
G9010 Service and Pedestrian Tunnels	2001	2001	3	DCS	11/05/21	Substantial concrete culvert at main access road to site - minor maintenance to clean and inspect.
G9090 Other Site Systems	2001	2001	3	DCS	11/05/21	Newer historic apparatus display building adjacent to main entry - no power or other utilities observed - minor maintenance to add metal gutter and downspout to storm and power to illuminate display. Substantial multi-story drill tower (not evaluated). Various training fixtures and vehicles in burn training area. Permanent generator building housing the site main power distribution panel, diesel generator, and generator day tank in one room, and fire hose storage in the second room. At least one connex storage unit.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Fire Station 42

Facility: Fire Station 42 Infrastructure

G2020 Parking Lots	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	1	$50,000.00	LS	$50,000	$97,920

Deficient Material: **Stormwater**

Sheet flow of runoff bypasses storm water quality treatment into pond, which is especially problematic at the training yard where contaminants from training on vehicles and burning can potentially enter water system.



Remedial Action:

Assess opportunity to direct/divert storm water runoff from curb cuts, and convey to a new cartridge filter vault to pre-treat runoff prior to release and entering wetland.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42 Infrastructure

G3010 Water Supply	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$7,500.00	LS	$7,500	$14,688

Deficient Material: **Irrigation**

The damaged irrigation system reportedly floods landscaped areas; observed control vaults are mostly full of mud, covering control devices and wiring.



Remedial Action:

Clean, test, repair, and replace irrigation heads, piping, power, and controls as needed.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42 Infrastructure

G3020 Sanitary Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$6,500.00	LS	$6,500	$12,730

Deficient Material: **Septic system**

Aged septic system; while pump is reportedly recently replaced, the tank, piping, and controls are aging and of increasing concern.

Remedial Action:

Clean, test, and renew the septic system.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Fire Station 42

Facility: Fire Station 42 Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	2	$4,500.00	EA	$9,000	$17,626

Deficient Material: **Containment**

Vehicle fueling area spill containment feature appears blocked and/or failed. Vehicle and training fixture burn area, which drains to triangular storm water pond, has makeshift spill control being overrun by heavy rains, with visible petroleum products appearing to flow relatively untreated to the pond.



Remedial Action:

Clean, test, and repair the vehicle fueling area spill containment system; provide engineered drill water contaminant removal system for training burn area.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42 Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	3	$3,000.00	EA	$9,000	$17,626

Deficient Material: **Detention pond**

Detention ponds filling with debris and vegetation.



Remedial Action:

Fully maintain the storm water ponds and related swales, culverts, and open channels.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42 Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	2	$3,500.00	EA	$7,000	$13,709

Deficient Material: **Storm drain**

Storm drain is insufficient for several landscape areas, resulting in localized flooding during heavy rain.

Remedial Action:

Install additional storm water drainage capacity for excessively wet landscape areas.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42 Infrastructure

G3060 Fuel Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$6,500.00	LS	$6,500	$12,730

Deficient Material: **Fuel oil storage tank**

Aging diesel fuel oil storage tank is discolored and stained, with rusted fuel dispenser, rusty piping to and from diesel generator day tanks, and apparently failed fuel metering subsystem.



Remedial Action:

Clean, test, and renew the fuel oil storage tank, fuel dispenser, and fuel metering system.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 42
Facility: Fire Station 42 Infrastructure

G4020 Site Lighting	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Exterior lighting**

Exterior lighting reportedly illuminates multiple dormitory rooms, reducing staff sleep effectiveness.

Remedial Action:

Install cut-off shield, remote controls and/or window blackout shades to allow station staff to sleep in the dormitories during night hours.

Action Type:

Other



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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Fire Station 42

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Fire Station 42	B30 Roofing	$5,000	$1,000	$1,200	$2,592	$9,792	$9,792
	C30 Interior Finishes	$68,000	$13,600	$16,320	$35,251	$133,171	$138,018
	D20 Plumbing	$13,500	$2,700	$3,240	$6,998	$26,438	$27,212
	D30 HVAC	$158,266	$31,653	$37,984	$82,045	$309,948	$317,453
	D50 Electrical	$40,000	$8,000	$9,600	$20,736	$78,336	$79,934
	Facility Total	**$284,766**	**$56,953**	**$68,344**	**$147,623**	**$557,686**	**$572,409**
Fire Station 42 Infrastructure	G20 Site Improvements	$50,000	$10,000	$12,000	$25,920	$97,920	$97,920
	G30 Site Civil / Mechanical Utilities	$45,500	$9,100	$10,920	$23,587	$89,107	$89,945
	G40 Site Electrical utilities	$5,000	$1,000	$1,200	$2,592	$9,792	$9,937
	Facility Total	**$100,500**	**$20,100**	**$24,120**	**$52,099**	**$196,819**	**$197,802**
	Site Total	**$385,266**	**$77,053**	**$92,464**	**$199,722**	**$754,505**	**$770,211**

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Opportunity Summary By Subsystem

City of Camas

Site: Fire Station 42 **Total Site Opportunity Cost: $772,780**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Fire Station 42**						
System:	**Plumbing**	**Total Cost: $19,600**					
D2010	**Plumbing Fixtures**						
		All manual plumbing fixture trim (faucets and flush valves).	Upgrade to hardwired, automatic (infrared) trim for improved infection control and reduced water use.	16.00	$600.00	EA	$9,600
D2020	**Domestic Water Distribution**						
		Hard city water staining fixtures and reportedly shortening life of plumbing piping, valves, devices, and fixture trim.	Install whole-building water softener.	1.00	$10,000.00	LS	$10,000
Facility:	**Fire Station 42**						
System:	**HVAC**	**Total Cost: $255,180**					
D3030	**Cooling Generating Systems**						
		No cooling for the apparatus bay than natural ventilation with doors open and apparent mechanical ventilation.	Install ceiling fans.	6.00	$850.00	EA	$5,100
D3040	**HVAC Distribution Systems**						
		Old apparent variable air volume & temperature (VVT) system with marginal comfort and energy efficiency, with furnaces and condensing units approaching end of life.	Replace with modern variable refrigerant flow (VRF) system with heat recovery dedicated outside air system (DOAS).	6,836.00	$30.00	SF	$205,080
D3090	**Other HVAC Systems and Equipment**						
		No vehicle engine exhaust system, other than opening apparatus bay doors when fire apparatus engines are operated.	Install vehicle engine exhaust system.	6.00	$7,500.00	EA	$45,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Fire Station 42 **Total Site Opportunity Cost: $772,780**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Fire Station 42**						
System:	**Electrical**	**Total Cost: $105,000**					
D5010	**Electrical Service and Distribution**						
		All distribution panel circuits full, no transient voltage surge suppression (TVSS), no submetering.	Install subpanels to support reportedly needed new loads; retrofit TVSS and submetering.	10,000.00	$2.00	SF	$20,000
D5020	**Lighting and Branch Wiring**						
		Increasingly obsolete T8 fluorescent lighting with manual control.	Upgrade to LED lighting with automatic control.	10,000.00	$5.00	SF	$50,000
D5038	**Low Voltage Security**						
		No electronic security.	Add per City standard (access control, CCTV, and intrusion detection).	10,000.00	$2.00	SF	$20,000
D5039	**Low Voltage Data**						
		No connection to City network; no WiFi for staff and guests.	Connect to City network and provide secure WiFi for occupant use.	10,000.00	$1.50	SF	$15,000
Facility:	**Fire Station 42**						
System:	**Special Construction**	**Total Cost: $15,000**					
F1050	**Special Controls and Instrumentation**						
		Reportedly no standardized City fire-department-wide tone alarm call interface and interlocks with fire station systems.	Develop City-wide tone alarm response standard and implement at Fire Station 42 to begin this process.	1.00	$15,000.00	LS	$15,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Fire Station 42 **Total Site Opportunity Cost: $772,780**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Fire Station 42 Infrastructure**						
System:	**Site Improvements**	**Total Cost: $10,000**					
G2050	**Landscaping**						
		Irrigation system is original, some spray heads are buried in the landscape. According to users, irrigation system appears to be over irrigating, creating marshy conditions in lawn and perimeter of building. Also, the number of irrigation heads appears to be excessive, especially for established landscape.	Remove and replace irrigation controller with modern water-efficient system tied to soil moisture meters and weather conditions. Evaluate head location and cap unnecessary irrigation heads.	1.00	$10,000.00	LS	$10,000
Facility:	**Fire Station 42 Infrastructure**						
System:	**Site Civil / Mechanical Utilities**	**Total Cost: $8,000**					
G3030	**Storm Sewer**						
		Metal roof with piped roof drains.	Harvest roof rain water for training and testing drafting tank fill.	1.00	$8,000.00	LS	$8,000
Facility:	**Fire Station 42 Infrastructure**						
System:	**Site Electrical utilities**	**Total Cost: $360,000**					
G4010	**Electrical Distribution**						
		Metal roof with several south- and west-facing sloping sections, and with good solar exposure.	Install 50 kW photovoltaic (PV) power system to generate renewable energy.	50.00	$7,000.00	EA	$350,000
G4030	**Site Communications and Security**						
		No site electronic security system, with planned development of adjacent property.	Budget to conduct crime prevention through environmental design (CPTED) analysis and provide appropriate electronic security in conjunction with development of the adjacent site.	1.00	$10,000.00	LS	$10,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43

1400 A Street
Washougal, WA 98671

Facility Size - Gross S.F.	8,496
Year Of Original Construction	1974
Facility Use Type	Fire Station
Construction Type	Medium
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	1974
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.8**			
Facility Condition Index (FCI)	0.13	**Predicted Renewal Budget 2028 - 2041**	$1,720,000	$1,959,000
Current Replacement Value (CRV)	$3,843,000	**Observed Deficiencies 2022 - 2027**	$440,000	$447,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$688,000	N/A

Facility Condition Summary

Single-story fire station (with a mezzanine and hose tower). Originally a combined Fire / Police Station, including fire administration, the building has been adapted and now dedicated to fire station operations only after 2003 (the former police sally port garage is now a storage and work out area, jail cells have been adapted as storage). Roofing is pitched metal, exterior cladding is metal, some locations over a CMU base, windows are thermal insulated operable vinyl. Several code issues identified should be addressed: fire/smoke separation at apparatus bay from living areas, auto shut off of oven/cook top and BBQ with alarm call, egress compliance from sleeping/dorm, among others.

HVAC is forced-air heating and cooling from gas furnaces with split-Dx cooling for the station house area, excepting the southeast dorm rooms which are electric split-Dx heat pump; the apparatus bays have gas-fired unit heaters. There no apparent mechanical ventilation for the station house, other than operable windows for some areas. There are small exhaust fans for the large apparatus bay area. City water with gas-fired hot water heater. No fire sprinkler, but a modern fire alarm system is present. Power is light commercial 120/240V, single-phase from Clark PUD with propane-fired generator back-up. Lighting is fluorescent with manual control. High-speed fiber and cable is present for telecommunications. A large cell tower antenna with modular equipment building is present at the back of fire station, with assumed ground-lease to AT&T.

As the fire station approaches 50 years of age, it is due modernization, with sub-optimal site traffic flow, difficult wildlife (bird) issues, marginal site storm drainage with repeated flooding at the main entry and ongoing water damage at much of the building perimeter, deteriorating hardscape and softscape, inefficient space configuration, poor thermal envelope, increasingly obsolete single-phase power, fluorescent lighting, and R-22 refrigerant HVAC equipment, minimal apparatus bay ventilation with no vehicle engine exhaust, unheated and unvented hose tower, dispersed bunker and turn-out gear management, aging plumbing fixtures and failing appliances, no fire sprinkler system, and other concerns. The site, building, and building systems should be fully modernized. The underlying pre-engineered metal building (PEMB) structure appears sound, but is typically considered sub-standard for modern permanent public safety buildings.

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.0**			
A10 Foundations						
A1010 Standard Foundations	1974	1974	2	TRB	01/11/22	Standard concrete strip footings and stem walls.
A1030 Slab On Grade	1974	1974	2	TRB	01/11/22	Concrete slab on grade, no issues observed or reported. Minor cracking at apparatus bay.
B Shell			**2.7**			
B10 Superstructure						
B1010 Floor Construction	1974	1974	2	TRB	01/11/22	Wood deck on wood framing at mechanical and equipment mezzanines.
B1020 Roof Construction	1974	1974	3	TRB	01/11/22	Metal deck with supersaver insulation (assumed to be only R-10 value batt insulation with integral vapor barrier) on a pre-engineered steel building structure.
B20 Exterior Closure						
B2010 Exterior Walls	1974	1974	3	TRB	01/11/22	Pre-finished metal cladding and some CMU wainscot veneer. Generally in fair condition with some fading of finish, and areas of algae growth that should be cleaned up to protect materials and improve appearance.
B2020 Exterior Windows	1974	2003	3	TRB	01/11/22	Insulated glazing in vinyl operable frames. Window at sleeping room is not code-compliant for emergency egress, two other sleeping rooms do not even have the code-required second egress.
B2030 Exterior Doors	1974	2003	3	TRB	01/11/22	Hollow metal doors and frames (paint fading, repainting recommended). Glazing seals of overhead vehicle apparatus doors have failed. South side apparatus door has some impact damage.

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**2.7**			
B30 Roofing						
B3010 Roof Coverings	1974	1974	3	TRB	01/11/22	Standing seam metal roofing, algae and moss growth, in need of washing to preserve life and appearance. One water stain in south side of training room may be a roof or flashing leak, but no known roof leaks reported by firefighters.
B3030 Projections	1974	1974	3	TRB	01/11/22	Hose drying tower. Interior insulation vapor barrier failing exposing insulation to moisture.
C Interiors			**2.9**			
C10 Interior Construction						
C1010 Partitions	1974	1974	3	TRB	01/11/22	Gypsum on wood studs. The 1-hr smoke fire separation between the apparatus bay and living quarters has been compromised with an opening cut in the drywall at the mezzanine.
C1020 Interior Doors	1974	1974	3	TRB	01/11/22	A combination of wood and metal interior doors, high-traffic area doors showing wear and could use repainting.
C1030 Fittings	1974	1974	3	TRB	01/11/22	Rubber base, toilet and bath accessories, equipment racks, kitchen accessories.
C20 Staircases						
C2010 Stair Construction	1974	1974	2	TRB	01/11/22	Open wood stair to mezzanine.
C30 Interior Finishes						
C3010 Wall Finishes	1974	2003	3	TRB	01/11/22	Paint, some areas of wear. Areas actively being repaired where drywall has been removed due to recent plumbing flood issues - repair price not included as it is assumed work to repair is already covered and will continue.

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**2.9**			
C30 Interior Finishes						
C3020 Floor Finishes	1974	2003	3	TRB	01/11/22	Carpet is stained, worn, and at end of life. VCT and sheet good areas in fair condition except for area in kitchen where flooring removed due to water damage.
C3030 Ceiling Finishes	1974	2003	3	TRB	01/11/22	Suspended acoustical tile, spot areas of water damage. Others painted hard lid.
D Services			**3.0**			
D20 Plumbing						
D2010 Plumbing Fixtures	1974	2000	3	DCS	01/11/22	Multiple restrooms and locker rooms with mostly newer water closets, urinals, and lavatories, but older showers. Failed and damaged kitchen cabinets and sink, with temporary deep sink - minor maintenance to replace sink as kitchen is rebuilt, following water damage from leaking dishwasher. Stainless steel double-basin decontamination sink in the main apparatus bay. No observed hydration station or decontamination shower. At least one water closet removed to allow repair of general construction following recent dishwasher leak - minor maintenance to reinstall or replace.
D2020 Domestic Water Distribution	1974	1974	3	DCS	01/11/22	Original 1.5-inch water service entry with galvanized steel pipe, to newer copper tubing where newer fixtures were installed about 2000; gas-fired domestic hot water heater - aging but functional with five to ten years remaining life with good maintenance. Staff report long wait times for hot water at station house fixtures, given remote domestic hot water heater in apparatus bay utility room and no apparent recirculation pump - minor maintenance to install a recirc line and pump.
D2030 Sanitary Waste	1974	1974	4	DCS	01/11/22	Cast iron drain, waste, and vent (DW&V) piping, with some fixtures flushing or draining somewhat slow, with increasing back-ups. No apparent grease interceptor for the kitchen, despite presence of a Type 1 grease hood.

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.0**			
D20 Plumbing						
D2040 Rain Water Drainage	1974	1974	3	DCS	01/11/22	Metal gutter and downspout, some to grade, some to storm, some to flexible pipe, with multiple overflows and damage to exterior wall, hardscape, and softscape below.
D2090 Other Plumbing Systems	1974	1974	3	DCS	01/11/22	Air compressor at base of hose tower with distribution to apparatus bay and support spaces, with 5-hp motor. No apparent grease interceptor for kitchen - minor maintenance to install point-of-use grease interceptor during upcoming kitchen renewal following dishwasher leak.
D30 HVAC						
D3010 Energy Supply	1974	1974	3	DCS	01/11/22	Natural gas to two gas-fired furnaces, one domestic hot water heater, kitchen range, outside BBQ, standby generator, and apparatus bay unit heaters - no submetering. No tone alarm interlock to shut-down cooking equipment (range and BBQ) upon alarm - minor maintenance to install.
D3020 Heat Generating Systems	1974	2000	3	DCS	01/11/22	Two gas-fired high-efficiency condensing furnaces serving station house areas; one older Bryant, one newer Payne. Four gas-fired unit heaters serving the main and auxiliary apparatus bays; all appear older, but functional with five to ten years remaining life with good maintenance. No hose tower heat.
D3030 Cooling Generating Systems	1974	2000	3	DCS	01/11/22	Three outside condensing units, two serving split-Dx forced air cooling for the station house to west, and one serving the split-Dx heat pump for the southeast dormitory area; two older Goodman, one newer Payne. No apparent cooling for the telecom/data closet, but no issues reported.

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Facility Summary

City of Camas
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Fire Station 43

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.0**			
D30 HVAC						
D3040 HVAC Distribution Systems	1974	2000	3	DCS	01/11/22	Forced-air heating and cooling for station house and dormitory areas, with two sets of gas furnaces with split-Dx cooling serving the west office, day-room, and kitchen areas, and one split-Dx heat pump system serving the southeast dormitory area. All with fully ducted supply and return, but without any apparent outside ventilation air, and with no apparent economizer - but further investigation is suggested in the ceiling space and on the roof. Some spaces, including dormitory rooms, have no apparent return air path. Bathroom exhaust and utility space ceiling exhaust fans. Two ducted sidewall exhaust fans serving the main apparatus bay area, but with no apparent make-up air path.
D3050 Terminal and Package Units	1974	2000	2	DCS	01/11/22	Several electric wall heaters in newer (2000) renovated areas; at least one original electric baseboard heater (in vehicle sally port garage).
D3060 Controls and Instrumentation	1974	2000	3	DCS	01/11/22	Standalone programmable thermostats controlling the three station house forced-air systems. Manual thermostats controlling apparatus bay unit heaters, electric wall heaters, and baseboard heater.
D3090 Other HVAC Systems and Equipment	1974	1974	3	DCS	01/11/22	Small commercial kitchen grease hood above kitchen range with assume rooftop up-blast exhaust fan, and apparent evaporative cooler make-up air unit - minor maintenance to verify and service as needed. No vehicle engine exhaust system. No make-up air for apparatus bays.
D40 Fire Protection						
D4030 Fire Protection Specialties	1974	2000	2	DCS	01/11/22	Fire extinguishers on hooks.
D4090 Other Fire Protection Systems	1974	2000	3	DCS	01/11/22	Fire suppression system for kitchen Type 1 grease hood.

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.0**			
D50 Electrical						
D5010 Electrical Service and Distribution	1974	1974	3	DCS	01/11/22	Utility power with gutter-type supply to two 120/240V distribution panels A & B, each with 200A capacity; plus one ASCO automatic transfer switch (ATS) supplying standby power loads via one 200A disconnect. All aging but functional, noting ATS appears newer (assume 1995 to match generator age).
D5020 Lighting and Branch Wiring	1974	2000	3	DCS	01/11/22	T8 fluorescent lay-in or industrial pendent in most areas, with mix of manual line-voltage and low-voltage "scene" control in some station house areas.
D5032 Low Voltage Communication	1974	2000	3	DCS	01/11/22	Original abandoned plain-old-telephone system (POTS) wiring in cabinet in storage room, behind hose tower - minor maintenance to demolish abandoned POTS wiring and devices. Aged voice over internet protocol (VOIP) handsets - minor maintenance to upgrade to City standard video VOIP handsets. Obsolete and abandoned in place fire alarm siren at roof level behind the hose tower - minor maintenance to demolish or repurpose.
D5037 Low Voltage Fire Alarm	1974	2000	3	DCS	01/11/22	2000 Silent Knight SK-5208 fire alarm control panel (FACP) with remote annunciator, and detection and notification devices - aging but functional with no issues reported.
D5039 Low Voltage Data	1974	2010	2	DCS	01/11/22	Modern high-speed fiber-optic data, plus apparent cable data service with IDF in closet - without dedicated cooling, but no issues reported.
D5090 Other Electrical Systems	1974	1995	3	DCS	01/11/22	Generac natural-gas-fired 120/240V, 35 kVA standby generator with 175A capacity under canopy to southwest, aging but functional, and recently completed load testing to 80% capacity with no issues reported. Automatic transfer switch (ATS) inside the former vehicle sally port garage. Mix of lighted and placard exit signs, plus some egress pathway lighting - minor maintenance to add additional for full coverage.

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1010 Commercial Equipment	1974	2000	3	DCS	01/11/22	Mostly residential-grade kitchen appliances, plus light-duty office equipment, such as copier and desktop computers. Two heavy-duty residential-grade laundry washers, and one medium-duty commercial-grade dryer.
E1020 Institutional Equipment	1974	2000	3	DCS	01/11/22	Fire department specialized equipment - mix of older and newer; minor maintenance to better organize storage. SCBA tank charging equipment in the makeshift gym in the former police vehicle sally port. Exercise equipment in makeshift fitness area in former police sally port garage, with unclear ventilation - minor maintenance to improve ventilation.
E1030 Vehicular Equipment	1974	2000	3	DCS	01/11/22	Mix of older and newer garage door openers, with seven openers: 1) Four at the main apparatus bays, 2) Two at the east addition, and 3) One at the former police sally port garage.
E20 Furnishings						
E2010 Fixed Furnishings	1974	1974	3	TRB	01/11/22	Built-in casework for lockers, shop benches, storage, and equipment. Kitchen casework generally in fair condition with wear from use, and base cabinets missing from recent dishwasher flood. Blinds in good condition.
F Special Construction			**3.0**			
F10 Special Construction						
F1050 Special Controls and Instrumentation	1974	2000	3	DCS	01/11/22	Tone alarm call system and radio communications integrated into the station public address system, but with unclear integration with lighting, garage door, apparatus bay ventilation, and other systems.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

B2020 Exterior Windows	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	3	$4,000.00	EA	$12,000	$23,501

Deficient Material: **Exterior Openings**

Window at sleeping room is not code-compliant for emergency egress, two other sleeping dorm rooms do not even have a code-required second egress.

Remedial Action:

Replace window with code-compliant egress window. Add second emergency egress doors from remaining landlocked sleeping rooms into adjacent bay.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	16	$600.00	EA	$9,600	$18,801

Deficient Material: **Sectional Overhead Doors**

Seals of glazed overhead vehicle apparatus doors have failed (fogging and moisture inside glazing sandwich).

Remedial Action:

Replace glazing units in overhead doors.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

B3030 Projections	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	1	$8,000.00	LS	$8,000	$15,667

Deficient Material: **Tower**

Interior insulation vapor barrier failing exposing insulation to moisture.



Remedial Action:

Provide mechanical exhaust venting of tower. Remove and reinstall insulation and sealed vapor barrier.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

C1010 Partitions	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	1	$5,000.00	EA	$5,000	$9,792

Deficient Material: **Fire/Smoke Assembly**

The 1-hr smoke fire separation between the apparatus bay and living quarters has been compromised with an opening cut in the drywall at the mezzanine.



Remedial Action:

Add fire/smoke access door to attic space (or replace and repair drywall).

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

C3020 Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	4,000	$10.00	SF	$40,000	$78,336

Deficient Material: **Flooring**

Carpet is stained, worn, and at end of life. VCT removed in area in kitchen where water damage flood occurred.

Remedial Action:

Remove and replace all carpet (carpet tile recommended over replacing with broadloom). Repair missing VCT.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

D2030 Sanitary Waste	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	8,496	$3.00	SF	$25,488	$49,916

Deficient Material: **DW&V piping**

Aged cast iron drain, waste, and vent (DW&V) piping, with increasing back-ups.



Remedial Action:

Replace DW&V piping.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

D2040 Rain Water Drainage	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	250	$30.00	LF	$7,500	$14,688

Deficient Material: **Gutter & downspouts**

Clogged, leaking, damaged, and/or misdirected gutter and downspout, damaging building and site materials below and creating slip hazards and rusting or corroding utility service entries.

Remedial Action:

Renew gutter and downspout and direct all to storm.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

D3020 Heat Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2025	1	$10,000.00	LS	$10,000	$19,584

Deficient Material: **Furnace**

One older Bryant gas-fired condensing furnace serving the kitchen area.



Remedial Action:

Budget to replace furnace upon failure.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2025	2	$9,500.00	EA	$19,000	$37,210

Deficient Material: **Condensing unit**

Aging condensing units with increasingly obsolete R-22 refrigerant.

Remedial Action:

Budget to replace upon failure, including obsolete R-22 inside coils.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	10	$650.00	EA	$6,500	$12,730

Deficient Material: **Return air**

No apparent return air path from dormitory rooms and potentially other small spaces.



Remedial Action:

install return air path for space missing same.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	3	$4,000.00	EA	$12,000	$23,501

Deficient Material: **Ventilation**

No apparent ventilation air for station house including office, day-room, and dormitory areas; additionally no economizer for free cooling during shoulder seasons, as required by code.



Remedial Action:

Install full economizer with relief air path for each of the three forced-air HVAC systems, to improve indoor air quality and increase energy efficiency.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	8,496	$7.00	SF	$59,472	$116,470

Deficient Material: **Fire Sprinkler**
No fire sprinkler system.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43

E2010 Fixed Furnishings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2022	1	$10,000.00	LS	$10,000	$19,584

Deficient Material: **Casework**

Kitchen base cabinets missing from recent dishwasher flood. Countertop worn, plastic laminate edge surface broken.

Remedial Action:

Replace kitchen base cabinets. Replace kitchen countertop.

Action Type:

Other



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Facility Summary

City of Camas
Fire Station 43
Fire Station 43 Infrastructure

1400 A Street
Washougal, WA 98671

Facility Condition Summary

Property contains the fire station, but is also the access for a very small public park to the south that includes a concrete half basketball court, and lawn area. There are also a number of connex storage containers for Fire, Police, and Parks Departments.

Just to the south of the building there is an area leased to a communications company (AT&T) and contains a fenced in cell tower and adjacent portable controls building.

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43 Infrastructure

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1974	1974	3	TRB	01/11/22	Concrete drive aprons at sidewalks in good condition. Asphalt perimeter drive in fair condition with various levels of cracking (worse condition on the south lot). Apparatus bay asphalt generally in good condition except right at garage entry where asphalt sinking from vehicle tile loading.
G2020 Parking Lots	1974	1974	3	TRB	01/11/22	Asphalt parking. Aging wheel stops.
G2030 Pedestrian Paving	1974	1974	3	TRB	01/11/22	Concrete walks and brick pavers at main entry. Pavers should be cleaned of moss to not be a slip hazard. Street storm event flooding is directed straight down the front entry walk into the building.
G2040 Site Development	1974	1974	3	TRB	01/11/22	Flag pole, covered display shed for historic fire fighting apparatus, BBQ area.
G2050 Landscaping	1974	1974	3	TRB	01/11/22	Well established trees, perimeter with minimal landscaping, some grass.
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1974	1974	3	DCS	01/11/22	City water with estimated 1.5-inch meter by flag pole, leading to main shut-off valve inside at the base of the hose tower. No fire service; no apparent irrigation system.
G3020 Sanitary Sewer	1974	1974	4	DCS	01/11/22	City sewer with failing side sewer and increasing back-ups and damage.

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Facility Summary

City of Camas
Fire Station 43
Fire Station 43 Infrastructure

1400 A Street
Washougal, WA 98671

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3030 Storm Sewer	1974	1974	4	DCS	01/11/22	Flooding from street at main entry; standing water, dirt, mold, and mildew along the building foundation in multiple locations, and at several other hardscape locations. Fouled trench drain to southeast - minor maintenance to clean-out. Small storm water swale at southeast corner of south paved area.
G3060 Fuel Distribution	1974	1974	3	DCS	01/11/22	NW Natural gas meter No. 1058611 with 630 cfh capacity and including seismic shut-off valve; supplying two gas furnaces, standby generator, domestic hot water heater, one gas-fired BBQ, and four gas-fired unit heaters in the apparatus bays.
G40 Site Electrical utilities						
G4010 Electrical Distribution	1974	1974	3	DCS	01/11/22	Aging Clark PUD power underground to southeast former police vehicle sally port bay distribution panels via PUD meter No. 81-464-04; while meter indicates four-wire, the two panels are 120/240V single-phase, each with 200A capacity. Separate PUD meter No. 78-449-755 to the AT&T cell tower equipment building adjacent to the base of the tower; reportedly ground-leased to AT&T.
G4020 Site Lighting	1974	1974	4	DCS	01/11/22	No site lighting, except at building perimeter, mostly above apparatus bay main entries - minor maintenance to install additional wall-packs to better illuminate the rear service yard; also minor maintenance to upgrade to LED lamps at existing fixtures. Many exterior lights are on during the day - minor maintenance to adjust controls to turn off exterior lighting during daylight hours.
G4030 Site Communications and Security	1974	2010	2	DCS	01/11/22	High-speed fiber-optic telecom, plus apparent high-speed cable-service; aged plain-old-telephone service (POTS) appears abandoned in place. No apparent site electronic security - minor maintenance to install exterior perimeter CCTV monitoring cameras. AT&T cell tower immediately south of the fire station building, with adjacent cell equipment building adjacent to the fenced tower base.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43 Infrastructure

G2010 Roadways	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2027	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **AC Paving**

Apparatus bay asphalt generally in good condition except right at garage entry where asphalt sinking from vehicle tile loading. other areas of cracking and degradation beginning.

Remedial Action:

Saw cut and replace asphalt with heavy-duty pavement at apparatus bay (consider concrete in lieu of asphalt for durability). Seal other cracks and slurry coat.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43 Infrastructure

G2030 Pedestrian Paving	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2023	2	$2,500.00	EA	$5,000	$9,792

Deficient Material: **Concrete Sidewalk**

Street storm event flooding is directed straight over the ADA curb cut and is funneled down the front entry walk into the building.



Remedial Action:

Saw cut entry walk adjacent to public sidewalk and at face of entry foyer, install trench drains to divert additional storm flow from the street.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Fire Station 43
Facility: Fire Station 43 Infrastructure

G3020 Sanitary Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1	$8,000.00	LS	$8,000	$15,667

Deficient Material: **Sanitary Sewer**

City sewer with failing side sewer and increasing back-ups and damage.



Remedial Action:

Replace side sewer.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Fire Station 43

Facility: Fire Station 43 Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1	$17,500.00	LS	$17,500	$34,272

Deficient Material: **Storm**

Flooding from street at main entry; standing water, dirt, mold, and mildew along the building foundation in multiple locations, and at several other hardscape locations.



Remedial Action:

Reslope site hardscape and softscape, add new catch basins, trench drains, and roof downspout conveyance to drain rain water away from the building and prevent standing water at hardscape and public park use area.

Action Type:

Code Issue

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Fire Station 43

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Fire Station 43	B20 Exterior Closure	$21,600	$4,320	$5,184	$11,197	$42,301	$42,580
	B30 Roofing	$8,000	$1,600	$1,920	$4,147	$15,667	$15,898
	C10 Interior Construction	$5,000	$1,000	$1,200	$2,592	$9,792	$9,792
	C30 Interior Finishes	$40,000	$8,000	$9,600	$20,736	$78,336	$80,668
	D20 Plumbing	$32,988	$6,598	$7,917	$17,101	$64,604	$66,308
	D30 HVAC	$47,500	$9,500	$11,400	$24,624	$93,024	$96,114
	D40 Fire Protection	$59,472	$11,894	$14,273	$30,830	$116,470	$116,470
	E20 Furnishings	$10,000	$2,000	$2,400	$5,184	$19,584	$19,584
	Facility Total	**$224,560**	**$44,912**	**$53,894**	**$116,412**	**$439,778**	**$447,414**
Fire Station 43 Infrastructure	G20 Site Improvements	$10,000	$2,000	$2,400	$5,184	$19,584	$20,475
	G30 Site Civil / Mechanical Utilities	$25,500	$5,100	$6,120	$13,219	$49,939	$51,426
	Facility Total	**$35,500**	**$7,100**	**$8,520**	**$18,403**	**$69,523**	**$71,901**
	Site Total	**$260,060**	**$52,012**	**$62,414**	**$134,815**	**$509,302**	**$519,315**

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Opportunity Summary By Subsystem

City of Camas

Site: Fire Station 43 **Total Site Opportunity Cost: $361,456**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Fire Station 43**						
System:	**Superstructure**	**Total Cost: $50,976**					
B1020	**Roof Construction**						
		1974 era minimal insulation assumed to be only R-10.	Upgrade building thermal envelope to at least current code for energy efficiency and thermal comfort.	8,496.00	$6.00	SF	$50,976
Facility:	**Fire Station 43**						
System:	**Exterior Closure**	**Total Cost: $200,000**					
B2020	**Exterior Windows**						
		Three sleeping rooms are not code-compliant (no second egress) and the fourth space ("the leper room") is in a circulation route, interrupting privacy and sleep when others circulate through the room to access other portions of the building.	Remodel the west side of the building to provide functional, private, and code-compliant sleeping rooms. Remodel and relocate entertainment room to unused conference room adjacent to kitchen and BBQ. Remodel current sleeping area into new workout room.	2,000.00	$100.00	SF	$200,000
Facility:	**Fire Station 43**						
System:	**Plumbing**	**Total Cost: $7,000**					
D2010	**Plumbing Fixtures**						
		No hydration station or decontamination shower.	Add hydration station and decontamination shower.	2.00	$3,500.00	EA	$7,000
Facility:	**Fire Station 43**						
System:	**HVAC**	**Total Cost: $36,000**					
D3020	**Heat Generating Systems**						
		No heat or vent for hose tower.	Install heat and vent for hose tower.	1.00	$9,000.00	LS	$9,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Fire Station 43

Total Site Opportunity Cost: $361,456

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
D3090	Other HVAC Systems and Equipment	No apparatus bay vehicle engine exhaust system.	Install vehicle engine exhaust system such as Nederman or Plymovent.	6.00	$4,500.00	EA	$27,000
Facility:	**Fire Station 43**						
System:	**Electrical**	**Total Cost: $42,480**					
D5020	Lighting and Branch Wiring						
		Fluorescent lighting with manual control.	Upgrade to LED lighting with automatic control.	8,496.00	$5.00	SF	$42,480
Facility:	**Fire Station 43**						
System:	**Equipment**	**Total Cost: $15,000**					
E1020	Institutional Equipment						
		Bunker and turn-out gear drying and storage spread out among the far apparatus bay addition, mezzanine, main apparatus bay, and other locations.	Consolidate bunker and turn-out gear drying, laundry, and storage into one cohesive area for improved operational efficiency.	1.00	$15,000.00	LS	$15,000
Facility:	**Fire Station 43 Infrastructure**						
System:	**Site Improvements**	**Total Cost: $10,000**					
G2030	Pedestrian Paving						
		Street catch basin is inadequate to collect storm event runoff, and stormwater overflows the curb straight into the ADA curb cut, and is funneled straight down into the building, causing repeated structure damage.	Increase storm catch basin capacity to accommodate storm events, possibly also modify roadway asphalt to divert water flow away from the ADA curb-cut.	1.00	$10,000.00	EA	$10,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge

227 NW Lake Road
Camas, WA 98607

Facility Size - Gross S.F.	4,615
Year Of Original Construction	2014
Facility Use Type	Community Center
Construction Type	Light
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	2014
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.2**			
Facility Condition Index (FCI)	0.07	**Predicted Renewal Budget 2028 - 2041**	$356,000	$421,000
Current Replacement Value (CRV)	$1,517,000	**Observed Deficiencies 2022 - 2027**	$184,000	$185,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$20,000	N/A

Facility Condition Summary

Single-story community center with several meeting rooms, a large main hall, office, and prep kitchen. Roofing is a pitched composition shingle roof with daylight dormers, exterior cladding consists of a combination of fiber cement composite board and batten and lap siding, and areas of basalt stone base and column elements. Exposed stained timber frame look trusses and columns. Windows are thermal units in composite aluminum and wood.

HVAC is four gas furnaces in attic mezzanine with split-Dx cooling including economizer; one gas-fired fireplace, plumbing support for warming kitchen and men's and women's restrooms; no fire sprinkler, but modern fire alarm; light commercial 120/240V, single-phase power; mix of fluorescent and LED lighting; modern low-voltage systems.

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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge

227 NW Lake Road
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.0**			
A10 Foundations						
A1010 Standard Foundations	2014	2014	2	TRB	01/12/22	Standard concrete footings and stem walls.
A1030 Slab On Grade	2014	2014	2	TRB	01/12/22	Concrete slab on grade.
B Shell			**2.3**			
B10 Superstructure						
B1010 Floor Construction	2014	2014	2	TRB	01/12/22	Mechanical mezzanine is wood sheathing on wood joists.
B1020 Roof Construction	2014	2014	3	TRB	01/12/22	Wood sheathing on wood trusses. Batt insulation is suspended by the vapor barrier off the bottom of trusses, and appears to be falling away onto the gypsum ceiling below, leaving the thermal envelope compromised (observed in at least one location, and is assumed to be occurring elsewhere).
B20 Exterior Closure						
B2010 Exterior Walls	2014	2014	2	TRB	01/12/22	Exterior cladding consists of a combination of fiber cement composite board and batten and lap siding, and areas of basalt stone base and column elements on insulated wood walls. Exposed stained timber frame look trusses and columns.
B2020 Exterior Windows	2014	2014	2	TRB	01/12/22	Pre-finished aluminum exterior clad composite windows (stained wood interior), with thermal low-emissivity glazing.

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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge

227 NW Lake Road
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**2.3**			
B20 Exterior Closure						
B2030 Exterior Doors	2014	2014	3	TRB	01/12/22	Oversize pairs of hollow metal doors and frames with thermally insulated glass. Door closers, locks, and latches are reported to be problematic, and daylight is visible with significant gaps at the thresholds. Installing new seal/sweep hardware is recommended to reduce energy use and thwart insect infiltration.
B30 Roofing						
B3010 Roof Coverings	2014	2014	3	TRB	01/12/22	Composition shingle roofing. Moss growth beginning which should be treated and removed. It appears that snow/ice guards have been removed from roofing.
B3030 Projections	2014	2014	2	TRB	01/12/22	Stained wood timber framed entry canopy with tongue and groove wood deck, and stained timber frame expression back covered porch with painted soffit board.
C Interiors			**1.9**			
C10 Interior Construction						
C1010 Partitions	2014	2014	2	TRB	01/12/22	Gypsum on wood stud walls.
C1020 Interior Doors	2014	2014	2	TRB	01/12/22	Wood doors in hollow metal frames. Overhead counter door at kitchen. A vinyl accordion door was installed after occupancy to segregate the hall from the main hall to reduce disruption to other meetings and building occupants, it has been flagged by the fire marshal for non-compliance and removal.
C1030 Fittings	2014	2014	2	TRB	01/12/22	Wood base, trim, and miscellaneous.
C30 Interior Finishes						
C3010 Wall Finishes	2014	2021	1	TRB	01/12/22	Recently repainted interiors.

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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge

227 NW Lake Road
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**1.9**			
C30 Interior Finishes						
C3020 Floor Finishes	2014	2014	2	TRB	01/12/22	Vinyl plank floors in the main hall. Carpet in hallways, office, and meeting rooms. Vinyl sheet goods in the kitchen, custodial, and toilet rooms.
C3030 Ceiling Finishes	2014	2014	2	TRB	01/12/22	Painted gypsum, suspended acoustical tile, and small areas of accent wood at dormer clerestory vaulted ceiling areas.
D Services			**2.3**			
D20 Plumbing						
D2010 Plumbing Fixtures	2014	2014	2	DCS	01/12/22	Men's and women's restrooms flushing fixtures and lavatories; commercial warning kitchen with sinks and support for several appliances; drinking fountain.
D2020 Domestic Water Distribution	2014	2014	2	DCS	01/12/22	City water to copper distribution, with two Bradford-White high-efficiency (condensing) gas-fired domestic hot water heaters with recirculation pumps.
D2030 Sanitary Waste	2014	2014	2	DCS	01/12/22	Non-metallic ABS drain, waste, and vent piping where observed, with point-of-use grease interceptor at commercial warming kitchen pot-wash sink; no issues reported.
D2040 Rain Water Drainage	2014	2014	2	DCS	01/12/22	Metal gutter and downspout to storm, but snow and ice guards are missing or damaged - minor maintenance to replace to protect gutters, plus equipment in southwest service yard.
D2090 Other Plumbing Systems	2014	2014	2	DCS	01/12/22	Point-of-use grease interceptor in warming kitchen.
D30 HVAC						
D3010 Energy Supply	2014	2014	2	DCS	01/12/22	Natural gas to four furnaces, two water heaters, two kitchen ranges, and one fireplace.

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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge

227 NW Lake Road
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.3**			
D30 HVAC						
D3020 Heat Generating Systems	2014	2014	2	DCS	01/12/22	Four high-efficiency (condensing) Lennox gas-fired furnaces all located at the attic mezzanine; two larger and two smaller. The associated leak detection system is reportedly to generator false alarms, however, signs of past moisture leakage were observed - regardless, minor maintenance to correct leakage and/or repair or replace leak detection sensors.
D3030 Cooling Generating Systems	2014	2014	2	DCS	01/12/22	Four exterior split-Dx condensing units; one 2-ton, one 1.5-ton, and two 5-ton; providing service to four inside evaporator coils connected to the attic mezzanine furnaces and including condensate drainage - see D3020 for moisture detection alarm issue.
D3040 HVAC Distribution Systems	2014	2014	2	DCS	01/12/22	Forced-air heating, cooling, and ventilation with four systems (zones), each with apparent full economizer, but with unclear economizer operation - minor maintenance to investigate and correct as needed. Restroom ceiling exhaust fans, plus telecom/fire alarm control panel room ventilation cooling ceiling exhaust fan. Most or all windows are non-operable.
D3060 Controls and Instrumentation	2014	2014	3	DCS	01/12/22	Four standalone programmable thermostats with unclear economizer cycle control. The Lacamas Lake Lodge is one of the highest energy using facilities in the City building inventory; suspected due to: 1) High-use, including after hours and weekends, 2) Damaged or missing insulation in the attic space, 3) Economizer (free cooling) malfunction, and/or 4) Sub-optimized HVAC and lighting controls.
D3090 Other HVAC Systems and Equipment	2014	2014	4	DCS	01/12/22	Warming kitchen recirculating hoods - may not meet code for service above commercial gas ranges; plus limits use of the otherwise functional kitchen. Sealed combustion gas-fired fireplace in the main event space.

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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge

227 NW Lake Road
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.3**			
D40 Fire Protection						
D4030 Fire Protection Specialties	2014	2014	2	DCS	01/12/22	Fire extinguishers in cabinets, some blocked for storage material or furniture - minor maintenance to keep clear access.
D50 Electrical						
D5010 Electrical Service and Distribution	2014	2014	2	DCS	01/12/22	Two 120/240V, single-phase panels; 1) Panel A is 200A serving most receptacle and lighting loads, and 2) Panel B is 225A serving most HVAC loads, plus septic system pump(s).
D5020 Lighting and Branch Wiring	2014	2014	3	DCS	01/12/22	Mix of fluorescent in core areas, and LED in perimeter areas, with occupancy sensors and limited scene control; no dimming in core areas, specifically in the main event space, hampering event production. Minor maintenance to upgrade all LED and add dimming capability to core area of the main event space.
D5032 Low Voltage Communication	2014	2014	3	DCS	01/12/22	City standard voice over internet protocol (VOIP) handsets - minor maintenance to upgrade to modern video phone handsets.
D5037 Low Voltage Fire Alarm	2014	2014	2	DCS	01/12/22	Modern fire alarm system with Notifier fire alarm control panel (FACP) and remote annunciator with pull stations, detectors, and notification devices throughout.
D5038 Low Voltage Security	2014	2014	2	DCS	01/12/22	Card-key access, perimeter monitoring, and intrusion detection, but no CCTV - minor maintenance to install several CCTV cameras.
D5039 Low Voltage Data	2014	2014	2	DCS	01/12/22	High-speed data to small MDF in the telecom closet, which includes dedicated ventilation cooling.

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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.3**			
D50 Electrical						
D5090 Other Electrical Systems	2014	2014	2	DCS	01/12/22	Lighted egress pathway bug-eye fixtures and exit signs, both with battery back-up. Some batteries are weak or failed - minor maintenance to test and replace when needed. Some ceiling light fixtures also have battery back-up, but are problematic - minor maintenance to correct.
E Equipment and Furnishings			**2.0**			
E10 Equipment						
E1010 Commercial Equipment	2014	2014	2	DCS	01/12/22	Office equipment.
E1020 Institutional Equipment	2014	2014	2	DCS	01/12/22	Commercial kitchen equipment. Parks program equipment, but with insufficient storage - minor maintenance to install a Tuff Shed outside for additional storage.
E20 Furnishings						
E2010 Fixed Furnishings	2014	2014	2	TRB	01/12/22	Fixed furnishings include built-in office desk counters, casework, built-in perimeter window benches in the main hall, miscellaneous storage shelving.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Lacamas Lake Lodge
Facility: Lacamas Lake Lodge

B1020 Roof Construction	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2022	4,615	$8.00	SF	$36,920	$72,304

Deficient Material: **Insulation**

Insulation has fallen away from bottom of trusses. Could be the reason this facility reports significant energy use. (Only observable in at least one location, and is assumed to be occurring elsewhere.)



Remedial Action:

Reinstall and reseal vapor barrier and insulation, and upgrade to meet current energy code.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Lacamas Lake Lodge
Facility: Lacamas Lake Lodge

D3090 Other HVAC Systems and Equipment	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1	$20,000.00	LS	$20,000	$39,168

Deficient Material: **Hood**

Recirculating hoods above both gas-fired ranges, limiting use of kitchen to warming only.

Remedial Action:

Install grease hood system to allow cooking in the kitchen.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Lacamas Lake Lodge
Facility: Lacamas Lake Lodge

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	4,615	$8.00	SF	$36,920	$72,304

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge Infrastructure

227 NW Lake Road
Camas, WA 98607

Facility Condition Summary

Community center lodge set in Lacamas Lake Park, housing a parking lot for the lodge, and access to the water, and includes a floating fishing dock.

City water and sewer, but via a septic tank with ejector pump assumed; no fire sprinkler service. Several bioswale and rain garden areas, with treatment vault prior to apparent discharge to lake. NW Natural gas service. Power from Clark PUD; no site electronic security.

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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge Infrastructure

227 NW Lake Road
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1940	2014	2	TRB	01/12/22	Asphalt with concrete curbs.
G2020 Parking Lots	1940	2014	2	TRB	01/12/22	Asphalt with precast concrete curb stops.
G2030 Pedestrian Paving	1940	2014	2	TRB	01/12/22	Concrete walkways (recommend power washing very slick algae growth off south-facing walk near kitchen).
G2040 Site Development	1940	2014	2	TRB	01/12/22	Monument sign, bollards, bicycle racks, fixed wood benches. Lakefront bank stabilization with large basalt boulders.
G2050 Landscaping	1940	2014	2	TRB	01/12/22	Mature and well maintained landscaping, and irrigation system.
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1940	2014	2	DCS	01/12/22	City water to building, plus apparent separate irrigation service. No fire sprinkler service to building.
G3020 Sanitary Sewer	1940	2014	2	DCS	01/12/22	Building sanitary waste to septic tank with assumed pump to force-main to assume City sewer at street - no issues reported. No exterior grease interceptor for kitchen.
G3030 Storm Sewer	1940	2014	3	DCS	01/12/22	Several bioswales - reportedly overflowing and partially flooding the parking lot during heavy rains; one Convault filtration vault for paved area.
G3060 Fuel Distribution	2014	2014	2	DCS	01/12/22	NW Natural gas meter No. 1090147 with 630 cfh capacity and no seismic shut-off valve - minor maintenance to install.

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Facility Summary

City of Camas
Lacamas Lake Lodge
Lacamas Lake Lodge Infrastructure

227 NW Lake Road
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G40 Site Electrical utilities						
G4010 Electrical Distribution	2014	2014	3	DCS	01/12/22	Power underground to service entry at southwest corner of the building in small fenced service yard area; Clark PUD meter No. 75-417-279, delivering 120/240V, single-phase power to two inside panels via two 200A exterior breakers A & B; noting inside Panel B is a larger 225A panel - minor maintenance to upsize the Panel B exterior supply breaker if needed. No standby generator, renewable energy, or electric vehicle charging stations.
G4020 Site Lighting	1940	2014	2	DCS	01/12/22	About ten parking lot and roadway light poles with box-type luminaires. About 24 hardscape pedestrian pathway lights along north and east side of the lodge. Recessed lighting under east patio canopy.
G4030 Site Communications and Security	1940	2014	2	DCS	01/12/22	High-speed data to telecom room north center of building; reported rough-in for site electronic security (CCTV).
G90 Other Site Construction						
G9090 Other Site Systems	1940	2014	2	TRB	01/12/22	Floating fishing dock, wood deck at dock weathering, aluminum ramp to dock in good condition.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Lacamas Lake Lodge
Facility: Lacamas Lake Lodge Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Storm**

Parking lot bioswale flooding during heavy rain.



Remedial Action:

Expand bioswale and/or storm water detention capacity to reduce flooding.

Action Type:

Code Issue

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Lacamas Lake Lodge

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Lacamas Lake Lodge	B10 Superstructure	$36,920	$7,384	$8,861	$19,139	$72,304	$72,304
	D30 HVAC	$20,000	$4,000	$4,800	$10,368	$39,168	$40,335
	D40 Fire Protection	$36,920	$7,384	$8,861	$19,139	$72,304	$72,304
	Facility Total	**$93,840**	**$18,768**	**$22,522**	**$48,647**	**$183,776**	**$184,943**
Lacamas Lake Lodge Infrastructure	G30 Site Civil / Mechanical Utilities	$5,000	$1,000	$1,200	$2,592	$9,792	$10,084
	Facility Total	**$5,000**	**$1,000**	**$1,200**	**$2,592**	**$9,792**	**$10,084**
	Site Total	**$98,840**	**$19,768**	**$23,722**	**$51,239**	**$193,568**	**$195,027**

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Opportunity Summary By Subsystem

City of Camas

Site: Lacamas Lake Lodge

Total Site Opportunity Cost: $20,250

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Lacamas Lake Lodge**						
System:	**Interior Construction**	**Total Cost: $10,000**					
C1020	**Interior Doors**						
		Provide acoustic separation, securement, and egress from the main hall into the hallway.	At the entrance from the hallway to the main hall, consider constructing a 1-hr alcove into the main hall, with a pair of outswinging 20-min fire rated egress doors (for acoustic separation and securement of the main hall, while maintaining egress).	1.00	$10,000.00	LS	$10,000
Facility:	**Lacamas Lake Lodge Infrastructure**						
System:	**Site Electrical utilities**	**Total Cost: $10,250**					
G4010	**Electrical Distribution**						
		No electric vehicle (EV) charging stations.	Install one double EV charging station, with rough-in for one future additional.	1.00	$5,000.00	LS	$5,000
G4030	**Site Communications and Security**						
		Reported rough-in for parking lot CCTV security.	Install CCTV cameras to improve security in the parking lot area.	3.00	$1,750.00	EA	$5,250

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Library
Library

625 NE 4th Ave
Camas, WA 98607

Facility Size - Gross S.F.	36,500
Year Of Original Construction	1940
Facility Use Type	Library
Construction Type	Medium
# of Floors	3
Energy Source	Gas
Year Of Last Renovation	2002
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.7**			
Facility Condition Index (FCI)	0.12	**Predicted Renewal Budget 2028 - 2041**	$3,593,000	$4,233,000
Current Replacement Value (CRV)	$12,839,000	**Observed Deficiencies 2022 - 2027**	$1,714,000	$1,761,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$1,692,000	N/A

Facility Condition Summary

A two-story municipal library building with a basement. The building was originally constructed in 1940 with a substantial addition and remodel in 2002. Roofing is at end of life and there are constant leak issues related to roofing and flashings. Many of the windows are 2002 thermally glazed, but there are original ornamental doors and windows that are at end of life with rot and decay. Overall, the building is generally in fair to good condition with the exceptions of roofing, exterior doors, some windows, and HVAC controls which are driving the volume of maintenance issues.

HVAC is a four-pipe system with two boilers in the basement and one air-cooled chiller on roof. The four-pipe hydronic system serves five variable air volume (VAV) air handling units, in turn each supplying a network of VAV boxes with hot water reheat; full economizer for free cooling and mechanical ventilation is included. Plumbing for restroom, kitchens, drinking fountains, and utility use. Modern fire sprinkler and alarm. Power is modern 3-phase 208V, but without standby power generation. Lighting is a mix of original fluorescent, with some fixtures upgraded to LED lamps. Somewhat newer communications and data systems, but aged and failing electronic security.

While there are many complaints and problems with the HVAC system, it appears most the issues are related to obsolete and out-of-tune controls.

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Facility Summary

City of Camas
Library
Library

625 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.8**			
A10 Foundations						
A1010 Standard Foundations	1940	2002	3	TRB	12/03/21	Assumed to be standard concrete footings and concrete stem walls. No issues noted or reported.
A1030 Slab On Grade	1940	2002	3	TRB	12/03/21	Concrete slab on grade in basement. Staff noted the slab slopes to a low spot at the hall intersection, but on investigation, this was by design in the original basement floor to drain to the center of the basement.
A20 Basements						
A2020 Basement Walls	1940	2002	2	TRB	12/03/21	Board formed cast-in-place concrete.
B Shell			**2.6**			
B10 Superstructure						
B1010 Floor Construction	1940	2002	2	TRB	12/03/21	Original floor appears to be concrete on metal mesh, on metal open web joists and concrete beams. New addition assumed to be composite concrete on steel pan on steel.
B1020 Roof Construction	1940	2002	3	TRB	12/03/21	Original tongue and groove deck on framed wood roof trusses with blown-in insulation over the ceiling, new addition appears to be plywood on wood trusses with batt insulation and vapor barrier stapled to underside of cords.

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Facility Summary

City of Camas
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625 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**2.6**			
B20 Exterior Closure						
B2010 Exterior Walls	1940	2002	3	TRB	12/03/21	Brick masonry at original building. Brick veneer on studs and cement stucco (at west "back" facade). Cement plaster is cracking and experiencing moisture intrusion. Emergency overflow also has been draining down the face of the wall, also discovered the overflow inlet pipe was incorrectly installed (see D2040 Rain Water Drainage for further information).
B2020 Exterior Windows	1940	2002	3	TRB	12/03/21	2002 thermally glazed windows in wood windows with metal exterior replaced existing windows and set in existing wood frames. Some sills were not replaced and are rotting.
B2030 Exterior Doors	1940	2002	4	TRB	12/03/21	Three 1940 wood doors and ornamental wood frame trim and single-pane ornamental glass panels and transom in poor condition. 2002 aluminum storefront entry vestibule doors at main entrance with oversized doors that are causing functional operation and maintenance issues.
B30 Roofing						
B3010 Roof Coverings	1940	2002	4	TRB	12/03/21	Cementitious tiles on sloped roofs, white membrane on low-slope roofs, rock ballast over membrane, and copper over dormers and the cupola. Roofing systems are at end of life and, combined with improper flashing and drainage, have been causing constant leak problems. The underlayment below the cementitious tiles has completely degraded, and there is a large hole in the sub-roofing at the intersection of a roof to a wall that is currently leaking. No fall restraint system.
B3020 Roof Openings	1940	2002	3	TRB	12/03/21	Long central spine gable form skylight, no issues reported. Single roof access hatch.
B3030 Projections	1940	2002	3	TRB	12/03/21	Copper clad cupola, entry canopies, east side steel sunshade (in need of cleaning).

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Facility Summary

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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**2.4**			
C10 Interior Construction						
C1010 Partitions	1940	2002	3	TRB	12/03/21	Gypsum on stud walls, concrete walls in basement. Minor areas of water damage. Toilet partitions are painted steel.
C1020 Interior Doors	1940	2002	2	TRB	12/03/21	Wood doors and frames.
C1030 Fittings	1940	2002	2	TRB	12/03/21	Base wood trim and paneling, rubber base, ADA toilet room grab bars, display cases, and display objects and art.
C20 Staircases						
C2010 Stair Construction	1940	2002	2	TRB	12/03/21	Stair 1: Public stair, wood (to second floor) Stair 2: Internal staff circulation, steel stair with concrete treads Stair 3: Emergency egress, steel stair with concrete treads Stair 4: Emergency egress, not observed, assumed steel egress access stair with concrete treads (contemporary to stairs 2 & 3) Stair 5: Public stair, wood (to balcony) Stair 6: Concrete exterior (from fire riser / mechanical)
C2020 Stair Finishes	1940	2002	2	TRB	12/03/21	Stair 1: Carpet runner on wood. Stair 2: Exposed concrete on painted steel. Stair 3: Exposed concrete on painted steel. Stair 4: Not observed, assumed exposed concrete on painted steel. Stair 5: Wood. Stair 6: Exterior exposed concrete.
C30 Interior Finishes						
C3010 Wall Finishes	1940	2002	2	TRB	12/03/21	Paint.
C3020 Floor Finishes	1940	2002	3	TRB	12/03/21	Mostly broadloom carpet from 2002, original worn and dated VCT in the non-fiction wing, ceramic tile in restrooms, and a combination of VCT and exposed concrete in basement.

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Facility Summary

City of Camas
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Library

625 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**2.4**			
C30 Interior Finishes						
C3030 Ceiling Finishes	1940	2002	2	TRB	12/03/21	Suspended acoustical tile (minor areas of water leak stained tile), some areas of painted gypsum soffits.
D Services			**2.8**			
D10 Vertical Transportation						
D1010 Elevators and Lifts	1940	2002	2	DCS	12/03/21	Two Schindler 3,500-lb capacity, 30-hp hydraulic elevators; one two-stop for public use, and one three-stop for staff use. Dedicated Sanyo ductless split-Dx cooling for each elevator machinery room (EMR).
D1090 Other Conveying Systems	1940	2002	4	DCS	12/03/21	Removed, but hole to patch as minor maintenance. Reportedly, there is no longer any need for book or other material conveyance, other than via the full-size elevators.
D20 Plumbing						
D2010 Plumbing Fixtures	1940	2002	2	DCS	12/03/21	Restrooms, event warming kitchen, staff kitchenette, custodial mop sink, and dual-height (ADA) drinking fountain with minor issues reported, needing minor maintenance from time to time. Some fixtures exhibit minor water-hammer, assumed due to sticky plumbing fixture trim (faucets and flush valves). Reportedly, some flush valves have been recently replaced; all observed trim is manual (not automatic infrared type).

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Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.8**			
D20 Plumbing						
D2020 Domestic Water Distribution	1940	2002	2	DCS	12/03/21	City water with 2.5-inch service enters basement mechanical room without any apparent backflow prevention, but with an inside pressure reducing valve (PRV) that appears to duplicate function of outside PRV. The inside PRV and associated strainer is bypassed, hence unstrained water is distributed throughout the building, potentially fouling piping, fixtures, and especially trim - minor maintenance to reconfigure this system for proper operation. There have been several recent copper piping failures - further investigation is required as minor maintenance to determine the cause of failure and take action to reduce future failure risk. The City water system provides make-up water to the heating hot water and chilled water systems via a common small reduced pressure backflow preventer (RPBP), with separate PRVs for each. One A.O. Smith 80-gal electric domestic hot water (DHW) heater in the boiler room, with Taco recirc pump.
D2030 Sanitary Waste	1940	2002	2	DCS	12/03/21	Cast iron drain, waste, and vent (DW&V) piping where observed. Tested fixtures flush and drain well, but multiple spaces have sewer gas odor complaints - these may be due to malfunctioning floor drain trip primers - further investigation and maintenance is needed as minor maintenance.
D2040 Rain Water Drainage	1940	2002	3	DCS	12/03/21	Mix of metal gutter and downspout to storm at sloped roof, and roof and overflow roof drains at flat roof. All observed overflow roof drains are missing their code-required two-inch dams, hence the overflow roof drains flow frequently, damaging building walls and landscaping. Several gutters and/or roof drains are reportedly not piped to the site storm system. Some of the metal gutters are difficult to clean due to no roof access, and no practical access through overhanging tress. There are occupant complaints on plumbing piping water flow noises, that may be from the drain, waste, and vent and/or roof drain system - minor maintenance to further investigate and develop mitigation plan.
D30 HVAC						
D3010 Energy Supply	1940	2002	2	DCS	12/03/21	Natural gas piping to boilers and fireplace.

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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.8**			
D30 HVAC						
D3020 Heat Generating Systems	1940	2002	3	DCS	12/03/21	Two aging but functional Weil McClain standard-efficiency (80%) boilers, each with 641 mbh capacity; two constant-speed 1.5-hp hot water pumps; and insulated heating water supply and return piping. The boilers should provide ten to fifteen years of additional service with continued good maintenance.
D3030 Cooling Generating Systems	1940	2002	3	DCS	12/03/21	One rooftop McQuay air-cooled chiller with two 2016 compressors, and one 2- or 3-hp constant-speed chilled water pump.
D3040 HVAC Distribution Systems	1940	2002	3	DCS	12/03/21	Four-pipe hydronic distribution piping to five McQuay variable air volume (VAV) air handling units (AHUs), each with variable-speed driven (VFD) supply and return air fans, two-stage filtration, heating coil, and cooling coil. The AHUs supply downstream VAV box terminal units. Exhaust fans for restrooms and kitchen areas. The VAV system needs re-TAB (test, adjust, and balance), as air flows were observed to be inconsistent in multiple areas.
D3050 Terminal and Package Units	1940	2002	3	DCS	12/03/21	Variable air volume (VAV) terminal units with hot water reheat coils. Five electric wall heaters in lobbies, stairwells, and utility spaces.
D3060 Controls and Instrumentation	1940	2002	4	DCS	12/03/21	Aged direct digital control (DDC) HVAC control system, with reported and observed piecemeal repairs and partial upgrades over time, but reportedly has never worked correctly. While there is an original construction TAB report, a Commissioning Report was not observed. There are many occupant comfort and noise complaints, with portable heaters and fans in use throughout, especially in staff areas. The energy use intensity (EUI) is 34, which is good for this nearly 20-year-old library, but could likely be better (lower) with improved controls.
D3090 Other HVAC Systems and Equipment	1940	2002	2	DCS	12/03/21	Gas log set fireplace with brick chimney.

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Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.8**			
D40 Fire Protection						
D4010 Fire Protection Sprinkler Systems	1940	2002	2	DCS	12/03/21	Four risers, three wet and one dry; pressure at base of riser is 130 psig. The larger (4-inch) dry pipe system is marked as supplying the lobby; the three wet-pipe risers are smaller 2.5- or 3-inch risers.
D4030 Fire Protection Specialties	1940	2002	2	DCS	12/03/21	Fire extinguishers and AED.
D50 Electrical						
D5010 Electrical Service and Distribution	1940	2002	2	DCS	12/03/21	Cutler-Hammer (CH) 208V main switchboard with 1,600A capacity feeding seven distribution panels, two sub-panels, and the rooftop chiller. The two 208V, 800A sub-panels are primarily for larger HVAC loads. Several panels includes integral TVSS (surge suppressors). No standby generator, but assume no need, as the library is a reportedly non-essential facility.
D5020 Lighting and Branch Wiring	1940	2002	3	DCS	12/03/21	2002 fixtures with mix of T8 fluorescent and some upgraded to LED. Poor lighting in some stack and reading areas. Two lighting control panels, with reportedly problematic and obsolete hardware and especially software.
D5032 Low Voltage Communication	1940	2002	3	DCS	12/03/21	2008 voice over internet protocol (VOIP) telephone system, but no issues reported. A/V support in several spaces.
D5037 Low Voltage Fire Alarm	2002	2002	3	DCS	12/03/21	Aging, but functional EST-2 addressable fire alarm control panel, with no issues reported. Assume five to ten years remaining service with continued good maintenance.
D5038 Low Voltage Security	2002	2002	4	DCS	12/03/21	2002 card-key access system is failing.
D5039 Low Voltage Data	1940	2002	3	DCS	12/03/21	High-speed fiber-optic to MDF, but insufficient WiFi converge.

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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.8**			
D50 Electrical						
D5090 Other Electrical Systems	1940	2002	3	DCS	12/03/21	Battery back-up egress and exit signs, but no standby power system.
E Equipment and Furnishings			**2.0**			
E10 Equipment						
E1010 Commercial Equipment	1940	2002	3	DCS	12/03/21	Aging kitchen appliances and office equipment.
E1020 Institutional Equipment	1940	2002	2	DCS	12/03/21	Specialty library equipment, such as digital patron service kiosks.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

B2010 Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	2,000	$10.00	SF	$20,000	$39,168

Deficient Material: **Cement Plaster**

Cement plaster on the west wall area is cracking and moisture intrusion is evident.



Remedial Action:

Repair, seal, and recoat cement plaster walls.

Action Type:

Other

Copyright MENG Analysis 2022

Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

B2020 Exterior Windows	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	20	$1,000.00	EA	$20,000	$39,168

Deficient Material: **Wood Windows**

Windows set in original wood frames, some sills were replaced or capped, but estimate about 20 are not and the wood sills are now rotting.

Remedial Action:

Replace sills, reseal, and provide finish cap.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	4	$4,000.00	EA	$16,000	$31,334

Deficient Material: **Aluminum Storefront**

Aluminum storefront doors are very tall and heavy and settlement is causing wear between leaves. These doors require constant adjustment, are difficult to operate as the leaves jamb together, and sometimes prevent securement of the facility.



Remedial Action:

Remove doors from existing frames, and replace with standard-sized storefront doors with a transom light above set into the existing frame.

Action Type:

ADA

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	3	$10,000.00	EA	$30,000	$58,752

Deficient Material: **Wood Doors and Wood Frames**

Original wood doors, ornamental wood frame trim, and single-pane ornamental glass panels and transom. Wood elements are beginning to show signs of dry rot. During fire smoke season, smoke enters the library through the air gaps.



Remedial Action:

Replicate and replace ornamental entry features, replace doors and windows with similar aesthetic, but provide modern thermal insulated glass, seals, and hardware.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	18,500	$17.00	SF	$314,500	$615,917

Deficient Material: **Roof Coverings**

Roofing systems are at end of life and, combined with improper flashing, geometry, and drainage installation, have been causing systemic leak problems.

Remedial Action:

Remove all roof systems, repair and replace damaged wood substrate, repair substandard roof drain systems, provide emergency overflow (inlet 2" above main drain) where missing, and install new membrane roofing systems (extend proper height up perimeter walls in wells and seal with masonry regrets). On pitched roofs, install self-adhered and healing membrane and ice and water shield sub-roofing systems (integrated with side wall counter and kick flashings) and install new durable roofing tiles. Add drainage to all canopies, avoid internal drains where possible (like over entry canopies), and provide scupper and tightline downspouts.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

C3020 Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	3,500	$12.00	SF	$42,000	$82,253

Deficient Material: **VCT**

Original VCT in fiction section is at end of life, seams cupping, and discolored.



Remedial Action:

Remove and replace (consider replacement with carpet tile).

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D2040 Rain Water Drainage	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	36,500	$0.75	SF	$27,375	$53,611

Deficient Material: **Roof drains**

Overflow roof drains missing dams; ballasted roof area drains not clear - may be fouled; gutters adjacent to trees are full of leaves and difficult to access; some roof drains not piped to site storm.



Remedial Action:

Install overflow roof drain dams; locate, clean, and mark ballasted roof drains; clean all fouled gutters and provide gutter-guards adjacent to overhanging trees (alternate remove or cut back trees); pipe all roof drains to storm.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	5	$3,500.00	EA	$17,500	$34,272

Deficient Material: **AHUs**

Air handling units (AHUs) are nearing 20 years old.



Remedial Action:

Thoroughly clean and fully service AHUs.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	36,500	$1.00	SF	$36,500	$71,482

Deficient Material: **Test, Adjust, and Balance (TAB)**

Inconsistent air flows throughout.



Remedial Action:

Re-TAB (test, adjust, and balance) per plans; considering any modifications since original construction.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D3050 Terminal and Package Units	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	25	$350.00	EA	$8,750	$17,136

Deficient Material: **Terminal units**

Aging variable air volume (VAV) terminal units and reheat coils.



Remedial Action:

Fully clean and service VAV terminal units.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D3060 Controls and Instrumentation	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	36,500	$5.00	SF	$182,500	$357,408

Deficient Material: **Controls**

Mix of older and newer control elements, with obsolete user interface; collectively resulting in many occupant thermal comfort and some noise complaints. No sign of original commissioning.



Remedial Action:

Retro-commission (R-Cx) the library HVAC system, and upgrade the control system to current standards; repair or replace HVAC system components as need to restore full function.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D5020 Lighting and Branch Wiring	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	5,000	$5.00	SF	$25,000	$48,960

Deficient Material: **Lighting**
Insufficient lighting in some stack area.

Remedial Action:
Add fixtures and/or task lighting to dark areas.

Action Type:
Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D5020 Lighting and Branch Wiring	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	36,500	$1.50	SF	$54,750	$107,222

Deficient Material: **Lighting Controls**
Obsolete and problematic lighting controls.



Remedial Action:
Upgrade to current technology; potentially in conjunction with HVAC system upgrade.

Action Type:
Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D5032 Low Voltage Communication	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	36,500	$1.00	SF	$36,500	$71,482

Deficient Material: **Telephone**

Aging telephone system.



Remedial Action:

Upgrade to current (video-enabled) telephone technology.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D5038 Low Voltage Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	36,500	$0.70	SF	$25,550	$50,037

Deficient Material: **Security**
2002 card-key access systems is failing.

Remedial Action:
Renew per City standard.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library

D5039 Low Voltage Data	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	36,500	$0.50	SF	$18,250	$35,741

Deficient Material: **WiFi**

Poor WiFi coverage - no signal in multiple staff and patron areas.



Remedial Action:

Add WiFi WAPs to provide full coverage.

Action Type:

Other

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Facility Summary

City of Camas
Library
Library Infrastructure

625 NE 4th Ave
Camas, WA 98607

Facility Condition Summary

The site is completely dedicated to the library and contains the library building and related amenities including plazas, seating areas, ornamental fencing, and mature landscaping.

City water, fire, sewer, irrigation and storm; Clark PUD power, NW Natural gas, and telecom from purveyors; most site lighting from City municipal street and sidewalk lighting; one electric vehicle charging station.

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Facility Summary

City of Camas
Library
Library Infrastructure

625 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1940	2002	3	TRB	12/03/21	Small asphalt drive ramp to the basement level loading.
G2030 Pedestrian Paving	1940	2002	3	TRB	12/03/21	City street sidewalks with root upheaval (City regularly grinding pavement slabs to thwart trip hazard).
G2040 Site Development	1940	2002	3	TRB	12/03/21	Flag pole, Library Honey Bee hive, courtyard seating amenities (central area tiles have been removed, leaving a two-inch trip hazard well). Other retaining walls (recommend moss removal). Recent past street flooding entered the exterior stair to the fire riser and mechanical rooms, and flooded the basement. Vaults also flood and drain into the building.
G2050 Landscaping	1940	2002	3	TRB	12/03/21	Mature landscaping includes trees, rose bushes, and other shrubs, bushes, and lawn areas. Landscaping on the east, south, and west were well manicured at the time of observation, but trees and shrubs on the north are significantly overgrown and provide places for hiding (safety and security issue). Cut all branches of trees away from the building, and trim back shrubs and bushes well away from the facade. A number of irrigation system heads are buried under bark and mud.

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Facility Summary

City of Camas
Library
Library Infrastructure

625 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1940	2002	2	DCS	12/03/21	City water with two-inch meter; City fire with six-inch service; and City irrigation meter. All water services enter from east; water pressure is at 130 psig at fire sprinkler riser base, but there appears to be a pressure reducing valve (PRV) in the domestic water service hand-vault - this should be removed, as there is a newer PRV inside the basement. A backflow prevention device also appears needed - minor maintenance to make these changes. The fire service includes a six-inch fire department connection (FDC).
G3020 Sanitary Sewer	1940	2002	2	DCS	12/03/21	City sewer with no issues reported.
G3030 Storm Sewer	1940	2002	4	DCS	12/03/21	Mix of older and newer storm with multiple site and especially roof drain conveyance issues; past basement flooding from overwhelmed City street storm system uphill - City Public Works should address this as a separate project to reduce risk of flooding to the community. In the meantime, a makeshift one-foot-high piece of wood "protects" the library basement from repeat flooding.
G3060 Fuel Distribution	1940	2002	2	DCS	12/03/21	NW Natural gas rotary meter No. 626834592 with 1500 cfh capacity delivered at 2 psig; includes a mechanical seismic shut-off valve. Assume any original underground fuel oil storage tank was removed during the 2002 modernization.
G40 Site Electrical utilities						
G4010 Electrical Distribution	1940	2002	2	DCS	12/03/21	Clark PUD power down from pole to north, underground to 300 kVA utility pad-mounted 208V, three-phase transformer to north, then underground to the basement main electrical room; PUD meter No. 81-464-092; no standby generator or renewable energy, but one electric vehicle (EV) charging station to southeast.

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Facility Summary

City of Camas
Library
Library Infrastructure

625 NE 4th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G40 Site Electrical utilities						
G4020 Site Lighting	1940	2002	3	DCS	12/03/21	Minimal pedestrian paving landscape and step lighting; lighting at entries; some pedestrian paving lamps appear failed; controls leave lights on during daylight hours - minor maintenance to repair failed lamps and set outside light controller. Most site lighting is from City street lighting.
G4030 Site Communications and Security	1940	2010	2	DCS	12/03/21	High-speed fiber-optic data service, plus original plain-old-telephone service (POTS) for legacy systems. Minimal site electronic security.
G90 Other Site Construction						
G9010 Service and Pedestrian Tunnels	1940	2002	3	DCS	12/03/21	Stairwell down to basement from outside to east, with makeshift flood protection, and opportunity to add additional stair from outside to basement to west for new basement program use. Basement ventilation and light-wells are covered with security and safety grates; well heights are too low and some are partially blocked by landscaping.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library Infrastructure

G2030 Pedestrian Paving	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	6	$2,500.00	EA	$15,000	$29,376

Deficient Material: **Concrete Sidewalk**

Sidewalks with root upheaval. City regularly grinding pavement slabs to thwart trip hazard, but upheaval continues.



Remedial Action:

Remove full sections of sidewalk impacted by roots, repair, compact, and repour.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library Infrastructure

G2040 Site Development	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	400	$60.00	SF	$24,000	$47,002

Deficient Material: **Paving**

Courtyard plaza pavers were loose and have been removed, creating a trip hazard.



Remedial Action:

Provide area drain. Replace pavers (or consider converting recess into a soft play area).

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library Infrastructure

G2040 Site Development	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	2	$3,000.00	EA	$6,000	$11,750

Deficient Material: **Reader Board**

Both of the monument sign electronic reader boards are not functioning.



Remedial Action:

Remove and replace and update system.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library Infrastructure

G2040 Site Development	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	1	$8,000.00	EA	$8,000	$15,667

Deficient Material: **Stairwell**

Recent past street flooding entered the exterior stair to the fire riser and mechanical rooms, and flooded the basement, area drain at base of stair is insufficient to handle storm event capacity.

Remedial Action:

Retain board dam installed at top of stair, sawcut and demo top landing, and install trench drain system with grate. Hard pipe to storm sewer to capture and remove storm event water from the top of the stairwell.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	12	$750.00	EA	$9,000	$17,626

Deficient Material: **Storm**

Multiple roof drain downspouts not fully connected to site storm water conveyance piping; several locations where heavy rains result in standing water immediately adjacent to the basement foundation.



Remedial Action:

Fully connect roof drains to site storm drain system; provide additional storm water catch basins and connect to the storm water system to eliminate localized flooding, including at overflow roof drain point of discharge locations. Provide additional roof drain downspout connections as needed by roof drain modifications under D2040.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library Infrastructure

G9010 Service and Pedestrian Tunnels	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$12,000.00	LS	$12,000	$23,501

Deficient Material: **Basement stairwell**

Basement subject to flooding due to marginal City street storm system; semi-temporary protection in place by a one-foot-high piece of wood.

Remedial Action:

Raise east basement stairwell wall several feet with permanent step-up/down over permanent flood protection well wall.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Library
Facility: Library Infrastructure

G9010 Service and Pedestrian Tunnels	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	12	$2,500.00	EA	$30,000	$58,752

Deficient Material: **Basement wells**

Basement ventilation and light well shaft curbs are too low - only a few inches above grade; some are partially blocked by landscaping and other obstructions; weeds or small trees are growing in several wells; the heavy security and safety grates make shaft maintenance difficult.



Remedial Action:

Clear landscaping well away from basement wells; clean the wells and remove plants growing in the wells; provide drainage for the wells, such as with drywells or integrated with site storm drain improvements; cover base of well with drain rock; raise wells at least to code minimum height to protect air quality and reduce rodent and insect entry; modify grates to facilitate access.

Action Type:

Code Issue

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Library

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Library	B20 Exterior Closure	$86,000	$17,200	$20,640	$44,582	$168,422	$170,802
	B30 Roofing	$314,500	$62,900	$75,480	$163,037	$615,917	$643,628
	C30 Interior Finishes	$42,000	$8,400	$10,080	$21,773	$82,253	$85,954
	D20 Plumbing	$27,375	$5,475	$6,570	$14,191	$53,611	$54,404
	D30 HVAC	$245,250	$49,050	$58,860	$127,138	$480,298	$487,395
	D50 Electrical	$160,050	$32,010	$38,412	$82,970	$313,442	$318,618
	Facility Total	**$875,175**	**$175,035**	**$210,042**	**$453,691**	**$1,713,943**	**$1,760,801**
Library Infrastructure	G20 Site Improvements	$53,000	$10,600	$12,720	$27,475	$103,795	$104,230
	G30 Site Civil / Mechanical Utilities	$9,000	$1,800	$2,160	$4,666	$17,626	$17,626
	G90 Other Site Construction	$42,000	$8,400	$10,080	$21,773	$82,253	$83,467
	Facility Total	**$104,000**	**$20,800**	**$24,960**	**$53,914**	**$203,674**	**$205,323**
	Site Total	**$979,175**	**$195,835**	**$235,002**	**$507,604**	**$1,917,616**	**$1,966,124**

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Opportunity Summary By Subsystem

City of Camas

Site: Library **Total Site Opportunity Cost: $951,625**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Library**						
System:	**Roofing**	**Total Cost: $60,000**					
B3010	**Roof Coverings**						
		No fall restraint system.	Install a fall restraint system for safety and security of maintenance and subcontractors.	1.00	$60,000.00	LS	$60,000
Facility:	**Library**						
System:	**Plumbing**	**Total Cost: $107,375**					
D2010	**Plumbing Fixtures**						
		All observed plumbing fixture trim (faucets and flush valves) is manually operated, and no water bottle fillers.	Upgrade to automatic (hardwired infrared) trim and replace drinking fountains with hydration stations, which include water filtering and bottle filling.	36,500.00	$0.75	SF	$27,375
D2040	**Rain Water Drainage**						
		Multiple roof drains.	Collect already piped roof drains to a basement cistern to form a rain water harvesting system for free flushing water.	1.00	$45,000.00	LS	$45,000
D2090	**Other Plumbing Systems**						
		Desire to offer specialty programs, such as cooking classes.	Construct a small commercial kitchen for cooking classes.	1.00	$35,000.00	LS	$35,000
Facility:	**Library**						
System:	**HVAC**	**Total Cost: $85,000**					
D3020	**Heat Generating Systems**						
		Existing boilers are aging and only 80% efficient.	Upgrade to high-efficiency (90%) boilers.	2.00	$35,000.00	EA	$70,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Library **Total Site Opportunity Cost: $951,625**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
D3090	Other HVAC Systems and Equipment	One basement space appears to include older leather-bound books and semi-special collections.	Provide a special collections space with enhanced temperature, humidity, and air cleanliness control.	1.00	$15,000.00	LS	$15,000
Facility:	**Library**						
System:	**Electrical**	**Total Cost: $611,750**					
D5010	Electrical Service and Distribution						
		Failing roof to be replaced in the near future; portions of the roof slope to south with good solar exposure, excepting tall tress to south of south wing.	Install 50 kW photovoltaic (PV) renewable energy system.	50.00	$8,000.00	EA	$400,000
D5020	Lighting and Branch Wiring						
		Mostly original fluorescent lighting.	Upgrade to LED throughout using retrofit kits.	36,500.00	$3.50	SF	$127,750
D5032	Low Voltage Communication						
		Temporary green screen area in basement.	Construct video studio with green screen capability.	1.00	$25,000.00	LS	$25,000
		Minimal small group/team collaboration space.	Develop small group/team collaboration space, including modern technology features, such as large touch screens.	3.00	$13,000.00	EA	$39,000
		Weak cell phone signal in basement.	Install cell phone signal amplification system.	10,000.00	$2.00	SF	$20,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Library **Total Site Opportunity Cost: $951,625**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Library Infrastructure**						
System:	**Site Improvements**	**Total Cost: $20,500**					
G2040	**Site Development**						
		Courtyard seating is underutilized (and not visible to patrons).	Consider relocating existing concrete benches to other more visible locations around the property (near entries), and add additional seating furnishings in the courtyard for a face lift.	1.00	$10,000.00	LS	$10,000
		Storm events often flood water vault boxes and vent well in the northeast corner of the property and runs into the building.	To thwart future flooding, consider building a landscape seating wall along the lawn adjacent to the sidewalk (to prevent stormwater from flooding the vault boxes and vent well).	35.00	$300.00	LF	$10,500
Facility:	**Library Infrastructure**						
System:	**Site Electrical utilities**	**Total Cost: $17,000**					
G4010	**Electrical Distribution**						
		Just one single-connection electric vehicle (EV) charging station; aged with failed display.	Replace the existing EV charging station and replace with two double charging stations, plus rough-in for two more.	2.00	$8,500.00	EA	$17,000
Facility:	**Library Infrastructure**						
System:	**Other Site Construction**	**Total Cost: $50,000**					
G9010	**Service and Pedestrian Tunnels**						
		No direct access or egress to/from the large basement area planned for patron program use.	Install new stairwell to large basement program area.	1.00	$35,000.00	LS	$35,000
G9090	**Other Site Systems**						
		No children's physical play area.	Provide play area inside or more likely outside at east courtyard.	1.00	$15,000.00	LS	$15,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Police Station
Police Station

2100 NE 3rd Ave
Camas, WA 98607

Facility Size - Gross S.F.	23,100
Year Of Original Construction	1997
Facility Use Type	Police Station
Construction Type	Light
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	1997
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.5**			
Facility Condition Index (FCI)	0.11	**Predicted Renewal Budget 2028 - 2041**	$2,099,000	$2,465,000
Current Replacement Value (CRV)	$8,077,000	**Observed Deficiencies 2022 - 2027**	$531,000	$539,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$963,000	N/A

Facility Condition Summary

A single-story police station constructed in 1997 in good to fair condition overall. The membrane roof was replaced in 2017. The exterior walls are clad in split-face CMU with precast concrete, and are in need of cleaning and resealing. Exterior windows are insulated glazing set in aluminum frames and aluminum storefront entries, in addition to hollow metal doors and frames. The facility also includes a pull-through sally port garage with overhead coiling doors on each end.

HVAC is two rooftop multi-zone units with gas furnace heat and on-board Dx cool, with supply and return duct in the ceiling space; approximately twelve exhaust fans. Plumbing is original copper piping, with newer tankless gas-fired water heater; fixtures are all manual. Fire sprinkler throughout, with mostly concealed sprinkler heads; aged fire alarm system. Power is 480/208V three-phase including both generator-backed automatic transfer switch (ATS), plus uninterruptible power supply (UPS) for critical systems. Low voltage systems include communications, data and security; with mix of older and newer.

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Facility Summary

City of Camas
Police Station
Police Station

2100 NE 3rd Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.0**			
A10 Foundations						
A1010 Standard Foundations	1997	1997	2	TRB	11/30/21	Standard concrete footings and foundations, no settlement or cracking observed, no issues reported.
A1030 Slab On Grade	1997	1997	2	TRB	11/30/21	Concrete slab on grade, no issues observed or reported.
B Shell			**2.4**			
B10 Superstructure						
B1020 Roof Construction	1997	1997	2	TRB	11/30/21	Insulation on steel deck on steel joists on steel columns.
B20 Exterior Closure						
B2010 Exterior Walls	1997	1997	3	TRB	11/30/21	Split-faced CMU and precast concrete elements are in need of cleaning and resealing. Interior facing studs assumed to be light gauge metal with batt insulation in cavity. Cast-in-place concrete entry facade feature.
B2020 Exterior Windows	1997	1997	3	TRB	11/30/21	Thermal glazed units in aluminum storefront frames.
B2030 Exterior Doors	1997	1997	3	TRB	11/30/21	Aluminum storefront entry systems at primary entry access areas (the front doors have problems closing and locking due to fit and air pressure imbalance, investigate adjusting close force of door hardware to assure proper closing and securement). Other doors include heavy duty hollow metal doors and frames (in need of repainting due to faded finish), and overhead coiling doors for large evidence and the sally port access and egress.

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Facility Summary

City of Camas
Police Station
Police Station

2100 NE 3rd Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**2.4**			
B30 Roofing						
B3010 Roof Coverings	1997	2017	2	TRB	11/30/21	2017 white membrane roof. Some leaks reported, but recently fixed. The roof is slick with dirt and algae and needs to be cleaned. Minor areas of standing water observed and debris to be cleaned. Maintenance access walk pads only extend from hatch to mechanical units, and no fall restraint connections provided.
B3020 Roof Openings	1997	1997	3	TRB	11/30/21	Pyramidal skylights, moss growth beginning to accumulate in frames (see B3010 Roof Coverings for cleaning). Roof access hatch in fair condition (but with a bent operator arm), recommend installing safety extension post at hatch.
B3030 Projections	1997	1997	3	TRB	11/30/21	Canvas entry protection canopy, in need of cleaning.
C Interiors			**2.3**			
C10 Interior Construction						
C1010 Partitions	1997	1997	2	TRB	11/30/21	A combination of light-gauge steel, and wood stud walls with gypsum wallboard. Some areas of CMU. Painted metal toilet partitions.
C1020 Interior Doors	1997	1997	2	TRB	11/30/21	Wood doors in hollow metal frames. Steel doors in detention area. Numerous doors and relites with wire glass (now not allowed by code in new construction due to safety issues).
C1030 Fittings	1997	1997	3	TRB	11/30/21	Fittings are generally in good condition, but there are some minor issues in some locations with chair rails and loose trim. Corner guards are light-duty stick-on plastic. Other miscellaneous fittings relating to police station functions.

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Facility Summary

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Police Station

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Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**2.3**			
C30 Interior Finishes						
C3010 Wall Finishes	1997	1997	3	TRB	11/30/21	A mix of paint, vinyl wall coverings, and wood panel accent. Areas of gypsum walls in circulation areas are seeing wear and tear.
C3020 Floor Finishes	1997	2019	1	TRB	11/30/21	2019 carpet squares, and 95% of the VCT replaced. Ceramic tile in locker and restrooms, rubber mat flooring in weight room. Areas of exposed concrete (including detention area).
C3030 Ceiling Finishes	1997	1997	3	TRB	11/30/21	Suspended acoustical tile in fair condition with some minor areas of water staining. Gypsum soffits and areas of hard lid in good condition.
D Services			**2.9**			
D20 Plumbing						
D2010 Plumbing Fixtures	1997	1997	2	DCS	11/30/21	Traditional plumbing fixtures at restrooms, locker rooms including showers, dual-height (ADA) drinking fountains, kitchens with stainless steel sinks and disposals, and janitor mop sink; all with manual trim (faucets and flush valves). At least one makeshift kitchenette in detective area.
D2020 Domestic Water Distribution	1997	1997	2	DCS	11/30/21	Two-inch city water service entry to strainer and pressure reducing valve (PRV) with copper distribution piping. The original temperature mixing valves (TMVs) appear to have been bypassed, when the new tankless gas-fired hot water heater with recirculation pump was installed. The strainer is somewhat rusty - minor maintenance to replace. The bypassed TMVs cut-off the pressure gauge - minor maintenance to relocate.
D2030 Sanitary Waste	1997	1997	3	DCS	11/30/21	Cast iron drain, waste, & vent (DW&V) piping where observed, with most tested fixtures flushing and draining slowly, reportedly due to aged waste piping.

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Facility Summary

City of Camas
Police Station
Police Station

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Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.9**			
D20 Plumbing						
D2040 Rain Water Drainage	1997	1997	3	DCS	11/30/21	Roof perimeter scupper and downspouts to storm, with scupper boxes; overflow roof drain openings through parapets as well. While the scuppers and downspouts are working well, the roof slope has multiple low spots with standing water and debris - see B3010 Roof Coverings.
D2090 Other Plumbing Systems	1997	2015	3	DCS	11/30/21	Portable air compressor in the gun cleaning shop; consider a permanent system as minor maintenance. Stainless steel combination water closet and lavatory units in two holding cells. The associated Acorn valves controlling lavatory water flow need adjustment as minor maintenance.
D30 HVAC						
D3010 Energy Supply	1997	1997	3	DCS	11/30/21	Natural gas piping to two rooftop units and the domestic hot water (DHW) heater; no issues reported, noting no submetering between HVAC and DHW loads.
D3040 HVAC Distribution Systems	1997	1997	3	DCS	11/30/21	Two Seasons-4 multi-zone rooftop units with gas furnace heat and on-board R-410A direct expansion (Dx) refrigerant cooling, with variable speed supply and powered exhaust fans, and apparent full economizer (free cooling); including MERV-13 filters at time of field survey. The two rooftop units should have ten to fifteen years remaining life with continued good maintenance. Insulated sheet metal duct distribution in ceiling space to grilles, registers, and diffusers, with apparent ducted return from larger spaces and open plenum return from smaller spaces, and smoke/fire dampers where passing through rated walls. At least twelve exhaust fans; five larger on the roof and approximately seven ceiling exhaust fans discharging up to roof jacks with gravity backdraft dampers.
D3050 Terminal and Package Units	1997	1997	3	DCS	11/30/21	Two ceiling-mounted electric resistance cabinet unit heaters at the front and rear entry vestibules. Three electric resistance ceiling-hung unit heaters at the vehicle sally port and storage garage.

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Facility Summary

City of Camas
Police Station
Police Station

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Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.9**			
D30 HVAC						
D3060 Controls and Instrumentation	1997	1997	4	DCS	11/30/21	Reportedly, all original (1997) Automated Logic direct digital control (DDC) system with observed mix of "Bapi" and Automated Logic thermostats (T-stats) in each temperature control zone. While overall energy efficiency is good for this 24x7 operation facility, with energy use intensity (EUI) of 49 kBtu/sf-yr, there are staff comfort, indoor air quality, and building pressurization complaints. Reportedly the Bapi T-stats have no programmed control of zone temperatures, despite having control buttons and display on-board. Reportedly, there is no remote monitoring of the DDC from outside the police station itself; however, there is an operator workstation set up in one of the storage rooms.
D3090 Other HVAC Systems and Equipment	1997	1997	3	DCS	11/30/21	Fume hood in crime lab, reportedly no longer used, but appears functional. Insufficient exhaust at the gun cleaning room - minor maintenance to increase capacity and ensure adequate make-up air is provided.
D40 Fire Protection						
D4010 Fire Protection Sprinkler Systems	1997	1997	2	DCS	11/30/21	Six-inch service to four-inch riser with 130 psig water pressure; concealed heads in most spaces, with some concealing caps falling down - minor maintenance to replace; no issues reported other than the caps.
D4030 Fire Protection Specialties	1997	1997	2	DCS	11/30/21	Fire extinguishers in cabinets; AED in cabinet.

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Facility Summary

City of Camas
Police Station
Police Station

2100 NE 3rd Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.9**			
D50 Electrical						
D5010 Electrical Service and Distribution	1997	1997	2	DCS	11/30/21	GE 480V, 3-phase, 600A main distribution panel (MDP) appears to serve the east half (office) of the building, plus RTU-1, and sub-feeds the 480V, 400A E-panel, via the 480V, 400A automatic transfer switch (ATS). The E-panel in turn appears to supply the west half of the building including RTU-2. Both the MDP and E-panel in turn appear to sub-feed 480V, 225A distribution panels, which in turn each feed a 480/208V transformer, each in turn powering a 208V, 225A distribution panel. Additionally, a special critical 208V panel is backed by an uninterruptable power supply (UPS). Most the panels include a LineMASTER transient voltage surge suppression (TVSS) device; one in the main electrical room has failed Phase A protection - minor maintenance to repair or replace.
D5020 Lighting and Branch Wiring	1997	1997	3	DCS	11/30/21	Mostly original fixtures with mix of original fluorescent an estimated 25% upgraded LED lamps, but all with manual control; some wall switch devices are failing - minor maintenance to replace. A few receptacles are loose or damaged - minor maintenance to repair or replace. At least one space has floor receptacles, but these were not in use at time of field survey.
D5032 Low Voltage Communication	1997	1997	3	DCS	11/30/21	Original plain old telephone service (POTS) and handsets. Several police radio systems with roof and exterior wall-mounted antennas and interconnecting cabling. Audio/video (A/V) support at meeting, training, and conference rooms.
D5037 Low Voltage Fire Alarm	1997	1997	4	DCS	11/30/21	1997 Radionics zoned (analog) fire alarm control panel; includes interface with fire door hold-open devices and HVAC smoke/fire dampers.
D5038 Low Voltage Security	1997	1997	3	DCS	11/30/21	Aging 1997 Sonitrol electronic security system including card-key access control, intrusion detection and closed-circuit television (CCTV).

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Facility Summary

City of Camas
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Police Station

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Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.9**			
D50 Electrical						
D5039 Low Voltage Data	1997	2010	2	DCS	11/30/21	High-speed fiber-optic data service to the dedicated main distribution frame (MDF) room, which appears cooled by the general building HVAC system. Opportunity to install a one- to two-ton ductless mini-split dedicated cooling system as minor maintenance. Several wireless fidelity (WiFi) antennas are present, but not properly installed, such as at ceiling versus hanging from data jacks on side-walls - minor maintenance to properly install.
D5090 Other Electrical Systems	1997	1997	3	DCS	11/30/21	Diesel generator outside supplies automatic transfer switch (ATS) inside, in turn powering priority loads after ten-second generator start-up delay - no observed egress lighting; however, apparent non-battery-backed exit signs are present. A modest uninterruptible power supply (UPS) powers the critical load panel at the main electrical room.
E Equipment and Furnishings			**2.7**			
E10 Equipment						
E1010 Commercial Equipment	1997	1997	3	DCS	11/30/21	Kitchen appliances and light office equipment aging but functional with no issues reported.
E1020 Institutional Equipment	1997	1997	3	DCS	11/30/21	Fume hood in crime lab. Gun cleaning equipment in gun cleaning room. Gun racks in armory. Exercise equipment in fitness room.
E1030 Vehicular Equipment	1997	1997	3	DCS	11/30/21	Garage door openers - two at vehicle sally port and one at the vehicle storage garage.
E20 Furnishings						
E2010 Fixed Furnishings	1997	1997	2	TRB	11/30/21	Plastic laminate casework at reception, office work room, break room, and bath and locker lavatory counters. Window blinds in fair condition, but replacement needed in detective office area.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

B2010 Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	11,400	$2.00	SF	$22,800	$44,652

Deficient Material: **CMU walls**

Algae and mildew growth (with some areas of moss growth) are beginning to appear on the facade, and will continue to degrade the materials if left untreated.



Remedial Action:

Professionally clean exterior CMU and concrete facade and reseal to protect and thwart moisture penetration into wall systems.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	3	2021	2026	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Membrane Roofing**

Moss growth in the skylight frames, algae growth on roof membrane, and dirt are creating a slick fall hazard. Accumulated debris (including seedling growth) in areas.



Remedial Action:

Clean skylights and roof.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

C1020 Interior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	10	$1,000.00	EA	$10,000	$19,584

Deficient Material: **Wire Glass**

Numerous doors and associated relites and interior windows with wire glass (now not allowed by code in new construction due to safety issues).



Remedial Action:

Remove wire glass and replace with modern safety glass.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

C3010 Wall Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1,300	$4.00	SF	$5,200	$10,184

Deficient Material: **Gypsum Wall**

Circulation areas (especially high-traffic and equipment abrasion areas near the door to the police parking lot), are experiencing significant wear.

Remedial Action:

Remove plastic corner guards, patch and repair drywall, and repaint circulation areas with damage. Replace corner guards. Consider upgrade to stainless steel corner guards, and even veneer plaster for greater abuse resistance.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D2030 Sanitary Waste	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	23,100	$0.75	SF	$17,325	$33,929

Deficient Material: **DW&V piping**

Many fixtures somewhat slow to drain or flush, some worse than others.



Remedial Action:

Clean, jet, inspect, and repair or replace waste lines as needed to restore full function to all flushing and draining plumbing fixtures.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	23,100	$1.25	SF	$28,875	$56,549

Deficient Material: **Ductwork**

Building reportedly over-pressurized, with little or no apparent return air path from multiple spaces, especially smaller spaces. Signs of uneven air distribution with occupants using portable space heaters in winter and box fans in summer.



Remedial Action:

Conduct test, adjust, and balance (TAB) to determine existing air flows. Compare to original design and modify ductwork, set balancing devices, and adjust controls to supply and return air to improve thermal comfort and indoor air quality throughout.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	5	$1,000.00	EA	$5,000	$9,792

Deficient Material: **Exhaust**

Multiple tested exhaust fans not working, especially ceiling exhaust fans in utility and storage spaces.



Remedial Action:

Service, test, and repair or replace currently failed exhaust fans.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	23,100	$1.00	SF	$23,100	$45,239

Deficient Material: **HVAC distribution**

HVAC ductwork reportedly never cleaned, with dirt streaks at some supply air diffusers and adjacent finishes.



Remedial Action:

Clean HVAC equipment air-sides, ductwork, grilles, registers, and diffusers (GRDs), and adjacent dirty finish surfaces.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	23,100	$0.50	SF	$11,550	$22,620

Deficient Material: **Smoke/fire dampers**

Smoke/fire dampers reportedly never serviced or tested.



Remedial Action:

Service and test smoke/fire dampers per new code requirements; several dozen dampers are assumed.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D3060 Controls and Instrumentation	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	23,100	$1.50	SF	$34,650	$67,859

Deficient Material: **Controls**

Aged and sub-optimized DDC controls, with occupant comfort, indoor air quality, and building pressurization issues.

Remedial Action:

Update the DDC system hardware and software to include occupant thermal comfort control adequate to eliminate the use of portable unit heaters and box fans.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D5032 Low Voltage Communication	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	23,100	$1.25	SF	$28,875	$56,549

Deficient Material: **Telephone**

Obsolete analog plain old telephone service (POTS) telephone system and handsets.



Remedial Action:

Upgrade to modern voice over internet protocol (VOIP) telephone technology.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	23,100	$2.00	SF	$46,200	$90,478

Deficient Material: **Fire alarm control panel and devices**

Increasingly obsolete original non-addressable fire alarm control panel and devices, with reported increase in supervisory and false alarms.

Remedial Action:

Replace with modern fully addressable (digital) fire alarm system.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D5038 Low Voltage Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	23,100	$1.20	SF	$27,720	$54,287

Deficient Material: **Electronic security**

Aging electronic security systems with increasing false and supervisory alarms.



Remedial Action:

Upgrade to modern electronic security throughout.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Police Station
Facility: Police Station

D5090 Other Electrical Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **UPS**

Uninterruptible power supply (UPS) batteries marked as last replaced in 2013, with reports of recent alarms.



Remedial Action:

Replace UPS batteries.

Action Type:

Life Safety

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Facility Summary

City of Camas
Police Station
Police Station Infrastructure

2100 NE 3rd Ave
Camas, WA 98607

Facility Condition Summary

The site contains a single-story police station constructed in 1997, public parking on the north street front portion of the property, a vehicular gate secured police vehicle parking area to the east, and the sally port access drive loops through to the south and exits via a back drive street. Landscape materials (including tree limbs) should be pruned away from the facility. Generally, the site is in fair condition.

Site utilities include City water for domestic, irrigation, and fire sprinkler; City sewer; City storm; Washington Gas; Clark County PUD power; and local telecom purveyors for communications and data.

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Facility Summary

City of Camas
Police Station
Police Station Infrastructure

2100 NE 3rd Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1997	1997	3	TRB	11/30/21	Limited on-site asphalt drive entry, and loop drive to sally port on south side.
G2020 Parking Lots	1997	1997	3	TRB	11/30/21	Asphalt parking (both a public front lot and a secured police vehicle lot on the east side).
G2030 Pedestrian Paving	1997	1997	3	TRB	11/30/21	Concrete sidewalk with minor areas of settlement and separation from curbs, and accent entry brick. The brick is beginning to accumulate moss growth and should be cleaned to prevent degradation and slip fall injury potential.
G2040 Site Development	1997	1997	3	TRB	11/30/21	Auto security gates installed in 2018 and serviced annually. Flag pole, picnic table, and surrounding concrete and masonry seat/retaining walls and plaza off the break area. Prefabricated plastic storage shed on the west side of the property.
G2050 Landscaping	1997	1997	3	TRB	11/30/21	Generally well maintained and no issues reported with irrigation system. Some trees and shrubs need to be trimmed away from building, and some English ivy beginning to crawl up the facade should also be removed.

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Facility Summary

City of Camas
Police Station
Police Station Infrastructure

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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1997	1997	2	DCS	11/30/21	Two-inch City water meter appears to supply two separate reduced-pressure backflow preventers (RPBPs) in hand-vaults for domestic water to the police station building and site landscape irrigation. The RPBPs are covered with dirt - minor maintenance to clean and test performance. Six-inch fire sprinkler service via double-detector check valve (DDCVA) in vault - the vault is partially flooded, minor maintenance to pump dry and service dry well and/or install sump pump. One fire department connection is located on the northwest corner of the building. The Rain Bird irrigation controller is wall-mounted on the west side of the building, adjacent to the electrical service yard. Water pressure is 130 psig observed at the fire sprinkler riser. If there is only one water meter, consider separating domestic from irrigation water as minor maintenance to reduce sewer bill charge from the water and sewer utility.
G3020 Sanitary Sewer	1997	1997	2	DCS	11/30/21	City sewer, with side sewer connection piping recently (Spring 2021) video inspected and found in good condition, with no tree root intrusion.
G3030 Storm Sewer	1997	1997	2	DCS	11/30/21	Both hardscape and softscape drains, plus piped roof drains, all to City storm system at street to south; no issues reported, other than some roof drain downspouts not fully connected to the underground storm piping system - minor maintenance to fully connect.
G3060 Fuel Distribution	1997	1997	2	DCS	11/30/21	Washington Gas meter No. 1167903 with 800 cfh capacity, delivering 2 psig gas via an exterior pressure reducing valve (PRV), reducing pressure to eight inches water column to building via a mechanical seismic shut-off valve. The diesel generator has an estimated 500-gallon belly tank, with unclear tank venting - confirm meets code as minor maintenance.

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Facility Summary

City of Camas
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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G40 Site Electrical utilities						
G4010 Electrical Distribution	1997	1997	2	DCS	11/30/21	Utility power from high-voltage lines from pole to north, underground to 300 kVA pad-mounted 480V transformer in electrical service yard, then underground to main electrical room, with Clark PUD 480V service meter No. 81-464-027. One 175 kW Cummins diesel generator is located in the electrical service yard, supplying back-up power to the automatic transfer switch (ATS) in the adjacent main electrical room.
G4020 Site Lighting	1997	1997	3	DCS	11/30/21	All original parking lot metal pole lights with shoe box heads, containing metal halide lamps; original bollards at front and rear entries, also with metal halide lamps. Time clock control is failed, hence exterior lighting is currently manually controlled - minor maintenance to repair or replace the site lighting controller.
G4030 Site Communications and Security	1997	2010	2	DCS	11/30/21	High-speed fiber-optic data service, plus original plain-old-telephone service (POTS) for legacy systems. Two motor-operated gates to fenced police vehicle parking area. Limited building exterior perimeter CCTV cameras - opportunity for full perimeter monitoring as minor maintenance.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Police Station

Facility: Police Station Infrastructure

G2050 Landscaping	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Landscaping**

Some trees and shrubs need to be trimmed away from building. There is a leaning tree on the west area that is also encroaching the roof, and may need to be removed. There is also some English ivy beginning to crawl up the facade from behind overgrown shrubs and should also be removed.



Remedial Action:

Trim back all plant materials a minimum of at least one foot from the facade, prune back tree limbs away from face of the building and overhanging roof areas.

Action Type:

Other

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Police Station

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Police Station	B20 Exterior Closure	$22,800	$4,560	$5,472	$11,820	$44,652	$45,312
	B30 Roofing	$5,000	$1,000	$1,200	$2,592	$9,792	$10,383
	C10 Interior Construction	$10,000	$2,000	$2,400	$5,184	$19,584	$19,584
	C30 Interior Finishes	$5,200	$1,040	$1,248	$2,696	$10,184	$10,334
	D20 Plumbing	$17,325	$3,465	$4,158	$8,981	$33,929	$34,431
	D30 HVAC	$103,175	$20,635	$24,762	$53,486	$202,058	$204,900
	D50 Electrical	$107,795	$21,559	$25,871	$55,881	$211,106	$214,082
	Facility Total	**$271,295**	**$54,259**	**$65,111**	**$140,639**	**$531,304**	**$539,026**
Police Station Infrastructure	G20 Site Improvements	$5,000	$1,000	$1,200	$2,592	$9,792	$9,937
	Facility Total	**$5,000**	**$1,000**	**$1,200**	**$2,592**	**$9,792**	**$9,937**
	Site Total	**$276,295**	**$55,259**	**$66,311**	**$143,231**	**$541,096**	**$548,963**

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Opportunity Summary By Subsystem

City of Camas

Site: Police Station **Total Site Opportunity Cost: $501,400**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Police Station**						
System:	**Roofing**	**Total Cost: $37,500**					
B3010	**Roof Coverings**						
		No fall restraint system.	Install a fall restraint system for safety and security of maintenance and subcontractors.	1.00	$30,000.00	LS	$30,000
		Maintenance access walk pads only extend from hatch to mechanical units.	Provide additional walk pad surfacing to all roof drain/scupper locations for no-slip safety and roof longevity.	500.00	$15.00	LF	$7,500
Facility:	**Police Station**						
System:	**Plumbing**	**Total Cost: $5,000**					
D2010	**Plumbing Fixtures**						
		Makeshift kitchenette in detective area.	Install permitted kitchenette.	1.00	$5,000.00	LS	$5,000
Facility:	**Police Station**						
System:	**HVAC**	**Total Cost: $15,000**					
D3040	**HVAC Distribution Systems**						
		No apparent heat recovery at the two rooftop units.	Retrofit heat recovery at the two rooftop units; such as heat pipe technology.	2.00	$7,500.00	EA	$15,000
Facility:	**Police Station**						
System:	**Electrical**	**Total Cost: $434,100**					
D5010	**Electrical Service and Distribution**						
		Flat roof with relatively good southern exposure.	Install nominal 50 kW photovoltaic (PV) power array to generate clean renewable energy.	50.00	$7,500.00	EA	$375,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Police Station

Total Site Opportunity Cost: $501,400

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
D5020	**Lighting and Branch Wiring**	About 75% of light fixtures are original fluorescent-type.	Complete upgrade to LED.	18,000.00	$2.00	SF	$36,000
D5090	**Other Electrical Systems**						
		No egress or exit sign emergency lighting when utility power is lost and before generator starts and automatic transfer switch (ATS) transfers load.	Install battery-backed combination egress and existing sign fixtures to maintain lighting on during transition from normal to emergency power.	23,100.00	$1.00	SF	$23,100
Facility:	**Police Station Infrastructure**						
System:	**Site Electrical utilities**	**Total Cost: $9,800**					
G4020	**Site Lighting**						
		Aged metal halide site lighting technology.	Replace metal halide lamps with LED at approximately sixteen pole lights, and one dozen bollard lights.	28.00	$350.00	EA	$9,800

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Operations Center

1620 SE 8th Ave
Camas, WA 98607

Facility Size - Gross S.F.	21,190
Year Of Original Construction	1995
Facility Use Type	Maintenance Shop
Construction Type	Light
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	1995
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.8**			
Facility Condition Index (FCI)	0.13	**Predicted Renewal Budget 2028 - 2041**	$1,069,000	$1,227,000
Current Replacement Value (CRV)	$4,706,000	**Observed Deficiencies 2022 - 2027**	$887,000	$899,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$2,099,000	N/A

Facility Condition Summary

The Public Works Operations Center is a single-story building in generally fair condition housing administrative offices and work bays for various department shops and vehicular maintenance functions. The wood structure is clad with a standing seam metal roof, with vinyl lap siding, aluminum insulated glazing, and painted metal person and overhead vehicle doors.

HVAC is original gas furnaces with split-Dx cooling for office area, and gas-fired infrared heat in the high-bay shop spaces, plus exhaust and ceiling fans in the vehicle maintenance shop. Plumbing includes support for locker rooms and kitchenettes, but is minimal in the shop areas. No fire sprinkler and no fire alarm. Power is 208V three-phase, but with no standby generator. Lighting is mostly fluorescent, with some LED. Low voltage systems are minimal, but do include high-speed fiber-optic data service.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Operations Center

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.0**			
A10 Foundations						
A1010 Standard Foundations	1995	1995	2	TRB	12/02/21	Standard concrete footings. No issues reported or observed.
A1030 Slab On Grade	1995	1995	2	TRB	12/02/21	Concrete slab on grade, no issues observed or reported.
B Shell			**3.0**			
B10 Superstructure						
B1010 Floor Construction	1995	1995	2	TRB	12/02/21	Plywood on wood joists for the small mechanical mezzanine. Plywood on steel for the small storage mezzanine at the vehicle maintenance bay.
B1020 Roof Construction	1995	1995	3	TRB	12/02/21	Plywood on I joists and glulam beams on steel columns. Vented airspace below deck with batt insulation, however, the vapor barrier was only face stapled and the vapor barrier is tearing away and large sections of the insulation is falling down. The vapor barrier was never sealed at the seams, and has been compromised.
B20 Exterior Closure						
B2010 Exterior Walls	1995	1995	3	TRB	12/02/21	Vinyl siding, faded and dirty, needs to be cleaned (avoid power washing to avoid damage of material).
B2020 Exterior Windows	1995	1995	3	TRB	12/02/21	Thermally glazed aluminum punched openings, some operable units.
B2030 Exterior Doors	1995	1995	3	TRB	12/02/21	Hollow metal door and frames, paint faded and doors are showing heavy use wear. Overhead garage doors, faded and dented with use, weatherstripping failing.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Operations Center

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**3.0**			
B30 Roofing						
B3010 Roof Coverings	1995	1995	3	TRB	12/02/21	Standing seam metal roofing, aging but well maintained, no issues reported.
B3030 Projections	1995	1995	3	TRB	12/02/21	Covered overhangs and eaves, painted plywood soffits are dirty and in need of pressure washing.
C Interiors			**3.0**			
C10 Interior Construction						
C1010 Partitions	1995	1995	3	TRB	12/02/21	Gypsum on wood studs, plywood on shop areas.
C1020 Interior Doors	1995	1995	3	TRB	12/02/21	Wood doors in hollow metal frames, with ADA-compliant hardware.
C1030 Fittings	1995	1995	3	TRB	12/02/21	Rubber base is showing wear and tear. Other tack boards and fittings in good to fair condition.
C20 Staircases						
C2010 Stair Construction	1995	1995	2	TRB	12/02/21	Metal stair to the vehicle maintenance bay storage loft.
C2020 Stair Finishes	1995	1995	2	TRB	12/02/21	Painted metal.
C30 Interior Finishes						
C3010 Wall Finishes	1995	1995	3	TRB	12/02/21	Painted interiors in good to fair condition.
C3020 Floor Finishes	1995	2010	3	TRB	12/02/21	Carpet replaced in offices in 2010. Original VCT showing some wear in high-traffic areas, and rust stains at metal cabinets in the administrative area. Concrete in locker and bays.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Operations Center

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**3.0**			
C30 Interior Finishes						
C3030 Ceiling Finishes	1995	1995	3	TRB	12/02/21	Suspended 2x4 acoustic tile in office spaces, minor areas of stained or lightly damaged tiles. Open to structure in bays.
D Services			**2.6**			
D10 Vertical Transportation						
D1090 Other Conveying Systems	1995	1995	2	DCS	12/02/21	Three-ton bridge crane in the vehicle maintenance shop with no issues reported.
D20 Plumbing						
D2010 Plumbing Fixtures	1995	1995	3	DCS	12/02/21	Restroom, locker room, kitchenette, and shop area fixtures with no issues reported.
D2020 Domestic Water Distribution	1995	1995	3	DCS	12/02/21	Mostly original copper water distribution with some newer PEX tubing to newer fixtures. One 2005 gas-fired domestic hot water heater at office attic mechanical platform.
D2030 Sanitary Waste	1995	1995	2	DCS	12/02/21	Non-metallic ABS drain, waste, & vent piping where observed; tested fixtures flush and drain well, with no issues reported. Apparent large oil/water separator under vehicle maintenance shop south exterior apron, assumed serving floor grade drain.
D2040 Rain Water Drainage	1995	1995	3	DCS	12/02/21	Metal gutter and downspout to site storm water system with no issues reported.
D2090 Other Plumbing Systems	1995	1995	3	DCS	12/02/21	Compressed air system with two outside air compressors (5-hp and 7.5-hp); limited shop fluids with pneumatically pumped 15W40 oil and five manually pumped tanks. Waste oil stored in portable tank outside.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Operations Center

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.6**			
D30 HVAC						
D3010 Energy Supply	1995	1995	3	DCS	12/02/21	Natural gas to furnaces, water heater, and shop overhead infrared heaters; confirm gas pressure regulators at each gas-fired appliance meet code; regulators without vent to roof, must be rated as such.
D3020 Heat Generating Systems	1995	1995	4	DCS	12/02/21	Three Lennox aging gas-fired furnaces serve the office area; infrared heaters in shop bays.
D3030 Cooling Generating Systems	1995	1995	4	DCS	12/02/21	Three outside split-Dx condensing units with inside evaporator coil sections at the office area attic equipment platform.
D3040 HVAC Distribution Systems	1995	1995	3	DCS	12/02/21	Forced-air heating, cooling, and ventilation for office area with fixed outside air (no economizer for free cooling). Bathroom exhaust fans. One small supply air fan to large high-bay shop area, with no observed exhaust or relief air path.
D3050 Terminal and Package Units	1995	2015	2	DCS	12/02/21	Through-wall packaged terminal air conditioning (PTAC) unit for vehicle maintenance shop office; somewhat newer in good condition.
D3060 Controls and Instrumentation	1995	1995	3	DCS	12/02/21	Standalone thermostats aging but functional - minor maintenance to replace upon failure or with replacement of associated equipment.
D3090 Other HVAC Systems and Equipment	1995	1995	3	DCS	12/02/21	Four low exhausts with ducts up to rooftop exhaust fans serving the vehicle repair shop; make-up air unconditioned from rooftop hoods down to circular make-up air diffusers. No vehicle engine exhaust system.
D40 Fire Protection						
D4030 Fire Protection Specialties	1995	1995	2	DCS	12/02/21	Fire extinguishers, AEDs, and first aid kits.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Operations Center

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.6**			
D50 Electrical						
D5010 Electrical Service and Distribution	1995	1995	2	DCS	12/02/21	Square D 208V, three-phase main distribution panel with 800A capacity, in turn supplying three 225A distribution panels and three HVAC condensing units. No standby generator, renewable energy, or electric vehicle charging observed.
D5020 Lighting and Branch Wiring	1995	1995	3	DCS	12/02/21	Original fluorescent light fixtures; with estimated 15% upgraded to LED lamps.
D5032 Low Voltage Communication	1995	1995	3	DCS	12/02/21	Aging voice over internet protocol (VOIP) telephone system.
D5037 Low Voltage Fire Alarm	1995	1995	4	DCS	12/02/21	Several plug-in carbon monoxide alarm; no fire alarm system.
D5038 Low Voltage Security	1995	1995	3	DCS	12/02/21	Aging electronic security system with limited card-key access and CCTV coverage.
D5039 Low Voltage Data	1995	1995	3	DCS	12/02/21	High-speed fiber-optic data service to makeshift communication "room" shared with the main electrical service panels, with no cooling; limited WiFi.
D5090 Other Electrical Systems	1995	1995	3	DCS	12/02/21	Egress and exit sign wall-packs with assumed battery back-up. Ongoing minor maintenance to test and replace batteries as needed.
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1010 Commercial Equipment	1995	1995	3	DCS	12/02/21	Kitchen appliances and office equipment.
E1020 Institutional Equipment	1995	1995	3	DCS	12/02/21	Shop equipment with no issues reported.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Operations Center

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1030 Vehicular Equipment	1995	1995	3	DCS	12/02/21	Two fixed vehicle lifts in the vehicle maintenance shop area.
E20 Furnishings						
E2010 Fixed Furnishings	1995	1995	3	TRB	12/02/21	Minimal casework fixed furnishings. Window blinds are in fair condition. Lockers are in good condition.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Public Works Operations Center

Facility: Public Works Operations Center

B1020 Roof Construction	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	20,000	$4.00	SF	$80,000	$156,672

Deficient Material: **Roof insulation**

All applications of the vapor barrier were only face stapled and the vapor barrier is tearing away and large sections of the insulation falling down. Additionally, the seams were never sealed and there are areas where interior vapor intrusion has compromised the insulation.



Remedial Action:

Remove and reinsulate roof, and properly install, secure, and seam seal all vapor barrier joints.

As an alternative to reinstalling batt insulation and vapor barrier, you can consider spray foam insulation with vapor barrier prime and coat to the underside of insulation.

At the vehicle maintenance bay where this work has already occurred, verify the foam product used has a perm rate meeting vapor barrier standards. If not, prime and paint with a compatible vapor barrier paint system to prevent moisture intrusion into the foam.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	15	$1,000.00	EA	$15,000	$29,376

Deficient Material: **Doors**

Worn door finishes and failing weatherstripping.



Remedial Action:

Replace weatherstripping on overhead doors, minor repairs to systems, prep and repaint all overhead and person doors.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D2020 Domestic Water Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2026	1	$6,500.00	LS	$6,500	$12,730

Deficient Material: **DWH heater**
Aging gas-fired domestic hot water heater.

Remedial Action:
Budget to replace upon failure.

Action Type:
Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D3020 Heat Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2026	3	$9,500.00	EA	$28,500	$55,814

Deficient Material: **Furnace**
Original gas-fired furnaces approaching end of life.

Remedial Action:
Budget for replacement upon failure.

Action Type:
Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	3	$8,500.00	EA	$25,500	$49,939

Deficient Material: **Condensing unit**

Split-Dx condensing unit.

Remedial Action:

Budget to replace upon failure.

Action Type:

Energy Efficiency



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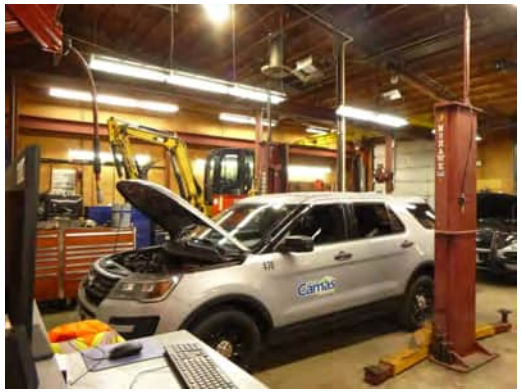
Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D3090 Other HVAC Systems and Equipment	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	4	$1,500.00	EA	$6,000	$11,750

Deficient Material: **Exhaust**

Failing vehicle maintenance shop exhaust fans.



Remedial Action:

Replace upon complete failure.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	21,190	$7.00	SF	$148,330	$290,489

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D5032 Low Voltage Communication	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2025	21,190	$1.50	SF	$31,785	$62,248

Deficient Material: **Telephone**
Aging voice over internet protocol (VOIP) telephone system.

Remedial Action:
Update to modern VOIP telephone including video service.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	21,190	$2.50	SF	$52,975	$103,746

Deficient Material: **Fire alarm**
No fire alarm.

Remedial Action:
Install fire alarm system.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D5038 Low Voltage Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	21,190	$1.50	SF	$31,785	$62,248

Deficient Material: **Electronic security**

Aging electronic security with minimal coverage in high-risk area.

Remedial Action:

Upgrade per City standard.

Action Type:

Other



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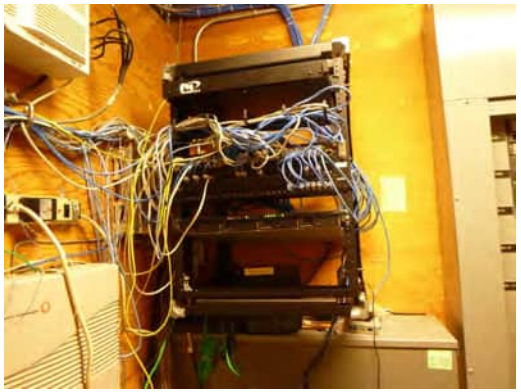
Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Operations Center

D5039 Low Voltage Data	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	21,190	$1.25	SF	$26,488	$51,873

Deficient Material: **Data System**

Makeshift data "room" in electrical service space, with no cooling and minimal WiFi coverage.



Remedial Action:

Create data room with dedicated cooing and improved WiFi coverage throughout.

Action Type:

Other

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Facility Summary

City of Camas
Public Works Operations Center
Mobile Office

1620 SE 8th Ave
Camas, WA 98607

Facility Size - Gross S.F.	715
Year Of Original Construction	2005
Facility Use Type	Admin - Low rise
Construction Type	Temporary
# of Floors	1
Energy Source	Electric
Year Of Last Renovation	2005
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**3.1**			
Facility Condition Index (FCI)	0.16	**Predicted Renewal Budget 2028 - 2041**	$40,000	$45,000
Current Replacement Value (CRV)	$236,000	**Observed Deficiencies 2022 - 2027**	$48,000	$50,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$29,000	N/A

Facility Condition Summary

A modular building (pre-fabricated office structure) housing the City Water & Sewer Department in two offices on west half, and the Streets & Storm and Facility Maintenance in two offices in the east half. There are metal stairs to each half, but no ADA access, and no restroom or kitchenette facilities. The facility is in fair to poor condition.

HVAC is one Bard wall-pack heat pump with forced-air heating and cooling; the forced-air system no longer functions due to blockage of return air by the department separation walls. No plumbing and no fire sprinkler or fire alarm. Power and telecom are sub-fed from the adjacent main operations building; lighting is fluorescent. There is no gutter for the roof, hence rain water drains off the roof down the wood siding of the structure, slowly degrading the siding and wood trim - minor maintenance to install gutters and downspouts to grade.

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Facility Summary

City of Camas
Public Works Operations Center
Mobile Office

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure						
A10 Foundations						
A1020 Special Foundations	2005	2005	3	TRB	12/02/21	Foundation not visible due to perimeter skirting, but the structure is assumed to bear on concrete modular footings on grade.
B Shell			**3.2**			
B10 Superstructure						
B1010 Floor Construction	2005	2005	3	TRB	12/02/21	Assumed to be wood deck on wood joists with batt insulation (not visible for observation). No issues reported.
B1020 Roof Construction	2005	2005	3	TRB	12/02/21	Assumed to be wood deck on wood trusses, with batt insulation (black vapor barrier is visible from interior above ceiling tiles).
B20 Exterior Closure						
B2010 Exterior Walls	2005	2005	4	TRB	12/02/21	T1-11 siding with trim in various states of degradation, over wood studs with batt insulation.
B2020 Exterior Windows	2005	2005	3	TRB	12/02/21	Insulated aluminum operable units.
B2030 Exterior Doors	2005	2005	3	TRB	12/02/21	Wood doors and frames.
B30 Roofing						
B3010 Roof Coverings	2005	2005	3	TRB	12/02/21	Original membrane roofing, not accessible for observation. No issues reported. Assumed to be approaching end of useful life.

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Facility Summary

City of Camas
Public Works Operations Center
Mobile Office

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**3.0**			
C10 Interior Construction						
C1010 Partitions	2005	2005	3	TRB	12/02/21	Demountable acoustic partitions for separating office spaces.
C1020 Interior Doors	2005	2005	3	TRB	12/02/21	Wood office doors and frames.
C20 Staircases						
C2010 Stair Construction	2005	2005	3	TRB	12/02/21	Two sets of exterior expanded metal stairs and landings providing access to each office. No ADA access or ramps provided.
C30 Interior Finishes						
C3010 Wall Finishes	2005	2005	3	TRB	12/02/21	Paint.
C3020 Floor Finishes	2005	2005	3	TRB	12/02/21	VCT, some wear and tear evident.
C3030 Ceiling Finishes	2005	2005	3	TRB	12/02/21	Thin 2x4 vinyl faced fiberglass acoustical tiles in a suspended system. Some tiles damaged.
D Services			**3.1**			
D30 HVAC						
D3040 HVAC Distribution Systems	2005	2005	4	DCS	12/02/21	Forced-air supply air duct in the ceiling space, with one return air grille at the east end of the modular; several unpermitted departmental separation walls have been installed, completely blocking the return air path, effectively eliminating meaningful HVAC service to over half of the modular - minor maintenance to cut-in transfer grilles or ducts.
D3050 Terminal and Package Units	2005	2005	4	DCS	12/02/21	Original Bard wall-pack heat pump unit at east end of the modular.

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Facility Summary

City of Camas
Public Works Operations Center
Mobile Office

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.1**			
D30 HVAC						
D3060 Controls and Instrumentation	2005	2005	3	DCS	12/02/21	White-Rogers thermostat for Bard wall-pack HVAC unit.
D40 Fire Protection						
D4030 Fire Protection Specialties	2005	2005	3	DCS	12/02/21	Fire extinguisher on hook.
D50 Electrical						
D5010 Electrical Service and Distribution	2005	2005	2	DCS	12/02/21	Square D 120/240V single-phase 200A distribution panel sub-fed from adjacent site main operations building. Opportunity to install submeter as minor maintenance.
D5020 Lighting and Branch Wiring	2005	2005	3	DCS	12/02/21	Fluorescent lighting with manual control.
D5032 Low Voltage Communication	2005	2005	3	DCS	12/02/21	Telcom sub-fed from adjacent operations building with support for voice/telephone and data, but no fire alarm or electronic security; minor maintenance to upgrade all.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Public Works Operations Center

Facility: Mobile Office

B2010 Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	1,360	$9.00	SF	$12,240	$23,971

Deficient Material: **Exterior Siding**

Siding and trim are showing signs of degradation, especially window trim and skirt material exposed to moisture.

Remedial Action:

Remove and replace flashing and trim. Replace skirting material. Consider replacing all siding. Prime and paint.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Mobile Office

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2024	715	$7.00	SF	$5,005	$9,802

Deficient Material: **Built-Up Roof**
Roof assumed to be nearing end of life and due for replacement.

Remedial Action:
Replace roofing.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Mobile Office

D3050 Terminal and Package Units	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2026	1	$7,500.00	EA	$7,500	$14,688

Deficient Material: **Wall pack**
Aging Bard wall-pack heat pump unit.

Remedial Action:
Budget to replace upon failure.

Action Type:
Energy Efficiency



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Facility Summary

City of Camas
Public Works Operations Center
Public Works Infrastructure

1620 SE 8th Ave
Camas, WA 98607

Facility Condition Summary

Property houses the Public Works Operation Center main building, modular office building, and open air pre-engineered metal canopy structures for equipment and material storage. The site has a public parking area, and the remainder of the property is secured behind security fencing and gates, and include staff and city vehicle parking, and gravel storage yard for larger equipment vehicles.

City water and city sewer, but no fire sprinkler service and no storm drain service - storm is to an on-site storm water pond. Natural gas to the main operations building only. Utility power is underground to the main operations building, in turn powering all other on-site buildings, site lighting, and special loads. Site lighting is minimal. Telecommunications includes high-speed fiber-optic data and legacy plain-old-telephone-service (POTS). Special features include a large vehicle wash rack, vactor-truck decant station, deicing tank with containment, bulk materials storage, and support for extensive yard-stored vehicles and equipment, but no vehicle fueling system.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Infrastructure

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1995	1995	3	TRB	12/02/21	Concrete curb apron (broken). Concrete curbs broken.
G2020 Parking Lots	1995	1995	3	TRB	12/02/21	Two asphalt lots (public parking with ADA on north side, and secured lot on south side for staff and City vehicles), with some cracking beginning to occur. Gravel yard on south, with drainage issue at southeast corner in gravel yard. Capacity of staff parking is inadequate. Consider relocating work release program and parking to a different site (not within the secured parking lot for staff and City vehicles).
G2030 Pedestrian Paving	1995	1995	3	TRB	12/02/21	Concrete sidewalks, no issues reported.
G2040 Site Development	1995	1995	3	TRB	12/02/21	Perimeter chain link security fencing with barbed wire top. Flag pole. Original vehicular security gates (always left open during business hours because of antiquated pin code access hassle). Recent theft of City vehicle, and ongoing equipment theft has occurred. Other operations site development relates to material storage (e.g. jersey barrier block containment of materials and leaf compost).
G2050 Landscaping	1995	1995	3	TRB	12/02/21	Mature landscaping, trees, and shrubs. Minor maintenance to trim trees away from face of building.
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1995	1995	3	DCS	12/02/21	City water with two apparent meters to: 1) Operations building with no observed backflow prevention, and 2) Wash rack and decant area via reduced-pressure backflow preventer in a hot box. No fire sprinkler service.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Infrastructure

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3020 Sanitary Sewer	1995	1995	3	DCS	12/02/21	Site sewer to City with no issues reported; an apparent oil/water separator appears present at the operations building vehicle bays south apron.
G3030 Storm Sewer	1995	1995	3	DCS	12/02/21	Storm piped or sheet flow to storm drainage pond at southeast corner of site.
G3060 Fuel Distribution	1995	1995	3	DCS	12/02/21	Natural gas service to the main operations building with NW Natural Gas meter No. 110796, with 630 cfh capacity, delivered at 2 psig, and including a mechanical seismic shut-off valve. While the meter capacity appears under-sized for the main building gas-fired equipment load, delivery at 2 psig allows the meter to readily exceed its nominal rated capacity; to make this work, it appears the gas-fired equipment includes point-of-connection gas pressure regulators, but with unclear venting to roof - investigation is suggested as minor maintenance to assume safe regulator venting.
G40 Site Electrical utilities						
G4010 Electrical Distribution	1995	1995	2	DCS	12/02/21	Power from pole to east, down to pad-mounted 208V transformer, then underground to main operations building with Clark PUD meter No. 81-464-066, then to main electrical room main distribution panel. The main building sub-feeds all other buildings on the site; plus vehicle parking engine block heaters and miscellaneous loads. No electric vehicle charging, no renewable energy, no
G4020 Site Lighting	1995	1995	4	DCS	12/02/21	Minimal site lighting, with multiple dark areas, and resultant vandalism, safety, and operational issues.
G4030 Site Communications and Security	1995	1995	3	DCS	12/02/21	High-speed data, but poor electronic security.

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Facility Summary

City of Camas
Public Works Operations Center
Public Works Infrastructure

1620 SE 8th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G90 Other Site Construction						
G9090 Other Site Systems	1995	1995	3	DCS	12/02/21	Multiple pre-engineered metal covered structures for equipment and materials. Modular building for work release - this program is an ongoing safety and security risk for public works operations. Need more covered storage for parking expensive equipment vehicles (like vac trucks, garbage trucks, excavators, skid steers, and sewer pump truck). Salt brine tank in ecology-block containment; needs weather cover.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Public Works Operations Center

Facility: Public Works Infrastructure

G2010 Roadways	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	500	$30.00	LF	$15,000	$29,376

Deficient Material: **Concrete Curb**

Extruded concrete curbs are broken from impact by trucks and trailers.



Remedial Action:

Remove and replace concrete curbs. Considering the amount of abuse they receive, consider replacing with robust cast-in-place roll-up curbs.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Public Works Operations Center

Facility: Public Works Infrastructure

G2010 Roadways	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2021	2022	3	$12,000.00	EA	$36,000	$70,502

Deficient Material: **Concrete Pavement**

Street front concrete drive curb cuts at sidewalks are cracked and broken from heavy vehicle use and sub-grade, and will continue to degrade rapidly.



Remedial Action:

Remove and replace concrete drive aprons.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Infrastructure

G2020 Parking Lots	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	18,000	$4.00	SF	$72,000	$141,005

Deficient Material: **AC Paving**

Cracking and water intrusion beginning, and will become worse if untreated.

Remedial Action:

Seal cracks, consider topcoat with restripe of lots.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Infrastructure

G3030 Storm Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	3	2021	2023	1	$30,000.00	LS	$30,000	$58,752

Deficient Material: **Storm**

Localized flooding in at least one area to southwest; standing water in gravel parking areas.



Remedial Action:

Improve storm drainage to reduce localized flooding and reduce standing water.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: **Public Works Operations Center**

Facility: **Public Works Infrastructure**

G4020 Site Lighting	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	12	$2,000.00	EA	$24,000	$47,002

Deficient Material: **Exterior Lighting**

Minimal site lighting, with multiple dark areas, and resultant vandalism, safety, and operational issues.

Remedial Action:

Install additional pole and building-mounted light fixtures to better illuminate the site; assume all LED.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Infrastructure

G4030 Site Communications and Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2022	1	$20,000.00	LS	$20,000	$39,168

Deficient Material: **Electronic security**

Poor site electronic security, with increasing vandalism damage and theft; plus security concerns for staff.

Remedial Action:

Install modern electronic security including radio-controlled powered gates and CCTV.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Public Works Operations Center
Facility: Public Works Infrastructure

G9090 Other Site Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2021	2023	1	$30,000.00	LS	$30,000	$58,752

Deficient Material: **Decant water**

Decant water processing system capacity is regularly being exceeded, hampering operations.



Remedial Action:

Increase decant water processing capacity to meet current and near-term needs.

Action Type:

Code Issue

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Public Works Operations Center

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Public Works Operations Center	B10 Superstructure	$80,000	$16,000	$19,200	$41,472	$156,672	$156,672
	B20 Exterior Closure	$15,000	$3,000	$3,600	$7,776	$29,376	$30,698
	D20 Plumbing	$6,500	$1,300	$1,560	$3,370	$12,730	$13,499
	D30 HVAC	$60,000	$12,000	$14,400	$31,104	$117,504	$122,537
	D40 Fire Protection	$148,330	$29,666	$35,599	$76,894	$290,489	$290,489
	D50 Electrical	$143,033	$28,607	$34,328	$74,148	$280,115	$285,380
	Facility Total	**$452,863**	**$90,573**	**$108,687**	**$234,764**	**$886,886**	**$899,276**
Mobile Office	B20 Exterior Closure	$12,240	$2,448	$2,938	$6,345	$23,971	$24,684
	B30 Roofing	$5,005	$1,001	$1,201	$2,595	$9,802	$10,094
	D30 HVAC	$7,500	$1,500	$1,800	$3,888	$14,688	$15,575
	Facility Total	**$24,745**	**$4,949**	**$5,939**	**$12,828**	**$48,461**	**$50,352**
Public Works Infrastructure	G20 Site Improvements	$123,000	$24,600	$29,520	$63,763	$240,883	$242,967
	G30 Site Civil / Mechanical Utilities	$30,000	$6,000	$7,200	$15,552	$58,752	$59,620
	G40 Site Electrical utilities	$44,000	$8,800	$10,560	$22,810	$86,170	$86,865
	G90 Other Site Construction	$30,000	$6,000	$7,200	$15,552	$58,752	$59,620
	Facility Total	**$227,000**	**$45,400**	**$54,480**	**$117,677**	**$444,557**	**$449,071**
	Site Total	**$704,608**	**$140,922**	**$169,106**	**$365,269**	**$1,379,903**	**$1,398,699**

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Opportunity Summary By Subsystem

City of Camas

Site: Public Works Operations Center

Total Site Opportunity Cost: $2,296,570

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Public Works Operations Center**						
System:	**HVAC**	**Total Cost: $160,570**					
D3020	**Heat Generating Systems**						
		Waste oil transported off-site for disposal; natural gas for heat in the vehicle maintenance shop.	Add waste oil furnace to heat the vehicle maintenance shop.	1.00	$25,000.00	LS	$25,000
D3040	**HVAC Distribution Systems**						
		No economizer for free cooling of office area spaces.	Install economizer for free cooling of office area spaces and improved indoor air quality.	3.00	$15,000.00	EA	$45,000
D3060	**Controls and Instrumentation**						
		No networked controls.	Install networked control system.	21,190.00	$3.00	SF	$63,570
D3090	**Other HVAC Systems and Equipment**						
		No vehicle engine exhaust system.	Install vehicle engine exhaust system.	2.00	$13,500.00	EA	$27,000
Facility:	**Public Works Operations Center**						
System:	**Electrical**	**Total Cost: $911,000**					
D5010	**Electrical Service and Distribution**						
		No standby generator to support assumed City mission-critical functions during power outages.	Install standby generator, say 300 kW, with automatic transfer switch (ATS).	1.00	$150,000.00	LS	$150,000
		No electric vehicle (EV) charging stations.	Install EV charging stations; say two double, with rough-in for two more sets.	2.00	$8,000.00	EA	$16,000
		Large roof with south-facing slope.	Install photovoltaic (PV) renewable energy system, say 100 kW.	100.00	$7,000.00	EA	$700,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Public Works Operations Center

Total Site Opportunity Cost: $2,296,570

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
D5020	Lighting and Branch Wiring	Mostly original fluorescent lamps.	Upgrade all to LED.	18,000.00	$2.50	SF	$45,000
Facility:	Mobile Office						
System:	Plumbing	Total Cost: $15,000					
D2010	Plumbing Fixtures						
		No restroom or kitchenette.	Add restroom and kitchenette.	1.00	$15,000.00	LS	$15,000
Facility:	Public Works Infrastructure						
System:	Site Improvements	Total Cost: $110,000					
G2020	Parking Lots						
		Limited parking capacity and storm water issues from gravel / mud parking.	Convert the gravel yard into a paved yard for equipment and additional parking lot area. Include new storm water containment and treatment.	2,000.00	$40.00	SF	$80,000
G2040	Site Development						
		Gate controls with antiquated pin code are not used, leaving site unsecured during business hours.	To improve security and functionality, upgrade gate systems with sensor code controls for City vehicles with transponders (automatically opening gates on approach) and also add key card access for private vehicles. Consider replacing motors and chains nearing end of life.	2.00	$15,000.00	EA	$30,000
Facility:	Public Works Infrastructure						
System:	Site Civil / Mechanical Utilities	Total Cost: $300,000					
G3030	Storm Sewer						
		Large storm water pond to southwest.	Install storm cells, cover, and use resultant surface for open storage.	20,000.00	$15.00	SF	$300,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Public Works Operations Center

Total Site Opportunity Cost: $2,296,570

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Public Works Infrastructure**						
System:	**Site Electrical utilities**	**Total Cost: $490,000**					
G4010	**Electrical Distribution**						
		No campus standby power system.	Install standby power system to allow Public Works operations to continue during utility power outages; assume 175 kW.	1.00	$125,000.00	LS	$125,000
		No electric vehicle (EV) charging stations.	Add two double EV charging stations, with rough-in for two more.	2.00	$7,500.00	EA	$15,000
		Large site with several buildings having good solar exposure.	Install renewal photovoltaic (PV) power system, assume 50 kW, on south-facing roof areas.	50.00	$7,000.00	EA	$350,000
Facility:	**Public Works Infrastructure**						
System:	**Other Site Construction**	**Total Cost: $310,000**					
G9090	**Other Site Systems**						
		The brine tank and pump are exposed to weather with access via stair - ice and slip hazard when needed during cold weather.	Install a fabric cover over the brine tank and pump containment area.	1.00	$15,000.00	LS	$15,000
		Work release is on-site, resulting in safety and security issues.	Separate work release program from public works operations.	1.00	$100,000.00	LS	$100,000
		Wash rack water is discharged to the storm water pond.	Install a wash rack water recycling system.	1.00	$45,000.00	LS	$45,000
		Need more covered storage for parking expensive equipment vehicles (like vac trucks, garbage trucks, excavators, skid steers, sewer pump truck, etc.).	Provide new pre-engineered covered parking structure for expensive equipment.	2,000.00	$75.00	SF	$150,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Scout Hall
Scout Hall

621 NE 15th Ave
Camas, WA 98607

Facility Size - Gross S.F.	1,200
Year Of Original Construction	1882
Facility Use Type	General Classroom
Construction Type	Light
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	1882
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**3.5**			
Facility Condition Index (FCI)	0.20	**Predicted Renewal Budget 2028 - 2041**	$105,000	$121,000
Current Replacement Value (CRV)	$371,000	**Observed Deficiencies 2022 - 2027**	$253,000	$257,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$174,000	N/A

Facility Condition Summary

This simple wood building with a gable roof was the original one-room schoolhouse in Camas, constructed in 1882. It was relocated to this site in 1907 when it was subsequently repurposed as "Scout Hall" and used by both the Boy and Girl Scouts. Plumbing and electricity appear to have been added in 1930, and the old wood or coal stove replaced with a gas furnace at some point. It appears that recent renovations included metal roofing, cedar shingle siding, and thermal vinyl windows (installed in 1999).

Access to the single front entry is up a flight of concrete stairs with landing, and is not ADA accessible.

The foundation is a concern, with a mix of brick and concrete bearing blocks, with a mix of wood squash blocks, with wood beams gravity bearing. The structure is not seismically tied or secured to the foundation blocks, and there is some beam rot evident. There is about a twelve-inch open crawlspace below the structure, with no perimeter screening. The floor joists are exposed and there is no insulation. There is no vapor barrier below, and the structure is exposed to the soil below.

HVAC includes one gas-fired unit heater, and natural ventilation via operable windows with screens. Indoor plumbing with one unisex bathroom and one drinking fountain. No fire sprinkler or alarm. Single-phase, 120V-only electrical fuse panel; fluorescent lighting with manual control; and assumed abandoned plain old telephone service (POTS), with no other low-voltage systems - minor maintenance to upgrade as needed to support programs and City risk management standards, such as fire alarm, electronic security, and data service.

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Facility Summary

City of Camas
Scout Hall
Scout Hall

621 NE 15th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure						
A10 Foundations						
A1020 Special Foundations	1882	1907	5	TRB	01/12/22	The foundation is a concern, with a mix of brick and concrete bearing blocks, with a mix of wood squash blocks and a variety of wood shims, with wood beams gravity bearing on the blocks. The structure is not seismically tied or secured to the foundation blocks. See also B1010 for floor structure issues.
B Shell			**3.8**			
B10 Superstructure						
B1010 Floor Construction	1882	1882	5	TRB	01/12/22	The structure is not seismically tied or secured to the foundation blocks, and there is some beam rot and possible termite damage evident. There is about a twelve-inch open crawlspace below the structure, with no perimeter screening. The floor joists are exposed and there is no insulation. There is no vapor barrier below, and the structure is exposed to the soil below. See also A1020 Special Foundations for related issues for the foundation.
B1020 Roof Construction	1882	1882	4	TRB	01/12/22	Roofing is assumed to be boards on wood timber trusses. Assumed to have no insulation. True condition not observable.
B20 Exterior Closure						
B2010 Exterior Walls	1882	1999	3	TRB	01/12/22	Stained cedar shake siding. Restained in 2007. Some missing shakes on the east elevation. Some moss growth caused by ground splash-back along base, especially along west elevation. Existing window trim paint is bubbling and boards appear to be significantly weathered and nearing end of life. Walls assumed to have no insulation.
B2020 Exterior Windows	1882	1999	3	TRB	01/12/22	Thermally glazed vinyl operable windows installed in 1999 in existing wood frame.

Copyright MENG Analysis 2022

Facility Summary

City of Camas
Scout Hall
Scout Hall

621 NE 15th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**3.8**			
B20 Exterior Closure						
B2030 Exterior Doors	1882	1930	5	TRB	01/12/22	Old, worn, and warped pair of wood doors with non-ADA-compliant hardware.
B30 Roofing						
B3010 Roof Coverings	1882	1999	3	TRB	01/12/22	Metal roofing.
B3030 Projections	1882	1882	4	TRB	01/12/22	Covered entry canopy with painted soffit board. Unreinforced brick chimney.
C Interiors			**3.1**			
C10 Interior Construction						
C1010 Partitions	1882	1930	3	TRB	01/12/22	Wood framed walls at toilet room, custodial, and storage closet.
C1020 Interior Doors	1930	1930	3	TRB	01/12/22	Wood doors and frames at toilet room, custodial, and storage. No ADA-compliant hardware. Recommend upgrading hardware to toilet room.
C30 Interior Finishes						
C3010 Wall Finishes	1882	1882	3	TRB	01/12/22	Painted historic wood bead board. Due to age, assume paint contains past layers of lead-based paint; repainting recommended.
C3020 Floor Finishes	1882	1882	4	TRB	01/12/22	Original wood floor, showing years of use, but still has the charm of history. Refinishing recommended.
C3030 Ceiling Finishes	1882	1882	3	TRB	01/12/22	Painted wood bead board. Electrical conduit and boxes exposed on the underside of ceiling. Consider removing electrical, rerouting it through the attic, and refinishing ceiling.

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Facility Summary

City of Camas
Scout Hall
Scout Hall

621 NE 15th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.5**			
D20 Plumbing						
D2010 Plumbing Fixtures	1930	1990	3	DCS	01/12/22	One unisex restroom with one tank-type water closet, one wall-mounted lavatory, one aged drinking fountain - minor maintenance to replace any upon damage or failure.
D2020 Domestic Water Distribution	1930	1990	4	DCS	01/12/22	Mix of galvanized and other piping materials; no domestic hot water - minor maintenance to replace all piping with copper and/or PEX, and add a water heater, plus add exterior hose bib.
D2030 Sanitary Waste	1930	1990	3	DCS	01/12/22	Older cast iron waste and vent, with somewhat newer drain for sink and drinking fountain - minor maintenance to replace any or all upon failure.
D2040 Rain Water Drainage	1882	2000	4	DCS	01/12/22	Roof rain water sheet flow to eave, then drops to grade along drip line, damaging building foundation and siding, and eroding softscape.
D30 HVAC						
D3010 Energy Supply	1882	1990	3	DCS	01/12/22	Natural gas line to gas-fired unit heater.
D3020 Heat Generating Systems	1882	1990	3	DCS	01/12/22	One Reznor gas-fired unit heater with 50,000 btu/hr input capacity and flue to original brick chimney - aging but functional with five to ten years remaining life with good maintenance.
D3040 HVAC Distribution Systems	1882	1882	3	DCS	01/12/22	Natural ventilation via operable windows; minor maintenance to install bathroom exhaust fan.
D3060 Controls and Instrumentation	1960	1960	4	DCS	01/12/22	Aged manual thermostat, still works - minor maintenance to install modern programmable thermostat.
D40 Fire Protection						
D4030 Fire Protection Specialties	1990	1990	3	DCS	01/12/22	One fire extinguisher on hook.

Copyright MENG Analysis 2022

Facility Summary

City of Camas
Scout Hall
Scout Hall

621 NE 15th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.5**			
D50 Electrical						
D5010 Electrical Service and Distribution	1930	1930	4	DCS	01/12/22	Well-aged and obsolete screw-in fuse-type electrical panel supplying lighting, furnace, and duplex receptacle(s); 120V, single-phase (not 240V).
D5020 Lighting and Branch Wiring	1930	1990	3	DCS	01/12/22	Fluorescent lighting with manual control, with some drop-in replacement LED lamps - minor maintenance to upgrade all to LED.
D5032 Low Voltage Communication	1960	1960	4	DCS	01/12/22	Aged plain old telephone service (POTS) - minor maintenance to upgrade as needed.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

A1020 Special Foundations	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	1	$35,000.00	LS	$35,000	$68,544

Deficient Material: **Concrete**

The foundation is a concern, with a mix of brick and concrete bearing blocks, with a mix of wood squash blocks and wood shims, with wood beams gravity bearing on the blocks. The structure is not seismically tied or secured to the foundation blocks.



Remedial Action:

Provide new foundations in a new location with the future park master plan or jack up the structure, and replace foundations with modern concrete footing/piers, seismically tied to the building structure. Recommend increasing height to provide ample crawlspace.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

B1010 Floor Construction	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	1,200	$42.00	SF	$50,400	$98,703

Deficient Material: **Floor Framing**

The structure is not seismically tied or secured to the foundation blocks, and there is some beam rot evident. There is about an average of 12" open crawlspace below the structure, with no perimeter screening. The floor joists are exposed and there is no insulation. There is no vapor barrier below, and the structure is exposed to the soil below.



Remedial Action:

Inspect and replace any rotten or insect compromised timbers and joists. Seismically secure structure to new foundation (see A1020 Special Foundations). Insulate underside of floor deck. Install sealed vapor barrier in crawlspace. Provide crawlspace skirt with critter screening around perimeter of crawlspace to thwart infestation while maintaining natural ventilation.

Action Type:

Life Safety

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

B2010 Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2026	10	$700.00	EA	$7,000	$13,709

Deficient Material: **Wood Trim**

Existing window trim paint is bubbling and boards appear to be significantly weathered and nearing end of life. Missing cedar shakes. Moss growth. Assume painted trim contains lead-based paint based on age.

Remedial Action:

Replace window trim with new wood trim and flashings. Replace missing shakes, clean moss, and restain as needed.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2024	1	$5,000.00	EA	$5,000	$9,792

Deficient Material: **Wood Doors and Wood Frames**

Old, worn, and warped pair of wood doors with non-ADA-compliant hardware.



Remedial Action:

Replace door, wood frame, and trim. Install new ADA-compliant hardware and code-compliant egress hardware.

Action Type:

ADA

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

B3030 Projections	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	1	$6,000.00	EA	$6,000	$11,750

Deficient Material: **Brick Chimney**

Unreinforced brick chimney.

Remedial Action:

Remove chimney, provide new vent stack for heater, patch roof and interior.

Action Type:

Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

C3010 Wall Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2027	1,400	$5.00	SF	$7,000	$13,709

Deficient Material: **Paint**

Paint showing chips, marks, and wear. (Note, based on age, the existing interior painted surfaces should be assumed to contain lead-based paint, unless testing suggests otherwise.)



Remedial Action:

Repaint interior.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

C3020 Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2027	1,000	$8.00	SF	$8,000	$15,667

Deficient Material: **Wood Flooring**
Original wood floor, showing wear.



Remedial Action:
Strip and carefully sand and epoxy seal cracks in floor. Refinish original floors.

Action Type:
Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

D2040 Rain Water Drainage	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	100	$50.00	LF	$5,000	$9,792

Deficient Material: **Gutter & downspout**

Roof rain water sheet flow to eave, then drops to grade along drip line, damaging building foundation and siding, and eroding softscape.

Remedial Action:

Install metal gutter and downspout with leaf-guard, direct downspout drainage well away from building foundation.

Action Type:

Code Issue



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Scout Hall
Facility: Scout Hall

D5010 Electrical Service and Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1,200	$5.00	SF	$6,000	$11,750

Deficient Material: **Electrical distribution**

Obsolete fuse-type distribution panel with only 120V, single-phase and minimal capacity; only one observed receptacle.



Remedial Action:

Replace with modern 120/240V service and distribution, to include receptacles on each wall and outside as needed for program use.

Action Type:

Code Issue

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Facility Summary

City of Camas
Scout Hall
Scout Hall Infrastructure

621 NE 15th Ave
Camas, WA 98607

Facility Condition Summary

1882 era single-room schoolhouse relocated to this property around 1907, now used by Boy and Girl Scouts and community groups, set in a large park. Site utilities include City water and sewer, but no fire sprinkler; Clark PUD 110V, single-phase power, and telephone line.

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Facility Summary

City of Camas
Scout Hall
Scout Hall Infrastructure

621 NE 15th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2030 Pedestrian Paving	1907	1935	3	TRB	01/12/22	Concrete walk and concrete stairs to the front entry. No ADA access provided.
G2050 Landscaping	1907	1935	2	TRB	01/12/22	Grass around the immediate vicinity of the building, full mature landscaping elsewhere in the park.
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1907	1935	3	DCS	01/12/22	City water with assumed 5/8-inch meter at sidewalk to south - minor maintenance to replace service line upon failure.
G3020 Sanitary Sewer	1907	1935	3	DCS	01/12/22	Aged cast iron side sewer to City sewer at street with clean-out in hand-vault at southeast corner of building; no issues reported, and minor maintenance to replace upon eventual failure.
G3030 Storm Sewer	1907	1935	4	DCS	01/12/22	Sheet flow to adjacent park landscape with damage along roof eave drip line - minor maintenance to install rock to reduce impact and slope to better convey water away from the building foundation.
G3060 Fuel Distribution	1907	1991	3	DCS	01/12/22	Original wood and/or coal pile replaced with NW Natural gas meter No. 446651 with estimated 175 cfh capacity, and no seismic shut-off valve - minor maintenance to install.
G40 Site Electrical utilities						
G4010 Electrical Distribution	1930	2020	3	DCS	01/12/22	Overhead power to single-phase, 120V-only electrical service with Clark PUD meter No. 568503 with opportunity to upgrade to modern 120/240V service should future redevelopment required 240V power for modern appliances or equipment.

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Facility Summary

City of Camas
Scout Hall
Scout Hall Infrastructure

621 NE 15th Ave
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G40 Site Electrical utilities						
G4020 Site Lighting	1907	1935	3	DCS	01/12/22	Minimal site lighting with one exterior fixture at main entry and remaining from adjacent street lights.
G4030 Site Communications and Security	1907	1935	4	DCS	01/12/22	Plain-old-telephone service (POTS) overhead, but appears abandoned in place, unless used by the park staff - minor maintenance to upgrade as needed. No site electronic security.

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Scout Hall

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Scout Hall	A10 Foundations	$35,000	$7,000	$8,400	$18,144	$68,544	$68,544
	B10 Superstructure	$50,400	$10,080	$12,096	$26,127	$98,703	$98,703
	B20 Exterior Closure	$12,000	$2,400	$2,880	$6,221	$23,501	$24,621
	B30 Roofing	$6,000	$1,200	$1,440	$3,110	$11,750	$11,750
	C30 Interior Finishes	$15,000	$3,000	$3,600	$7,776	$29,376	$31,612
	D20 Plumbing	$5,000	$1,000	$1,200	$2,592	$9,792	$10,084
	D50 Electrical	$6,000	$1,200	$1,440	$3,110	$11,750	$12,101
	Facility Total	**$129,400**	**$25,880**	**$31,056**	**$67,081**	**$253,417**	**$257,416**
	Site Total	**$129,400**	**$25,880**	**$31,056**	**$67,081**	**$253,417**	**$257,416**

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Opportunity Summary By Subsystem

City of Camas

Site: Scout Hall **Total Site Opportunity Cost: $99,000**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Scout Hall**						
System:	**Exterior Closure**	**Total Cost: $20,000**					
B2010	**Exterior Walls**						
		Existing walls are assumed to be uninsulated.	Pull shingles strategically (or interior bead board), and blow in foam insulation in wall cavities. Reinstall cladding.	1.00	$20,000.00	LS	$20,000
Facility:	**Scout Hall**						
System:	**Interior Construction**	**Total Cost: $40,000**					
C1020	**Interior Doors**						
		No ADA toilet room.	Demo existing toilet room, and construct new larger modern ADA-compliant unisex toilet room (expand into meeting hall).	1.00	$40,000.00	EA	$40,000
Facility:	**Scout Hall**						
System:	**Plumbing**	**Total Cost: $5,000**					
D2010	**Plumbing Fixtures**						
		No kitchenette to support events and activities.	Add kitchenette.	1.00	$5,000.00	LS	$5,000
Facility:	**Scout Hall**						
System:	**HVAC**	**Total Cost: $24,000**					
D3040	**HVAC Distribution Systems**						
		No forced-air HVAC.	Install forced-air HVAC system with equipment and ductwork in attic.	1,200.00	$20.00	SF	$24,000
Facility:	**Scout Hall Infrastructure**						
System:	**Site Improvements**	**Total Cost: $10,000**					
G2030	**Pedestrian Paving**						
		No ADA access.	Install an ADA ramp.	1.00	$10,000.00	LS	$10,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Facility Summary

City of Camas
Wastewater Treatment Plant
Main Office

1129 SE Polk Street
Camas, WA 98607

Facility Size - Gross S.F.	1,770
Year Of Original Construction	1997
Facility Use Type	Office
Construction Type	Light
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	1997
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.7**			
Facility Condition Index (FCI)	0.11	**Predicted Renewal Budget 2028 - 2041**	$123,000	$143,000
Current Replacement Value (CRV)	$538,000	**Observed Deficiencies 2022 - 2027**	$149,000	$157,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$89,000	N/A

Facility Condition Summary

A single-story building housing offices, lab, and break/conference room.

HVAC is one packaged rooftop heat pump unit, plus lab fume hood and locker room exhaust fans. Plumbing includes one locker room, one drinking fountain, and support for the lab and breakroom kitchenette. No fire sprinkler or alarm. Power sub-fed from adjacent UV Building. Fluorescent lighting with manual control. High-speed fiber-optic data and SCADA.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Main Office

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.0**			
A10 Foundations						
A1010 Standard Foundations	1997	1997	2	TRB	01/10/22	Standard concrete footings and stem walls.
A1030 Slab On Grade	1997	1997	2	TRB	01/10/22	Concrete slab on grade, no observed issues.
B Shell			**2.7**			
B10 Superstructure						
B1020 Roof Construction	1997	1997	2	TRB	01/10/22	Wood deck and I-joists (no insulation under deck).
B20 Exterior Closure						
B2010 Exterior Walls	1997	1997	3	TRB	01/10/22	A combination of split-faced concrete masonry units with some smooth face accent banding. Weathering and accumulation of algae growth evident. Power wash and seal recommended as minor maintenance.
B2020 Exterior Windows	1997	1997	2	TRB	01/10/22	Thermally glazed operable windows in aluminum frames.
B2030 Exterior Doors	1997	1997	2	TRB	01/10/22	Glazed metal.
B30 Roofing						
B3010 Roof Coverings	1997	1997	4	TRB	01/10/22	Membrane roofing, nearing end of life with past leaks beginning to start.
B3020 Roof Openings	1997	2019	2	TRB	01/10/22	Access hatch replaced in 2019.
B3030 Projections	1997	1997	3	TRB	01/10/22	Entry canopy at front and back doors with painted wood soffit and clad with weathered cedar shingles.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Main Office

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**2.4**			
C10 Interior Construction						
C1010 Partitions	1997	1997	2	TRB	01/10/22	Gypsum on wood studs.
C1020 Interior Doors	1997	1997	2	TRB	01/10/22	Hollow metal door and frames.
C1030 Fittings	1997	1997	2	TRB	01/10/22	Window blinds, base.
C30 Interior Finishes						
C3010 Wall Finishes	1997	1997	2	TRB	01/10/22	Paint.
C3020 Floor Finishes	1997	1997	3	TRB	01/10/22	VCT.
C3030 Ceiling Finishes	1997	1997	3	TRB	01/10/22	Suspended acoustic ceiling tile (a few water stained, back entry tile missing).
D Services			**2.9**			
D20 Plumbing						
D2010 Plumbing Fixtures	1997	1997	3	DCS	01/10/22	Men's only locker room with shower (unisex locker room is available in the Control Building immediately adjacent); break room kitchenette with sink; janitor floor sink in the utility room; sinks in the lab; single-height (non-ADA) hydration station (drinking fountain and bottle-filler) in the corridor.
D2020 Domestic Water Distribution	1997	1997	2	DCS	01/10/22	City water with three reduced pressure backflow preventers - one 1.5-inch and two 0.75-inch; copper distribution piping; no apparent pressure reducing valve (PRV); one A.O. Smith electric 66-gallon domestic hot water (DHW) heater with expansion tank.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Main Office

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.9**			
D20 Plumbing						
D2030 Sanitary Waste	1997	1997	2	DCS	01/10/22	Cast iron drain, waste, and vent (DW&V) - tested fixtures flush and drain ok, except the locker room sink - assume the fixture P-trap needs cleaning as minor maintenance.
D2040 Rain Water Drainage	1997	1997	3	DCS	01/10/22	The roof drains east and west from the main high roof to the much smaller entry canopies, in turn with scupper and downspout to storm; this configuration lends itself to back-up and spill at the front and rear entries - minor maintenance to ensure the drains are kept clear of debris.
D2090 Other Plumbing Systems	1997	1997	3	DCS	01/10/22	Acid waste piping in lab with unclear neutralization. Safety shower and eyewash in lab.
D30 HVAC						
D3040 HVAC Distribution Systems	1997	1997	3	DCS	01/10/22	Fully-ducted forced-air heating, cooling, and ventilation system; plus operable windows; just one zone for the entire building - hence comfort complaints. Locker room exhaust fan.
D3050 Terminal and Package Units	1997	1997	4	DCS	01/10/22	Aging Trane 4-ton rooftop heat pump unit with economizer.
D3060 Controls and Instrumentation	1997	1997	3	DCS	01/10/22	Honeywell temperature averaging programmable thermostat - minor maintenance to replace when the associated rooftop heat pump unit is replaced.
D3090 Other HVAC Systems and Equipment	1997	1997	3	DCS	01/10/22	Lab fume hood utility-set fan on roof with unclear fan housing volute drainage - minor maintenance to add if missing.
D40 Fire Protection						
D4030 Fire Protection Specialties	1997	1997	2	DCS	01/10/22	Fire extinguisher on hook.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Main Office

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.9**			
D50 Electrical						
D5010 Electrical Service and Distribution	1997	1997	2	DCS	01/10/22	Power sub-fed from adjacent UV Building to two 480V, three-phase 250A panels; in turn feeding one 45 kVA 480/208V transformer; in turn feeding two 208V, three-phase 225A distribution panels.
D5020 Lighting and Branch Wiring	1997	1997	3	DCS	01/10/22	Lay-in T8 fluorescent fixtures with manual control. Minimal exterior lighting.
D5032 Low Voltage Communication	1997	1997	3	DCS	01/10/22	Aged telephone system - minor maintenance to upgrade to City standard video voice over internet protocol (VOIP) system. Site public address system reportedly abandoned in place - assume replaced by radio and/or cell phone.
D5039 Low Voltage Data	1997	2010	2	DCS	01/10/22	High-speed fiber-optic data to IDF.
D5090 Other Electrical Systems	1997	1997	4	DCS	01/10/22	Unclear standby power - may be powered from adjacent UV Building standby generator system - to be confirmed; aged exit signs, but no apparent emergency egress light fixtures - minor maintenance to install.
E Equipment and Furnishings						
E10 Equipment						
E1010 Commercial Equipment	1997	1997	3	DCS	01/10/22	Kitchenette appliances and small office equipment.
E1020 Institutional Equipment	1997	2010	2	DCS	01/10/22	Lab equipment - most appears kept up to date.
F Special Construction						
F10 Special Construction						
F1050 Special Controls and Instrumentation	1997	1997	2	DCS	01/10/22	WWTP SCADA system interface; small rooftop weather station with remote display in lab.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Main Office

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2027	2,000	$20.00	SF	$40,000	$78,336

Deficient Material: **Membrane Roof**

Membrane roofing, nearing end of life with past leaks beginning to start.

Remedial Action:

Remove roofing, investigate condition of insulation. increase insulation to R-40 and reroof.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Main Office

B3030 Projections	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2026	2	$2,500.00	EA	$5,000	$9,792

Deficient Material: **Parapet/Mansard**

Weathered cedar shingles at entries at end of life.

Remedial Action:

Remove shingles and re-clad.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Main Office

D3050 Terminal and Package Units	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1	$13,500.00	LS	$13,500	$26,438

Deficient Material: **Roof Top Unit**

Aging rooftop heat pump unit hearing end of life and with obsolete R-22 refrigerant.



Remedial Action:

Replace with new rooftop heat pump unit, including full economizer.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Main Office

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	1,770	$7.00	SF	$12,390	$24,265

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Main Office

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	1,779	$3.00	SF	$5,337	$10,452

Deficient Material: **Fire alarm**
No fire alarm.

Remedial Action:
Install fire alarm.

Action Type:
Life Safety



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Facility Summary

City of Camas
Wastewater Treatment Plant
Bio-solids Dryer Building

1129 SE Polk Street
Camas, WA 98607

Facility Size - Gross S.F.	3,670
Year Of Original Construction	2010
Facility Use Type	Transfer Station
Construction Type	Medium
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	2010
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.5**			
Facility Condition Index (FCI)	0.07	**Predicted Renewal Budget 2028 - 2041**	$66,000	$75,000
Current Replacement Value (CRV)	$344,000	**Observed Deficiencies 2022 - 2027**	$99,000	$100,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$356,000	N/A

Facility Condition Summary

A single-story building houses the bio-solids dryer and sludge storage. A pre-engineered metal building frame integrated with CMU base. The pitched gable form roofing is standing seam metal on steel structure, walls are a combination of concrete masonry units and metal wall panels.

Gas-fired overhead infrared heaters; process exhaust fans; minimal plumbing; no fire sprinkler or alarm; power sub-fed from adjacent Equipment Building.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Bio-solids Dryer Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.0**			
A10 Foundations						
A1010 Standard Foundations	2010	2010	2	TRB	01/10/22	Standard concrete footings and stem walls.
A1030 Slab On Grade	2010	2010	2	TRB	01/10/22	Concrete slab on grade.
B Shell			**2.6**			
B10 Superstructure						
B1010 Floor Construction	2010	2010	2	TRB	01/10/22	Raised metal grate catwalks and platforms for equipment access.
B1020 Roof Construction	2010	2010	2	TRB	01/10/22	Metal on girts on pre-engineered metal frame structure.
B20 Exterior Closure						
B2010 Exterior Walls	2010	2010	3	TRB	01/10/22	Metal wall panels over split-faced concrete masonry units. Weathering and accumulation of algae growth evident, especially significant moss growth on the east wall. Power wash and seal recommended.
B2020 Exterior Windows	2010	2010	3	TRB	01/10/22	Limited punched thermally glazed aluminum units. Noted one west unit interior surface low-emissivity coating failing (southwest corner).
B2030 Exterior Doors	2010	2010	2	TRB	01/10/22	Large overhead door, hollow metal doors and frames.
B30 Roofing						
B3010 Roof Coverings	2010	2010	3	TRB	01/10/22	Standing seal metal roof, weathering.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Bio-solids Dryer Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors						
C10 Interior Construction						
C1010 Partitions	2010	2010	2	TRB	01/10/22	CMU at the motor control center (MCC) electrical room.
C1020 Interior Doors	2010	2010	2	TRB	01/10/22	Hollow metal doors and frames.
C20 Staircases						
C2010 Stair Construction	2010	2010	2	TRB	01/10/22	Metal stairs to catwalk and platforms.
C30 Interior Finishes						
C3010 Wall Finishes	2010	2010	2	TRB	01/10/22	Paint.
C3030 Ceiling Finishes	2010	2010	2	TRB	01/10/22	Painted drywall.
D Services			**2.9**			
D20 Plumbing						
D2040 Rain Water Drainage	2010	2010	4	DCS	01/10/22	Metal roof sheet flows to grade along drip edge, damaging building and softscape.
D2090 Other Plumbing Systems	2010	2010	3	DCS	01/10/22	Non-potable plant water system for wash-down and utility use.
D30 HVAC						
D3010 Energy Supply	2010	2010	3	DCS	01/10/22	Natural gas and digester gas systems; reportedly submetered by the SCADA system. The natural gas service has 5 million btu/hr capacity. The gas-fired dryer burner capacity is 2.5 million btu/hr. The gas system sub-feeds the adjacent Digester Building, which includes a gas-fired boiler with under 1 million btu/hr capacity.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Bio-solids Dryer Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.9**			
D30 HVAC						
D3020 Heat Generating Systems	2010	2010	2	DCS	01/10/22	Three observed gas-fired overhead low-intensity radiant infrared heaters; reportedly there are four total.
D3030 Cooling Generating Systems	2010	2010	2	DCS	01/10/22	Dedicated ductless split-Dx cooling for the electrical motor control center (MCC) room.
D3040 HVAC Distribution Systems	2010	2010	2	DCS	01/10/22	Two supply air fans low at outside walls north and south, with two assumed through roof exhaust fans - no issues reported.
D3060 Controls and Instrumentation	2010	2010	2	DCS	01/10/22	Local controls for HVAC; plus SCADA for process equipment.
D40 Fire Protection						
D4030 Fire Protection Specialties	2010	2010	3	DCS	01/10/22	Fire extinguisher on hook.
D50 Electrical						
D5010 Electrical Service and Distribution	2010	2010	2	DCS	01/10/22	Power sub-fed from adjacent Equipment Building at 480V to Switchboard G with 400A capacity, in turn sub-feeding one large Square D motor control center (MCC). Dedicated split-Dx cooling for the electrical room.
D5020 Lighting and Branch Wiring	2010	2010	3	DCS	01/10/22	High-bay pendant fixtures in high-bay process spaces; T8 fluorescent lighting in the electrical room. Lighting appears marginal under some equipment platforms - minor maintenance to install task lighting.
D5032 Low Voltage Communication	2010	2010	3	DCS	01/10/22	Aging telephone - minor maintenance to update to City standard.
D5039 Low Voltage Data	2010	2010	2	DCS	01/10/22	Fiber-optic data with IDF in the electrical room.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Bio-solids Dryer Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.9**			
D50 Electrical						
D5090 Other Electrical Systems	2010	2010	4	DCS	01/10/22	Minimal emergency lighting and no backup power.
E Equipment and Furnishings						
E10 Equipment						
E1030 Vehicular Equipment	2010	2010	3	DCS	01/10/22	Vehicle waste loading area in open-walled storage area.
E1090 Other Equipment	2010	2010	3	DCS	01/10/22	Bio-solids dryer and material handling system.
F Special Construction						
F10 Special Construction						
F1050 Special Controls and Instrumentation	2010	2010	2	DCS	01/10/22	SCADA control and monitoring system.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility: Bio-solids Dryer Building

B2010 Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2027	1	$5,000.00	LS	$5,000	$9,792

Deficient Material: **Exterior Siding**

Weathering and accumulation of algae growth evident, especially significant moss growth on the east wall exterior and interior which may be caused by moisture intrusion and improper kick flashing off metal siding above. Growth and moisture will eventually degrade and destroy the CMU.



Remedial Action:

Investigate source of moisture. Apply base flashing. Power wash and seal masonry.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility: Bio-solids Dryer Building

D2040 Rain Water Drainage	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	300	$30.00	LF	$9,000	$17,626

Deficient Material: **Roof drains**

No gutter and downspout system, with roof water falling to grade along drip edge, damaging building exterior walls, potentially undermining the foundation and damaging the softscape below.

Remedial Action:

Install metal gutter and downspout system and pipe to site storm drain system.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Bio-solids Dryer Building

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	3,670	$7.00	SF	$25,690	$50,311

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Bio-solids Dryer Building

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	3,670	$3.00	SF	$11,010	$21,562

Deficient Material: **Fire alarm**
No fire alarm.

Remedial Action:
Install fire alarm.

Action Type:
Life Safety



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Facility Summary

City of Camas
Wastewater Treatment Plant
Control Building

1129 SE Polk Street
Camas, WA 98607

Facility Size - Gross S.F.	1,630
Year Of Original Construction	1972
Facility Use Type	Operational Support
Construction Type	Light
# of Floors	1
Energy Source	Electric
Year Of Last Renovation	1972
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**3.0**			
Facility Condition Index (FCI)	0.05	**Predicted Renewal Budget 2028 - 2041**	$40,000	$47,000
Current Replacement Value (CRV)	$376,000	**Observed Deficiencies 2022 - 2027**	$223,000	$228,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$252,000	N/A

Facility Condition Summary

A single-story brick building with a newer membrane roof on wood deck on wood timbers. Converted use in 1997 for controls, and contains three process pumps for secondary treatment, maintenance shop, and operator office. Underutilized, this facility can be updated to house operator work spaces into the former lab, and to accommodate needs with an addition for maintenance shop and storage (see G9090 - Other Site Systems, under Infrastructure).

HVAC includes several electric resistance unit and wall heaters with no mechanical ventilation other then the bathroom exhaust fans - however there are operable windows and doors. Small locker room. Former wet-lab, now used for makeshift office space. Original (1972) plant power system, mostly abandoned in place, plus several newer smaller panels. Aging fluorescent light fixtures. No fire sprinkler or alarm. SCADA panel.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Control Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**3.0**			
A10 Foundations						
A1010 Standard Foundations	1972	1972	3	TRB	01/10/22	Standard concrete footings and stem walls.
A1030 Slab On Grade	1972	1972	3	TRB	01/10/22	Slab on grade. Minor cracking noted.
B Shell			**3.0**			
B10 Superstructure						
B1020 Roof Construction	1972	1972	3	TRB	01/10/22	Wood deck on wood beams.
B20 Exterior Closure						
B2010 Exterior Walls	1972	1972	3	TRB	01/10/22	Uninsulated brick.
B2020 Exterior Windows	1972	1972	5	TRB	01/10/22	Single-pane aluminum windows.
B2030 Exterior Doors	1972	1972	5	TRB	01/10/22	Old doors and frames with single-pane glazing.
B30 Roofing						
B3010 Roof Coverings	1972	2019	2	TRB	01/10/22	Membrane roofing.
B3030 Projections	1972	1972	3	TRB	01/10/22	Painted wood soffits. Gaps in coverage near gantry crane could become bird or insect nests.
C Interiors			**3.5**			
C10 Interior Construction						
C1010 Partitions	1972	1972	3	TRB	01/10/22	Drywall on wood studs.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Control Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors			**3.5**			
C10 Interior Construction						
C1020 Interior Doors	1972	1972	3	TRB	01/10/22	Wood doors and hollow metal frames. Non-ADA-compliant hardware.
C1030 Fittings	1972	1972	4	TRB	01/10/22	Mix of window coverings. Minor maintenance to replace.
C30 Interior Finishes						
C3010 Wall Finishes	1972	1997	3	TRB	01/10/22	Painted walls and exposed exterior brick walls.
C3020 Floor Finishes	1972	1972	4	TRB	01/10/22	Worn VCT and exposed concrete.
C3030 Ceiling Finishes	1972	1972	4	TRB	01/10/22	Suspended acoustical tiles in office and hallway; water stains and numerous tiles missing. Remainder exposed to structure.
D Services			**3.0**			
D10 Vertical Transportation						
D1090 Other Conveying Systems	1972	1972	3	DCS	01/10/22	Two-ton powered hoist on I-beam rail.
D20 Plumbing						
D2010 Plumbing Fixtures	1972	1972	3	DCS	01/10/22	Aged plumbing fixtures including floor-mounted tank-type water closet, wall-mounted lavatory, tiled shower, deep sink, and support for one laundry washing-machine.
D2020 Domestic Water Distribution	1972	1972	4	DCS	01/10/22	Original galvanized piping with some newer copper.
D2030 Sanitary Waste	1972	1972	4	DCS	01/10/22	Mix of drain, waste, and vent (DW&V) materials, with some fixtures somewhat slow to drain or flush.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Control Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.0**			
D20 Plumbing						
D2040 Rain Water Drainage	1972	2019	3	DCS	01/10/22	2019 metal gutter and downspout to grade; portions of gutter blocked by leaves - minor maintenance to clean-out and direct drains away from the building foundation.
D2090 Other Plumbing Systems	1972	1972	3	DCS	01/10/22	7.5-hp shop air compressor in closet - this unit appears oversized for need - consider replacing with a smaller unit as minor maintenance.
D30 HVAC						
D3020 Heat Generating Systems	1972	2000	3	DCS	01/10/22	Several ceiling- or wall-mounted electric resistance unit heaters with estimated 5 kW capacity.
D3030 Cooling Generating Systems	1972	1972	4	DCS	01/10/22	Aged packaged terminal air conditioning unit (PTAC) through wall in former lab space - minor maintenance to replace upon failure; see D3040 for opportunity to upgrade.
D3040 HVAC Distribution Systems	1972	1972	4	DCS	01/10/22	Natural ventilation for most spaces; bathroom exhaust fan for the small locker room.
D3050 Terminal and Package Units	1972	1972	4	DCS	01/10/22	Two older wall-mounted electric resistance unit heaters - minor maintenance to replace upon failure.
D3060 Controls and Instrumentation	1972	1997	3	DCS	01/10/22	Process control panel connected to SCADA system.
D40 Fire Protection						
D4030 Fire Protection Specialties	1972	1997	3	DCS	01/10/22	Fire extinguisher on hood; small first aid kit on wall.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Control Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.0**			
D50 Electrical						
D5010 Electrical Service and Distribution	1972	1972	3	DCS	01/10/22	Original (1972) 480V service with 800A capacity switchboard and motor control center (MCC), with most modules (buckets) abandoned in place during the 1997 plant modernization. Two newer 208V, three-phase 225A panels.
D5020 Lighting and Branch Wiring	1972	1997	3	DCS	01/10/22	T8 fluorescent lighting with manual control.
D5032 Low Voltage Communication	1972	1997	3	DCS	01/10/22	Aging phone system - minor maintenance to upgrade to City standard video voice over internet protocol (VOIP) handsets.
D5039 Low Voltage Data	1972	2010	2	DCS	01/10/22	High-speed fiber-optic service with small IDF, including WiFi antenna.
E Equipment and Furnishings			**3.0**			
E10 Equipment						
E1010 Commercial Equipment	1972	1997	3	DCS	01/10/22	Clothes washer and light office equipment.
E1020 Institutional Equipment	1972	1972	3	DCS	01/10/22	Various shop tools.
E1090 Other Equipment	1972	1972	3	DCS	01/10/22	Several process pumps in the equipment room - no issues reported.
E20 Furnishings						
E2010 Fixed Furnishings	1972	1972	4	TRB	01/10/22	Old casework and work surfaces.
E2020 Moveable Furnishings (Capital Funde	1972	1972	4	TRB	01/19/22	Workstations and environment are inadequate for modern office work conditions.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Control Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
F Special Construction			**2.0**			
F10 Special Construction						
F1050 Special Controls and Instrumentation	1972	1972	2	DCS	01/10/22	Process control programmable logic controller (PLC) in cabinet with SCADA interface.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

B2020 Exterior Windows	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2023	14	$2,000.00	EA	$28,000	$54,835

Deficient Material: **Aluminum Single Pane Windows**

Single-pane aluminum windows with no thermal comfort for current office use, and poor energy efficiency.

Remedial Action:

Replace windows with insulated glass and thermally broken frames.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2024	5	$2,000.00	EA	$10,000	$19,584

Deficient Material: **Door and Frame**

Old doors and frames with single-pane glazing.

Remedial Action:

Replace with energy-efficient doors and ADA-compliant hardware.

Action Type:

Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

C3020 Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2026	400	$20.00	SF	$8,000	$15,667

Deficient Material: **VCT**
Worn VCT.

Remedial Action:
Replace flooring.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

C3030 Ceiling Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2022	500	$10.00	SF	$5,000	$9,792

Deficient Material: **Ceiling Tiles**

Water stains on ceiling tiles and numerous tiles missing.



Remedial Action:

Replace ceiling tiles with all new.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

D2020 Domestic Water Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1,630	$4.00	SF	$6,520	$12,769

Deficient Material: **Galvanized pipe**
Original galvanized piping.

Remedial Action:
Replace with copper and/or PEX.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

D2030 Sanitary Waste	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1,630	$4.00	SF	$6,520	$12,769

Deficient Material: **DW&V piping**
Some fixtures somewhat slow to drain and flush.

Remedial Action:
Renew the drain, waste, and vent system.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	1,630	$3.50	SF	$5,705	$11,173

Deficient Material: **Fire alarm**
No fire alarm.

Remedial Action:
Install fire alarm system.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

D5090 Other Electrical Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	1,630	$5.00	SF	$8,150	$15,961

Deficient Material: **Standby power and emergency lighting**
No apparent standby power and/or emergency lighting.

Remedial Action:
Provide standby power and/or emergency lighting per City policy.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

E2010 Fixed Furnishings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	60	$300.00	LF	$18,000	$35,251

Deficient Material: **Casework**

Old casework and work surfaces.

Remedial Action:

Replace casework and work surfaces with new.

Action Type:

Other



Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Control Building

E2020 Moveable Furnishings (Capital Funded Only)	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	240	$75.00	SF	$18,000	$35,251

Deficient Material: **Tables, Desks, Conference Tables, Chairs**

Workstations and environment are inadequate for modern office work conditions.



Remedial Action:

Furr in walls and add insulation, update interior finishes, workstations, and techniology to provide three staff office workstations to house operator work spaces.

Action Type:

Other

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Facility Summary

City of Camas
Wastewater Treatment Plant
Digester Building

1129 SE Polk Street
Camas, WA 98607

Facility Size - Gross S.F.	3,420
Year Of Original Construction	2010
Facility Use Type	Transfer Station
Construction Type	Medium
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	2010
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.4**			
Facility Condition Index (FCI)	0.06	**Predicted Renewal Budget 2028 - 2041**	$63,000	$73,000
Current Replacement Value (CRV)	$321,000	**Observed Deficiencies 2022 - 2027**	$133,000	$135,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$366,000	N/A

Facility Condition Summary

Houses solid waste processing, between two aerobic digesters, and contains pumps, rotary drum sludge thickener, heat exchangers, and odor control fan no 2.

Gas-fired make-up air unit and space exhaust fan; gas-fired process boiler; plant water; no fire sprinkler or alarm; 480V three-phase industrial power, but no standby generator; fluorescent lighting; SCADA system.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Digester Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.0**			
A10 Foundations						
A1010 Standard Foundations	2010	2010	2	TRB	01/10/22	Standard footings and stem walls.
A1030 Slab On Grade	2010	2010	2	TRB	01/10/22	Concrete slab on grade.
B Shell			**2.6**			
B10 Superstructure						
B1010 Floor Construction	2010	2010	2	TRB	01/10/22	Raised metal grate platform for equipment access at sludge thickening room.
B1020 Roof Construction	2010	2010	2	TRB	01/10/22	Metal deck on metal trusses.
B20 Exterior Closure						
B2010 Exterior Walls	2010	2010	3	TRB	01/10/22	A combination of split-faced concrete masonry units with some smooth face accent banding. Weathering and accumulation of algae growth evident, especially at tanks. Power wash and seal recommended as minor maintenance.
B2020 Exterior Windows	2010	2010	2	TRB	01/10/22	Minor thermally insulated units in aluminum frame punched openings.
B2030 Exterior Doors	2010	2010	2	TRB	01/10/22	Hollow metal doors and frames, overhead roll-up door.
B30 Roofing						
B3010 Roof Coverings	2010	2010	3	TRB	01/10/22	Membrane roofing on main building. Granule coated membrane over foam insulation at digester lids; system bubbling/slumping/delaminating.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Digester Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors						
C10 Interior Construction						
C1010 Partitions	2010	2010	2	TRB	01/10/22	CMU at motor control center (MCC), boiler, and odor control rooms.
C1020 Interior Doors	2010	2010	2	TRB	01/10/22	Hollow metal doors and frames.
C20 Staircases						
C2010 Stair Construction	2010	2010	2	TRB	01/10/22	Metal stair to platform.
C30 Interior Finishes						
C3010 Wall Finishes	2010	2010	2	TRB	01/10/22	Paint.
D Services			**2.1**			
D20 Plumbing						
D2020 Domestic Water Distribution	2010	2010	2	DCS	01/10/22	Potable water reportedly piped to certain process subsystems.
D2090 Other Plumbing Systems	2010	2010	2	DCS	01/10/22	Non-potable plant water for wash-down and utility use.
D30 HVAC						
D3010 Energy Supply	2010	2010	2	DCS	01/10/22	Natural gas sub-fed from adjacent Bio-solids Building, and generated in-building by the two digesters; supplies the process boiler and rooftop gas-fired make-up air unit.
D3020 Heat Generating Systems	2010	2010	3	DCS	01/10/22	Gas-fired boiler runs on mix of digester and natural gas; under one million btu/hr capacity.
D3030 Cooling Generating Systems	2010	2019	2	DCS	01/10/22	Dedicated ductless-split Dx cooling system for the electrical room; replaced in 2019.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Digester Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.1**			
D30 HVAC						
D3040 HVAC Distribution Systems	2010	2010	2	DCS	01/10/22	Gas-fired rooftop make-up air unit for main process space; paired with associated exhaust fan. Several other exhaust fans. Reportedly, the rooftop unit "goes through belts" - the fan and motor may need alignment as minor maintenance to eliminate this problem.
D3050 Terminal and Package Units	2010	2010	3	DCS	01/10/22	Gas-fired rooftop make-up air unit.
D3060 Controls and Instrumentation	2010	2010	2	DCS	01/10/22	Local HVAC controls; plus SCADA process control.
D3090 Other HVAC Systems and Equipment	2010	2010	3	DCS	01/10/22	Process exhaust and make-up air.
D40 Fire Protection						
D4030 Fire Protection Specialties	2010	2010	3	DCS	01/10/22	Fire extinguisher on hook.
D50 Electrical						
D5010 Electrical Service and Distribution	2010	2010	2	DCS	01/10/22	Modern 480V three-phase industrial power with Switchboard F 400A capacity.
D5020 Lighting and Branch Wiring	2010	2010	2	DCS	01/10/22	Fluorescent with manual control.
D5032 Low Voltage Communication	2010	2010	3	DCS	01/10/22	Telephone.
D5039 Low Voltage Data	2010	2010	2	DCS	01/10/22	Fiber-optic data communication.
D5090 Other Electrical Systems	2010	2010	4	DCS	01/10/22	Minimal emergency lighting; no standby generator.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Digester Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
E Equipment and Furnishings						
E10 Equipment						
E1090 Other Equipment	2010	2010	2	DCS	01/10/22	Extensive process treatment equipment, including two large digester tanks, sludge thickener, pumps, and process boiler.
F Special Construction						
F10 Special Construction						
F1050 Special Controls and Instrumentation	2010	2010	2	DCS	01/10/22	SCADA system.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Digester Building

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	1,600	$20.00	SF	$32,000	$62,669

Deficient Material: **Roof Covering**

At digester lids, granule coated membrane over foam insulation; system bubbling/slumping/delaminating.

Remedial Action:

Remove and replace insulation and roofing over digesters.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Digester Building

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	3,670	$7.00	SF	$25,690	$50,311

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Digester Building

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	3,420	$3.00	SF	$10,260	$20,093

Deficient Material: **Fire alarm**
No fire alarm.

Remedial Action:
Install fire alarm.

Action Type:
Life Safety



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Facility Summary

City of Camas
Wastewater Treatment Plant
Equipment Building

1129 SE Polk Street
Camas, WA 98607

Facility Size - Gross S.F.	4,250
Year Of Original Construction	1997
Facility Use Type	Transfer Station
Construction Type	Heavy
# of Floors	1
Energy Source	Electric
Year Of Last Renovation	1997
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**3.2**			
Facility Condition Index (FCI)	0.17	**Predicted Renewal Budget 2028 - 2041**	$80,000	$94,000
Current Replacement Value (CRV)	$418,000	**Observed Deficiencies 2022 - 2027**	$951,000	$968,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$103,000	N/A

Facility Condition Summary

The Equipment Building is a one-story concrete masonry building with metal trusses and low-slope roof. There is also a basement housing equipment and a small operations office. The building houses equipment for primary and secondary systems including primary treatment pumps, grit removal, secondary blowers, centrifuge, and additional primary and secondary pumps.

Multiple HVAC exhaust fans and some unit heaters, with poor ventilation in several areas, specifically the centrifuge room, with corrosive gasses damaging other systems. One restroom and plant water system. No fire sprinkler or alarm. The electrical room sub-feeds adjacent buildings and process equipment and includes a standby generator. Lighting is aging fluorescent. Minimal low voltage systems; but includes SCADA process control.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Equipment Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.7**			
A10 Foundations						
A1010 Standard Foundations	1997	1997	2	TRB	01/10/22	Standard concrete spread footings and stem walls.
A1030 Slab On Grade	1997	1997	3	TRB	01/10/22	Concrete slab on grade, minor cracking observed.
A20 Basements						
A2020 Basement Walls	1997	1997	3	TRB	01/10/22	Concrete, some leaks at pipe penetrations to grit removal and conduit penetrations.
B Shell			**3.6**			
B10 Superstructure						
B1010 Floor Construction	1997	1997	2	TRB	01/10/22	Concrete deck and integrated concrete beams.
B1020 Roof Construction	1997	1997	2	TRB	01/10/22	Metal deck on metal trusses.
B20 Exterior Closure						
B2010 Exterior Walls	1997	1997	3	TRB	01/10/22	A combination of split-faced concrete masonry units with some smooth face accent banding. Minor cracking at mortar joints noted. Weathering and accumulation of algae growth evident. Power wash and seal recommended as minor maintenance.
B2030 Exterior Doors	1997	1997	5	TRB	01/10/22	Hollow metal doors and frames at end of life due to exposure and use. Hardware failing (locksets, hinges, closers). Constant patch and repair issues.
B30 Roofing						
B3010 Roof Coverings	1997	1997	4	TRB	01/10/22	Membrane roofing at end of life. Numerous ongoing leaks reported. No fall restraint system provided.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Equipment Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**3.6**			
B30 Roofing						
B3020 Roof Openings	1997	1997	3	TRB	01/10/22	Roof hatch (cross structure angle iron hazard near top of ladder). Recommend adding safety handhold extension as minor maintenance.
C Interiors						
C10 Interior Construction						
C1010 Partitions	1997	1997	3	TRB	01/10/22	Concrete masonry walls, minor cracks in hallway observed.
C1020 Interior Doors	1997	1997	3	TRB	01/10/22	Hollow metal doors and frames.
C20 Staircases						
C2010 Stair Construction	1997	1997	2	TRB	01/10/22	Galvanized metal stair and open grate treads to basement level.
C30 Interior Finishes						
C3010 Wall Finishes	1997	1997	3	TRB	01/10/22	Painted walls, in need of cleaning.
C3030 Ceiling Finishes	1997	1997	4	TRB	01/10/22	Suspended acoustic ceiling at hall and office, significant water stains. Replace tiles as minor maintenance.
D Services			**3.1**			
D10 Vertical Transportation						
D1090 Other Conveying Systems	1997	1997	3	DCS	01/10/22	Multiple traveling hoists, including one 2-ton for each of the four blowers in the blower room, and one larger 3-ton unit in the centrifuge room.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Equipment Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.1**			
D20 Plumbing						
D2010 Plumbing Fixtures	1997	1997	3	DCS	01/10/22	Aged plumbing fixtures in the office area restroom - stained but functional.
D2020 Domestic Water Distribution	1997	1997	3	DCS	01/10/22	Domestic water for the restroom, with small point-of-use tankless domestic hot water heater for the restroom lavatory faucet.
D2030 Sanitary Waste	1997	1997	3	DCS	01/10/22	Sanitary waste to the site WWTP. Floor drains serve multiple areas.
D2040 Rain Water Drainage	1997	1997	3	DCS	01/10/22	Roof drains piped to storm; overflow scuppers through parapet - minor maintenance to remove leaves from roof, which partially block some roof drains.
D2090 Other Plumbing Systems	1997	1997	3	DCS	01/10/22	Plant (non-potable) water system; plus extensive WWTP piping.
D30 HVAC						
D3020 Heat Generating Systems	1997	1997	3	DCS	01/10/22	Electric unit heater for one or more process spaces - minor maintenance to replace upon failure.
D3030 Cooling Generating Systems	1997	1997	4	DCS	01/10/22	Ventilation cooling only for the electrical room, causing overheating and/or shortened equipment life.
D3040 HVAC Distribution Systems	1997	1997	4	DCS	01/10/22	Minimal ventilation in some areas; others with excessive dirt and debris damaging process equipment and controls.
D3050 Terminal and Package Units	1997	1997	3	DCS	01/10/22	Electric wall heater in office space.
D3060 Controls and Instrumentation	1997	1997	3	DCS	01/10/22	Aging HVAC controls - minor maintenance to replace when associated equipment is renewed.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Equipment Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.1**			
D30 HVAC						
D3090 Other HVAC Systems and Equipment	1997	1997	4	DCS	01/10/22	Foul air system serving the centrifuge room, and nearby process systems.
D40 Fire Protection						
D4030 Fire Protection Specialties	1997	1997	3	DCS	01/10/22	Fire extinguishers on hooks.
D50 Electrical						
D5010 Electrical Service and Distribution	1997	1997	3	DCS	01/10/22	Square D 480V, three-phase, 1,200A switchboard supplying adjacent buildings and Square D motor control center (MCC). Four large variable frequency drives (VFDs) with associated harmonic filters for the four large blowers (three 150 hp and one 125 hp).
D5020 Lighting and Branch Wiring	1997	1997	3	DCS	01/10/22	Aging fluorescent lighting with manual control.
D5032 Low Voltage Communication	1997	1997	3	DCS	01/10/22	Aging telephone system - minor maintenance to upgrade.
D5038 Low Voltage Security	1997	1997	4	DCS	01/10/22	Aging CCTV - minor maintenance to upgrade.
D5039 Low Voltage Data	1997	2010	2	DCS	01/10/22	Newer fiber-optic communications for SCADA system.
D5090 Other Electrical Systems	1997	1997	3	DCS	01/10/22	Kohler 250 kW standby diesel generator and automatic transfer switch (ATS); minimal emergency egress pathway and exit door lighting - minor maintenance to add battery-backed wall-packs.
E Equipment and Furnishings						
E10 Equipment						
E1090 Other Equipment	1997	1997	3	DCS	01/10/22	Extensive WWTP primary treatment equipment and support systems - aging but functional.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility: Equipment Building

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2023	5	$9,000.00	EA	$45,000	$88,128

Deficient Material: **Doors and Frames**

Pairs of oversized hollow metal doors and frames at end of life due to exposure and use. Hardware failing (locksets, hinges, closers). Constant patch and repair issues.

Remedial Action:

Address corrosion source. Replace all door frames, doors, and hardware. Apply corrosion-resistant industrial coatings.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility: Equipment Building

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2025	4,000	$9.00	SF	$36,000	$70,502

Deficient Material: **Roof Covering**

Membrane roofing at end of life. Numerous ongoing leaks reported. Parapet cap flashings heavily corroded.

Remedial Action:

Replace roofing with new membrane. Replace cap flashings. Consider extending corrosive exhaust vents to higher up above roof.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Equipment Building

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	1	$8,500.00	LS	$8,500	$16,646

Deficient Material: **Air conditioning**
No mechanical cooling for the electrical room.

Remedial Action:
Install air conditioning (mechanical cooling) for the electrical room.

Action Type:
Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Equipment Building

D3040 HVAC Distribution Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	4,250	$15.00	SF	$63,750	$124,848

Deficient Material: **Ventilation**

Minimal ventilation in some areas; others with excessive dirt and debris damaging process equipment and controls.

Remedial Action:

Re-engineer the HVAC system to better ventilate the building and eliminate dust, dirt, and debris contamination.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Equipment Building

D3090 Other HVAC Systems and Equipment	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	1	$30,000.00	LS	$30,000	$58,752

Deficient Material: **Foul air system**

Insufficient foul air system resulting in corrosive gas attack on multiple materials.



Remedial Action:

Re-engineer and upgrade the foul air system to properly ventilate the centrifuge room.

Action Type:

Code Issue

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Equipment Building

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	4,250	$7.00	SF	$29,750	$58,262

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Equipment Building

D5010 Electrical Service and Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	4	$30,000.00	EA	$120,000	$235,008

Deficient Material: **Harmonic filters**

Blower harmonic filters are failing; power factory correction modules currently bypassed.



Remedial Action:

Replace blower harmonic filters; noting filters may be failing in part due to dirty components.

Action Type:

Energy Efficiency

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Equipment Building

D5010 Electrical Service and Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	4	$35,000.00	EA	$140,000	$274,176

Deficient Material: **VFDs**
Blower variable frequency drives (VFDs) failing.

Remedial Action:
Replace blower VFDs.

Action Type:
Energy Efficiency



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Equipment Building

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	4,250	$3.00	SF	$12,750	$24,970

Deficient Material: **Fire alarm**
No fire alarm system.

Remedial Action:
Install fire alarm system.

Action Type:
Life Safety



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Facility Summary

City of Camas
Wastewater Treatment Plant
UV Building

1129 SE Polk Street
Camas, WA 98607

Facility Size - Gross S.F.	3,360
Year Of Original Construction	1997
Facility Use Type	Transfer Station
Construction Type	Medium
# of Floors	1
Energy Source	Electric
Year Of Last Renovation	1997
Historic Register	No



			Total Project Cost	Total Project Cost Present Value
Weighted Avg Condition Score	**2.7**			
Facility Condition Index (FCI)	0.09	**Predicted Renewal Budget 2028 - 2041**	$52,000	$63,000
Current Replacement Value (CRV)	$315,000	**Observed Deficiencies 2022 - 2027**	$1,179,000	$1,215,000
Beginning Budget Year	2022	**Opportunity Total Project Cost**	$92,000	N/A

Facility Condition Summary

A single-story concrete masonry building with membrane roof on metal deck and structure. This facility houses the tertiary filtration and UV treatment, plant water reuse, and effluent pumps.

HVAC includes electric resistance heat and several exhaust fans. No significant plumbing other than plant water system. No fire sprinkler or alarm. The electrical room serves the east campus area, and includes a 250 kW standby diesel generator. Fluorescent lighting and minimal low-voltage systems, other than process control and SCADA.

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Facility Summary

City of Camas
Wastewater Treatment Plant
UV Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure			**2.0**			
A10 Foundations						
A1010 Standard Foundations	1997	1997	2	TRB	01/10/22	Concrete strip footings and stem walls.
A1030 Slab On Grade	1997	1997	2	TRB	01/10/22	Concrete slab on grade.
A20 Basements						
A2020 Basement Walls	1997	1997	2	TRB	01/10/22	Poured in place concrete (large sump).
B Shell			**3.1**			
B10 Superstructure						
B1010 Floor Construction	1997	1997	2	TRB	01/10/22	Metal grate over open channel.
B1020 Roof Construction	1997	1997	2	TRB	01/10/22	Metal deck on metal trusses.
B20 Exterior Closure						
B2010 Exterior Walls	1997	1997	3	TRB	01/10/22	A combination of split-faced concrete masonry units with some smooth face accent banding. Some minor joint cracking and moisture penetration evident. Black algae growth on split-face CMU. Power wash and seal, and monitoring recommended.
B2030 Exterior Doors	1997	1997	3	TRB	01/10/22	Hollow metal doors and frames. Heavily corroded hollow metal door and frames.
B30 Roofing						
B3010 Roof Coverings	1997	1997	4	TRB	01/10/22	Membrane roof appears as expected but nearing end of life.

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Facility Summary

City of Camas
Wastewater Treatment Plant
UV Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell			**3.1**			
B30 Roofing						
B3020 Roof Openings	1997	1997	3	TRB	01/10/22	Access hatch, skylights, maintenance equipment access hatches. Skylights are aging.
C Interiors						
C10 Interior Construction						
C1010 Partitions	1997	1997	2	TRB	01/10/22	CMU at motor control center and generator rooms.
C1020 Interior Doors	1997	1997	3	TRB	01/10/22	Hollow metal doors and frames.
C30 Interior Finishes						
C3010 Wall Finishes	1997	1997	3	TRB	01/10/22	Paint.
D Services			**2.5**			
D10 Vertical Transportation						
D1090 Other Conveying Systems	1997	1997	2	DCS	01/10/22	A one-ton mobile lift with powered hoist is present for pump and other heavy equipment service.
D20 Plumbing						
D2090 Other Plumbing Systems	1997	1997	3	DCS	01/10/22	Plant water system.
D30 HVAC						
D3020 Heat Generating Systems	1997	1997	3	DCS	01/10/22	Two electric resistance unit heaters - one larger, one smaller.
D3030 Cooling Generating Systems	1997	1997	4	DCS	01/10/22	Ventilation cooling, including for the motor control center room, which overheats during hot weather.

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Facility Summary

City of Camas
Wastewater Treatment Plant
UV Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**2.5**			
D30 HVAC						
D3040 HVAC Distribution Systems	1997	1997	3	DCS	01/10/22	Ventilation make-up air louvers, and rooftop exhaust fans.
D3060 Controls and Instrumentation	1997	1997	3	DCS	01/10/22	Basic controls for HVAC equipment.
D40 Fire Protection						
D4030 Fire Protection Specialties	1997	1997	3	DCS	01/10/22	Fire extinguisher on hook (confirm).
D50 Electrical						
D5010 Electrical Service and Distribution	1997	1997	2	DCS	01/10/22	Electrical service from 500 kVA 480V exterior pad-mounted utility transformer, underground to main electrical room with 480V, three-phase switchboard with 600A capacity, in turn feeding one large and one small Square D motor control center (MCC). Aging variable frequency drives.
D5020 Lighting and Branch Wiring	1997	1997	3	DCS	01/10/22	T8 fluorescent in sealed fixtures, with manual control.
D5032 Low Voltage Communication	1997	1997	3	DCS	01/10/22	Older telephone - minor maintenance to update.
D5038 Low Voltage Security	1997	1997	4	DCS	01/10/22	Aged CCTV camera at exterior - minor maintenance to update.
D5039 Low Voltage Data	1997	2010	3	DCS	01/10/22	IDF in electrical room with WiFi antenna.
D5090 Other Electrical Systems	1997	1997	3	DCS	01/10/22	Katolight 250 kW standby diesel generator with automatic transfer switch (ATS) at building switchboard; fuel oil storage tank venting may not be to outside as required by code - further investigation is suggested as minor maintenance.

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Facility Summary

City of Camas
Wastewater Treatment Plant
UV Building

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
E Equipment and Furnishings						
E10 Equipment						
E1090 Other Equipment	1997	1997	3	DCS	01/10/22	Extensive WWTP tertiary process treatment equipment including two disk filters and four UV sections.
F Special Construction						
F10 Special Construction						
F1050 Special Controls and Instrumentation	1997	1997	3	DCS	01/10/22	SCADA system, aging but functional, but due for an upgrade in the near future.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility: UV Building

B2010 Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2027	1	$8,000.00	LS	$8,000	$15,667

Deficient Material: **CMU walls**

Some minor joint cracking. Active moisture penetration evident suspected from entering masonry during recent rains. Black algae growth on split face CMU elsewhere.

Remedial Action:

Power wash. seal joints and apply sealant to surface. Monitor for future moisture penetration.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: UV Building

B2030 Exterior Doors	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	1	$5,000.00	EA	$5,000	$9,792

Deficient Material: **Doors and Frames**

Significant hollow metal door corrosion.



Remedial Action:

Replace door frame, door, and hardware. Finish with moisture/corrosion resistant industrial metal paint coating.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: UV Building

B3010 Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2025	3,360	$8.00	SF	$26,880	$52,642

Deficient Material: **Roof Covering**
Membrane roof nearing end of life, seams separating.



Remedial Action:
Replace roofing.

Action Type:
Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: UV Building

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2023	1	$8,500.00	LS	$8,500	$16,646

Deficient Material: **Air conditioning**

No air conditioning (mechanical cooling) for the motor control center (MCC) room.



Remedial Action:

Install dedicated cooling for the MCC room.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: UV Building

D4010 Fire Protection Sprinkler Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	3,360	$6.00	SF	$20,160	$39,481

Deficient Material: **Fire Sprinkler**
No fire sprinkler.

Remedial Action:
Install fire sprinkler.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: UV Building

D5010 Electrical Service and Distribution	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2025	3	$25,000.00	EA	$75,000	$146,880

Deficient Material: **VFDs**

Reportedly aging variable frequency drives (VFDs) approaching end-of-life and/or obsolescence.



Remedial Action:

Replace aged VFDs.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: UV Building

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	5	2022	2022	3,360	$2.50	SF	$8,400	$16,451

Deficient Material: **Fire alarm**
No fire alarm.

Remedial Action:
Install fire alarm.

Action Type:
Life Safety



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: UV Building

E1090 Other Equipment	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	3	$150,000.00	EA	$450,000	$881,280

Deficient Material: **UV**
Three aging UV sections.

Remedial Action:
Replace prior to complete failure.

Action Type:
Other



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Facility Summary

City of Camas
Wastewater Treatment Plant
Wastewater Treatment Plant Infrastructure

1129 SE Polk Street
Camas, WA 98607

Facility Condition Summary

This fence enclosed site contains the wastewater treatment plant and operations office serving the city.

City water, on-site sewer direct to waste-water treatment plant (WWTP), private utility natural gas, public utility power, high-speed fiber-optic data, on-site storm water management, and extensive WWTP process structures, equipment, pumps, piping, and controls.

A WWTP process study was completed by HDR in 2015, with update during the City-wide sewer plan of 2020; plus separate 2020 Gray & Osborne (G&O) Inflow & Infiltration (I&I) study in conjunction with National Pollution Discharge Elimination System (NPDES) permit - reportedly, I&I is substantial and represents a significant Operations & Maintenance (O&M) cost reduction opportunity.

Reportedly, Alliant is contracted to provide maintenance services for building facility HVAC (heating, ventilating & air-conditioning) equipment throughout the WWTP, and reportedly has a detailed list of equipment maintained - noting some equipment does not appear to be fully maintained - further investigation is suggested. All direct process equipment, including foul air exhaust, but not general space HVAC, such as general space exhaust fans and make-up air louvers, are maintained by WWTP O&M staff. WWTP staff use Rockwell Automation's "Fiix" CMMS (computerized maintenance management system) for maintenance management.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Wastewater Treatment Plant Infrastructure

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G20 Site Improvements						
G2010 Roadways	1970	1997	4	TRB	01/10/22	Asphalt drives, entry pavement at entry grates is failing, returning to gravel in some locations, and significantly alligatoring elsewhere.
G2020 Parking Lots	1970	1997	3	TRB	01/10/22	Parking lots with some alligatoring, sealing cracks recommended. Slurry reseal and re-striping occurred in 2017 on a portion.
G2030 Pedestrian Paving	1972	1997	2	TRB	01/10/22	Exterior concrete stairs and railings at buildings.
G2040 Site Development	1972	1997	3	TRB	01/10/22	Perimeter chain link fencing with barbed wire. Picnic bench. Vehicle drive gate operators are failing.
G2050 Landscaping	1972	1972	3	TRB	01/10/22	Trees recently trimmed. Irrigation system is causing problems and requires constant maintenance.
G30 Site Civil / Mechanical Utilities						
G3010 Water Supply	1972	1997	2	DCS	01/10/22	City water to several buildings, plus aged irrigation system, but no fire sprinkler service to any building. Reclaimed (non-potable) plant water system distributed throughout the site for clean-up, flushing, and wash-down use. City water appears to enter the site at the southwest gate, via a two-inch reduced pressure backflow preventer (RPBP) inside an above grade hot-box.
G3020 Sanitary Sewer	1972	1997	2	DCS	01/10/22	Sanitary waste from served buildings to on-site WWTP.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Wastewater Treatment Plant Infrastructure

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G30 Site Civil / Mechanical Utilities						
G3030 Storm Sewer	1972	1997	3	DCS	01/10/22	On-site storm water management with catch basins to storm water detention and apparent infiltration on the southwest portion of the site, reportedly with overflow to the adjacent Columbia River. Localized flooding in several areas, including at the main entry at the southeast corner of the site - minor maintenance to improve. Reportedly, the wastewater hauler truck dump pad drains to storm, instead of to WWTP influent - minor maintenance to redirect.
G3060 Fuel Distribution	1972	1997	3	DCS	01/10/22	One NW Natural gas rotary meter No. 992137 at northwest exterior wall of the Bio-solids Building, with 5,000 cfh capacity; in turn sub-feeding the adjacent Digester Building, reportedly including SCADA gas sub-metering. Additionally, digester gas is distributed from the Digester Building to both the digester boiler and to the bio-solids dryer, reportedly submetered via SCADA to each of these two buildings. Diesel generator fuel tanks are located under the generators in the Equipment and Bio-solids Buildings.
G40 Site Electrical utilities						
G4010 Electrical Distribution	1972	1997	2	DCS	01/10/22	Clark PUD utility power underground to three 480V, three-phase services: 1) Original (1972) Control Building meter No. 88-677-808, with 800A capacity, but largely no longer utilized, 2) 1997 Equipment Building meter No. 81-463-997 with 1,200A capacity, and 3) 1997 UV Building meter No. 41-401-004 (19214-C34IR3) with 600A capacity. The Equipment Building switchgear powers most of the buildings and plant equipment to west; whereas the UV Building switchgear powers the buildings and plant equipment to east, excepting the Control Building and certain loads sub-fed therefrom. There are two 250 kW diesel generators, located adjacent to the electrical rooms in both the Equipment and UV Buildings, in turn sub-feeding automatic transfer switches (ATS) in past mission-critical buildings, but not the Digester and/or Bio-solids Buildings.
G4020 Site Lighting	1972	1997	3	DCS	01/10/22	Aging high-pressure sodium and/or metal halide exterior lighting - aging but functional with no issues reported.

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Facility Summary

City of Camas
Wastewater Treatment Plant
Wastewater Treatment Plant Infrastructure

1129 SE Polk Street
Camas, WA 98607

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G40 Site Electrical utilities						
G4030 Site Communications and Security	1972	2010	2	DCS	01/10/22	High-speed fiber-optic data service to the WWTP site for City network connection; plus separate fiber-optic system linking each building's SCADA cabinet with others. Minimal site electronic security including keypad entry gate control and limited site perimeter CCTV monitoring.
G90 Other Site Construction						
G9010 Service and Pedestrian Tunnels	1972	1997	2	DCS	01/10/22	Extensive vaults, trenches, stairs, and bridges between buildings and large process equipment - no issues reported.
G9090 Other Site Systems	1972	1972	3	TRB	01/10/22	Landscape and equipment storage. Roughly 30' x 30' garage (reroofed in 2019), but functionally obsolescent due to size.

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility: Wastewater Treatment Plant Infrastructure

G2010 Roadways	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2024	12,500	$15.00	SF	$187,500	$367,200

Deficient Material: **AC Paving**

Asphalt drive paving is breaking up at the entry, is degrading back into gravel elsewhere, and has significant alligatoring.

Remedial Action:

Grind, prep, and repave main driveway for heavy use vehicle loads.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Wastewater Treatment Plant Infrastructure

G2040 Site Development	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2026	2	$9,000.00	EA	$18,000	$35,251

Deficient Material: **Vehicle Gate**

Gate operators are at end of life.

Remedial Action:

Replace gate operators. Clean track and adjust gate roller components.

Action Type:

Other



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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility: Wastewater Treatment Plant Infrastructure

G2050 Landscaping	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2025	1	$20,000.00	LS	$20,000	$39,168

Deficient Material: **Irrigation**

Irrigation system is causing problems and requires constant maintenance.



Remedial Action:

Revamp irrigation system and controls, update with current technology for soil humidity and water conservation.

Action Type:

Other

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Detailed Assessment - Observed Deficiencies 2022 - 2027

City of Camas
Site: Wastewater Treatment Plant
Facility: Wastewater Treatment Plant Infrastructure

G4030 Site Communications and Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2022	2025	1	$500,000.00	LS	$500,000	$979,200

Deficient Material: **SCADA**
Aging SCADA system.

Remedial Action:
Upgrade to current technology throughout the WWTP.

Action Type:
Other



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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Main Office	B30 Roofing	$45,000	$9,000	$10,800	$23,328	$88,128	$94,681
	D30 HVAC	$13,500	$2,700	$3,240	$6,998	$26,438	$27,226
	D40 Fire Protection	$12,390	$2,478	$2,974	$6,423	$24,265	$24,265
	D50 Electrical	$5,337	$1,067	$1,281	$2,767	$10,452	$10,452
	Facility Total	**$76,227**	**$15,245**	**$18,294**	**$39,516**	**$149,283**	**$156,623**
Bio-solids Dryer Building	B20 Exterior Closure	$5,000	$1,000	$1,200	$2,592	$9,792	$10,538
	D20 Plumbing	$9,000	$1,800	$2,160	$4,666	$17,626	$17,886
	D40 Fire Protection	$25,690	$5,138	$6,166	$13,318	$50,311	$50,311
	D50 Electrical	$11,010	$2,202	$2,642	$5,708	$21,562	$21,562
	Facility Total	**$50,700**	**$10,140**	**$12,168**	**$26,283**	**$99,291**	**$100,297**
Control Building	B20 Exterior Closure	$38,000	$7,600	$9,120	$19,699	$74,419	$75,814
	C30 Interior Finishes	$13,000	$2,600	$3,120	$6,739	$25,459	$26,405
	D20 Plumbing	$13,040	$2,608	$3,130	$6,760	$25,538	$26,297
	D50 Electrical	$13,855	$2,771	$3,325	$7,182	$27,134	$27,369
	E20 Furnishings	$36,000	$7,200	$8,640	$18,662	$70,502	$72,073
	Facility Total	**$113,895**	**$22,779**	**$27,335**	**$59,043**	**$223,052**	**$227,958**
Digester Building	B30 Roofing	$32,000	$6,400	$7,680	$16,589	$62,669	$64,535
	D40 Fire Protection	$25,690	$5,138	$6,166	$13,318	$50,311	$50,311
	D50 Electrical	$10,260	$2,052	$2,462	$5,319	$20,093	$20,093
	Facility Total	**$67,950**	**$13,590**	**$16,308**	**$35,225**	**$133,073**	**$134,940**
Equipment Building	B20 Exterior Closure	$45,000	$9,000	$10,800	$23,328	$88,128	$89,430
	B30 Roofing	$36,000	$7,200	$8,640	$18,662	$70,502	$73,675
	D30 HVAC	$102,250	$20,450	$24,540	$53,006	$200,246	$205,078
	D40 Fire Protection	$29,750	$5,950	$7,140	$15,422	$58,262	$58,262
	D50 Electrical	$272,750	$54,550	$65,460	$141,394	$534,154	$541,678
	Facility Total	**$485,750**	**$97,150**	**$116,580**	**$251,813**	**$951,293**	**$968,123**

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Deficiency Repair Cost Markups By System 2022 - 2027

City of Camas

Site: Wastewater Treatment Plant

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
UV Building	B20 Exterior Closure	$13,000	$2,600	$3,120	$6,739	$25,459	$26,652
	B30 Roofing	$26,880	$5,376	$6,451	$13,935	$52,642	$55,009
	D30 HVAC	$8,500	$1,700	$2,040	$4,406	$16,646	$16,893
	D40 Fire Protection	$20,160	$4,032	$4,838	$10,451	$39,481	$39,481
	D50 Electrical	$83,400	$16,680	$20,016	$43,235	$163,331	$169,940
	E10 Equipment	$450,000	$90,000	$108,000	$233,280	$881,280	$907,521
	Facility Total	**$601,940**	**$120,388**	**$144,466**	**$312,046**	**$1,178,839**	**$1,215,497**
Wastewater Treatment Plant Infrastructure	G20 Site Improvements	$225,500	$45,100	$54,120	$116,899	$441,619	$456,446
	G40 Site Electrical utilities	$500,000	$100,000	$120,000	$259,200	$979,200	$1,023,258
	Facility Total	**$725,500**	**$145,100**	**$174,120**	**$376,099**	**$1,420,819**	**$1,479,704**
	Site Total	**$2,121,962**	**$424,392**	**$509,271**	**$1,100,025**	**$4,155,650**	**$4,283,142**

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Opportunity Summary By Subsystem

City of Camas

Site: Wastewater Treatment Plant

Total Site Opportunity Cost: $1,243,050

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Main Office**						
System:	**Roofing**	**Total Cost: $10,000**					
B3010	**Roof Coverings**						
		No fall restraint system.	Add fall restraint system.	1.00	$10,000.00	EA	$10,000
Facility:	**Main Office**						
System:	**HVAC**	**Total Cost: $17,790**					
D3040	**HVAC Distribution Systems**						
		Just one single HVAC zone, hence comfort complaints.	Upon replacement of the rooftop unit, upgrade to a multi-zone system.	1,779.00	$10.00	SF	$17,790
Facility:	**Main Office**						
System:	**Electrical**	**Total Cost: $17,700**					
D5020	**Lighting and Branch Wiring**						
		Fluorescent fixtures with manual control.	Upgrade to LED with automatic control.	1,770.00	$7.00	SF	$12,390
D5038	**Low Voltage Security**						
		No apparent electronic security.	Install electronic security per City standard.	1,770.00	$3.00	SF	$5,310
Facility:	**Bio-solids Dryer Building**						
System:	**Plumbing**	**Total Cost: $7,000**					
D2010	**Plumbing Fixtures**						
		No safety shower, eyewash, or hand-wash sink.	Add safety shower, eyewash, and hand-wash sink to improve health and safety.	2.00	$3,500.00	EA	$7,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Wastewater Treatment Plant **Total Site Opportunity Cost: $1,243,050**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Bio-solids Dryer Building**						
System:	**Electrical**	**Total Cost: $175,000**					
D5090	**Other Electrical Systems**						
		No reported backup power.	Install diesel generator with automatic transfer switch (ATS) for standby power.	1.00	$175,000.00	LS	$175,000
Facility:	**Control Building**						
System:	**Exterior Closure**	**Total Cost: $60,000**					
B2010	**Exterior Walls**						
		Uninsulated structure.	Furr out interior and add insulation and painted drywall interior finish.	1,200.00	$50.00	SF	$60,000
Facility:	**Control Building**						
System:	**Plumbing**	**Total Cost: $5,000**					
D2010	**Plumbing Fixtures**						
		No safety shower and eyewash.	Install safety shower and eyewash in process space.	1.00	$5,000.00	LS	$5,000
Facility:	**Control Building**						
System:	**HVAC**	**Total Cost: $40,750**					
D3040	**HVAC Distribution Systems**						
		No cohesive HVAC system - just operable windows and doors and electric resistance unit heaters; no air conditioning (mechanical cooling).	Install cohesive HVAC system to provide mechanical heating, cooling, and ventilation.	1,630.00	$25.00	SF	$40,750
Facility:	**Control Building**						
System:	**Electrical**	**Total Cost: $23,150**					
D5010	**Electrical Service and Distribution**						
		Large, dedicated, and mostly abandoned electrical service, switchboard, and motor control center.	Switch to the east plant service at the UV Building and demolish this increasingly obsolete and mostly utilized service.	1.00	$15,000.00	LS	$15,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Wastewater Treatment Plant

Total Site Opportunity Cost: $1,243,050

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
D5020	**Lighting and Branch Wiring**						
		Aging fluorescent lighting with manual control.	Upgrade to LED with automatic control.	1,630.00	$5.00	SF	$8,150
Facility:	**Digester Building**						
System:	**Roofing**	**Total Cost: $30,000**					
B3010	**Roof Coverings**						
		No fall restraint system.	install fall restraint systems.	3.00	$10,000.00	EA	$30,000
Facility:	**Digester Building**						
System:	**Plumbing**	**Total Cost: $7,000**					
D2010	**Plumbing Fixtures**						
		No safety shower, eyewash, or hand-wash sink.	Add safety shower, eyewash, and hand-wash sink for health and safety.	2.00	$3,500.00	EA	$7,000
Facility:	**Digester Building**						
System:	**Electrical**	**Total Cost: $150,000**					
D5090	**Other Electrical Systems**						
		No standby generator.	Install standby generator and automatic transfer switch (ATS).	1.00	$150,000.00	LS	$150,000
Facility:	**Equipment Building**						
System:	**Roofing**	**Total Cost: $20,000**					
B3010	**Roof Coverings**						
		No fall restraint system.	Install fall restraint tie off anchored to structure.	1.00	$20,000.00	LS	$20,000
Facility:	**Equipment Building**						
System:	**Plumbing**	**Total Cost: $7,000**					
D2010	**Plumbing Fixtures**						
		No permanent safety shower and eyewash.	Install safety shower and eyewash.	2.00	$3,500.00	EA	$7,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/22

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Opportunity Summary By Subsystem

City of Camas

Site: Wastewater Treatment Plant **Total Site Opportunity Cost: $1,243,050**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Equipment Building**						
System:	**Electrical**	**Total Cost: $25,500**					
D5020	**Lighting and Branch Wiring**						
		Aging fluorescent lighting with manual control.	Upgrade to LED with automatic control.	4,250.00	$6.00	SF	$25,500
Facility:	**UV Building**						
System:	**Roofing**	**Total Cost: $20,000**					
B3010	**Roof Coverings**						
		No fall restraint system.	Install fall restraint system.	1.00	$20,000.00	LS	$20,000
Facility:	**UV Building**						
System:	**Plumbing**	**Total Cost: $7,000**					
D2010	**Plumbing Fixtures**						
		No safety shower, eyewash, or hand-sink.	Install safety shower, eyewash, and hand-sink for health and safety.	2.00	$3,500.00	EA	$7,000
Facility:	**UV Building**						
System:	**Electrical**	**Total Cost: $20,160**					
D5020	**Lighting and Branch Wiring**						
		Aging fluorescent lighting with manual control.	Upgrade to LED lighting with automatic control.	3,360.00	$6.00	SF	$20,160

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Opportunity Summary By Subsystem

City of Camas

Site: Wastewater Treatment Plant

Total Site Opportunity Cost: $1,243,050

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	**Wastewater Treatment Plant Infrastructure**						
System:	**Site Electrical utilities**	**Total Cost: $400,000**					
G4010	**Electrical Distribution**						
		Reportedly no standby diesel generator power to the Digester and/or Bio-solids Buildings.	Install additional diesel generator and automatic transfer switches (ATSs) to power all current WWTP equipment; specifically the Digester and/or Bio-solids Buildings and associated process equipment. Assume one 250 kW diesel generator with 72-hour diesel fuel storage tank and ATSs for both buildings.	1.00	$400,000.00	LS	$400,000
Facility:	**Wastewater Treatment Plant Infrastructure**						
System:	**Other Site Construction**	**Total Cost: $200,000**					
G9090	**Other Site Systems**						
		Garage functionally obsolescent due to size.	Construct an additional secure dry storage / repair shop building or addition to the Control building.	1,000.00	$200.00	SF	$200,000

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Appendix L: Parks, Recreation & Open Space (PROS) Plan

PARKS, RECREATION & OPEN SPACE PLAN

City of Camas

March 2022



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Photo Cover
Washougal River Greenway

The Camas 2022 Parks, Recreation & Open Space Plan was adopted by City Council on March 7, 2022.

Acknowledgements

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2022 PROS Plan

Message from the Director

Core to our city, our community, and our residents are the parks, open spaces, forested lands, and recreational system that you've had a hand in building and growing. These treasured amenities compel stewardship as a core value, create great places, and engage our community to be active and healthy. It has been my great honor to start my tenure as Camas Parks & Recreation Director by working with the community, Parks and Recreation Commission, City Council, Planning Commission, City staff and the consultant team to develop this Parks, Recreation and Open Space Plan that will help guide the City and the Parks and Recreation Department over the next 6+ years to maintain, care for and grow this beautiful system we call home. Please join me on the trail to accomplishing our shared vision for Camas.

Trang K. Lam, Parks & Recreation Director

Executive Summary

The City of Camas owns and manages over 1,000 acres of parks and open spaces, which supports a range of active and passive recreation experiences. The park and recreation system provides developed parks with playgrounds, public waterfront access sites, active recreational facilities for team sports, a skate park and 12 miles of walking paths and trails.



Additionally, recreation facilities and services available within Camas are a major community asset and support the physical, mental and social health of community members. Camas residents can also access additional parks, trails, open spaces and recreational facilities provided by Clark County, the Camas School District, the Port of Camas-Washougal, and the cities of Washougal and Vancouver.

This Parks, Recreation and Open Space (PROS) Plan is a six-year guide and strategic plan for managing and enhancing park and recreation services in Camas. It establishes a path forward for providing high quality, community-driven parks, trails, open spaces and recreational opportunities. The Plan proposes updates to service standards for parks and trails and addresses goals, action items and other management considerations toward the continuation of quality recreation opportunities to benefit the residents of Camas.

Camas is preparing for continued growth, with a forecasted 2035 population of approximately 34,100. New investments in parks and recreation will be necessary to meet the needs of the community, support youth development, expand opportunities for inclusion, provide options for residents to lead healthy, active lives, and foster greater social and community connections.

This Plan was developed with the input and direction of Camas residents. The Plan inventories and evaluates existing park and recreation areas, assesses the needs for acquisition, site development



and operations, and offers specific policies and recommendations to achieve the community's goals. Through a robust and COVID-sensitive community engagement process, the Community feedback can be synthesized into three core, community priorities:

- Maintain what we have,
- Fill gaps and improve trail connections, and
- Develop and improve existing park.

With these key community priorities in mind and thorough data driven evaluation of the system, the following Plan findings and recommendations will help Camas meet its growth sustainably:

Maintain what we have

Mindful stewardship of over 1,000 acres of parks and open spaces will require strengthening of maintenance and operational approaches. Specifically, the Plan recommends the preparation of a system-wide Open Space Management Plan to guide City staff in the care, maintenance and stewardship of open space, along with an Urban Forestry Management Plan to examine the health and coverage of the urban forest. These two plans should define an implementation program that effectively carries out the maintenance and operations strategies outlined in the plans.

Fill gaps and improve trail connections & develop and improve existing parks

The Plan includes a modest acquisition program to secure strategically located sites for future parks and/or trail corridors. To connect Camas' residents to destinations throughout the City and provide healthy and safe options for walking and bicycling, the Plan recommends additional trail development, and trail connections including sidewalk and bike lane improvements, along with coordination with local subdivision and site development projects for smaller scale linkages.

Serving existing and future residents will require improvements to existing parks and additional investments in the park, trail and recreation system. To ensure existing and new parks provide desired recreational amenities and offer safe and accessible opportunities to play and gather, the PROS Plan recommends investments throughout the park system to enhance accessibility, safety and usability of park features. Recommended projects include an all-inclusive play area, water feature, pump track, sport field enhancements and mountain bike trails.

Implementing the Plan

The City has built an amazing system of developed parks, trails and open spaces. Per capita, the Camas community enjoys more park land and trail miles than other similarly sized cities. In the last decade, the City has been fortunate to add nearly 463 acres into its system. Despite flat staffing levels since 2010, developed parks have been well maintained; however, park amenities are aging out of their life cycle and levels of service for maintenance of open space have not kept up with acquisition. The City currently relies on Park Impact Fees (PIF), Real Estate Excise Taxes (REET), grants, donations, and general and special revenue funds to finance individual projects or programs. Periodically updating the existing PIF program, which assesses fees on new development to meet the increased demand for parks, will allow the City to obtain future acquisition and development funding from residential development. Dedicated, new funding will be required to finance maintenance and operations, upgrades to, and growth in the parks system to meet community needs.

The Camas community is reaching a size that will result in greater public demand for major facilities investments such as a recreation center with aquatics programs and a sports field complex, which will require additional public and policy conversations. Bond or levy will be needed to augment existing revenue to support major investments such as parkland acquisitions and development, trail development, recreational facilities, waterfront opportunities and general park element upgrades. Such mechanisms would require both political and public support. State and federal grant programs offer additional potential opportunities to leverage available local revenues to fund specific projects.





CHAPTER 1

A Thriving **CAMAS**



When my kids were young, activities such as the Easter Egg Hunt and Boo Bash were important as was safe, accessible and fun playground equipment. Without children in our household, I'm more interested in trails, both walking and biking.

- Online Open House participant



PURPOSE OF THE PLAN

The City of Camas Parks, Recreation & Open Space Plan (PROS Plan) is an update to the 2014 Parks, Recreation & Open Space Plan that builds on the previously completed planning work and incorporates the feedback from an extensive community engagement process conducted throughout 2021. This Plan creates a vision for a thriving, inclusive, and interconnected system of parks, trails, and open space that promotes recreation, health,



Photo: Paul Newmann

environmental conservation, and fiscal responsibility as integral elements of a thriving, livable Camas.

The PROS Plan serves as a blueprint for the growth, enhancement, and management of the City of Camas park and recreation system and assists in guiding decisions related to planning, acquiring, developing, and maintaining parks, open space, trails, and recreational facilities. This Plan also identifies priorities for recreation programs and special events.

The 2022 PROS Plan provides updated system inventories, demographic conditions, needs analyses, and a comprehensive capital project list. The Plan identifies parks and recreation goals and establishes a long-range plan for the Camas park and recreation system, including action items and strategies for implementation over the next six to ten years. The recommendations in this Plan are based on community input, evaluations of the existing park system, operating conditions, and fiscal considerations.

The PROS Plan is part of the City's broader Comprehensive Plan and is consistent with the guidelines established by the Washington State's Growth Management Act. The PROS Plan, updated approximately every six years, allows Camas to remain current with community interests and retain eligibility for state grants through the Washington State Recreation and Conservation Office (RCO), which administers various grant programs for outdoor recreation and conservation efforts.

Planning Process

This PROS Plan represents the culmination of a year-long planning effort, and it reflects the community's interests and needs for parks, open space, trails, and programming - balanced with the realities of budget considerations. The planning process, which included a variety of public outreach activities, encouraged public engagement to inform the development of the priorities and future direction of Camas' park and recreation system. Community members expressed their interests through surveys, an online open house, stakeholder interviews, focus group discussions, tabling at events, online outreach, Parks and Recreation Commission meetings, and City Council meetings.

In addition to community engagement, the actions identified in this Plan are based on:

- An inventory and assessment of the City's existing park and recreation facilities to establish the system's current performance and to identify needed maintenance and capital repair and replacement projects, and
- Service level and walkability assessments to quantify the system's ability to serve current and future residents.

The Plan's capital facilities section and accompanying implementation and funding strategies are intended to sustain and enhance, preserve, and steward the City's critical parks and recreation infrastructure.

Department Overview

The City of Camas Parks and Recreation Department (Department) provides and manages a wide range of places that provide year-round active and passive recreational opportunities for residents and visitors. The Department develops, operates and maintains:

- 16 developed parks, including Fallen Leaf Lake Park
- A variety of outdoor recreation facilities, ranging from playgrounds and picnic areas to boating and water access points, to sports facilities like the Camas Skate Park and Prune Hill Sports Park
- Three indoor recreation and community gathering facilities – the Camas Community Center, Lacamas Lake Lodge, and Scout Hall
- 12 miles of City trails
- Over 1,060 acres of parks and open space

The Department also provides special events and recreational programs – including sports instruction, arts and crafts, and general education programs – for residents of all ages, often in partnership with local businesses.

Guided by Values

As part of this PROS Plan update, the Parks and Recreation Commission took the opportunity to update the Department's vision and mission statements to reflect current community input. The vision and mission statements, along with the PROS Plan goals, will guide the Department's work in the coming years.

Mission:

Camas Parks and Recreation promotes a healthy and sustainable community by listening and responding to the community's needs and desires, protecting and preserving its natural spaces to improve ecological health, and developing and maintaining parks, trails and recreation programs that are welcoming for all.

Vision:

We envision Camas as a thriving, cohesive community that honors a unique legacy of coordinated parks, trails, natural areas and diverse recreation opportunities highlighted by our lakes, rivers and streams. Stewardship and thoughtful enhancement of these assets ensure a safe, healthy, active and balanced lifestyle for all.

Accomplishments Since the 2014 Plan

The 2014 PROS Plan guided City officials, management, and staff in making decisions about planning, operating, and implementing various parks and recreation services. The following represents a short list of the major accomplishments realized following the adoption of the previous Plan:

- Opened the Lacamas Lake Lodge and Conference Center
- Prepared a site master plan to guide renovations to Fallen Leaf Lake Park
- Completed the first phase of field and site improvements for the Prune Hill Sports Park
- Constructed the Cooper's View Neighborhood Park
- Prepared a site master plan to guide renovations to Crown Park
- Acquired multiple properties along the north shore of Lacamas Lake, also known as Legacy Lands, (165 acres) and forest land at Green Mountain (115 acres)

Parks & Recreation Commission

Additionally, the efforts of the Department are guided by the Parks and Recreation Commission, a seven-member advisory group to the City Council. The Commission meets monthly to provide guidance and give recommendations on policy and issues relating to the delivery of parks and recreation services. The Commissioners are appointed by the Mayor and subject to confirmation by the City Council for three year terms.

Current Challenges

Impacts of the COVID-19 Pandemic

The COVID-19 pandemic and the associated health mandates for social distancing have transformed the way municipalities plan for and conduct public engagement. To develop this Plan, the City implemented a sound public process that was compliant with health mandates by using a range of online tools for communications, engagement and community feedback.

Health mandates related to the pandemic also had dramatic impacts on the City's recreation programming and operations, requiring the temporary closure of some facilities, capacity and use restrictions, and the cancellation of recreation programming. However, with improvements in local caseloads, Camas has now begun to offer in-person recreation programs and community events.

Equity, Inclusivity & Accessibility

Much has been written lately about the subject of equity and inclusion. Maintaining and enhancing social equity across recreational opportunities and facilities should be a core function of municipal park and recreation systems. Through this PROS Plan, the City of Camas made a concerted effort to reach out to and engage its historically underrepresented communities, and the City also invested in a dual language community survey to include Spanish.

Also, portions of the City's parks, trails and open space system were developed before the Americans with Disabilities Act (ADA) was implemented. The conditions assessment identified several deficiencies related to ADA compliance. The City must continue to find ways to provide safe and



equitable access to parks, trails, open space areas, facilities, recreation programs and other services.

Growth & Development

Over the past ten years, Camas has seen rapid population growth, which is expected to continue over the coming decade. More residents and new development will increase the need for recreational spaces and experiences across the city and increase the use of existing parks and facilities. Rapid growth will also intensify existing community needs for safe and accessible walking and biking routes as well as the preservation of open space and natural resources. In response, the City should consider ways to improve recreation facilities and parks to adapt to emerging needs, complete crtical connections in the City's extensive trail network, and proactively aquire or preserve parks and open spaces in strategic areas.

Asset Management

Established park and recreation systems require ongoing maintenance to serve the community safely and effectively. Public recreation providers across the country consider maintaining existing park facilities to be a key management issue. Poorly maintained assets – from benches to playgrounds to pools – can fail, either structurally or operationally, posing safety risks and reducing their recreational value. Aging infrastructure may also fail to meet community expectations or need capital upgrades to adapt to changing community needs. However, recreation providers often struggle to establish adequate funding mechanisms for routine and preventative maintenance and repair of facilities as well as the major rehabilitation and replacement of existing recreation facilities at the end of their useful life.

This Plan includes condition assessments of the City's parks and facilities to provide a baseline of current conditions that then informs facility, maintenance, and operations policies and improvements. Proper maintenance of park and recreation assets will prevent them from deteriorating thereby reducing long-term capital and operating costs, maintaining safety, improving public perception and increasing community use.

Active Older Adults

The City of Camas' relatively older population, low rates of disability among residents over 65, and high rates of participation among residents of all ages, indicate a potential local need for active recreation opportunities for active older adults. Nationwide, active seniors are often looking at retirement age differently, and many are transitioning to new careers, finding ways to engage with their community, and focusing on their health and fitness. To meet the needs of active older residents, the City will need to consider how the City's park and recreation facilities and programming can meet the needs of this growing group.





Guiding Documents

This PROS Plan is one of several documents that comprise Camas' long-range planning and policy framework. Past community plans and other relevant documents were reviewed for policy direction and goals as they relate to parks, open space, trails, and recreation opportunities across Camas.

- Comprehensive Plan Camas 2035
- City of Camas Strategic Plan
- Camas Parks, Recreation and Open Space Plan (2014)
- City of Camas Transportation Plan
- Lacamas Lake Management Plan (under development)
- North Shore Lacamas Lake – A Vision for Conservation and Recreation (2017)
- Lewis & Clark Regional Trail Concept Plan (2020)
- Clark County Conservation Areas Acquisition Plan (2020)
- Clark County Parks, Recreation & Open Space Plan (2020)
- City of Washougal Comprehensive Parks & Recreation Plan (2021)

Contents of the Plan

The remainder of the Camas PROS Plan is organized as follows:

- Chapter 2: Community Profile – provides an overview of the City of Camas and its demographics.
- Chapter 3: Community Engagement – highlights the methods used to engage the Camas community in developing the Plan.
- Chapter 4: Classifications & Inventory – describes the existing park and recreation system.
- Chapter 5: Parks & Trails
- Chapter 6: Open Space & Stewardship
- Chapter 7: Recreation & Events
- Chapter 8: Operations & Maintenance
- Chapter 9: Goals & Objectives – provides a policy framework for the park and recreation system grouped by major functional areas and goal themes.
- Chapter 10: Capital Planning & Implementation – details a 6-year program for addressing park and recreation facility enhancements, maintenance, or expansion projects.
- Appendices: Provides technical or supporting information to the planning effort and includes survey summaries, focus group notes, recreation trends, and funding options, among others.

CHAPTER 2

Community PROFILE

Situated in the eastern, hilly portion of Clark County, the City of Camas offers many amenities for the community including a quaint yet vibrant downtown, First Friday evening family events, a beautiful public library, summer farmer's market on Wednesdays, Lacamas Lake and miles of surrounding trails to walk, and much more.



The City of Camas is located along the Columbia River and State Route 14 in southwestern Washington. Incorporated in 1906, Camas is now home to 26,065 residents. Camas prides itself on its small-town character, vibrant downtown, safe residential neighborhoods, and an abundance of open space and trails.

Most of the City is developed with single family homes interspersed with forested green spaces. The City's historic downtown attracts locals and tourists while major employers, including many high-tech manufacturers, provide employment opportunities for city and regional residents. The City is bordered to the east by the City of Washougal and by the City of Vancouver to the west. Camas is located just 20 miles from downtown Portland, Oregon.

The City of Camas provides a wide range of government services and is dedicated to maintaining the community's family-friendly character while providing sustainable economic growth and preserving the city's access to nature. The City's parks, open spaces, trails, and recreational opportunities are highly valued – for recreation, respite, and their ecosystem values.



"

I love the walking trails through the natural areas SO MUCH!! Would love to have more of them connected.

- Online Open House participant

Demographic Profile

Camas is a city of over 26,000 residents and has tripled in population over the past thirty years. The city is home to many families with children, see Figure 1. The City's residents are generally very well educated and have higher incomes than other county residents. Many are employed in the education, health care, professional, or manufacturing sectors, including at the multiple technology companies located in Camas. Residents also commute to other areas of the Portland-Vancouver metropolitan region for work.

Figure 1. Population Characteristics: Camas, Clark County, and Washington

Demographics	Camas	Clark County	Washington
Population Characteristics			
Population (2020)	**26,065**	503,311	7,705,281
Population (2010)	**19,355**	426,709	6,724,540
Population (2000)	**12,534**	347,510	5,894,121
Percent Change (2000-20)	**100.0%**	45.0%	31.0%
Persons w/ Disabilities (%)	**9.1%%**	12.3%%	12.7%%
Household Characteristics			
Households	**9,234**	195,036	3,202,241
Percent with children	**45.1%**	33.8%	30.6%
Median Household Income	**$111,584**	$75,253	$73,775
Average Household Size	**2.81**	2.69	2.55
Average Family Size	**3.16**	3.15	3.09
Owner Occupancy Rate	**77.7%**	67.0%	63.0%
Age Groups			
Median Age	**40.2**	38.4	37.7
Population < 5 years of age	**5.6%**	6.2%	6.1%
Population < 18 years of age	**28.5%**	24.3%	22.2%
Population 18 - 64 years of age	**59.6%**	60.7%	62.7%
Population > 65 years of age	**11.9%**	15.0%	15.1%

Sources: Washington Office of Financial Management Population Estimates, 2020
U.S. Census, 2000 Census, 2010 Census, 2015-2019 American Community Survey

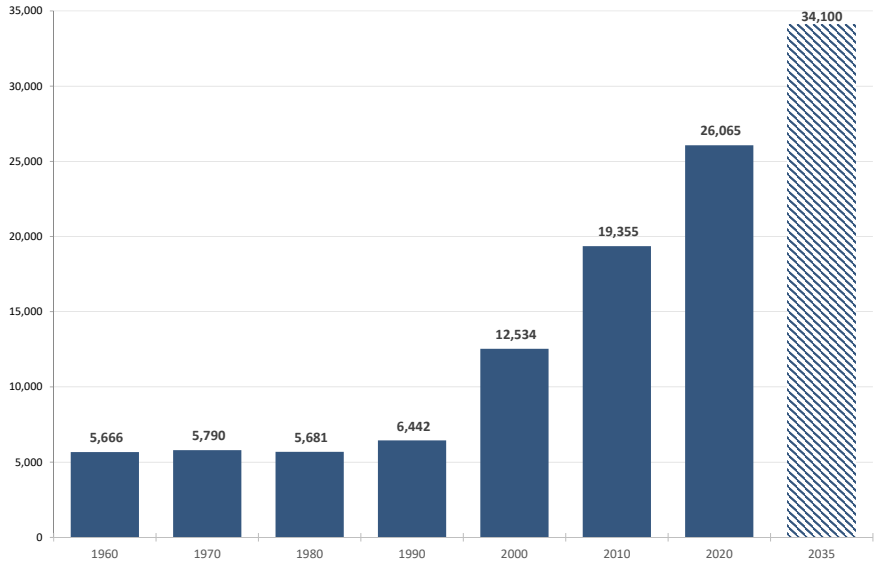
Population and Anticipated Growth

The City of Camas incorporated in 1906 and grew slowly through most of the 20th century, see Figure 2. However, the completion of the Interstate 205 bridge and the opening of Hewlett Packard and Tektronix plants in the mid-1980s spurred rapid growth. Between 1990 and 2000, Camas' population nearly doubled, from 6,442 to 12,534 residents. Continued economic expansion in the technology industry, expansion of the city limits through annexation, and the City's proximity to the growing Portland, Oregon and Vancouver, Washington have spurred steady growth in the past two decades. In 2020, Camas was home to about 26,065 residents and makes up about 5% of the total population of Clark County. Annual population growth has averaged over 5% per year over the past forty years. The Camas 2035 Comprehensive Plan projects that the city will grow to about 34,100 people by 2035, equivalent to about 2.05% annual growth over that period.

In 2020, Camas was home to 9,235 households of which 45% were families with children under 18, and 36% were individuals living alone. The 2019 average household size in Camas was 2.81 people, which is quite a bit larger than that of the county (2.69) and state (2.55).

The size of a community and its anticipated growth over time are key indicators of whether existing park and recreation facilities will be sufficient to meet future needs. Population growth can also result in increased residential density and/or the development of currently vacant land within a city, potentially increasing the need for away-from-home recreation opportunities while simultaneously reducing potential locations for park and open space acquisition. Advanced planning for parks and recreation facilities can help ensure residents can enjoy sufficient, conveniently located parks, open space, and recreation facilities while the community grows and evolves.

Figure 2. Population – Actual and Projected: 1970-2040



Age Group Distribution

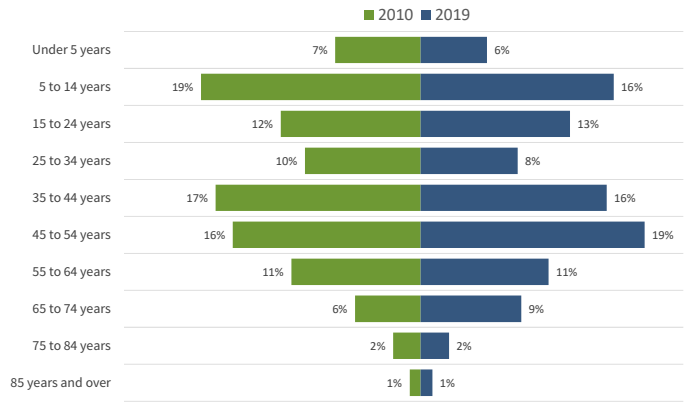
Camas has a median age of 40 (2019), older than that of the county (38.4) and state (37.7). The City also has a relatively high population of families with children (45%). These demographics have important implications for park and recreation needs. Adults between 40 to 59 years old make up the city's largest 20-year population group, comprising 35% of the overall population in 2019, see Figure 3.

- Youth under 5 years of age make up 5.6% of Camas' population, see Figure 3. This group represents users of preschool and tot programs and facilities, and, as trails and open space users, are often in strollers. These individuals are the future participants in youth activities.
- Children ages 5 to 14 years make up current youth program, whole-family program, and event participants. Approximately 16% of the city's population falls into this age range.
- Teens and young adults, age 15 to 24 years, are in transition from youth programs to adult programs and participate in teen/young adult programs where available. Members of this age group are often seasonal employment seekers. About 13% of city residents are teens and young adults.

While just over one-third of residents are youth and young adults up to 24 years of age, 43% are 25 to 54 years old, and 23% are 55 and older.

- Adults ages 25 to 34 years are users of adult programs. Approximately 8% of residents are in this age category. These residents may be entering long-term relationships and establishing families.
- Adults between 35 and 54 years of age represent users of a wide range of adult programs and park facilities. Their characteristics extend from having children using preschool and youth programs to becoming empty nesters. This age group makes up 35% of the city's population.
- Older adults, ages 55 years plus, make up approximately 23% of Camas' population. This group represents users of adult and senior programs. These residents may be approaching retirement or already retired and may be spending time with grandchildren. This group also ranges from very healthy, active seniors to more physically inactive seniors.

Figure 3. Age Group Distributions: 2010 & 2019



Race and Ethnicity

According to the 2019 American Community Survey, Camas residents identified as 84% White, 8% Asian, 6% as two or more races, and less than 1% Black or African American, American Indian or Alaskan Native, Pacific Islander, or another race. Approximately 5% of people identified as Hispanic or Latino of any race. Camas' low level of racial diversity is on par with that of Clark County, where 85% of residents identify as White. Camas' population has become only modestly more diverse over the past decade, see Figure 4.

In 2019, approximately 11% of Camas' population spoke a language other than English at home; Asian and Pacific Island languages and other Indo-European languages comprise the largest non-English language groups. However, less than 3% of residents speak English 'less than very well'. Camas has a smaller percentage of people who speak a language other than English at home than compared to Clark County as a whole (15%).

Nationally, the design and marketing of municipal recreation programs have also historically been biased against serving communities of color. In addition, residents who speak languages other than English may face barriers in finding, accessing, and participating in park and recreation facilities and programs. Camas should consider how it could best provide recreational opportunities, programs, and information that are accessible and relevant to, and meet the needs of, all community members.

Figure 4. Changes in Racial Composition - 2000 to 2019

Racial Identification	2010	2019
White	87.4%	83.6%
Asian	6.0%	8.2%
Two or more races	3.6%	6.0%
Some other race	1.2%	0.4%
Black or African American	1.0%	0.8%
American Indian and Alaska Native	0.6%	0.9%
Native Hawaiian & Other Pacific Islander	0.2%	0.1%
Hispanic or Latino (of any race)	4.1%	4.9%

Persons with Disabilities

The 2019 American Community Survey reported 9.1% (2,092 persons) of Camas' population aged 5 years and older as having a disability that interferes with life activities. This is lower than the county (12.3%) and state average (12.7%). Approximately 8% of residents between 18 and 64 have a disability. Among residents 65 and older, the percentage rises to 25%, which is lower than the percentage found in the general senior population of Washington State (35%).

Planning, designing, and operating a park system that facilitates participation by residents of all abilities will help ensure compliance with Title II of the Americans with Disabilities Act (ADA). In addition to ADA, there are other accommodations that people with disabilities may need to access parks and participate in recreation programs. Camas should consider community needs for inclusive and accessible parks, recreational facilities, programs, marketing, and communications.

Employment & Education

According to the 2019 American Community Survey, the 2019 work force population of Camas was 17,743 (76%). Of this population, 68% is in the labor force, 2% is unemployed, and 32% is not in the labor force. Nearly 60% of employed residents work in a management, business, science, or arts occupation. One quarter of employed residents work the education or health care industries, while another 15% work in the professional/management industries. The manufacturing sector also employs a large percentage of local workers (approximately 13%).

Approximately 29% of Camas residents over age 25 have a bachelor's degree or higher, and 82% have at least some college education. This level of education attainment is higher than that of Clark County and the state (in which 68% and 69% of residents have some college, respectively). Additionally, 95% of city residents have a high school degree or higher, approximately four percentage points higher than the statewide average.

Higher levels of employment and educational attainment positively correlate with both the income and health status of a community – both of which have further impacts on the use and need for park and recreation facilities, as described in the next two sections.

Income & Poverty

A community's level of household income can impact the types of recreational services prioritized by community members, as well as their willingness and ability to pay for recreational services. Perhaps more importantly, household income is closely linked with levels of physical activity. Low-income households are three times more likely to live a sedentary lifestyle than middle and upper-income households, according to an analysis of national data by the Active Living by Design organization.

In 2019, the median household income in Camas was $111,584. This income level was about 50% higher than the median income for Clark County ($75,253) and Washington households ($73,775).

Higher income households have an increased ability and willingness to pay for recreation and leisure services, and they often face fewer barriers to participation. Approximately 56% of city households have incomes in the higher income brackets ($100,000 and greater), which is significantly more than across the state (36%).

At the lower end of the household income scale, approximately 6% percent of Camas households earn less than $25,000 annually, significantly fewer than households in Clark County (13%), the State of Washington (15%), and across the United States (23%). In 2019, less than 2% of the city's families were living below the poverty level, set at an income of $25,750 for a family of four. This percentage is lower than the countywide (approximately 5.8%) and statewide (7%) levels. Poverty affects 3% of youth under 18 and 4% of those 65 and older.

Generally, lower-income residents may face barriers to physical activity, including reduced access to parks and recreational facilities, a lack of transportation options, a lack of time, and poor health. Low-income residents may also be less financially able to afford recreational service fees or to pay for services, such as childcare, that can make physical activity possible.

Health Status

The overall health of a community's residents can impact their ability to participate in recreation and other physical activity and may also reflect, in part, the locality's level of access to appropriate and convenient green spaces, recreation opportunities, and active transportation facilities.

Information on the health of Camas residents was not immediately available. However, according to the County Health Rankings, Clark County ranks in the highest quartile of Washington counties for health outcomes, including length and quality of life.

Clark County residents also rank as some of the healthiest residents in Washington (high middle quartile) when it comes to health behaviors. Only 18% of Clark County adults ages 20 and older report getting no leisure-time physical activity – on par than the statewide average of 17%. This may be due, in part, to the large number of places to participate in physical activity, including parks and public or private community centers, gyms, or other recreational facilities. Over 96% of residents in Clark County have access to adequate physical activity opportunities, more than the 88% average for all Washington residents. However, approximately 29% of Clark County adults are overweight or obese, compared to 27% of Washington adults.

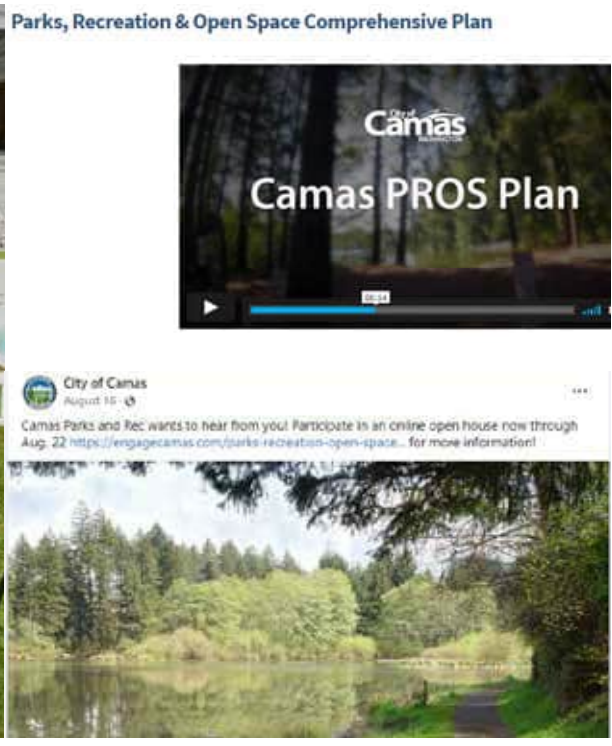
CHAPTER 3

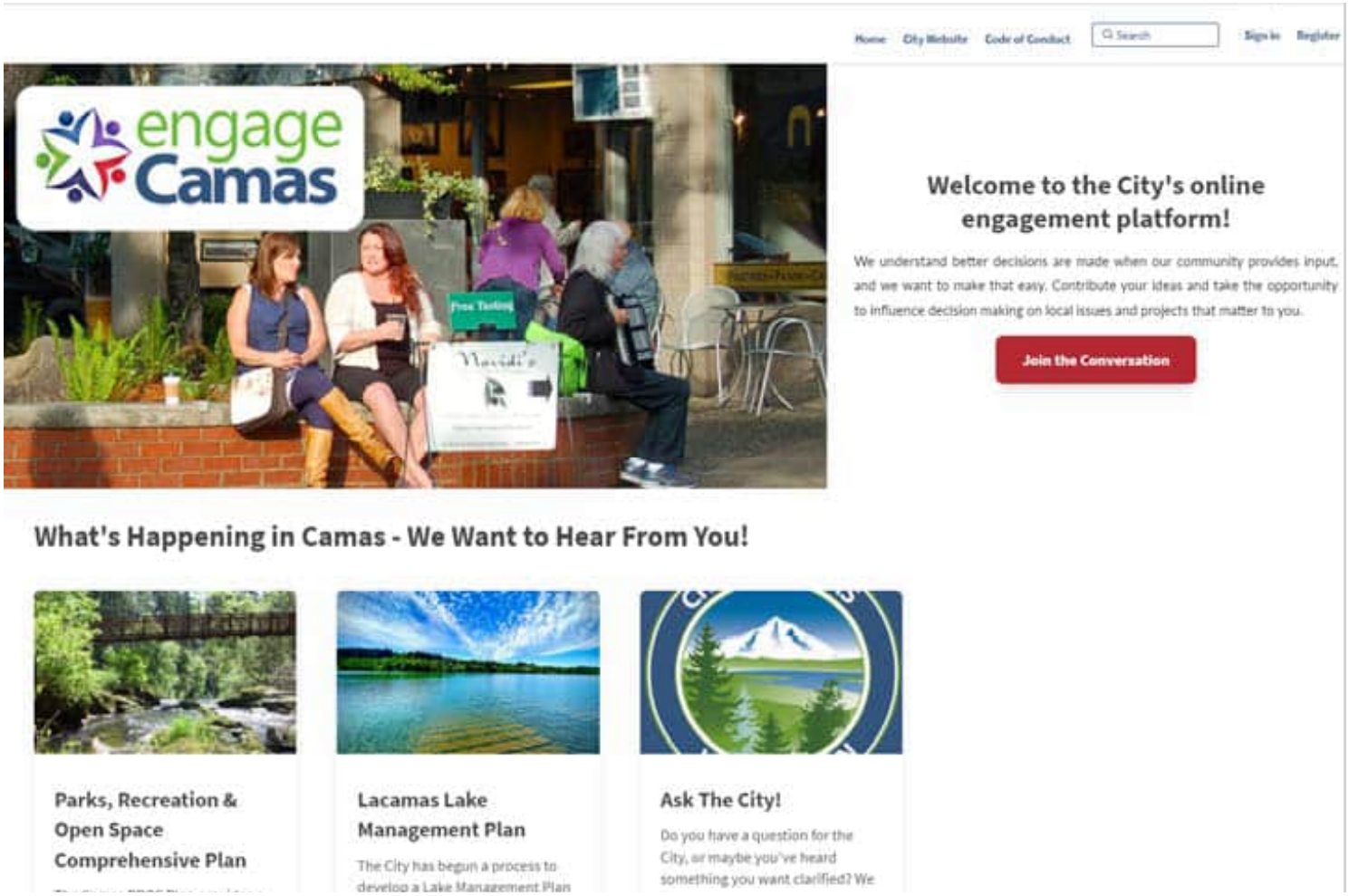
Community **LISTENING**

Community engagement played an essential role in developing the 2022 PROS Plan. Although the planning process occurred during the COVID-19 pandemic, numerous efforts were made to connect with the community, seek their input and provide information about the project. Public outreach methods were varied and extensive, including:

- Random-sample mail survey
- Online community-wide survey in English and Spanish
- Two online open houses
- Stakeholder group discussions
- Individual stakeholder interviews
- Tabling and outreach at multiple community events
- Meetings with the Parks and Recreation Commission, Planning Commission and City Council
- Camas city website and Engage Camas online forum with interactive mapping tool, plan information and feedback opportunities
- Multiple social media postings, email blasts







Over 1,700 participants provided insights on current community preferences and priorities.

COMMUNITY SURVEY

A community-wide, online survey was conducted to assess the recreational needs and priorities of Camas residents. The City mailed 2,500 surveys to randomly chosen households in Camas on May 29, 2021, of which 509 surveys were completed and returned. Online versions of the survey in English and Spanish were posted to the City's website on June 4, 2021. An additional 874 surveys in English and two in Spanish were completed from the general, community-wide online surveys. In all, 1,385 surveys were completed.

Information about the survey was provided on the City's website and on the Engage Camas site for the PROS Plan project. It was promoted via public meeting announcements, multiple social media postings, city email blasts and an email blast through Camas School District mailing list. Print copies were made available at the Camas Library and the Camas School District Family Community Resource Center. Also, signage and flyers with QR codes were placed at numerous parks and local businesses.

The survey measured current levels of satisfaction and which facilities were primarily being used by residents. Residents were asked about future improvements and the types of recreational amenities they would like to see considered for the park system. Survey respondents were asked about:

- Performance and quality of programs and parks
- Usage of city parks and recreation facilities
- Overall satisfaction with the value of services being delivered by the city
- Opinions about the need for various park, recreation, and trail improvements
- Preference for learning about programs
- Priorities for future park and recreation services and facilities, including revenue generation and other funding tools

Significant survey findings are noted below, and a more detailed discussion of results can be found in the needs assessment chapters covering parks, open space, recreation, and trails (Chapters 6 - 8).

Major Survey Findings:

- **Livability:** Nearly all respondents (97%) feel that public parks and recreation opportunities are important or essential to the quality of life in Camas.
- **Usage:** Park visitation is high, with 88% of respondents visiting parks or recreation facilities at least once a month. The most popular activities are walking or running (80%), followed by fitness and exercise (70%), and relaxation (56%).
- **Park Amenity Priorities:** More than three in four respondents are very or somewhat supportive of adding walking trails (87%), updated (75%) and accessible (75%) playground features, and more picnic shelters (74%) to the City's existing parks. A plurality of survey respondents think that Camas does not have enough walking and biking trails (46%).
- **Recreation Facilities & Programming:** Respondents to both the mail and online survey ranked maintaining existing parks, expanding trail opportunities, building new parks, and acquiring land for future parks as their top priorities. More than half of survey respondents felt the City needed more outdoor adventure summer camps, teen activities, adult wellness classes, and programs for adults over 55.

The complete survey summary is provided in Appendix A.

Online Open House #1

The City hosted an online open house to share information about the Camas Parks, Recreation and Open Space (PROS) Plan Update with the public and dive deeper into survey responses to explore more about which park and recreation programs, services and facilities are important to them. More than 130 people visited the online open house from July 29 and August 22, 2021, and 74 community members provided responses in the online open house. The online open house was promoted via social media posts, community event tabling, email blasts and public meeting announcements.

Major Online Open House Findings:

- After-school and summer day camps, outdoor adventure camps and youth sport programs were strongly supported by respondents.
- Top park improvement priorities included building new parks on city-owned land, installing a splash pad and building additional shared-used trails.
- Other top improvements included acquiring and developing trail corridors to fill gaps and providing an off-leash dog area.

A summary of responses to the online open house is provided in Appendix B.

Stakeholder Discussions

COVID-sensitive, online focus group discussions and individual interviews with external stakeholders were conducted to more broadly assess local needs and opportunities for partnership and coordination. Stakeholders were identified by city staff based on their past coordination, their involvement, or interest in the future of recreation, park, athletic or trail facilities. The group-based discussion sessions were conducted via Zoom and occurred between July 2020 and September 2021. Representatives from the following organizations participated:

Summary meeting notes from each focus group session are provided in Appendix C.

Figure 5. Stakeholder Group Participants

Mountain Bike & Pump Track Advocates	**Sport Field User Groups**
■ Evergreen Mountain Bike Alliance ■ Camas Bikes ■ Local resident advocates ■ Portland Parks & Recreation	■ Camas Little League ■ Camas Lacrosse
Underrepresented Users Group	**Bike & Pedestrian Trail Users Group**
■ Clark County Commission on Aging ■ Clark County Community Services ■ Washington State School for the Blind ■ SW Washington Center of the Deaf and Hard of Hearing ■ Hispanic Metropolitan Chamber of Commerce of SW Washington	■ Evergreen Mountain Bike Alliance ■ Camas Ivy League ■ All Weather Walkers ■ Washington Trails Alliance ■ Local volunteers
Public Agencies Group	**Individual Interviews**
■ City of Washougal ■ City of Vancouver ■ Clark County ■ Port of Camas-Washougal	■ Former City Administrator ■ Former Mayor ■ Local Land Development Representative ■ Downtown Camas Association

Engage Camas Online Forum

The City of Camas has implemented an integrated online engagement platform to their city website, called Engage Camas. The PROS Plan was a highlighted city project on Engage Camas, which included information about the plan update and public process, a video introducing the project, periodic updates and interim project documents, such as presentation materials and summaries from community outreach. Engage Camas was also a primary forum for community members to offer direct feedback, comments and questions. The PROS Plan page was maintained and updated through the duration of the project.

Online Interactive Mapping

On the Engage Camas project page, the public was provided an interactive map of Camas and given the opportunity to share which parks, trails, and open spaces they currently visit in Camas; where they think improvements need to be made; and what new things they would like to see offered in Camas' park system. Eleven unique users submitted a total of 22 comments. A highlight of some of the comments follows:

- Replace the play equipment at Grass Valley Park
- Provide parking on the north side of Lacamas Lake
- At Crown Park, consider new/updated programming to tie in with programs/activities to be offered at new Garfield Performing Arts Center, splash pad or kids pool, new restroom
- Consider a splash pad or community fountain, parking lot and picnic tables at Fallen Leaf Lake

Community Event Tabling

This section summarizes the feedback received at the three tabling events held in July and August to build awareness of the PROS Plan Update and share information about the project. Approximately 50 people were engaged at these events. Tabling was held at the following times and places:

- July 31st at Heritage Park from 10 a.m.-12 p.m. and 1 p.m. - 2 p.m.
- August 17th at Concert in the Park from 6:30 p.m. - 8:30 p.m.
- August 18 at Camas Farmer's Market from 3 p.m. - 7 p.m.

Community comments ranged from concerns about water quality at the lakes, to interest in an expanded trail network, to specific park improvements and enhanced communications from the City.

Online Open House #2

The City hosted a second online open house to share information and seek feedback on the public draft of the PROS Plan in January 2022. The online open house garnered a total of 136 survey responses and 923 site visits. The majority of participants (68%) believe the PROS Plan is on the right track. The two most common requests were for a bike park/pump track and new sports fields. Many respondents would like off road/mountain biking trails and turf and/or lights added to sport fields. A few other notable requests include adding a pool, creating more trail connections, and adding more bike lanes and trails.

Parks & Recreation Commission Meetings

The Parks and Recreation Commission provided feedback on the development of the PROS Plan during five regularly scheduled public sessions. The first session occurred on April 28, 2021, immediately after the planning project was initiated. The Commission discussed the update and provided their perspectives on a vision for the system, specific challenges, opportunities, and ideas about parks, trails and programs. The Commission spent significant effort reviewing and commenting on the PROS Plan public process, project priorities, and system-wide goals and strategies to implement improvement projects. Subsequent sessions in July, September (joint with Planning Commission), October, December 2021 and January 2022 (joint with Planning Commission) were used to review public feedback and solicit direction from the Commission on priorities and recommendations for the new PROS Plan.

Other Outreach

In addition to the direct outreach opportunities described above, the Camas community was informed about the planning process through a variety of media platforms. The following methods were used to share information about the project and provide opportunities to participate and offer comments:

- City website home page
- PROS Plan project page on Engage Camas
- Email blasts to the Parks and Recreation distribution list
- Social media: Twitter & Facebook
- Media releases
- Announcements at Council and Parks & Recreation Commission public meetings
- Announcements at Stakeholder Focus Group meeting



BENEFITS OF PARKS, RECREATION & OPEN SPACE

A number of organizations and non-profits have documented the overall health and wellness benefits provided by parks, open space and trails. The Trust for Public Land published a report called *The Benefits of Parks: Why America Needs More City Parks and Open Space*. This report makes the following observations about the health, economic, environmental, and social benefits of parks and open space:

- Physical activity makes people healthier.
- Physical activity increases with access to parks.
- Contact with the natural world improves physical and psychological health.
- Value is added to community and economic development sustainability.
- Benefits of tourism are enhanced.
- Trees are effective in improving air quality and assisting with stormwater control.
- Recreational opportunities for all ages are provided.



Physical Activity Benefits

Residents in communities with increased access to parks, recreation, natural areas and trails have more opportunities for physical activity, both through recreation and active transportation. By participating in physical activity, residents can reduce their risk of being or becoming overweight or obese, decrease their likelihood of suffering from chronic diseases, such as heart disease and type-2 diabetes, and improve their levels of stress and anxiety. Nearby access to parks has been shown to increase levels of physical activity. According to studies cited in a 2010 report by the National Park and Recreation Association, the majority of people of all ages who visit parks are physically active during their visit. Also, the Centers for Disease Control and Prevention (CDC) reports that greater access to parks leads to 25% more people exercising three or more days per week.



Community Benefits

Park and recreation facilities provide opportunities to engage with family, friends, and neighbors, thereby increasing social capital and community cohesion, which can improve residents' mental health and overall well-being. People who feel that they are connected to their community and those who participate in recreational, community and other activities are more likely to have better mental and physical health and to live longer lives. Access to parks and recreational facilities has also been linked to reductions in crime, particularly juvenile delinquency.



Economic Benefits

Parks and recreation facilities can bring positive economic impacts through increased property values, increased attractiveness for businesses and workers (quality of life), and through direct increases in employment opportunities.

In Washington, outdoor recreation generates $26.2 billion in consumer spending annually, $7.6 billion in wages and salaries, and $2.3 billion in state and local tax revenue. Preserving access to outdoor recreation protects the economy, the businesses, the communities and the people who depend on the ability to play outside. According to the Outdoor Recreation Economy Report published by the Outdoor Industry Association, outdoor recreation can grow jobs and drive the economy through management and investment in parks, waters and trails as an interconnected system designed to sustain economic dividends for citizens.

CHAPTER 4

Classifications & INVENTORY

Need to provide facilities for additional outdoor activities that create community connection and activity. With the number of sporting families, Camas lacks facilities that other communities provide.
- Online Open House participant



The City of Camas manages over 1,000 acres of parks and open space lands, providing several public waterfront access sites, active recreational facilities for team sports, several playgrounds, more than 12 miles of walking paths and trails, picnic areas, and hundreds of acres of natural forest lands.

PARKLAND CLASSIFICATIONS

Parkland is classified to assist in planning for the community's recreational needs. The classifications also reflect standards that inform development decisions during site planning, in addition to operations and maintenance expectations for the level of developed facilities or natural lands. The Camas park system is composed of a hierarchy of various park types, each offering recreational opportunities and natural environmental functions. Collectively, the park system is intended to serve the full range of community needs.

Each park classification defines the site's function and expected amenities and recreational uses. The classification characteristics serve as general guidelines addressing the size and use of each park type. The following six classifications are used in Camas' park system.

Neighborhood Parks



Neighborhood parks provide close-to-home recreation opportunities. These parks provide both active and passive recreation opportunities for people living within approximately one-half mile of the park. Typical facilities found in a neighborhood park include playground equipment, picnic areas, open grass areas for passive use, outdoor basketball court, and multi-use open grass area for field sport practice. Dorothy Fox Park and Cooper's View Park are examples of typical neighborhood parks in Camas.

Neighborhood parks should be located and designed based on the scale and type of surrounding uses. During site master planning, parks in locations with higher residential density should be designed with more resilient features and facilities that can withstand more intensive use.

Site Selection & Design:

- Neighborhood park sites should be 5 to 10 acres in size. The minimum size for neighborhood parks is 3 acres when land constraints do not allow a larger site.
- At least 50% of a neighborhood park site should be suitable for active uses.
- The site should have good visibility from surrounding streets and have a minimum of 200' of street frontage.
- The site should be relatively central to the area it is intended to serve (within about ½ mile of the intended users).
- The site should be accessible by walking, bicycling, or driving. Connections to the community trail network should be provided, where possible, to facilitate walking and bicycling. Sidewalks should be provided.
- Regional-scale facilities (e.g., large sports complex, community center, etc.) should not be provided







Community Parks



Community parks are larger parks, typically between 10 and 30 acres, that provide a wide variety of recreation opportunities that appeal to the entire community. Typically, these sites are designed for active recreation, supported by facilities such as sport fields, outdoor courts, skate parks and recreation centers. Community parks can accommodate large numbers of people and offer a wider variety of facilities than neighborhood parks, such as disc golf, volleyball, tennis courts, dog parks, and group picnic areas. These parks also may serve as destination for access to water and large community events, and they may include significant natural areas and trails. For this reason, community parks require more support facilities, such as off-street parking and restrooms. Community parks can also serve as local neighborhood parks for their immediate areas, and they may be connected to schools or other community facilities. Prune Hill Sports Park and Crown Park are examples of community parks.

Site Selection & Design:

- Community park sites should be 10 to 30 acres in size. The minimum size for community parks is 6 acres when land constraints do not allow a larger site.
- At least 30% of a community park site should be suitable for active uses.
- The site should have good visibility from surrounding streets and provide parking and restrooms.
- The site should be accessible by walking, bicycling, or driving. Connections to the trail network should be provided, where possible, to facilitate walking and bicycling. Sidewalks should be provided.
- Community parks should accommodate diverse active-use recreation, such as sport fields, sport courts and large playgrounds.

Regional Parks



Regional parks may be provided by Camas and also are provided by Clark County - serving residents from throughout Clark County and beyond. Regional parks are usually larger than 50 acres in size and provide opportunities for diverse recreational activities. Facilities may include sports fields, extensive trail systems, or large picnic areas. In addition, regional parks often include passive recreation space and unique features, such as significant natural areas or access to lakes or rivers.

Site Selection & Design:

- Regional park sites should be 50 to 200 acres in size. There is no minimum size for regional parks, since the size of the site relates to the uniqueness of the landscape or recreational experience provided.
- Regional parks should provide parking and restrooms.
- The site should be accessible by walking, bicycling, or driving. Connections to the trail network should be provided, where possible, to facilitate walking and bicycling.
- Regional parks may accommodate active-use recreation and/or passive uses such as trail walking or wildlife viewing. Specialized regional amenities may be provided, such as mountain biking trails, equestrian trails, and water access (e.g., boat ramps & docks).

Special Use Areas



Special use areas are sites that are occupied by a specialized facility or that fulfill a specialized purpose. Some uses that fall into this park type include waterfront parks, pools, boat ramps, interpretive centers, botanical gardens, community gardens, single purpose sites used for a particular field sport or sites that offer indoor recreation opportunities. Fallen Leaf Softball Field, Lacamas Lodge and the Camas Community Center are examples of special use areas in Camas.

Site Selection:

- Site size should be adequate to support the proposed specialized use, as well as necessary supporting facilities, including parking, stormwater management, etc.
- Site selection criteria will be dependent on the specific specialized use proposed, and may include criteria determined through an economic feasibility study.
- The site should be accessible from the community-wide trail system.
- Prior to the addition of any special use areas, the City should prepare a detailed cost/benefit analysis and maintenance impact statement for each proposed site being considered.

Natural Open Space



Natural open space is defined as undeveloped land primarily left in its natural form with passive recreation use as a secondary objective, such as trails. This type of land often includes wetlands, steep hillsides, or other similar undevelopable spaces. In some cases, environmentally sensitive areas are considered as open space and may include wildlife habitats, stream and creek corridors, or unique and/or endangered plant species. There are currently a number of natural open space areas in Camas, and the Ostensen Canyon Greenway and the Prune Hill South Open Space are examples of natural open space.

Site Selection:

- Site size should be based on natural resource and connectivity needs.
- Public use of natural open space sites should be encouraged through trails, viewpoints, and other features, but environmentally sensitive areas should be protected.
- The site should have access to a public street, to public land, or contribute to the planned open space network.
- Features in natural open space areas should be limited to those appropriate for the numbers and types of visitors the area can accommodate, while retaining its resource value, natural character, and the intended level of solitude.

Cemetery

The Camas Cemetery is an important historic and aesthetic resource for the City of Camas. Located adjacent to Lacamas Park, the cemetery is a unique, special facility and component of the park and open space system that provides a peaceful resting place and a quiet splace for reflection. The City took over the operations of the cemetery in 2007.

Park & Open Space Inventory

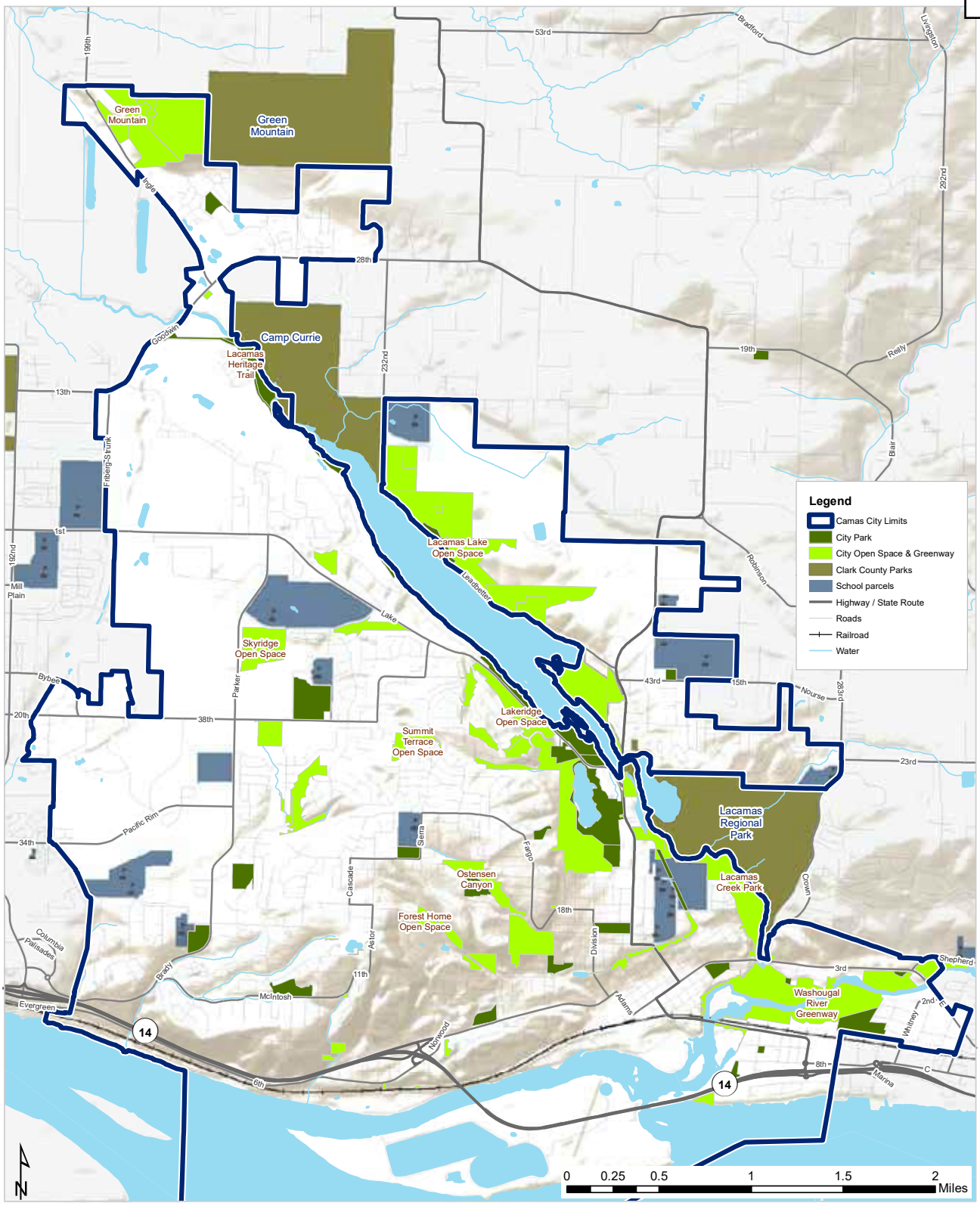
The park and open space inventory identifies the recreational assets within Camas. The City provides 1,068 acres of public parkland distributed among 59 parks and natural area properties, see Figure 6 and 7.

Figure 6. Existing Inventory of City Park & Natural Areas

Name	Classification	Status	Acreage
Fallen Leaf Lake Park	Regional Park	Developed	54.8
Green Mountain	Regional Park	Undeveloped	114.2
		Subtotal	**169.0**
Crown Park	Community Park	Developed	7.3
Grass Valley Park	Community Park	Developed	25.0
Goot Park	Community Park	Developed	5.8
Heritage Park	Community Park	Developed	12.8
Prune Hill Sports Park	Community Park	Developed	9.0
		Subtotal	**59.7**
Ash Creek Park	Neighborhood Park	Undeveloped	9.7
Benton Park	Neighborhood Park	Developed	2.2
Coopers View Park	Neighborhood Park	Developed	2.5
Dorothy Fox Park	Neighborhood Park	Developed	5.0
Forest Home Park	Neighborhood Park	Developed	4.7
Green Mountain Neighborhood Park	Neighborhood Park	Developed	5.3
Klickitat Park	Neighborhood Park	Developed	8.8
Lacamas Heights Park	Neighborhood Park	Undeveloped	2.3
Louis Bloch Park	Neighborhood Park	Developed	5.0
Oak Park	Neighborhood Park	Developed	2.5
Ostensen Canyon Park	Neighborhood Park	Undeveloped	8.2
		Subtotal	**56.2**
Baz Park	Special Facility	Developed	0.6
Camas Community Center	Special Facility	Developed	0.9
Downtown Community Garden	Special Facility	Developed	0.1
Fallen Leaf Softball Field	Special Facility	Developed	6.0
Lacamas Lake Lodge & Conference Center	Special Facility	Developed	4.8
Leadbetter House	Special Facility	Undeveloped	3.0
Pomaria House	Special Facility	Undeveloped	3.0
Skate Park	Special Facility	Developed	0.9
		Subtotal	**19.4**
Heritage Trail	Trail / Linear Park	Developed	30.9
Mill Ditch Trail	Trail / Linear Park	Undeveloped	1.7
Renaissance Summit Trail Access	Trail / Linear Park	Undeveloped	0.4
		Subtotal	**33.0**
Camas Cemetery	Cemetery	Developed	25.4
		Subtotal	**25.4**
		TOTAL PARKS & GREENSPACE	**1,068.0**

A listing of existing City open space and greenways follow in Figure 7. Detailed descriptions of the City's parks and natural areas is provided in Appendix D.

The following map shows the location of existing parks and natural areas within the City.



Map 1: Existing Parks & Open Spaces

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Figure 7. Existing Inventory of City Greenways & Natural Areas

Name	Acreage
6th Ave Open Space	0.6
Columbia River Open Space	2.8
Columbia View Terrace Open Space	0.2
Crown Road Open Space	1.4
Fallen Leaf Open Space	52.3
Forest Home Open Space	19.7
Goodwin Road Open Space	0.8
Grass Valley Open Space	11.3
Lacamas Creek Open Space	10.6
Lacamas Creek Park	50.9
Lacamas Lake Open Space	169.3
Lake Road Open Space	7.0
Lakeridge North	33.3
Lakeridge Open Space	26.2
Meadows Open Space	3.4

Name	Acreage
Mill Ditch Open Space	9.1
Mills Open Space	31.6
Ostensen Canyon Greenway	50.3
Prune Hill Slope Open Space	19.1
Prune Hill South Open Space	3.9
Renaissance Summit Open Space	0.3
Skyridge Open Space	29.6
Summit Terrace Open Space	12.3
Sunningdale Open Space	1.7
Tidland Heights Open Space	1.5
Top Fallen Leaf Open Space	0.4
Triangle Open Space	9.4
View Ridge Open Space	0.3
Washougal River Greenway	135.7
Wildlife League	10.3
Subtotal	**705.3**

Other Recreational Opportunities Near Camas

The ownership and management of recreational resources in the larger Camas region involves several public agencies. Facilities include parks, trails, boat launches, and other attractions. Though some of these facilities are not located within city limits, their close proximity to residents of Camas makes them important components of the broader recreation ecosystem.

Homeowner Associations

Numerous homeowner associations (HOA) across Camas include open space tracts, and some include small pocket parks serving HOA residents. In all, HOA properties include 385 acres of open space and 43 acres of pocket parks.

School Districts

The Camas School District operates 19 school sites across Camas and, via use agreements, makes certain fields and gymnasiums available for community use by youth sport leagues. Evergreen School District borders Camas to the west and also makes sport fields and gymnasiums available for community use.

Clark County

Clark County provides and maintains a system of regional parks, special facilities, regional trails, greenways and natural areas, in addition to neighborhood and community parks and sports fields in or proximate to the Vancouver urban unincorporated area. The park and open space inventory identifies the recreational assets within the county. The county provides 3,325 acres of public parks and recreation facilities distributed among 88 sites, along with an additional number of greenway parcels that comprises over 3,135 acres of conserved public open space. Within and near Camas, Clark County manages Lacamas Regional Park, Camp Currie, Green Mountain, and Harmony Sports Complex.

Port of Camas-Washougal

The Port of Camas-Washougal provides several recreation opportunities for the greater Camas community.

- Captain William Clark Park at Cottonwood Beach is an 85-acre park that includes walking paths, paved parking, picnic tables, covered cooking areas, a

recognition plaza, three restroom buildings, and replicas of Chinookan canoes and Lewis and Clark's dugout canoes. A two-mile trail on top of the levee at the north side of the Park offers opportunities for hiking, jogging, biking, and horseback riding.

- The 3-mile Lewis and Clark Heritage Trail follows the Columbia River from Steamboat Landing Park to the border of the Steigerwald Lake National Wildlife Refuge. This has been connected to the Washougal Waterfront Park and trail creating a long walking trail into Camas and Washougal.
- Marina Park offers a walking path, picnic tables, an open lawn for entertainment, and a deck overlooking the marina.
- The Natural Play Area features a giant Sasquatch named Eegah along with a hill-side slide, log steppers, xylophone, drums, a boulder maze, and log balancing beams.

Other Urban Park Systems

Adjacent cities provide recreation opportunities that should be considered relevant components of the overall Camas open space system. Some facilities, such as regional trails, will require partnerships and coordination that extend beyond city boundaries. Two adjacent municipalities operate and maintain park and recreation facilities, including:

- City of Washougal: The City of Washougal has over 120 acres of park land, ranging from parks, playgrounds, sports fields, and open space. Washougal's 19 parks include special use areas, including several riverfront sites that enhance Washougal's Park system.
- City of Vancouver: The City of Vancouver serves the community with approximately 1,600 acres of parkland at 113 sites, which includes 90 parks and 20 miles of trails plus numerous natural areas. The city offers a full range of recreation programming and operates two community centers.





CHAPTER 5

Parks & TRAILS

The PROS planning process assesses recreational needs and priorities for park facilities, active use areas, and trails in Camas. The park assessment included a discussion of specific local needs with consideration given to the City's broader park system. Public input and information on park inventory conditions were also heavily relied upon in the planning process.

By considering the location, size, and the number of park facilities by type and use, along with community interests and priorities, the PROS Plan evaluates the existing and future demand for park and recreation amenities and provides recommendations for future initiatives. The six-year Capital Facilities Plan, which identifies and prioritizes crucial upgrades, improvements, and expansions, is based on the needs assessment and the recreational interests expressed by residents.

The recreational interests of Camas residents were captured in the community survey and compared to regional, state and national trend data. Local support for and interest in trails for walking and biking, water access opportunities, and kayaking align with recreation participation data from multiple sources.

Park Use Trends

Various resources have been assembled and summarized to provide an overview of current trends, market demands, and agency comparisons in the provision of parks and recreation services. This information is helpful when balanced with local insights and feedback from the community in guiding future initiatives.

The following national and state data highlights some of the current park use trends and may frame future considerations for Camas' park system. Additional trend data and summaries are provided in Appendix E.

- Nationwide, 82% of U.S. adults believe that parks and recreation are essential according to the American Engagement with Parks Survey from 2020. (1)
- 77% of survey respondents indicate that having a high-quality park, playground, public open space, or a recreation center nearby is an important factor in deciding where they want to live. (1)
- Just over half of Americans ages six and older participated in outdoor recreation at least once in 2019, the highest participation rate in five years. However, the number of outings per participant declined – continuing a decade-long trend – resulting in fewer total recreational outings (pre-pandemic). (2)
- Walking, running, hiking, and cycling saw significant increases in participation in the early months of the COVID-19 pandemic (March to June 2020). (2)
- Running, jogging, and trail running are the most popular outdoor activities across the nation, based on levels of participation, followed by fishing, hiking, biking, and camping. (2)
- Walking ranked as the top activity by participation rate (94%) in Washington State. (4)
- Trail running, day hiking, and recreational kayaking are rapidly increasing in popularity – participation in each increased more than 5% per year between 2014 and 2019. (3)
- People of all ages and income levels are interested in outdoor activities like fishing, camping, hiking, biking, bicycling, and swimming. Younger people are more interested in participating in team sports, such as soccer, basketball, and volleyball. Older adults are more likely to aspire to individual activities like swimming for fitness, bird and nature viewing, and canoeing. (3)

Sources:

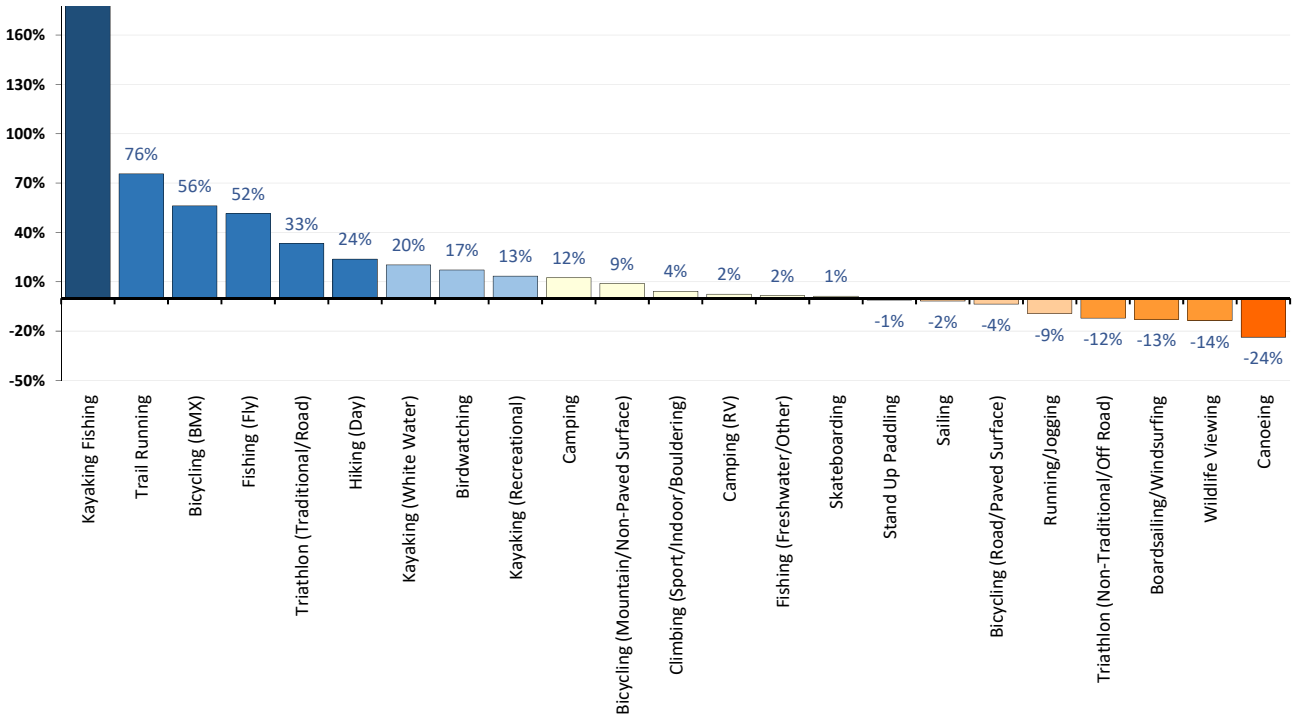
(1) 2020 American Engagement with Parks Survey

(2) 2020 Outdoor Participation Report

(3) 2020 Sports, Fitness, and Leisure Activities Topline Participation Report

(4) 2018-2022 Recreation and Conservation Plan for Washington State

Figure 8. 5-Year Change in Outdoor Recreation Participation by Major Activity (2021 Outdoor Participation Report)



Operational & Service Challenges Due to COVID-19

A statewide survey of Washington park and recreation agencies was conducted in the second half of 2020, with a focus on service demand and operational challenges, both preceding and as a result of COVID-19. City, county, and parks and recreation district leaders were asked to complete the survey, and the survey was sent to 227 agencies - 109 cities, 39 counties, 79 Special Purpose Park Districts with 73 responses. The project was a collaboration between the Washington Recreation & Park Association, the Washington State Association of Counties, the Association of Washington Cities, and Metro Parks Tacoma.

In a question that asked the agency about how stable its outlook is for 2020 pre- and during COVID-19, the percentage of agencies that stated their outlook as very strong and stable decreased by 25 points, with 27.8% indicating as very stable at the beginning of the year to 2.8% indicating as very stable by August 1, 2020. Similarly, agencies that felt moderately or significantly underfunded and unstable rose from 5.5% to 50% by August 1, 2020.

Also, significant majorities of agencies indicated service delivery impacts due to the COVID-19 pandemic in the following ways:

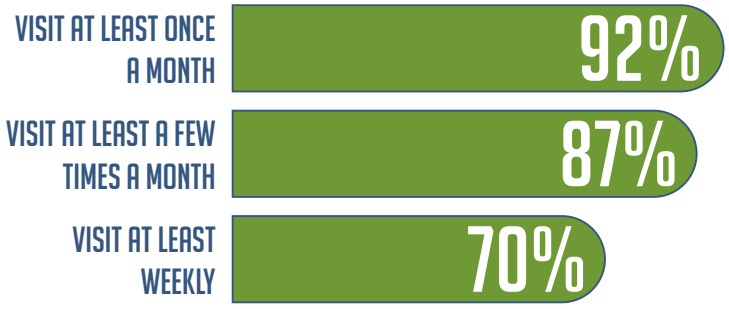
- Reduced ability to manage, maintain, operate, and secure passive parks to safety standards and control access (87%).
- Cancellation of special events and tourism campaigns that support local employment and drives the local economy (87%).
- Inability to operate critical community programs, pools, attractions and facilities, including services for vulnerable populations (81%).
- Lack of ability to hire/maintain seasonal employees & offer programs/services allowable under Safe Start (74%).
- Addressing public use and behaviors that put the community at risk, such as tearing down caution tape, using fields (85%).

Local Insights

Local recreation demands and needs were explored through various community engagements to gather feedback on the strengths and limitations of existing recreational resources and parks available to Camas residents. Public outreach included a community survey, an online open house and several stakeholder focus group discussions to explore project priorities and opportunities to enhance the City's park system (see Appendices A, B & C). Through this outreach, nearly 1,600 responses were recorded.

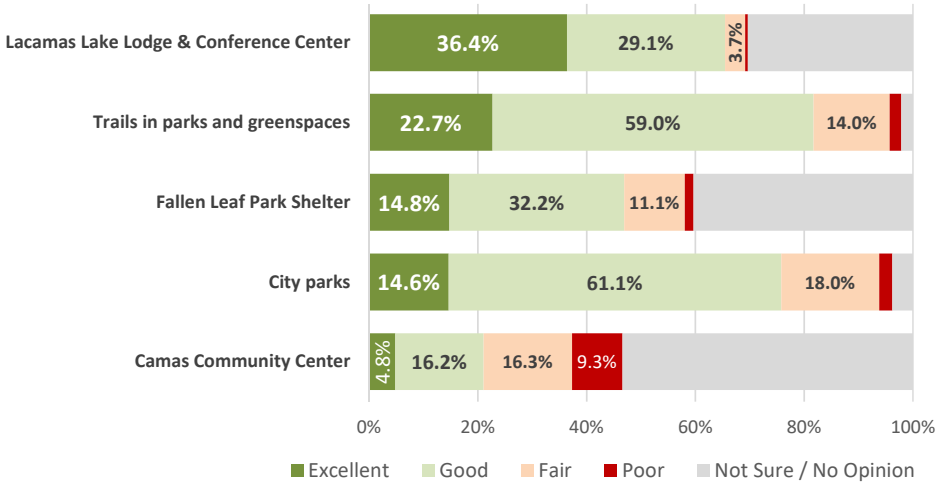
The community survey confirmed that local parks, recreation options, and open space opportunities are important or essential to the quality of life in Camas. Virtually all respondents (97%) feel that local parks and recreation opportunities are important or essential to the quality of life in Camas. Respondents tend to visit frequently, with more than two in three visiting at least once a week (68%) and another 20% visiting one to three times per month.

Figure 9. Freequency of Visitation to Parks, Trails & Open Space



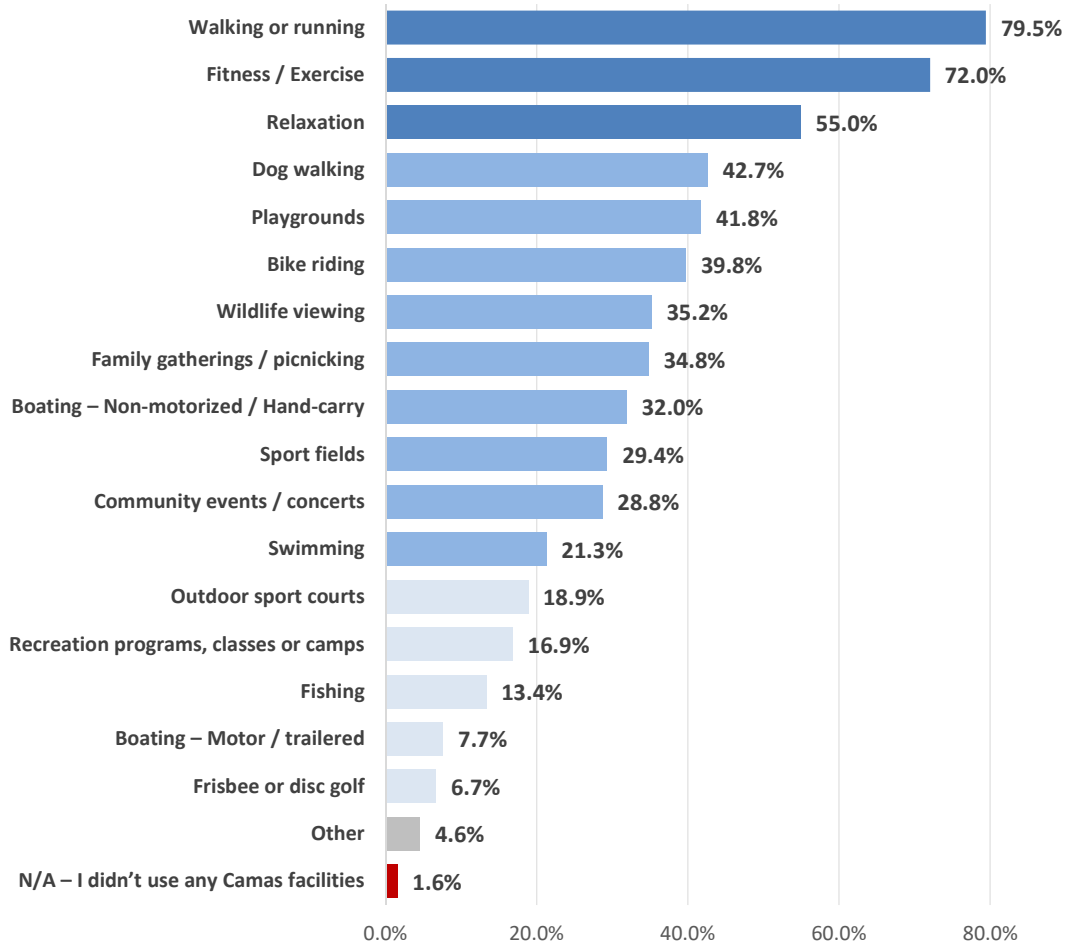
Survey respondents were asked to rate the condition of a variety of park and recreation facilities on a scale from poor to excellent. Respondents gave overwhelming high marks to the condition of the City's trails in parks and greenspaces and the parks themselves. Overall, the Lacamas Lake Lodge & Conference Center received the highest condition ratings, with 95% of respondents who provided a ranking rating it as excellent or good.

Figure 10. Sentiment of Condition of Park and Recreation Facilities.



Survey respondents visit local parks and recreation facilities for a variety of reasons. The most popular activities are walking or running (80%), followed by fitness and exercise (72%), and relaxation (55%). More than three in ten respondents visited to walk their dog (43%), visit a playground (41%), ride their bike (40%), view wildlife (35%), or attend a family gathering or picnic (35%). Relating to statewide and national trend statistics, the popularity of walking and running have consistently ranked as top outdoor activities – in alignment with Camas' survey responses.

Figure 11. Main Reasons For Visiting Local Parks and Recreation Facilities.



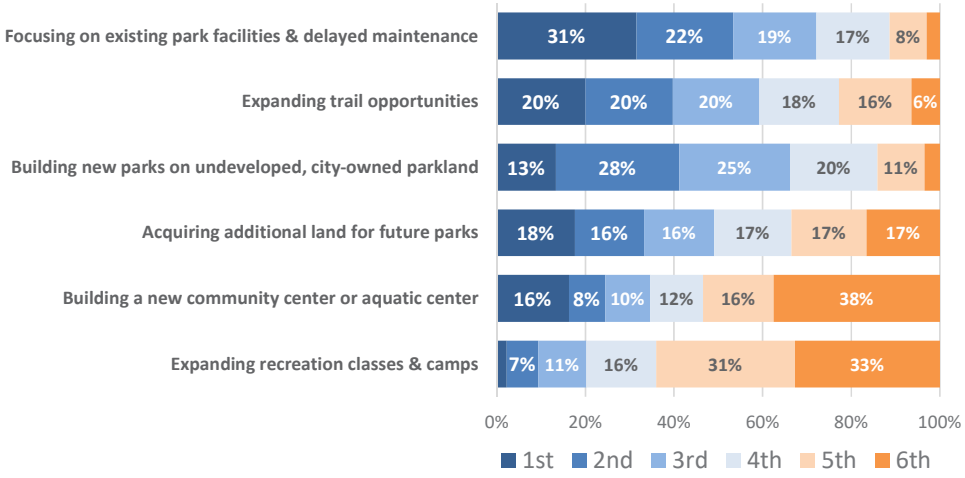
More than three in four respondents are very or somewhat supportive of adding walking trails (88%), updated or renovated playgrounds at existing parks (82%), all-abilities accessible playground equipment (81%), and more picnic shelters (80%) to the City's existing parks. A majority of respondents are also supportive of developing more biking trails, splash pads, off leash dog areas, pools or aquatic centers, tennis or pickleball courts, a new community center, disc golf course, and basketball courts. However, through the community survey, approximately two out of three community members are willing to travel for an unmet recreational amenity in Camas (such as splash pad, aquatic/pool center, community center and bike skills park) versus increasing taxes to pay for development of a new facility.

Recognizing the significance of trail access to the Camas community, the survey also inquired about different trail types. Respondents overwhelmingly rated unpaved trails in natural areas (94%) as very or somewhat important. Majorities of respondents also feel paved, shared use paths for pedestrians and cyclists (87%) and accessible trails (73%) are either very or somewhat important. An online open house followed the community survey to dive deeper into the community's strong interest in trails. Respondents to the online open house, 74 respondents total, noted the need to acquire land and develop trails to fill gaps in trail corridors as a top priority. Also, respondents were particularly interested in improving trail connections for the North Shore of Lacamas Lake, the Mill Ditch, Lake Road, and the Lewis & Clark Regional Trail.

Respondents were asked to rank a list of potential recreation, park, and open space investments. Generally, respondents ranked maintaining existing parks, expanding trail opportunities, building new parks, and acquiring land for future parks as top priorities. Respondents ranked offering building a new community or aquatic center and expanding program offerings as their lowest priorities. Respondents of different ages prioritized the investment options similarly, with the exception of building a new community or aquatic center, which was a higher priority for significantly more younger respondents. Respondents with children in their home tended to rate building a new community or aquatic center higher than those without children in the home, who were more likely to rate expanding trail opportunities as a high priority.



Figure 12. Park Amenities to Consider Adding to Camas Park System



Common Themes from Community Outreach

Considering all of the community feedback from the survey, online open house, stakeholder interviews, and stakeholder focus group discussions, a number of core themes and interests emerged.

Trails

- Trail connectivity is important. Complete loops and circuits, and focus on trail connectivity (connecting trail gaps).
- Enhanced linkages between residential neighborhoods and downtown via pedestrian- and bicycle-friendly routes are an important focus area.
- COVID has accelerated the trends toward higher trail usage, which include more users on trails and a wider age distribution of off-road bike riders.
- There is broad interest and excitement for the potential of expanded trail connections via the Mill Ditch property for walking/hiking and the Green Mountain acquisition for mountain biking and hiking. The Mill Ditch property for walking/hiking and the Green Mountain acquisition for mountain biking and hiking are two examples of potential projects.

Parks & Open Space

- The maintenance of existing parks and open spaces remains a key priority.
- Building new parks on undeveloped, city-owned parkland was one of the highest rated priorities.
- There has been strong interest in expanding recreational options in the park system that include the installation of a splash pad, bike skills/pump track, off leash dog areas, and tennis or pickleball courts.
- The City should provide space and amenities for programming (sport fields & courts, shelters for outdoor education, etc.) and increase sport field capacity by improving field quality and adding lighting where appropriate.
- Coordination with the school district might result in benefits for more community access to existing school fields and the development of additional sport fields.

Convenience & Support Amenities

- Upgraded and expanded access to restrooms and parking is a highly-desired user convenience improvement.
- Wayfinding, maps and communications were noted as ways to improve the user experience and familiarity with the park and trail system.







Park System Conditions Assessment

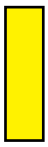
The overall condition of park infrastructure and amenities is one measure of park adequacy and assurance of public safety. Proper stewardship of park infrastructure requires developing a long-term maintenance and capital plan to ensure the safety of park users that aligns with community needs and allocates limited funding resources properly.

The current conditions of the Camas park system were assessed to identify existing site maintenance issues and opportunities for future capital improvements. The assessment included walkways, parking lots, park furniture, drainage and irrigation, lighting systems, vegetation, and other amenities. The following conditions assessment matrix summarizes the results of these assessments. They will inform the PROS Plan, including developing the project prioritization strategy for park improvements, identifying funding strategies, and updating the recommended parks six-year Capital Facilities Plan.

Park infrastructure and amenities were rated based on the following scale:



1 – Good Condition: Generally, amenities in good condition offer full functionality and do not need repairs. Good facilities have playable sports surfaces and equipment, working fixtures, and fully intact safety features (railings, fences, etc.). Good facilities may have minor cosmetic defects and encourage area residents to use the park.



2 – Fair: In general, amenities in fair condition are mainly functional, but need minor or moderate repairs. Play surfaces, equipment, fixtures, and safety features that are operational and allow play, but have deficiencies or periods where they are unusable. Fair facilities remain essential amenities for the community but may slightly discourage the use of the park by residents given the current condition.



3 – Poor: In general, amenities in poor condition are largely or completely unusable. They need significant repairs to be functional. Some examples include athletic fields that are too uneven for ball games, irreparably broken features, buildings that need structural retrofitting, etc. Poor facilities discourage residents from using the park and may present safety issues if left open or operational.

In general, good conditions should be the goal for the management and stewardship of park facilities. Where infrastructure or amenities are rated as “fair,” strategies should be developed for repair or restoration. Park features, structures, amenities, or landscapes rated as “poor” should receive immediate attention and be prioritized for near-term maintenance, capital repairs, or a new capital project. Facilities in “poor” condition should also be evaluated and taken out of operation if they are deemed unsafe. Based on this assessment, the City’s sport courts, trails, site furnishings, turf and ADA compliance are in the greatest need of attention.

Detailed site conditions and site enhancement recommendations are noted in Appendix D for the park sites visited.

Overview of Condition of Existing Parks

The following list summarizes some of the key observations and recommendations to enhance the City's park and trail system, its visual character, and longer-term sustainability.

1. Overall, the level of maintenance observed at the developed parks appears to be very good.
2. Consider upgrades to City Park Standards for signage and furnishings. For future park improvements and prior to implementing new master plans for undeveloped parks, it would be beneficial to use the same standard design, style and color for benches, picnic tables, other site furnishings and signs to provide a consistent identity to the park and trail system and reduce future maintenance costs.
3. As the trail system develops with additional connections, a wayfinding system would be beneficial. Coordinated with the graphic style for the park identification signs, this wayfinding signage would help trail users navigate the connections and know the destinations along the trails. Distances, destinations, trail etiquette, and other essential information should be planned and located at strategic sites to inform walkers, runners, and bikers.
4. Consider adding more destination amenities into the park system, such as splash pads, rock climbing, fitness equipment, nature play, inclusive play and/or themed designs to add a more diverse character to the system.
5. Many of the developed sites need ADA upgrades. Among the most common deficiencies observed are:
    - Current park standard trash and recycling receptacles are not ADA
    - The minimum ratio of ADA compliant tables and benches is below the required ADA standards
    - Lack of companion spaces adjacent to ADA compliant benches
    - Minimum clearances surrounding picnic tables are often not met
    - Several ADA compliant amenities are not along accessible routes
    - Many of the playgrounds lack ADA ramps leading into the play pit areas
    - All of the playground surfacing consists of engineered wood fiber. Although it is considered accessible when it is properly maintained; however, infrequent maintenance and refilling is fairly common. Consider transitioning to more stable playground safety surfacing options for the heaviest used playgrounds.
    - Several playgrounds do not have the minimum number of ADA accessible features
6. Several parks have vegetated open space within or adjacent to the property and may be good candidates for trail locations. Some open spaces connect residential neighborhoods with parks together and could provide alternative routes to City parks.
7. Camas has multiple storm facilities and or wetlands throughout the City, some of which are adjacent to existing developed parks. These facilities might offer opportunities to incorporate interpretive and educational experiences within the parks for a relatively low implementation cost. Proposed educational amenities might include wildlife viewing blinds and overlooks accompanied by interpretive signage.

Most of the undeveloped open space that was observed consisted of dense vegetation, including invasive species. The City should consider an invasive weed removal program, along with a more broadly framed open space management plan to identify resources and tactics to care for the City's nearly 700 acres of natural areas.

Figure 13. Park Condition Assessment

			Recreation Amenities										Site Amenities				Park Structures				Vegetation				ADA
Site Name	Park Type	Park Site Average	Playgrounds	Paved Courts: Basketba	Paved Courts: Tennis	Volleyball	Soccer Fields	Baseball / Softball Fields	Pathways / Trails	Off-Leash Area	Waterfront/Beach	Other Rec Element	Site Furnishings	Lighting (Y/N)	Signage	Parking Areas	Restrooms	Picnic Shelters	Boat Dock / Ramp	Concession Building	Turf	Park Trees	Landscaped Beds	Natural Areas	Compliance
PARKS																									
Ash Creek Park	Undeveloped / Undefined	2.0																						2	
Coopers View Park	Neighborhood Park	1.1	1						1				1	N	1						1	2	1	1	1
Crown Park	Community Park	2.0	2		2	2		2	2				3	N	2	2	2	2			2	1	2		2
Dorothy Fox Park	Neighborhood Park	1.5	2	1.5			1		2				2	N	1.5	1	1				1	1	2		2
Forest Home Park	Neighborhood Park	1.8	1	2				1	2				2	Y	2	2	2			2	2	2	2		2
Goot Park	Community Park	1.4	1.5	1.5			1.5	1.5	1.5				1.5	N	1	1	1				1.5	1.5	1.5	1.5	
Grass Valley Park	Community Park	1.7	2	1	2.5			2	1.5				1	Y	2	1	2	1			2	1	2	2	2
Green Mountain Neighborhood Park	Neighborhood Park	1.3	1	1		2			1.5				1	N	1.5	1	1	1			2	1			2
Louis Bloch Park	Neighborhood Park	1.7	1	2				1.5					2	Y	1.5	2	1			2	2	1	2		2
Oak Park	Neighborhood Park	1.8	1.5	2					2				2	N	1						2	1			3
Benton Park	Neighborhood Park	2.1											1.5	N	1						3			2	3
Klickitat Park	Neighborhood Park	1.9	1.5	2					2				1.5	N	2	1	1	1			2.5	2	3	2.5	3
Lacamas Heights Park	Neighborhood Park	2.0												N								2		2	
SPECIAL FACILITY SITES																									
Fallen Leaf Lake Park	Regional Park	1.9				3					2		2	Y		1.5	locked	2						1	2
Fallen Leaf Softball Field	Special Facility	1.7						1	1				2	N	2	2.5	1.5			1	2	1		2	3
Prune Hill Sports Park	Community Park	1.4	2	1.5			1	1.5	2						1	1					1.5	1	1		1.5
Heritage Park	Community Park	1.3	1						1.5		1.5		1		1	1	1.5	1	1		2	1	2	2	1
Leadbetter House	Undefined Park	-																							
Pitt Property	Undefined Park	1.2	1			2			1				1	Y	1	1					1	1		1	2
Pomaria House	Undefined Park	1.0																			1	1		1	
Wildlife League	Undefined Park	1.4	2						2				1	N	1			1			1	1		2	2
Baz River Front Park	Special Facility	2.0							3		1					2								2	
Skate Park	Special Facility	2.5							2		2		3	N	2	3	2		2		3	2	3	3	3
	Average:	**1.67**	**1.46**	**1.61**	**2.25**	**2.25**	**1.17**	**1.50**	**1.75**	**-**	**1.63**	**-**	**1.68**	**-**	**1.44**	**1.53**	**1.45**	**1.29**	**1.50**	**1.67**	**1.81**	**1.31**	**1.95**	**1.80**	**2.15**

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Gap Analysis

Understanding the known gaps in the park system and evaluating the City's existing levels of service for parks (i.e., snapshot in time of how well the City is meeting its adopted standards) will provide a foundation for strategic planning as a basis for a balanced distribution of parks, trails and recreation amenities in the future.

To better understand where acquisition efforts should be considered, a gap analysis of the park system was conducted to examine and assess the current distribution of parks throughout the City. The analysis reviewed the locations and types of existing facilities, land use classifications, transportation/access barriers and other factors as a means to identify preliminary acquisition target areas. In reviewing parkland distribution and assessing opportunities to fill identified gaps, residentially zoned lands were isolated, since neighborhood and community parks primarily serve these areas. Additionally, travelsheds were defined for neighborhood parks using a ¼-mile primary and ½-mile secondary service area with travel distances calculated along the road network starting from known and accessible access points at each park. Travelsheds for community parks were derived using ¼-mile, ½-mile, 1-mile and 2-mile travel distances to acknowledge that these park types (including athletic fields) serve a wider array of users and driving to such sites is typical.

Maps 2 through 5 illustrate the application of the distribution criteria from existing parks. Areas in white do not have a public park within reasonable walking distance of their home. The illustrated 'travelshed' for each existing Camas park highlights that certain areas within the city do not have the desired proximity to a local park.

Striving to provide a neighborhood park within a reasonable walking distance (e.g., ½-mile) may require acquiring new park properties in currently under-served locations or improving multi-modal transportation connections to allow local residents to safely and conveniently reach their local park. As Camas develops and acquisition opportunities diminish, the City should consider taking advantage of acquisition opportunities in strategic locations and as funding allows to fill remaining gaps. In concert with the search for developable park land, the City should continue to coordinate with proposed residential land development projects to consider when and how a public park (or trail connection) could be incorporated into the planning of newly developed residential areas.

The mapping of park distribution and 'travelsheds' helps to illustrate the underserved neighborhoods in Camas. Areas of southwest Camas and north-central Camas have limited access to public parks or open space as indicated by white areas on Map 6. These areas of the City should be targeted for future acquisitions to help create more equitable access for all residents.

Camas has been very successful in securing park and open space as the community has grown, and the small number of potential acquisition sites is a testament to that effort. It should also be noted that the City owns several properties that are intended to serve as neighborhood parks, but are as of yet undeveloped. The future planning and development of these sites will further improve the overall distribution of parks for the Camas community, and these sites have been accounted for in the gap analysis. These future parks include:

- Ash Creek Park (future neighborhood park)
- Ostensen Canyon Park (future neighborhood park on approximately 8 acres of upper shelf)
- Lacamas Heights Park (future neighborhood park adjacent to Camas High School)
- Green Mountain property (pending community planning)
- North Shore Lacamas Lake (TBD, pending community planning)

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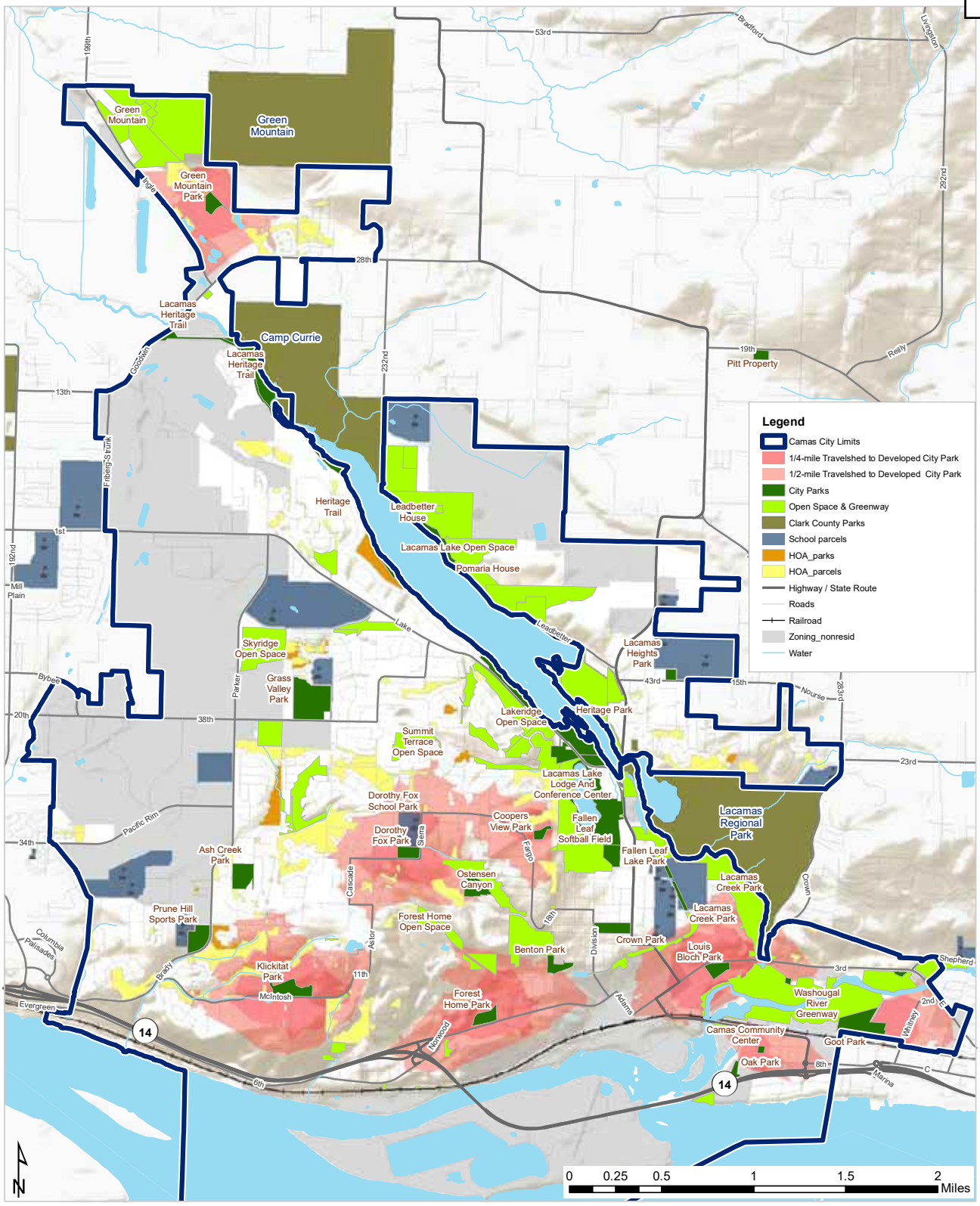

Map 2: Travelsheds for Neighborhood Parks (½-mile)

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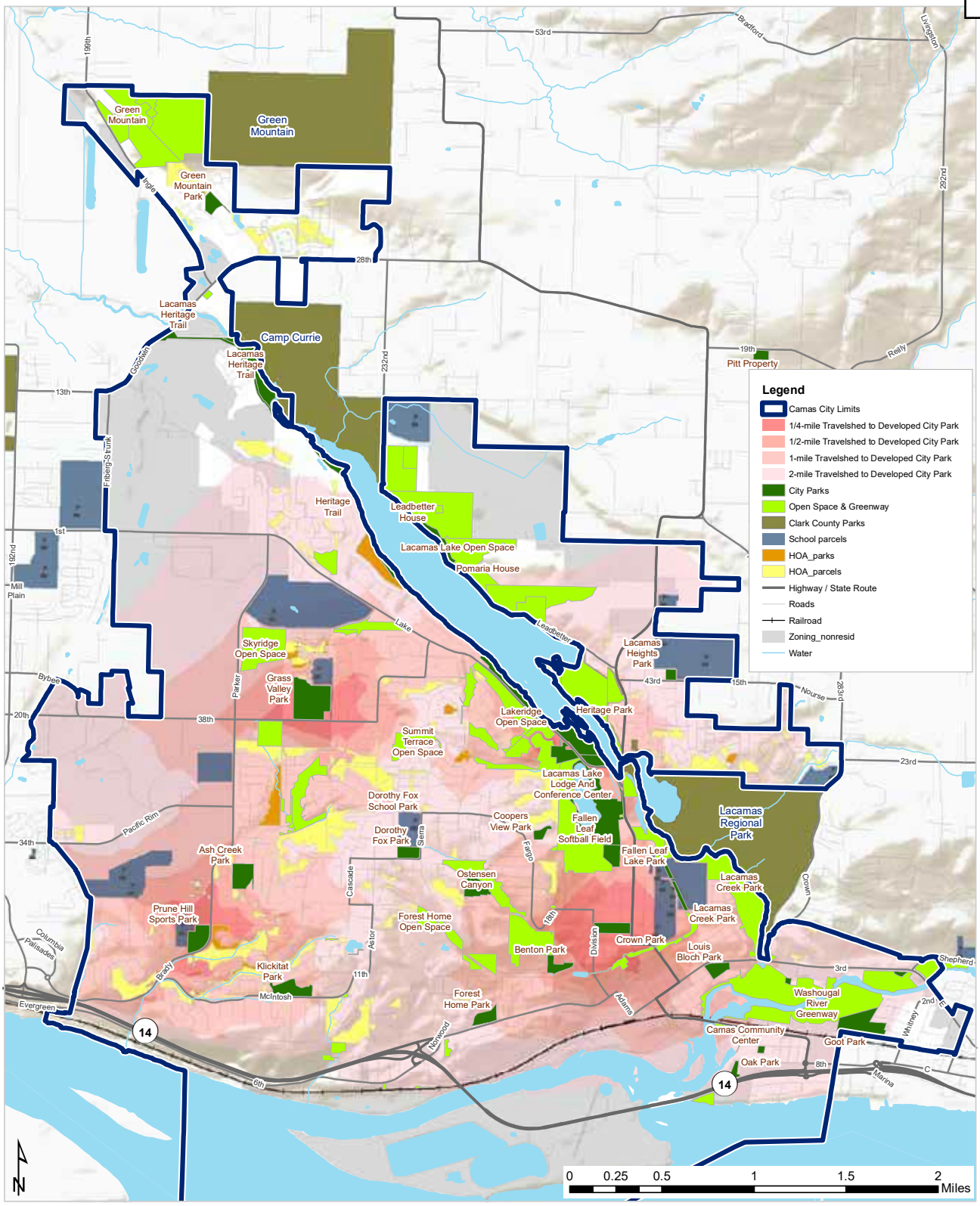

Map 3: Travelsheds for Community Parks (2-miles)

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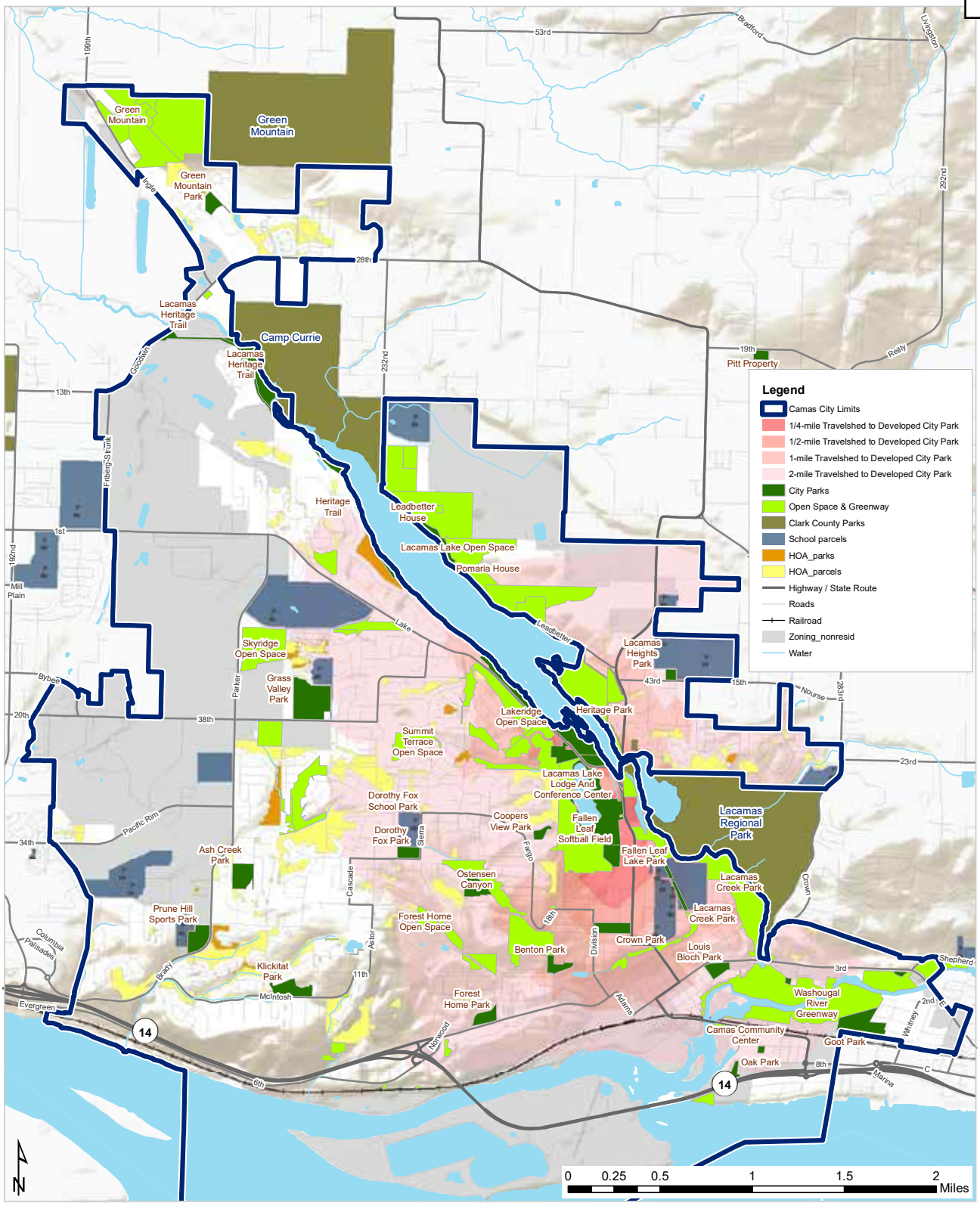

Map 4: Travelsheds for Special Use Areas (2-miles)

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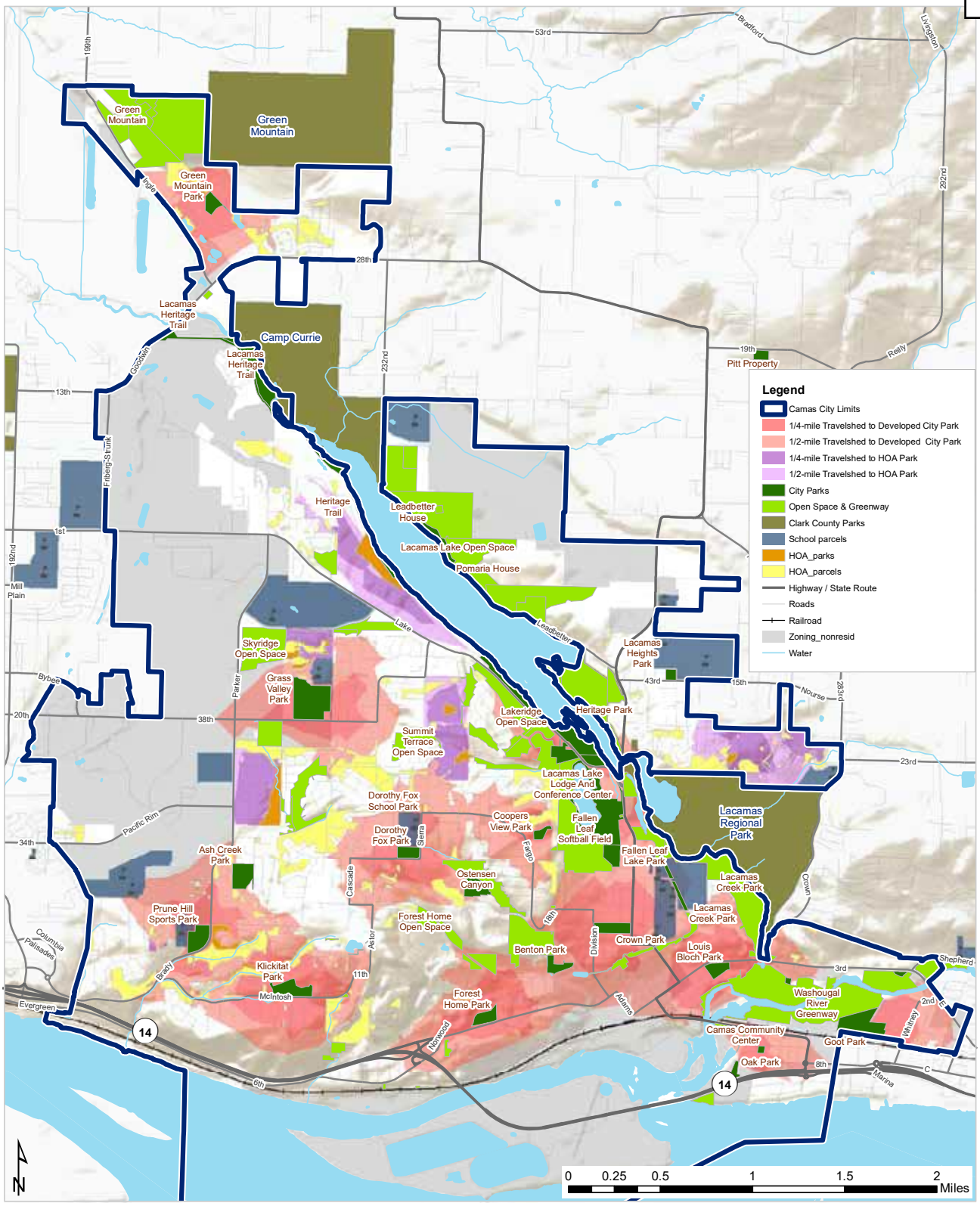

Map 5: Travelsheds for All Parks & HOA Parks (½-mile)

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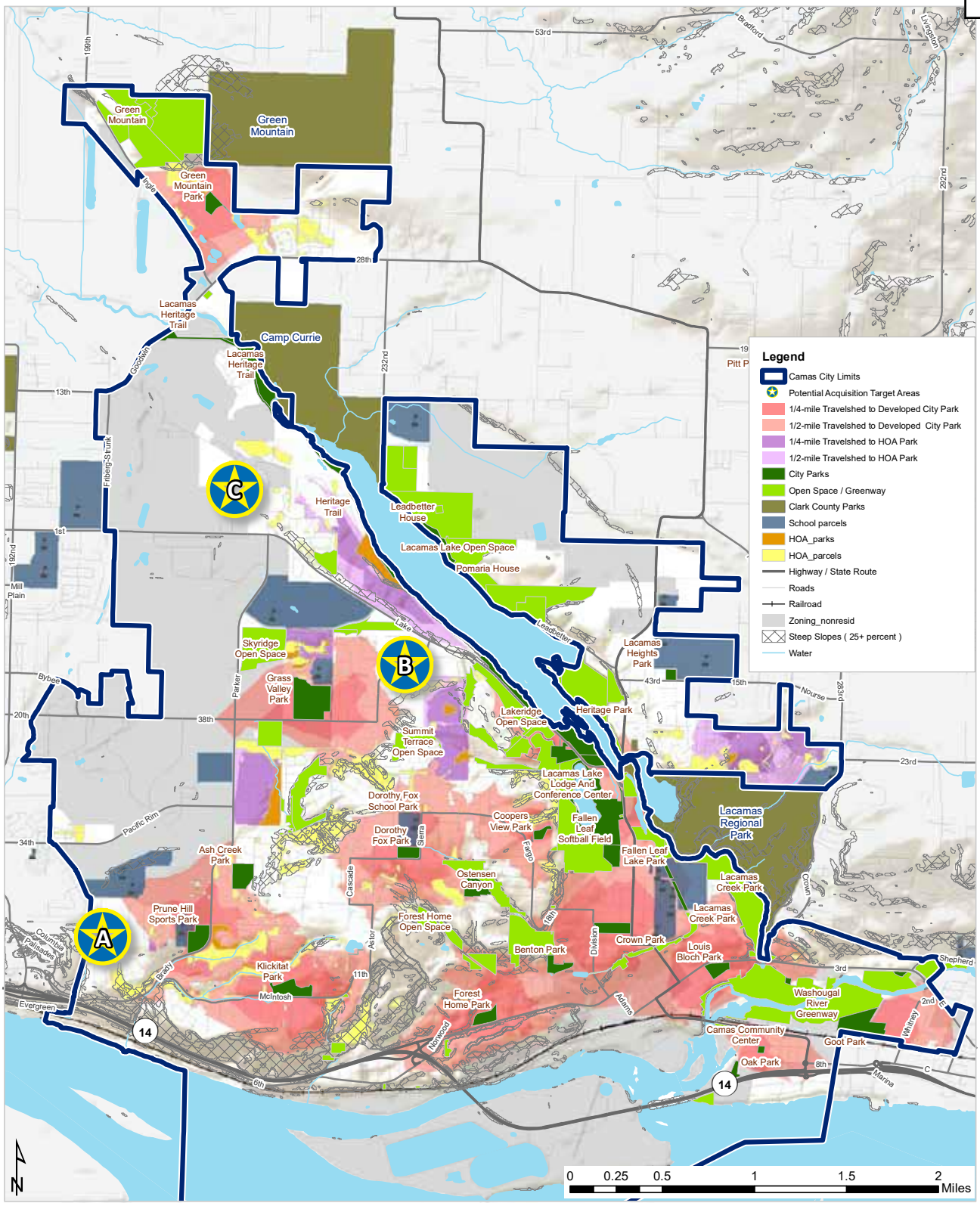

Map 6: Potential Acquisition Target Areas

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Trails

The City of Camas consistently has been working to create a network of trails to connect important destinations and help create a more walkable community. Individual parks typically have internal (and usually paved) pathways that provide walking opportunities within the park. While these are popular amenities for park visitors and help provide access to recreational amenities, their isolation from other destinations limits their value. The lakefront, riparian areas and woodlands in Camas also have provided locations for aligning recreational, off-road trails as opportunity arises. Trail connections and walking or biking linkages have been noted as the highest priority for future improvements to Camas' park system.

The Heritage Trail offers the longest, singular trail at 3.7 miles within City ownership, and Lacamas Creek Park provides an additional 2.4 miles within a forested, park setting. Other significant trails within City open space include those at Fallen Leaf Lake (1.7 miles), Heritage Park (1.3 miles) and the Washougal River Greenway (1.5 miles). In total, Camas has almost 12 miles of walking or biking trails dispersed across its park system.

Figure 14.. Trail Inventory in Camas

Trail Owner Type	Mileage
Camas Recreational Trails	11.9
Camas ROW* Trails	6.8
Clark County Park Trails	10.9
Private / HOA Trails	8.4
School District Trails	1.2
Total Trail Miles	**39.2**

* Right-of-Way (ROW) trails utilize sidewalk and/or bike lane connections

Figure 15. City of Camas Park Path & Trail Inventory

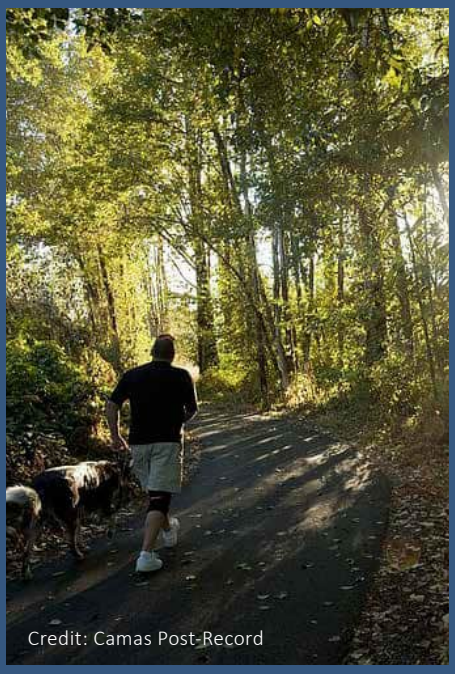
City Trails	Mileage
Benton Park	0.2
Dorothy Fox Park	0.2
Fallen Leaf Lake Park & Open Space	1.7
Goot Park	0.1
Grass Valley Park	0.4
Heritage Trail	3.7
Klickitat Park	0.6
Lacamas Creek Park	2.4
Oak Park	0.1
Ostensen Canyon Greenway	0.5
Prune Hill Slope Open Space	0.6
Washougal River Greenway	1.5
Total City Trail Miles	**11.9**





Trails for Walkable Communities

Parks are known to contribute to a healthier community by providing accessible outdoor recreation particularly through the walking trail within each park. Getting to the park by foot or bike can also offer a healthier choice integrated with the park destination and its amenities. In the NRPA publication *Safe Routes to Parks*, the elements of walkable, healthy community design are outlined as convenience, comfort, access & design, safety, and the park itself. Sidewalks, bikeways and trails should provide an integrated alternative transportation system for residents to access parks and other destinations within their community. As further emphasis for the importance of a walkable community to promote public health, the Surgeon General has issued a *Call to Action* to "step it up" and promote more walking and build a more walkable world. A more connected network of trails, sidewalks, and bike lanes with links to public transit also provides economic values.



Credit: Camas Post-Record

Trails for Aging Populations

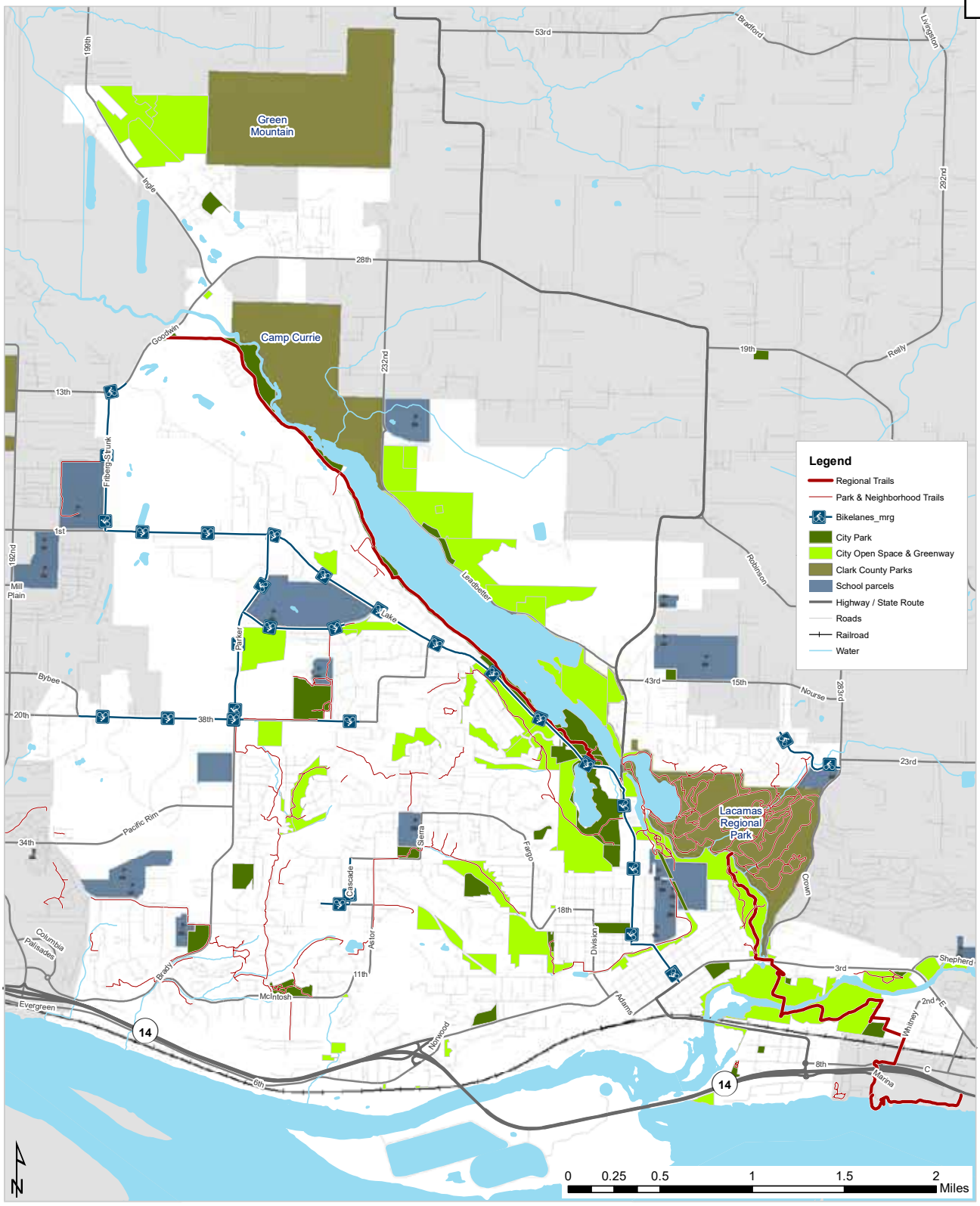
Today's active seniors are looking at retirement age differently, as many are retooling for a new career, finding ways to engage with their community and focusing on their health and fitness. It will be critical for Camas' park and recreation system to take a comprehensive approach to the city's aging population needs. Accessibility and barrier-free parking and paths, walkability and connectivity will be paramount to future planning. Providing programming for today's older adults includes not only active and passive recreation, but also the type of equipment needed to engage in certain activities. Trails provide the infrastructure for the most popular and frequent outdoor recreation activity of older adults: walking.



Credit: Camas Post-Record

Trails for Economic Health

In the 2009 report, *Walking the Walk: How Walkability Raises Housing Values in US Cities* by Joe Cortright for CEOs for Cities, research cited the connection between home value and walkability. Higher WalkScore measurements, where more typical consumer destinations were within walking distance, were directly associated with higher home values. Homes located in more walkable neighborhoods command a price premium over otherwise similar homes in less walkable areas. The National Association of Realtors reports in their *On Common Ground* publication with numerous articles citing the preference of walkable, mixed-use neighborhoods and the role of walkability in creating healthier communities. These preferences translate into higher housing values. Even the National Association of Homebuilders (March 2014 publication: "Walkability, why we care and you should too") have recognized that walkability is desired by consumers, creates lower development costs and allows flexibility in design. As part of the system of walkability and bike-ability, recreational trails are real estate assets that enhance community connections and contribute to economic health, and these attributes should be considered as Camas enhances trail connections to downtown and plans the future of the North Shore.



Map 7: Existing Trails

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Trail Demand

Park & Neighborhood Trails

During the public outreach, 80% of the community clearly identified that walking or running was a top reason for visiting Camas' parks. Park pathways are popular recreational amenities and significant contributors for promoting physical activity. This recreational trend is notable in state and national recreation surveys. Running, jogging and trail running are the most popular outdoor activities across the nation, based on levels of participation. Also, the need for more walking and biking trail connections that link parks together has been reinforced in the community survey and other public feedback. The online open house polled opinions about potential trail links and which were the highest priority. The Mill Ditch connection and safe crossings along Lake Road were also noted as important.

With the array of existing park trails and pathways within homeowner association lands, the City should prioritize a couple other connections to close existing gaps and improve options for loop trail routes, to include:

- Ostensen Canyon gap to link Dorothy Fox Park to Benton Park
- Prune Hill Sports Complex to Forest Home Park via Forest Home Open Space (will require on-street connections in coordination with transportation system planning)

Regional Trails

A regional trail system helps knit communities within Clark County together. Public feedback deemed longer trails segments, such as the Lewis and Clark Regional Trail along the Columbia River and a North Shore Lacamas Lake connection important for Camas. The ongoing development of the North Shore Subarea Plan and conceptual trail planning outlined in the North Shores Lacamas lake - A Vision for Conservation and Recreation will guide more specific planning of trails through the North Shore Lacamas Lake area, including completing the loop to Heritage Trail. Future trail connections should link Round Lake to Camp Currie to Green Mountain, in addition to neighborhood and commercial area connections, trailheads, parking and signage.

Transportation Planning

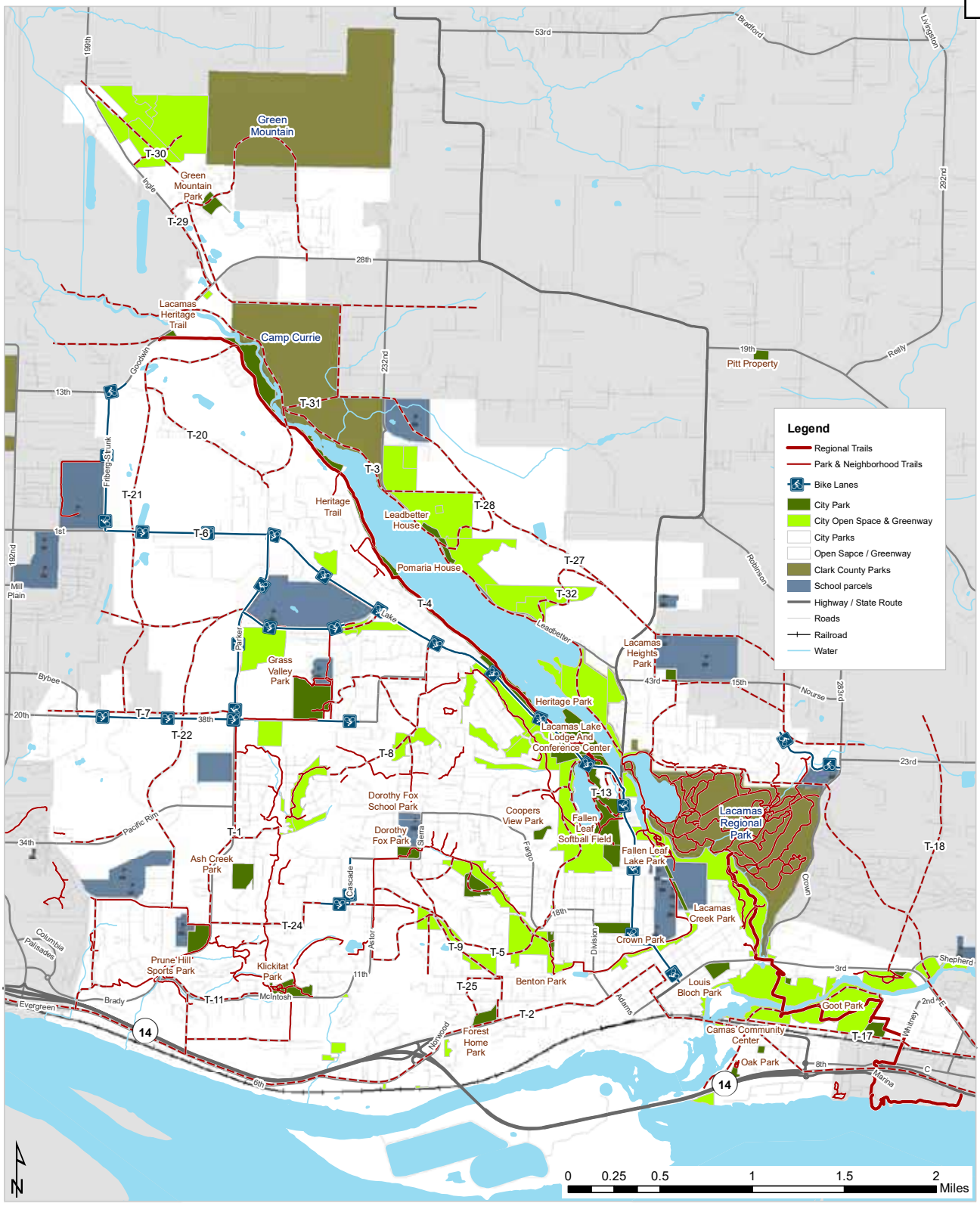
The City is currently in the process of preparing an updated Transportation System Plan, and a review of existing pedestrian and bicycle infrastructure and discussion of future needs will be included in that plan. The existing conditions memo for the plan noted that paved, shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and are also scattered throughout the residential neighborhoods. Regarding pedestrian routes and sidewalk coverage, a few areas do not have complete sidewalks, and gaps are most significant in southwest, southeast and northeast Camas.

Additionally, the City of Camas has a number of targeted improvement projects that will help further the alternative transportation options for residents. The City's Six-Year Transportation Improvement Program (TIP) from 2022 to 2027 lists planned road, intersection, sidewalk and bikeway projects. Funding and project partners are identified for each planned improvement project. The TIP includes 15 road projects that include bike lanes that will improve connectivity and rider safety along Camas streets.



I just love the natural spaces, so if they're there and accessible (and safe), I'll be so grateful to walk for miles and miles. Thank you!

- Online Open House participant



Map 8: Potential Trails

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Trail Design Considerations

Alignment

The future growth of the trail network will need to balance between alignments that are optimal from trail user, trail experience and connectivity perspectives and those that are practical from cost, design and engineering, regulatory and availability perspectives. Future consideration should be given toward finding alignment options that can accommodate different trail use types (i.e., commuter vs. recreational/destination oriented, and ADA accessibility), as well as potentially interim solutions that rely on wider sidewalks to serve trail users or routing that utilizes existing or planned sewer lines or utility corridors. Accommodating alignments for local, neighborhood link trails as connections to regional, shared-used trails or major park trails is important for providing access and reducing the sole reliance on trailheads for providing access to the trail network.

Access & Trailheads

Safe, convenient entryways to the trail network expand access for users and are a necessary component of a strong, successful system. A trailhead typically includes parking, kiosks and signage and may include site furnishings such as trash receptacles, benches, restrooms, drinking fountains, and bicycle parking. Trailheads may be within public parks and open space or provided via interagency agreements with partner organizations (e.g., county, school district, etc.) to increase use and reduce unnecessary duplication of support facilities. Specific trailhead design and layout should be created as part of planning and design development for individual projects and take into account the intended user groups and unique site conditions. Trail connections and walking or biking linkages also are good access point to designated local and regional trails.

Trail Development Limitations

One underlying tenet of the recreational trail system is to enable the placement of trails within or close to natural features to provide access to the city's unique landscapes, as well as accommodate outdoor recreational access to creeks, hillsides and waterfront. The future planning and design of trail routes through natural areas should be based on sensitive and low-impact design solutions that offer controlled access that protects the resource, while providing for a positive experience for trail users. Trail routes should consider intended and unintended impacts to natural areas, such as soil erosion, especially near streams and shorelines. The determination of future trail alignments should place high priority on natural resource and natural hazards planning and protections, in part to meet local land use policies as well as Washington State requirements.

Ongoing Maintenance

Following trail construction, ongoing trail monitoring and maintenance will keep the trails functioning as designed, while working to protect capital investments in the network. Future trail renovation projects should be included in the Capital Improvement Plans as a means to identify and secure appropriate resources for needed enhancement, such as adding additional capacity to the trail. The City should maintain and expand their connection to and communications with the robust network of local volunteers to provide support as appropriate.

Trail Signs & Wayfinding

Coordinated signage plays a crucial role in facilitating a successful trail system. A comprehensive and consistent signage system is a critical component for the trail network and is necessary to inform, orient and educate users about the trail system itself, as well as appropriate trail etiquette. Such a system of signs should include trail identification information, orientation markers, safety and regulatory messages and a unifying design identity or element for branding. The following signage types should be considered and consistently implemented throughout the network:

- Directional and regulatory signage
- Trail user etiquette and hierarchy signage
- Continuous route signage for route identification and wayfinding
- Mileage markers or periodic information regarding distance to areas of interest
- Warning signs to caution users of upcoming trail transitions or potential conflicts with motor vehicles
- Interpretive information regarding ecological, historical and cultural features found along and in proximity to the trail
- Add QR codes to signs to provide links to additional information

Also, the installation of kiosks at trailheads is a best practice that should continue and provides important trail information, while reinforcing the visual brand of the Camas trail experience.

Level of Service Assessment

A level of service (LOS) review was conducted in addition to and in support of the gap analysis as a means to understand the distribution of parkland acreage by classification and for a broader measure of how well the City is serving its residents with access to parks, trails and open space. Service standards are the adopted guidelines or benchmarks the City is trying to attain with their park system; the level of service is a snapshot in time of how well the City is meeting its adopted standards.

Many jurisdictions are developing guidelines that are customized to their community and its unique and often changing park and recreation demands, rather than solely applying the historic National Recreation and Park Association's (NRPA) published park standards that primarily focused on parkland acreage per capita. The use and application of standards continues to evolve and develop diverse approaches. This Plan evaluates the City's current parkland level of service through a variety of characteristics, including acreage per capita, as a snapshot in time and means to describe the performance of the park system.

Figure 16. Existing & Projected Levels of Service by Park Classification

Type	Current Inventory	Existing Level of Service (2020)	Projected Level of Service (2035)
Regional & Community Park	219.1 acres	8.4 ac./1000	**6.4** ac./1000
Neighborhood Park	75.9 acres	2.9 ac./1000	**2.2** ac./1000
Special Facility	15.9 acres	0.6 ac./1000	**0.5** ac./1000
Trail / Linear Park	61.8 acres	2.4 ac./1000	**1.8** ac./1000
Open Space & Greenway	691.5 acres	26.5 ac./1000	**20.3** ac./1000
	1,064.1 acres	**40.8 ac./1000**	**31.2 ac./1000**

The National Recreation and Park Association (NRPA) conducts annual surveys to generate a Park Metrics database (formerly known as PRORAGIS) that reflects the current levels of service of park agencies across the country based on a variety of factors: population size, population density, number of full-time equivalent employees, number of park facilities, acres of parkland, and more. The Park Metrics survey data are used to compare different park and recreation providers in widely different communities across the country; however, the Park Metrics database relies on self-reporting by municipalities. Some agencies only include developed, active parks, while others include natural lands with limited or no improvements, amenities or access. The comparative standards in the table below should be viewed with this variability in mind.

A few highlights from the NRPA agency comparison provide perspectives on Camas' park system. Figure 17 compares jurisdictional populations served by park and recreation agencies against certain performance metrics. The number of residents per park and acres of parkland per 1,000 residents implicate the potential wear and tear on park facilities. Compared with similar population sizes, Camas provides considerably more parkland acreage (40.8 acres, including open space) per 1,000 residents. Comparing just developed park properties, the City has 6.4 acres per 1,000 residents. Looking at the numbers of residents per playground, Camas has more playgrounds (at 1,862 residents per playground) than similar-sized jurisdictions (at 3,157 residents per playground).

Figure 17. Service Levels Comparing Park Metric (NRPA) Data

Metric	Median Value		
	All Agencies	Pop. Range 20-50,000	Camas
Residents per Park	2,281	1,963	1,629
Acres of Parkland per 1,000 population	9.9	9.6	40.8
Miles of Trails *	11	8.5	39.2
Number of Residents per Playground	3,750	3,157	1,862
Number of Residents per Recreation Center**	31,141	25,716	6,516

* Note: Includes trails in County parks

** Note: Assumes 25% of Camas population for Camas Community Center and Lacamas Lake Lodge as neither facilities function as traditional recreation centers

The use of numeric standards is a blunt and limited tool to assess how well the City is delivering park and recreation services, since the numeric values alone neglect any recognition for the quality of the facilities or their distribution (i.e., the ease to which residents have reasonable, proximate access to park sites). While public ownership of a broad range of recreation lands is crucial to the well-being of the city, the simple use of an overall acreage standard does not match with the citizen input received during this planning process. Residents were particularly interested in the availability of trails, water access, and open space within a reasonable distance from their homes.

The City's park system also was assessed using Washington Recreation and Conservation Office's (RCO) level of service metrics provided in their planning manual. In reviewing the park system as a whole, Figure 18 illustrates the current levels of service across different performance measurements. From the community survey results, public satisfaction of the facilities and amenities that Camas provides ranked as the strongest indicator for the park system. Future development of Ash Creek Park, Lacamas Heights Park and Ostensen Canyon Neighborhood Park will further improve the distribution rating noted in the figure.

Figure 18. Levels of Service with RCO Metrics (System-wide)

Quality Criteria	
Public Satisfaction	
Condition of City Parks (rated as Excellent or Good)	**75.8%**
LOS Grade	**B**
Condition of Trails in Greenspaces (rated as Excellent or Good)	**81.7%**
LOS Grade	**A**
Agency-based Assessment	
Condition Assessment Rating of Existing Parks (3-point scale)	**1.67**
LOS Grade	**B**
Distribution Criteria*	
Parkland Access (within 1/2-mile travelshed)	
Percent Service Area with Access to Active-Use Parks	**71%**
LOS Grade	**C**
Usage / Visitation Criteria	
Frequency of Park or Trail Usage	
Percent Visiting Parks at Least Multiple Times per Month	**86.9%**
LOS Grade	**A**

* Note: The percentage of land area covered by service area walksheds is a proxy for the population within the residential portion of the City.

Scale: Condition Assessment

A	= <1.2
B	= 1.2 - 1.74
C	= 1.75 - 2.24
D	= 2.25 - 2.79
F	= >2.8

Scale: Satisfaction, Distribution & Usage

A	= >80%
B	= 70 – 79.9%
C	= 60 – 69.9%
D	= 40 – 59.9%
F	= <40%

No numeric standards are recommended or proposed for open spaces. While numerical planning standards are common for helping to determine a desirable number of neighborhood parks per thousand residents, they do not translate easily to open space because of the uniqueness of the land base itself. Rather than being guided by numerical standards for open space, the priority for future open space acquisitions, if any, should be focused toward those lands that expand ownership of adjacent City-owned properties or to ensure sufficient property is available to accommodate public access and future trail connections.

As with roadway system and transportation planning, planning for recreational trails should be geared toward connectivity, rather than mileage. Considering a mileage standard for paths within the Camas park system would provide only an isolated and inadequate assessment of need for the community and its plans for better connectivity, and as such no numeric standards are recommended or proposed for trails. This Plan recommends a connectivity goal that re-states and reinforces the desire to improve overall connections across the City and enhance off-street linkages between parks and major destinations, as feasible.

Other Considerations

While this Plan uses total parkland acreage and parkland access as primary indicators of parkland need, the City could also consider other factors as its population grows, including:

- Park pressure, or the potential user demand on a park: Residents are most likely to use the park closest to their home. This measure uses GIS analysis to assign all households to their nearest respective park and calculates level of service (in acres of parkland per 1,000 residents) based on the acreage of the park and the number of residents in the 'parkshed'. Areas with lower levels of service are more likely to be underserved by parkland and to see higher degrees of use and wear and tear on park amenities.
- Availability of park amenities: Park systems should include an equitable distribution and quantity of the most common amenities like playgrounds, picnic shelters, sports courts, sports fields and trails to meet local needs and help distribute the potential usage of individual parks. Working to provide well-distributed basic park amenities, while also offering unique outdoor experiences, will result in a varied park system with a range of different recreational opportunities for residents. See Appendix G for considerations.



Credit: Camas Post-Record

Park & Trail System Recommendations

Acquisitions and Development for Trail Connections

Additional trail connections are needed, as well as sidewalk and bike lanes improvements, to help link destinations across the community and park system to offer more walkability and promote healthier outdoor lifestyles. Acquisitions of easements, corridors and parcels will be needed to create the comprehensive linkages for Camas' future trail system. The Public Works and Parks and Recreation Departments will need to collaborate on the project planning to ensure the most appropriate links that improve the park and trail system. This should also include coordination with the Transportation System Plan (and subsequent updates), as well as coordination with local subdivision and site development projects.

Park Development & Improvement Projects

The preparation of an updated site master plan for Ash Creek Park and a new site plan for the flat, upper shelf of Ostensen Canyon Park will be beneficial to guide future decision-making and development of those two parks. Once master plans have been adopted, phased park development should be planned as part of the capital facilities program.

Field drainage problems are observed issues at various parks. The City should conduct a city-wide field assessment to create a capital improvement project list and on-going maintenance plan. Ongoing coordination with local leagues and the school district should inform other field improvements, including turfing existing fields, installing lights to expand play seasons and the development of additional fields to accommodate demand.

Expanding Recreation Options

Splash Pads / Spray Parks

Spray parks are water play features that are very popular and provide a means of integrating aquatics into parks at a relatively low cost. Camas currently does not have a splash pad in the park system, and strong public support exists for this feature. The City should consider at least one spray park to serve residents as an option for summertime water play that doesn't require lifeguarding. This special use amenity typically is supported by parking and restrooms, since it draws users from a wider area. Any spray park facility should be designed to recycle water, if practical.

Bike Skills

Engaging older youth, teens, and adults in more intense physical activity within parks requires amenities that support challenging active movement. The City should plan for a pump track and connecting flow track in a visible location that can accommodate parking and can enable a synergy with other park uses. These features would add new challenges for riders and add to the range of outdoor recreational opportunities across older youth and teens.

Alternative Sports

Providing facilities for alternative or emerging sports, such as skateboarding, BMX, mountain biking, climbing and parkour, can offer residents a more diverse range of recreational experiences, while creating destinations that attract local and regional visitors. Camas currently has an outdoor, concrete skatepark located next to the Washougal River Greenway, and opportunities and facilities for other alternative sports should be considered as new parks, such as Green Mountain, are designed and developed.

All-Inclusive Playgrounds

Upgrading play areas for ADA-accessibility will be necessary to ensure compliance and universal access; however, providing for ADA-accessibility should not be the City's only goal. As new parks or playground replacements are planned, Camas should consider opportunities for fully-accessible all-inclusive play areas to provide for users of all abilities.

Off-Leash Dog Area

Walking with a dog is a very popular recreational activity, and off-leash areas have become desired amenities for dog owners living in urban environments who may otherwise have limited opportunities to exercise their pets. Recreational trends and community input indicate an existing

need for an off-leash area. The City of Camas currently does not have an official off-leash dog area; however, the City of Washougal has prioritized implementation of a dog park within the next year with opportunities for Camas residents to use.

Appropriate sites should be safe, not isolated, and noise impacts on neighbors should be considered. Ideally, a dog park would be a component to a larger (future) community park, where infrastructure (e.g., parking, restrooms and garbage collection) exists and supports multiple activities. The development of a dog park may require code revisions, the development of rules and policies, and community support for self-policing for behavioral issues and waste pick-up. Communities throughout the Northwest have relied on grassroots or non-profit organizations, such as DOGPAW, for the ongoing operations and maintenance of such facilities.

Sport Courts

A limited variety of sport courts exists within Camas. Two tennis courts, three volleyball courts and nine basketball courts are provided at City parks. Tennis court surfacing will require attention in the coming years, and Camas has an opportunity to transition one or both courts to multi-sport use. Camas currently has no outdoor, dedicated pickleball courts available within public parks.

Pickleball continues to rank as one of the fastest -growing sports and has seen significant jumps in participation over the past decade, attracting a wide range of age groups. As an interim step, the City should plan to convert some tennis courts to multi-sport courts through striping and examine the need for additional multi-sport courts in the future.

Community Gardens

Community gardens provide common space for residents to grow fruits, vegetables and flowers. Gardens have been shown to increase healthy food consumption, while providing opportunities for active living, social interactions and lifelong learning. Community gardens are becoming more popular park amenities in urban environments, where residents may have limited outdoor space. Gardens are also popular with a diverse range of residents. Additional gardens could be sited in community or neighborhood parks or in stand-alone locations with parking and access to water. Due to limited staffing, the City should continue to seek partnerships for garden management with local community groups.

Water-oriented Recreation

Camas' location on the Columbia River and with three major lakes provide substantial opportunities for water-based recreation, including both motorized and non-motorized boating, fishing, paddle sports, wildlife watching, and beach activities. The City has made significant investments in waterfront acquisitions and water-oriented infrastructure over past decades, and this infrastructure, which includes docks, ramps and other water access amenities, should continue to be monitored.

Outdoor recreation businesses in the Camas-Washougal community benefit from the close proximity of the rivers, forests and mountains that provide venues for mountain biking, backpacking, rock climbing and similar outdoor activities. The cities of Camas and Washougal should coordinate and partner with local businesses to run classes that provide an introduction to these outdoor sports and broaden the outreach to new participants.

Acquisitions for a Complete Park System

Camas' park system has been expanding as the City grows and the need for more facilities triggers additions of both parkland and recreational amenities. The City is expected to continue its growth as a desirable place to live and, thus, must press forward to acquire more parkland and develop more amenities within existing parks. The mapping of existing parks within Camas' residential neighborhoods illustrated the need for three more strategically located park sites to ensure reasonable access to walkable parks for the bulk of the community. Acquiring parkland requires a proactive approach and may need to look beyond undeveloped or partially developed properties. In addition to fee-simple purchases, the City should continue to work and coordinate with local residential developers to include public parks in new subdivisions and utilize tools, such as park impact fee credits, to facilitate the process.







User Conveniences

Restrooms

Supporting park and trail use through the provision of restrooms is a critical element in any park system. Based on the park site assessments, several parks should have the restrooms replaced or upgraded; and where possible add new permanent bathrooms to parks and trailheads.

Parking

Camas has several park and trail assets that are heavily used during the summer, especially those that are adjacent to water or have access to water-oriented recreation such as Heritage Park and Heritage Trail. The City should evaluate such locations for parking and transportation constraints and needs and consider improvements to add capacity for heavy seasonal uses.

Picnic Areas & Shelters

Improving access to existing picnic areas and shelters for ADA compliance should be a core focus. Additionally, the City should assess and consider installation of new picnic shelters by city quadrants. Site master plans for Ash Creek Park and Ostensen Canyon Park should guide the future decisions about the need and location of picnic areas and shelter facilities.

Wayfinding

The City of Camas can benefit from enhanced wayfinding and signage supporting its overall park and trail system. Opportunities exist to help visitors navigate and inform them about the public spaces they are entering. A good wayfinding system can provide a consistent identity and display valuable and accessible information to orient the user. This guidance system ensures efficient use of the trail, park, or other public space and conveys safety to the user by translating the environment into a known geography. Signs, symbols, mapping, color, and standardized site amenities combined with good design of the physical environment (i.e., trail or park) help the user navigate the space and stay comfortably oriented.

ADA compliance

Minor improvements to access, such as providing ramped entrances, for site furnishings are necessary to conform to the Americans with Disabilities Act (ADA) and ensure universal accessibility. Also, the City should evaluate the play equipment and its signage for code compliance and replace outdated equipment, as appropriate. The Capital Planning section includes a line item for covering small upgrades and improvements to remove barriers and improve universal access. In general, the City should complete a system-wide ADA assessment and make improvements to existing parks as needed to ensure proper maintenance, usability and quality of park features and grounds.

CHAPTER 6

Open Space & **STEWARDSHIP**

Camas' open space, greenways and waterways are a critical component of the City's green infrastructure and play critical roles in supporting healthy, well-functioning ecosystems. These many benefits include maintaining and enhancing air and water quality, mitigating impacts of climate change, capturing stormwater runoff, and providing recreational and scenic opportunities to connect with nature that promote physical and mental well-being.



Open Space

The Camas community is fortunate to have retained several significant natural areas across the City. Over 700 acres of open space properties and natural lands are either owned or managed by the City, in coordination with the acreage of the developed park areas. These open space properties include forested lands, riparian corridors, wetlands, and steep slopes across 31 different sites. Together, the open space properties around Lacamas Lake comprise the most extensive and contiguous public open spaces, accounting for 49% of the open space in the City. Several other significant natural areas, ranging in size from 11 to 125 acres, also provide substantial forested areas. Smaller open space properties, under 10 acres in size, are distributed across Camas.

The open space classification distinguishes natural lands from parks developed for active recreation and other highly managed landscapes. Open space may refer to public properties that are exclusively natural areas or portions of larger parks that are managed as natural areas. These open space lands are managed to preserve, restore, and conserve ecosystem functions, water quality, native vegetation, and wildlife habitat. Open space properties are undeveloped, primarily left in their natural form, and are managed to retain or enhance natural or



Would like to see development of parking, picnic shelters, and water entry to Fallen Leaf Lake on opposite side of Lake Road.

- Online Open House participant

scenic resources. However, open space may include trails or interpretive signs, along with modest support amenities such as parking or restrooms. Additionally, some properties that are acquired and held as future, active-use parks are managed as open space until they are developed as parks, which may last five to ten years or even longer from the time of purchase.

Figure 19. City-owned Open Space Areas

Open Space Area	Acreage
Larger Open Space Properties	
Fallen Leaf Open Space	52.30
Forest Home Open Space	19.71
Grass Valley Open Space	11.26
Lacamas Creek Open Space	65.79
Lacamas Lake Open Space	52.41
Lakeridge Open Space	59.49
North Lacamas Lake Open Space	159.91
Ostensen Canyon Greenway	47.70
Prune Hill Open Space	22.96
Skyridge Open Space	29.63
Summit Terrace Open Space	12.34
Washougal River Greenway	124.29
Subtotal	**657.78**
Smaller Open Space Properties	
6th Ave Open Space	0.60
Columbia River Open Space	2.81
Columbia View Terrace Open Space	0.24
Crown Road Open Space	1.37
Goodwin Road Open Space	0.84
Lake Road Open Space	6.99
Meadows Open Space	3.37
Mill Ditch Open Space	9.12
Renaissance Summit Open Space	0.33
Sunningdale Open Space	1.67
Tidland Heights Open Space	1.46
Top Fallen Leaf Open Space	0.41
Triangle Open Space	9.41
View Ridge Open Space	0.33
Subtotal	**38.95**
Undeveloped Park Properties	
Ash Creek Park	9.54
Benton Park	4.77
Green Mountain	114.21
Lacamas Heights Park	2.30
Ostensen Canyon Park	8.23
Subtotal	**139.05**
TOTAL OPEN SPACE	**835.78**

Large Open Space Properties

The City manages several other sizable open space properties. At more than 10 acres, significant habitat for wildlife and a quiet experience for park visitors is buffered by nature from the surrounding urban environment. These areas, in addition to the Lacamas Lake and Washougal River Greenway areas, include Ostensen Canyon, Prune Hill, Skyridge, Forest Home, and Grass Valley. These large open space areas contain a variety of distinct habitats, such as wetlands and creeks, adding to the diversity of plant species they host. Some of these open spaces also include developed trail systems, serving as recreation opportunities and valuable pedestrian connections for local streets and neighborhoods.

Smaller Open Space Properties

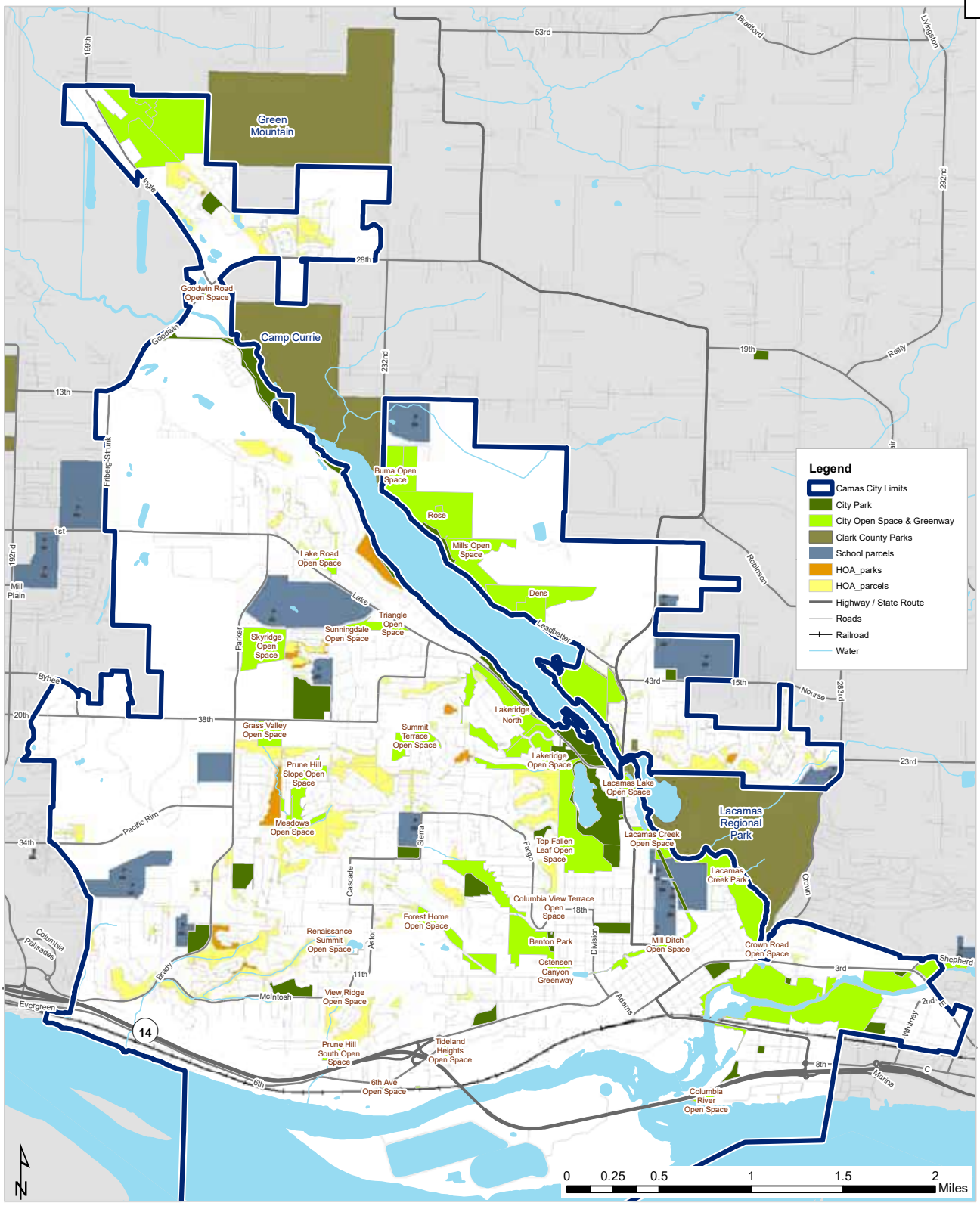
Smaller open space areas, ranging from less than one acre to ten acres, are distributed across the City. Though small, these pockets of natural area serve as refuges for wildlife traveling between larger forested areas, and in some cases, provide meaningful trail connections between adjoining neighborhoods. Several of these areas have no developed trails or site improvements and are managed exclusively as natural area set-asides and to preserve or enhance their ecosystem functions. These include Crown Road Open Space, Lake Road Open Space, Meadows Open Space, Mill Ditch Open Space and Triangle Open Space, among others. Development of these sites for public recreational use, including the construction of trails, may be limited, or restricted by natural characteristics of the land, including steep slopes, wetlands, and other features.

Other Open Space Properties

Other significant natural open space areas include sites owned by Clark County, such as Lacamas Regional Park and Camp Currie, and a significant collection of privately-held parcels owned by various homeowners' associations throughout the City.

Figure 20. Other Open Space Areas

Non-City Open Space Lands	Acreage
Clark Co	891.10
HOA Parks	43.25
HOA Open Space	341.65
TOTAL NON-CITY OPEN SPACE	**1,276.00**



Map 9: Existing Open Space by Provider

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Land Conservation

The City of Camas has demonstrated its commitment to conserving its natural resources within the context of a major metropolitan region. The preservation of the network of open space around Lacamas Lake and the Washougal River Greenway are shining examples of the importance of land conservation to the community. The City has also preserved a variety of public waterfront access and public park amenities along Lacamas Lake and the Washougal River.

Many of the public lands that the City owns and manages host unique, high-value landscapes, such as intact forests, waterfronts, and vistas. These areas are prioritized for conservation, acquisition, and restoration activities to ensure that they continue to thrive and provide their distinct ecosystem functions and benefits. High-quality waterfronts, watercourses, and wetlands are all vital to protecting water quality of these environments and preserving Camas' diversity of habitats. Providing safe public access to and within these areas needs to be carefully balanced with the crucial goal of environmental stewardship and natural habitat protection.

Waterfronts

Camas' diverse waterfronts present some of its most aesthetic and environmentally important characteristics. With only small exceptions, nearly the entire waterfronts of Lacamas Lake, Round Lake and Fallen Leaf Lake are in public ownership. Water access sites are provided at Heritage Park, Fallen Leaf Lake Park, Lacamas Regional Park and along Leadbetter Road. River access is provided within the Washougal River Greenway, and the Port of Camas-Washougal provides water access to the Columbia River. Through ongoing planning and coordination with Clark County, the City should continue to explore options to expand its waterfront ownership along the Columbia River. The conservation and continued restoration of these open spaces further highlight the conservation values of the Camas community.

Watercourses

The City's stormwater management area includes three major watersheds: the Columbia River, the Washougal River, and the Lacamas Lake watersheds. The Stormwater Management Program aims to inform and assist in the development of water quality management policies and strategies to protect local waterways, consistent with the state and federal requirements. Watercourses traversing the numerous sub-basins within the three main watersheds are naturally occurring or partially altered streams characterized by perennial or seasonal flows that contribute to water filtration, stormwater buffering, erosion control, and the provision of wildlife habitats. Within City-owned properties, preservation and restoration of the land surrounding watercourses are a priority, ensuring that these areas continue to provide their unique ecosystem services.

Wetlands & Steep Slopes

The City code also protects and regulates wetlands and steep slopes in Camas. The City's natural open space areas include several wetland areas, including riparian or lakeside wetlands and perched wetlands in upland forest areas. Steep slopes exist throughout the drainage basins and small canyons, such as Ostensen Canyon. These areas continue to be a high priority for protection and restoration efforts. Generally, they represent fragile ecosystems that host unique plant communities and serve as a valuable habitat for many animals, including bird and amphibian populations. These areas should be included in future open space management planning.

Forest Lands

Healthy and resilient forest lands are crucial for the preservation of Camas' high-value ecosystems. The City is fortunate to have acquired and protected many of the forested hillsides and canyons and open spaces around the three major lakes. Ongoing monitoring and management of these forest lands will be necessary to control impacts to water bodies and water quality, control invasive vegetation, maintain native plant communities and accommodate appropriate recreational access and usage.

Land Acquisition

Conservation may also take the form of acquiring important lands that contribute to the ecological health of Camas' forests, wetlands, and watercourses. For many years, the City has partnered and planned with Clark County on the Legacy Lands Program to secure such lands adjacent to the North Shore of Lacamas Lake.

The 2021 update to the Clark County Natural Areas Acquisition Plan provides a vision for preserving and enhancing a system of natural lands that includes greenways, habitat, farm, and forest resource lands. The plan provides a regional perspective, identifying specific acquisition opportunities, as well as accommodates future opportunities for park development, trail creation, and restoration. Within Camas, this county-wide plan continues to identify high-value conservation lands along the Columbia River shoreline (including Lady Island) for open space and to accommodate the Lewis and Clark Regional Trail, in addition to lands along Lacamas Creek.

Undeveloped lands or sections of existing properties are often restricted in their potential development by steep slopes, wetlands, or critical areas. These features are often highly valued for habitat conservation. These areas may extend existing natural areas or serve as essential habitat corridors between larger open space lands. Conservation easements and public access easements are tools that could be applied to increase habitat benefits and access across the parks and open space system.

Stewardship

With the growth of the open space network, the City has initiated several studies to guide the stewardship and management of these lands, informed by quantitative data and best practices.

Open Space Studies and Management Plans

Lacamas Lake Management Plan

The City has begun a process to develop a Lake Management Plan to outline actions to improve water quality in Lacamas, Fallen Leaf, and Round lakes. The project will address algae blooms, along with other water quality concerns that City Council has identified as a top priority. The planning effort will include water sampling and monitoring to better understand current water quality and to develop potential management strategies to improve the overall health of the lakes.

North Shore Subarea Plan

The area north of Lacamas Lake is anticipated to experience substantial growth and redevelopment within the next 20 years, and the City is actively planning the future of the North Shore through an ongoing community process. Current uses are primarily agriculture and single-





family residences, and most of the subarea is in private ownership. Planned transportation infrastructure will improve connectivity and support the employment and retail uses desired in the North Shore area. A large portion of the land in this area is zoned Business Park and Multi-Family, with some Commercial and lower density residential zoning. An eight-point vision statement, adopted by City Council in September 2020, includes as the first two points the intent to preserve the natural beauty of the North Shore and plan for connected greenspace.

1. Preserve the North Shore's natural beauty and environmental health. Policies, regulations and design rules must protect significant trees, tree groves, and surrounding lakes. Identify and preserve views to the treed hillside and the lake.
2. Plan a network of green spaces and recreational opportunities. Integrate a variety of parks, playgrounds, trails, and open spaces into residential and employment areas throughout the North Shore area. Create a "green corridor" along the lake that completes the Heritage Trail, provides lake access, and buffers the lake from adjacent development.

System-wide Open Space Management

In 2003, the City prepared Policy Guidelines for an Open Space Management Plan, which was intended to give staff the basis for effective resource management decisions. The plan identified nine management goals and eight policies to guide open space management. The plan identifies high-level issues related to land management and trail development in and through the open space network.

Since 2003, the City's open space network has grown by over 50% in terms of city-owned acreage, and an updated, more specific and science-oriented open space management and urban forest management plans are required to better guide City staff in the care, maintenance and stewardship of open space and forested lands. In particular, these new plans should reflect the realities of limited program funding and the challenges presented by climate change to include the following considerations:

1. Maintain the functional benefits of open space vegetation.
2. Foster resilient plant communities that can recover from disturbances and adapt to climate change and its impacts, such as forest fires.
3. Implement work based on the value of these functional benefits, the community's priorities for the open space properties and the condition of the vegetation found there.
4. Maximize the return on available funding through volunteers, matching grants, and donations.

Sustainable Stewardship Practices

The management of landscapes in City parklands, whether formal plantings in developed parks or diverse forest ecosystems in open space areas, requires continual attention and an investment of significant resources to properly steward and maintain the living landscape. Regardless of the use of these landscapes, the desired outcomes are the same – to sustain healthy, thriving plants.

Past practices and traditional horticultural methods to achieve this goal have become less reliable in recent years. Changes to the Pacific Northwest climate have increased summer heat and drought, causing more stress for mature and establishing plants. This change has been accompanied by a shift toward more sustainable landscape maintenance practices, reducing potential impacts on the surrounding environment and its inhabitants.

Water Conservation

Despite the rainy winters, water is not an unlimited resource in the mid Columbia River valley, and summers are expected to get even hotter and drier as climate change intensifies. It is increasingly likely that not just voluntary, but mandatory, water conservation measures will become necessary on occasion to preserve supplies for the most critical uses, such as domestic consumption.

In landscaped areas where shrubs and trees rely on some summer water, maintenance staff have adjusted the irrigation systems to water before sunrise to reduce water waste and maximize plant uptake. Depending on the landscape, watering also may need to be shifted to a deeper and less frequent watering schedule to reduce evaporation and encourage plants to root more deeply. In addition to reducing irrigation volumes and frequency, the City should consider shifting to planting more drought-tolerant species and schedule the majority of new plant installations in the early part of the rainy season to maximize root growth and establishment before the onset of the dry season.

Plant Selection

Selecting appropriate plants species for park landscapes is the source of a great deal of discussion, both on the local and regional scale. While drought-tolerant plants will be better able to establish in the short term, consideration is also given to how well newly established plants will survive in the long term. In recent years, cities across the Pacific Northwest have seen many mature native trees decline and die in recent years, unable to adapt quickly to the increased summer temperatures and lack of summer moisture. Plant selection for tree replacements or renovations that consider the anticipated climate in 10-50 years will be more likely to create resilient, mature landscapes that can better transition to warmer, drier conditions.

In natural areas, generally replanted with trees and shrubs native to the immediate area, staff should begin selecting new plants from seed zones that reflect the greater Portland-Vancouver area's projected climate. This focus on plant provenance (the original geographic source of seed, pollen, or propagule) will allow staff to plant the same native species better adapted to future conditions.

In addition to considering the climate in the selection of plants for developed parks, other factors must also be considered, including the mature size of the tree or shrub, any known pests or diseases that may affect the species, and how a fully developed root system will interact with nearby paved surfaces.

Invasive Species Management

The control of invasive species is a critical element of the restoration process and essential in maintaining a healthy natural landscape. Many invasive and non-native species exhibit strong adaptability to Pacific Northwest environments and displace native species, especially within the disturbed landscapes proximate to urban development. In relation to the need for an updated open space management plan, the City should expand resources to managing invasive species and enhanced partnerships to help with these efforts. While removal efforts may be ongoing, those sites cleared of invasives will require continuous monitoring and intervention to reduce or limit the re-establishment of the invasive plants. Through proper management of public open spaces and natural areas, the City and its partners can maintain and enhance its open space areas and the critical ecosystem and community benefits they provide.

Stormwater Management

The Pacific Northwest region is experiencing more severe rainstorms due to climate change, and more of that rain is falling on impervious surfaces: roads, parking lots, and rooftops. This untreated surface water runoff is a source of contamination along the Columbia River, Washougal River, Lacamas Lake, and in other riparian areas, impacting both people and wildlife, especially salmon populations.

State requirements for surface water management are becoming more stringent and costly for both developers and the City. Ongoing updates to and management of the City's NPDES Phase II Permit, Stormwater Design Standards, Stormwater Management Plan, and Stormwater Management Program should be acknowledged in relation to park and open space system management.

Runoff volumes, peak stream flows, and local flooding can be reduced by incorporating trees into stormwater management planning, lessening the need for expensive detention facilities (e.g., catch basins) and the cost of treatment to remove sediment and other pollutants such as lawn chemicals. Green infrastructure is far more cost-effective than grey infrastructure.

Using open space areas and greenspaces to capture stormwater runoff encourages infiltration into the soil, prevents excessive streambed erosion, and reduces sedimentation in major waterways. In addition, a healthy tree canopy increases carbon sequestration potential, encourages local biodiversity, and enhances overall environmental resilience by reducing heat island effects and offering cooler, shaded air.



CHAPTER 7

Recreation & EVENTS

...my top priority "Outdoor adventure summer camps, including archery..." I would be very interested in these types of activities/camps not only for children and youth, but adults as well. I would love to participate in all of the activities that were listed, not only to learn more but also to meet more people in the community.

- Online Open House participant



The recreation facilities and services available within Camas are a major community asset and support the physical, mental and social health of community members. Recreation services are available through a range of public and private recreation, health and fitness providers and facilities. The City currently provides nearly all of its programing through partnerships and program contractors and does not provide a full suite of 'traditional' recreation offerings, such as fitness and aquatics, due to limited facility space and staffing.

RECREATION MACROTRENDS

The following national and state data highlights some of the current trends in recreation and may frame future considerations in Camas' recreation programs. Additional trend data are provided in Appendix E.

- Nationwide, eighty-two percent of U.S. adults believe that parks and recreation are essential. (1)
- Seventy-seven percent of survey respondents indicate that having a high-quality park, playground, public open space or recreation center nearby is an important factor in deciding where they want to live. (1)
- Nearly all (93%) park and recreation agencies provide recreation programs and services. The top five most commonly offered programs include holiday or other special events (65%), educational programs (59%), group exercise (59%), fitness programs (58%), and day or summer camps (57%). (2)
- Youth aged 6 to 17 were active outside far less in 2019 than in previous years – the average

number of outings per child dropped 15% between 2012 and 2019. [4]

- Adults over the age of 65 showed significant change in inactivity rates in the six year period between 2014 and 2019, decreasing 6.8%. The rise in popularity of low impact exercise like aquatic exercise, swimming for fitness, yoga, and barre could be attributing to the decline of inactivity in this older age group. [5]
- Nearly all park and recreation providers in the U.S. experienced a decline in revenue in 2020 due to the COVID-19 pandemic. As early as May 2020, most providers had to close facilities temporarily in accordance with health and safety directives. Nearly half had also furloughed or laid off staff due to the funding and facility impacts of the pandemic. [3]

Sources:

(1) American Engagement with Parks Survey

(2) 2020 NRPA Agency Performance Review

(3) 2020 State of the Industry Report

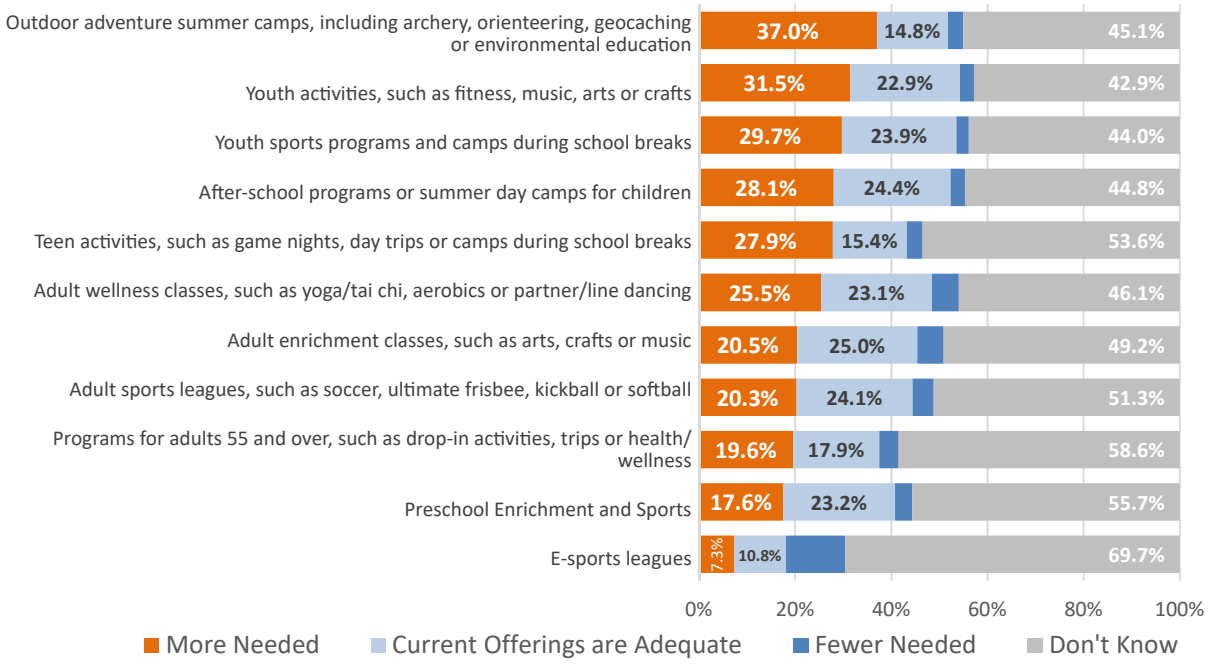
(4) 2020 Outdoor Participation Report

(5) 2020 Sport & Fitness Industry Association Sports, Fitness, And Leisure Activities Topline Participation Report

Local Perspectives

The community survey conducted as part of this PROS Plan update asked respondents which types of recreation programs, classes and activities they would like to see more of. Notably, approximately half of respondents indicated that they did not know whether current offerings were adequate or not. Of those who expressed an opinion, more than half felt the City needed more outdoor adventure summer camps, teen activities, adult wellness classes and programs for adults over 55. Respondents under 34 years of age were more likely to feel the City needs more adult sports leagues, youth camps and after-school programs, preschool activities, and E-sports leagues.

Figure 21. Adequacy of Current Recreation Options



Additional insight was gleaned from the online open house, which asked participants to prioritize the list of recreation programs and activities that ranked strongly from the above community survey. The top three recreation program priorities were noted as the following:

(1) After-school programs or summer day camps for children

(2) Outdoor adventure summer camps, including archery, orienteering, geocaching or environmental education

(3) Youth sports programs and camps during school breaks

The online open house also included a question about community events. Participants were asked to rate the priority (high, medium or low) from a list of ten program options. The top three event priorities were noted as the following:

(1) Hometown Holidays

(2) Movies in the Park

(3) Concerts in the Park

- Outdoor Recreation – Environmental education, hiking, camping, kayaking, and other activities
- Sports – Team and individual sports including camps, clinics and tournaments, as well as adventure/non-traditional sports
- Seniors – Programs and services that are dedicated to serving the needs of seniors
- Special Events – City wide special events that are conducted throughout the year
- Teens - Programs and services that are focused on serving the needs of teens. This can include all of the activity areas noted above (except seniors)
- Youth – Before and after school programs, summer/school break camps, and preschool

Figure 22 highlights the major areas of focus for current Camas recreation programs, segmented by general program classification and age group. The programs noted are based on a review of program offerings for 2018-2021, that were provided by the Department.

Recreation Programs

Interest in the City providing recreation programs appears to be strong; however, the number and types of activities the City can offer is very limited due to the lack of staffing and indoor facility capacity. The City should consider incremental growth in recreation programs and initially focus on facilitating programs via contract vendors who provide their own staff and/or focusing on those programs that are not currently offered by local or regional providers.

Programming Classifications

Recreation program offerings can be classified and segmented into general program categories to assist in the planning and provision of programs and activities. The following general program categories have been applied to a review of programs offered by the City to illustrate the range and variety of program options:

- Education – Language programs, tutoring, science (STEM) classes, computer, financial planning, and CPR/AED/First Aid
- Fitness – Group fitness classes, personal training, education, and nutrition



Figure 22. Existing City Programs by Classification

Area	Focus	Programs
Sports	Youth Sports	Sports Camps, Soccer, Skyhawks Sports Camps, Co-ed Flag Football
	Adult Sports	Adult Co-ed Softball, Men's Softball
Fitness / Wellness	Youth	Fencing, Kung Fu, Fitness Classes, Tiny Tots Tumbling
	Adult	Fitness Classes, Yoga, Tai Chi, Women's Self Defense, Barre
Youth		Spring Kids Camp, Preschool, Preschool Summer Camp, Brickzone Summer Camp, School Break Camps
Teens		Camtown Art Show, plus Sports & Fitness (see above)
Education	Youth	CPR/AED/First Aid. Busy Bee Preschool
	Adult	CPR/AED/First Aid
Specialty / General Interest	Youth	Music Together, Craft Workshops, Family Paint Night
	Adult	Craft Workshops, Family Paint Night
Special Events		Easter Egg Hunt, Camtown Youth Festival, Movies in the Park, Summer Concerts, Family Fun Fridays, Hometown Holidays
Outdoor Recreation	Youth	Spring Adventure Camp
	Adult	N/A
Seniors		Fitness Classes, Tai Chi, Self-Defense, Cultural Bus Tours, Casino Tours

Programs Available by Age Groups

Below is listed the general program categories that are available for different age groups. Full dots represent categories where Camas has an established set of programs, and hollow dots represent categories where Camas currently provides some program options and is working to grow the programming.

Figure 23. Segmentation of City Programs by Age Group

Program Category	Preschool	Youth	Teen	Adults	Senior
Education	●		◎	◎	◎
Fitness		●	◎	●	●
Outdoor Recreation		●			
Seniors					●
Special Events	●	●	●	●	●
Sports	●	●	●	◎	◎
Teens			●		
Youth		●			

For the programs it provides, Camas serves all of the major age groups to a degree. Education and Outdoor Recreation have very limited programs in place and should be supplemented as staff and resources allow. Education programs could include language programs, tutoring, science (STEM) classes, computer classes and financial planning. Outdoor recreation programs could occur at many of the local parks and include environmental education, birding, hiking, camping, kayaking and other activities.

As shown in the community survey conducted as part of this Plan, the Camas community considers youth programs to be a high priority for City recreation services. More than three in ten survey respondents indicated that there were not enough youth activities, such as fitness, music, arts or crafts (31.5%) and outdoor adventure summer camps, including archery, orienteering, geocaching or environmental education (37%). To address community needs and demand, the City should explore how to provide adequate resources to expand and diversify its youth programs to meet the growing need for engaging, affordable, safe options for children and teens. The City should continue to work with the school district, community partners, recreation providers, and sports organizations to explore facility options and availability. In utilizing existing parks and outdoor resources during the summer months, the City should explore specialized outdoor youth camps focusing on hiking, climbing or orienteering, as well as expand and strengthen its Adventure Camp program.

If opportunities are created for additional indoor or classroom space, the City should consider whether to expand the quantity and breadth of youth and adult programs offered. In particular, the City should consider health and fitness classes, additional team sports programs, classes in alternative sports, art and music classes, and educational programs, such as language, and personal and home improvement. Because recreational programming can be influenced by national and regional trends, staff must stay abreast of current trends and continue to evaluate and adjust program offerings within its contractor-reliant service model and if indoor program space becomes available.

The City also should continue to coordinate with the school district and explore options to partner with the district for the use of school facilities (e.g., gymnasiums and classrooms) as space for expanded program options, especially during non-school summer months. Such an option would require the loosening of COVID restrictions, as the school district has stopped allowing outside organizations to use their spaces for activities.

Regarding programs for adults over 55, the depth and breadth of programming for seniors may need to increase or be adjusted as the overall population ages, with a greater emphasis on the wide-ranging needs and expectations of the Baby Boomer generation. As noted in the Community Profile chapter, Camas has a slightly higher median age than the county and state, and nearly one-quarter of the city population is 55 years of age and over. Today's seniors are generally more active than previous generations and would benefit from a diverse array of recreational and educational programs that promote active, healthy lifestyles. The City will likely see an increased demand for programs offered on evenings and weekends, as older community members maintain employment or volunteer activities later in life.

Additionally, the following program categories are not provided due to the limited nature of the City's facilities and staffing capacity to support these programs:

- Aquatics – Learn to swim classes, aqua exercise classes, competitive swimming/diving, SCUBA, and other programs (synchro, water polo, etc.).
- Cultural Arts – Performing arts classes, visual arts classes, music/video production and arts events.
- Self-Directed – This includes the opportunities for individuals to recreate on their own. This can include activities such as open gym, use of weight/cardio space, and lap/recreational swimming.
- Special Needs – Programs for the physically and mentally impaired, as well as inclusion programs.
- Social Services – This can include nutrition and feeding programs, job training, life skills training, childcare and other activities, such as health screenings.

Recreation Facilities

Camas Community Center

The Camas Community Center is a historic school building located south of the Washougal River and downtown Camas, in the Oak Park neighborhood. The center is used for community meeting and private event space, recreation programs, senior activities, as well as storage for non-profit partners, special event and recreation program supplies. The facility has limited function due to its small size, limited amenities, location, and inability to expand. Built in 1915, the Center was not designed for recreation programming and does not have a full-size gym. In the future, if a new recreation center is approved, the City should reexamine the use of the existing community center to avoid duplication of services.

Lacamas Lake Lodge

The Lacamas Lake Lodge is located adjacent to Heritage Park on Lake Road, along Lacamas Lake. Located on the site formerly occupied by the Camas Moose Lodge, the new building provides community meeting and event space, adult and youth recreation programs, as well as improved access to Lacamas Lake and public parking. This facility is intentionally designed for multiple uses but is especially well suited to rent for events. The City should continue to program this facility to support recreation programs, but in a manner balanced with rental use of the facility, which provides the greatest revenue to support this facility and other City services.

Private Fitness

Several private fitness and aquatic clubs are located in or near Camas. These facilities vary in their offerings and clientele, and their strength in the marketplace is an indicator that the wider Camas-Washougal community seeks out and has a need for fitness-related activities and programs.

School District Facilities

In addition to school gymnasiums and sport fields, the Camas School District also operates the Jack, Will and Rob Center. The facility was opened in 2002 and run as a Boys & Girl Club until 2017. At that time, the Camas School District assumed operations. The center provides after-school programs, classes and rentals, and the facility offers a gym, classroom space, art room, computer lab and Family Community Resource Center.

Future Recreation & Aquatic Center

In 2019, Camas voters rejected a $78 million bond to build a community recreation and aquatics center with a recreation pool and competitive pool, in addition to sport field improvements. Although the outcome of that vote was clear, the outreach conducted through this planning effort indicates that many in the Camas community still have interest in an aquatics facility and indoor recreation space.

Traditional guidelines from the National Recreation and Parks Association for service demand for recreation centers are based on a population benchmark, with the idea that one recreation center could be supported by a population of 40,000. With the City's current population and projected growth, the City should continue to explore the potential to site and finance an indoor facility and continue the dialogue with the community about what could be included in a new facility, its projected costs, and the community willingness to support such an endeavor – at a scale that would be supported by voters. Partnerships will be necessary to offset development and operational costs of a community recreation center, so the City should continue discussions with local agency partners (e.g., City of Washougal, Camas School District) and with operators (e.g., YMCA) to explore options for the development and operations of a future center.

Special Events

The main recreation program area that is directly offered by Camas Parks and Recreation is special events, which include the following (pre-COVID):

- Easter Day Egg Hunt
- Camtown Youth Festival
- S'more Stories Under the Stars
- Concerts in the Park
- Camas Days Kids Parade
- Family Fun Fridays
- Movies in the Park
- Family Halloween Night
- Hometown Holidays

Community and special events should continue to be an area of emphasis. Special events draw communities together, attract visitors from outside the community, and are popular with residents. However, due to resource requirements of coordinating special events, the overall growth in the number of events should be carefully managed. This will ensure the City can adequately invest in its overall recreational offerings and maintain high-quality special events. Other community groups should be encouraged to be the primary funders and organizers of as many community-wide events as possible. If the City decides to offer more events, it should obtain sponsorships to offset costs and develop a series of seasonal activities.



Program Enhancement & Development

Staff should periodically review data from the following sources to determine community needs for programs and services:

- Historical registration trends/success of current programs and services
- Surveys and questionnaires
- Washington SCORP and national trend data
- Suggestions provided by current instructors and current employees
- Suggestions submitted by prospective instructors/ employees

Staff should continue to evaluate and assess the City's program offerings and prioritize future programs based on a mix of criteria that include:

- Current or potential importance for community-wide or broad individual benefit
- Community needs or deficiencies
- Potential for increased participation
- Revenue potential, affordability and accessibility

With the City of Washougal's interest in expanding recreation options, the City of Camas should directly coordinate and plan with Washougal staff to provide a balanced suite of programs in a complementary manner. This should be in parallel with the development of Camas' programming philosophy to detail how the City will deliver recreation programs and services in the future, which also is framed by the availability of flexible, indoor space for programs and classes. As part of the programming philosophy, the City must determine what programs and services will be offered directly by recreation staff and which will be contracted to other individuals or organizations. The City's current model of utilizing program contractors could be expanded or supplemented as indoor space is available via arrangements with the school district and/or the construction of a larger recreation center that can accommodate fitness, athletics and classes.

Before determining which programs and services to contract or have provided by others, an assessment of the specific pros and cons of such a move needs to be completed. A major aspect of this analysis should be to determine the financial impacts and

quality of the services that will be provided. Key questions to be asked include:

- Is this program offer consistent with community wants and needs?
- Do we have the facility capacity to provide the program? If not, can we partner with someone who has the space?
- Will this be the most cost-effective method to obtain the program, service or function?
- Does the Department have the knowledge, equipment, staffing resources and systems to provide the program, service or function?
- Are there other more qualified organizations that should provide the program, service or function? Will the quality of the program, service or function suffer if it is contracted to other organizations?
- Is the program, service or function only available from a contract provider?
- Are the safety and liability risks too high to provide the program or service in house/
- How will we effectively and efficiently market this program?

Communications & Marketing

As staffing and resources allow, the City should take a stronger role in coordinating and delivering recreation programs and services in the community to ensure that there is a broad base of inclusive programming options available. This will require strong communications with other providers to determine roles, tracking of programs offered and number of participants, plus actively promoting the availability of services. Strong marketing efforts will be needed to inform and promote the recreation programs that are available and should focus on the following areas:

- Website enhancement to better promote programs and services
- The development of an updated program catalog, circulated multiple times a year
- Promotion of program registration options
- Programs and services offered by other providers
- Using appropriate communication channels to effectively market to various demographic segments.
- Cross marketing and/or promotional opportunities with other organizations such as the Camas School District, Camas Library, Meals on Wheels, Camas-Washougal Rotary and others.

There must be a strong recognition of the different demographic markets that have to be served. The youth, senior and family populations in the area should be specifically addressed, as should the different ethnic groups. Cross marketing programs with the school district and using social media to highlight programs by target audience also should be employed.



CHAPTER 8

> ***Near-term – increase field capacity by improving field quality.***
> **- Stakeholder Focus Group participant**

Operations & MAINTENANCE

The City of Camas aims to provide a quality park, recreation, natural open space, and trail system that is efficient to administer and cost-effective to maintain. The previous 2014 PROS Plan outlined a set of objectives for operations and maintenance to help achieve this goal. These included staff training, updated equipment, the exploration of additional resources through alternative staffing, a volunteer coordinator position and the investment in preventative maintenance and upgrades to park facilities to maximize long-term benefits. Camas has since purchased larger mowing equipment, added two FTE positions in the fiscal 2019/20 period and added a playground inspection program with funding for playground equipment repair. This park management effort is ongoing as resources are available but further progress



is needed. Park Operations staff have demonstrated their dedication to keeping parks functioning while the parkland system, city population, and park use has been expanding rapidly.

This chapter will provide data and assessments to help identify existing resource gaps and explore opportunities that may improve the capacity of park operations and maintenance.

Background

The City of Camas has doubled its population since 2000 and has been very successful at implementing its plans for acquiring and preserving open space in the face of development pressures. The City has worked diligently to create its open space network with a connecting system of trails around Lacamas Lake and linked to regional trails. In the last decade alone the City has added over 316 acres of open space and over 146 acres for future parks. The ten years of successful acquisitions increased the 2010 park system size by over 75%.



Figure 24. Camas Parklands Acquisitions since 2010

	Acquisition Acreage		
Year	Park	Open Space	Total
2011	7.02	4.92	**11.93**
2012		48.92	**48.92**
2013		23.59	**23.59**
2014		5.82	**5.82**
2015	25.12		**25.12**
2016			**0**
2017			**0**
2018		75.57	**75.57**
2019		37.99	**37.99**
2020	58.55	119.66	**178.22**
2021	55.65		**55.65**
Subtotals	**146.34**	**316.47**	
	Total Acquisitions since 2010		**462.81**

While the park system in Camas increased by over 462 acres, the park maintenance staffing remained at the same equivalent employee level. There is some degree of maintenance outsourcing that accomplishes tree pruning or removal and invasive weed control.

Figure 25. Camas Park Maintenance Staffing Levels from 2010-2020

Metrics	2010 Actual	2020 Budget	2020 Actual
Parks Maintenance Expenditures	$842,449	$1,284,856	$1,246,099
Parks Maintenance Staffing (FTEs)*	7.3	7.3	*

* No seasonal workers were hired in 2020 due to COVID
2010 FTE's combined full-time and seasonal equivalents

In 2010, park maintenance was conducted by 5.3 full-time employees (FTE) and two FTE equivalents for summer seasonal work. Having added two FTEs in 2019, park maintenance was executed by 7.3 FTEs with two additional seasonal positions. In 2020, no seasonal workers were hired due to COVID restrictions. While the park maintenance budgetary expenditures increased by about 48%, the actual personnel level was similar to 2010. Those budget increases were mainly from normal inflation, additional playground repair/maintenance, and cost of living adjustments. Clearly, the operational resources have not kept up with the increase in the park system.

National Park and Recreation Agency Comparisons

The National Recreation and Park Association (NRPA) 2020 Agency Performance Review provides some park metrics that offer perspectives on the Camas park system. Selected findings from their benchmarking tool illustrate some disparities with park acreage, population size and Park Operations staffing levels.

Figure 26. NRPA Agency Performance Comparisons with Camas' City-owned Park Facilities

Metric	All Agencies	Pop. 20,000-49,999	Camas
Number of Parks	20	-	**18**
Park Acres	437.1	-	**240**
Parks & Open Space Facilities (# sites)	27	-	**70**
Parks, Open Space & Non-Parks Acres	530	-	**1,064**
Residents per Park	2,281	1,963	**1,448**
Park Acres per 1,000 Residents	9.9	9.6	**40.8**
Trail Miles	11	8.5	**18.7**

The City of Camas, with 1,064 acres of parks and natural areas, has more than double the acreage of parks and open space than the median park and recreation agency (at 530 acres). That acreage comparison uses only city-owned parklands excluding the parklands owned by Clark County. The City also manages much more than the median trail mileage as typical agencies across the country. For Camas residents, these additional park facilities help improve the quality of life. However, the existing park operations staffing level does not provide enough resources to oversee, monitor or steward this extent of open space and natural parkland. A review of additional NRPA metrics provides further comparison with other agencies and jurisdictions of similar size. The number of park FTE positions relative to the population size for most park and recreation providers is 8.9 FTEs per 1,000. The Camas park and recreation system has 0.4 FTEs per 1,000 population; the number of FTEs is considerably lower. The operating expenditures per capita is much lower than comparable cities.

Figure 27. NRPA Agency Performance Metrics Comparisons – Park & Recreation Staffing

Metric	All Agencies	Pop. 20,000-49,999	Camas 2020
Park & Rec FTEs*	41.9	27.3	**11.1**
P&R FTEs per 1,000 Residents	8.1	8.9	**0.4**
Annual Operating Expenditures	$4,342,495	$2,885,847	**$1,771,272**
Operating Expenditures per Capita	$81.19	$95.34	**$67.96**
Operating Expenditures per Park Acre	$7,160	$8,522	**$1,665**

**No seasonal FTEs for Camas in 2020 due to COVID*

The comparison with NRPA metrics predicts the need for additional staffing resources to effectively manage the extensive system of parklands owned by the City. As the City continues to work to fill in the gaps in its open space network and to further develop its comprehensive trail system, park operations will need to be expanded to meet the need for more active stewardship and care.

Additional agency performance review findings are located in the 2020 NRPA Agency Performance Review summary in Appendix E.

Washington Cities Park and Recreation Provider Comparisons

Park and recreation operations can be highly variable, particularly at different population sizes and residential densities. A more refined comparison of park metrics was prepared using several cities in western Washington with population sizes within range of the population size of Camas. This comparison used budgetary and staffing numbers from 2018 to avoid the highly variable impacts from the COVID-19 shutdown and ensuing restrictions.

Figure 28.. Comparable Washington Cities' Park & Recreation Performance Measures

		City Park Providers				Park District Providers	
Performance Measure	**City of Camas**	**Port Angeles**	**Maple Valley**	**Mercer Island**	**Mountlake Terrace**	**Si View**	**PenMet**
Population	**26,065**	19,960	28,013	25,748	21,286	25,410	37,485
P&R total spending (2018)	**$1,020,000**	$3,462,300	$2,525,940	$5,209,047	$3,623,851	$7,645,050	$14,567,517
Spending per resident (2018)	**$39.13**	$173.46	$90.17	$202.31	$170.25	$300.87	$388.62
Operating Budget (2018)	**$2,050,000**	$3,356,600	$2,525,940	$5,864,507	$3,623,851	$5,042,038	$6,297,517
Operating per Resident	**$78.65**	$168.17	$90.17	$227.77	$170.25	$198.43	$168.00
Annual Capital Spending (2018)	**-**	$1,024,000	$8,100,000	$3,154,753	-	$1,460,952	$8,270,000
Capital Spending per Resident	**N/A**	$51.30	$289.15	$122.52	-	$57.50	$220.62
Park & Rec FTE (2018)	**5.25**	25.6	11.75	29.75	44	14.5	22.3
Seasonal FTE positions	**3.75**	7.6	(combined)	(combined)	(combined)	-	(combined)
P&R FTEs per 10,000 Residents	**3.45**	16.6	4.2	2.6	2.1	5.8	4.6
Total Developed Parks (acres)	**240**	270	320	259.9	269	46	266.1
Park acres per 1,000 Residents	**9.2**	13.5	6.9	10.1	12.6	1.8	7.1
Total Parks & Natural Areas (ac.)	**1064**	270	370.8	479	269.0	890	570.9
Parkland acres per 1,000 Residents	**40.8**	13.5	13.2	18.6	12.6	35.0	15.2
Parkland acres per P&R FTE	**118.2**	8.1	31.6	16.1	6.1	61.4	25.6
Population Density (people/sq. mi.)	**1,853**	1,865	4,669	4,036	5,243	941	742
Park Facilities	**18**	23	9	52	15	65	19
Trails (miles)	**18.7**	8.5	3	24.9	-	-	1.6

Note: 2018 budget numbers were used for the provider comparison to avoid the highly variable budget impacts from COVID.

In reviewing the comparisons, a few observations about the Camas system stand out.

- Overall spending per resident for park and recreation services was considerably lower for Camas ($39.13 per resident). The average across the other comparable cities was $220.95 per resident.
- Also, Camas parks and recreation budget allocated the equivalent of $78.75 per resident compared with an average $170.46 per resident for the other cities.
- Overall, Camas had more total park and open space acres per 1,000 population (40.8 per 1,000) than the comparable agencies. However, when comparing staffing for that larger parkland system, Camas measured at 118.2 parkland acres per FTE significantly higher than the averaged 24.8 parkland acres per FTE of other comparable cities.

This comparison indicates some off-balance traits for Park Operations charged with stewardship of the entire Camas park system.

Open Space Management

The City provides conserved public lands and undeveloped parklands temporarily held as greenspace totaling over 830 acres. Recent additions of Green Mountain and properties in the north Lacamas Lake area have helped create a significant network of contiguous natural areas with high ecosystem value. Park Operations currently manage to accomplish field mowing in open space lands such as Goot power lines, Ostensen Canyon, etc. and have performed annual invasive species spraying in areas identified by the County Weed Management Board in the spring.

However, the capacity of the Park Operations staffing has not kept up with the more extensive need for open space management that may involve proactive hazard tree removal, vegetation monitoring, invasive plant control and addressing any ecological restoration needs. The open space network has grown by over 50% in terms of City-owned acreage since 2000.

With the growth of its open space network, the City has responsibilities for extensive conserved landscapes and has conducted several studies to guide the stewardship and management of these lands.

To highlight the intended need for open space management, past planning efforts have been summarized below.

The 2003 City of Camas Policy Guidelines for an Open Space Management Plan established the overall policies to guide the management of both public and private property within the Open Space Network. The Open Space Network was identified and mapped as part of the 2000 Parks & Open Space Comprehensive Plan. The Policy Guidelines document was intended to set the direction of open space planning and to provide staff with the foundation for effective resource management decisions. The Management Goals for open space policy included nine directives that coordinated best management practices in natural areas and funding for an open space management program by the City. The Parks and Recreation Department was designated with the responsibility for administration, management and maintenance of the open space network. Trails are considered to be an integral part of the open space network. The Parks and Recreation Department is designated with the responsibility for trail safety and security, inspection and monitoring, and maintenance.

The 2014 PROS Plan included Design and Development Guidelines for the City's Natural Open Space Areas that recognized natural areas should be protected for their environmental value with only limited improvements for passive recreation where appropriate. The guidelines encouraged public use of the natural open space through trails, viewpoints and other features while ensuring protection of ecologically sensitive areas. A minimum of park features were cited for improving natural open space including trails and site furnishing such as benches, picnic tables, bike racks, trash receptacles, and signs. The guidelines suggest additional park features for consideration such as parking, restrooms, picnic shelters, gathering spaces (for education), interpretive exhibits, trailhead or entry kiosks, and restoration areas.

The Legacy Lands Master Plan – 2020 Draft Design Report, was the culmination of a consensus-building process for guiding the future development of the north shore of Lacamas Lake. The City had secured significant lands intended for shoreline protection, conservation and recreation. The Legacy Lands Master Plan built on the concepts that were put forth in the 2016 North Shore Lacamas Lake Vision Plan whose guiding principles included recreational trails with connections to the regional trail network, active recreational facilities, native habitats, and preserving key visual landmarks along the shore. Acknowledging future population growth and development pressures, the City is undergoing the North Shore Subarea Plan that encompasses 800 acres north of Lacamas Lake, and will incorporate the concepts developed in the draft Legacy Lands Master Plan.

None of the above planning efforts addressed the predictable need for more maintenance staffing or the necessary increased funding for management and maintenance.

Trail Maintenance

Camas' trail network provides tremendous value to its residents and visitors with walking and biking infrastructure for healthy outdoor recreation and connections to destinations across the city. With limited Park Operations staffing, trail maintenance, upkeep and capital repairs will fall behind or be deferred on a recreational asset that receives continual, daily use. Park Operations are currently able to manage brush clearing on significant trail on the Washougal River Greenway and Heritage Trails. Trail resurfacing is scheduled when pathway tread conditions deteriorate. Other maintenance activities tend to be triggered by public comments or complaints.

The planned expansion of Camas' trail network along the north shore of Lacamas Lake, Mill Ditch and connecting to Green Mountain will add miles of public shared-use trails. To ensure safe and beautiful trails, park operations estimates one FTE to maintain trails, at .04 FTE per trail mile. The current level of service for trail maintenance is estimated at .02 FTEs/mile. As miles of trail are added, additional FTE resources should be increased concurrently.

To help convey the importance of trail upkeep, parks operations may want to consider adding one or two trail counters along the busier trail sections. Measuring the trail use can help communicate how many people are affected daily by the trail conditions. A record of trail use can also help when providing quantifiable data for grant support or submittals.

Sport Field Maintenance

Camas has sport fields in ten of its park facilities. Some of its sport fields receive extensive maintenance and care through partnering sports organizations (such as Little League) while other fields may only receive mowing, annual weed control and litter control. In parks where local sports organizations are not providing added level of care, Camas should address deficiencies to ensure that access and equity for sports facilities is maintained across the city. Additional maintenance on these sport fields calls for turf maintenance, including over seeding, fertilization, and top dressing; athletic field fence maintenance, including backstops and fence perimeters; and goal post maintenance.

Park Facilities Maintenance

Park maintenance staffing has been stretched to care for the City's aging park facilities, while the system continues to expand to meet the increased park use. Additional attention needs to be given to bolster existing general park maintenance tasks: playgrounds inspections, maintenance and repairs, and noxious and invasive weed control. Updating the older park amenities can help lighten the load on needed repairs and ongoing maintenance tasks, but as newly developed parks are added to the system, additional operational and maintenance resources will be necessary to ensure those park assets are managed for safe and enjoyable public use and longevity. Park Operations has not been able to proactively perform tree assessments within parks to ensure proper care of its tree canopy resource or to mitigate for potential tree hazards. Additionally, Park Operations is tasked with managing and maintaining the Camas Cemetery.

Asset Management

The NRPA has developed a quality risk assessment tool called "Park Check" to provide an analysis of an agency's risk profile. The online tool uses a series of questions to explore the likelihood of problems due to lack of resources available over time. The Park Check risk assessment tool rates your responses to these questions to determine if your agency's ability to deliver quality park and recreation amenities and services to all members of your community in the future is at "low," "moderate" or "high" risk. The online tool generates a customized report that could help department's further articulate their needs for dedicated and reliable funding and local support.

More specifically, the conditions assessment conducted in this PROS planning process reveals a number of areas where more attention in needed to physical amenities with park facilities. Whether the need to repair site furnishings, reduce ADA barriers, or correct deficiencies is identified, the conditions assessment should be used to help improve public safety in the parks and reduce public risk.

As an example, playgrounds across the city are in different stages of their life cycles. Some play equipment has aged beyond its life expectancy and may not meet current safety standards.

While the city has started regular scheduled safety inspections, additional funding needs to be evaluated to ensure timely repair or replacement of play equipment. In addition, the inspection report could include assessment of the likelihood and consequence, in terms of financial, community and environmental impact, of the future failure of its assets, such as shelters and other structures. Such an assessment can provide key information for the strategic prioritization of limited resources toward those assets whose failure would have the greatest negative impact on the Camas community.

As an element of Park Operations, the management of physical assets requires proactive planning for capture cost efficiencies. Tracking repairs, maintenance tasks, routine operations and seasonal work can help predict the needs for future labor resources as the system grows. The 2014 PROS Plan recommended developing a detailed list of the assets at each park facility site and evaluating asset conditions annually. Such a tracking schedule would create a framework for long-term management of the Camas park system. Detailed inventories with conditions tracking will inform replacement needs, monitor safe use, and assist in assigning maintenance frequency.

Most built park amenities have limited lifespans. Buildings, play equipment, pavement, etc. can be tracked from installation dates. As repairs are needed, those assets can have predictable replacement dates that are added to the capital facilities program. Life-cycle planning can help avoid extra time spent repairing outdated amenities and foster more cost effective labor resource use.

Following on a program of asset management tracking and life-cycle planning, a regular capital repair program should proactively address minor repairs and help extend the life of some amenities. The delay of small repairs can lead to more frequent maintenance that could be avoided. When existing staffing is stretched to its limit, park agencies must rely more heavily on outside contractors for implementing even the small capital repair projects. Without adequate staffing, a backlog of needed maintenance and repairs usually exists. With a sufficient skilled labor force, the City can capitalize on using existing staff resources to complete the smaller capital repair projects during off-season capacity.

Americans with Disabilities Act Compliance

The Americans with Disabilities Act of 1990 (ADA) prohibits discrimination on the basis of disability. Titles II and III of the ADA require, among other things, that newly constructed and altered state and local government facilities, places of public accommodation, and commercial facilities be readily accessible to, and usable by, individuals with disabilities. Recreation facilities, such as play areas, are among the types of facilities covered by Titles II and III of the ADA.

The U.S. Department of Justice 2010 ADA Standards for Accessible Design provide guidelines that are intended to address design conditions to ensure that barriers or obstacles blocking outdoor recreation facilities are prevented or removed, such that all park patrons have reasonable access to site amenities. As older facilities are in the process of renovations and replacements and new facilities are added to the system, Camas will need to ensure compliance with ADA accessibility requirements.

Invasive Species Management

The control of invasive species is a critical element in the stewardship of open space lands to ensure their continued conservation values and ecosystem services. An active invasive species control program is also necessary to ensure that the City is meeting the requirements of RCW 7.10 Noxious Weed regulations. This may involve direct control measures for known and identified noxious weed problems, pre-construction prevention of noxious weed spreading, and evaluating new parkland or conservation land noxious weed coverage. Clark County's Vegetation Management Division currently handles some of the invasive weed control for the Camas park system but more work needs to be accomplished to effectively meet the regulations. Camas should consider hiring and training its own staff to perform an invasive weed control program for all its park and open space lands.

In-House vs. Outside Contractors

Park and recreation agencies throughout the country should continually weigh the costs of service provision through internal staffing versus external contracts. Full-time staffing weighed against seasonal resources should explore the off-season workload, training time for new part-time seasonal employees, the availability of seasonal labor, and the specialized skill sets for some types of operations. One-time projects and specialized repairs and renovations may require outside contractors while some park agencies have enough trained in-house staff to accomplish smaller capital projects.



Staffing Needs

The assessments and comparisons of park operations staffing have indicated the need for a stronger labor force for maintaining Camas' parks and open space/natural lands. The 2014 PROS Plan recommended adding specialized trail position, an urban forester or arborist, and a natural resource specialist to the operations team to build the level of expertise needed to effectively manage the existing natural resources owned by the City. Since the 2014 PROS Plan, several additional open space properties have been acquired, increasing the natural lands owned by the City from 440 to 691 acres.

For the Clark County park system that includes extensive natural areas, regional parks, community and neighborhood parks, many years of tracking maintenance tasks and labor expenditures produced some five-year averages for the amount of labor required to adequately care for its park system.

Figure 29. Performance Metrics for Clark County Parks Maintenance

Predictive Labor Staffing Needs	Total Park Acres	Labor Hours/Acre	Total Labor Hours	FTE # (1,820/yr)
Neighborhood Parks	75.9	152	11,536.8	6.3
Community Parks	67.7	111	7,514.7	4.1
Regional Parks	151.4	98	14,837.2	8.2
Open Space/Natural Areas	691.5	21	14,521.5	8.0

Using those metrics can help predict the potential park maintenance staffing needs for the Camas park system as it ramps up its stewardship of natural areas and adds new developed parks.

Figure 30. Predictive Staffing Levels for Camas Park System

Annual Labor Expenditures per Acre	5-yr Average
Greenspace Labor Hours per Acre	21
Neighborhood Parks Labor Hours per Acre	152
Community Parks Labor Hours per Acre	111
Regional Parks Labor Hours per Acre	98

The table in Figure 30 (above) uses acreage that includes both developed and undeveloped parkland acreage. If only the currently developed park acreage was calculated in this staffing prediction and included special facilities sites, the 240 acres of developed facilities (not including trails or open space) would suggest the need for 15 full-time equivalent employees, double the size of the current staff level. Staffing resources are needed to implement the updating and renovations for older parks, to provide maintenance for expanded trail connections and to steward its hard-earned open space lands. Camas should be prepared to support its park system with adequate operations and maintenance staffing to ensure protecting and preserving the value of its outdoor assets now and in the future.

CHAPTER 9

Goals & OBJECTIVES



Add interpretive cultural and historical information to the parks or trails to honor local heritage. Highlight tribal history. This information can draw people into a park, and it helps teach kids. Provide signage in a blind/deaf-friendly way.

- Stakeholder Focus Group participant

The goals and objectives described in this chapter define the recreation and park services that Camas aims to provide. These goals and objectives were derived from input received throughout the planning process, from City staff, the Parks and Recreation Commission, City Council and community members.

The Growth Management Act (GMA) adopted by the Washington State Legislature in 1990 provided a foundation for land use planning in selected cities and counties throughout the state, including Clark County and the City of Camas. The GMA's purpose is to help communities manage efficiently with the challenges of growth to ensure their long-term sustainability and high quality of life. It identifies 14 planning goals to guide the development of comprehensive plans and development regulations (codified in Chapter 36.70A of the Revised Code of Washington). Four of these goals directly affect the development and implementation of this plan.

- "Encourage the retention of open space and development of recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks." RCW 36.70A.020(9)
- "Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water." RCW 36.70A.020(10)
- "Identify and encourage the preservation of lands, sites, and structures, that have historical or archaeological significance." RCW 36.70A.020(13)
- "Carry-out the goals of the Shoreline Management Act



with regards to shorelines and critical areas." RCW 36.70A.020(14)

Furthermore, the Camas Comprehensive Plan, the previous park system plan and county-wide planning policies provide a framework for this PROS Plan.

The following goals matrix is structured by functional areas and thematic goals, as follows:

Functional Areas

- Administrative
- Projects & Programs
- Policy

Goal Themes

- Welcoming For All
- Stewardship of Land, Parks & Programs
- Plan for & Fill Known System Gaps
- Organizational Excellence

Goals are stated within each thematic area and associated to the functional areas. Under each goal, action item(s) will be listed.

A goal is a general statement that describes the overarching direction for the park and recreation system. Action items are more specific and describe an outcome or a means to achieve the stated goals. Near-term recommendations are specific and measurable actions or projects intended to implement and achieve the goals, and will be contained within the Needs Assessment and Capital Planning chapters of the PROS Plan.

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WELCOMING FOR ALL



STEWARDSHIP OF LAND, PARKS & PROGRAMS



PLAN FOR & FILL KNOWN SYSTEM GAPS



ORGANIZATIONAL EXCELLENCE

PROJECTS & PROGRAMS

Actively communicate and improve outreach and marketing to increase participation.

- Promote and increase participation in youth and senior scholarships.
- Keep park and trail facilities map updated.
- Pursue opportunities for alternative outreach and education to diverse groups, such as piloting youth parks stewardship programs and active communication through faith groups and non-profit organizations that work with people of color and underserved communities.
- Pursue partnership opportunities with health care organizations to promote active recreation and wellness activities and events.

Opportunities for dogs to recreate with their human family.

- Partner with non-profits for more pet and animal and animal friendly events.
- Explore a partnership with DOGPAW to develop and manage off leash areas.

Increase capacity for sports field users.

- Explore opportunities through joint use agreements with school districts to use existing fields or interim use of other lands.
- Enable an effective scheduling system.
- Implement creative design options, such as multi-use fields, upgrade field turf surfacing, and/or install lights.

Improve Asset Management.

- Improve the asset management system; to include parks facilities and amenities assets along with tree and plant assets.
- Update levels of service standards and develop a per acre maintenance budget.
- Develop an urban forestry program that articulates long-term strategy for tree protection, urban forestry management and education.
- Develop and implement improved natural area management practices to enhance ecological health and remove invasive plant species.
- Continue to build on playground equipment inspection program, prioritizing removal and replacement of unsafe/hazardous equipment and plan for a cycle of replacement based on equipment age and anticipated useful life.

Enhance parks and trails amenities.

- Refresh existing legacy parks with new features to reflect current community desires, such as Crown Park.
- Prioritize permanent bathrooms at neighborhood parks and trailheads.
- Increase portable restrooms when permanent bathrooms are unavailable during the summer.
- Provide additional picnic shelters, tables and benches.
- Maximize the multiple-use aspects of critical areas, stormwater detention ponds, etc. with addition of public trails or viewing access and education of ecological value of the area.

Design new parks, trails and amenities with environment, safety and accessibility in mind.

- Design and maintain parks and facilities to offer universal accessibility for residents of all physical abilities, skill levels and age; at a minimal in compliance with the Americans with Disabilities Act (ADA) Standards for Accessible Design.
- Identify and grow trail segments and trailhead amenities that can accommodates residents of all physical abilities.
- Standardize and install a more complete wayfinding and signage system.
- Incorporate sustainable development and low impact design practices into the design, planning and rehabilitation of new and existing parks, trails and facilities.

Enhance outdoor recreation opportunities.

- Identify and prioritize the acquisition of parklands based on factors such as contribution to level of service, connectivity, preservation and scenic or recreational opportunities for residents.
- Develop park master plans that reflect local needs, community input, recreation and conservation goals; with consideration for financial resources and availability of similar amenities/facilities within the city and region.
- Prioritize implementation of existing master plans with consideration for service gap delivery and available financial resources.
- Add new unique park amenities to the system such as nature play area, a splash pad, a bike skills pump track, and all-inclusive playgrounds.

Partner with Developers to fill parks and trails gaps.

- Actively pursue trail connections via rights-of-way or easements.
- Continue and maintain Parks & Recreation review and comment on private development proposals that includes park and trail siting and design.
- Partner with developer to create robust public engagement process for park and trail design projects within the development project site intended to be transferred to the city.

Continued...

Continue building strong partnerships.

- Collaborate with local arts organizations, business, education institutions, other non-profits and jurisdictions to deliver on recreational programs and community events.
- Partner with user groups of specialized facilities, such as sport fields, off-leash areas, disc golf, skatepark, bike skills/pump track, etc. to continually improve programing and maintenance.



PLAN FOR & FILL KNOWN SYSTEM GAPS

Continued...

Partner with neighboring jurisdictions to fill regional trail network gaps.

- Work with Clark County, City of Washougal, City of Vancouver and Port of Camas-Washougal to align trail connectivity priorities.
- Coordinate and connect the City's pedestrian and bicycle system with the Clark County regional system of on-street and off-street trails.

Promote water access and safety.

- Collaborate with other agencies regionally in developing and operating parks and/or programs that access our bodies of water.
- Promote water safety through educational and marketing program in partnership with County and School Districts.
- Evaluate the north shores city-owned Legacy Lands properties to expand trails and water access points around Lacamas Lake.

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WELCOMING FOR ALL



STEWARDSHIP OF LAND, PARKS & PROGRAMS



PLAN FOR & FILL KNOWN SYSTEM GAPS



ORGANIZATIONAL EXCELLENCE

ADMINISTRATIVE

Regularly review and renew recreational classes for all ages, interest and abilities.

- Provide annual recreational program summary to Parks & Recreation Commission for review and input.
- Pilot new classes each year that reflects current market trends and community desires.
- Provide Summer free pop-up classes to promote recreational programs.

Continue to host events and provide community spaces that bring people together.

- Continue to partner to implement legacy events.
- Have intentional engagement with diverse community groups to create and partner on new diverse events.
- Expand locally sourced food options at parks and events.

Maintain Parks and Facilities.

- Standardize park furnishings and amenities (trash cans, tables, benches, fencing, etc.) to reduce inventory and replacement costs and improve appearance.
- Continue growing volunteer parks enhancement and beautification program.

Continue to preserve, protect and restore natural area corridors, include shorelines.

- Strengthen partnerships with public agencies, tribes, and private partners to facilitate greenway corridor connectivity.
- Continue to support and actively participate in shoreline and/or bodies of water conservation and restoration projects lead by other city departments, agencies and/or non-profits.
- Pilot environmental education program.
- Add educational interpretive signage to natural areas, shorelines and trails.

Evaluate user satisfaction and use.

- Implement periodic surveys to gauge user satisfaction, program initiatives and statistical use of parks, facilities and programs, including trail counts.

Promote and support Parks & Recreation Commission.

- Promote P&R Commission meetings as forum to discuss parks and recreation topics.
- Provide more training and resources to build parks and recreation knowledge base within Commission members.

Encourage staff innovation and creativity.

- Provide professional development opportunities through training and affiliation with NRPA and WRPA, among others.
- Provide opportunities to explore and implement pilot programs.

POLICY

Enhance our parks and recreation system to make it more welcoming and accessible.

- Develop Diversity/Equity/Inclusion policy that removes accessibility barriers (socio-economic, language, physical, geographic, transportation) to programs, parks and trails, and in alignment with City vision and policies.

Better understand funding gaps and funding alternatives.

- Develop and implement a cost recovery policy that provides for an equitable fee structure for park facilities and recreation programs, with high-community benefit programs and event funded appropriately to ensure accessibility for all residents.
- Periodically revise the park impact fee methodology and rates to accurately reflect changes in level of service standards and/or the costs of expanding the park infrastructure to accommodate population growth.
- Review and update the adopted six-year Parks Capital Facilities Plan (CFP) every two years to remain current with local recreational interests and account for the capital needs of the parks and recreation system.
- Pursue alternative funding options and dedicated revenues, including engaging and exploring with the City of Washougal a feasibility study to assess the potential of establishing a regional financing tool for recreation service.

Provide equitable access to parks and open space system.

- Prioritize park and trail development in areas where service gaps exist (e.g., where households are more than ½-mile from a developed park, open space or trail) and in areas of the City facing population growth and residential and commercial development.
- Evaluate and update design and development standards for parks and recreation amenities within private development to promote and achieve equitable levels of service and provide amenities that are complementary to the city park.

Expand recreational services.

- Re-examine the opportunity for new recreational center with aquatics facility, taking into consideration financial feasibility and partnership opportunities.

Coordinate collaborative discussions on policy matters.

- Bring together Parks and Recreation Commission, City Council, and other standing City boards, such as the Planning Commission, to discuss policy matters pertaining to recreational resources, opportunities and funding.

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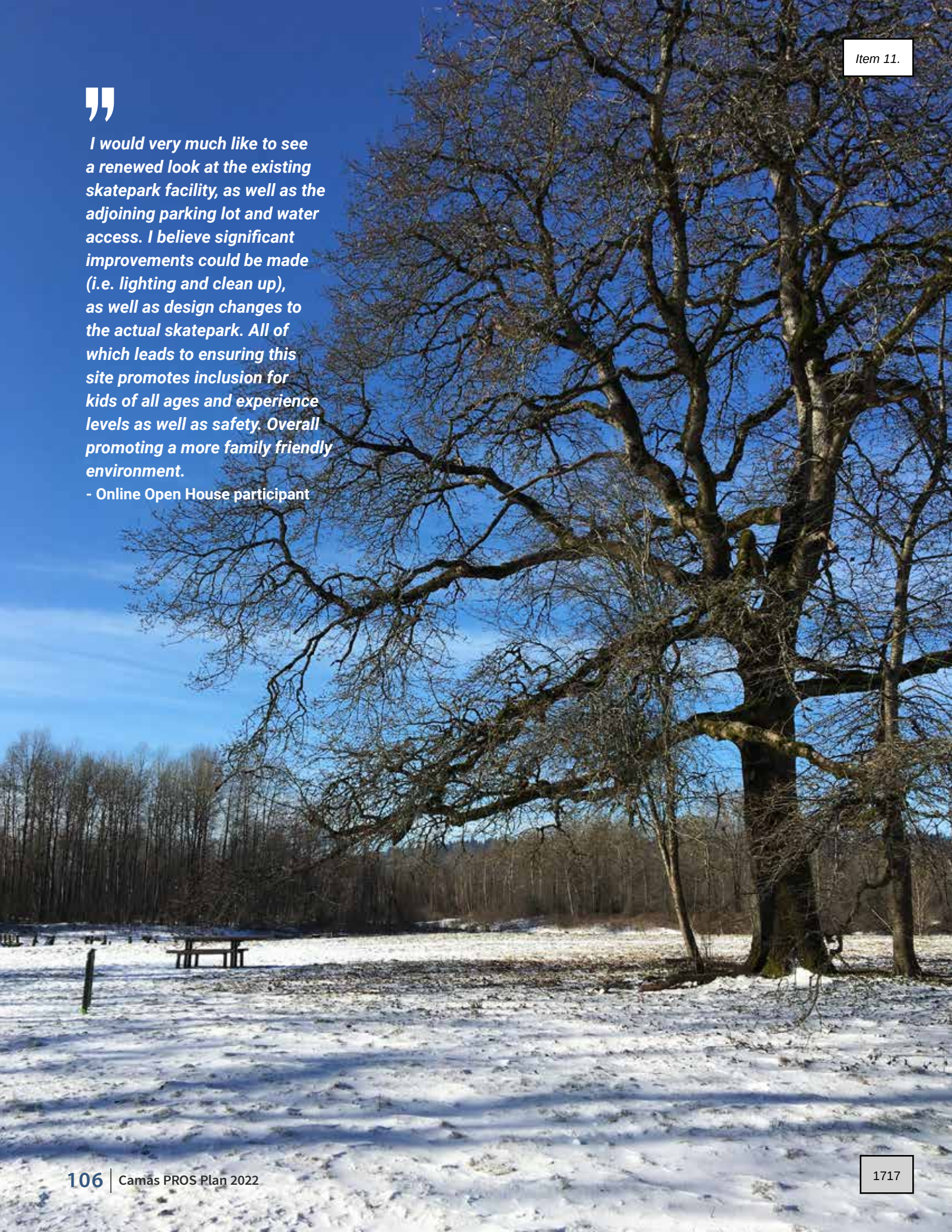

> *I would very much like to see a renewed look at the existing skatepark facility, as well as the adjoining parking lot and water access. I believe significant improvements could be made (i.e. lighting and clean up), as well as design changes to the actual skatepark. All of which leads to ensuring this site promotes inclusion for kids of all ages and experience levels as well as safety. Overall promoting a more family friendly environment.*
>
> **- Online Open House participant**

CHAPTER 10

Capital Planning & **Implementation**

KEY PROJECT RECOMMENDATIONS







The following is a summary of key project recommendations which will require commitment from the City and its residents for the continued support of a healthy park and recreation system that preserves and enhances the safety, livability, and character of the community.

Trail Connections

Trail connections, including sidewalk and bike lane improvements, are needed to help link destinations across the community. Acquire easements, corridors and parcels to create the comprehensive linkages for Camas' future trail system. Develop larger trails desired by the community, such as North Shores of Lacamas, Mill Ditch, Lewis & Clark. Coordinate with the Transportation System Plan (and subsequent updates), as well as coordinate with local subdivision and site development projects.

Park Design & Planning

Prepare an updated site master plan for Ash Creek Park and a new site plan for the flat, upper shelf of Ostensen Canyon Park. As development and maintenance funding allow, prepare site plans for Lacamas Heights, Green Mountain and Benton Park.

Sport Field Improvements

Conduct a city-wide assessment of sport fields to plan for drainage improvements and other field improvements, including turfing existing fields, installing lights to expand play seasons, and the development of additional fields to accommodate demand.



Splash Pads / Spray Parks

Install at least one spray park to serve residents as an option for summertime water play in a park that provides parking and restrooms.

Bike Skills & Mountain Bike Trails

Plan for a pump track and connecting flow track in a visible location that can accommodate parking and can enable a synergy with other park uses. Pursue options for mountain bike trails during the planning for the new Green Mountain property.



Skate Park Upgrade

Upgrade and enhance the existing concrete skatepark to improve the design and flow, as well as improve adjoining recreational amenities such as access to the Washougal River.



All-Inclusive Playgrounds

Develop fully-accessible, all-inclusive play areas as new parks are built or playground upgrades occur to provide for users of all abilities.

Off-Leash Dog Area

Coordinate with the City of Washougal on off-leash dog park planning for the potential of a joint use facility for Camas residents to use.



Sport Courts

Convert existing tennis courts to multi-sport courts through striping and examine the need for additional multi-sport courts in the future.

Community Gardens

Partner with local community groups for the installation of community gardens in community or neighborhood parks or in stand-alone locations with parking and access to water.



Acquisitions to Fill Park System Gaps

Acquire strategically located sites for future parks to ensure reasonable access to walkable parks. Coordinate with local residential developers to include public parks in new subdivisions and utilize tools, such as park impact fee credits, to facilitate the process.



Universal Accessibility

Complete a system-wide ADA assessment and make improvements to existing parks as needed to offer universal accessibility of park features and grounds.

Water Access

Improve shoreline and water access for motorized and non-motorized launches, including user conveniences such as restroom facilities and parking.



Recreation Programming

Continue to foster agreements or partnerships with programming partners and contract vendors for providing recreation services. Coordinate and partner with the City of Washougal on programming options. Explore new pilot programs, and partner where possible, to broaden the portfolio of offerings to youth. Explore options for access to additional flexible indoor recreation space to accommodate programs, classes and fitness.



North Shore Subarea Plan

Maintain strong role in planning for future parks and trails along the North Shore.



Open Space Management Plan

Prepare an updated, science-oriented open space management plan to guide City staff in the care, maintenance and stewardship of open space, as well as forecast maintenance needs and staffing resources.

Urban Forestry Management Plan

Prepare an urban forestry management plan to examine the health and coverage of the urban forest, define maintenance and operations strategies, and respond to the challenges of climate change, as well as other environmental and fiscal factors on long-term tree health and forest resiliency.



Wayfinding & Signage

Continue to implement a wayfinding program that includes both visual graphic standards. Colors, sign types, and information can help users navigate the outdoor recreation experiences offered by the City.



Communications

Maintain the website for easy-to-access park system maps, trail maps and an up-to-date listing of park sites and amenities to enhance the experience of the on-the-go user. Continue to promote via social media and highlight events, volunteer opportunities and parks and trails to visit. Utilize QR codes or comparable technology on signage as a means to share with or receive information from visitors about maintenance, restoration or monitoring data. Utilize the network of partners to help disseminate information on parks and recreational programs and events.



Implementation Tools

A number of strategies exist to enhance and expand park and recreation service delivery for the City of Camas; however, clear decisions must be made in an environment of competing interests and limited resources. A strong community will is necessary to bring many of the projects listed in this Plan to life, and the Camas City Council has demonstrated its willingness in the past to support parks and recreation, legacy land acquisitions and a high quality of life.

The recommendations for park and recreation services noted in this Plan may trigger the need for funding beyond current allocations and for additional staffing, operations and maintenance responsibilities. Given that the operating and capital budget of the Parks and Recreation Department is finite, additional resources may be needed to leverage, supplement and support the implementation of proposed objectives, programs and projects. While grants and other efficiencies may help, these alone will not be enough to realize many ideas and projects noted in this Plan. The following recommendations and strategies are presented to offer near-term direction to realize these projects and as a means to continue dialogue between City leadership, local residents and partners. The tools presented only capture development of the capital improvements and not the long-term operations of the new assets.

Additionally, a review of potential implementation tools is included as Appendix F, which addresses local financing, federal and state grant and conservation programs, acquisition methods and others.

Enhanced Local Funding

According to the city budget, Camas maintains reserve debt capacity for local bonds and voter approved debt. The city's non-voted general obligation debt is under its debt capacity limit of $41 million for non-voted debt. Community conversations regarding the potential to develop a recreation center with aquatics and/or bundle several projects from the Capital Improvements Plan warrant a review of debt implications and operating costs for the City, along with the need to conduct polling of voter support for such projects.

Park Impact Fees & Real Estate Excise Tax

Park Impact Fees (PIF) are imposed on new development to meet the increased demand for parks resulting from the new growth. PIF can only be used for parkland acquisition, planning and/or development. They cannot be used for operations and maintenance of parks and facilities. The City of Camas currently assesses impact fees, but the City should review its PIF ordinance and update the methodology and rate structure, as appropriate, to be best positioned to obtain future acquisition and development financing from the planned growth of the community. The City should prioritize the usage of PIF to secure new park properties and finance park or trail development consistent with the priorities within this Plan.

The City currently imposes both of the quarter percent excise taxes on real estate, known as REET 1 and REET 2. The REET must be spent on capital projects listed in the City's capital facilities plan element of their comprehensive plan. Eligible project types include planning, construction, reconstruction, repair, rehabilitation or improvement of parks, recreational facilities and trails. Acquisition of land for parks is not a permitted use of REET 2. REET is used for other City projects, such as facility construction and public works projects, and may be used to make loan and debt service payments on permissible projects. Through annual budgeting and with discussions with City Council, the Parks and Recreation Department should seek access to REET funds and use the capital facilities plan to compile compelling projects to enhance service delivery of the amenities the community has provided voice to.

Conservation Futures & Legacy Lands Program

Clark County assesses the maximum allowable excise of $0.0625 per $1,000 assessed value to fund the Conservation Futures program and provides cities a venue to access these funds through a local grant process. The City should continue to submit applications for support in financing the acquisition of additional natural areas identified in the most recent Legacy Lands Program Natural Areas Acquisition Plan to facilitate the protection of these lands and enable improved linkages to expand the trail network.

Parkland Donations & Dedications

Parkland donations from private individuals or conservation organizations could occur to complement the acquisition of park and open space lands across the City and urban growth boundary. Gift deeds or bequests from philanthropic-minded landowners could allow for lands to come into City ownership upon the death of the owner or as a tax-deductible charitable donation. Also, parkland dedication by a developer could occur in exchange for Park Impact Fees or as part of a planned development where public open space is a key design for the layout and marketing of a new residential project. Any potential dedication should be vetted by the Department to ensure that such land is located in an area of need or can expand an existing City property and can be developed with site amenities appropriate for the projected use of the property.

Grants & Appropriations

Several state and federal grant programs are available on a competitive basis, including WWRP, ALEA, and LWCF. Pursuing grants is not a panacea for park system funding, since grants are both competitive and often require a significant percentage of local funds to match the request to the granting agency, which depending on the grant program can be as much as 50% of the total project budget. Camas should continue to leverage its local resources to the greatest extent by pursuing grants independently and in cooperation with other local partners.

Appropriations from state or federal sources, though rare, can supplement projects with partial funding. State and federal funding allocations are particularly relevant on regional transportation projects, and the likelihood for appropriations could be increased if multiple partners are collaborating on projects.

Internal Project Coordination & Collaboration

Internal coordination with the Public Works and Community Development Departments can increase the potential of discrete actions toward the implementation of the proposed trail and path network, which relies heavily on street right-of-way enhancements, and in the review of development applications with consideration toward potential parkland acquisition areas, planned path corridors and the need for easement or set-aside requests. However, to more fully expand the extent of the park system and recreation programs, additional partnerships and collaborations should be sought.

Public-Private Partnerships

Public-private partnerships are increasingly necessary for local agencies to leverage their limited resources in providing park and recreation services to the community. Corporate sponsorships, health organization grants, conservation stewardship programs and non-profit organizations are just a few examples of partnerships where collaboration provides value to both partners. The City has a variety of existing agency and community-based organization partners and should continue to explore additional and expanded partnerships to help implement these Plan recommendations.

Volunteer & Community-based Action

Volunteers and community groups already contribute to the improvement of park and recreation services in Camas. Volunteer projects include park clean-up days, invasive plant removal, tree planting and community event support, among others. Camas should maintain and update a revolving list of potential small works or volunteer-appropriate projects for the website, while also reaching out to civic groups and the high school to encourage student projects. While supporting organized groups and community-minded individuals continues to add value to the Camas park and recreation system, volunteer coordination requires a substantial amount of staff time, and additional resources may be necessary to more fully take advantage of the community's willingness to support park and recreation efforts.

Metropolitan Park District

Metropolitan park districts (MPD) may be formed for the purposes of management, control, improvement, maintenance and acquisition of parks, parkways and boulevards. Several years ago, the City started a preliminary look at a metropolitan park district as a tool for Camas Parks and Recreation. The City should continue to evaluate the potential of an MPD along with other implementation tools as part of a long-term funding strategy.

Other Implementation Tools

Appendix F identifies other implementation tools, such as voter-approved funding, grants and acquisition tactics, that the City could utilize to further the implementation of the projects noted in the Potential Projects List.

Capital Improvements Plan

The following Capital Improvements Plan (CIP) identifies the park, trail and facility projects considered for the next six to twenty years, along with brief project descriptions. The majority of these projects entail the maintenance, acquisition and development of parks, recreational amenities and trails. Based on survey results and other feedback, Camas residents have indicated an interest in park facility upgrades and enhanced trail connections as priorities, and the Capital Improvements Plan is reflective of that desire.

2022 Camas PROS Plan

Capital Facilities Plan

Amended per ORD 22-002

Project Type	Site	Project	Current Cost
A	Trail Corridors	Acquisition to link corridors	$2,500,000
D	Crown Park	Park development per site master plan	$6,200,000
P	Open Space Management Plan	Develop Plan	$200,000
P	Urban Forestry Management Plan	Develop Plan	$150,000
P/D	System-wide	Trails & Trailheads - planning and development	$1,800,000
D	T-3 Trail - East segment of N. Shore Trail	Development of trail	$350,000
P/D	Closing the Loop - Heritage and N. Shore trails	Planning and development	$1,500,000
P	Mill Ditch Trail	Trail corridor access point & stairway planning	$225,000
R	System-wide	Minor repair/replacement (parks amenities) projects	$250,000
D	Forest Home Park	Picnic shelter, drainage, building replacement & minor upgrades	$300,000
P	Skate Park	Phase I - Redesign and construct skate park	$250,000
D	3rd Ave. Trailhead	Trailhead development	$700,000
P	Legacy Lands - Phase I, develop site master plan	Using existing draft Vision Plan, phased approach to Master Planning. This would be Phase I.	$200,000
D	Legacy Lands - Phase I, implementation site master plan	Phase I Implementation - interim use, trails, trailhead, boat ramp, parking, Rose facility, Leadbetter facility	$4,000,000
D	Mill Ditch Trail	Shared-use trail development	$3,500,000
D	Skate Park	Phase II - Water access, trail and parking improvements	$2,000,000
D	Bike pump track	Install bike pump track at selected site	$350,000
D	Dog Park	Install dog park at selected site	$125,000
D	All-inclusive playground	Install all-inclusive playground at selected site	$600,000
P/R	System-wide	ADA compliance projects: facilities, pathway & amenities	$200,000
P	System-wide	Sports Field - assessment of existing fields & planning for system gaps	$100,000
R	Fallen Leaf Softball Field	Field improvements, new fence, infield dirt/grading, etc.	$200,000
P	Green Mountain property	Site master plan	$250,000
P/D	System-wide	Wayfinding and Park Signage program	$150,000
R	Heritage Park	Modify dock, staging to separate non-motorized launches and Gate access control upgrades	$125,000
R	System-wide	Playground replacements	$1,000,000
R	Dorothy Fox Park	Sport field drainage/renovations	$150,000
R	Grass Valley Park	Sport field drainage/renovations	$150,000
D	Green Mountain property	Park development (Phase 1 trails)	$1,500,000
R/D	Heritage Park	Picnic shelter installation & minor upgrades	$280,000
R	Prune Hill Sports Park	Sport field drainage/renovations	$150,000
R	Heritage Park	Install additional parking	$250,000
D	Prune Hill Sports Park	Picnic shelter installation & minor upgrades	$200,000
P/D	Sports Complex *	Site selection, site master plan, implementation	$20,000,000
P	Ash Creek Park	Site master plan	$90,000
D	Goot Park	Picnic shelter installation, replace bleachers & minor upgrades	$150,000
D	Louis Block Park	Upgrade baseball facilities (fencing, restroom, concession, etc.)	$750,000
P	Ostensen Canyon Park	Site master plan	$100,000
P/D	Leadbetter House redevelopment	Feasibility analysis and redevelopment	$2,000,000
D	Community garden support	New garden to fill gap in the system	$50,000
P	Lacamas Heights Park	Site master plan	$75,000
D	Oak Park	Restroom installation & minor site upgrades	$400,000
A	Neighborhood park	Acquisition to address distribution gap (Area A, 2-3 ac.)	$4,500,000
A	Neighborhood park	Acquisition to address distribution gap (Area B, 2-3 ac.)	$4,000,000
P/D	Camas Community Center *	Feasibility analysis and redevelopment	$10,000,000
R	Heritage Park	Upgrade playground & restroom	$450,000
R	Grass Valley Park	Replace playground	$250,000
D	Ash Creek Park	Park development per site master plan	$2,200,000
A	Neighborhood park	Acquisition to address distribution gap (Area C, 2-4 ac.)	$3,500,000
D	Fallen Leaf Lake Park	Park development per site master plan	$2,600,000
D	Lacamas Heights Park	Park development per site master plan	$1,000,000
D	Ostensen Canyon Park	Park development per site master plan	$3,000,000
P	Goot Park - area under powerline	Site master plan and development	$1,750,000
P/D	Aquatic Center *	Site selection, master plan, implementation	$19,000,000
P/D	Public Plaza	Master Planning and development	$1,000,000
P/D	Pickelball Courts	Master Planning and development (upto 8 courts)	$895,000

Total Estimated Project Costs $107,665,000

Project Type

A	Acquisition
P	Master planning
D	Development - new
R	Replacement/Upgrade

NOTES:

This list identifies planning-level cost estimates and does not assume the value of volunteer or other non-City contributions.

Detailed costing may be necessary for projects noted.

Legacy Lands and Green Mountain projects will have additional phase in the future (i.e. 20+ years).

This list is not an official budget and intended as a guiding document for City staff in the

*Additional public and policy discussion needed to refine project

Items highlighted in green are top priortity for the next 2-3 years (2022-24).

Items highlighted in blue bing high priority as opportunities arises.

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Appendix A
Survey Summary

To: Trang Lam, Parks & Recreation Director

From: Steve Duh, Conservation Technix, Inc.

Date: July 19, 2021

Re: **City of Camas Park, Recreation & Open Space Plan**
Community Survey Summary Results

Conservation Technix is pleased to present the results of a survey of the general population of the City of Camas that assesses residents' recreational needs and priorities.

KEY FINDINGS

Camas residents strongly value their parks and recreation facilities.

Nearly all respondents (97%) think parks and recreation are important or essential to quality of life in Camas. Very few, less than 4%, feel they are useful, but not necessary, or not important at all.

Residents visit frequently and are generally very satisfied with existing parks, trails and recreation facilities and programs.

Respondents visit the city's parks, trails, and recreation facilities frequently – most at least once a week – often for fitness or exercise, to walk or run, or to relax. Respondents are less likely to have participated in the City's recreation programs, classes, and camps, with less than one in four households participating in 2019. Those who had participated were most likely to have participated in youth-oriented classes and camps.

Overall, respondents feel that the City's parks and trails are in good condition. Not all respondents are familiar enough with Lacamas Lake Lodge & Conference Center and the Fallen Leaf Park Shelter, but those who are feel they are in very good condition. However, nearly six in ten respondents who rated the Camas Community Center responded that it is only in fair to good condition, signaling a potential need for maintenance and improvements at this facility.

Respondents generally feel the City has sufficient parks, water access, community events, and other recreation opportunities. The notable exception is trails, which 44% of respondents would like to see expanded. Most expressed a preference for more unpaved trails in natural areas over other trail types.

While residents prioritize maintaining existing parks and facilities, they are generally supportive of improving the City's park and recreation system as well.

When asked to rank their priorities for future City investment, respondents prioritized maintain existing parks, expanding trails, and building new parks. More than three in four respondents are very or somewhat supportive of the City adding walking trails, updated and accessible playgrounds, and more picnic shelters to the existing park system. A majority of respondents are also supportive of developing more biking trails, splash pads, off leash dog areas, pools or aquatic centers, tennis or pickleball courts, a new community center, disc golf course, and basketball courts.

As a whole, respondents are most supportive of raising revenue through reservation fees for rentals of part facilities, rather than through parking passes or raising taxes. Again, developing trails is a notable exception, where nearly six in ten respondents were willing to pay additional taxes to support improvements. Younger respondents and respondents with children at home are generally more supportive of expanding the City's park, trail, and recreation system and of increasing taxes or other revenue sources to support system expansion.

SURVEY METHODOLOGY

In close collaboration with City of Camas staff and the Parks and Recreation Commission, Conservation Technix developed the 17-question survey that was estimated to take less than ten minutes to complete.

The City mailed 2,500 surveys to randomly chosen households in Camas on May 29, 2021, of which 509 surveys were completed and returned. Online versions of the survey in English and Spanish were posted to the City's website on June 4, 2021. An additional 874 surveys in English and two in Spanish were completed from the general, community-wide online surveys. In all, 1,385 surveys were completed.

Information about the survey was provided on the City's website and on the EngageCamas site for the PROS Plan project. It was promoted via multiple social media postings, city email blasts and an email blast through Camas school district mailing list. Print copies were made available at the Camas library and the Camas School District Family Community Resource Center Also, flyers with QR codes were placed at numerous parks and local businesses. The survey was closed on July 2, 2021, and data were compiled and reviewed.

Although households were randomly chosen to receive the mail survey, respondents were not necessarily representative of all City residents. However, age group segmentation shows general alignment with current Census data. The table below shows the age demographics for the mail and online surveys, as well as comparative percentages for Camas' population.

	Survey Respondents			Camas population	
Age group	Mail	Online-only	Combined	All	Over 20
Under 20	<1%	<1%	<1%	31%	--
20 to 34	7%	9%	8%	12%	17%
35 to 44	25%	36%	32%	16%	23%
45 to 54	25%	31%	28%	19%	27%
55 to 64	17%	13%	15%	11%	16%
65 to 74	18%	8%	12%	9%	12%
75 and older	8%	2%	4%	3%	5%
Total	100%	100%	100%	100%	100%

This report includes findings of community opinions based principally on mailed survey responses. Each section also notes key differences between different demographic groups and among responses to the online-only survey, where applicable. Percentages in the report may not add up to 100% due to rounding.

DETAILED FINDINGS

Value and use of parks and recreation

How much do residents value parks and recreation?

Virtually all respondents (97%) feel that local parks, recreation opportunities are important or essential to the quality of life in Camas. More than eight in ten respondents feel that they are essential; while an additional 16% believe that they are important to quality of life, but not essential. Less than 1% of respondents believe parks are "Useful, but not important".

1. When you think about the things that contribute to the quality of life in Camas, would you say that public parks and recreation opportunities are…

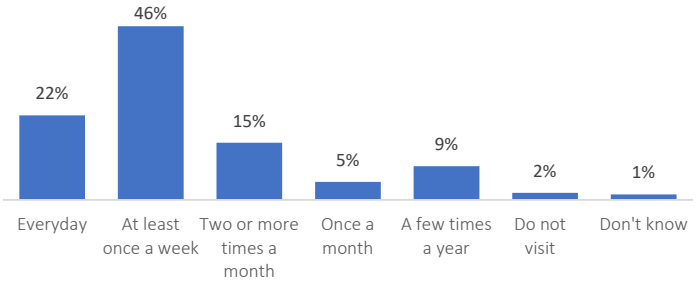
Response options	Mail		Online-only	
Essential to the quality of life here	81%	97%	88%	99%
Important, but not really necessary	16%		11%	
Useful, but not important	3%		<1%	
Not important or don't know	1%		<1%	

Though respondents of all ages value parks and recreation, younger respondents were significantly more likely to deem them essential to quality of life. Respondents with children at home, as well as those who responded to the online survey, also valued parks and recreation even more strongly than the general population.

How often do residents use Camas' parks, trails, recreation facilities, and natural areas?

Respondents were asked how often they, or members of their household, visited a City of Camas park, trail, recreation facility, or natural area (prior to the COVID-19 pandemic). Respondents tend to visit frequently, with more than two in three visiting at least once a week (68%) and another 20% visiting one to three times per month. Only 9% of respondents visit just a few times per year. Very few (2%) did not visit a park at all.

3. Prior to the COVID-19 quarantine, how often did you visit or use Camas' parks, trails, recreation facilities, or natural areas?



While younger respondents visit the City's parks, trails, and natural areas more frequently than older respondents, over half of respondents over 75 years old still visit at least once a week. Those in households with children also visit significantly more frequently than those without children, with participation increasing in correspondence with the number of children in the home. Respondents who live in the southwest portion of the city are less likely than respondents elsewhere to use parks and recreation facilities frequently. Online-only survey respondents tend to visit at similar frequencies as mail survey respondents.

Why do residents visit parks, trails and recreation facilities?

Respondents visit local parks and recreation facilities for a variety of reasons. The most popular activities are walking or running (80%), followed by fitness and exercise (70%), and relaxation (56%). More than three in ten respondents visited to walk their dog (40%), view wildlife (36%), visit a playground (33%), ride their bike (33%) or attend a family gathering or picnic (30%). Between 15% and 30% of respondents visit parks for non-motorized boating, like canoeing or kayaking, to attend a community event or concert, play on a sports field, swim, or use an outdoor sports court. Less than one in six respondents visit fish, participate in a recreation program, use a motorized boat, or play disc golf.

With a few exceptions, respondents who responded to the online-only survey were more likely to visit recreation facilities and parks for each reason listed than mail respondents were.

4. Prior to the COVID-19 Pandemic, what would you say are the main reasons you visited Camas recreation facilities, parks or open spaces in the past year?

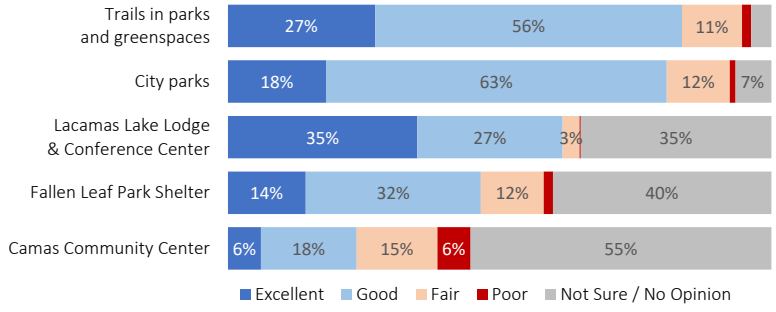
Reason	Mail	Online
Walking or running	80%	79%
Fitness / exercise	70%	73%
Relaxation	56%	54%
Dog walking	40%	45%
Wildlife viewing	36%	35%
Playgrounds	33%	47%
Bike riding	33%	44%
Family gatherings / picnics	30%	38%
Boating – non-motorized	28%	34%
Community events / concerts	23%	32%
Sport fields	21%	35%
Swimming	18%	24%
Outdoor sport courts	17%	20%
Fishing	13%	13%
Recreation program, class, or camp	10%	21%
Boating – motorized	9%	7%
Frisbee or disc golf	5%	8%

Respondents under 44 years of age are more likely than other groups to visit for community events, playgrounds and recreation programs. Respondents over 65 are more likely than younger respondents to visit to view wildlife. Some activities, including fitness and exercise, family gatherings, walking or running, and relaxation are similarly popular with all age groups. Respondents with children in their home are more likely to visit for playgrounds, recreation programs, sports fields, swimming, and family gatherings, than respondents without children who are more likely to visit to view wildlife.

How would residents rate the condition of Camas' parks and recreation facilities?

Respondents were asked to rate the condition of a variety of park and recreation facilities on a scale from poor to excellent. Respondents gave overwhelming high marks to the condition of the City's trails in parks and greenspaces and the parks themselves.

5. How would you rate the condition of the following parks or recreation facilities?



Overall, the Lacamas Lake Lodge & Conference Center received the highest condition ratings, with 95% of respondents who provided a ranking rating it as excellent or good. About 40% of respondents did not rate the condition of the Fallen Leaf Park Shelter – of those who did, nearly eighty percent rated its condition as either

excellent or good. The Camas Community Center received the lowest ratings, with 58% of respondents rating its condition as fair or poor (excluding those who responded not sure/no opinion). Notably, more than half of respondents were unsure and may have not visited this facility recently.

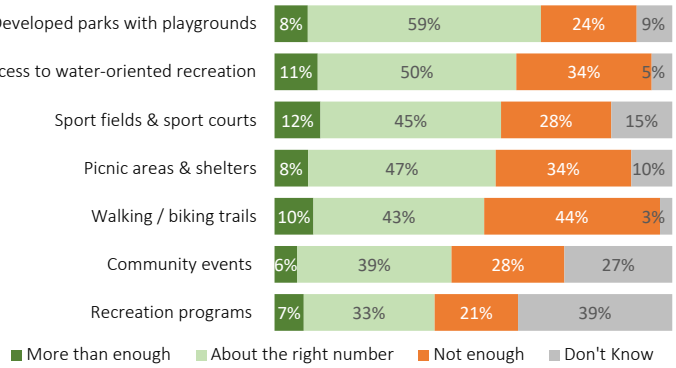
There were no significant variations in how respondents rated the condition of parks and facilities based on age, number of children in the home, or location of residence.

Does the number of existing park and recreation amenities meet residents' needs?

Respondents generally feel that the City already provides enough, or more than enough, of all of the amenities listed.

If respondents who answered "Don't Know" are excluded from the results, 46% of respondents believe there are not enough walking and biking trails. Between 33% and 39% of respondents who rated the options believe that there is not enough access to water-oriented recreation, picnic areas, sports fields and courts, community events, and developed parks.

2. When it comes to amenities provided by the City of Camas for meeting your needs for parks, trails and recreation facilities, would you say there are…



Younger respondents – those under 44 – were more likely than older respondents to feel there were not enough developed parks with playgrounds, picnic areas, recreation programs, and community events. Respondents between 55 and 64 years of age were far more likely than respondents of other ages to want more walking and biking trails in Camas. Respondents with children in their home are more likely than those without to believe there are not enough of every listed amenity except walking and biking trails. Respondents who live in southwest Camas (Council Ward 3) were more likely than respondents of other areas to feel there are not enough walking and biking trails.

Parks

What park improvements would Camas residents like to see?

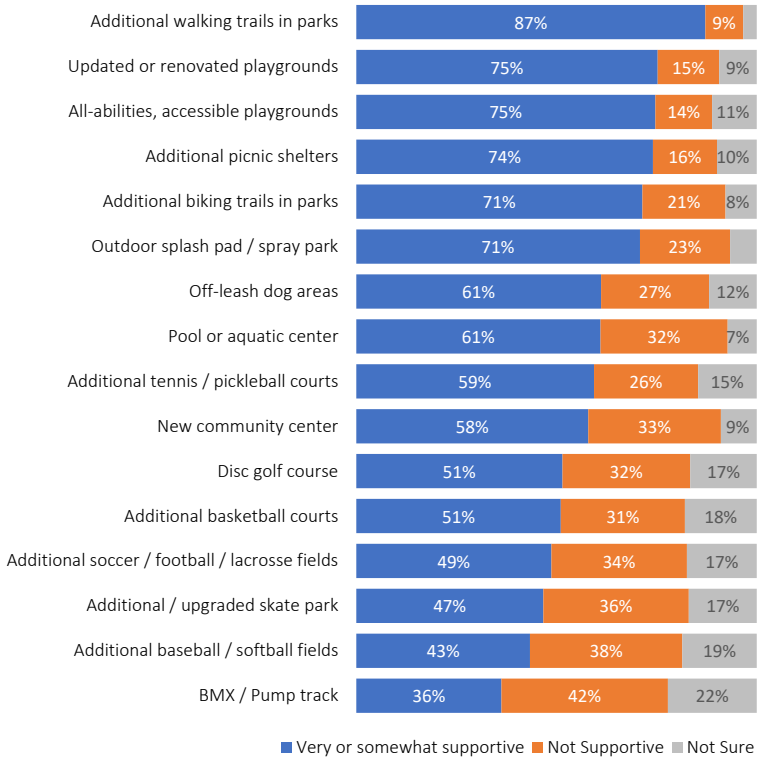
More than three in four respondents are very or somewhat supportive of adding walking trails (87%), updated (75%) and accessible (75%) playground features, and more picnic shelters (74%) to the City's existing parks.

A majority of respondents are also supportive of developing more biking trails, splash pads, off leash dog areas, pools or aquatic centers, tennis or pickleball courts, a new community center, disc golf course, and basketball courts.

Less than half of respondents were supportive of adding more basketball courts, sports fields, skate parks, and BMX or pump tracks.

Respondents under 45 years old were more likely than older respondents to support every improvement listed in the survey.

6. The following list includes park amenities that the City of Camas could consider adding to the park system. Please indicate whether you would be very supportive, somewhat supportive, not sure, or not supportive of each.



Respondents with children in their household were more supportive of city investment in playgrounds (including accessible playgrounds), sports fields and courts, community and aquatic centers, outdoor splash pads, BMX/bike skills courses, skate parks, and disc golf courses than those without children.

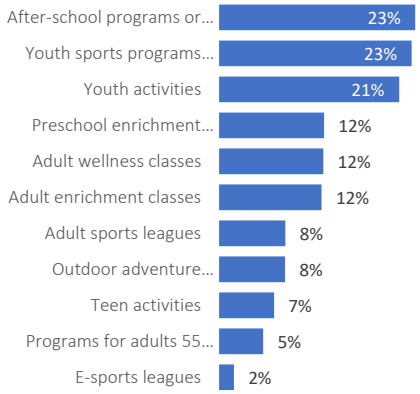
Recreation programs

What recreation programs have residents participated in?

Less than one in four respondents who took the mailed survey have participated in the City's recreation programs. Of the listed activities, the greatest number of respondents had participated in after-school programs or summer camps for children (23%), youth sports programs (23%), and youth activities (21%). In general, respondents were less likely to have participated in activities for teens, adults, and older adults.

Members of households of younger respondents (under age 44) were more likely to have participated in youth-oriented programming, while those of older respondents were more likely to have participated in adult programs and classes. Respondents with children in their home were significantly more likely to have participated in youth-oriented programs and camps than those without.

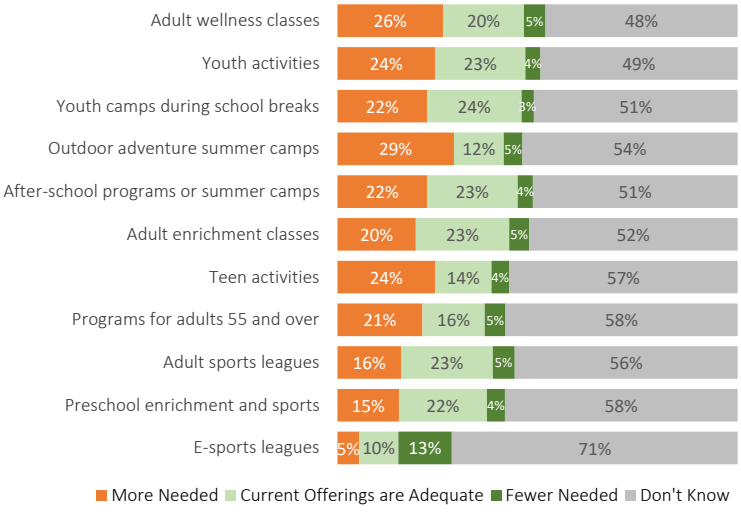
8. Please indicate if your household used each of the listed recreation program types in 2019 (pre-COVID-19).



What recreation options do residents have a need for?

The survey asked respondents which types of recreation programs, classes, and activities they would like to see more of. Notably, approximately half of respondents responded that they did not know whether current offerings are adequate or not. Of those who expressed an opinion, more than half felt the City needed more outdoor adventure summer camps, teen activities, adult wellness classes, and programs for adults over 55.

9. Please indicate whether you think there should be more less of each of the listed program types.



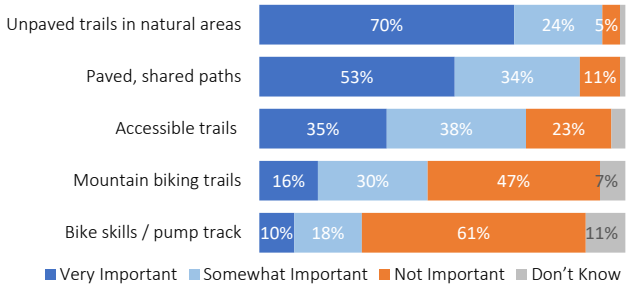
Respondents under 34 years of age were more likely than older respondents to feel the City needs more adult sports leagues, youth camps and after-school programs, pre-school activities, and E-sports leagues. Adults over 55 had the greatest unmet needs for classes and programs specific to people over 55. Respondents of all ages expressed similar levels of need for adult enrichment and wellness classes. Households with children were more likely than those without to feel like their need for youth activities were not well met. In general, respondents of southwest Camas (Ward 3) were more likely than respondents of other areas to feel that current offerings are adequate or more than enough.

Trails

What trail types do residents think are important?

Of various types of trails, respondents overwhelmingly rate unpaved trails in natural areas as important – 94% believe they are very or somewhat important. Majorities of respondents also feel paved, shared use paths for pedestrians and cyclists (87%) and accessible trails (73%) are at least somewhat important. Respondents are less likely to feel mountain biking trails (46%) and bike skills / pump tracks (28%) are important. In general, the importance of each type of trail decreased with the age of respondent. However, similar percentages of adults in each age group from 35 to 64 considered mountain biking trails to be very or somewhat important, with slightly stronger levels of importance noted by respondents between 45 and 64. There were no significant differences in importance based on where respondents live or whether they have children at home.

10. Please rate how important each trail type or amenity is to your household.



Investment and revenue priorities

What recreation and park investments would residents prioritize?

Respondents were asked to rank a list of potential recreation, park, and open space investments. Generally, respondents to both the mail and online survey ranked maintaining existing parks, expanding trail opportunities, building new parks, and acquiring land for future parks as their top priorities. Respondents ranked offering building a new community or aquatic center and expanding program offerings as their lowest priorities in both the mail and online surveys.

Respondents of different ages prioritized the investment options similarly, with the exception of building a new community or aquatic center, which was a higher priority for significantly more younger respondents. Respondents with children in their home tended to rate building a new community or aquatic center higher than those without children in the home, who were more likely to rate expanding trail opportunities as a high priority. Respondents did not vary significant in their priorities depending on which part of the city they live in.

8. For the following list, indicate how you would rank the priority for each.

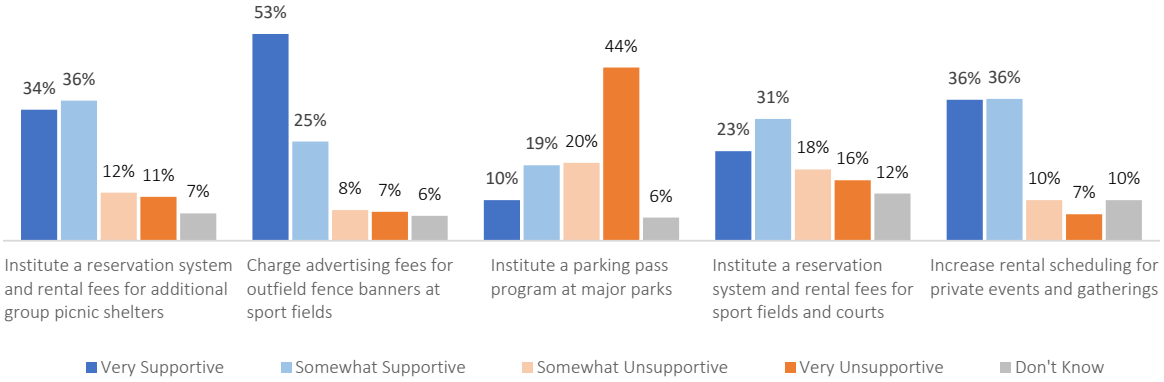
	Mail	Online
Highest	▪ Focusing on existing parks & delayed maintenance	▪ Focusing on existing parks & delayed maintenance
	▪ Expanding trail opportunities	▪ Building new parks on undeveloped, city parkland
	▪ Building new parks on undeveloped, city parkland	▪ Expanding trail opportunities
	▪ Acquiring land for future parks	▪ Acquiring land for future parks
	▪ Building a new community center or aquatic center	▪ Building a new community center or aquatic center
Lowest	▪ Expanding recreation classes & camps	▪ Expanding recreation classes & camps

What revenue generating options would residents support?

The survey asked respondents whether they would support various revenue generating options. Large majorities of respondents were either very or somewhat supportive of a) charging advertising fees for outfield fence banners at sports fields (88%), b) increasing rental scheduling for private events and gatherings (72%), and instituting a reservation system and rental fees for additional group picnic shelters (70%). A slight majority (54%) were supportive of instituting a reservation and fee program for sports fields and courts. Significantly fewer respondents (29%) were supportive of implementing a parking pass program at major City parks.

There were no consistent, significant differences in support for revenue generating options across respondents of various ages or between respondents with children at home and those without.

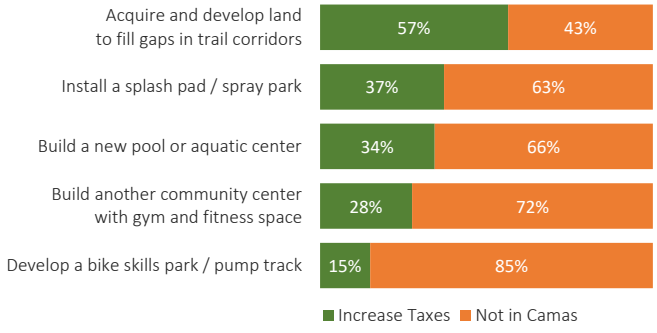
11. The Parks & Recreation Department has limited budget to deliver parks and recreational services, and the City is exploring options to enhance revenue generation to support the delivery of services. How would you rate your level of support for each of the following options?



Are residents willing to support increased taxes to fund new amenities and experiences?

Respondents with children at home were significantly more likely that those without to support increasing taxes for all improvements other than expanding trails (which received similarly high support levels). However, building a community or aquatic center was the only option for which more than half of respondents with children supported raising taxes. Respondents under 44 years of age were significantly more likely than older respondents to support raising taxes to fund a new pool or aquatic center or to install splash pads. There were no significant differences based on respondents' location of residence.

12. There may be some park and recreation experiences that are limited or not available in Camas but are available in neighboring communities. If it came down to a choice between increasing taxes to develop that facility in Camas versus not having that in Camas, which would you choose?

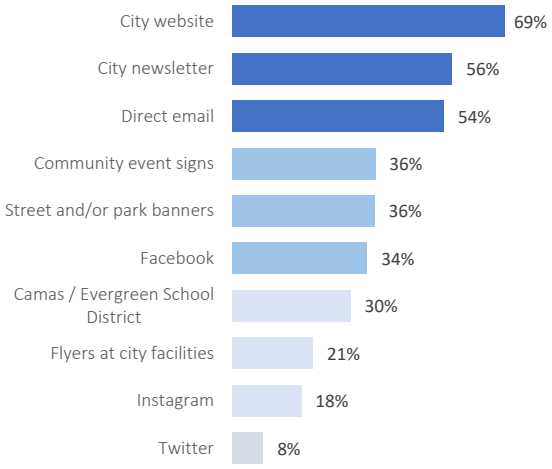


Communication preferences

How do residents want to hear about Camas' parks, programs, and events?

More than two-thirds of respondents would prefer to learn about City parks, programs, and events through the City's website. The City newsletter and direct email are also popular communication options, preferred by 56% and 54% of respondents respectively. These sources were popular with respondents to both the mail and online-only surveys and with respondents of all ages.

13. Please check ALL the ways you would prefer to learn about Camas' parks, programs, and events.



About a third of resident preferred to learn about City offerings through various types of promotional signs, including community event signs (36%), street or park banners (36%), and flyers at City facilities (21%). Thirty percent of respondents would like to hear about programs and events through local school districts.

Fewer than about one in three respondents would like to hear about park and recreation opportunities through social media (Facebook (34%), Instagram (18%), and Twitter (8%)). However, social media – especially Facebook and Instagram – is a significantly more popular source of information for respondents under 44 years of age. Respondents who responded to the online-only survey were also significantly more likely to prefer social media sources – 61% prefer Facebook, 29% Instagram, and 13% Instagram.

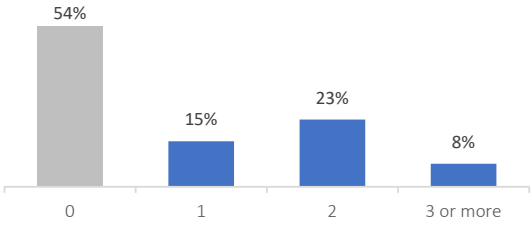
Respondents with children at home were significantly more likely to prefer receiving information through the school district than those without. There were no significant differences in communication preferences between respondents living in different areas of the city.

Demographics

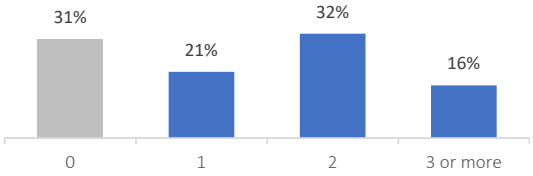
Number of children in household

The majority (54%) of respondents to the mail survey live in households with no children under 18, while about just under half live in a household with either one (15%), two (23%), or three or more (8%) children. Online-only survey respondents were significantly more likely to live in households with children than respondents to the mail survey – nearly 70% had children in the home.

Mail survey responses



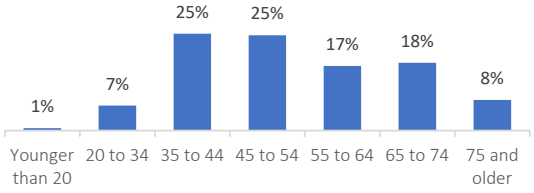
Online-only survey responses



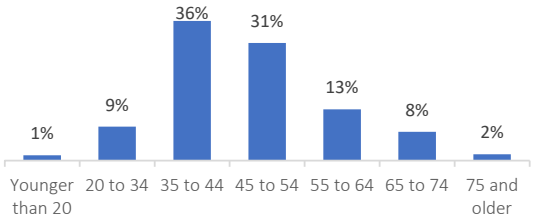
Age

Approximately half of respondents to the mail survey were between the ages of 35 and 54. Another 35% were between 55 and 74, while 8% were older than 75 years. Fewer than 8% of respondents were less 35 years old. The online-only survey tended to be younger than those who responded to the mail survey – 10% were under 35 years old, 67% were between 35 and 54 years, and only 23% were over 55.

Mail survey responses



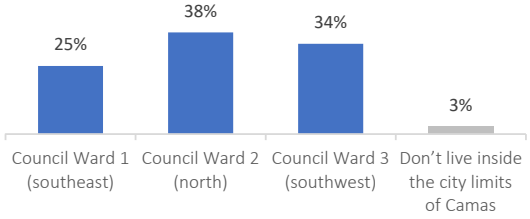
Online-only survey responses



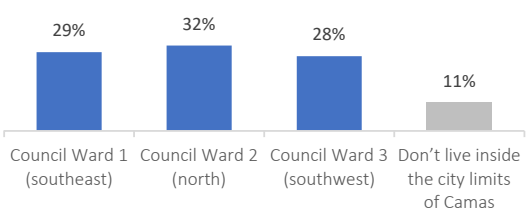
Location of residence

Respondents were relatively evenly distributed throughout the City of Camas. Thirty-eight percent live in Council Ward 2 (north Camas), 34% live in Ward 3 (southwest), and 25% live in Ward 1 (southeast). The mail survey garnered a few responses (3%) from people who live outside the City of Camas, however all live within the 98607 zip code. Respondents to the online survey were similarly distributed across the city, with slightly higher representation of residents in Ward 1. However, a larger portion (11%) of online-only respondents do not live in the city.

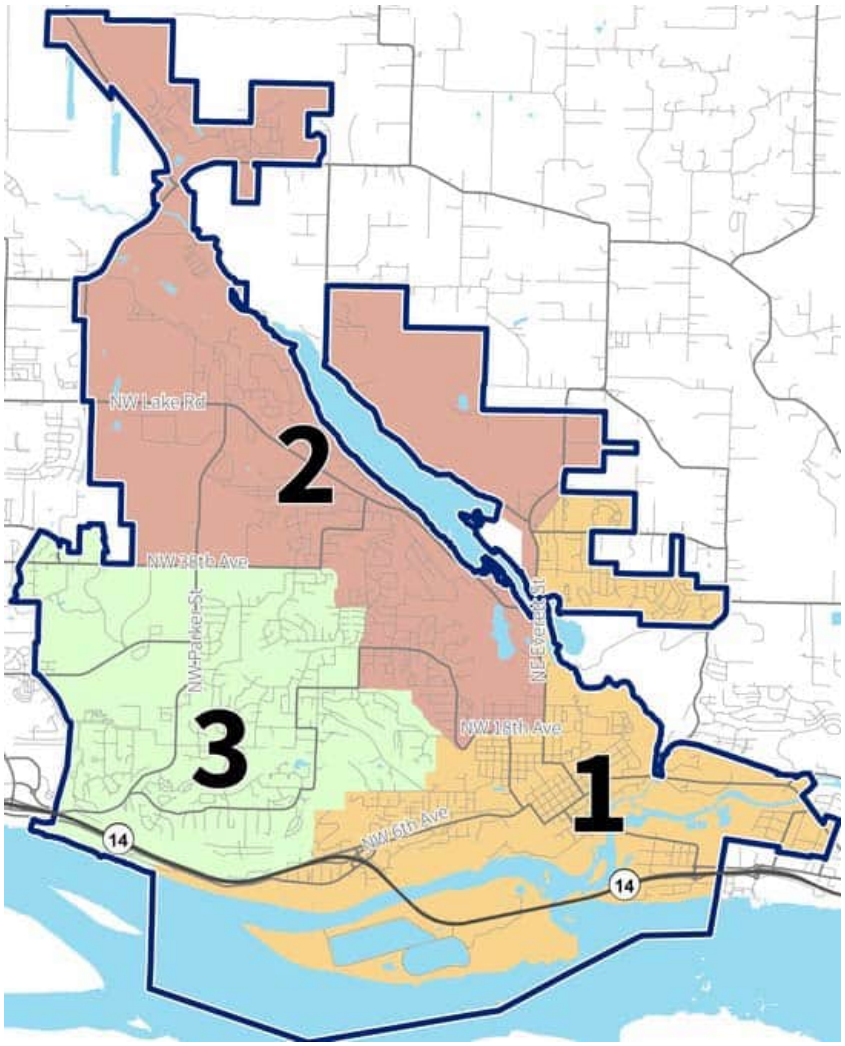
Mail survey responses



Online-only survey responses



Location Map



ATTACHMENT 1. SURVEY INSTRUMENT

City of Camas WASHINGTON

Community Survey on Parks and Recreation

Dear Camas Resident:

The City of Camas is beginning a community-led process to update its citywide Recreation, Parks and Open Space Plan (PROS Plan, for short). We need your help to determine how to prioritize projects and what we should focus on to keep our parks and programs thriving for the next 6-10 years. As an initial step, the City is conducting this short survey to assess the community's recreation needs. We understand that COVID-19 has impacted your ability to participate in programs and visit parks this year. We ask that you consider needs for the future as you evaluate recreation amenities. Your opinions are important to the City.

The survey has 16 questions and will only take a few minutes to complete. Use the QR code to take this survey online at https://www.surveymonkey.com/r/CamasPROS

1. **When you think about what contributes to the quality of life in Camas, would you say that public parks and recreation opportunities are... (CHECK ONE OPTION)**

   ☐ Essential to the quality of life here
   ☐ Important, but not really essential
   ☐ Useful, but not necessary
   ☐ Not Important
   ☐ Don't know

2. **When it comes to amenities provided by the City of Camas for meeting your needs for parks, trails and recreation facilities, would you say there are... (CHECK ONLY ONE BOX IN EACH ROW)**

	More than Enough	About the Right Amount	Not Enough	Don't Know
Developed parks with playgrounds	☐	☐	☐	☐
Walking / biking trails	☐	☐	☐	☐
Sport fields & sport courts	☐	☐	☐	☐
Picnic areas & shelters	☐	☐	☐	☐
Access to water-oriented recreation (lakes, rivers)	☐	☐	☐	☐
Recreation programs (camps & classes)	☐	☐	☐	☐
Community events (such as the Movies in the Park)	☐	☐	☐	☐

3. **Prior to the COVID-19 pandemic, how often did you visit or use Camas parks, trails, recreation facilities or natural areas?**

   ☐ Everyday
   ☐ At least once a week
   ☐ Two or more times a month
   ☐ About once a month
   ☐ A few times over the year
   ☐ Do not visit facilities / parks / open spaces
   ☐ Don't know

4. **Prior to the COVID-19 pandemic, what would you say are the main reasons your household visited Camas parks, recreation facilities or open spaces in the past year? (CHECK ALL THAT APPLY)**

   ☐ Fitness / Exercise
   ☐ Dog walking
   ☐ Playgrounds
   ☐ Walking or running
   ☐ Bike riding
   ☐ Family gatherings / picnicking
   ☐ Community events / concerts
   ☐ Recreation program, class or camp
   ☐ Sport fields
   ☐ Outdoor sport courts
   ☐ Wildlife viewing
   ☐ Fishing
   ☐ Swimming
   ☐ Boating - Non-motorized / Hand-carry (canoeing, kayaking)
   ☐ Boating - Motor / trailered
   ☐ Frisbee or disc golf
   ☐ Relaxation
   ☐ N/A - I didn't use any Camas facilities
   ☐ Other: _____

Save a stamp! Use the QR code and take this survey online:
https://www.surveymonkey.com/r/CamasPROS
Or send it back in the enclosed Return-Reply envelope provided. **Thank you in advance for participating!**

5. **How would you rate the condition of each of the following parks or recreation facilities?**

	Excellent	Good	Fair	Poor	Not Sure / No Opinion
City parks	☐	☐	☐	☐	☐
Trails in parks and greenspaces	☐	☐	☐	☐	☐
Fallen Leaf Park Shelter	☐	☐	☐	☐	☐
Camas Community Center	☐	☐	☐	☐	☐
Lacamas Lake Lodge & Conference Center	☐	☐	☐	☐	☐

6. **The following list includes park amenities that the City could consider adding to the park system. Please indicate whether you would be very supportive, somewhat supportive, not sure, or not supportive of each.**

	Very Supportive	Somewhat Supportive	Not Supportive	Not Sure
Additional picnic areas & shelters for group gatherings	☐	☐	☐	☐
Updated or renovated playgrounds at existing parks	☐	☐	☐	☐
All-abilities, accessible playground equipment	☐	☐	☐	☐
Additional walking trails in parks	☐	☐	☐	☐
Additional biking trails in parks	☐	☐	☐	☐
Pool or aquatic center	☐	☐	☐	☐
Outdoor splash pad / water spray park	☐	☐	☐	☐
New Community Center with indoor gymnasium & space for classes	☐	☐	☐	☐
Off-leash dog areas (dog parks)	☐	☐	☐	☐
Additional sport fields for soccer, football & lacrosse	☐	☐	☐	☐
Additional sport fields for baseball / softball	☐	☐	☐	☐
Additional basketball courts	☐	☐	☐	☐
Additional tennis / pickleball courts	☐	☐	☐	☐
BMX / Pump track	☐	☐	☐	☐
Additional / upgraded skate park	☐	☐	☐	☐
Disc golf course	☐	☐	☐	☐

7. **For the following list, indicate how you would rank the priority for each (1st priority is highest and 6th priority is lowest). Mark each ranking number only once.**

	Select each priority ONLY ONCE. Highest priority → Lowest priority						Don't know / No opinion
	1st	2nd	3rd	4th	5th	6th	
Acquiring additional land for future parks	☐	☐	☐	☐	☐	☐	☐
Building new parks on undeveloped, city-owned parkland	☐	☐	☐	☐	☐	☐	☐
Building a new community center or aquatic center	☐	☐	☐	☐	☐	☐	☐
Focusing on existing park facilities & delayed maintenance	☐	☐	☐	☐	☐	☐	☐
Expanding trail opportunities	☐	☐	☐	☐	☐	☐	☐
Expanding recreation classes & camps	☐	☐	☐	☐	☐	☐	☐

Community Survey on Park & Recreation Preferences

8. **Please indicate if your household has participated or used each of the listed recreation program types in 2019 (pre COVID-19) AND indicate if there should be more or less of each available.**

	Have you participated/ used in 2019 (pre-COVID)?		Do you think there should be more or less of this type of activity or program available?			
	Yes	No	More Needed	Current Offerings are Adequate	Fewer Needed	Don't Know
Adult enrichment classes, such as arts, crafts or music	○	○	☐	☐	☐	☐
Adult wellness classes, such as yoga/tai chi, aerobics or partner/line dancing	○	○	☐	☐	☐	☐
Adult sports leagues, such as soccer, ultimate frisbee, kickball or softball	○	○	☐	☐	☐	☐
Programs for adults 55 and over, such as drop-in activities, trips or health/wellness	○	○	☐	☐	☐	☐
After-school programs or summer day camps for children	○	○	☐	☐	☐	☐
Youth sports programs and camps during school breaks	○	○	☐	☐	☐	☐
Youth activities, such as fitness, music, arts or crafts	○	○	☐	☐	☐	☐
Preschool Enrichment and Sports	○	○	☐	☐	☐	☐
Teen activities, such as game nights, day trips or camps during school breaks	○	○	☐	☐	☐	☐
Outdoor adventure summer camps, including archery, orienteering, geocaching or environmental education	○	○	☐	☐	☐	☐
E-sports leagues	○	○	☐	☐	☐	☐

9. **Please rate how important each trail type or amenity is to your household.**

	Very Important	Somewhat Important	Not Important	Don't Know
Paved, shared paths for pedestrians and cyclists	☐	☐	☐	☐
Unpaved trails in natural areas	☐	☐	☐	☐
Accessible trails without steep slopes for users of all abilities (strollers, wheelchairs, etc.)	☐	☐	☐	☐
Mountain biking trails	☐	☐	☐	☐
Bike skills / pump track	☐	☐	☐	☐

10. **The Parks & Recreation Department has limited budget to deliver parks and recreational services, and the City is exploring options to enhance revenue generation to support the delivery of services. How would you rate your level of support for each of the following options?**

	Very Supportive	Somewhat Supportive	Somewhat Unsupportive	Very Unsupportive	Don't Know
Install and institute a reservation system and rental fees for additional group picnic shelters	☐	☐	☐	☐	☐
Charge advertising fees for the installation of outfield fence banners at sport fields	☐	☐	☐	☐	☐
Institute a parking pass program at major parks	☐	☐	☐	☐	☐
Institute a reservation system and rental fees for sport fields and courts	☐	☐	☐	☐	☐
Increase rental scheduling for private events and gatherings	☐	☐	☐	☐	☐

11. There may be some park and recreation experiences that are limited or not available in Camas but are available in neighboring communities. If it came down to a choice between increasing taxes to develop that facility in Camas versus not having that in Camas, which would you choose?

	Increase Taxes	Not in Camas
Install a splash pad / spray park	☐	☐
Build a new pool or aquatic center	☐	☐
Acquire and develop land to fill gaps in trail corridors	☐	☐
Build another community center with gymnasium and fitness space	☐	☐
Develop a bike skills park / pump track	☐	☐

12. Please check ALL the ways you would prefer to learn about Camas's parks, programs and events.

- ☐ City website
- ☐ City newsletter
- ☐ Facebook
- ☐ Twitter
- ☐ Instagram
- ☐ Camas / Evergreen School District
- ☐ Direct email
- ☐ Community event signs
- ☐ Flyers at city facilities
- ☐ Street and/or park banners
- ☐ None of these
- ☐ Other: _____

The following questions help us understand whether we have a cross-section of the community responding to this survey. It's important that you provide a response to each question.

13. How many children under age 18 live in your household?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3 or more

14. What is your age?

- ☐ Younger than 20
- ☐ 20 to 34
- ☐ 35 to 44
- ☐ 45 to 54
- ☐ 55 to 64
- ☐ 65 and 74
- ☐ 75 and older

15. In which section of Camas do you live?

- ☐ (1) Council Ward 1 - southeast Camas
- ☐ (2) Council Ward 2 - north Camas
- ☐ (3) Council Ward 3 - southwest Camas
- ☐ Don't live inside the city limits of Camas

16. If you don't live in Camas, what is your zip code? _____



Thank you for taking the time to complete this survey!

Your input will help guide the development of the Camas Parks, Recreation & Open Space Plan.

Sava a stamp! Take this survey online with the QR code or at: https://www.surveymonkey.com/r/CamasPROS

Learn more about Camas parks, trail and programs and stay informed about the Parks, Recreation & Open Space Plan process at www.cityofcamas.us

The City of Camas is using the services of a consultant team who specializes in park and recreation planning.

Please return your completed survey in the enclosed Return-Reply Envelope addressed to:

Conservation Technix Inc.
PO Box 12736
Portland, OR 97212

ATTACHMENT 2. OPEN-ENDED RESPONSES

Question 4. Prior to the COVID-19 pandemic, what would you say are the main reasons your household visited Camas parks, recreation facilities, or natural areas in the past year? (open-ended "other" responses)

Mail

- The parks are why I moved here
- Photography
- Cemetery - pry of Parks responsibility
- Meeting a friend or getting out of the house
- DOG PARK PLEASE!!!!
- Miss public swim pool
- Kayaking, paddle boarding
- Too much noise, dangerous bikes, boats disruptive
- We moved here during the pandemic
- Kites
- Just moved here
- Internet access and restrooms
- Hiking Lacamas park
- Getting out of yard work!!!
- Overall enjoyment of nature in its natural state on maintained trails
- Visit my wife's cemetery plot
- We moved to Camas during the pandemic.
- Skatepark
- Moved here during PHE
- Photography
- Hiking
- Skateboarding

Online

- Bike Riding
- Bird watching
- Did not live in Camas
- Didn't live here prior to COVID
- Disc Golf
- Gather with friends
- Horseback riding
- I moved here during the pandemic, so the question doesn't really apply to me, but I'm utilizing many of these now and have been since arriving.
- I moved to Camas during COVID.
- Lacamas Lake is toxic and should be cleaned and filtered, currently unsafe
- Mental health / forest bathing

- Mental health, community health
- Mountain biking
- Mountain biking
- Moved here during COVID
- Moving to Camas during COVID
- Nature immersion
- Paddle boarding
- Photos
- Pickleball at Crown Park!!!
- pump track and dirt jumps
- Relaxing
- Scouts
- Skateboarding
- Skatepark
- sketching
- Soaking up nature
- SUP
- To be outside for no reason
- To practice disc golf throws!
- Turf the baseball fields. For how much u make it taxes stop wasting money and invest in the youth or I'll move to Ridgefield
- Visiting with out-of-town guests
- We just moved here last June during the pandemic.
- We just moved to Camas in July 2020, so we didn't have experiences before the pandemic.
- We need an off-leash dog park
- We recently moved here during the pandemic.
- Would have gone to pool if still had one

Question 13. Please check ALL the ways you would prefer to learn about Camas' parks, programs and events. (open-ended "other" responses)

Mail

- Advertising/information around downtown Camas
- Camas Post Recorder
- Direct mail
- Direct mail - USPS
- Direct mailing
- Direct mailing once or more per year
- Do not know
- Don't care. Any.
- Email/mailers
- Google or ask Siri
- Mail

- Mailed brochure of schedule
- Newspaper
- Newspaper - Columbian
- Next Door
- NextDoor app
- Nextdoor
- NextDoor app
- NextDoor app
- Send with water bill
- The Columbian
- USPS
- Word of mouth

Online

- "Opt-In" texts with links to website with the relevant information
- All
- Believe Street and park banners are currently prohibited by city ordinance.
- Camas and Columbian Newspapers
- Camas Library
- Camas Washougal Post Record, Nextdoor
- City App with updated info
- Email
- Emails through the Camas schools are a great way to advertise events.
- Everything you can think of
- I believe a community / city announcement board in DT Camas would be good.
- Insert with city water bill
- Newspaper
- Next door app
- Nextdoor
- Nextdoor
- NextDoor
- post on nextdoor riverview
- Push Notifications Text
- Send links w/ event info via text
- text
- Text and/or mobile app
- The Columbian and Post Record Newspaper
- This seems the only place where I can say that I am supportive of a Firstenburg style aquatic center, but at $70 million.
- Turf the baseball/softball fields, maintain the parks and put in a pump track for the youth. Ur taxes are already higher than any other city in SW Washington. Our community is pissed off with the waste of funds our leaders have shown and not using that money to enrich our quality of life.



Appendix B
Online Open House Summary

CAMAS PROS PLAN UPDATE

SUMMER 2021 PUBLIC OUTREACH SUMMARY

Prepared for:

City of Camas

Prepared by:

JLA Public Involvement, Inc.

August 2021

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INTRODUCTION

The City of Camas conducted outreach between July 29 and August 22, 2021 to share information about the Camas Parks, Recreation and Open Space (PROS) Plan Update with the public and solicit input about which park and recreation programs, services and facilities are important to them. Feedback received through this outreach period will help the city build the draft PROS Plan, which will be shared in late fall through a second round of outreach.

OVERALL PARTICIPATION AND NOTIFICATION

To gather feedback to inform the PROS Plan update, the project team developed an **online open house, online interactive map,** and held **three (3) tabling events** in Camas to build project awareness and solicit feedback.

Overall, **we reached approximately 131 people**, with 74 participating in the online open house, approximately 50 visiting with the team at tabling events, and 7 people contributing to the interactive map.

Community members were informed about the online open house and tabling events through the following:

- Social media posts to the City of Camas Facebook page and Twitter account
- Social media posts to the Camas Parks & Recreation Facebook page
- Posts on the project Engage Camas page
- Emails sent to the Parks and Recreation distribution list
- Media release
- Announcements at Council and Parks & Recreation Commission public meetings
- Announcements at Stakeholder Focus Group meetings

FEEDBACK SUMMARY

OPEN HOUSE QUESTIONS

This section summarizes the feedback received through the online open house.

ONLINE OPEN HOUSE RESPONSES

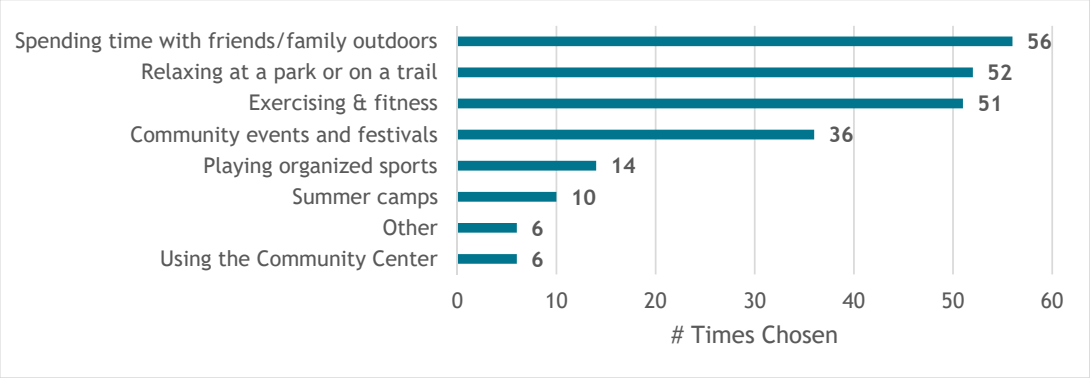
Online open house participants were given the opportunity to respond to a series of questions about park and recreation programs, services, and facilities. Feedback is summarized below.

Note: Unless otherwise stated, the percentages listed in the analysis of each question take into consideration the number of participants who responded to the question, not the total number of people who participated in the online open house.

1. **What are you most looking forward to doing again in City parks and facilities as COVID-19 restrictions are lifted? (Select all that apply.)**

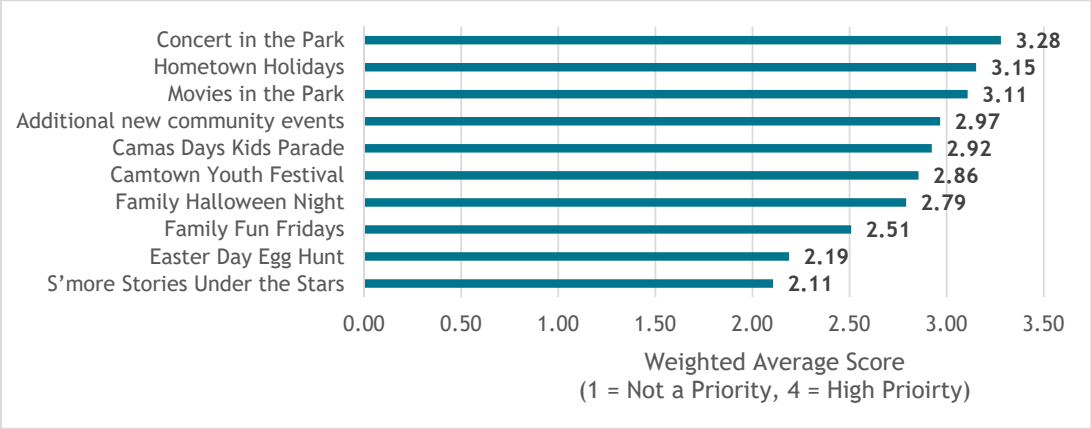
   As COVID-19 restrictions are lifted, participants are most looking forward to spending time with friends/family outdoors, relaxing at a park or on a trail, and exercising and fitness.

   For those who selected "Other," kayaking, floating on the river, swimming, and taking children to the playgrounds was mentioned. Someone mentioned splash pads at Crown Park and that bathrooms are needed. Please see **Appendix A** to read the individual, unedited comments.

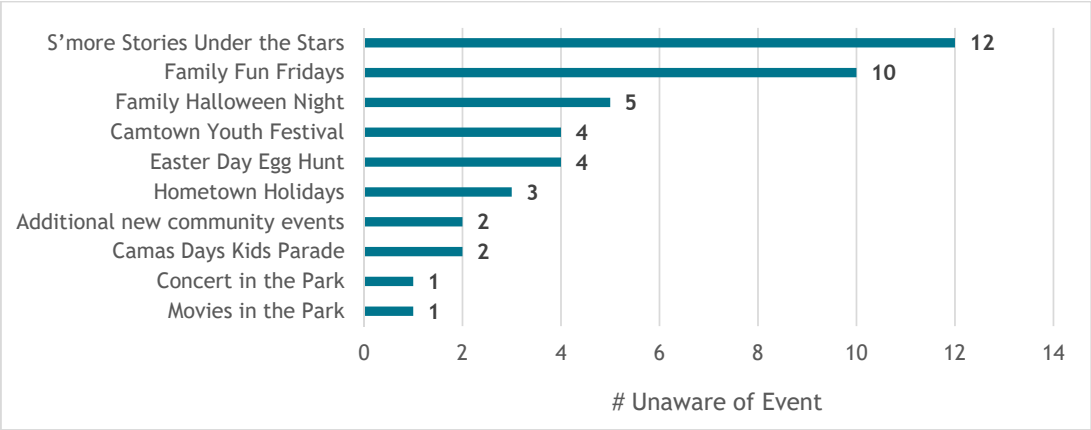


2. **The City of Camas offers or supports many community events throughout the year that are free to the public but utilize city staff resources and funding. Below is a list of Camas community events that are currently offered. For each event, indicate whether you think it is a High Priority, a Medium Priority, a Low Priority, or Not a Priority for your household.**

   "Concert in the park" scored the highest, indicating it was a high priority for respondents. This was followed by "Hometown Holidays" and "Movies in the Park." Respondents indicated that "S'more Stories Under the Stars" was the lowest priority community event.

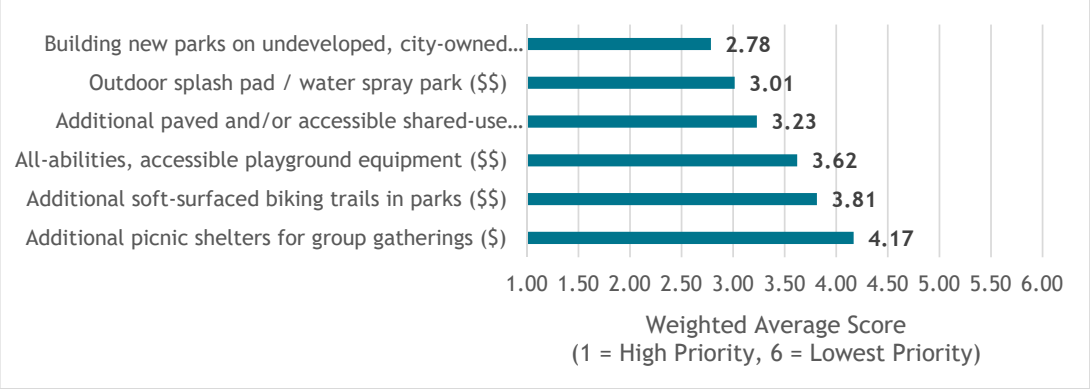


12 respondents indicated that they were unaware of S'more Stories Under the Stars, 10 were unaware of Family Fun Fridays, and 5 were unaware of Family Halloween Night.



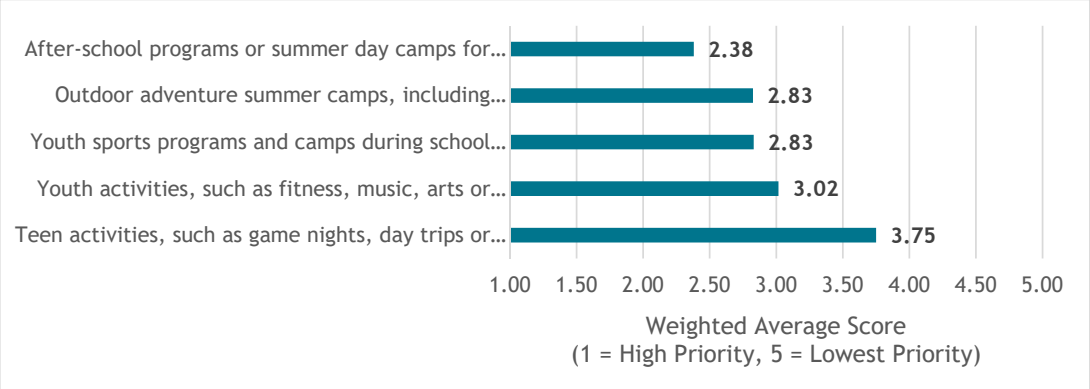
3. **The spring 2021 community survey identified six priorities for the park system. For the following list of park system priorities, indicate how you would rank the priority for each (first (1) priority is highest and sixth (6) priority is lowest). Cost estimates are shown as $ (somewhat expensive), $$ (moderately expensive) or $$$ (expensive).**

   Respondents ranked **"Building new parks on undeveloped, city-owned parkland ($$$)" highest,** followed by "Outdoor splash pad / water spray park ($$)." Respondents ranked "Additional picnic shelters for group gatherings ($)" the lowest.



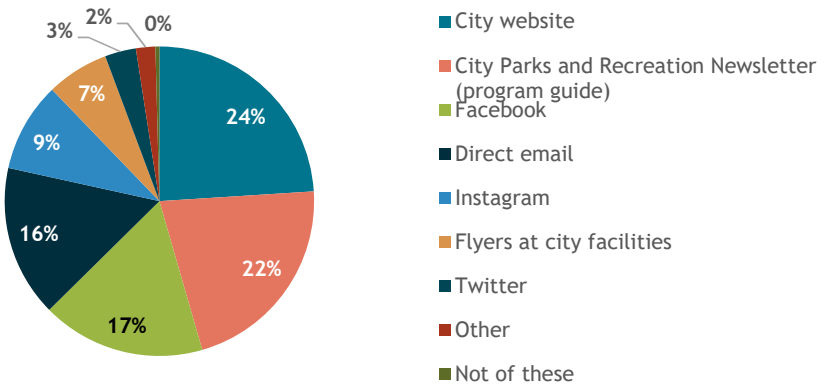
4. **The spring 2021 community survey identified five priorities for recreation programs and activities. For the following list of recreation programs and activities, indicate how you would rank the priority for each (first (1) priority is highest and fifth (5) priority is lowest).**

   Respondents ranked **"After-school programs or summer day camps for children" highest,** followed by "Youth sports programs and camps during school breaks" and "Outdoor adventure summer camps, including archery, orienteering, geocaching or environmental education." Respondents ranked "Teen activities, such as game nights, day trips or camps during school breaks" the lowest.



5. **Please check ALL the ways you would like to get information about Camas' recreation programs and activities.**

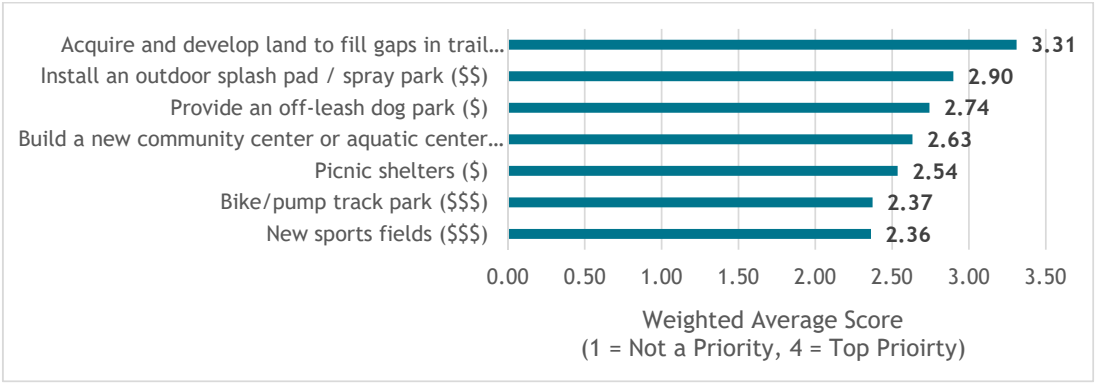
   Most people would like to get information about Camas' recreation programs and activities through the **city's website and/or through the City Parks and Recreation Newsletter.**



For those who indicated "Other," text messaging, events on Facebook, Camas Library, and Nextdoor were mentioned as ways people like would to get information

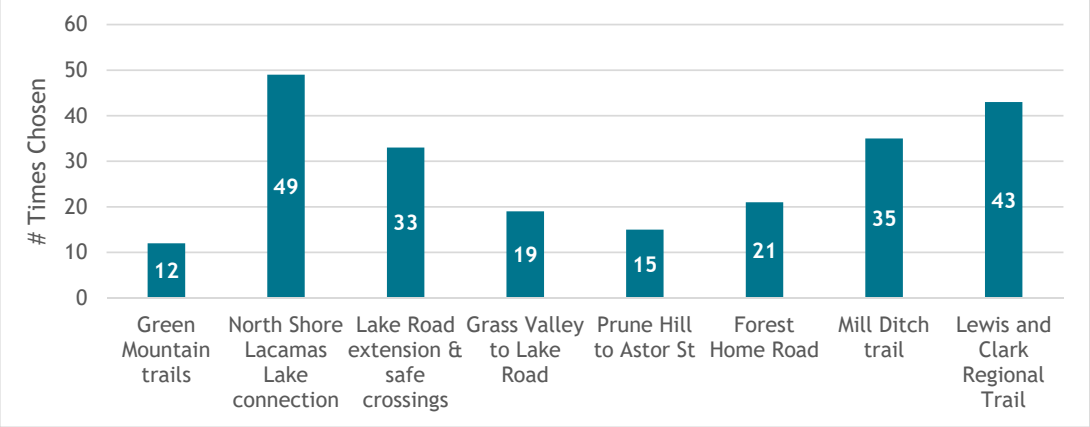
6. **The following list of new facilities/amenities may be considered in the new PROS Plan. For each item, please tell us if it should be a top priority, a high priority, a low priority or not a priority at all. Cost estimates are shown as $ (somewhat expensive), $$ (moderately expensive), $$$ (expensive) or $$$$ (very expensive).**

"Acquire and develop land to fill gaps in trail corridors ($$)" scored the highest, indicating it was a high priority for respondents. This was followed by "Install an outdoor splash pad / spray park ($$)" and "Provide an off-leash dog park ($)."



7. **Thinking about trails and paths, which potential trail connections are the highest priority for your household? (Select up to 4.)**

Respondents chose the **North Shore Lacamas Lake connection the most (49 times),** followed closely by Lewis and Clark Regional Trail, chosen 43 times, indicating that these two trails were highest priority for households. Green Mountain trails was chosen the least.



8. **Please share any additional needs for park and recreation improvements, programs or activities that you think are important and relevant to the growth of our community for the next five years.**

   36 people left feedback in this open text box. Below are some common themes found for those who responded. Please see **Appendix A** to read the individual, unedited comments.

   - 7 said that maintenance of existing parks needs to be a priority.
   - 5 said they would like to see more water features, such as pools and splash pads, at parks.
   - 6 said they want expanded bicycle facilities.
   - 6 said there is a need for an accessible and safe system of interconnected trails.
   - 4 said they want more and improved/expanded sports fields and courts.
   - 2 said the restrooms at Crown Park need to be improved.

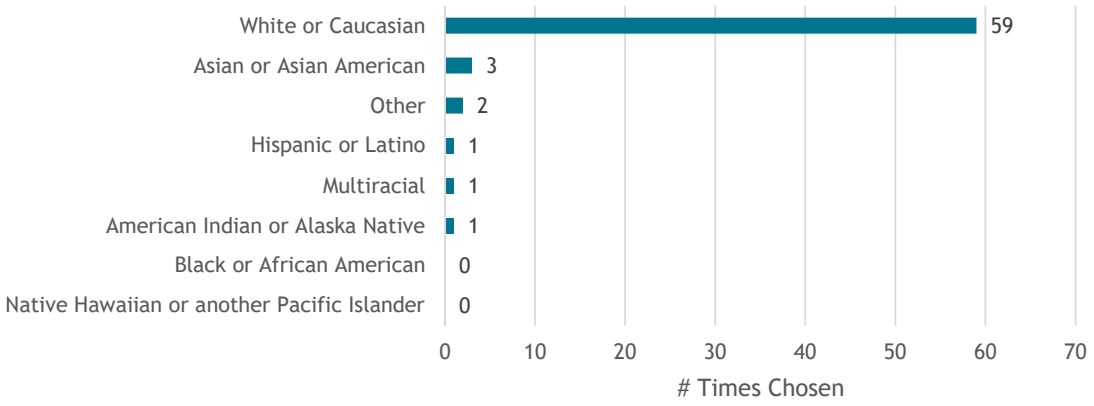
DEMOGRAPHIC INFORMATION

Participants from the online open house were asked a series of optional demographic questions.

Note: Unless otherwise stated, the percentages listed in the analysis of each question take into consideration the number of participants who responded to the question, not the total number of people who participated in the online open house.

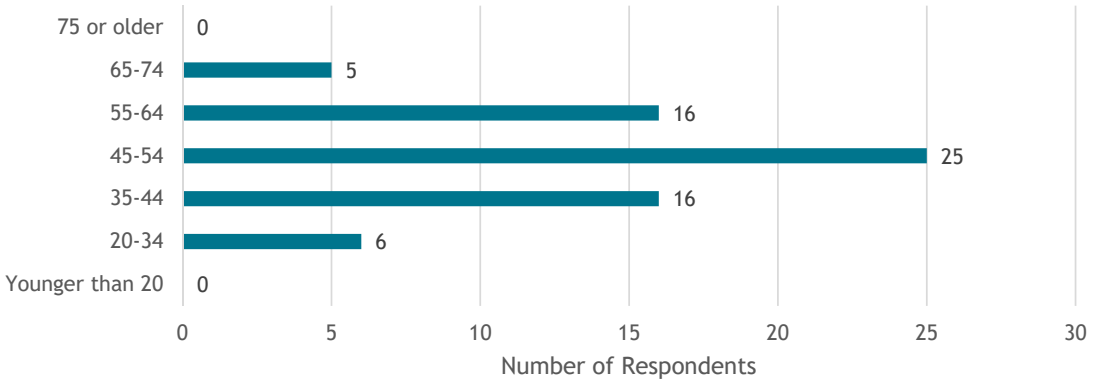
Racial or Ethnic Identity

The majority of participants identify as white (88%). The second largest group of participants selected Asian or Asian American (4%).



Age

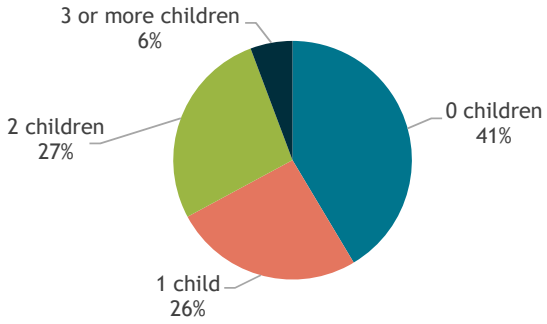
Of those that responded, the **largest group of participants were between the ages of 45 – 54 (37%).** The second largest groups were between the ages of 55 – 64 (24%) and 35-44 (24%)



Number of children in household

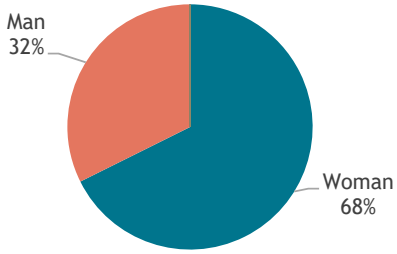
The majority of participants **(41%) indicated they had no children under the age of 18 living in their household.** This was followed by a little more than a quarter (27%) having two children

and 26% having one child.



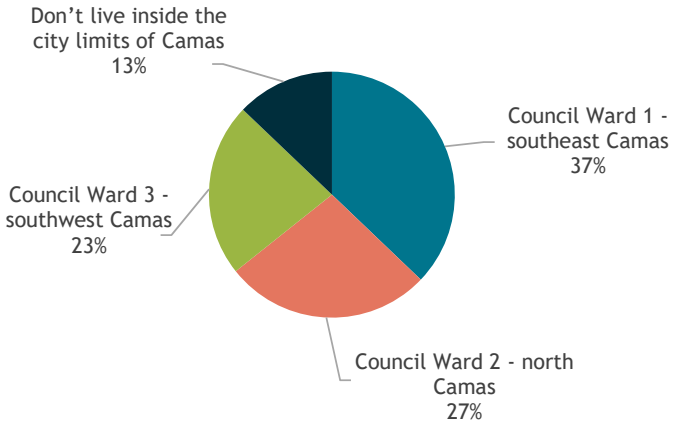
Gender

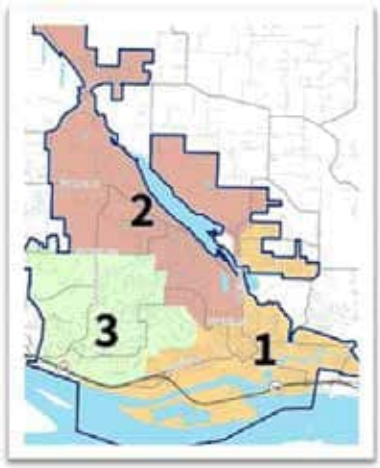
The majority of participants (68%) identified as women, while 32% identified as men. No one identified as transgender, non-binary, genderqueer, or third gender.



Primary Residence

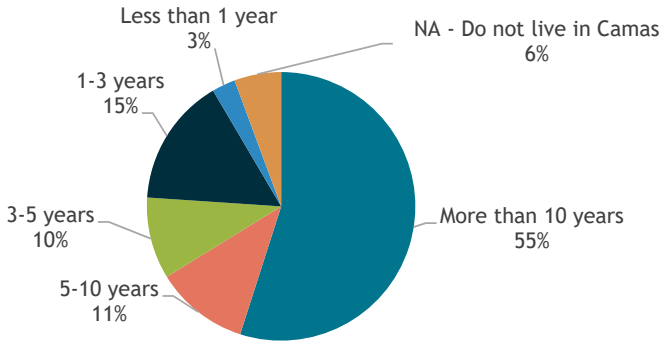
Most respondents (37%) indicated that they live in Council Ward 1 – southeast Camas. About a quarter of respondents live in Council Ward 2 and a quarter also live in Council Ward 3.





Time living in Camas

Most respondents, 55%, have lived in Camas for over 10 years. This was followed by 15% of respondents saying they have lived in Camas for 1-3 years.



TABLING EVENTS FEEDBACK SUMMARY

This section summarizes the feedback received at the three (3) tabling events held in July and August to build awareness of the PROS Plan Update and share information about the project. Approximately 50 people were engaged at these events. Tabling was held at the following times and places:

- July 31st at Heritage Park from 10a-12p and 1-2p
- August 17th at Concert in the Park from 6:30-8:30p
- August 18 at Camas Farmer's Market from 3-7p

Below is a summary of the feedback we received organized by common theme:

- **Heritage Park and Surrounding Lakes:**
  - **Trail signage is needed** at Heritage Park and Lacamas Lake; topographic maps may be helpful
  - **More outreach, promotion and notification** are needed about the annual Drawdown Event
  - Someone asked **if the lakes are stocked with fish** or if the fish are being studied
  - People expressed **concern about algal blooms** at the lakes
  - Desire for **more tree protection policies**
  - **Recycling bins** are needed
  - Desire for **more educational and interpretive offerings and facilities**
  - More **lake access and beaches** needed
  - **Parking at the lakes is an issue**. A few people mentioned that parking could be added on the north side of Lacamas Lake

  - Concern about **filtration at Lacamas Lake**
  - Concern about **erosion and wear-and-tear to trails around Round Lake** due to bikes
  - Someone mentioned that **Lacamas Creek Trail is blocked**
  - Consider **cutting back foliage in Lacamas Lake** sooner
  - **Fallen Leaf Lake is peaceful**, but sometimes it is easy to get lost
- **Crown Park:**
  - People like that **Crown Park is clean and quiet** – it is the heart of the neighborhood
  - Desire for **restrooms and sprinklers/splash pad**
- **Parks and Recreation in Camas:**
  - Desire for **more facilities to serve people in Camas** (i.e., parks, trails for bicyclists and pedestrians, etc.)
  - Would like to see **better bike connections** from downtown waterfront area to Crown Park
  - Need **more promotion for Concert in the Park** events
- **Other:**
  - People expressed **concern about population growth** in Camas, as well as **increased traffic** – especially when thinking about development in North Shore area
  - Someone mentioned that people are having **survey fatigue** and would have liked to have seen open text questions on the Spring PROS Plan survey
  - Someone mentioned that a **Parks and Recreation QR code** from a month ago is not working
  - There was some **confusion about the summer online open house** – some people thought it was the same as the spring survey

People were able to share on a map the places they like to visit and areas that need improvement. They are as follows:

- **Places people like to visit** (indicated by green dot):
    - Lacamas Lake
    - Heritage Park
    - Fallen Leaf Lake
    - Lacamas Regional Park
    - Lacamas Creek Park
    - Washougal River Greenway
- **Places needing improvement** (indicated by red dot):
    - Open space area on lower end of Lacamas Lake
    - Area between Lacamas Lake and Round Lake
    - Forest Home Park



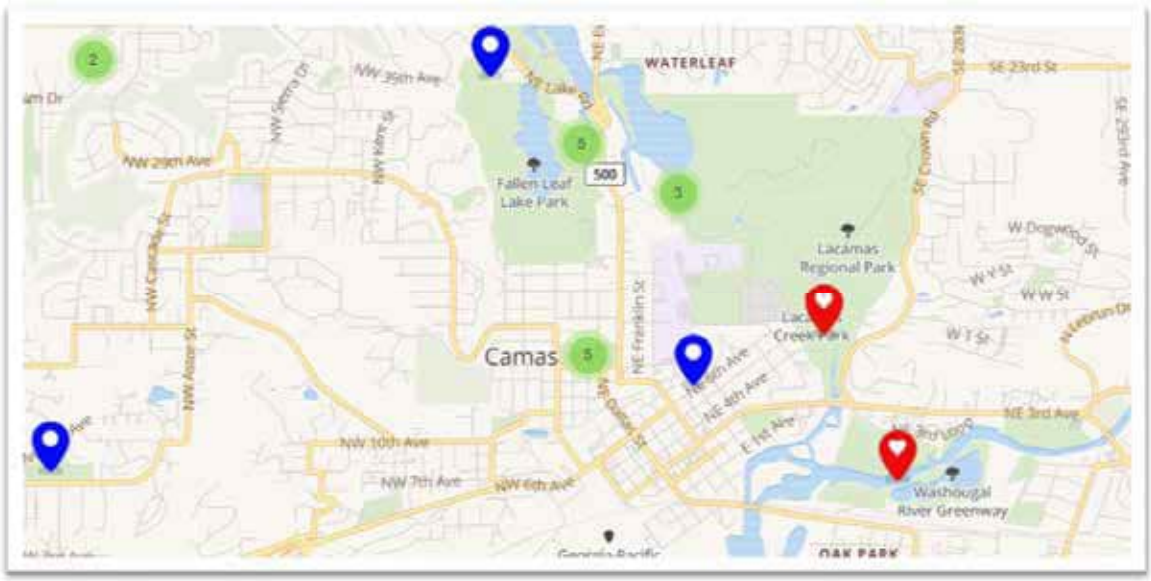
INTERACTIVE MAP

On the Engage Camas project page, the public was given the opportunity to share which parks, trails, and open spaces they currently visit in Camas (denoted by a red heart pin); where they think improvements need to be made (denoted by a blue pin); and what new things they would like to see offered in Camas' park system (denoted by a yellow star pin). **11 unique users** submitted a total of **22 comments.** Below is a summary of their comments:

- **Places people currently visit:** Fallen Leaf Lake, Washougal River Greenway, Lake to Lake Trail, Lacamas Lake
- **Improvements needed:**
    - **Lake to Lake Trail:** Replace the broken fences and add danger signs around cliffs on both sides of the river, place more trashcans along the trail, replace maps
    - **Mill Ditch Trail:** Fill in Mill Ditch and make it a large accessible walking path
    - **Grass Valley Park:** Play equipment is in disrepair and needs to be replaced
    - **Lacamas Lake Dam:** Extend the fence for safety
    - **Klickitat Park:** Landscaping and removal of dead trees
    - **Roof cleaning and painting** of buildings near Fallen Leaf Lake and Lacamas Lake
    - **Parking on the north side** of Lacamas Lake needed

    - Someone indicated there are **overgrown brambles** behind houses on NW 31st Ave and NW Dahlia Dr
- **Ideas for new park offerings:**
    - **Crown Park:** New/updated programming to tie in with programs/activities to be offered at new Garfield Performing Arts Center, splash pad or kids pool, new restroom
    - **Fallen Leaf Lake:** Splash pad or community fountain, parking lot and picnic tables; retaining walls and a sort of "art walk" fencing could highlight local artistry and sculptures.
- **Other:** Someone was concerned about the Sierra/43rd Street corridor and that because of increased traffic, it needs improvement

Please see **Appendix B** for more details about the comments as well as the specific addresses of the locations or places participants submitted comments about. It may be helpful to view the comments in context with the location they were placed. The issues map and comments are viewable at this link: **https://engagecamas.com/parks-recreation-open-space-comprehensive-plan/maps/camas-park-system-interactive-map**



APPENDICES

APPENDIX A: ONLINE OPEN HOUSE OPEN TEXT QUESTIONS

Below are the unedited comments respondents submitted for the open text questions in the open house.

QUESTION 1: What are you most looking forward to doing again in City parks and facilities as COVID-19 restrictions are lifted? (Select all that apply.)

Those who chose “Other,” wrote the following in the open text box:

- Kayaking on the lakes
- River Access for inner tubing
- Skatepark
- Swimming
- Taking child to playgrounds
- Using the splash pad at Crown Park that replaced the pool you tore down. Oh, that’s right, you haven’t fulfilled that promise yet. And the new bathrooms at Crown Park are wonderful 😉.

QUESTION 5: Please check ALL the ways you would like to get information about Camas’ recreation programs and activities.

Those who chose “Other,” wrote the following in the open text box:

- Camas Library
- Events Page on Facebook so I can simply add it to my google calendar with ease. Also include link to register there.
- NextDoor
- text
- text

QUESTION 8: Please share any additional needs for park and recreation improvements, programs or activities that you think are important and relevant to the growth of our community for the next five years.

- Algae bloom control at Lacamas Lake

- Crown Park is in dire need to be updated to make the playgrounds safe for children. The community was promised a splash pad when the pool was removed.
- I think providing a walking path from Green Mountain to the Heritage Trail is imperative. I don't know why this wasn't insisted upon during annexation and development approval.
- The current parks are a mess. Weeds are so bad at some parks that you can't even sit on the grass or put a baby on it. The small park area on NW 8th, really?? Weeds up to my knees and so brown. No reason for this. Hire some new employees instead of office workers and suits.
- I'd like to see the existing parks better maintained. I live near Klikitat Park and have had to comment several times over the past several years about how poorly the park is cared for. Oversight is needed apparently. New neighborhoods should be required to have natural green space. Camas has needed sports fields and practice fields for over a decade. Consider turfing existing fields for improved playability ie. GV ball park is almost never game-ready (picture of it on city website is not a real representation.) Better and more access points to put kayaks, canoes, etc. into Lacamas and Round Lakes. Make known how residents can donate or buy new sports equipment/uniforms, etc. for kids who need it. Trail connections are super important with the increased road traffic.
- The city buys LaCamas Swim and Sport and makes it into a Camas recreation center. The loss of crown park pool means no public pools in Camas. Parks department works to get public support to build an aquatics center with a pool that local swim teams can rent and use. Less emphasis on the splash pads, pools get more use by a range of age groups."
- #1 Lighted pickleball courts. #2 Soccer fields/basketball courts #3 Walking trails Pickleball, pickleball, pickleball
- Would like to see development of parking, picnic shelters, and water entry to fallen leaf lake on opposite side off Lake Road.
- Bike safety improvements between north end of Heritage trail and Green Mountain and North Shore Lacamas Connection. That segment of road is very dangerous for bikes and there are no alternate routes.
- We are in desperate need of additional sports fields and a multi use complex. Other cities seem to be way ahead with their facilities vs Camas
- Hi there! I would love recycling options at our parks and promote leave nothing behind. Education about recycling. Also, more education about our native trees, how trees provide oxygen etc., mainly environmental education. Signs and interactive "stations" for this. Educating how we can all make a difference to keep and maintain our natural beauty.

- Please add to the high priority, 2 way Bike paths off the freeway to share with Joggers path along SR500 from downtown all the way to Fern Prairie Market and up or down Lake Road. Huge safety issue!
- Most wanted: Car-free , soft-surfaced walking/running trails
- More adult sports options please!! Would love to see volleyball or a tennis league offered
- Both Forest Home Road and Leadbetter Road have tremendous recreational potential as multi-use roads but current traffic speeds are just too dangerous. Please consider lowering and enforcing traffic speeds on these roads so walkers and bikers can also enjoy the routes. Thanks!
- Sidewalks that connect our neighborhoods and get us to the paths and the trails should be a priority. There are many areas in our city that we cannot access because the sidewalks end.
- Maybe a few trash receptacles on the trails for dog poop bags. Bags are all over the trail.
- Number 1 priority is restrooms - Crown Park, trail heads and open space. This is a public health issue. Life stage definitely affects my priorities. When my kids were young activities such as the Easter Egg Hunt and Boo Bash were important as was safe, accessible and fun playground equipment. Without children in our household, I'm more interested in trails, both walking and biking.
- Please limit horsepower (speed) of boats allowed on Lacamas Lake to reduce/eliminate dangerous wakes and ensure safety of fishing boats, canoes, kayakers and swimmers. Thank you.
- I previously submitted a review on making current renewal or repairs to the current skatepark facility and would be thrilled to have that issue become a part of the discussion. Having past engaged, in discussions with the skatepark committee for tualatin hills park and recreation as well as assisting in maintenance and promotion of a popular indoor skatepark facility in portland. I would very much like to see a renewed look at the existing skatepark facility off of 3rd avenue as well as the adjoining parking lot and water access. I believe significant improvements could be made i.e. lighting and clean up as well as design changes to the actual skatepark. All of which leads to ensuring this site promotes inclusion for kids of all ages and experience levels as well as safety. Overall promoting a more family friendly environment.
- Improvements made on the existing skate park, utilizing someone with actual skatepark design knowledge or experience. Re-designing or rebuilding of the skatepark. Possibly building an all new skatepark with a bike/pump track next to it. The facility could offer a recreational area for kids of all ages to enjoy and stay out of trouble. However the current facility does not meet all levels of experience and is designed poorly, it has resulted in users bringing in outside equipment in order to make it somewhat usable. Also cleaning up the area around it i.e. the parking lot and water access/trails as well as

adding lighting for the park and parking lot would add safety and promote a more family friendly atmosphere.

- We would like to see a pool in Camas again, but perhaps not on the scale of a full aquatic center.
- I walk and bike the Mill Dutch trail regularly and am wondering what is going to happen with the stagnant water in the ditch. It's turning into a mosquito farm. Is the city going to do something with it such as flush it out or fill it in?
- I have been wondering why the play areas aren't covered. Children could play on rainy days and hot days
- The little green space on NW 8th is disgusting. It needs to be taken care. Kids want to play there and the weeds have taken over the grass. City really needs to wake up and take care of what we it has before it adds more to the list. Can't go to any park and put a toddler or crawler down to play in the grass, to many weeds.
- What would be most beneficial is a network of *connected* bike paths and hiking trails not a series of separate, non-contiguous trails, in order to provide safe and extensive opportunities for families and people of all ages. In particular new bike patgs should be integrated with the side walk NOT the road as this is much safer, particularly for children, and will encourage more use by families and bike commuting.
- Exercise equipment in select parks -- pull-up and dip bars, etc.
- It would be great if you could adjust the Camas rules regarding new housing developments to require more green space and/or trails for each large development. This way the city of Camas isn't competing with developers to purchase land for parks and other recreational activities. Allow the developer to buy the land and then require that they build the park you wanted!
- Maintenance on some city-owned trials is non-existent. Vegetation, especially blackberries, hang over the trail in many areas. Some of the trails are so steep in sections that they are pretty much non-usable, especially when it is wet or icy. The city-owned so-called "natural" area and collection pond north of Knapp Street in Parker Estates had maintenance delayed so long that many of the trees have died and beavers moved in further making a mess of the whole thing (project is currently in process to hopefully mitigate). I wish there were more safe places to ride bicycles (road bikes, not mountain or off-road) and that the trail system was more continuous. Ash Creek Park was promised to be developed MANY years ago and nothing has been done with it yet. Parker Estates (where I live) would appreciate it. I would like city staff to walk the full distance of all the trails in the area to get a good understanding of what it is like to live in the neighborhoods and walk them.
- No need for a million dollar pool, just build a splash pad or fountains with wading pools. Keep is accessible and add more parking. Better fishing opportunities on lacamas lake would be good.

- We need to see bathroom facilities in our parks. Crown Park is a beautiful park with ugly dirty porta potties. It's kind of sad. Also since The pool was destroyed CrownmPark has big wide open areas that aren't used for anything.
- I just wish so badly we could have an outdoor pool again! It made Camas so unique and we used it all summer long! I don't understand the cost issue when it comes to an outdoor pool. If you can build an aquatic center, why not an outdoor pool? I will forever be sad that the outdoor pool was taken away. It was a yearly tradition in our family and made Camas unique. It seems like all the fun things for kids are being taken away!!!!
- I love the walking trails through the natural areas SO MUCH!! Would love to have more of them connected. However, would also love to know that they are safe since I'm a woman walking a medium-size, cuddly-looking dog. The recent attack near Round Lake has me avoiding the trails right now. Are there regulations about camping in the local parks, or any way to help our law enforcement actually do the enforcing (they can't do anything about someone breaking a law if the law doesn't exist)? Official programs and organized events aren't particularly useful to me. I just love the natural spaces, so if they're there and accessible (and safe), I'll be so grateful to walk for miles and miles. Thank you!
- I put as my top priority "Outdoor adventure summer camps, including archery..." I would be very interested in these types of activities/camps not only for children and youth, but adults as well. I am a single adult in Camas, and would love to participate in all of the activities that were listed under that option, not only to learn more but also to meet more people in the community. I would love to support the city in creating such programs for kids and adults as well, I'm assuming we have a lot of untapped talent here, i.e. I'm an Herbalist/Botanist/Teacher who already does plant walks, I would be happy to volunteer for the city in putting together some sort of program/activity around that with our trails and greenspaces.
- Need to provide facilities for additional outdoor activities that create community connection and activity. With the number of sporting families Camas lacks facilities that other communities provide.
- Water quality improvements at all of our local lakes/rivers. Also, would like to ensure we don't see homeless camps springing up in our parks/shared forest lands.

APPENDIX B: INTERACTIVE MAP COMMENTS

Below are the unedited comments respondents submitted in the issues map, grouped by address.

Category	Comment	Address

Place I visit now	A trash can at the waterfall would be really wonderful please.	1644 Northeast 5th Court, Camas, Washington 98607, United States
Place I visit now	Love the accessible trail with benches for our elderly family members to rest during their walks, and viewing the wildlife here throughout the seasons	1906 Northeast 3rd Loop, Camas, Washington 98607, United States
Place I visit now	We love the solitude of Fallen Leaf and are here almost daily.	2911 Northeast Everett Street, Camas, Washington 98607, United States
Place I visit now	Great place to hike or trail run	Round Lake Loop Trail, Camas, Washington 98607, United States
Place I visit now	Love the lake for open swimming and kayaking. It's peaceful	2911 Northeast Everett Street, Camas, Washington 98607, United States
Needs improvement	Trash cans next to the map signs would be really wonderful. Additionally, all the maps need to be redone (they've been peeled away).	2700 Northeast Everett Street, Camas, Washington 98607, United States
Needs improvement	Replace the broken fences and add danger signs around cliffs on both sides of the river.	Camas School District #117, 841 NE 22nd Ave, Camas, Washington 98607, United States
Needs improvement	At one point (2-3 years ago) Jerry Atkinson had shown us a concept for filling in the Mill Ditch and making it a large accessible walking path through the town to the trails. Would love to see that happen, or at the very least, clean the mill ditch.	935 Northeast 6th Avenue, Camas, Washington 98607, United States

Needs improvement	Used to take the kids here frequently. Would love to still, but the play equipment is in disrepair. Swings broke a while ago and still aren't replaced. When a bench near the play area was wrecked years back it took months for it to be replaced. The large slide has been broken for over a year and the receiving pole dangerously stuck out where kids run without removal. It gets a ton of use - an upgrade and better maintenance is a must.	2949 Northwest 38th Avenue, Camas, Washington 98607, United States
Needs improvement	I get nervous with small children on the sides of the dam particularly one end that has only half the fence covering the drop	2828 Northeast Everett Street, Camas, Washington 98607, United States
Needs improvement	Multiple trees are dead, pruning of shrubs is half done, mulch needed in landscaping areas, general weed management	824 Northwest Klickitat Street, Camas, Washington 98607, United States
Needs improvement	Roof cleaning and painting of building is needed	2911 Northeast Everett Street, Camas, Washington 98607, United States
Needs improvement	Roof cleaning is needed	Round Lake Loop Trail, Camas, Washington 98607, United States
Idea for something new	Please add a splash pad to Crown Park (similar to beautiful, architecturally-designed Jamison Park splash pad in Pearl District in Portland) which will be a wonderful activity for kids/families	126 Northeast 15th Avenue, Camas, Washington 98607, United States
Idea for something new	Consider new/updated Crown Park programming to tie in with programs/activities to be offered at new Garfield Performing Arts Center -- 2 blocks away, such as regional Art Fair similar to nationally-known Salem Art Fair (Oregon), family	1437 Northeast Everett Street, Camas, Washington 98607, United States

	athletic event similar to Pole Pedal Paddle (Bend, OR), etc. which would boost local economy, increase tourism, and highlight our "Crown Jewel" of a park!	
Idea for something new	A water feature for the kids- pool or splash pad. Something safe and fun for all ages.	Camas Municipal Pool, 120 Northeast 17th Avenue, Camas, Washington 98607, United States
Needs improvement	Adding a splash pad or community fountain, parking lot and picnic tables could be a nice addition to Fallen Leaf Lake area for the community. Retaining walls and a sort of "art walk" fencing could highlight local artistry and scultures.	252 Northwest Lake Road, Camas, Washington 98607, United States
Needs improvement	This Sierra/43rd Street corridor needs speed improvements. With the addition of 7% growth in traffic (prior to new homes being actually completed), the daily traffic including large earth moving vehicles and construction vehicles has dangerously increased speed down this TWENTY FIVE MPH corridor.	1642 Northwest 43rd Avenue, Camas, Washington 98607, United States
Idea for something new	Splash pad would be great	120 Northeast 17th Avenue, Camas, Washington 98607, United States
Needs improvement	Parking at Heritage Park and Round Lake always fill up quickly. Making the north side of the lake more of an attractive destination (with parking) could help distribute the congestion	811 Southeast Leadbetter Road, Camas, Washington 98607, United States
Needs improvement	Brambles overgrowing the path	3105 Northwest 31st Avenue, Camas, Washington 98607, United States

Needs improvement	Needs a nice restroom. A splash park would be nice here since they removed our pool.	120 Northeast 17th Avenue, Camas, Washington 98607, United States



Appendix C
Stakeholder Summaries

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan Update		**Project No.:**	Proj-# 21-135PLN	
Location:	Zoom Video Conference	**Interview Date:**	July 9, 2021	**Time:**	3:30 pm
Notes by:	Steve Duh, Conservation Technix				
Participant:	Annette Anderson, Camas Lacrosse		Jeff Immel, Camas Little League		
	Karen Gibson, Camas Lacrosse		Trang Lam, Camas Parks & Recreation		
	Nick Kralj, Camas Little League		Steve Duh, Conservation Technix		

Subject: **Stakeholder Group Discussion with Field Sport Associations**

PURPOSE

To discuss current interests and future needs addressing sport field improvements and capacity. The meeting took place on July 9, 2021, via a Zoom video conference from 3:30 – 5:00 pm.

DISCUSSION

The discussion began with brief introductions and an overview of the City's PROS Plan update process. A set of questions were used to initiate the discussion and explore ideas about field usage, capacity, maintenance and potentially needed improvements to local sport fields.

Lacrosse Comments

- Lacrosse can only use school-owned facilities due to need for larger field and fencing to manage errant balls. It has been a challenge using Camas School District (CSD) facilities, and the league can't use fields until 5 or 5:30p, which is difficult for elementary and middle school age players
- Prune Hill is the only other field, but it is on a first come, first served arrangement.
- School field have maintenance and quality issues; there are a lot of mole/gopher holes
- Lacrosse is at capacity for the fields it uses. There is competition for field space with soccer (which has every school field booked, except Cardon). If Lacrosse had more field access, then it could accommodate more teams and more localized competition (instead of competing against Portland, Hood River, etc.). All games are on turf fields. The season is in the spring – generally March through June

Little League Comments

- Little league uses a mix of city fields and rents fields from CSD. Little League has a use rights agreement with City for Forest Home Park, which is used primarily for games. Softball is exclusively at Doc Harris. Lower divisions use Doc Harris and Woodburn. Younger players use Crown Park, Goot and Klickitat.

Interview Notes (continued)

Other Comments

- CSD is starting middle school soccer and spring football. These will impact field availability.
- Within Camas, there are only two turf fields, and both are at CSD. High school sports get priority use, and CSD charges a lot for field rental ($100/hr.). Little League pays CSD $15,000 annually for field rentals.
- Soccer mostly uses Doc Harris, with Woodburn as an alternative
- CYSF (fall) plays at Sky Ridge, upper and lower
- Pop Warner practices at Prune Hill; they would like more field space and turf
- Babe Ruth is exclusively at Louis Bloch, but the league seems to be diminishing and numbers are down

Sport Field Needs

- Near-term – increase field capacity by improving field quality
- Prune Hill is turfed for baseball and football. The baseball infield is in rough shape and is weedy
- Prune Hill has infrastructure (bleachers, fencing, parking, restroom), so improve the function of the field
- Adding lights adds capacity, and there are few neighbors near Prune Hill who might be impacted
- The property across the street from Prune Hill is for sale again. Maybe consider this as an expansion site to accommodate a complex
- Grass Valley and Prune Hill are weedy. City could do weed mitigation to improve field grass quality
- Drainage issues at Grass Valley (doesn't dry out until June) and Forest Home (outfield is wet)
- The irrigation system at Forest Home Park is aging – leaks, broken sprinkler heads, etc.
- Fallen Leaf Park could be utilized for more capacity as a single event space. Parking is limited and a challenge, but it has lights and restroom
- The leagues need to work with school district to build out other CSD property

Collaboration with City

- Communication with City for Little League has been tremendous. Dennis Ryan has helped with weed control, plugging the outfield, fertilizing and providing dumpster use
- Little League volunteers add a lot of value by improving field conditions
- Leagues can support field improvements and development with fundraisers, grant support and sweat equity
- The field turf program offered as part of the pool levy was rejected, but it could have made improvements to Prune Hill, Dorothy Fox and Forest Home
- Sport leagues are volunteer organizations and have transient membership. Is there a role for the city in helping with continuity of leadership – maybe a leadership forum. Continuity of leadership could help develop a more collective voice across sports

Other Feedback: Annette and Nick provided written comments via email to the discussion questions. These are attached on the following pages.

-- End of Notes --

City of Camas
Parks, Recreation & Open Space Plan Update
Camas Parks and Recreation

July 9, 2021
Sport Fields Group – 3:30 p.m.
Discussion Questions

The following are intended to spark group discussion and interaction; questions posed/topics addressed might not follow as shown.

Introductions & Background
- Brief overview of PROS Plan & process
  Camas Lacrosse - 7/6/21 by Annette Anderson Youth Girls VP

Group Discussion Questions
- What has been the trend in participation by your league/sport over the past 3 years? (i.e., trending up/down; number of participants by age group/gender) **Trending up. K-12 girls and boys. 2019 - 280 2020 - 410 2021- 201**

- What sport recreation opportunities are missing? What facilities do you see as the most needed in the community? **Turfed fields.**

- Discuss coordination between leagues (overlapping calendars, multi-use fields, seasonality, etc). Do you have any concerns about availability and scheduling? Would a coordinated annual booking system, with a nominal fee help? **Our concerns have been with the High School kicking us off the only turf fields in the city. The youth have no other options. Also with only being able to use school run fields we are not allowed to use them until 5:30 at night which causes problems with booking so many teams and also with the younger elementary players. If they were city run fields we could have the elementary kids start practices after school gets out at 2:30.**

- Besides Camas Parks & Rec fields, what other fields does your group/organization use? **The school distrtict. ZAC, Doc Harris, Cardon.**

- What does your organization see as the key priorities for the city's system of parks and sport fields? **Short term capacity increase - turf at Prune Hill, Grass Valley, Dorothy Fox. Long term - new complex**

- Jump forward 5 years and imagine Camas in 2026. Please share your vision for one stand-out project completed to improve the parks system and/or local sport facilities.
  2 turf fields at Prune Hill

- How is field maintenance? Are there ways to improve this, especially through partnerships?
  We have been maintaining Prune Hill, ZAC, and Doc Harris E & F fields filling the mole holes multiple times a year. If the dirt/sand was provided that would be nice.

- With the understanding that the PROS Plan will help guide the City's investments and use of resources for the next 6 years; in your opinion, where should the City focus resources and energy in the next 5 years? **Getting fields turffed so that we can be competitive with the teams in Portland and Vancouver.**

- What contribution, collaboration, and responsibilities can your organization bring to the future implementation of the City's public park and recreation system? Are there opportunities for more collaborative projects between the leagues and City? **We could help provide funding through fundraising activities and sponsorships for the turf fields.**

Additional Information Request (not for group conversation – please email feedback)

- Describe the current state and quality of City of Camas-managed athletic fields and sport courts (quantity, quality, geographic distribution, etc.) **The quantity is good, quality is lacking in turf (all of our games in Vancouver and Portland are played on turf, their players practice on turf. Our players practice on grass and it is a hard transition for them during game days because the ball bounces different and is harder to pickup.). Geographic distribution is good.**
- How is the geographic distribution of fields / courts? Are they well distributed? Where are more needed? **Yes well distributed.**

City of Camas
Parks, Recreation & Open Space Plan Update
Camas Parks and Recreation

July 9, 2021
Sport Fields Group – 3:30 p.m.
Discussion Questions

The following are intended to spark group discussion and interaction; questions posed/topics addressed might not follow as shown.

Introductions & Background

- Brief overview of PROS Plan & process

Camas Little Leage Responses - 7/5/2021 by Nick Kralj, president

Group Discussion Questions

- What has been the trend in participation by your league/sport over the past 3 years? (i.e., trending up/down; number of participants by age group/gender)
  Trending steady; 2020 = 483 participants, 2019 = 513 participants, 2018 = 476 participants
  Boys and girls baseball and softball ages 5-13 (could be thru 15 soon)
- What sport recreation opportunities are missing? What facilities do you see as the most needed in the community?
  Field capacity is and will be the primary issue. Under-utilization of existing space due to weather or infastrucure issues. Growing community will make it even harder. Could be solved in some cases with turf and lights and other infrastucture like ADA dugouts and bathrooms, and drainage
- Discuss coordination between leagues (overlapping calendars, multi-use fields, seasonality, etc). Do you have any concerns about availability and scheduling? Would a coordinated annual booking system, with a nominal fee help? We feel the above would create more opportunities for all leagues. For instance, Fallen Leaf turfed could be used for football, lacrosse and soccer offseason, and with turf and lights, even during season with proper scheduling
- Besides Camas Parks & Rec fields, what other fields does your group/organization use?
  Camas school district rental Doc, other leagues fields, such as Schmid and others in Washougal
- What does your organization see as the key priorities for the city's system of parks and sport fields?
  Short term capacity increase - turf, lights at key facilities that are not optimized, such as Prune Hill, Fallen Leaf, Grass Valley, Dorothy Fox, and Goot Park. Long term - new complex
- Jump forward 5 years and imagine Camas in 2026. Please share your vision for one stand-out project completed to improve the parks system and/or local sport facilities.
  Turf and lights added to parks facilities to increase time available/not waste existing space
- How is field maintenance? Are there ways to improve this, especially through partnerships?
  This is good. We utilize our field rights usage agreement to maintain fields with support from Cama
  We appreciate our relationship with Parks and Rec today.
- With the understanding that the PROS Plan will help guide the City's investments and use of resources for the next 6 years; in your opinion, where should the City focus resources and energy in the next 5 years? Creating more capacity for our growing community. With more people coming, the fields are close to maxed in their current state. New opportunities will be needed
- What contribution, collaboration, and responsibilities can your organization bring to the future implementation of the City's public park and recreation system? Are there opportunities for more collaborative projects between the leagues and City?
  We can provide seed funding to contribute to grants for lights and turf. Our membership base is passionate and ready to help support. We can also reach out to business community partners as we
- Are there other organizations/individuals that the City could bring to the table as partners?
  Yes, we can work with other business organizations to provide loand, donations and other financial support. We have run this exercise before and would be able to leveage our network.

Additional Information Request (not for group conversation – please email feedback)

- Describe the current state and quality of City of Camas-managed athletic fields and sport courts (quantity, quality, geographic distribution, etc.) See below**
- How is the geographic distribution of fields / courts? Are they well distributed? Where are more needed? Distribution is reasonably good. We have land/parks that are nicely spread out; however, we cannot use them fully due to poor drainage, poor maintenance, lack of infastructure such as lights, dugouts, restrooms, etc.
  Long-term, we feel that a new complex would benefit Camas the most, as it has the ability to generate rental income as well as provide tourism revenue to the local area from tournaments.

** Forest Home Park - 2 baseball fields with lights. Needed: ADA dugouts, bathrooms, and pathing, as well as outfield drainage and turf. Already has lights.
** Prune Hill - excellent setting, however, hardly used due to exceptionally poor drainage and no lights. Turf and lights needed. Dugouts and storeage are needed as well
** Fallen Leaf - excellent facility, but limited parking and poor drainage. Not really available until late June/early July which is too late. Our spring season is primary and is late Feb thru July. Turf recommended.
** Grass Valley Park - limited parking and poor drainage. Not really available until late June/early July which is too late for baseball/softball.
** Goot Park - limited parking and poor drainage. Not really available until late June/ early July which is too late for baseball/softball
**Dorothy Fox - no infastructure available. Need to build out.
** Other practice fields used include today Klickitat Park, Crown Park, Doc A, B, C, Liberty

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan Update		**Project No.:**	Proj-# 21-135PLN	
Location:	Zoom Video Conference	**Interview Date:**	July 6, 2021	**Time:**	8:00 am
Notes by:	Steve Duh, Conservation Technix				
Participant:	Patty Barnard, Mountain bike advocate		Katy Daane, Parks & Recreation Commissioner		
	Jeff Cary, Camas Bikes		David Dewey, Parks & Recreation Commissioner		
	Jeremy Mores, Evergreen Mountain Bike Alliance		Trang Lam, Camas Parks & Recreation		
	Ross Swanson, Portland Parks & Recreation		Steve Duh, Conservation Technix		

Subject: **Stakeholder Group Discussion on Mountain Biking & Pump Track Interests**

PURPOSE

To discuss current trends, interests and future needs addressing mountain biking and skills development. The meeting took place on July 6, 2021, via a Zoom video conference from 8:00 – 9:30 am.

DISCUSSION

The discussion began with brief introductions and an overview of the City's PROS Plan update process. A set of questions were used to initiate the discussion. Ross Swanson from Portland Parks and Recreation was invited to share information about Gateway Green to offer context about design, development and management considerations. The remainder of the session focused on local interests for trail and biking facilities.

Overview of Gateway Green in Portland

- Ross provided an overview of the Gateway Green project and some lessons learned. The 24-acre site lies between TriMet and railroad property. It is a bike to and walk to site only. It has 70-80' of vertical drop and offers good length on laps. It was built in three phases, in part to see how people use the site. The city legitimized the park with restrooms and designed it as a four-hour experience.
- It provides for a range of users: dirt jumpers & BMX, mountain bikers, skaters and runners
- Cross country runners use the site; it is a compatible use
- Pump track is paved and designed/built by Velos

  Tips:
  - Don't assume your rider base is just 24-35 year old white men.
  - Gather data to prove users
  - Consider other features (Gateway Green added nature play area) to give parents an opportunity to play with one kid while the other rides

Interview Notes (continued)

- Re-frame the perceptions about users: everyone wants to progress and get better; most are willing to help each other

Comments on Camas' Parks and Trails System

- Camas has great trails
- Current usage is outgrowing Lacamas Park
- Heritage Trail is a way to get to Lacamas Park for mountain bikers; trail usage on Heritage Trail is heavy
- Fallen Leaf Lake offers more advanced options for mountain bikers
- New neighborhoods northeast of lake attract residents with interests in trails and mountain biking; however, since COVID, there is more trail usage overall
- Need to have trails built by experienced trail builders and in places sanctioned for trails. Installation of rogue trails by people cutting/digging routes is a problem the City is trying to address.
- There is a need for places for kids to practice on stryders/skoots
- There is a need for a pump track and more mountain bike trails
- Camas has become more of a destination and will continue as new trails are added.
- Have the information to keep people in town and as part of the circuit of regional tourism

Usage & Potential

- COVID has super-charged trends: more usage on trails, wider age distribution of riders, wider age groups
- Consider dedicated infrastructure, directional trails and signage for mountain bikers.
- Green Mountain has potential and could use lower slope area for bike park/skills – perimeter could be for climbing trail and multi-use trail
- New trails are being installed on Larch Mountain / Livingstone
- Consider 'competition-ready' facilities, whether mountain bike trail or pump track or both; people will travel for different experiences. Have a destination bike park with a 'race worthy' track. Design it large to avoid user conflicts. Promote the city/region as a destination and tap into tax and tourism revenue
- Hub-type trail system – how do we find places to build or connect to grow the system over time
- Lake Oswego is building a hub and starting with a network of one trail. It will be a catalyst project to hold the growing system together

Connections to Consider

- Have a network of trails connecting all parts of town. Include a network of flat dirt trails as a great start. Kids can build confidence with beginner mountain bike rides – provide a place for youth to go (i.e., lighted pump track)
- Make connections in areas near Everett and Everett to Leadbetter
- Mill Ditch could act as a longer, linear ribbon
- Make connections along the north side of Lacamas Lake
- Improve road crossings and safety between Fallen Leaf Lake and Lacamas Park

Interview Notes (continued)

Future Investments

- Pump track with lights, parking and restroom, signage/maps, app coordination so people know what to expect
- Have (city) staff who knows community, culture and mountain biking; utilize consultant teams to guide growth and development of a trail system or biking facility
- Use sustainable trail design principles (i.e., 5-7% grade slopes with switchbacks)
- Know the stumbling blocks and how to overcome, especially related to regulations, development codes and local leadership.
- Environmental overlays (development code, zoning, SEPA) – educate regulators
- Be aware of the potential neighbors to act as NIMBYs
- Policymaker rides and outings to buoy interest and build relationships/support

Other examples noted

- Hood River, OR
- Duthie Hills (Issaquah), WA
- Valmont, CO
- Whistler / BC
- Bentonville, AR
- Bend, OR
- Klamath Falls, OR
- Tiger Mountain (Issaquah/Maple Valley area), WA

-- End of Notes --

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan Update		**Project No.:**	Proj-# 21-135PLN	
Location:	Zoom Video Conference	**Interview Date:**	July 7, 2021	**Time:**	12:00 pm
Notes by:	Steve Duh, Conservation Technix				
Participant:	Cassi Marshall, Ivy League		Janet Nenadic, All Weather Walkers		
	Duff Linde, Evergreen Mountain Bike Alliance		Ryan Bridges Golb, Intern with WTA		
	Lyndee Cunningham, local volunteer		Trang Lam, Camas Parks & Recreation		
			Steve Duh, Conservation Technix		

Subject: **Stakeholder Group Discussion with Bike and Pedestrian Interests**

PURPOSE

To discuss current interests and future needs addressing bicycle and pedestrian facilities and trails. The meeting took place on July 7, 2021, via a Zoom video conference from noon – 1:30 pm.

DISCUSSION

The discussion began with brief introductions and an overview of the City's PROS Plan update process. A set of questions were used to initiate the discussion and explore ideas about bicycle and pedestrian trail needs.

Initial Comments

- The City has great trails and has done a great job building trails for the community
- Quality of life in Camas is good because of trails
- There are concerns about growth and expansion - houses getting closer together. With population growth and more people on the trails, what can the city do to expand use and access to trails?
- There is some confusion of who maintains/owns the different trails (i.e., city/county)
- Love the Trails to Tables challenge
- Connectivity is important; complete loops and circuits. Connect to Washougal, to the Port and to levee trail. Educate Camas residents about the trail linkages
- Link neighborhoods to downtown via ped/bike friendly routes;
- Develop the Mill Ditch alignment; it's ripe for something amazing. In the short-term, start with basic use and pathway. In long-term, build a shared-use trail
- Create stronger linkages between Camas and Washougal, via Oak Park or Goot Park or WRG
- In the North Shore and around the lake trail, that loop will require work for water crossings, safe street crossings and road segment closures to make it work in the long-term

Interview Notes (continued)

- The regional Lewis & Clark Trail from refuge to refuge is not well known to the group, but they noted interest and support.

Conflicts

- Users are generally getting along and sharing trails; conflicts are limited and sharing trails is better than it has been in recent years
- Sometimes walkers are intimidated by bikers
- Since COVID, usage on trails has increased, but there has been a low number of conflicts
- Conflict issues are a two-way street. Some walkers have earplugs and dogs and are not paying attention to the surroundings
- Heritage Trail is getting crowded, especially with families and groups of riders. The trail is undersized. If Lake Road had better bike lanes, that might alleviate some of the demand from Heritage Trail. Some users are starting to avoid Heritage Trail due to overuse.
- One spillover trail is Lacamas Creek, but there is simply more trail usage on all the trails. Ostensen Canyon is also underutilized. If improved, this trail could make for better connections to neighborhoods near downtown

Amenities

- Provide restrooms at trailheads. For organized walking groups, they tend to plan the routes to have a restroom at a mid-point during their walks.
- All Weather Walkers prefer paved or gravel trails
- Trails with views should be a priority

Hierarchy

- Should single track trails be shared or not. One-way routes, like Red Tape Trail, is one approach to managing users and flow. Larch Mountain has all shared use trails, and most are 'green' and 'blue' trails
- Family rides – Little Washougal River Greenway Trail – gets washed out each year. The city has changed the design and improved, so it has been recently fixed
- Waterfront Trail (Port) and Dike Trail (Refuge) are not in the Camas system, but these are great destinations to link to
- Improve sidewalks and wayfinding for connections from Prune Hill to downtown. Maybe improved connectivity will reduce parking demand at parks. Sidewalk network is an important part of the overall trail network. Work to fill gaps
- Forest Home Park – Forest Home Road might make for a good connection.

Collaborations

- The Evergreen Mountain Bike Alliance will continue to be involved for trail maintenance; will want to stay informed about trail projects
- All Weather Walkers has trail days to encourage people to come out on trails (5K & 10K routes); will help get the word out and make for bigger events

Interview Notes (continued)

Getting youth and next generation involved

- Engage kids at young age with volunteer projects and outings, like Watershed Alliance and trail/beach clean-ups
- Scouts bring packs out for clean-ups and other projects
- Camas has a deep pool of volunteers to call on to help
- High School has a 'green club' and could assist with park/trail care
- Have mini Sunday Parkways (ala Portland) throughout Camas

Other Feedback (emailed responses)

From Ryan Ojerio, SW Washington Regional Manager, Washington Trails Association

How do you feel the City is doing in meeting the needs for recreational trails and connectivity in its park system?
I don't think I have enough information to have a solid opinion on this question since I don't live in Camas. My personal experience is limited to using the Lacamas Heritage Trail and the trails at Lacamas Park which I think are really fun to hike run and mountain bike on. I think that a survey of local residents who use the trail system would have a better opinion than mine. We do have WTA members and volunteers who live in Camas, but I haven't talked with them about this question.

What are the gaps, missing links or barriers that need to be addressed? What destinations need to be connected?
Similar to the first question I think I need more information to have a really solid opinion. I'm assuming that the question pertains to all sorts of parks, trails and places that people living in Camas recreate in regardless of the ultimate land manager (e.g., Camp Bonneville will be a Clark County facility, but I expect it will be a destination for local residents.) My guess is that people experience barriers getting to the Waterfront and eventually when Steigerwald is finished they may want to get down there without having to use the car. Likewise, Green Mountain and perhaps Camp Bonneville to the north seem like good destinations for trail-based recreation. Getting to those places may prove difficult for people who don't have ready access to a car or the physical ability to ride a bike all the way there and have enough energy left over to recreate. Some sort of public transit option would be ideal for a future where personal automobiles are less common than they are today.

There seems to be an unmet demand for trail experiences specific two bicycles I think that the proliferation of user-created routes that were adopted into the Lacamas Park trail system is an example of rapidly changing demographic trends over the past 20 years that outpaced agencies' abilities' to evolve and adapt the trail system accordingly.

At WTA we are generally supportive other user types such as mountain bikes and equestrians more and more we find that people who wreck rate on trails enjoy a variety of modes. leave that working with our partners Hugh create Trail systems that meet a diversity of Interest helps people to find Trail base Recreation experiences matched to their particular interest at that time in their life.

Back in the 80s I was heavily into mountain biking in high school which continued through college. Later on I became passionate about hiking and backpacking. Once I had kids I got really excited about trails where I could take our stroller. I enjoy hiking with my parents and their physical limitations are best served by accessible fails. I'm fortunate at this point in my life that I can enjoy a hard trail run, bombing down a mountain bike downhill trail and spending

Interview Notes (continued)

time with my young children and older parents on a quiet path. I think that this whole-life-cycle approach to designing trail systems is the right lens to look at planning processes.

Are there any conflicts on multi-use trails? Please share some examples. Besides making the trail a single-use trails (i.e., Pedestrian or Bicyclist) what other ideas do you have for reducing these conflicts?
I think that there are always tensions between users on trails. Rather than focusing on specific examples of conflict I think it makes more sense to seek examples where there are many users on a trail system and the tensions are minimal. In the last few decades, a lot of effort has gone into education and promoting empathy between trail users which is good, but I think more emphasis needs to go into thoughtful system design that provides areas within the trail system where users are more likely to find an experience free from intrusions. An "intrusion" is an interaction with a different trail user that breaks sense of peace or flow or rhythm that takes the person's mind off the enjoyment of the experience.

I think that ski areas are a good example of making the most out of a limited geographic footprint to serve a lot of people. A busy downhill ski area and serves a wide range of physical abilities and people seeking different types of experiences from snowboarding in a terrain park to skiing steep powder in the trees. The design of the system allows people to find activity zones that are matched to their skill and even when it gets crowded, they're sharing those spaces with like-minded people generally traveling at similar speeds. In this way the sense of intrusion is minimized, and the design of the system helps reduce the number of times incompatible uses clash like having the dual slalom dump out into the bunny hill - that would be a very bad idea.

But at ski areas there are also places where everybody shares the same space in relative harmony like on lift lines, in the lodge, or even on those wide cat tracks that people use to get from one place to another. Any trail system needs to have segments that are shared use. Some facilities like bathrooms in parking lots that are shared best parts of the trail system or people in or immersed in their particular activity might be designed for that particular activity and that particular speed; these are directional to avoid head-to-head encounters which are particularly intrusive.

I think that single use designations are useful tool, but I also think you can get a lot of use segregation with thoughtful design that nudges people into trail segments where they want to be, and they will naturally congregate with other people doing the same type of activity.

What does you and/or your organization see as the key priorities for the city's local trail system?
One of our focal areas is providing natural surface trail experiences that connect people with nature in their neighborhood. this could include regional parks that someone might take a bus to or ride their bike to, essentially, it's trying to lower the barriers for everyone to have access to healthy physical activities.

Jump forward 5 years and imagine Camas in 2026. Please share your vision for one stand-out project or connection completed to improve the city's trail system.
5 years goes pretty fast when it comes to planning trails at least that's been my experience! there are probably several other projects that other folks would know more about but there is an area adjacent to Round Lake that used to have a user created BMX track could be developed in a thoughtful way to provide trail recreation and environmental protection.

With the understanding that the PROS Plan will help guide the City's investments and use of resources for the next 6 years; in your opinion, where should the City focus resources and energy in the next 5 years?

Interview Notes (continued)

I find our organization can work more efficiently if we have good relationships and open lines of communication with agencies and other trail user groups sometimes this coordination is driven by the land manager but often due to lack of capacity is informal and based on relationships between trail user groups that evolve organically. Perhaps a good goal for the city would be to figure out how to tap into the different volunteer organizations that could help with maintenance and new construction in the future.

What contribution, collaboration and responsibilities can your organization bring to the future implementation of your vision for the City's trail system? Are there other organizations/individuals that the City could bring to the table as partners?
We've done new trail design, construction and do lots of maintenance work throughout Clark County and the state. Depending on the project and how it aligns with our focal areas we could become heavily engaged or act more as advisor; it all depends on what elements come out of the planning process.

From Jean M. Avery, Vancouver, WA

Heart-felt thanks to Camas for the excellent park system (close to me in East Vancouver). I especially enjoy:
- Round Lake
- Fallen Leaf Lake
- Lacamas Heritage Trail

Overall, I think the parks, trails, and restrooms are in excellent condition. The concerns I have probably relate more to the nature of society, rather than to any improvements that Camas can make, per se.

My thoughts:
1. When the Camas lilies bloom, please mark off the trails (as was done at the end of this season). The fragile blooms got stepped on, with the increased foot traffic.
2. Consider closing off informal side trails, which trample fragile vegetation.
3. Similarly, clarify which trails are for walkers only, without bikers. (I think you do this.)
4. Please provide more trash containers and more dog poop bags. (Unfortunately, folks don't always pick up after themselves.)
5. I'm not a dog owner, but I believe there is a leash law. I'm not sure how that can be enforced. (I see MANY more dogs in recent months, and quite a few off-leash.)
6.. As you know, there is some graffiti (mostly under the bridge). Does it last if the graffiti is painted over? Maybe this could be a service project for a civic group?
7. There's a lot of invasive ivy. Bravo to the Ivy League for removing some of it. But the job is a huge one.
8.The recent news article about the assault near Round Lake was very disturbing. I don't know what can be done. It may come down to individual vigilance.
9. I have not yet seen overnight campers around Round Lake or Fallen Leaf Lake. I hope it stays that way.
10. If things reach the point where "monitors" are needed, here's an idea from the Hoyt arboretum: They have volunteers who walk the trails, direct folks, identify trees, and (yes) pick up trash.
11. I did not realize that Fallen Leaf Lake park can be closed for private events. If so, I hope the revenue collected outweighs the inconvenience to the public.

My requests:

Interview Notes (continued)

1. In the past, I attended a civic meeting regarding the North Shore of Lacamas Lake. Please limit the amount of tree removal. (It still is a jolt to me when I see the houses on the edge of the Round Lake trails. Do we have to have more houses so close to the park??)
2. The new turnaround at the foot of 1st Ave. (before Everett) is VERY confusing. (I've heard this from other folks as well.)

Thank you for requesting public input.

From Lyndee Cunningham (to Cassi Marshall and forwarded to Trang Lam)

Cassi, I asked a lot of people of varying ages about current and future state of our Camas parks and trails. Some of them had done the survey, but most had not heard of it. A few found it on "Next Door' site. I wish we'd all remember to check out the Parks Dept website more often.

Some common consensus follows:
- Everyone mentions more and expansive trails and connecting all possible ones.
- All want a trail around Lacamas Lake some day.
- Some are afraid there will soon be charges for parking at parks and trails. Everyone prefers to pay more taxes to compensate.
- Too many are confused by the new roundabout.

The Osprey Walking Group input:
- Asking about new property north of Lacamas and hope it will be connected easily to Lacamas Park trails. Also, asking about trail east of Steigerwald continuing farther east.
- Reporting dangers of loose gravel on down slopes of Service roads. Two of their group fell last rainy season when the gullies and rivulets formed, and gravel became loosened. Suggested scraping of those downhill slopes.
- No one enforcing leash law and poop bags not being picked up. One person leaving her bag trailside informed Osprey gal that because bag was biodegradable it was okay. False information. I know that the bag may be, but feces is not. Watershed Alliance informed us volunteers that feces and cigarette butts are the worst toxins for fish and wildlife in waterways.
- Would like to use the ditch more if filled in and looking more appealing.
- Will there be a trail someday around Fallen Leaf Lake?
- Worried about the browning of our trees. Will it become as bad as on Oregon side of river? One gal would like to start a campaign called Save Our Trees before it is too late.
- All are still angry that Crown Park pool is gone. Would like to pay more taxes to get it back.
- They all love and respect the quality of our parks and trails and seem genuinely grateful for them. All are aware of maintaining that same quality with a growing population, yet change is inevitable.

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan /Vancouver PROS Plan		**Project No.:**	Proj-# 21-135PLN	
Location:	Zoom Video Conference	**Interview Date:**	September 16, 2021	**Time:**	10:30 am
Notes by:	Laura Hoggatt, City of Vancouver Steve Duh, Conservation Technix				
Participant:	Jenna Kay, Clark County Community Planning / Commission on Aging Rebecca Royce, Clark County Community Services / Community Development Block Grant Scott McCallum, Superintendent at Washington State School for the Blind Terese Rognmo, Director of the SW Washington Center of the Deaf and Hard of Hearing		Gigi Olguin, Hispanic Metropolitan Chamber of Commerce of SW Washington Trang Lam, City of Camas, Parks and Recreation Director Laura Hoggatt, City of Vancouver Parks, Recreation and Cultural Services Planner Steve Duh, Conservation Technix		
Subject:	**Stakeholder Group Discussion on Under-Represented Voices**				

PURPOSE

To discuss current interests and future needs addressing community members of traditionally under-represented voices. The meeting took place on September 16, 2021, via a Zoom video conference from 10:30 am – noon.

DISCUSSION

The discussion began with brief introductions and an overview of the PROS Plan updates for Camas and Vancouver. A set of questions were used to initiate the group discussion.

Trang Lam, City of Camas Parks and Recreation Director, provided an overview of their PROS Plan update, noting that it began in the spring of this year. The PROS Plan will cover the six-year period from 2022-2028 and provide a decision-making framework to steward and build upon a park, trail and recreation system that serves and enhances our community's health and quality of life – now and into the future.

Laura Hoggatt provided a brief overview of the City of Vancouver, Parks, Recreation and Cultural Services Comprehensive Plan update and stressed that the plan fundamentally is based on community engagement. A variety of methods were used for public involvement that include two surveys, in-person community outreach at multiple locations, stakeholder group discussions, and information dispersion through multiple resources.

Interview Notes (continued)

Steve Duh, Conservation Technix, provided additional background for the purpose of the comprehensive plan framework and noted that the adoption and certification of the plan for each city fulfills the requirements of the State of Washington Recreation and Conservation Office (RCO) for grant funding eligibility.

Introductions:

- Gigi Olguin is a Business Development Coordinator for the Hispanic Metropolitan Chamber of Commerce in the Clark County area. She works with Hispanic community members to develop a business plan, provides support through business coaching, connects them to resources and additional services.
- Scott McCallum is the Superintendent for WA State School for the Blind, serves on multiple boards and commissions, including the State of WA Commission for blind children. He currently Lives in the Salmon Creek area.
- Terese Rognmo is the Director for the SW Washington Center for the Deaf and Hard of Hearing. She is currently responsible for three regions that includes Clark County, Cowlitz County and the Yakima area. The center was established in 1993 and located in Vancouver, Washington. The center provides advocacy, assistance for basic needs, training services, referrals, advocacy workshops and general support. Their mission is to improve and enhance the lives of deaf and hard of hearing community members in the southwestern Washington region.
- Rebecca Royce, Clark County Community Services oversees the Community Development Block Grant (CDBG) program for affordable housing and community development. She also oversees programs for the community action program. There is a requirement to complete a comprehensive community assessment. The most recent report is available at: https://clark.wa.gov/community-services/community-action
- Jenna Kay is a Land Use Planner for Clark County Community Planning. She also provides support for the Commission on Aging. Part of her participation role in the conversation will center on advocacy for the goals and objectives of the Commission.

Comments on Improving Access to Recreational Opportunities

- Connect directly with blind and low vision people. Some resources include the National Federation for the Blind and the Washington Council for the Blind and Low Vision People.
- Conduct an accessibility audit of the website and signage. Communications and signage need to be accessible.
    - Partner with people who have expertise in varying abilities and pay them for their time.
    - Provide signage in braille.
    - Use simple language.
    - Easier fonts that can be accessed brail are important.
    - Dark backgrounds with yellow/gold colored text are helpful.
    - Pictures in signage are sometimes distracting; they are difficult to read linguistically.
- The Commission on Aging has talked about universal design going beyond ADA accessibility. For instance, benches with backs areas to rest. Utilize an audit of current amenities to help move toward universal design.
- Walking trails are very popular for aging. Many are mobility device (e.g., walkers, scooters) friendly, and others are not.
- Access to bathrooms and water (fountains) is important for all users.

Interview Notes (continued)

- Parks provide multi-generational spaces, and the placement of amenities (such as benches or picnic tables near playgrounds) should be accommodated.
- For those who are struggling financially, accessing parking and having to pay to park are barriers.
- It would be beneficial to provide free parking passes for low income where fees are required. Consider creating options for income-qualified users for free parking or nearby parking in neighborhoods. Also, consider public transportation access and overlay transit route maps with park planning and design.
- It would be nice if the parks had a visual identifier in the park or along a trail, like a map or wayfinding signs that are visually accessible and for the user to know 'you are here'.
- Another thing to consider is disaster events (e.g., flood, wind, ice). How is the park system going to notify people at the park that something is happening if they are blind or hearing impaired? Some ideas could include a flashing light for hearing impaired, a loudspeaker and clear messaging to get people to safety.
- For some in the Latinx community, they don't consider hiking as something to do. The trail areas do not feel welcoming, there are concerns there may not be any phone reception, and the signs are only in English and English units (miles only, instead of miles plus kilometers).
- Many families enjoy picnic shelters and large gatherings in the parks; however, the fees that are added are often intimidating, such as a pinata fee. Re-branding fees as clean-up fees is a better direction.
- There are Hispanic business owners who would like to opportunities to provide pop-up vendors booths at games and events to sell their food or commercial goods. The process to get a permit or who to contact is challenging. Opportunities could be shared with community members to participate at events besides the Farmer's Market.
- Consider paying community members as consultants for advice for development and design. A list of vendors to assist could be developed, and then continue to add folks to the list. If this approach is used, consider what kind of insurance or licensing might be needed. Get help from community-based groups to build up the roster or list.

<u>Age groups or communities needing more focus</u>

- Provide opportunities for a wide range of users that are inter-generational and inter-cultural, so the design does not silo people by age.
- Restrooms should be gender-inclusive and not binary. Gender specific bathrooms are not good for the LBGTQ community.
- Restrooms with baby changing stations should always be provided.

<u>Other barriers to address</u>

- Not everyone knows what is available.
- Make sure communications are provided in the top languages, such as Russian, Vietnamese and Pacific Island languages.
- Schools are trusted resources, use trusted community-based organizations to build trust for both culture and community.
- If tapping into local residents as support for outreach or translations, do not expect them to do this for free. Provide a fee for the service; compensate people for the experience they bring to the community.

Interview Notes (continued)

- The association for blind athletes a great resource. The athletes have provided tandem bike rides for individuals who would otherwise never get to have the experience of riding a bicycle. The program is run by a person who is low vision. They have also conducted hikes and kayak/paddleboard experiences.
- Larger parks are well advertised. More information is needed to help people be aware of all of the parks. A key or legend of what is available at each location and other information would also be helpful.
- There is wonderful new signage in Vancouver for the Waterfront park. There is little signage for neighborhood parks.
- In terms of access to parks, there is a lack of sidewalks to get to a park to walk or roll, and many are not located near public transit etc.
- The Community Development Block Grant (CDBG) can help with funding to build or improve sidewalks in low-income neighborhoods.

Future Investments

- Add interpretive cultural and historical information to the parks or trails to honor local heritage. Highlight tribal history. This information can draw people into a park, and it helps teach kids. This is very important to tribal members. Provide signage in a blind/deaf-friendly way.
- Expand access for transportation. A shuttle bus could be considered to get people to Vancouver Lake, Frenchman's Bar or other regional parks.
- The Hispanic Chamber of Commerce has clients that would like an opportunity to set up a booth for soccer or other events. Is there a way to help provide support or do something in the future? For example, during a Sunday league championship there are clients who would like to set up a booth for a couple of hours. This is common in the communities where they used to live.
- The COVID pandemic has left us to reimagine what life could be like in the future. For the aging community we are considering how future of programming might need to look different. If recreation programs and senior centers were the only socializing people utilized before the pandemic, how are they doing now? What can we do to make it better?
- The old papermill sight could be used for a venue that might provide indoor and outdoor amenities. Expand the site to provide a great variety of opportunities that brings the whole community together. The old Torpedo Factory in Alexandria, VA was repurposed as an Arts Center, this could provide some ideas.
- If there was a web page that would provide more history, please include video with captions.

Elements to prioritize to advance diversity, equity and inclusion in the park and open space system

- Hire diverse staff and appoint diverse commissions/advisory boards. Provide support, such as a stipend, childcare, free parking, transportation if needed, etc. Don’t make it a burden.
- Make sure to provide communication access for any kind of meetings, such as live captioning. This includes having back up plans in place.
- Make sure you provide the opportunity and hear from the voices of diverse individuals. Talk to the people who are experiencing challenges.
- Go beyond just the requirements for ADA per code. We can all do much better and make our parks and recreation spaces accessible for all.

Interview Notes (continued)

Other Feedback (emailed response)

From Yasmina Aknin, Clark County Chronic Disease Prevention Team Input

A wide array of amenities exists today – from sport fields and courts, to aquatics, to walking/running trails, to playgrounds, to lake and river water access. What recreation opportunities are missing or should be improved to meet the needs of the group(s) you regularly work with and/or support? For example, what is missing and needs to be addressed.

- More public pools needed.
- Extend and expand paved trails for multi-use (example: extend Round Lake pavement)
- Ensure and expand recreation equipment for children living with disabilities
- Improve lighting and other safety features to existing trails (i.e., Burnt Bridge Trail)
- Add more parks (even small ones) or nature spaces in low-income areas
- Add pump station/repair station near recreation water areas for paddle boarders
- Ensure all parks have picnic/gathering places (ideally near play structures, etc.)
- Ensure access to clean bathrooms at all parks, even small ones or porta-potty service during Summer

At recreation centers:

- Affordable childcare services on a regular basis/schedule.
- Breastfeeding/breast-pumping clean, safe spaces and/or family "rooms" for changing diapers/ breastfeeding
- Information about parks/park amenities in different languages
- Bilingual staff
- Grants for children's memberships
- Add a private shower section for respect to some cultures/families

What age groups or communities need more focus in general?

- Community members that don't speak English
- People with disabilities (including youth)
- Seniors
- Low-income communities
- BIPOC
- Teens (offer varied sport opportunities at parks- pickle ball, tennis, skateboarding, etc.)
- New moms/parents (fitness classes/support groups like lactation support, post-partum blues, play groups)

Jump forward 5 years and imagine Vancouver and Camas in 2026. Please share your vision for one stand-out project/amenity to be completed or initiative started to improve access to the park and recreation system.

- Big Dream: add at least two recreation centers in priority areas (low-income areas) with full amenities that are welcoming to all.
- Realistic Dream 1#: Make Burnt Creek Trail more inviting with enhanced safety features, improved signage in multi-language (graffiti free) and other improvements to increase use/value to community
- Realistic Dream #2: Add water fixture and restroom to the Evergreen Park on the Fourth Plain corridor/add camera surveillance system

Interview Notes (continued)

What, if any, barriers do you see or face in accessing either city's park and recreation systems? (e.g., physical access, safety, cultural concerns, communications/information)

- Reduce parking fees
- Make recreation memberships more accessible via multi-lingual applications, promotional materials, diverse staff, etc.
- Some community members may not feel welcome, work to make recreation systems/parks more inviting to diverse cultures/BIPOC communities
- Language/multiple language spoken and offered
- Increase connectivity of trails/transportation systems
- Increase access to off-leash dog parks with walking areas
- Multi-use areas (i.e., play structures next to soccer areas, etc.)

How would you suggest increasing awareness about parks, trails or recreation programs within your community?

- Promote recreation opportunities in multiple languages
- Host Open Houses with multi-cultural activities (pinata-making, etc.)
- "If You Build It, They Will Come" (Washington County does a great job of building inviting spaces and collaborating with schools/youth programs to promote them)
- Create culturally specific trail groups so community members feel safer exploring new trails/being out in nature (i.e., not alone)
- Host walking events for older adults (partner with senior centers/AAA/independent living centers)
- Host day trips to fun places/trails, rivers in our county i.e., Salmon related activities, nature conservancy related, etc. select days for different language hosts/guides

What should the City of Vancouver and the City of Camas prioritize in order to advance diversity, equity and inclusion in its parks and facilities?

- There are significant language barriers. More bilingual staff and multi-lingual signage, promotional materials and forms in multiple language needed at recreation facilities/centers. Translated signs on trails.
- Increase safety -lighting, visibility (open-spaces)
- Add parks/recreation areas in areas of density that are easily accessibility
- Reduce barriers to accessing fee-based programs, streamline application processes and eligibility for paid programming
- Promote services in diverse areas

What contribution or collaboration can you or your organization bring to the advancement of inclusion in either city's park system?

- CCPH shares the vision of encouraging people being active (indoor and outdoors) and could assist with community engagement.

-- End of Notes --

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan Update		**Project No.:**	Proj-# 21-135PLN	
Location:	Zoom Video Conference	**Interview Date:**	August 11, 2021	**Time:**	10:30 am
Notes by:	Steve Duh, Conservation Technix				
Participant:	Monica Tubberville, City of Vancouver		Sadie Prodanovich, Port of Camas-Wahougal		
	Michelle Wright, City of Washougal		Trang Lam, Camas Parks & Recreation		
	Kevin Tyler, Clark County		Steve Duh, Conservation Technix		

Subject: **Stakeholder Group Discussion with Parks & Recreation Agencies**

PURPOSE

To discuss current park system planning issues and explore opportunities for future partnership or collaboration efforts. The meeting took place on August 11, 2021, via a Zoom video conference from 10:30am to noon.

DISCUSSION

The discussion began with brief introductions and an overview of the City's PROS Plan update process.

Past Collaborations with Camas

- Clark County worked with the city on past Legacy Land acquisitions around Lacamas Lake and leveraged Conservation Futures dollars to secure some fantastic property, such as CJ Dens. The County has also participated in visioning exercises for planning the Lacamas Lake north shore area.
- The Port coordinated with Camas and Washougal on the wayfinding system.
- Vancouver appreciated Camas' support for the Joint Agency Review for the Lewis and Clark Regional Trail. The city also coordinated with Camas on a code amendment to extend service limits/areas related to park impact fees. Vancouver has also coordinated with Camas on land acquisitions.

Initial Comments on Park System

- The city's focus around Lacamas Lake has been exemplary. The collection of properties is becoming a regional park in a bigger fashion
- Continue to explore grant pursuits that serve Camas and neighboring jurisdictions
- Camas has done a great job land banking for open space and recreation. Some properties are developed, but there exists more opportunities for trail connections
- The city should also spread park development around the city and not place all of its focus around the lakes

Interview Notes (continued)

- Washougal is just starting recreation programming and is looking for partners, especially with regard to access to fields and facilities for future program offerings. For example, Washougal doesn't have a full court basketball court in its system, so it is looking for partners with facilities available for use.
- Communications – consideration should be given to a joint publication serving a wider area of the county. Monica referenced that a joint park and trail map was compiled about 4-5 years ago, and it should be updated. Washougal commented that for partnership project(s), coordinate to bring each jurisdictions' Parks Board/Commission along so that project funding can be prioritized similarly in each jurisdiction.

Future Needs

Comments that are not site specific are needs that are also generally needed in other jurisdictions.

- With its waterfront development, the Port has had a lot of requests for pickleball
- A recreation center for indoor programming is a need and should be reconsidered at a lower cost point
- Green Mountain is underutilized, and more emphasis should be placed on access, trails and viewpoints. Trails should be multi-use, as well as consider equestrian use. It could function a bit like Whipple Creek Park and would attract folks for vistas and wildlife.
- Reservable space for gatherings, parties and picnics.
- Clean and safe spaces – address encampment encroachments
- Playgrounds with universal accessibility
- Access to water in some form – during high heat periods, the waterfronts are overrun. Consider a splash pad as an alternative. Access to rivers and lakes is a big draw for users from across the region – including from Multnomah County
- Opportunity for Camas & Washougal to partner on dog park

Coordination with School Districts

- Be cautious developing city amenities on land owned by the school district. In Vancouver, there has been some push back on utilizing school sites for community needs.
- If possible, pursue joint use or maintenance agreements and develop relationships with the local principals to have conversations specific to each school site.
- As the school districts have staff who oversee sport field and facility rentals, the city should also have a staff person who is responsible for coordinating and programming city sport fields and assets.

Other Comments

- Vancouver is working with County GIS to develop a DEI mapping tool that also includes finer grain details about the park system, such as the quality of amenities, and not just whether a site is developed or undeveloped.
- Camas and Vancouver staff suggested the potential to partner on a stakeholder session to engage underrepresented community groups/members
- The group also agreed on the value of sharing contact information for stakeholders, including tribal contacts

-- End of Notes --

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan Update		**Project No.:**	Proj-# 21-135PLN	
Location:	Teleconference	**Interview Date:**	June 28, 2021	**Time:**	10:00 am
Notes by:	Steve Duh, Conservation Technix				
Participant:	Nan Henriksen, former Mayor		Steve Duh, Conservation Technix		

Subject: **Stakeholder Interview with Nan Henriksen**

PURPOSE

To discuss current interests and future needs for parks, recreation and trails in Camas with a former mayor. The meeting took place on June 28, 2021, via a Zoom teleconference from 10:00 – 10:40 am.

DISCUSSION

The discussion began with brief introductions and an overview of the City's PROS Plan update process. A set of questions were used to initiate the discussion and explore ideas about enhancements or improvements to the city's park, recreation and open space system.

Background

- Value the abundance of parks, open space and trails
- In the 1980s, the City of Camas set out a new vision for itself, knowing that the mill was not going to be sustained. The immediate concerns were on replacing the economic drivers of the city, but, as mayor, Nan also aimed to maintain focus on 'softer' things, such as parks and open space, related to the city's quality of life. At the time, Crown Zellerbach represented about 80% of the tax base of the city.
- In the '80s and '90s, the City was blessed with a high ratio of parklands to population, and her goal was to maintain a high ratio into the future. She worked with community members to position the city for a $1 million bond to acquire parks and open space. Bond funds were leveraged with donations to acquire some of the lands along the Washougal River.
- She convinced City Council to hire a City Administrator (Lloyd Halverson), and he maintained a focus on securing additional lands for the community.

Interview Notes (continued)

Facility Improvements & Ideas

- Connectivity of trails relies on development occurring. The City may need to think through the issue of timing and connections more, since development happens in a haphazard manner.
- With Trang, the focus should be to secure connectivity of trails where development hasn't occurred yet.
- The City has great trails now, but many of them go nowhere. Connectivity for wildlife is also important.
- There should be easy access for and use of parks and trails by people who have disabilities or physical limitations. ADA improvements and universal access are important, so are benches along trails.
- The City should get an off-leash area established and consider working with Washougal to make it happen. Do a joint project.
- On a pool and community center, the focus should be on a more modest pool project. The City needs to keep the project going, but some trust has been lost with the community after the most recent attempt for voter approval.
- Parks and Recreation can be a bit of a bastard child regarding the city budget. Staff have done wonderfully putting on events. The City should work out an arrangement with Camas Community Education to offer more programs. Find ways to augment and coordinate.
- Would like to see more programs designed for those with physical disabilities – whether through old age or other health issues (e.g., seated exercises, stretching or 'walks for walkers')
- On the whole, Parks and Recreation has done a great job with what they have had

Focus areas

- Finish planning and then implement a splash pad at Crown Park
- Develop an off-leash area
- Develop a modest pool and community center
- Trail connectivity

Other Comments

- Keep a focus on 'old' Camas for improvements and enhancements to parks and amenities. Development regulations that are in place will ensure newly developed areas have parks and open spaces.
- Kids at Oak Park and other older areas need to see upgrades and improved access close-in to Camas downtown. The City should aim to provide similar opportunities as those who live in new areas up on the hill.
- Offer programs in Spanish if possible and coordinate with Washougal to make it happen

-- End of Notes --

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan Update		**Project No.:**	Proj-# 21-135PLN	
Location:	Telephone call	**Interview Date:**	June 18, 2021	**Time:**	1:00 pm
Notes by:	Steve Duh, Conservation Technix				
Participant:	Lloyd Halverson, former city administrator		Steve Duh, Conservation Technix		

Subject: **Stakeholder Interview with Lloyd Halverson**

PURPOSE

To discuss current interests and future needs for parks, open space and trails in Camas with a former city administrator. The meeting took place on June 18, 2021 via a telephone call from 1:00 – 1:40 pm.

DISCUSSION

The discussion began with brief introductions and an overview of the City's PROS Plan update process. A set of questions were used to initiate the discussion and explore ideas about enhancements or improvements to the city's park and open space system.

Background Comments

- PROS Plan is a guide and vision for the city, and it will unlock resources.
- The parks and open space part of the PROS Plan and park system is about public space, and public space builds community (meeting people on trails, being in parks)
- City has done a great job with downtown, open spaces, trails and parks.
- Lloyd is a strong proponent of acquire now and develop later mantra. Plan for the next 10-15 years for open space – define what is needed and what gaps exist. Then, pursue purchases with help of dedications, donations, grants and partnerships. For the PROS Plan, a special emphasis should be on identifying the missing pieces in the open space system. The parks and open space elements of the plan should be opportunistic and seize opportunities as the arise or are created.

Future Improvements & Opportunities

- Ostenson Canyon to Dorothy Fox Park – has missing link. Also connect to Drake St Park. Use sidewalk and acquire additional lands to make trail linkage happen.
- The former GPO site (Benton triangle) will have reclamation costs, but it could be used to link a looped trail to Lacamas Park

Interview Notes (continued)

- On recreation, volunteer groups have been exceptionally strong in Camas for youth sports, along with private groups filling a need, such as gymnastics through Vega??
- Downtown events have been the shining star and have help build place together.
- Local taxpayers have financed significant amounts of public land, and too much is locked up to keep the public out. Coordinate more with the school district to explore how to let more people use school district lands and facilities. That would be a great step.
- Trang is dynamic and has the energetic drive to gets plan done. Amazing things will happen, and the community and Council will support it.
- The future is bright.

-- End of Notes --

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan Update		**Project No.:**	Proj-# 21-135PLN	
Location:	Teleconference	**Interview Date:**	June 18, 2021	**Time:**	10:00 am
Notes by:	Steve Duh, Conservation Technix				
Participant:	Carrie Schulstad, Downtown Camas Association		Steve Duh, Conservation Technix		

Subject: **Stakeholder Interview with Downtown Camas Association**

PURPOSE

To discuss current interests and future needs for parks, recreation and trails in Camas with a representative of the local downtown business association. The meeting took place on June 18, 2021 via a Zoom teleconference from 10:00 – 11:10 am.

DISCUSSION

The discussion began with brief introductions and an overview of the City's PROS Plan update process. A set of questions were used to initiate the discussion and explore ideas about enhancements or improvements to the city's park and open space system.

Background

- The Downtown camas Association (DCA) is a Main Street program and has been established for 15 years. In the early 2000s, several local business owners worked with a city committee to do visioning for the Camas downtown. Events and activities were planned and added, and the 1st Fridays has been ongoing since 2005. During the 2008-2009 recession, the City decided it could no longer support the downtown, and the association found organizational support and resources via the Main Streets program.
- The DCA supports numerous events, including 1st Fridays and the passport program, to promote downtown businesses. The refurbished downtown hotel and improvements to the Port waterfront continue to attract visitors to Camas.

Coordination with City

- The City Parks & Recreation Department partnered with the Camas School District for a socially distanced holiday event in 2020 during the pandemic. It included a passport, story walks and displays in downtown.

Interview Notes (continued)

- In discussions with Trang, the idea of connecting 'urban and nature' surfaced, which could be a way to encourage and link restaurant visits with exploring the trail network – especially trails close to downtown. Trails to Tables was conceived as a five hike passport with five restaurant visits for a pint glass give-away and entry into a raffle for a gift card.
- Another idea is to work with the city for a joint community calendar for the website, so more people can see all of the activities available in Camas.
- The City's acquisition of the Mill Ditch property will create a wide, walking/biking trail to connect downtown to the lakes. It would go by the Performing Art Center and connects businesses, the arts and recreation.
- Downtown is like a park, and the city has made investments over time, with tree plantings in the 1960s and landscaping in the 1990s. Planters on 3rd Avenue are not irrigated, and the city should find resources to care for the past investments.

Facility Improvements & Ideas

- Directional signage and wayfinding to direct people to downtown from the lakes and associated trails.
- Include brochure holders for maps and trail brochures
- A pool and community center that is affordable for Camas could bring people together. Maybe a seasonal, covered outdoor pool could suffice, instead of a large aquatic center. The city should look at the GP property as a potential site. It doesn't require a lot of clean-up, and it is close to downtown.
- According to DCA surveys, other local interests include a bowling alley, rock wall for climbing and splash pad.
- Emphasizing the trail system could be a communications piece, with signage to support a mural tour, bronze bird art or connections to other trails.
- Camas has a history of providing top tier sports through the school district, but there needs to be more accommodation for community recreation sports for all, not just elite players.
- Explore collaborations with the library and Journey for additional studios or classes (i.e., jazz, dance, art)
- Consider food carts or concessions at Heritage Park, especially since it is a popular venue for paddle boarding and kayak launching.

Other Comments

- See Fort Collins CO as an example of an extended downtown promenade that integrates art, fountains, recreation, plaza/stage space to restaurants and shops along the way.

-- End of Notes --

CONSERVATION TECHNIX

STAKEHOLDER DISCUSSION NOTES

Project Name:	Camas PROS Plan Update		**Project No.:**	Proj-# 21-135PLN	
Location:	Teleconference	**Interview Date:**	June 30, 2021	**Time:**	12:00 pm
Notes by:	Steve Duh, Conservation Technix				
Participant:	Kurt Stonex, Olson Engineering		Steve Duh, Conservation Technix		

Subject: **Stakeholder Interview with Development Community Representative**

PURPOSE

To discuss coordination and future needs for parks, open space and trails in Camas with a representative of the local residential development community. The meeting took place on June 30, 2021, via a Zoom teleconference from 12:00 – 12:45 pm.

DISCUSSION

The discussion began with brief introductions and an overview of the City's PROS Plan update process. A set of questions were used to initiate the discussion and explore ideas about enhancements or improvements to the city's park and open space system.

Background & Opening Comments

- Camas has been very aggressive in acquiring parks and open space property during the time Lloyd Halverson was city administrator.
- With its older regulations, the city used to require 30% set-aside for open space. The City was sued and lost. The Planned Unit Development regulations still require land dedication.
- Camas staff have been good with coordinating with and negotiating with developers for layout and design to accommodate set-asides and the use of PIF payments and credits. Developers are generally willing to provide parks with their projects, since the City is willing to use cash and credits and have the developer build the requested parks and trails. Staff have been very flexible and good to work with, and the CIP has accommodated that flexibility.

Recreation-related Improvements Seen as Positive for Developers

- Trails
- Critical area set asides / open space
- Small neighborhood parks and pocket parks

Interview Notes (continued)

Facility Improvements & Ideas

- Green Mountain will be hard to develop. It could have trails, and there is a flatter area on top that might work for picnic area and viewpoint. Depending on access and need, the site might be good for an outdoor education center or nature park. More extensive mountain biking trails might work as well.
- In the Lacamas Lake area, trails are critical to connect the north side of the lake to Green Mountain and to downtown.
- Looking out 50 years, the City should consider what to do with the GP site on the Columbia River.

Coordinating with Developers

- Ridgefield example, staff worked through development agreement and used PIF credits and outright purchase to secure land from developer (required some, credited some and bought some to compile a larger site that was desired). Deer Creek subdivision and Grass Valley were put together in a similar manner.
- Regarding PIF, the development community is resigned to the fact that they will pay impact fees, and most are fine with building parks or trails as part of a project and getting PIF credit. It's important for the public to know that PIF is passed through to the buyer as part of the cost of the home.
- Going forward, City staff should continue working with the same attitude of 'working together' with the development community as a partner. Continue to have flexibility with the CIP and adjust project cost allocations as appropriate with the projects considered and negotiated with developers.

-- End of Notes --



Appendix D
Site Observations



ASH CREEK PARK

9.5 acres (acquired: 2000) **Neighborhood /Undeveloped**

Capital Improvement & Planning Opportunities:

- This site is a wooded natural area. There is a fenced in storm facility on the site. On street parking is available and there is pedestrian access.
- The natural area has potential to be an amenity in the park with trails and interpretive signs. This undeveloped site is in the middle of a neighborhood and would be a good location for a small play area and shelter.

Maintenance Considerations:

- Manage as Open Space until developed.
- The site is very wet, especially on the south and west sides.
- Currently, no public access is provided.

Amenities:

- Wooded natural area



BAZ RIVERFRONT PARK

0.79 acres (acquired: 1989) **Special Facility**

Capital Improvement & Planning Opportunities:

- Opportunity for park master plan process to define site and connect to the river.
- Add interpretive signs.
- Add ADA accommodations for parking and paths to picnic table and trail.

Maintenance Considerations:

- Manage as Open Space with an added emphasis on weed/invasive plant management.

Amenities:

- Limited on street parking along road shoulder
- Picnic table
- Access to Washougal River Greenway Trail
- Narrow deer paths to waterfront
- Fishing
- Swimming
- Natural areas
- Scenic views of the Washougal River



BENTON PARK

4.8 acres (acquired: 1988, 2004) **Neighborhood**

Capital Improvement & Planning Opportunities:

- Improve pedestrian connection from Couch Street to asphalt path.
- Add more walking paths and trails with interpretive signs and rest areas.
- Add benches or tables along asphalt path.
- Standardize site furnishings to match other parks.

Maintenance Considerations:

- Most of the park is wooded area with a trail. Maintain trail surface.
- Enhance natural areas and remove invasive weeds.
- Add additional gravel and compact trail to provide a firm surface that is ADA accessible. Remove drops and elevation changes between the trail and the sidewalk and concrete table pads to provide a smooth transition.

Amenities:

- Earthen/Gravel trail
- Asphalt path
- Tables
- Passive lawn
- Community garden (partner managed)
- Natural areas
- View of creek







COOPERS VIEW PARK

2.5 acres (acquired: 2007) **Neighborhood**

Capital Improvement & Planning Opportunities:

- Consider adding a restroom and drinking fountain.
- Install dog waste station.
- Add accessible routes to existing picnic tables and enlarge pads to provide accessible clearance around table.
- Currently there are not accessible routes around the tables under the shelter for accessibility. Remove some of tables to provide more space and allow better circulation & accessibility.
- Install a ramp into play area with a slide.

Maintenance Considerations:

- Annual evaluation and supplement of playground safety surface.
- Standardize furnishings.

Amenities:

- On street parking
- Picnic tables with built in checkerboard
- Bike racks
- Bench
- Asphalt path
- Playground age 2-5 years old with nature play area
- Slide
- Trash receptacle
- Passive/active lawn





CROWN PARK

7.1 acres (acquired: 1987) **Community**

Capital Improvement & Planning Opportunities:

- Implement site master plan.

Maintenance Considerations:

- Address drainage problems in T-ball field and around shelter.
- Repair/re-surface tennis court.
- Repair asphalt paths.
- Annual evaluation and supplement of playground safety surface.
- Standardize furnishings.

Amenities:

- Off street parking
- Park building
- Picnic tables
- Benches
- Tennis courts with storage unit for pickleball nets
- Trash receptacles
- Trash dumpster
- Water spigot
- Playground 1 (Swing set and play equipment)
- Playground 2 (Age 5-12, Slide and play equipment)
- Playground 3 (Age 2-5, Swings and play equipment)
- Double sided wall ball court
- Carousel play equipment
- Lending library
- 20x20 shelter with lighting and electrical outlet
- T-ball field
- Passive/active lawn
- Volleyball court
- Horseshoe Pits with fence
- Porta putties



DOROTHY FOX PARK

4.8 acres (acquired: 1986, 1989) **Neighborhood**

Capital Improvement & Planning Opportunities:

- ADA improvements: playground ramp, pathway to tables, companion seating.

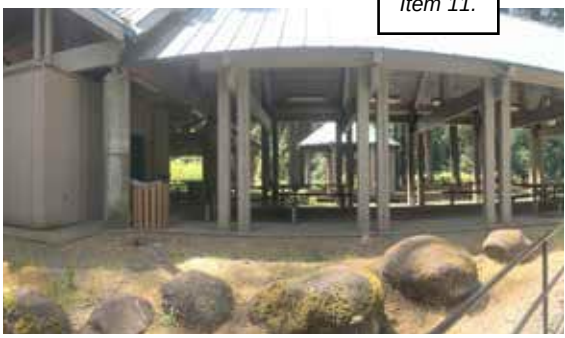
Maintenance Considerations:

- Replace faded on-leash sign.
- Annual evaluation and supplement of playground safety surface.
- Lawn and pathway repairs.
- Standardize furnishings.

Amenities:

- Interior parking
- Trash receptacles
- Restroom with storage chase
- Gear storage box
- Soccer field with goals
- Playground, age 2-5
- Benches
- Picnic table
- ½ basketball court
- Open lawn areas
- Storm water swale/facility







FALLEN LEAF LAKE PARK

32.9 acres (acquired: 2011) **Regional**

Capital Improvement & Planning Opportunities:

- Implement park master plan.
- Remove volleyball nets.
- ADA improvements: accessible route to lawn, install ADA accessible tables.
- Consider a nature play area for this park.

Maintenance Considerations:

- Clear vegetation around picnic tables along waterfront.
- Cleanup shelter.
- Inspect and repair roof.
- Repain tables.
- The ramp connection the gravel parking area to the shelter has a 1-2” lip, repair to remove lip and provide ADA access from parking lot to shelter.

Amenities:

- Off street gravel parking (inside gate)
- Informal gravel parking for day use parking (outside gate)
- RV host site
- Rough lawn/game area
- Lawn along lake
- Volleyball
- Tables
- Benches
- Large shelter with moveable tables (sinks, preparation tables, lights and power outlets)
- Restroom in shelter
- Trails
- Trash receptacles
- Trash dumpster







FOREST HOME PARK

5.3 acres (acquired: 1987) **Neighborhood**

Capital Improvement & Planning Opportunities:

- Add accessible routes to existing picnic tables, playgrounds and baseball fields and provide accessible clearance around amenities.
- Provide a drinking fountain and shelter.
- Provide additional ADA Parking spaces.
- Replace picnic tables with accessible models.
- Provide bike racks.
- Add other baseball amenities.
- Consider replacing wood bleachers with metal for easier maintenance.

Maintenance Considerations:

- Annual evaluation and supplement of playground safety surface.
- Pathway repairs.
- Standardize furnishings.

Amenities:

- Off street parking
- Trash receptacles
- Trash dumpster
- Picnic tables
- Baseball fields with dugouts, backstops, commentator boxes and bleachers
- Playground 1 (age 2-12)
- Playground 2 (age 2-5)
- Bench
- Passive/active lawn
- ½ Basketball court (no striping)
- Dog waste stations
- Concession building
- Maintenance building
- Porta potty





GOOT PARK

17.0 acres (acquired: 1987, 2006) **Neighborhood**

Capital Improvement & Planning Opportunities:

- Repair or replace bleachers.
- Replace picnic tables with accessible models.
- The natural area has potential to be an amenity in the park with trails and interpretive signs.
- Add accessible routes to existing picnic tables and enlarge pads to provide accessible clearance around table.
- Consider adding a shelter to this site.

Maintenance Considerations:

- Remove graffiti from maintenance structures.
- Repaint rusted play equipment.
- Annual evaluation and supplement of playground safety surface.
- Remove weeds in paved areas, shrub beds and lawn.
- Striping at basketball court is worn, restripe basketball court.
- Standardize furnishings.

Amenities:

- Off street parking
- ½ Basketball court
- Maintenance building
- Restroom
- Picnic tables
- Benches
- Bike rack
- Trash receptacles
- Soccer field with goals
- Baseball field with backstop and bleachers
- Wayfinding signs
- Passive/active lawn
- Dog waste station
- Drinking fountain
- Lending library
- Playground 1 (age 2-12, Swings and play equipment)
- Playground 2 (1 piece of play equipment)
- Water spigot
- Natural area







GRASS VALLEY PARK

24.9 acres (acquired: 1999, 2006) **Community**

Capital Improvement & Planning Opportunities:

- Add accessible routes to existing picnic tables and enlarge pads to provide accessible clearance around table.
- Currently there are not accessible routes around the tables under the shelter for accessibility. Remove some of tables to provide more space and allow better circulation & accessibility.
- The natural area has potential to be an amenity in the park with trails and interpretive signs.
- ADA improvements: accessible routes to tables, drinking fountain and trash grills, install playground ramp, provide companion seating.

Maintenance Considerations:

- Replace the missing restroom signs.
- Repair/re-surface tennis court.
- Remove weeds in paved areas, shrub beds and lawn.
- There are drainage problems in softball field that need to be resolved.
- Lawn has damage from gophers, control gopher population and repair lawn.
- There are minor cracks in paths that need repair.
- Vegetation is encroaching onto asphalt path, clear vegetation.
- Annual evaluation and supplement of playground safety surface.
- There is missing playground equipment, either repair or remove.
- Standardize furnishings.

Amenities:

- Off street parking
- Memorial brick pavers
- Picnic tables
- Bike rack
- BBQ grill
- Restrooms w/storage chase
- Drinking fountains
- Trash receptacles
- Tennis courts with practice wall and fence
- ½ Basketball court
- Softball field w/ backstop
- Playground ages 2-12
- 35’x45’ Shelter with lighting and electrical outlets
- 12’x20’ Shelter
- Asphalt loop path
- Signed natural areas







GREEN MOUNTAIN PARK

4.6 acres (acquired: ----) **Neighborhood**

Capital Improvement & Planning Opportunities:

- ADA improvements: accessible route to picnic tables, provide companion seating.

Maintenance Considerations:

- Replace the missing volleyball net.
- Remove weeds in lawn area and reseed bare spots.
- There are drainage problems in lawn area that need to be resolved.
- Annual evaluation and supplement of playground safety surface.
- Standardize furnishings.

Amenities:

- On street parking
- Restroom building
- Picnic tables
- Bike racks
- Benches
- Drinking fountains
- Full basketball court with striping
- Volleyball court
- 20’x20’ Picnic shelter
- Playground age 2-12 years old
- Asphalt paths
- Trash receptacles
- Passive/active lawn
- Dog waste station







HERITAGE PARK

26.9 acres (acquired: 1993) **Community**

Capital Improvement & Planning Opportunities:

- Gate access control improvements.
- Separate motorized & non-motorized launching.
- Opportunity for bird watching and interpretive signage. These could be combined with rest areas along the Lacamas/Heritage trail.
- Improve waterfront/fishing.
- Consider a large shelter for bigger groups.
- ADA improvements: signs for ADA parking stalls, provide access to grills.

Maintenance Considerations:

- Remove weeds in paved areas, shrub beds and lawn.
- Pathway repair.
- Enhance natural areas and remove invasive weeds.
- Standardize furnishings.

Amenities:

- Off street parking
- Lacamas/Heritage Trail (asphalt or crushed rock)
- Mowed meadows
- Benches along trail
- Views of lake
- Watercraft rentals (kayaks, standup paddle boards)
- Asphalt paths
- Restroom with drinking fountain
- Playground age 2-5
- Grills
- Boat ramp with floating docks and staging area
- Fishing/waterfront area
- Trash dumpster







KLICKITAT PARK

9.4 acres (acquired: 2001) **Neighborhood**

Capital Improvement & Planning Opportunities:

- The natural area has potential to be an amenity in the park with trails and interpretive signs.
- ADA improvements: accessible routes to tables and benches, provide alternate route to viewing area, provide accessible routes to the play areas.

Maintenance Considerations:

- Remove weeds in shrub areas and lawn and play areas
- Annual evaluation and supplement of playground safety surface.
- Control gopher population and repair lawn.
- Replace broken table.
- Clear storm grates.
- Add mulch to plant beds and redefine edges.
- Pathway repair and clearing.
- Add restroom signs.
- Remove tennis backboard.
- Replace unhealthy/failing trees.
- Re-stripe basketball court.
- Replace missing signs.
- Standardize furnishings.

Amenities:

- Interior parking
- Trash dumpster
- Drinking fountain
- Bike rack
- ½ basketball court w/ ¾ fence and wall ball
- Dog waste dispenser
- Play area 1 w/ swings
- Play area 2 age 2-12
- Trash receptacles



LACAMAS HEIGHTS PARK

2.3 acres (acquired: 2006) **Neighborhood /Undeveloped**

Capital Improvement & Planning Opportunities:

- The location is in the middle of a neighborhood and adjacent to Camas High School. Existing pedestrian access is easy and the high school parking lot is close enough that it could be used for parking during off school hours.
- About half of this site is covered in mature trees with lawn cover. There are gentle slopes throughout site. The Butler reservoir facility is located on the adjacent parcel to the west, with a fence around it.
- A playground, basketball court, picnic tables, shelter, walking paths should be considered for future development. This site might be a good location for a future dog park.

Maintenance Considerations:

- Manage as Open Space until developed.

Amenities:

- Trash receptacles
- Bike rack
- Picnic tables
- Bench
- Parking
- Playground
- Baseball/softball field
- Portable toilet







LACAMAS LAKE LODGE & CONFERENCE CENTER

4.3 acres (acquired: 2000) **Regional**

Capital Improvement & Planning Opportunities:

- None noted.

Maintenance Considerations:

- Enhance natural areas and remove invasive weeds.
- Manage and cleanup goose waste.

Amenities:

- Off street parking
- Passive lawn
- Trash receptacles
- Recycling receptacle
- Conference center building
- Patio with view of lake
- Access to pier
- Connecting path to heritage park







LOUIS BLOCH PARK

4.9 acres (acquired: 1987) **Neighborhood**

Capital Improvement & Planning Opportunities:

- Future park site planning to determine potential new amenities.
- ADA improvements: accessible routes to picnic tables, enlarge pads to provide accessible clearance, provide paved access to playgrounds.
- Consider adding another drinking fountain.
- Replace picnic tables in baseball area.

Maintenance Considerations:

- Restripe parking spaces.
- Control gopher population and repair lawn.
- Remove weeds in paved areas, shrub beds and lawn.
- Re-stripe basketball court and repair pavement.
- Annual evaluation and supplement of playground safety surface.
- Standardize furnishings.

Amenities:

- Off street parking
- Fenced in baseball field with backstop, bullpens
- Picnic tables
- Benches
- Concession building
- Commemorative plinth
- Restroom in baseball area
- Restroom in park
- Maintenance building
- Commentators building
- Lending library
- Playground 1 (swings)
- Playground 2
- Trash receptacles
- Recycling receptacles
- Trash dumpster
- Drinking fountain
- Dog waste station
- Bleachers
- ½ Basketball court
- Wayfinding signs
- Passive/active lawn







OAK PARK

2.5 acres (acquired: 1995) **Neighborhood**

Capital Improvement & Planning Opportunities:

- Replace porta potty with a permanent restroom.
- Consider a shelter and picnic area.
- ADA improvements: accessible routes to tables, basketball court and trash grills, provide playground ramp.

Maintenance Considerations:

- Remove weeds in paved areas, shrub beds and lawn.
- Annual evaluation and supplement of playground safety surface.
- Clean moss from asphalt path.

Amenities:

- On street parking
- Playground age 2-5
- Picnic tables
- Benches
- Grill
- Passive/active lawn
- ½ Basketball court
- Porta potty





OSTENSON CANYON PARK

8.2 acres (acquired: 2013) **Neighborhood**

Capital Improvement & Planning Opportunities:

- Conduct park site master plan process to guide development of open, upper shelf as neighborhood park.

Maintenance Considerations:

- Manage as Open Space until developed.

Amenities:

- Trash receptacles
- Bike rack
- Picnic tables
- Bench
- Parking
- Playground
- Baseball/softball field
- Portable toilet







PRUNE HILL SPORTS PARK

8.8 acres (acquired: 1997) **Community**

Capital Improvement & Planning Opportunities:

- The natural area has potential to be an amenity in the park with trails and interpretive signs.
- Add benches, tables and consider a small shelter.
- Add more shade trees near playground, behind bleachers and dugouts and along perimeter of sports fields.
- Stripe basketball courts and install a perimeter fence.
- Install a ramp into playground to provide an ADA accessible route. Sidewalk is sunken next to curb, repair to provide an accessible route into the playground.

Maintenance Considerations:

- Remove weeds in paved areas, shrub beds and lawn.
- Repair drainage problems in baseball field.
- Replace ball fence on east side of park.
- Control gopher population and repair lawn.
- Pathway repair.
- Annual evaluation and supplement of playground safety surface.
- Standardize furnishings.

Amenities:

- Shared off street parking with school
- Free library box
- 2 trash receptacles
- Ramp into park
- Asphalt paths with loop path
- Multisport fields with permanent and moveable soccer goals
- Baseball field with backstop, bleachers and storage bin
- Playground age 2-12
- ½ Basketball courts with no striping
- Storage bin near soccer fields
- Natural area next to fields with radio tower and access drive
- Passive/active lawn



SANDY SWIMMING HOLE

1.4 acres (joint property with Washougal) **Special Facility**

Capital Improvement & Planning Opportunities:

- Parking improvements and expansion.

Maintenance Considerations:

- This swimming hole is very popular. The beach access and experience looked great, but the minimal parking was a major limitation.
- No ADA accessible route to beach.

Amenities:

- 17 – standard stalls
- 1ADA stall (not on designated accessible route, not compliant, not properly signed)
- 6 Movable Recycling and Trash Receptacles
- Paved Overlook/Deck area with 2-picnic tables and 1 – bench
- Identification sign
- Various regulatory signs.







SKATE PARK

0.9 acres (acquired: 1987) **Special Facility**

Capital Improvement & Planning Opportunities:

- Redesign/add to skate park.
- Add permanent restroom, drinking fountain and shelter with lawn area.
- Existing parking lot is large, if it isn't fully utilized part of the parking lot could be repurposed for shelter, lawn area and day use activities.
- Enhance river access and provide more beach area.
- Replace picnic tables and benches.
- ADA improvements: accessible routes to existing picnic tables, replace ADA parking signs, provide companion space.

Maintenance Considerations:

- Restripe parking lot to identify parking stalls and drive aisle.
- Repair cracks or replace skate park.
- Enhance natural areas and remove invasive plant species..
- Standardize furnishings.

Amenities:

- Skate park
- Off street parking
- Trash receptacles
- Picnic tables
- Porta potty
- Benches
- Natural area with river access
- Trails
- Boat launch ramp



Appendix E
Recreation Trends

The following summaries from recognized park and recreation resources provide background on national, state and local park and recreation trends. Examining current recreation trends may guide potential park and recreation improvements and opportunities to enhance programs and services.

2020 NRPA Agency Performance Review

The 2020 National Recreation and Park Association (NRPA) *Agency Performance Review* summarizes the key findings from their Park Metrics benchmarking tool and is intended to assist park and recreation professionals in effectively managing and planning their operating resources and capital facilities. The report offers a comprehensive collection of park- and recreation-related benchmarks and insights to inform professionals, key stakeholders, and the public about the state of the park and recreation industry. The 2020 NRPA Agency Performance Review contains data from 1,053 unique park and recreation agencies across the United States as reported between 2017 and 2019.

Key Findings and Characteristics

Park facilities and operations vary greatly across the nation. The typical agency participating in the NRPA park metric survey serves a jurisdiction of approximately 42,500 people, but population size varies widely across all responding jurisdictions. The typical park and recreation agency has jurisdiction over 20 parks comprising over 430 acres. Park facilities also have a range of service levels in terms of acres of parkland per population and residents per park. These metrics are categorized by the agency's population size.

Park Facilities

Nearly all (96%) park and recreation agencies operate parks and related facilities. The typical park and recreation agency has:

- One park for every 2,281 residents
- 9.9 acres of park land for every 1,000 residents in its jurisdiction
- 11 miles of trails for walking, hiking, running and/or biking

Figure E1. Median Residents per Park Based On Population Size

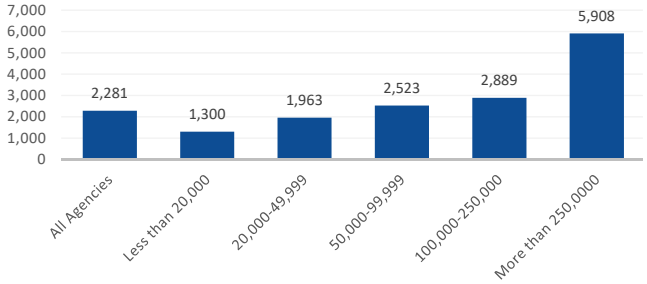
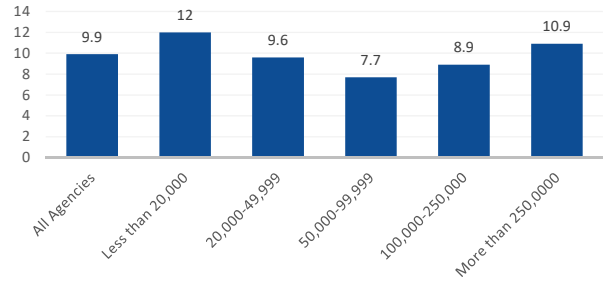


Figure E2. Acres of Parkland per 1,000 Residents based on Population Size

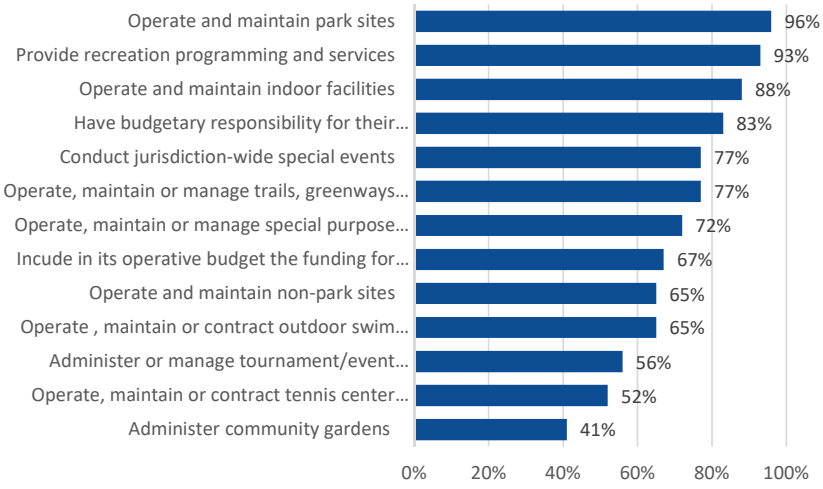


A large majority of park and recreation agencies provide playgrounds (93.9%) and basketball courts (86.5%) in their portfolio of outdoor assets. Most agencies offer community and/or recreation centers (60%) while two in five offer senior centers.

The typical park and recreation agency that manages or maintains trails for walking, hiking, running and/or biking has 11.0 miles of trails. Agencies serving more than 250,000 residents have a median of 84.5 miles of trails under their care.

Park and recreation agencies often take on responsibilities beyond their core functions of operating parks and providing recreational programs. Other responsibilities may include tourist attractions, golf courses, outdoor amphitheaters, indoor swim facilities, farmer's markets, indoor sports complexes, campgrounds, performing arts centers, stadiums/arenas/racetracks, fairgrounds and/or marinas.

Figure E3. Key Responsibilities of Park and Recreation Agencies



Programming

Nearly all (93%) of park and recreation agencies provide recreation programs and services. More than eight in ten agencies provide themed special events (88%), team sports (87%), social recreation events (87%), youth summer camps (83%), fitness enhancement classes (82%), and health and wellness education (81%).

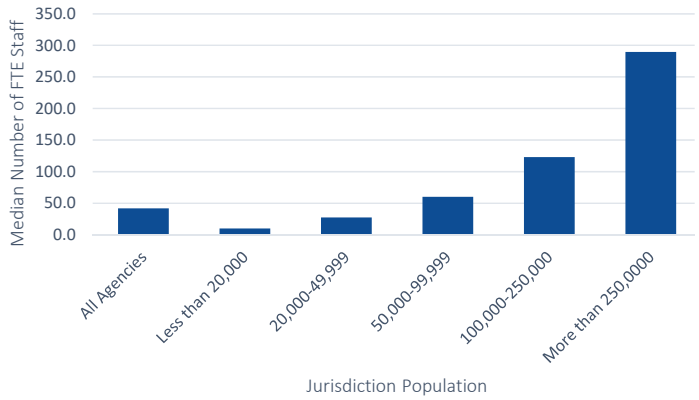
Staffing

Park and recreation employees are responsible for operations and maintenance, programming and administration. The typical park and recreation agency has:

- 41.9 full-time equivalent staff (FTEs) on payroll
- 8.1 FTEs on staff for every 10,000 residents in its jurisdiction

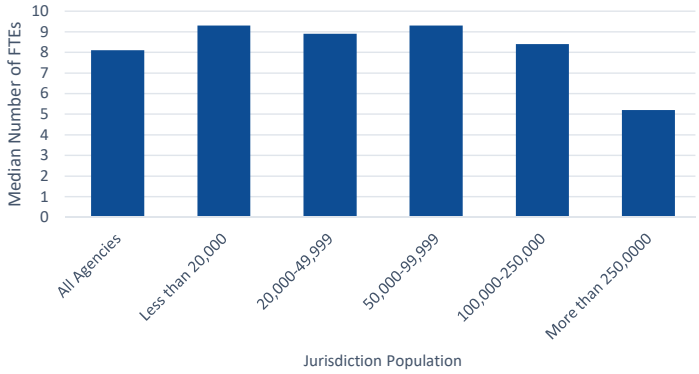
Median FTE counts also positively correlate with the number of acres maintained, the number of parks maintained, operating expenditures, and the population served. For example, agencies that serve populations between 20,000 and 49,999 residents employ an average of 27.3 FTE, while agencies that serve 50,000 to 99,000 people employ an average of 60 FTE.

Figure E4. Park and Recreation Agency Staffing: Full-Time Equivalents (By Jurisdiction Population)



Another way of comparing agency staffing across different park and recreation agencies examines number of staff per 10,000 residents. These comparative numbers hold fairly steady across population sizes with the median for all agencies at 8.1 FTEs.

Figure E5. Park and Recreation Agency FTEs Per 10,000 Residents



Capital and Operating Expenses

For capital expenses, the typical park agency:

- Dedicates about 55% to renovation projects and 32% to new development projects.
- Plans to spend about $5,000,000 million on capital expenditures over the next five years.

For operations, the typical park agency spends:

- $4.3 million per year on total operating expenses
- $7,000 on annual operating expenses per acre of park and non-park sites managed by the agency
- $81.00 on annual operating expenses per capita
- $97,000 in annual operating expenditures per employee
- 54% of the annual operating budget on personnel costs, 38% on operating expenses, and 5% on capital expenses not included in the agency's capital improvement plan (CIP)
- 44% of its operating budget on park management and maintenance, 43% on recreation, and 13% on other activities

2020 State of the Industry Report

Recreation Management magazine's *2020 Report on the State of the Managed Recreation Industry* summarizes the opinions and information provided by a wide range of professionals (with an average 22.3 years of experience) working in the recreation, sports, and fitness industry. Given the emerging COVID-19 pandemic, Recreation Management also conducted a supplemental survey in May 2020 to learn about both the impacts to the industry and what mitigation steps organizations were taking in response.

Partnerships

The 2020 report indicated that most (89%) recreation, sports, and fitness facility owners form partnerships with other organizations as a means of expanding their reach, offering additional programming opportunities or as a way to share resources and increase funding. Local schools are shown as the most common partner (64%) for all facility types. Youth-serving organizations (Ys, JCC, Boys & Girls Clubs) and park and recreation organizations were the most likely to report that they had partnered with outside organizations, at 100% and 95% respectively.

Revenue Outlook

In January 2020, half of respondents expected revenues to increase in both 2020 and 2021. Survey respondents from urban communities are more optimistic about revenue increases as compared to rural respondents.

In last year's report, parks respondents had reported increases in their average operating expenditures with operating costs that grew by 14% between fiscal year 2018 and 2019. Respondents generally expected their operating expenses to continue to increase between 2019 and 2021, with camps expecting a 10% increase, recreation centers at 8%, and parks at 6%.

Relative to costs and revenues, few facilities covered by the survey reported that they cover more than 75% of their operating costs via revenue. The percentage recovered varied with type of organization with the average percentage of costs recovered for all respondents hovering near 50% and private for-profit organizations achieving the highest cost recovery rates. For parks, the cost recovery rate remained steady at 44%.

Over the past decades, public park and recreation departments and districts have faced a growing expectation that facilities can be run like businesses. Many local facilities are expected to recover much of their operating costs via revenues. While this is the business model of for-profit facilities like health clubs, it is a relatively recent development for publicly owned facilities, which have typically been subsidized via tax dollars and other funding sources. Most recreation providers (81%) have been taking actions to reduce expenditures. Cost recovery actions typically involve reduction in expenses with improving energy efficiency as the most common action (51% of respondents). Increased fees and staffing cost reductions and putting off construction or renovation plans were reported as other common methods for reducing operating costs.

As of May 2020, nearly 90% of respondents anticipated that total revenues would decline in 2020 due to the COVID-19 pandemic. Most anticipated a revenue drop of 30-50%, though one in seven expected a decline of more than 50%. In general, respondents are split on when they expect that revenues will begin to recover – 44% believe revenues will begin to rebound in 2021 while 40% expect further revenue declines.

Facility Use

The majority of respondents reported an increase in use of their recreational facilities as of January 2020. Looking forward, more than half of respondents (53%), including 60-65% of park and recreation centers, were expecting to see further increases in the number of people using their facilities over the next two years.

In 2020, 22% of respondents said they were planning to add more staff at their facilities, 75% were planning to maintain existing staffing levels, and 3% were planning to reduce staffing. The May 2020 survey found, however, that nearly half of responding organizations had laid off or furloughed staff due to the impacts of COVID-19 and nearly two-thirds had suspended hiring plans.

Facilities and Improvements

Over the past seven years, the percentage of respondents who indicate that they have plans for construction, whether new facilities or additions or renovations to their existing facilities, has grown steadily, from 62.7 percent in 2013 to 72.9 percent in 2020. Construction budgets have also risen. The average amount respondents were planning to spend on their construction plans was up 10.8% in 2020, after an 18.4% increase in 2019. On average, respondents to the 2020 survey were planning to spend $5.6 million on construction.

A majority of park department respondents (54%) reported plans to add features at their facilities and were also the most likely to be planning to construct new facilities in the next three years (39%).

The top 10 planned features for all facility types include:

1. Splash play areas (25.4% of those with plans to add features were planning to add splash play)
2. Playgrounds (20.3%)
3. Park shelters (17.3%)
4. Dog parks (17.1%)
5. Park restrooms (16.1%)
6. Synthetic turf sports fields (14.8%)
7. Walking and hiking trails (14.8%)
8. Fitness trails and outdoor fitness equipment (14.8%)
9. Disc golf courses (12.9%)
10. Outdoor sports courts (11.3%)

The COVID-19 pandemic is having a significant impact on construction plans. As of May 2020, over one-third (34%) of respondents had put construction on hold due to the impacts of the pandemic, rising costs, and supply shortages.

Programming

Nearly all respondents (97%) offer programming of some kind. The top 10 most commonly offered programs include: holiday events and other special events (provided by 65.3% of respondents); educational programs (59%); group exercise programs (58.8%); fitness programs (57.6%); day camps and summer camps (57.3%); youth sports teams (55.2%); mind-body balance programs such as yoga and tai chi (51.2%); adult sports teams (46%); arts and crafts programs (45.8%); and programs for active older adults (45.4%).

Respondents from community centers, parks and health clubs were the most likely to report that they had plans to add programs at their facilities over the next few years. The ten most commonly planned program additions were:

1. Fitness programs (24% of those who have plans to add programs)
2. Group exercise programs (22.4%)
3. Teen programs (22%)
4. Environmental education (21.8%)
5. Day camps and summer camps (20.9%)

6. Mind-body balance programs (20.5%)
7. Programs for active older adults (18.1%)
8. Special needs programs (17.9%)
9. Holidays and other special events (17.4%)
10. Arts and crafts (17%)

Addressing the COVID-19 pandemic required many respondents to either put programs or services on hold (82%) or cut programs or services entirely (34%). Additionally, many respondents have had to rethink their programming portfolios. Two-thirds of respondents (67%) had added online fitness and wellness programming as of May 2020, 39% were involved in programs to address food insecurity, and one in four was involved in programs to provide educational support to out-of-school children.

General Challenges

In January 2020, facility managers were asked about the challenges they anticipated impacting their facilities in the future. Generally, overall budgets are the top concern for most respondents including their ability to support equipment and facility maintenance needs (58%) and staffing (54%). Marketing, safety/risk management, and creating new and innovative programming also remain continuing challenges for facility managers. Facility managers also report that environmental and conservation issues (13%) and social equity and access (10%) are posing increasing challenges. However, as of May 2020, many respondents concerns had shifted to addressing the COVID-19 pandemic impacts described in the sections above.

2020 Outdoor Participation Report

Overall Participation

According to the 2020 Outdoor Participation Report, published by the Outdoor Foundation, just over half of Americans ages 6 and older participated in outdoor recreation at least once in 2019, the highest participation rate in five years. This increase was not universal, however, and there was significant variation in participation between age, gender, and racial groups.

Despite the overall increase in the percentage of Americans engaging in outdoor recreation, the total number of recreational outings declined in 2019. Outdoor participants went on a total of 10.9 billion outdoor outings in 2019 – a 12% drop from the 2012 high-water mark of 12.4 billion outings. In addition, the number of outings per participant declined 17% in the past five years, from 85 outings per participant in 2014 to 71 in 2019.

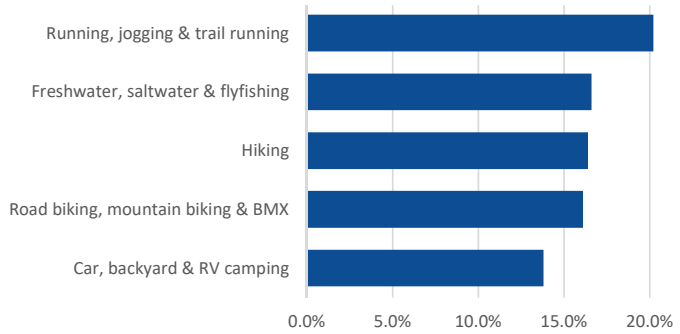
This drop mirrors a decline in the total number of outings per participant. Each year for over a decade, participants have engaged less often in outdoor activities. As a result, the percentage of ‘casual’ participants in outdoor recreation (i.e. those who participate one to 11 times per year) has grown by about 4% over the past 15 years, while the percentage of ‘core’ participants (i.e. weekly participants) has declined.

Figure E6. Frequency of Outdoor Outings: Trending Over Many Years

Frequency of Outdoor Outings	2007	2010	2013	2016	2019
Casual (1 to 11 times)	28.2%	27.9%	28.4%	31.7%	32.6%
Moderate (12 to 51 times)	32.5%	31.8%	33.1%	32.5%	32.6%
Core (52+ times)	39.3%	40.4%	38.5%	35.8%	34.9%

Running, jogging and trail running is the most popular outdoor activity by level of participation, as shown in the chart below, followed by fishing, hiking, biking and camping.

Figure E7. Most Popular Outdoor Activities by Participants, Nationwide



Youth Participation Declines

The youngest participants, children 6 to 17, were outdoors far less than in previous years. Their average outings fell from a high of 91 in 2012 to just 77 per child in 2019. Youth participation declined across the board in 2019, with the biggest declines seen in girls aged 18 to 24 (-5%) and boys ages 13 to 17 (-4%). Households with children, however, continue to drive growth in participation. Adults with children had much higher outdoor recreation participation rates (57%) than adults without children (44.4%).

Female Participation Continues to Grow

In 2019, women made up 46% of participants in outdoor recreation while men made up 53.8%, representing the smallest gender gap measured in the report's history. Women's participation has increased from 43% of all participants in 2009 to 46% in 2019.

Diversity Gap Remains

Despite increases in participation, Black/African American and Hispanic Americans continue to be significantly underrepresented in outdoor recreation. Hispanics made up 11.6% of outdoor recreation participants, a 35% shortfall relative to their proportion of the population ages 6 and over (17.9%). Similarly, Black/African Americans represented 12.4% of the U.S. population ages 6 and over in 2019, but just 9.4% of outdoor participants, a 24% participation deficit. Black youth were the least likely to participate in outdoor recreation as compared to Asian, Hispanic, and Caucasian youth – signaling a potential future gap in outdoor participants. However, those Black and Hispanic Americans who do participate in outdoor recreation do so frequently – more often, on average, than members of other racial groups.

In 2019, 62% of Asian Americans participated in outdoor recreation, followed by 53% of White, 48% of Hispanic, and 40% of Black/African Americans.

Impacts of COVID-19

An August 2020 report from the Outdoor Industry Association indicated that COVID-19 impacted recreation participation in April, May and June as Americans flocked to outdoor recreation amid COVID restrictions. Americans took up new activities in significant numbers with the biggest gains in running, cycling, and hiking given that these activities were widely considered the safest activities during pandemic shutdowns. The hardest hit activity segments during COVID shutdowns were team sports (down 69%) and racquet sports (down 55%). Reviewing just April, May and June 2020, participation rates for day hiking rose more than any other activity, up 8.4%.

2020 Sports, Fitness, and Leisure Activities Topline Participation Report

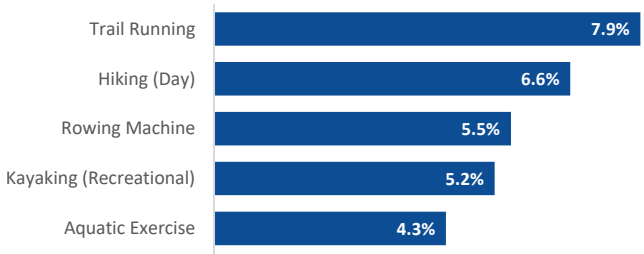
Prepared by a partnership of the Sports and Fitness Industry Association (SFIA) and the Physical Activity Council (PAC), this February 2020 participation report summarizes levels of activity and identifies key trends in sports, fitness, and recreation in the US. The report is based on over 18,000 online interviews of a nationwide sample that provides a high degree of statistical accuracy using strict quotas for gender, age, income, region, and ethnicity. The study looked at 122 different team and individual sports and outdoor activities.

Compared to 2014, eight million more Americans were casually active in 2019 indicating a positive movement toward an increasingly active population. Sports that made great strides in the last six years include trail running, cardio tennis, BMX biking, and day hiking. Over the last year, only 2.1 million additional people reported participating in an activity that raises their heart rate for more than 30 minutes. Participation in active high calorie activities has remained flat for the last four years.

The percentage of people reporting no physical activity during the past year declined to 27% in 2019 - its lowest point in six years – continuing an increasing trend in activity. Rates of inactivity continue to be linked to household income levels, with lower income households having higher rates of inactivity. However, in 2019, households across the income spectrum saw declines in inactivity.

Fitness sports continue to be the most popular activity type for the 5th consecutive year. Other sports activities, including individual sports, racquet sports, and water sports have seen a modest decline in participation since 2018. Team sports experienced a slight increase in participation, driven by the increasing popularity of basketball and outdoor soccer. While racquet sports lost about 2% of participants since 2018, mostly due to declines in squash and badminton participation, the rising popularity of pickleball and cardio tennis may reverse this declining trend.

Figure E8. Total Participation Rate by Activity Category



When asked which activities they aspire to do, all age-groups and income levels tend to show interest in outdoor activities like fishing, camping, hiking, biking, bicycling, and swimming. Younger age groups are more interested in participating in team sports, such as soccer, basketball and volleyball, while older adults are more likely to aspire to individual activities like swimming for fitness, bird/nature viewing, and canoeing.

Physical education (PE) participation shows 96% of 6 to 12-year old youth and 82% of 13-17 year olds participated in PE in 2019. While younger children were more likely to participate in PE, older youth had higher average days of participation. Children were more than twice as likely to be inactive if they did not attend PE. Overall, all ages saw an increase in PE 2019. Participation in PE is thought to lead to an increase of active, healthy lifestyles in adulthood.

Figure E9. Sports with the Highest 5-year Increase in Participation

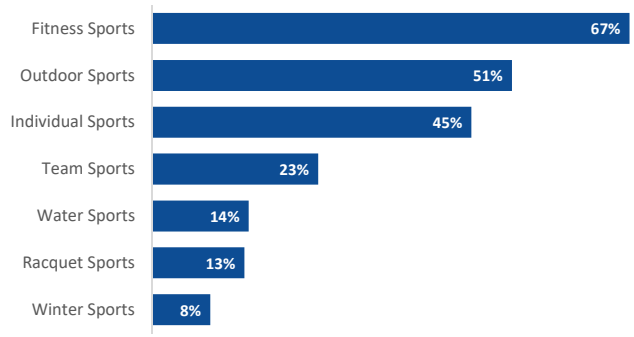
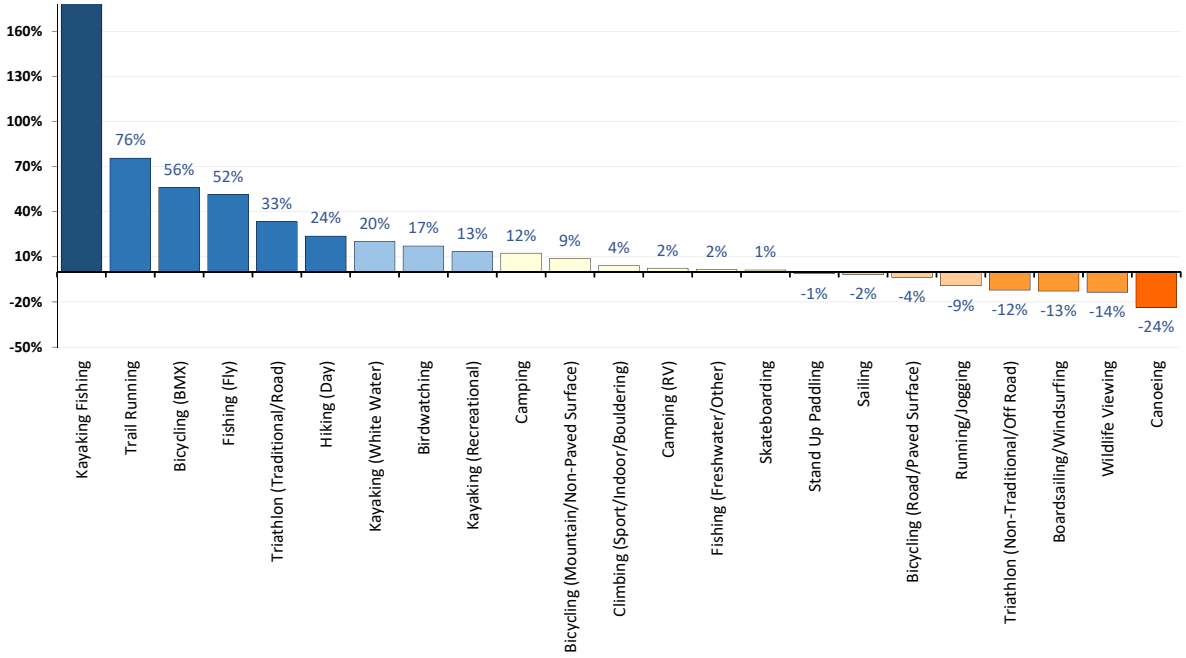


Figure E10. 5-Year Change in Outdoor Sports Participation



2020 Americans Engagement with Parks Survey

This annual study from the National Park and Recreation Association (NRPA) probes Americans' usage of parks, the key reasons that drive their use, and the greatest challenges preventing greater usage. Each year, the study examines the importance of public parks in Americans' lives, including how parks compare to other services and offerings of local governments. The survey of 1,000 American adults looks at frequency and drivers of parks/recreation facilities visits and the barriers that prevent greater enjoyment. Survey respondents also indicate the importance of how park and recreation plays in their decisions at the voting booth and their level of support for greater funding.

In 2020, NRPA conducted a shorter-than-typical Engagement survey because of the dynamic nature of life during the COVID-19 pandemic. The 2020 Study focused on the impacts of the COVID-19 pandemic on park and recreation usage, whether residents see public parks as an essential public service, and whether people vote for political leaders based on their support for park and recreation funding.

Key findings include:

- Eighty-two percent of U.S. adults agree that parks and recreation is essential.
- Seventy-seven percent of survey respondents indicate that having a high-quality park, playground, public open space or recreation center nearby is an important factor in deciding where they want to live.
- U.S. residents visit local park and recreation facilities more than twice a month on average.
- Three in five U.S. residents — more than 190 million people — visited a park, trail, public open space or other recreation facility at least once during the first three months of the pandemic (mid-March through mid-June 2020).

Impacts of the COVID-19 Pandemic

According to the Americans Engagement with Parks report,

> "In many communities across the nation, parks, trails and other public open spaces have been crucial resources available to people seeking a brief respite from the public health crisis. As businesses shut down operations during the spring, many parks and trails remained open, providing people with opportunities to safely enjoy outdoor physical activity with its many attendant physical and mental health benefits. According to NRPA Parks Snapshot Survey data (nrpa.org/ ParksSnapshot), 83 percent of park and recreation agencies kept some/all of their parks open during the initial wave of COVID-19 infections in April 2020, while 93 percent did the same with some/all of their trail networks.
>
> Consequently, people flocked to their local parks, trails and other public open spaces. Three in five U.S. residents — more than 190 million people — visited a park, trail, public open space or other recreation facility at least once during the first three months of the pandemic — from mid-March through mid-June 2020. Park and recreation usage was particularly strong among GenZers, Millenials, Gen Xers, parents, people who identify as Hispanic/Latinx and those who identify as nonwhite.
>
> As has been the case with virtually every aspect of life, the COVID-19 pandemic has altered the frequency with which most people engage with their local park and recreation amenities. Still, slightly more than half of people have been visiting parks, trails and other public open space amenities as often — if not more often — since the start of the pandemic than they had during the same period in 2019. Twenty-seven percent of U.S. residents report that their use of parks, trails and other public open spaces increased during the first three months of the pandemic relative to the same period in 2019. A quarter of survey respondents indicates their park and recreation usage during the period from mid-March to mid- June 2020 matched that of the same three months in 2019. Forty-eight percent of people report that their usage of parks, trails and public open spaces declined during the early months of the pandemic."

Washington State Recreation and Conservation Plan

The 2018-2022 Recreation and Conservation Plan for Washington State provides a strategic direction to help assure the effective and adequate provision of outdoor recreation and conservation to meet the needs of Washington State residents. The plan identifies the following five near and long-term priority areas and establishes specific actions within each priority to help meet the outdoor recreation and conservation needs within the state:

1. Sustain and Grow the Legacy of Parks, Trails, and Conservation Lands
2. Improve Equity of Parks, Trails, and Conservation Lands

3. Meet the Needs of Youth
4. Plan for Culturally Relevant Parks and Trails to Meet Changing Demographics
5. Assert Recreation and Conservation as a Vital Public Service

Sustain & Grow the Legacy

A wealth of existing recreation and conservation areas and facilities should be kept open, safe, and enjoyable for all. Some modifications to meet the interests of today's population may be needed at some facilities. Sustaining existing areas while expanding and building new facilities to keep up with a growing population is one of the five priority goals.

Improve Equity

The National Recreation and Park Association's position on social equity states:

> "Our nation's public parks and recreation services should be equally accessible and available to all people regardless of income level, ethnicity, gender, ability, or age. Public parks, recreation services and recreation programs including the maintenance, safety, and accessibility of parks and facilities, should be provided on an equitable basis to all citizens of communities served by public agencies."

The Washington plan restates that equity goal for all its citizens. Improving equity is also a strategy for improving a community's health. Current statewide participation rates in outdoor activities were surveyed as part of the plan.

Figure E11. Participation Rates for Washington Residents in Outdoor Activities

Participation Rates for Top 12 Categories	
Activity	**%**
Walking	94%
Nature activities	89%
Leisure activities at parks	82%
Swimming	68%
Sightseeing activities	67%
Hiking	61%
Outdoor sports	48%
Water-based activities (freshwater)	46%
Camping	45%
Trending activities	33%
Snow and ice activities	30%
Bicycling	28%

Get Youth Outside

Washington State youth participate in outdoor activities to a greater extent than youth nationally. Park and recreation providers are urged to offer a variety of outdoor activities for youth and to support youth programs. Most youth are walking, playing at a park, trying new or trending activities, fishing in freshwater, exploring nature, and riding bikes. Other activities of interest to youth are activities in freshwater such as boating and paddling, fishing in saltwater, target shooting, hiking, outdoor sports, and riding off-road vehicles.

Figure E12. Youth Participation Rates for Washington Residents in Outdoor Activities

Youth Participation Rates Activity	%
Walking	88%
Leisure in parks	78%
Trending activities	77%
Fishing in freshwater	77%
Nature-based activities	75%
Bicycling	74%
Freshwater-based activities*	66%
Target shooting	62%
Hiking	57%
Outdoor sports	57%
Off-road vehicle riding	57%
Fishing in saltwater	53%

*(not swimming)

Plan for Culturally Relevant Parks and Trails to Meet Changing Demographics

Washington's population is expected to grow by 2 million people by 2040 leading to more congestion and competition for recreation resources. Between 2010-2040, the percent of people of color are expected to increase from 27 percent to 44 percent. With the cultural change in the population, preferred recreational activities also will change. By 2030, more than one of every five Washingtonians will be 65 years old or older. By 2040, there will be more seniors than youth. Park and recreation providers should be prepared to create new and diverse opportunities and accommodate the active senior population.

Assert Recreation and Conservation as a Vital Public Service

The plan recognizes that outdoor recreation contributes to a strong economy and is a public investment like other public services and infrastructure. The report cites the Outdoor Industry Association and other economic studies that reinforce the importance of park and recreation services locally, regionally and statewide.

2019 Special Report on Paddlesports & Safety

In 2019, the Outdoor Foundation produced a report focused on paddlesports data based on a participation survey (over 20,000 online interviews with a nationwide sample of individuals and households). In 2018, 22.9 million Americans (approximately 7.4% of the population) participated in paddle sports. This represents an increase of more than 4 million participants since the study began in 2010. Over the last five years, there continues to be an increase in paddlesports popularity among outdoor enthusiasts, with significant portions of the nationwide growth occurring in the Pacific region.

Recreational kayaking continues to grow in popularity but may be driving some of the decline in canoeing. The popularity of stand-up paddling has soared, increasing by 1.5 million participants over the past five years, though it does not have nearly as high a participation rate as either recreational kayaking or canoeing.

Most paddlers are Caucasian, other racial and ethnic groups are largely under-represented. However, Caucasian participation has remained relatively flat while participation by people identifying as Hispanic

or Black/African American has grown by 0.5% to 1% per year since 2013. This growth has led to more than 773,000 new Hispanic paddlers in just six years, signaling the importance and potential of engaging minority groups in paddlesports.

One in eight paddlers have been participating in the sport for 21 years or more. However, many participants – between thirty and sixty percent, depending on the discipline – tried a paddlesport for the first time in 2018. Such high levels of first-time participation may produce longer term growth in paddling, assuming participants continue to enjoy the sport.

Among adult paddlers, most participate for excitement and adventure, for exercise, or to be close to nature. Kayakers, rafters, canoers and stand-up paddlers often enjoy, or would be willing to try, other paddlesports. Many also enjoy similar outdoor "crossover" activities such as hiking, camping, walking, and nature viewing.



Appendix F
Implementation Tools

LOCAL FUNDING OPTIONS

The City of Camas possesses a range of local funding tools that could be accessed for the benefit of growing, developing, and maintaining its parks and recreation facilities and programs. The sources listed below represent potential funding sources, but some also may be dedicated for numerous other local purposes which limit applicability and usage. Therefore, discussions with City leadership are critical to assess the political landscape to modify or expand the use of existing City revenue sources in favor of park and recreation programs.

Councilmanic Bonds

Councilmanic general obligation bonds may be sold by cities without public vote. The bonds, both principal and interest, are retired with payments from existing city revenue or new general tax revenue, such as additional sales tax or real estate excise tax. The state constitution has set a maximum debt limit for councilmanic bonds of 1½% of the assessed value of taxable property in the city.

Voted General Obligation Bond

For the purposes of funding capital projects, such as land acquisitions or facility construction, cities and counties have the authority to borrow money by selling bonds. Voter-approved general obligation bonds may be sold only after receiving a 60 percent majority vote at a general or special election. If approved, an excess property tax is levied each year for the life of the bond to pay both principal and interest. The maximum debt limit for voted debt is 2.5% of the assessed value of taxable property in the city. The state constitution (Article VIII, Section 6) limits total combined debt to 5% of the total assessed value of property in the jurisdiction.

Property Tax Excess Levy – One Year Only

Cities and counties that are levying their statutory maximum rate can ask the voters, at any special election date, to raise their rate for one year (RCW 84.52.052). As this action increases revenue for one-year at a time, it is wise to request this type of funding for one-time uses only. Majority approval by voters is required.

Regular Property Tax - Lid Lift

Cities are authorized to impose ad valorem taxes upon real and personal property. A city's maximum levy rate for general purposes is $3.375 per $1,000 of assessed valuation. Limitations on annual increases in tax collections, coupled with changes in property value, causes levy rates to rise or fall; however, in no case may they rise above statutory limits. Once the rate is established each year, it may not be raised without the approval of a majority of the voters. Receiving voter approval is known as a lid lift. A lid lift may be permanent, or may be for a specific purpose and time period.

A levy lid lift is an instrument for increasing property tax levies for operating and/or capital purposes. Taxing districts with a tax rate that is less than their statutory maximum rate may ask the voters to "lift" the levy lid by increasing the tax rate to some amount equal to or less than their statutory maximum rate. A simple majority vote of citizenry is required.

Cities and counties have two "lift" options available to them: Single-year/basic or Multi-year.

Single-year: The single-year lift does not mean that the lift goes away after one year; it can be for any amount of time, including permanently, unless the proceeds will be used for debt service on bonds, in which case the maximum time period is nine years. Districts may permanently increase the levy but must use language

in the ballot title expressly stating that future levies will increase as allowed by chapter 84.55 RCW. After the initial "lift" in the first year, the district's levy in future years is subject to the 101 percent lid in chapter 84.55 RCW. This is the maximum amount it can increase without returning to the voters for another lid lift.

The election to implement a single-year lift may take place on any election date listed in RCW 29A.04.321.

Multi-year: The multi-year lift allows the levy lid to be "bumped up" each year for up to a maximum of six years. At the end of the specified period, the levy in the final period may be designated as the basis for the calculation of all future levy increases (in other words, be made permanent) if expressly stated in the ballot title. The levy in future years would then be subject to the 101 percent lid in chapter 84.55 RCW.

In a multi-year lift, the lift for the first year must state the new tax rate for that year. For the ensuing years, the lift may be a dollar amount, a percentage increase tied to an index, or a percentage amount set by some other method. The amounts do not need to be the same for each year. If the amount of the increase for a particular year would require a tax rate that is above the maximum tax rate, the assessor will levy only the maximum amount allowed by law.

The election to implement a multi-year lift must be either the August primary or the November general election.

The single-year lift allows supplanting of expenditures within the lift period; the multi-year left does not, and the purpose for the lift must be specifically identified in the election materials. For both single- and multi-year lifts, when the lift expires the base for future levies will revert to what the dollar amount would have been if no lift had ever been done.

The total regular levy rate of senior taxing districts (counties and cities) and junior taxing districts (fire districts, library districts, etc.) may not exceed $5.90/$1,000 AV. If this limit is exceeded, levies are reduced or eliminated in the following order until the total tax rate is at $5.90.

1st.	Parks & Recreation Districts (up to $0.60)
	Parks & Recreation Service Areas (up to $0.60)
	Cultural Arts, Stadiums & Convention Districts (up to $0.25)
2nd.	Flood Control Zone Districts (up to $0.50)
3rd.	Hospital Districts (up to $0.25)
	Metropolitan Parks Districts (up to $0.25)
	All other districts not otherwise mentioned
4th.	Metropolitan Park Districts formed after January 1, 2002 or after (up to $0.50)
5th.	Fire Districts (up to $0.25)
6th.	Fire Districts (remaining $0.50)
	Regional Fire Protection Service Authorities (up to $0.50)
	Library Districts (up to $0.50)
	Hospital Districts (up to $0.50)
	Metropolitan Parks Districts formed before January 1, 2002 (up to $0.50)

Sales Tax

Paid by the consumer, sales tax is a percentage of the retail price paid for specific classifications of goods and services within the State of Washington.

Governing bodies of cities and counties may impose sales taxes within their boundaries at a rate set by state statute and local ordinances, subject to referendum.

Until the 1990 Legislative Session, the maximum possible total sales tax rate paid by purchasers in cities was 8.1 percent. The 8.1 percent is allocated as follows: State, 6.5 cents on the dollar; counties, 0.15 cents; cities, 0.85 cents; and transit districts, a maximum of 0.6 cents (raised to 0.9 cents in 2000). Since then multiple sales options were authorized. Those applicable to Parks and Recreation include: counties may ask voters to approve a sales tax of up to 0.3 percent, which is shared with cities. At least one-third of the revenue must be used for criminal justice purposes.

Counties and cities may also form public facilities districts, and these districts may ask the voters to approve a sales tax of up to 0.2 percent. The proceeds may be used for financing, designing, acquisition, construction, equipping, operating, maintaining, remodeling, repairing, and re-equipping its public facilities.

Revenue may be used to fund any essential county and municipal service.

If a jurisdiction is going to change a sales tax rate or levy a new sales tax, it must pass an ordinance to that effect and submit it to the Department of Revenue at least 75 days before the effective date. The effective date must be the first day of a quarter: January 1, April 1, July 1 or October 1.

Business and Occupation Tax

Business and occupation (B&O) taxes are excise taxes levied on different classes of business to raise revenue. Taxes are levied as a percentage of the gross receipts of a business, less some deductions. Businesses are put in different classes such as manufacturing, wholesaling, retailing, and services. Within each class, the rate must be the same, but it may differ among classes. Cities can impose this tax for the first time or raise rates following referendum procedure.

B&O taxes are limited to a maximum tax rate that can be imposed by a city's legislative body at 0.2 percent (0.002), but grandfathered in any higher rates that existed on January 1, 1982. Any city may levy a rate higher than 0.2 percent, if it is approved by a majority of voters (RCW 35.21.711). Beginning January 1, 2008, cities that levy the B&O tax must allow for allocation and apportionment, as set out in RCW 35.102.130.

Admissions Tax

An admissions tax is a use tax for entertainment. Both cities and counties may impose this tax through legislative action.

Cities and/or counties may levy an admission tax in an amount no greater than five percent of the admission charge, as is authorized by statute (cities: RCW 35.21.280; counties: RCW 35.57.100). This tax can be levied on admission charges (including season tickets) to places such as theaters, dance halls, circuses, clubs that have cover charges, observation towers, stadiums, and any other activity where an admission charge is made to enter the facility.

If a city imposes an admissions tax, the county may not levy a tax within city boundaries.

The statutes provide an exception for admission to elementary or secondary school activities. Generally, certain events sponsored by nonprofits are exempted from the tax; however, this is not a requirement. Counties also exempt any public facility of a public facility district for which admission is imposed. There are no statutory restrictions on the use of revenue.

Impact Fees

Development impact fees are charges placed on new development in unimproved areas to help pay for various public facilities that serve new development or for other impacts associated with such development. Both cities and counties may impose this tax through legislative action.

Counties that plan under the GMA, and cities, may impose impact fees on residential and commercial development activity to help pay for certain public facility improvements, including parks, open space, and recreation facilities identified in the county's capital facilities plan. The improvements financed from impact fees must be reasonably related to the new development and must reasonably benefit the new development. The fees must be spent or encumbered within ten years of collection. Camas currently assesses a parks impact fee and also utilizes impact fee credits as a tool to work with local developers.

Real Estate Excise Tax

Excise tax levied on all sales of real estate, measured by the full selling price, including the amount of any liens, mortgages, and other debts given to secure the purchase. Both cities and counties may impose this tax through legislative action.

Counties and cities may levy a quarter percent tax (REET 1); a second quarter percent tax (REET 2) is authorized. First quarter percent REET (REET 1) must be spent on capital projects listed in the city's capital facilities plan element of their comprehensive plan. Capital projects include planning, acquisition, construction, reconstruction, repair, replacement, rehabilitation, or improvement of parks, recreational facilities, and trails.

The second quarter percent REET (REET 2) must also be spent on capital projects, which includes planning, construction, reconstruction, repair, rehabilitation, or improvement of parks. Acquisition of land for parks is not a permitted use of REET 2. Both REET 1 and REET 2 may be used to make loan and debt service payments on projects that are a permitted use of these funds. The City of Camas currently assesses both REETs and uses this funding for a variety of capital project needs.

Lodging Tax

The lodging tax is a user fee for hotel/motel occupation. Both cities and counties may impose this tax through legislative action.

Cities and/or counties may impose a "basic" two percent tax under RCW 67.28.180 on all charges for furnishing lodging at hotels, motels and similar establishments for a continuous period of less than one month.

This tax is taken as a credit against the 6.5 percent state sales tax, so that the total tax that a patron pays in retail sales tax and hotel-motel tax combined is equal to the retail sales tax in the jurisdiction. In addition, jurisdictions may levy an additional tax of up to two percent, or a total rate of four percent, under RCW 67.28.181(1). This is not credited against the state sales tax. Therefore, if this tax is levied, the total tax on the lodging bill will increase by two percent.

If both a city and the county are levying this tax, the county must allow a credit for any tax levied by a city so that no two taxes are levied on the same taxable event. These revenues must be used solely for paying for tourism promotion and for the acquisition and/or operating of tourism-related facilities. "Tourism" is defined as economic activity resulting from tourists, which may include sales of overnight lodging, meals, tours, gifts, or souvenirs; there is no requirement that a tourist must stay overnight.

Conservation Futures Tax (Clark County)

The Conservation Futures Tax (CFT) is provided for in Chapter 84.34 of the Revised Code of Washington. Clark County imposes a Conservation Futures levy for the purpose of acquiring open space lands, including green spaces, greenbelts, wildlife habitat and trail rights-of-way proposed for preservation for public use by either the county or the cities within the county. Funds are allocated annually, and cities within the county, citizen groups and citizens may apply for funds through the county's process. The CFT program provides grants

to cities to support open space priorities in local plans and is administered by the County's Legacy Lands Program in the Parks & Lands Division of Public Works.

FEDERAL & STATE GRANTS AND CONSERVATION PROGRAMS

RIVERS, TRAILS AND CONSERVATION ASSISTANCE PROGRAM

The Rivers, Trails and Conservation Assistance Program, also known as the Rivers & Trails Program or RTCA, is a technical assistance resource for communities administered by the National Park Service and federal government agencies so they can conserve rivers, preserve open space and develop trails and greenways. The RTCA program implements the natural resource conservation and outdoor recreation mission of NPS in communities across America.

RECREATION AND CONSERVATION OFFICE GRANT PROGRAMS

The Recreation and Conservation Office was created in 1964 as part of the Marine Recreation Land Act. The RCO grants money to state and local agencies, generally on a matching basis, to acquire, develop, and enhance wildlife habitat and outdoor recreation properties. Some money is also distributed for planning grants. RCO grant programs utilize funds from various sources. Historically, these have included the Federal Land and Water Conservation Fund, state bonds, Initiative 215 monies (derived from un-reclaimed marine fuel taxes), off-road vehicle funds, Youth Athletic Facilities Account and the Washington Wildlife and Recreation Program.

Aquatic Lands Enhancement Account (ALEA)

This program, managed through the RCO, provides matching grants to state and local agencies to protect and enhance salmon habitat and to provide public access and recreation opportunities on aquatic lands. In 1998, DNR refocused the ALEA program to emphasize salmon habitat preservation and enhancement. However, the program is still open to traditional water access proposals. Any project must be located on navigable portions of waterways. ALEA funds are derived from the leasing of state-owned aquatic lands and from the sale of harvest rights for shellfish and other aquatic resources.

Washington Wildlife & Recreation Program (WWRP)

Funding sources managed by the RCO include the Washington Wildlife and Recreation Program. The WWRP is divided into Habitat Conservation and Outdoor Recreation Accounts; these are further divided into several project categories. Cities, counties and other local sponsors may apply for funding in urban wildlife habitat, local parks, trails and water access categories. Funds for local agencies are awarded on a matching basis. Grant applications are evaluated once each year, and the State Legislature must authorize funding for the WWRP project lists.

Land and Water Conservation Fund (LWCF)

The Land and Water Conservation Fund (LWCF) provides grants to buy land and develop public outdoor facilities, including parks, trails and wildlife lands. Grant recipients must provide at least 50% matching funds in either cash or in-kind contributions. Grant program revenue is from a portion of Federal revenue derived from sale or lease of off-shore oil and gas resources.

National Recreational Trails Program

The National Recreational Trails Program (NRTP) provides funds to maintain trails and facilities that provide a backcountry experience for a range of activities including hiking, mountain biking, horseback

riding, motorcycling, and snowmobiling. Eligible projects include the maintenance and re-routing of recreational trails, development of trail-side and trail-head facilities, and operation of environmental education and trail safety programs. A local match of 20% is required. This program is funded through Federal gasoline taxes attributed to recreational non-highway uses.

Youth Athletic Facilities (YAF) Program

The YAF provides grants to develop, equip, maintain, and improve youth and community athletic facilities. Cities, counties, and qualified non-profit organizations may apply for funding, and grant recipients must provide at least 50% matching funds in either cash or in-kind contributions.

OTHER TOOLS & OPTIONS

Metropolitan Park District

Metropolitan park districts may be formed for the purposes of management, control, improvement, maintenance and acquisition of parks, parkways and boulevards. In addition to acquiring and managing their own lands, metropolitan districts may accept and manage park and recreation lands and equipment turned over by any city within the district or by the county. Formation of a metropolitan park district may be initiated in cities of five thousand population or more by city council ordinance, or by petition, and requires majority approval by voters for creation. Several years ago, the City started a preliminary look at the MPD as a tool for Camas Parks and Recreation. With some existing information, the City could continue evaluation of MPD along with other implementation tools to develop their long-term funding strategy.

Park and Recreation District

Park and recreation districts may be formed for the purposes of providing leisure-time activities and recreation facilities (parks, playgrounds, pools, golf courses, paths, community centers, arboretums, campgrounds, boat launches, etc.) and must be initiated by petition of at least 15% percent of the registered voters within the proposed district. Upon completion of the petition process and review by county commissioners, a proposition for district formation and election of five district commissioners is submitted to the voters of the proposed district at the next general election. Once formed, park and recreation districts retain the authority to propose a regular property tax levy, annual excess property tax levies and general obligation bonds. All three of these funding types require 60% percent voter approval and 40% percent voter turnout. With voter approval, the district may levy a regular property tax not to exceed sixty cents per thousand dollars of assessed value for up to six consecutive years.

Park and Recreation Service Area (PRSA)

A quasi-municipal corporation with independent taxing authority whose purpose is to finance, acquire, construct, improve, maintain or operate any park, senior citizen activities center, zoo, aquarium and/or recreation facilities; and to provide higher level of park service.

Sponsorships / Donations / Naming Rights

Business sponsorships for programs may be available throughout the year. In-kind contributions are often received, including food, door prizes and equipment/material. Naming rights could be considered for substantial gifts and may have time limitations, depending on local policy.

Interagency Agreements

State law provides for interagency cooperative efforts between units of government. Joint acquisition, development and/or use of park and open space facilities may be provided between Parks, Public Works and utility providers.

Private Grants, Donations & Gifts

Many trusts and private foundations provide funding for park, recreation and open space projects. Grants from these sources are typically allocated through a competitive application process and vary dramatically in size based on the financial resources and funding criteria of the organization. Philanthropic giving is another source of project funding. Efforts in this area may involve cash gifts and include donations through other mechanisms such as wills or insurance policies. Community fundraising efforts can also support park, recreation or open space facilities and projects.

ACQUISITION TOOLS & METHODS

Direct Purchase Methods

Market Value Purchase

Through a written purchase and sale agreement, the city purchases land at the present market value based on an independent appraisal. Timing, payment of real estate taxes and other contingencies are negotiable.

Partial Value Purchase (or Bargain Sale)

In a bargain sale, the landowner agrees to sell for less than the property's fair market value. A landowner's decision to proceed with a bargain sale is unique and personal; landowners with a strong sense of civic pride, long community history or concerns about capital gains are possible candidates for this approach. In addition to cash proceeds upon closing, the landowner may be entitled to a charitable income tax deduction based on the difference between the land's fair market value and its sale price.

Life Estates & Bequests

In the event a landowner wishes to remain on the property for a long period of time or until death, several variations on a sale agreement exist. In a life estate agreement, the landowner may continue to live on the land by donating a remainder interest and retaining a "reserved life estate." Specifically, the landowner donates or sells the property to the city, but reserves the right for the seller or any other named person to continue to live on and use the property. When the owner or other specified person dies or releases his/her life interest, full title and control over the property will be transferred to the city. By donating a remainder interest, the landowner may be eligible for a tax deduction when the gift is made. In a bequest, the landowner designates in a will or trust document that the property is to be transferred to the city upon death. While a life estate offers the city some degree of title control during the life of the landowner, a bequest does not. Unless the intent to bequest is disclosed to and known by the city in advance, no guarantees exist with regard to the condition of the property upon transfer or to any liabilities that may exist.

Gift Deed

When a landowner wishes to bequeath their property to a public or private entity upon their death, they can record a gift deed with the county assessors office to insure their stated desire to transfer their property to the targeted beneficiary as part of their estate. The recording of the gift deed usually involves the tacit agreement of the receiving party.

Option to Purchase Agreement

This is a binding contract between a landowner and the city that would only apply according to the conditions of the option and limits the seller's power to revoke an offer. Once in place and signed, the Option Agreement may be triggered at a future, specified date or upon the completion of designated conditions. Option Agreements can be made for any time duration and can include all of the language pertinent to closing a property sale.

Right of First Refusal

In this agreement, the landowner grants the city the first chance to purchase the property once the landowner wishes to sell. The agreement does not establish the sale price for the property, and the landowner is free to refuse to sell it for the price offered by the city. This is the weakest form of agreement between an owner and a prospective buyer.

Conservation and/or Access Easements

Through a conservation easement, a landowner voluntarily agrees to sell or donate certain rights associated with his or her property (often the right to subdivide or develop), and a private organization or public agency agrees to hold the right to enforce the landowner's promise not to exercise those rights. In essence, the rights are forfeited and no longer exist. This is a legal agreement between the landowner and the city that permanently limits uses of the land in order to conserve a portion of the property for public use or protection. The landowner still owns the property, but the use of the land is restricted. Conservation easements may result in an income tax deduction and reduced property taxes and estate taxes. Typically, this approach is used to provide trail corridors where only a small portion of the land is needed or for the strategic protection of natural resources and habitat. Through a written purchase and sale agreement, the city purchases land at the present market value based on an independent appraisal. Timing, payment of real estate taxes and other contingencies are negotiable.

Park or Open Space Dedication Requirements

Local governments have the option to require developers to dedicate land for parks under the State Subdivision Law (Ch. 58.17 RCW) and the State Environmental Policy Act (SEPA) (Ch. 43.21C RCW). Under the subdivision law developers can be required to provide the parks/recreation improvements or pay a fee in lieu of the dedicated land and its improvements. Under the SEPA requirements, land dedication may occur as part of mitigation for a proposed development's impact.

Landowner Incentive Measures

Density Bonuses

Density bonuses are a planning tool used to encourage a variety of public land use objectives, usually in urban areas. They offer the incentive of being able to develop at densities beyond current regulations in one area, in return for concessions in another. Density bonuses are applied to a single parcel or development. An example is allowing developers of multi-family units to build at higher densities if they provide a certain number of low-income units or public open space. For density bonuses to work, market forces must support densities at a higher level than current regulations.

Transfer of Development Rights

The transfer of development rights (TDR) is an incentive-based planning tool that allows land owners to trade the right to develop property to its fullest extent in one area for the right to develop beyond existing regulations in another area. Local governments may establish the specific areas in which development may

be limited or restricted and the areas in which development beyond regulation may be allowed. Usually, but not always, the "sending" and "receiving" property are under common ownership. Some programs allow for different ownership, which, in effect, establishes a market for development rights to be bought and sold.

IRC 1031 Exchange

If the landowner owns business or investment property, an IRC Section 1031 Exchange can facilitate the exchange of like-kind property solely for business or investment purposes. No capital gain or loss is recognized under Internal Revenue Code Section 1031 (see www.irc.gov for more details). This option may be a useful tool in negotiations with an owner of investment property, especially if the tax savings offset to the owner can translate to a sale price discount for the City.

Current (Open Space) Use Taxation Programs

Property owners whose current lands are in open space, agricultural, and/or timber uses may have that land valued at their current use rather than their "highest and best" use assessment. This differential assessed value, allowed under the Washington Open Space Taxation Act (Ch.84.34 RCW) helps to preserve private properties as open space, farm or timber lands. If land is converted to other non-open space uses, the land owner is required to pay the difference between the current use annual taxes and highest/best taxes for the previous seven years. When properties are sold to a local government or conservation organization for land conservation/preservation purposes, the required payment of seven years worth of differential tax rates is waived. The amount of this tax liability can be part of the negotiated land acquisition from private to public or quasi-public conservation purposes. Clark County has a current use taxation program that offer this property tax reduction as an incentive to landowners to voluntarily preserve open space, farmland or forestland on their property.

OTHER LAND PROTECTION OPTIONS

Land Trusts & Conservancies

Land trusts are private non-profit organizations that acquire and protect special open spaces and are traditionally not associated with any government agency. Columbia Land Trust is the regional land trust serving the Camas area, and their efforts have led to the conservation of more than 50,000 acres of forests, shorelines, parks and natural areas in the region. Other national organizations with local representation include the Nature Conservancy, Trust for Public Land and the Wetlands Conservancy.

Regulatory Measures

A variety of regulatory measures are available to local agencies and jurisdictions. Available programs and regulations include: Critical Areas Ordinance, Camas; State Environmental Policy Act (SEPA); Shorelines Management Program; and Hydraulic Code, Washington State Department of Fisheries and Department of Wildlife.

Public / Private Utility Corridors

Utility corridors can be managed to maximize protection or enhancement of open space lands. Utilities maintain corridors for provision of services such as electricity, gas, oil, and rail travel. Some utility companies have cooperated with local governments for development of public programs such as parks and trails within utility corridors.



Appendix G
Site Acquisition & Development Guidelines

ACQUISITION GUIDELINES

Planning and land acquisition for future parks is a recognized component in land use and urban growth management, since the provision of parks and open space is considered essential to the livability of urban areas. For the recreation resource planner, the land acquisition process is an important task for ensuring the availability of future recreation resources for the majority of the community. The established planning goals for a community's comprehensive plan recognize the development of parks and retention of open space with conservation values as a tool for managing the effects of increased density and fostering livability.

Specific Site Suitability for Developed/Active Parks

While existing neighborhood parks may range from 2.3 to 10 acres in size, some basic location and land characteristics influence how accessible, "developable" and convenient a potential site might be for a future public park. Evaluating a potential land parcel should include consideration of the following property features:

- Access and visibility to the property. An adequate amount of public right-of-way is needed to allow for creating bike/pedestrian pathways, at a minimum, and either on-street parking or a parking lot for park visitors who must drive a vehicle.
- Existing publicly owned lands, easements and right-of-way. Are there existing lands under public ownership that could be converted to public park use? What other public amenities are proximate and complementary to a future park development (e.g., schools, police stations, etc.)?
- Connectivity to trails, schools, parks, neighborhoods and connectivity of the trail links. Connections to and from related land uses can add value to a potential park location.
- Environmental constraints, field assessment (does not include Environmental Assessment level detail), regulatory and permitting requirements and GIS data for critical areas. Sensitive environmental lands should be protected, but often they are not the best sites for development of recreational amenities for public parks. Protected and conserved lands can provide complementary value to public parks, while the public park land can create a buffer for the conserved land.
- Topography. Existing landforms, whether flat or hilly, will influence the park's design and best fit for provision of recreational facilities.
- Technical analysis of park standards and development costs should be evaluated to help provide realistic site development costs. For example, existing road improvements within the public right-of-way or lack of public water and sewer may trigger additional park development costs.

Within identified neighborhoods that may lack or have limited access to public parks, potential properties should be evaluated for suitable site conditions for the development of future recreational amenities and/or access to natural resources and water.

Neighborhood/Community Park Site Suitability Criteria:

- Access / visibility
- Parcel size / configuration
- Contiguous public land / connectivity
- Extent of sensitive areas
- Cost factors (acquisition, development & maintenance.)
- Compatibility with surrounding uses
- Vacant land preference

Trail Site Suitability Criteria:

- Development feasibility
- Continuity / connectivity (“safe routes”)
- Natural, cultural, historic value
- Public ROW access
- Land costs / value

Urban Natural Areas Site Suitability Criteria:

- Ecological, cultural, historic value
- Continuity / connectivity
- Public right of way access
- Development pressure (threat of conversion)
- Acquisition costs, donations, grants, third-party support (i.e., land trusts), etc.

Site-Specific Concerns

- Once a targeted park land acquisition has been identified and evaluated with consideration to its potential suitability as a future pubic park, more specific assessments should be conducted to ensure a measure of known development variables for future park use.
- A boundary survey and review of the title is important to identify an existing encroachments, encumbrances or entitlements that need to be addressed or corrected prior to closing.
- Environmental constraints, such as wetlands, waterways, other sensitive habitats and any associated buffers, should be identified to determine their impact on developable park spaces.
- An environmental site assessment should be conducted to identify environmental conditions that could have resulted from a past release of hazardous substances and determine any potential mitigation requirements to protect public health. Additionally, environmental law typically leaves the burden of responsibility on the property owner, so conducting an environmental site assessment is important to protect the City’s liability.
- An archaeological assessment to review potential cultural resources may also help bring to light future park development costs and variables.
- Any underground tanks, wells, septic systems and existing structures should be evaluated for the need to remove, decommission, or demolish after closing of land sale.
- Preliminary analysis of O&M cost for holding property until development.

Design Standards for Environmental Site Assessment

Considering a current use of a property is typically not sufficient for evaluating potential environmental concerns. For example, a vacant lot may previously have been used for agricultural purposes and may contain pesticide residues in the soil, or a current retail building formerly may have housed an auto repair business with underground tanks. Additionally, properties that are considered low-risk, such as a residence, could have a leaking underground heating oil tank or other concerns. Therefore, conducting an environmental site assessment is an important step in purchasing and managing property.

Prior to purchasing or accepting ownership of a property, the City should conduct an environmental site assessment to determine if contaminated soil, sediment or groundwater could be present. This process typically begins with a Phase I Environmental Site Assessment (ESA) per ASTM E1527-13 to identify environmental conditions or other business risk issues that could impact site development, pose a liability to the City, or present a risk to human health or the environment. Depending on the results of the Phase I ESA, a subsequent Phase II ESA may be warranted to sample and test soil, sediment or groundwater for the presence of contamination.

For property currently owned by the City, conducting an ESA prior to redevelopment can help to identify issues that could affect building design or result in construction delays.

For property that will be leased by the City, conducting a baseline environmental assessment may be warranted to establish initial conditions prior to the City occupying the site.

PRESERVING FUNDING ELIGIBILITY

Public outdoor park and recreation areas and facilities are eligible for funding assistance through the Washington Recreation and Conservation Office (RCO). Land acquisition projects must be consistent with the outdoor recreation goals and objectives contained in the Statewide Comprehensive Outdoor Recreation Plan (SCORP) or the recreation elements of local comprehensive plans and local master plans. Acquisition of land and waters for public outdoor recreation areas and facilities, including new areas or additions to existing parks, forests, wildlife areas, open spaces and other similar areas dedicated to outdoor recreation are eligible for assistance through the RCO. To be eligible, the acquisition procedures set forth by the RCO should be closely followed.

DESIGN & DEVELOPMENT GUIDELINES

With planned park upgrades and the potential for development of park acquisitions, Camas would benefit from park design and facility standards that help unify the system's amenities, operations and maintenance going into the future. Standards can begin with the adoption of typical bench details and expand to incorporate graphic sign styles, materials, colors and specific site furnishings. With the desire for Camas to create a unifying identity and enhance park maintenance efficiencies, guidelines for park standards should be planned, endorsed and implemented.

If the City should annex its urban reserve area, the acquisition and development of additional parks will be necessary. There may be opportunities to partner with residential development projects for providing new parks to be dedicated to the City upon completion. The establishment of park design and development

standards with predetermined requirements for consistency and quality of site amenities would ensure that new parks could readily fit within on-going park operations and maintenance.

All newly developed parks and trails shall adhere to the Final Guidelines for Outdoor Developed Areas as set forth by the United States Access Board.

Design Standards for Parks

Public park space should be clearly identifiable and provide a safe and secure environment for outdoor recreation and enjoyment. To help communicate the identity, amenities and uses within the park, some unified design standards should be applied. These standards are intended to help with public access, communication of safety and appropriate behaviors, and efficiency in operations and maintenance without creating a park system of identical "cloned" urban parks. Standardizing the designs for park signage, benches, picnic tables, drinking fountains, lighting, bollards, irrigation systems and fencing can allow for easier and less expensive procurement, installation, maintenance and replacement. The visual character of unified park amenities can quickly convey to the park visitor that the space is part of an overall system of public spaces where they are welcome.

While sharing standard site furnishings and signage styles helps unify the system identity, each individual park should have its own unique character. The shape and size of the land, the layout of circulation and location of key features, the styles, types and colors of play equipment, the architecture of restrooms, picnic and other park structures should be specific to that park. Even though each park contains some standardized site furnishings, each park site master plan design should strive to create a sense of place that highlights the character of that park in its local context and for its primary purpose (such as passive park with natural area or active sports-oriented facility).

The following tables highlight the range and considerations of various amenities that may be provided within urban parks (community and neighborhood parks) and can provide guidance for negotiating facility development opportunities in situations when private entities propose park development in-lieu of payment or for other, alternative arrangements, such as density bonuses.

Figure G1. Minimum Site Design Considerations for Neighborhood Parks

Amenity	Considerations - where feasible
Playground	▪ Minimum of 4,000 sq.ft. play area ▪ Equipment should be suitable for and developmentally-appropriate for toddlers and elementary school-aged children ▪ Playground should be ADA Accessible and play equipment should be ADA Compliant
Loop Walking Path	▪ Minimum 8' wide ▪ ADA-compliant surface to accessible elements (benches, tables, play area) ▪ Pathway slope not to exceed 5% grade or no more than 8% for more than 30 lineal feet without switchbacks or railings
Picnic Tables	▪ Minimum of 2, Use standard ADA compliant picnic table style
Drinking Fountain	▪ Provide ADA-compliant standard fixture. Install water bottle fill station as appropriate
Benches	▪ Minimum of 2, Use standard ADA compliant bench style
Open Turf Area	▪ Provide at least 15% of total lawn area with irrigation, preferably adjacent to the play area
Trees & Landscaping	▪ Provide shade for portion of playground area ▪ New trees and shrubs should be irrigated for a minimum of 2 years until established
Bicycle Racks	▪ Minimum of 2, with capacity to serve 4 bikes
Trash Receptacles & Dog Waste Disposal Stations	▪ Minimum of 1

For community parks, any or all of the following outdoor recreation features should be considered in addition to the same amenities provided in neighborhood parks.

Figure G2. Minimum Site Design Considerations for Community Parks

Amenity	Considerations - where feasible
Parking	▪ Based on types of amenities and their parking quantity requirements ▪ Include requisite number of handicapped parking stalls at appropriate locations ▪ Consider need for parking provision at multiple access points, where appropriate
Loop Walking Path	▪ Provide a perimeter trail in addition to pathways accessing all major park amenities
Multiple Access Points	▪ Provide connectivity to neighborhoods, nearby trails and public rights-of-way
Restrooms	▪ Provide ADA-compliant standardized design facilities
Picnic Shelter	▪ Provide minimum of 1 group picnic shelter
Sports fields	▪ Type and quantity dependent on available space and current public demand for each sport facility. Also depends on proximity to similar amenities within the city and/or region
Sports courts	▪ Type and quantity dependent on available space and current public demand for each sport facility. Also depends on proximity to similar amenities within the city and/or region
Tree Canopy	▪ Target a 25-45% tree canopy dependent on other park amenities and feasibility
Open Grass Area	▪ Open play area with sun exposure ▪ Minimum target of 1 acre
Natural Areas	▪ Based on existing and restored environmental characteristics
Off-leash Dog Area	▪ Minimum target of 1 acre ▪ Fenced enclosure with double-gate access ▪ Provide doggy waste dispenser and trash receptacle at entrance

Figure G3. Design Considerations for Other Park Amenities

Amenity	Considerations
Picnic Shelter	▪ Minimum of 400 sq.ft.
Sport field	▪ Practice level for youth soccer, T-ball, baseball and/or softball
Sport court	▪ ½ court basketball court
Tennis court	
Alternative recreation court	▪ Such as bocce ball, pickleball, horseshoes, lawn bowling
Skate spot	▪ 600 to 1,200 sq.ft. with small ramps, bowls or features for beginners
Disc golf course	▪ Minimum 9 baskets
Splash pad	
Natural area	
Water feature	▪ Such as a passive water-based amenity that provides a visual focal point, i.e. fountains, ponds, or waterfalls
Restroom	
Utilities	▪ Automatic Irrigation, Electricity, Water
Parking	

Design Standards for Open Space & Natural Areas

Open space and natural areas are primarily intended to conserve places with ecological sensitivity or natural landscape value. Most natural areas have some space where low-impact recreational uses and trails can be accommodated without reducing the environmental integrity of the land or water resource. Since the open space can range from wetlands and riparian corridors to fields and forests, design standards are not applied uniformly across the site. Each natural landscape is treated according to its level of sensitivity, need for conservation/restoration and tolerance for outdoor recreational use. However, where passive recreation opportunities such as trails can be provided, the standardized designs for park benches, picnic tables, signs and other site amenities should be applied.

Design Standards for Special Use Facilities

Consideration should be given in the design and renovation of any special use facility as to how and how much the site and its amenities should be identifiable within the park system through the application of standardized park signage and site furnishings. For example, a future sport field complex could accommodate some of the standardized park benches, picnic tables and signage, but it would also require its own specialized features, such as bleachers, backstops, field lighting, score boards and other equipment, that are unique to the facility. Each master plan design for new facilities should give careful consideration as to how a unique sense of place and identity is conveyed while still communicating that the facility is part of a system of outdoor recreation accommodation provided by the City of Camas.

Design Standards for Trails

A successful trail system is integrated with other transportation alternatives to include a range of trail, sidewalk, bike path and connection opportunities designed to the human scale. The typical recreational trail hierarchy is aligned from regional shared-use trails to local neighborhood paths and park trails. Trail systems can also incorporate specially designated trails for single track mountain biking, primitive hiking and equestrian uses.

Designing the actual physical trail starts with overall purpose of the trail, connecting travelers from one location to another (point A to point B) or through a particular environment (loop trail through a park). With a clear purpose for the trail, an appropriate alignment can then be determined to help provide the desired outdoor recreation experience or transportation value. For example, regional multi-use shared trails should be designed to a minimum width of 12 feet. In expanding urban centers, providing a 16-foot trail width can help accommodate significant bike and pedestrian use as the community grows and linkages to public transit enable increased trail usage. The most heavily used urban trails benefit from the installation of permanent pavement to withstand heavy traffic in a variety of weather conditions.

It should be noted that changes in transportation engineering and trail construction methods may warrant the need to update trail design standards over time. Site furnishings along the trail are one method for standardizing trails as part of the outdoor recreation system provided by Camas. The same benches, picnic tables, bollards and other site furnishings used throughout Camas' park system could be installed along its trails to help unify the sense of place, reduce procurement costs and simplify maintenance.

The unifying standard for Camas' trail system can be visually expressed through a designed wayfinding plan. Linked with the park system wayfinding, the trail signage should provide identification, direction, destination, travel information and safety messaging, while clearly reinforcing Camas' sense of place.

Trails should be constructed according to City specifications. It is recommended that trail layout and surfacing materials be approved by the City and meet the following general requirements:

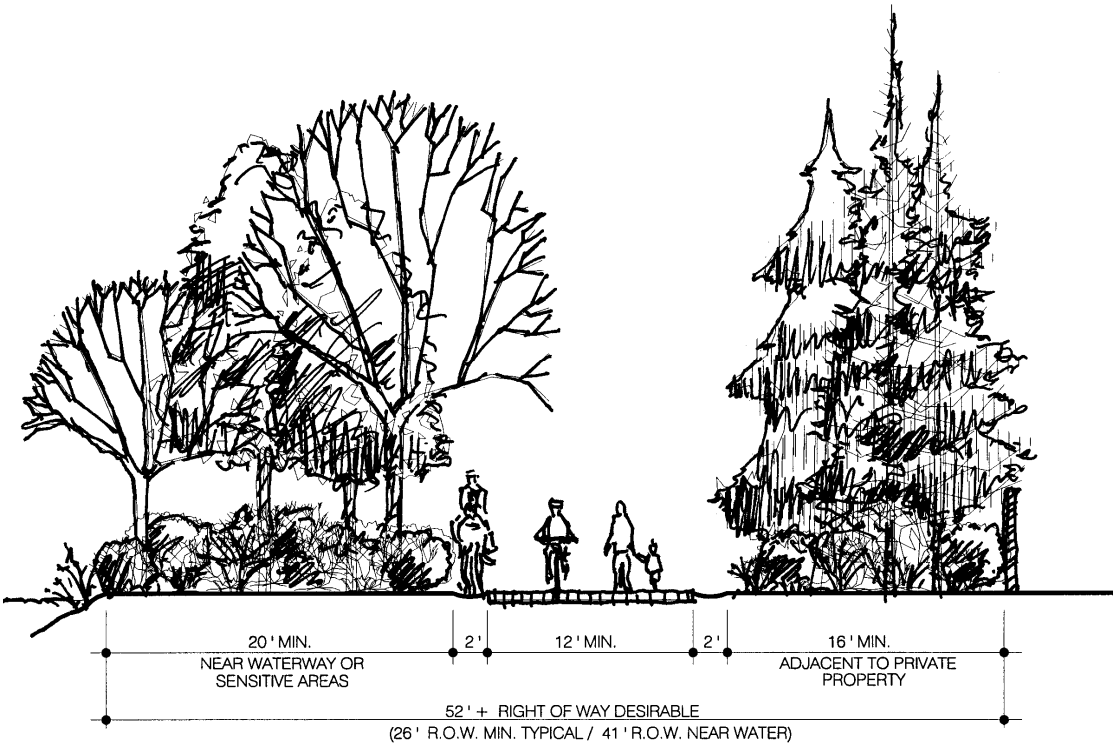
- Surfacing should be appropriate to the location; paved asphalt or concrete is recommended for upland areas, and wood chip, crusher waste or boardwalks are appropriate in lowland, wet or sensitive areas (City codes shall apply)
- Hard-surfaced trails should comply with ADAAG guidelines for slope and cross-slope; soft-surfaced trails should include properly placed and designed water bars or other surface water management techniques to minimize run-off and erosion.
- Entry signage should be provided at trailheads or access points, and boundary signage should be placed, as appropriate, to demarcate sensitive edges or private property boundaries.
- Trash receptacles should be provided at trailheads.

The four classifications of trails include: Regional, Local, Rustic, and Semi-Primitive. A primary distinguishing feature of City-owned trails is that these trails predominantly serve community-wide and regional purposes and receive this level of use. Local and secondary trails generally serve a local scale, at the neighborhood level. Such local and secondary trails will generally be owned and maintained by Homeowners Associations. While Regional and Local trails are designed as multiple use trails, Rustic and Semi-Primitive trails can be designed as single use trails.

Regional Trail

This trail type is designed to accommodate multiple uses (walking, running, bicycling) and connect to adjoining jurisdictions or destinations. The surfacing should be a minimum of 12 feet wide and be constructed of a hard surface material such as asphalt or concrete. Exceptions to surfacing materials may occur to mitigate impacts to critical or sensitive areas. Equestrian use could be permitted if an additional unpaved shoulder area is provided. The right-of-way required for regional trails should be 26 to 52 feet, depending on their location and surroundings. This type of trail is typically located off roadway surfaces and within its own corridor. A diagram of this trail standard is located in Figure G4.

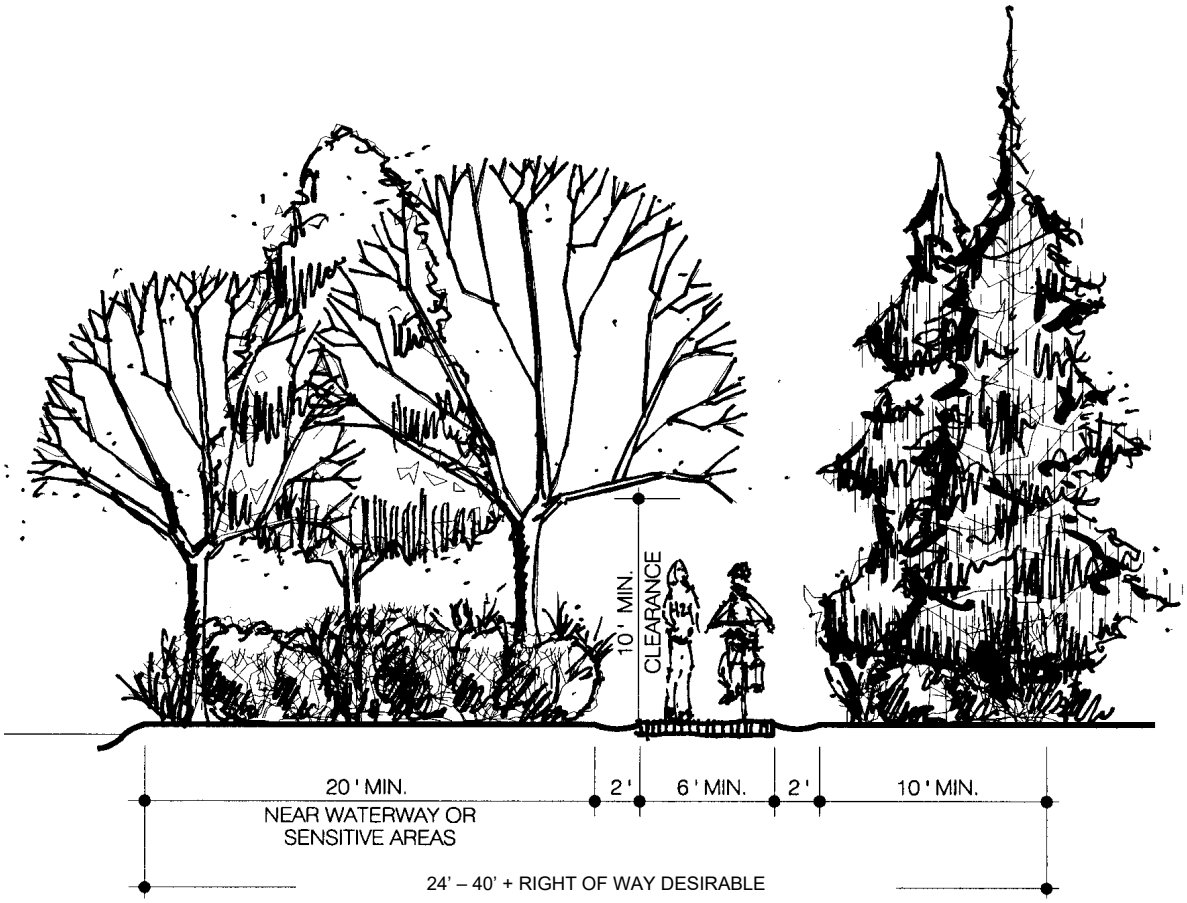
Figure G4. Regional Trail Cross Section



Local Trail

This trail type is designed to serve the local community and also provide access to the regional trail systems. It should be considered the “backbone” of the city’s trail network. The trail width should range from six to ten feet depending on the use and the terrain involved. It can be designed to accommodate the same uses listed for the regional trail. The surface for this type of trail may be paved or crushed aggregate depending on the use. Exceptions to surfacing materials may occur to mitigate impacts to critical or sensitive areas. The right of way for the local trail can range from 24 feet to 40 feet and can also be located on-road or off-road. Figure G5 is a typical configuration of a local trail.

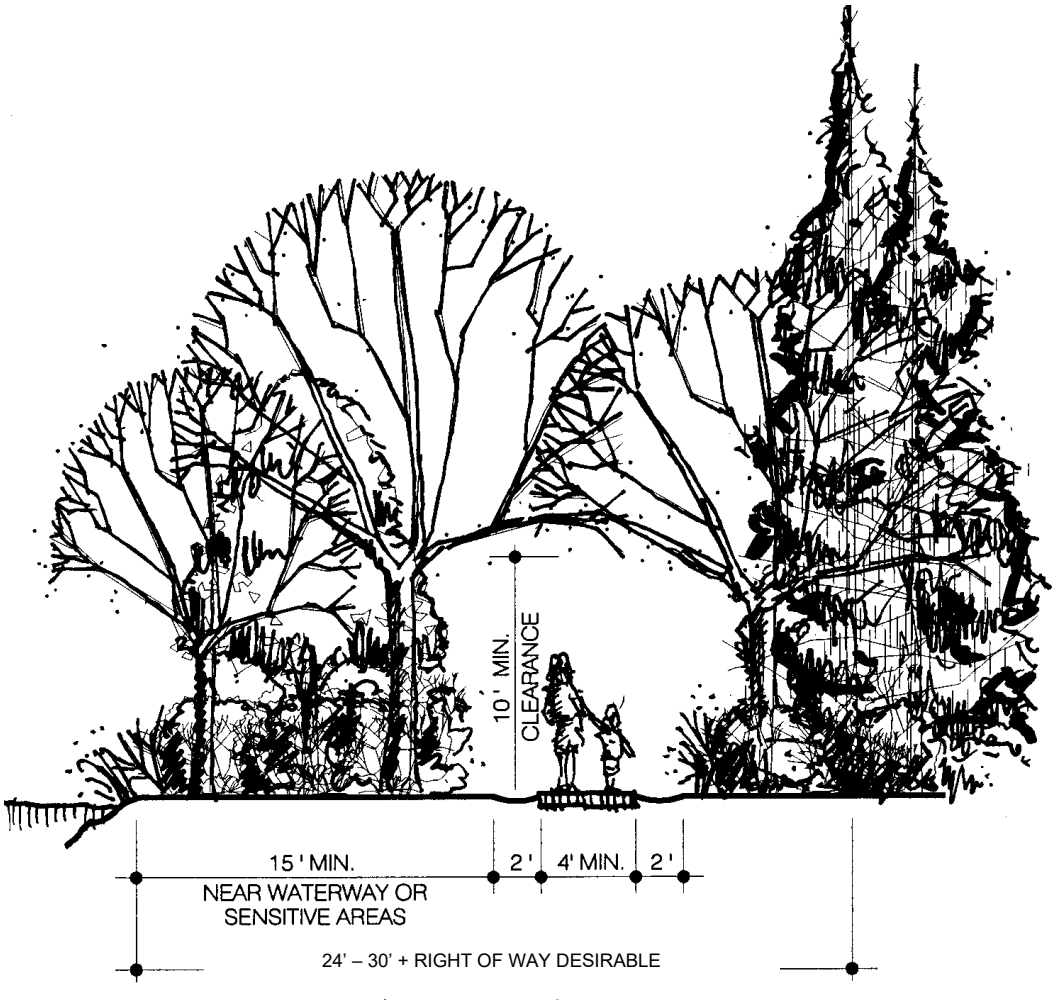
Figure G5. Local Trail Cross Section



Rustic Trail

This trail type provides access to local trails, and is more neighborhood-oriented. These trails will act as collectors for neighborhoods or developments and provide links to the community-wide trail system and other adjoining destinations. The rustic trail should be a minimum of four feet wide and be surfaced with stable accessible surfacing. The primary uses of a rustic trail are intended to be walking, bicycling and equestrian. The right-of-way widths desired for the rustic trail can range from 24 feet to 30 feet or more. These trails are always off-road in nature. Figure G6 details this trail classification.

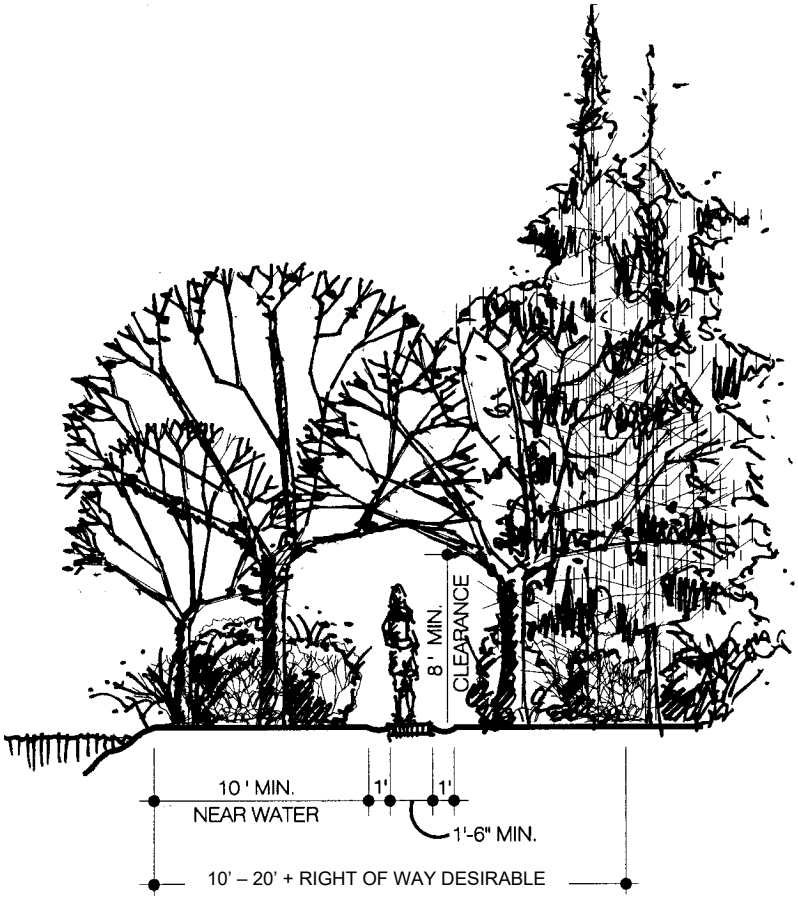
Figure G6. Rustic Trail Cross Section



Semi-Primitive Trail

This trail type is more specialized with regard to use, but it is more easily adaptable to the open space areas. It will serve in the more sensitive open space areas located within the city. It is designed to accommodate walkers, hikers, bicyclists, and equestrian users. It is typically two to four feet in width and is made up of compacted earth or other stable surfacing. The right-of-way width can range from ten to 20 feet. Typically, maintenance of these trails is minimal. Figure G7 below details the standards for this trail.

Figure G7. Semi-Primitive Trail Cross Section



Locating Trails in Sensitive (Critical) Areas

The large number of environmentally sensitive (critical) areas in Camas makes it likely that trails will be developed in some of these areas. The benefits of public access to natural areas (bird watching, nature appreciation, and environmental education) need to be balanced with the impacts of access.

Trails in environmentally sensitive areas will need to be carefully and appropriately located and designed. Exceptions to the trail improvement standards set forth in this Plan may be authorized in sensitive areas consistent with current best practices. This document recommends a thorough review and assessment of existing and proposed trail corridors, and careful placement of trails within sensitive areas to aid in minimizing the impacts. Guidelines for determining the suitability of trail locations in sensitive areas include the following:

1) Provide a minimum 20-foot wide vegetated buffer between wetland, sensitive area or water edge and the trail.
2) Construct boardwalks, railings, see-through fences and viewpoints to allow visual access to the areas and to keep trail users on the trail and away from the habitat.
3) Design wetland crossings for maximum protection of the wetland and locate them in an area suitable for public use.
4) Provide adjacent vegetation at access points that is dense enough to discourage off-trail travel. If necessary, install additional thick or thorny vegetation to prevent access.

5) Cover earthen based trails with dense turf where it crosses floodplains or other areas subject to periodic flooding to reduce puddling and walkers skirting the area.
6) Site trails away from active stream channels to prevent local bank erosion cause by trampling. In streamside locations where access is permitted or encouraged, provide access via boardwalks.
7) Locate bridge crossings in locations that will provide minimum impact to the water's edge and habitat while providing a rewarding experience for the trail user.

Recommended Trail Segments

The recommended trails plan provides a linked system based on a hierarchy of trail types. Linkages are provided at the neighborhood scale, at the community-wide scale, and regionally. The Potential Trails Map (Map 8) provides an overview of the segments, described in detail below. Proposed segments of the trail system are generalized to make connections or follow the direction of natural corridors. Final alignments are subject to change due to environmental conditions, development or alternate routes.

The following trail segment descriptions are excerpted from the 2014 PROS Plan.

Trail T-1

Trail T-1 runs along the west side of Camas, paralleling Parker Road. This trail segment provides a north-south connection and links two regional trails. About half of the alignment has been constructed. This segment passes from Prune Hill Park, to Ash Creek Park, past Sky Ridge Middle School and ending at its junction with T-3.

Trail T-2

Trail T-2 parallels the Columbia River. This regional trail is an extension of the Vancouver-Clark County trail system, and connects to neighboring Washougal's trail system. This trail provides visual access to the Columbia River, and makes an important regional connection.

Trail T-3

Trail T-3 is a regional trail running along the north shore of Lacamas Lake and connecting Lacamas Park, Camp Currie and the County's Green Mountain Trail heading north. Trails T-3 and T-4 make a loop around Lacamas Lake. This trail segment will include bridges or boardwalks across wetlands and water features in some locations. T-3 continues just north of Lacamas Park and then south, crossing T-4 at the Washougal River and continuing on to the Columbia River and trail T-2.

Trail T-4

Trail T-4 is the Heritage Trail, a regional trail running along the south side of Lacamas Lake and connecting Lacamas Park and Camp Currie. It passes through Heritage Park and will link to planned segment T-3, creating a loop around Lacamas Lake. T-4 links through Lacamas Park, continues into the Washougal River Greenway, and includes a bridge across the Washougal River to connect with T-17.

Trail T-5

Trail T-5 provides a loop around Prune Hill, with linkages to parks and neighborhoods. The northern half of the loop connects from Lake Road through the Open Space Network to the proposed Ash Creek Park. The southern half of the loop connects from Klickitat Park, continues through the Open Space Network, and connects Fallen Leaf Park. Camas has been completing pieces of trail T-5 as development has occurred along the alignment.

Trail T-6

Trail T-6 parallels Lake Road, connecting from T-1 to T-21. This segment has been partially constructed.

Trail T-7

Trail T-7 connects from T-5 through Grass Valley Park and parallels NW 38th Avenue toward the west boundary of Camas. The segment of the trail in the vicinity of Grass Valley Park has been constructed.

Trail T-8

Trail T-8 is a north/south connector that connects through the center of the T-5 loop. This trail connects through the Open Space Network and passes Dorothy Fox Elementary School and Dorothy Fox Park. The trail also includes several spur connections to T-9 and T-7 as well as a pedestrian bridge connection to T-9 across Ostensen Canyon.

Trail T-9

Trail T-9 connects from T-3/T-4 past Zellerbach Elementary School and Liberty Middle School (the renovated high school), through downtown, and then passes through the Benton Park and Ostensen Canyon sites. This trail then connects to trail T-8 at a bridge across Ostensen Canyon and at Dorothy Fox Park before turning south to reconnect to T-5.

Trail T-10

Trail T-10 includes a mini network of connections from neighborhoods to Klickitat Park and Prune Hill Sports Park. The trails also link to T-1, T-5 and T-11. This trail is owned and maintained by local Homeowners' Associations, is located largely within the Open Space Network, and is nearly complete.

Trail T-11

Trail T-11 is a loop that connects Klickitat Park to the overlook at SU-9.

Trail T-12

Trail T-12 connects from T-5 at Fallen Leaf Lake to a proposed neighborhood park.

Trail T-13

Trail T-13 is the trail network around Fallen Leaf Lake. This trail connects to Fallen Leaf Park as well as T-4 and T-5. The City has already completed several sections of this trail.

Trail T-14

Trail T-14 connects from T-3 and Lacamas Park to a planned neighborhood park, Lacamas Heights Elementary School, and Camas High School. T-14 also forms a loop with T-3 and T-27.

Trail T-15

Trail T-15 includes the Lacamas Park trail network. This system provides important community connections between T-3 and T-4.

Trail T-16

Trail T-16 provides a linkage from Louis Bloch Park to the Washougal River Greenway.

Trail T-17

Trail T-17 is the Washougal River Greenway trail system on the south river bank. This trail segment passes through the Washougal River Greenway, providing access to the river corridor for Camas, Washougal, and regional residents. This trail segment is joined to T-4 by a pedestrian bridge across the Washougal River to link the Greenway corridor and increase access. T-17 links to Oak Park, Goot Park, and T-2, the Columbia River trail.

Trail T-18

Trail T-18 follows a utility corridor from Washougal and meets up with Trail T-4 in the Washougal River Greenway. T-18 is also a proposed trail in the Washougal Comprehensive Park and Recreation Plan.

Trail T-19

Trail T-19 connects Lacamas Park trails to the north-south trail T-18 and to the Washougal trail system. This trail should be a jointly maintained connection between the two cities.

Trail T-20

Trail T-20 provides a secondary east-west connection between T-1 and T-21 in the northwestern corner of the City.

Trail T-21

Trail T-21 is a north-south connection on the western edge of Camas. It connects from T-4 south to T-1. East-west connections to T-21 are provided by trails T-6, T-7, T-20, T-22 and T-24.

Trail T-22

Trail T-22 includes the Leadbetter Corridor and connects T-6 east/west across T-1 to T-21.

Trail T-23

Trail T-23 connects through the open space network from the intersection of trails T-1 and T-22 to trail T-21.

Trail T-24

Trail T-24 connects trail T-23 with Prune Hill Sports Park and Trail T-1.

Trail T-25

Trail T-25 connects T-5 to Forest Home Park.

Trail T-26

Trail T-26 connects T-5 and T-8 to Grass Valley Park through a portion of the Open Space Network.

Trail T-27

Trail T-27 is the primary trail that will connect uses along the north shore of Lacamas Lake. This route will run parallel to the future realignment of Leadbetter Road and provide a continuous trail from the northern corner of the city towards Lacamas Park to the southeast.

Trail T-28

Similar to Trail T-32, Trail T-28 will link land uses on the north shore of Lacamas Lake. The City should design and construct this segment concurrent with future utility lines and pump stations planned to serve future uses.

Trail T-29

Trail T-29 will provide an alternative trail connection for residents of this future growth area.

Trail T-30

Trail T-30 will provide an alternative trail connection for residents of this future growth area.

Trail T-31

Trail T-31 will connect opposite sides of Camp Currie with a more direct route.

Trail T-32

Similar to Trail T-28, Trail T-32 will link land uses on the north shore of Lacamas Lake. The City should design and construct this segment concurrent with future utility lines and pump stations planned to serve future uses.

Figure G8 summarizes the recommendations for the Camas trail network.

Figure G8. Summary of Trail Recommendations (excerpted from 2014 PROS Plan)

Trail #	Name	Total Miles	Comments	City Maintained
T-1	West Camas Regional Trail	2.1	Completion/ Acquisition/ Development	✓
T-2	Columbia River Regional Trail	6.6	Acquisition/ Joint Development	✓*
T-3	East Camas Regional Trail*	7.9	Clark County Development	✓
T-4	Heritage Trail	1.8	Minor Additions/ Improvements/ Development of Washougal River crossing	✓
T-5	Camas Neighborhood Loop Trail	3.1	Additional Acquisition/ Development	✓
T-6	Lake Road Connector Trail	1.0	Completion/Upgrade to Standard	✓
T-7	West Camas Connector Trail	2.1	Completion/Upgrade to Standard	✓
T-8	Prune Hill Connector Trail	0.9	Completion/Upgrade to Standard	
T-9	Downtown Connector Trail	0.4	Completion/Upgrade to Standard	✓
T-10	Deer Creek Connector Trail	0.2	Completion/Upgrade to Standard	
T-11	View Ridge Connector Trail	0.3	Completion/Upgrade to Standard	✓
T-12	East Hilltop Connector Trail	0.2	Acquisition/ Development	✓
T-13	Fallen Leaf Lake Trails	1.8	Development/ Completion of Acquisition	✓
T-14	Lacamas Heights Connector Trail	1.1	Acquisition/ Development	
T-15	Lacamas Park Trails	3.7	No Changes	
T-16	Louis Bloch Connector Trail	0.3	Acquisition/ Development	
T-17	South Camas River Loop	3.3	Acquisition/ Development	✓
T-18	Washougal Connection	1.5	No Action	
T-19	Washougal Connection 2	0.6	No Action	✓*
T-20	Northwest Connector	0.8	Acquisition/ Development	
T-21	Westside Route	3.4	Acquisition/ Development	✓
T-22	Leadbetter Corridor	0.3	Acquisition/ Development	✓*
T-23	Natural Trail	2.6	Acquisition/ Development	
T-24	Prune Hill West Trail	0.9	Acquisition/ Development	
T-25	Forest Home Park Connection	0.8	Acquisition/ Development	
T-26	Grass Valley Link	0.9	No Changes	
T-27	North Camas 1	4.7	Acquisition/ Development	✓
T-28	North Camas 2	1.1	Acquisition/ Development	✓
T-29	Green Mountain 1	2.8	Acquisition/ Development	
T-30	Green Mountain 2	0.3	Acquisition/ Development	
T-31	Camp Currie Connection	0.3	Acquisition/ Development	✓
T-32	North Camas 3	0.8	Acquisition/ Development	✓
	TOTAL	58.6	Total City/Joint Maintained Trails	40.0 miles

*Jointly maintained

CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

The inventory assessment highlighted an opportunity to consider incorporating crime prevention through environmental design (CPTED) principles to enhance park and trail safety and facilitate the monitoring of park uses and behaviors. CPTED applies four principles that are used to deter criminal behavior in outdoor environments:

- Natural surveillance
- Natural access control
- Territorial reinforcement
- Maintenance

CPTED natural surveillance ("see and be seen") asserts that sight lines for better visibility can deter undesirable behavior and increase the perceptions of safety and comfort by park patrons. Lowering understory vegetation or raising lower tree branches through intentional vegetation management can provide more clear lines of sight in and around trails and other areas of use. Providing clear visibility and reducing blind corners can also improve safety by limiting conflicts between different users (e.g. runners, cyclists, dog walkers), where unanticipated encounters may result in crashes or entanglements.

Natural access control in park design is often very subtle. Controlling where vehicles enter and exit park facilities through designed barriers, bollards, boulders, and post and cable fencing can protect park users and minimize park property damage from misguided vehicular traffic. Walkways, lighting, fencing and landscaping provide explicit direction for park users. The flow of users through a park will help decrease the opportunity for crime and improve clarity for the intended park behaviors.

Territorial reinforcement comes through clear demarcation of boundaries. For public parks, those boundaries between public and private lands, safe and unsafe areas, and special use, limited access or reserved sites can be delineated with the appropriate placement of fencing, signs, landscaping or other physical or visual design techniques.

Finally, clearly visible, high-quality maintenance is an important element of CPTED, as well as general public safety. CPTED recognizes the "broken window" theory where neglected and poorly maintained amenities are more attractive targets for vandalism or other criminal activity. Deferred maintenance can also result in park amenities that put users at risk. Broken pavement, worn decking, uneven playing fields and missing play safety surfacing can create injuries. Overall attention to CPTED principles can help ensure safer public park environments.



2022 PROS Plan

CITY OF CAMAS, WA

616 NE 4th Ave,
Camas, WA 98607
www.cityofcamas.us

Appendix M: Parks and Open Space Management Plan (POSMP)

Parks and Open Space Management Plan
City of Camas

Acknowledgements

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This project was a collaboration between the City of Camas staff and commissioners, the consulting team, the Camas community, and other Washington agencies. It was built upon previous plans and engagement processes in order to move community values and goals into implementation. A big thank you to everyone who contributed and gave the support needed to carry the work forward.

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Camas Tree Canopy Vulnerability Report
Tree Canopy Assessment Report
Current Practices and Allocated Resources Assessment

Project Introduction: 2024 Parks and Open Space Management Plan



POSMP Goal:

Optimize the management of our resources through data-driven decision making and operational efficiencies and effectiveness.

POSMP Objective:

The City of Camas aims to create a framework to help prioritize efforts in a way that **aligns with community, city, and funding resource goals and shared values**. Effectiveness in our own operations will allow for a focus on BMPs in order to set an example, provide clear guidance, and collaborate more with the community.

Executive Summary

The Camas Parks & Open Space Management Plan (POSMP) responds to the community's feedback in Camas' long-range Parks, Recreation and Open Space Plan by outlining a strategic vision for the thoughtful management of parks and open spaces within the City of Camas, ensuring that they continue to serve as resources for all users. Camas recognizes the vital role that parks and open spaces play in fostering community well-being, recreation and environmental sustainability. Camas' parks, open space, greenways and waterways are a critical component of the City's green infrastructure and play critical roles in supporting healthy, well-functioning ecosystems.

Scope of the POSMP

The POSMP took a multi-prong approach to understanding existing conditions and practices in order to provide data-based recommendations on how to align with the goals of the project and values of the community. Key aspects of this effort included:

- City-wide urban tree canopy analysis
- Sample public land tree inventory
- Operations, organizational, and financial assessment
- Project prioritization approach to align with community values
- Best practices and recommendations
- Planning recommendations

The project also engaged with the public through the Parks & Recreation Commission meetings, a public open house, online survey, and tree inventory training.

Key Takeaways

- Nature is a valuable, critical infrastructure that serves the community in many ways
- Management of Camas' Parks and Open Spaces should utilize a systems-based approach in order to optimize ecosystem performance long-term
- Retaining canopy and character will have to be a public:private partnership with alignment on goals and expectations

The 5 Camas Community Values

Equitable access

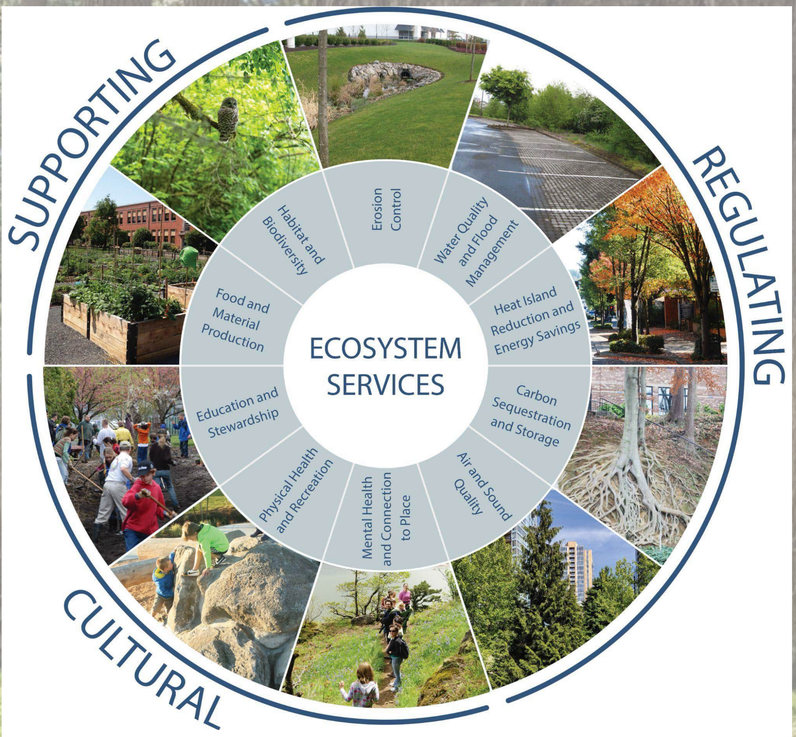
Asset protection and public safety

Preserve and enhance natural features

Outreach and education

Financial and resource allocation

Collectively increase the resilience of parks, open spaces and natural ecosystems in Camas



Best practice and planning recommendations took into account the multiple values that natural systems can provide the community.

Goals of this effort

We recognize the intrinsic value of our **parks and open spaces as essential assets** that contribute to the City's character and residents' quality of life. Through this Parks and Open Space Management Plan, we can increase the resilience of open spaces that will enrich the lives of current and future generations in Camas.

Enhance external communication and collaboration

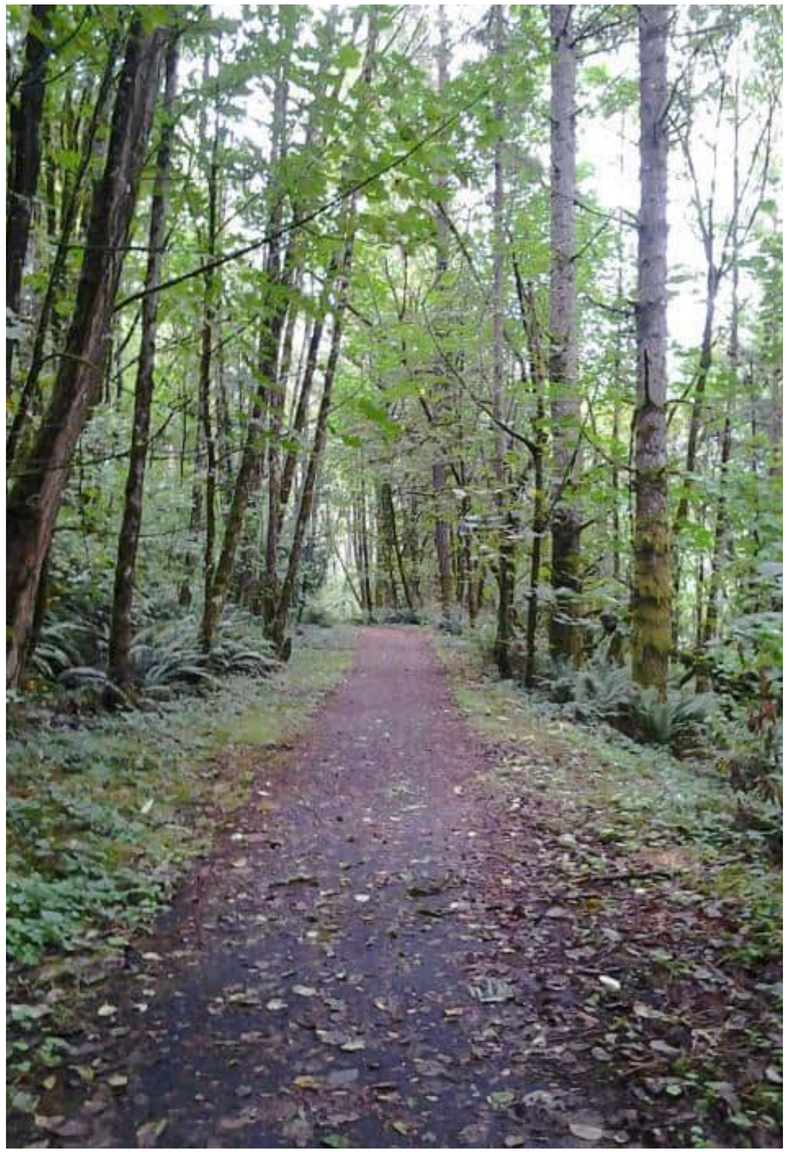
- Raise public awareness
- Encourage and support use of best management practices
- Make a Call to Action

Improve internal decision making

- Develop a clear inventory of existing conditions and best management practices
- Encourage and support use of best management practices
- Prioritize resource use with a science/ data-backed tool
- Identify opportunities for more investment

Collectively increase the resilience of parks, open spaces, and natural ecosystems

From challenges to opportunities



What challenges are we facing?

Tree canopy and open space service gaps

Without clear guidance and best management practices, coordinated management of open spaces is difficult. Gaps remain in the city that could serve the needs of those who need it most.

Climate change and extreme weather

Climate change and extreme weather events pose threats to ecosystem health and asset preservation. Longer term hazards and stressors not only impact the health of vegetation and habitats, but likely add risk to adjacent buildings and infrastructure.

Lack of data

There is a need for more comprehensive data on inventory, resources and best practices to help inform decision making on prioritizing work scope, resource allocation and funding.

Unclear guidance for private landowners

Lack of clarity around different planning documents and ordinances and the role and impact on private land owners. Limited resources limit the ability of consistent maintenance between public and private lands.

Lack of resources

Most resources are spent being reactive to ongoing safety issues and performing routine maintenance and upkeep across public lands. Proactive prioritization is needed in order to work toward the desired performance and use of parks and open space.

Community Values

Equitable access

Ensure that all community members have access to Camas' parks and natural resources and the benefits they provide.

Asset protection and public safety

Protect ecosystems, human health, safety and public and private assets through the management of natural systems to limit the effects of extreme weather, climate change and other potential impacts .

Preserve and enhance natural features

Maintain the existing natural character of Camas in ways that bolster community identity.

Outreach and education

Provide opportunities for learning to gain efficiencies, institute best practices and engage the community.

Financial and resource allocation

Optimize value and resource use in order to best balance the long-term performance goals with immediate needs for parks and public open space.

We all have a role to play

How can I help my community?

- Follow guidelines of Parks and Open Space Management Plan and other city codes and ordinances.
- Support trees and other natural systems on your properties and within your HOA.
- Volunteer your time and effort towards management of parks and open spaces through initiatives such as community tree inventory events.

How can the City of Camas help me?

- Provide clear incentives and guidelines for managing private open spaces.
- Lead by example through public land management efforts.

How can I help the City of Camas?

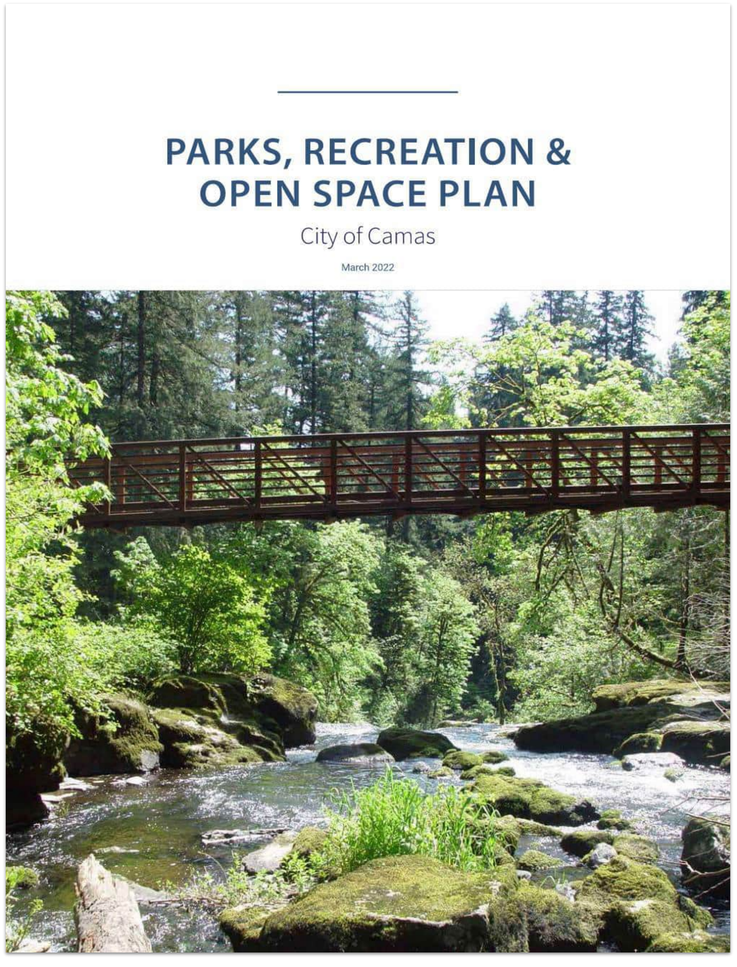
- Contribute feedback to shape resource priorities and next steps of the POSMP.
- Participate in the Comprehensive Plan update process



Setting the stage: Parks, Recreation & Open Space (PROS) Plan

Open space and stewardship

Camas' open space, greenways and waterways are a **critical component of the City's green infrastructure** and play critical roles in supporting healthy, well-functioning ecosystems.



This Parks and Open Space Management Plan responds to the community's feedback in the **2022 PROS Plan** to:

1) **Maintain what we have**
2) **Fill gaps and improve trail connections**
3) **Develop and improve existing parks**

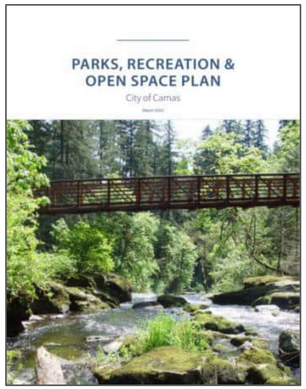
PROS Plan action

New plans should reflect the **realities of limited program funding** and the challenges presented by **climate change** to include the following considerations:

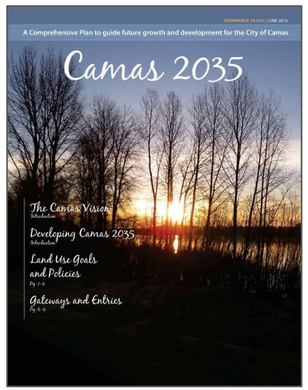
1. **Maintain the functional benefits** of open space vegetation.
2. Foster **resilient plant communities** that can recover from disturbances and adapt to climate change and its impacts, such as forest fires.
3. Implement work **based on the value** of these functional benefits, the community's priorities for the open space properties and the condition of the vegetation found there.
4. **Maximize the return** on available funding through volunteers, matching grants, and donations.

How does this plan align with existing practices and guidelines?

As part of the information gathering process, the team reviewed existing planning documents to understand the goals, challenges, and community feedback on how parks and open spaces are currently managed. They used this process to identify opportunities for improvements going forward to align better with city-wide goals.



2022 PROS Plan



2016 Comprehensive Plan


ORDINANCE NO. 18-014

AN ORDINANCE amending certain provisions of the Camas Municipal Code, repealing Chapter 16.51, and adding a new Chapter 3.54, relating to the Camas Urban Tree Program.

The Council of the City of Camas do ordain as follows:

Section I

A new Chapter 3.54 of the Camas Municipal Code, entitled City Tree Fund is hereby adopted as follows:

3.54.010 City Tree Fund

A. There is created a city tree fund into which all penalties and revenues received for tree protection under Chapters 12.04 Sidewalk and Street Tree Maintenance: 16.51 General Provisions for Critical Areas; and Chapter 18.13 Landscaping shall be placed. In addition, the following sources of funds may be placed in the city's tree fund:

1. Donations and gifts;
2. Donations and grants for the purposes of the fund;
3. Sale of trees or wood from city property where the proceeds from such sale have not been dedicated to another purpose;
4. Fines and penalties imposed under Chapters 12.04, 16.51 and 18.13, or settlements in lieu of penalties.

B. The city shall use the city tree fund for the following purposes:

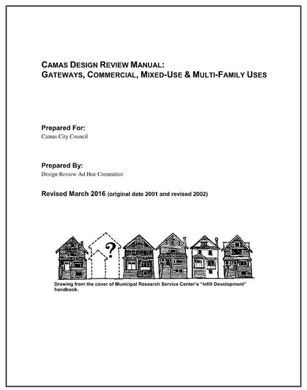
1. Acquiring, maintaining, and preserving areas of healthy soil and native vegetation within the city;
2. Planting and maintaining trees within the city to compensate for loss of canopy coverage;
3. Support community urban forestry education;
4. Support the management of urban forest areas to include eradicating aggressive non-native vegetation species;
5. Other purposes relating to trees as determined by city council.

3.54.020 Tree Removal Fine Table

A.

Tree Removal Infractions (measured as diameter at breast height "dbh")			
2" to 6"	$250	20" – 30"	$750
7" to 12"	$375	25" – 36"	$875
13" – 18"	$500	Greater than 37"	$1,050
19" – 24"	$625		

Tree Ordinance 18-014


CAMAS DESIGN REVIEW MANUAL:
GATEWAYS, COMMERCIAL, MIXED-USE & MULTI-FAMILY USES

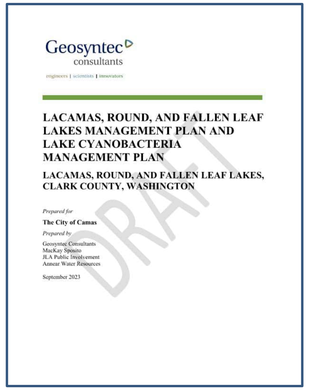
Prepared For:
Camas City Council

Prepared By:
Design Review Ad Hoc Committee

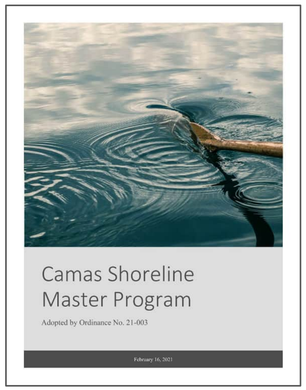
Revised March 2016 (original date 2001 and revised 2002)

Drawing from the cover of Municipal Research Service Center's "Infill Development" handbook.

2016 Design Review Manual



2023 DRAFT Lakes Management Plan



2021 Shoreline Master Program



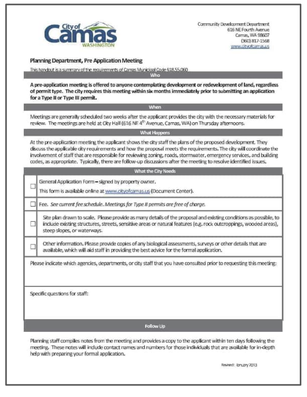
2023 Street Tree Succession Plan (for Downtown Camas)


TREES FOR NARROW SPACES
(Plant 15'-25' apart, compatible with mature tree size)
Typical size at time of planting: 2" minimum caliper (B&B or container)

Common Name	Botanical Name	Height	Spread	Min. Planter Width (ft.)	Form	Remarks
Adirondack Crabapple	Malus 'Adirondack'	18	10	4	Columnar	Densely upright in an inverted cone. Medium green foliage. White flower bright red fruit.
Amanogawa cherry	Prunus serrulata 'Amanogawa'	20	6	4	Columnar	Very narrow and upright structure, pale pink spring flowers.
American smoketree	Cotinus obovatus	30	30	4	Globe	Tolerant of hot and dry sites, Green foliage, purple flower clusters.
Beauty plum semi-dwarf	Prunus cultivar'Beauty'	15	15	4	Globe	Large fruit early summer, needs regular pruning.
Big Cityplum	Prunus x cistena 'Schmidtcis'	14	17	4	Globe	Light pink and very fragrant spring flowers, dark purple foliage.
Black Hawk mountain ash	Sorbus aucuparia 'Black Hawk'	25	15	4	Columnar	Bright white/cream for hardiness and resistance to sunscald. Rounded with maturity.
Black Hawthorne	Crataegus douglasii	35	20	4	Oval	Native to portland metropolitan region, has thorns.
Butterfly Japanese Maple	Acer palmatumm 'Butterfly'	12	6	4	Umbrella	Shiffy upright in habit. Variegated pink, white and green foliage with magenta tint in fall.
Callery Pear 'Capital'	Pyrus calleryana 'Capital'	35	12	4	Pyramidal	It is noted for its early profuse spring bloom, quality glossy green foliage and effect
Carmazam Crabapple	Malus 'Carmazam'	20	15	4	Oval	Purple to bronze foliage in summer. Flower is rose red. Bright red fruit.
Chinese Pistache	Pistachia chinensis	25	25	4	Globe	Impressive red-orange fall color, attracts wildlife.
Chinesulis Crabapple	Malus hchinensisii	30	15	4	Oval	Dark green foliage turns orange, red and purple in fall. Sparse fruit. Spreading.
Cleveland Select Pear (Chanticleer)	Pyrus calleryana 'Chanticleer'	30	20	4	Pyramidal	Glossy green foliage. White flowers. Purplish-red foliage in fall.
columnar goldenchain	Laburnum anagyroides 'Columnare'	20	10	4	Vase	Dense clusters of bright yellow flowers in spring.
Columnar Siberian Crabapple	Malus baccata 'Columnaris'	30	10	4	Columnar	White flower, yellow-red fruit. Good or red is fall, resistant to vertICillium
Cornelian cherry dogwood	Cornus mas	20	20	4	Umbrella	

City of Camas Plant Materials — Page 1 — Latest Revision: May 2019

Camas Plant Materials


City of Camas
WASHINGTON

Community Development Department
616 NE Fourth Avenue
Camas, WA 98607
(360) 817-1568
www.cityofcamas.us

Planning Department, Pre Application Meeting

This handout is a summary of the requirements of Camas Municipal Code (CMC) 5.80

Who

A pre-application meeting is offered to anyone contemplating development or redevelopment of land, regardless of permit type. The city requires this meeting within six months immediately prior to submitting an application for a Type II or Type III permit.

When

Meetings are generally scheduled two weeks after the applicant provides the city with the necessary materials for review. The meetings are held at City Hall (616 NE 4th Avenue, Camas, WA) on Thursday afternoons.

What Happens

At the pre-application meeting the applicant shows the city staff the plans of the proposed development. They discuss the applicable city requirements and how the proposal meets the requirements. The city will coordinate the involvement of staff that are responsible for reviewing zoning, roads, stormwater, emergency services, and building codes, as appropriate. Typically, there are follow-up discussions after the meeting to resolve identified issues.

What the City Needs

- ☐ General Application Form—signed by property owners.
  This form is available online at www.cityofcamas.us (Document Center).
- ☐ Fee. *See current fee schedule. Meetings for Type II permits are free of charge.*
- ☐ Site plan drawn to scale. Please provide as many details of the proposal and existing conditions as possible, to include existing structures, streets, sensitive areas or natural features (e.g. rock outcroppings, wooded areas), steep slopes, or waterways.
- ☐ Other information. Please provide copies of any biological assessments, surveys or other details that are available, which will aid staff in providing the best advice for the formal application.

Please indicate which agencies, departments, or city staff that you have consulted prior to requesting this meeting:

Specific questions for staff:

Follow Up

Planning staff compiles notes from the meeting and provides a copy to the applicant within ten days following the meeting. These notes will include contact names and numbers for those individuals that are available for in-depth help with preparing your formal application.

Revised: January 2013

Camas Development Code

….and many more

Key Concepts

Active Recreation
Activities that require physical exertion and typical require specialty facilities or equipment.

Ecosystem services
The benefits that ecosystems provide to humans. This can include things like clean air and water, temperature regulation, and recreational opportunities.

Maintenance
Maintenance responds to immediate issues and addresses day-to-day conditions through routine tasks and activities.

Management
Management addresses long-term goals through strategic planning, decision-making, and resource allocation.

Nature-based solutions / Green Infrastructure
Approaches that use natural processes and ecosystems to address challenges or provide functions to humans.

Naturescaping
Naturescaping involves designing landscapes using native plants and natural elements to create habitats that support local wildlife and conserve resources.

Passive Recreation
Outside activities that utilize the natural environment for exercise, relaxation, or entertainment.

Quantitative vs qualitative metrics
Qualitative metrics describe qualities or characteristics, while quantitative metrics measure quantities or amounts. Both can be valid ways to understand value.

Resilient
The ability to withstand or bounce back from a variety of shocks and stresses.

Stewardship
Restoring and guiding natural processes and systems to enable them to regenerate and function mostly on their own.

Succession planning
Managing the growth and replacement of species to maintain a healthy ecosystem over time. Includes using a diversity of species and ages to provide variety.

Vulnerability
A vulnerable system is prone to adverse impacts from stressors such as climate change, human activity, or natural disasters.

Project Schedule

	2023				2024							
	September	October	November	December	January	February	March	April	May	June	July	August
City & Community Engagement												
Kickoff Meeting	●											
Interview Parks and Operations Staff		●										
Conduct Open House								●				
Conduct Community Survey								■				
Earth Day Tree Inventory								●				
Parks and Rec Commission Presentation						●			●			
Submit Draft Plan to DNR										●		
Present Draft Plan at Parks & Rec Commission											●	
City Council Adoption												●
Gather Information												
Information Gathering and Mapping	■	■	■	■	■	■						
Assessments												
Financial Analysis, Operations Assessment, Management Practices					■	■	■	■	■			
Assess Strengths and Opportunities						■	■	■	■			
Recommendations for Improvements							■	■	■	■		
Plan Development												
Synthesize info into POSMP report							■	■	■	■	■	

Valuing Nature

This plan recognizes the value and multiple ways that natural systems contribute to the Camas community and underlines the importance for providing effective management practices to preserve and enhances those functions. It will look to identify and incorporate nature's value in prioritization, resource allocation, and ongoing management practices.

The Role of Natural Areas to Meet Our Needs

Parks and Open Spaces are critical infrastructure that provide a variety of benefits to our communities



Parks & Open Space contribute to human physical and mental health, economic wellbeing, climate mitigation and asset protection. Sometimes referred to as “Green Infrastructure” or “Nature-based solutions,” natural systems integrated into the built environment provide a variety of valuable services that make them a crucial part of the places we live, work, and play.

Mental Health and Connection to Place: Contributes to cognitive restoration, emotional connections and a sense of identity.

Physical Health and Recreation: Provides a venue for individual or group activities and exercise. Can contribute to safety and security.

Education and Stewardship: Provides learning opportunities, ways to contribute and a sense of community.

Food and Material Production: Plays host to a variety edible plants and berries, as well as raw materials that contribute to the economy.

Habitat and Biodiversity: Is home to or can support native or migratory fauna.

Erosion Control: Prevents degradation of soils and sedimentation.

Water Quality and Flood Management: Filters sediment, nutrients, and pollution and controls water temperature. Absorbs water during rain or snow events.

Heat Island Reduction and Energy Savings: Provides shade to surfaces and structures to reduce air and surface temperature and reduce glare.

Carbon Sequestration and Storage: Absorbs carbon dioxide and stores it in vegetation and soil.

Air and Sound Quality: Captures gases and particulates to reduce them in the environment. Provide buffers to block or absorb noises and contribute to positive soundscapes.

NATURE AS A VALUABLE ASSET

National and Research Trends

The benefits of nature are being quantified across multiple sectors and entities

National trends around ecosystem service valuations have been undertaken by FEMA, NOAA, EPA, USFS, and a variety of public and private research institutions.

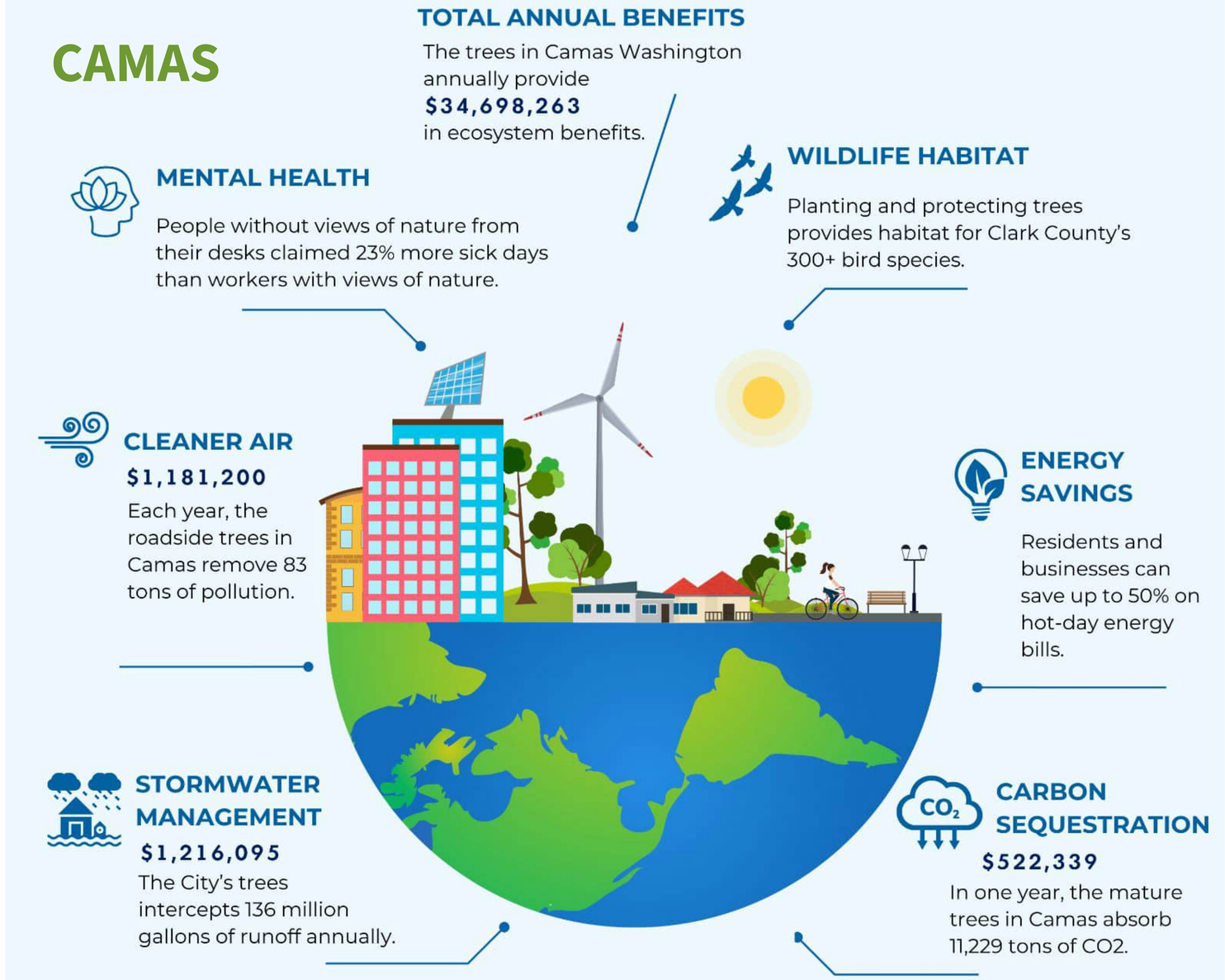
2022 Proposed Values	
Land Cover Category	Value (2021 USD/acre/year)
Forest	12,589
Urban Green Open Space	15,541
Rural Green Open Space	10,632
Riparian	37,199
Coastal Wetland	8,955
Inland Wetland	8,171

Source: FEMA Ecosystem Service Value Updates, June 2022

"Park access was associated with ***better mental health among children and parents***, and more parent physical activity and ***parent–child co-participation in outdoor activity during the COVID-19 pandemic***. Access to nearby parks may be an important resource to promote health and well-being, for both individuals and families."

Hazlehurst, M.F., Muqueeth, S., Wolf, K.L. *et al.* Park access and mental health among parents and children during the COVID-19 pandemic. *BMC Public Health* 22, 800 (2022). https://doi.org/10.1186/s12889-022-13148-2

Mental, physical, and social health benefits of being in or having access to nature has been studied in hundreds of research papers.



Eco. Benefit	Description	Camas Citywide*	Urban Tract	Rural Tract	Units
Air Quality	Particulates intercepted	$347.53	$347.57	$17.85	$/year/acre
CO		$0.60	$0.60	$0.01	$/year/acre
NO2		$1.40	$1.40	$0.07	$/year/acre
O3		$39.71	$39.72	$1.87	$/year/acre
PM10		$31.16	$31.16	$0.74	$/year/acre
PM2.5		$274.50	$274.53	$15.15	$/year/acre
SO2		$0.15	$0.15	$0.01	$/year/acre
StormWater	Avoided runoff	$357.79	$357.83	$30.00	$/year/acre
Carbon Sequestration	Accumulated carbon	$153.68	$168.14	$145.75	$/year/acre
Total		**$859.00**	**$873.54**	**$193.60**	**$/year/acre**
Carbon Storage		$9,349.72	$8,166.75	$10,004.32	$/acre

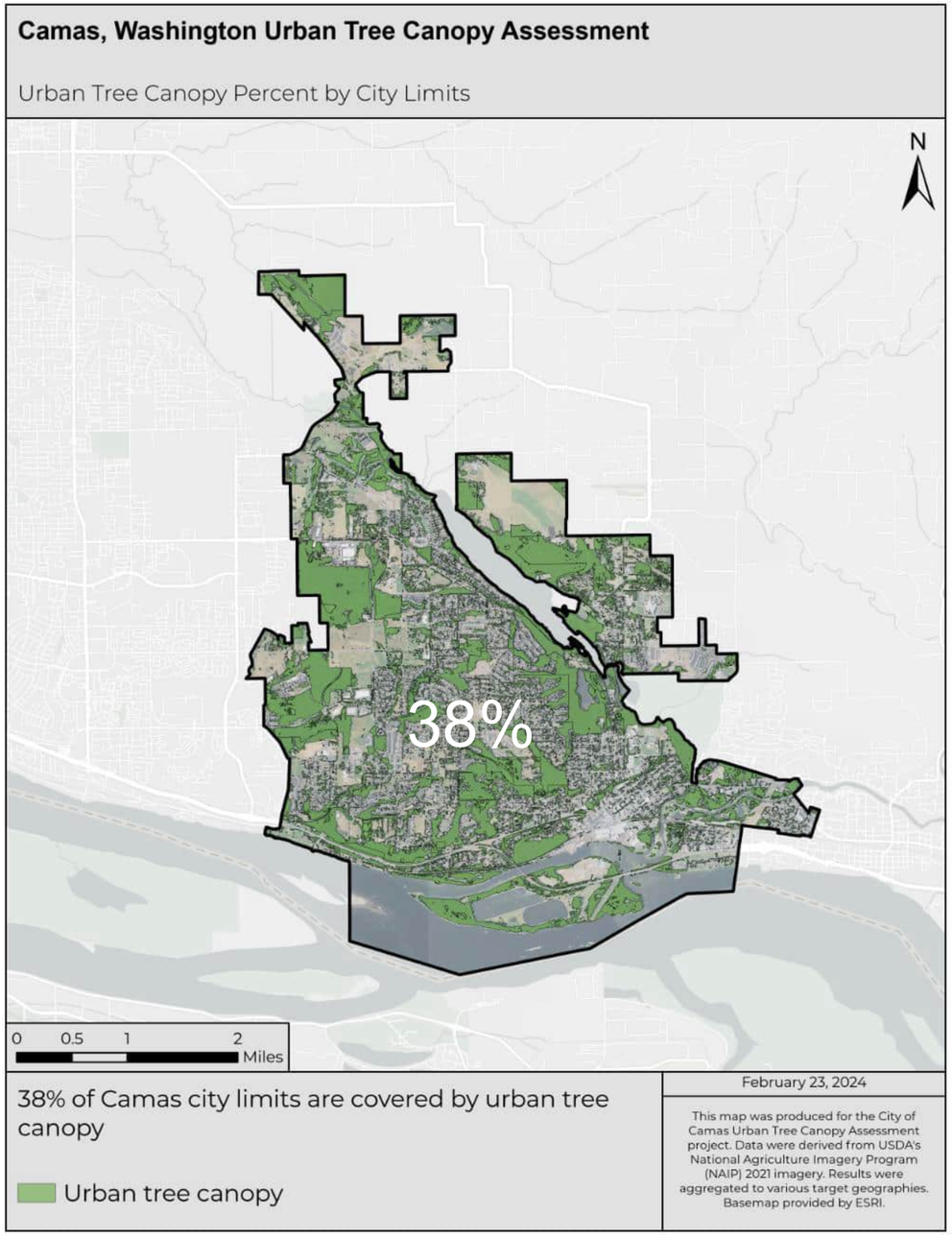
*Metrics are taken from iTree tool database. The tool classified a majority of the Camas area as "urban" which is reflected in the citywide calculations. With a more nuanced evaluation, some of the Camas land area may act as more rural, depending on the land use.

The annual economic benefits of Camas' urban tree canopy were quantified based on a commonly used standard (right). These numbers do NOT include benefits to energy savings, mental and physical health, wildlife, and other ecosystem services. They are for the tree canopy only, and do NOT quantify the benefits provided by other natural features and systems like wetlands, understory vegetation, lawns, and lakes. The quantified benefits are over 10x the annual Camas Parks and Recreation Department budget.

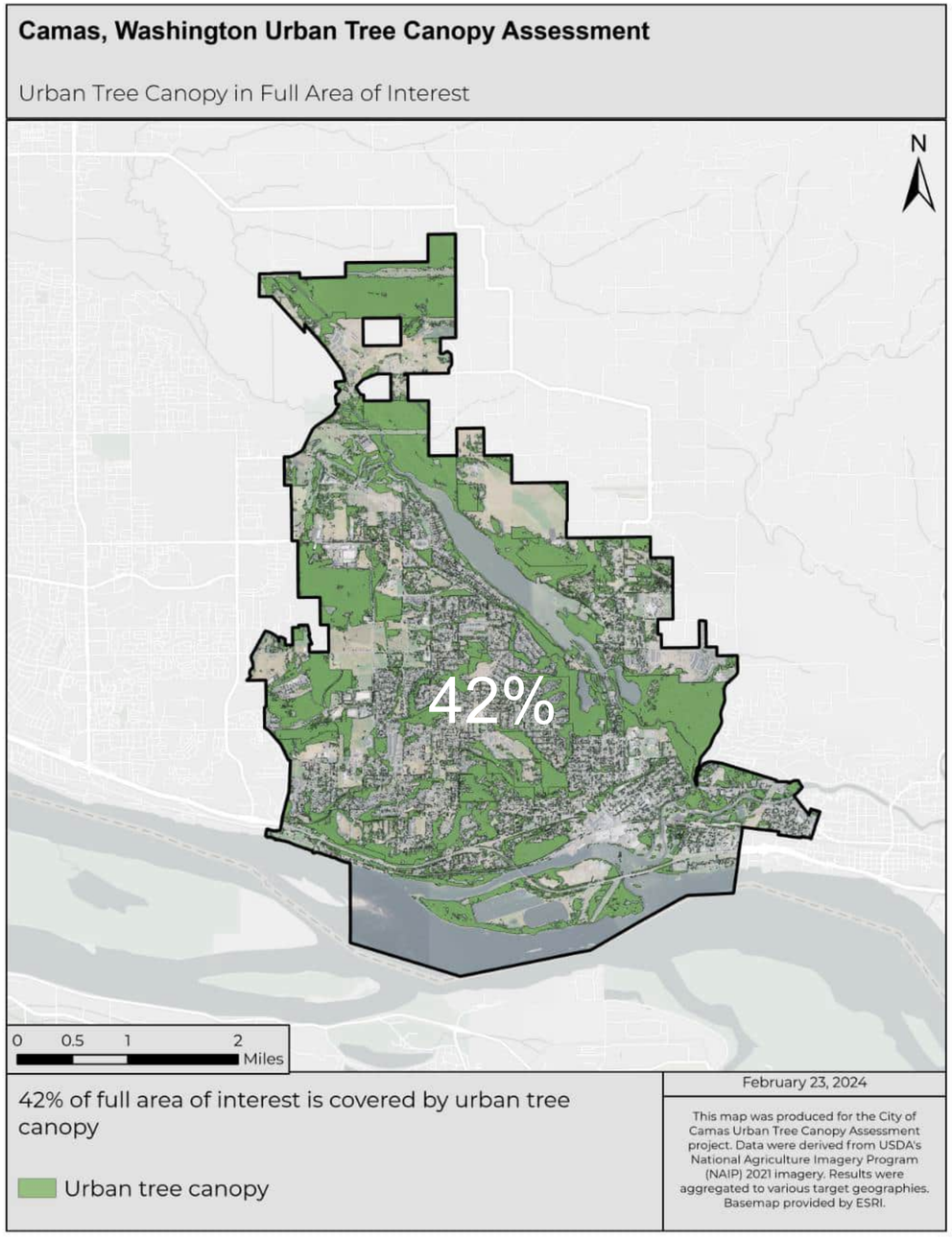
ECOSYSTEM SERVICES: CAMAS TREE CANOPY

Tree Canopy Assessment

As part of the POSMP, the team analyzed the existing conditions of the city-wide tree canopy as a whole, as well as inventoried a group of individual trees. These assessments establish a data-backed baseline to measure future conditions in order to track progress against goals. They looked at current conditions, change over the last decade, and potential for canopy enhancements.



CITY LIMITS

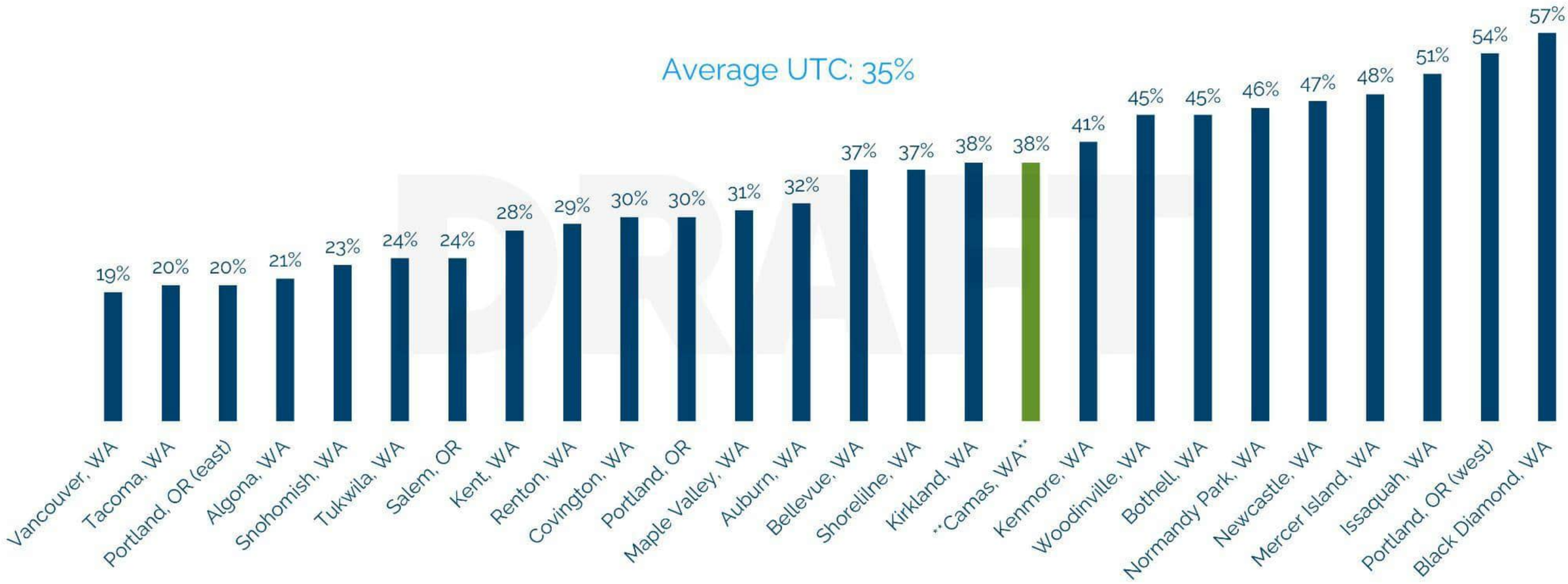


CITY LIMITS + COUNTY OPEN SPACE

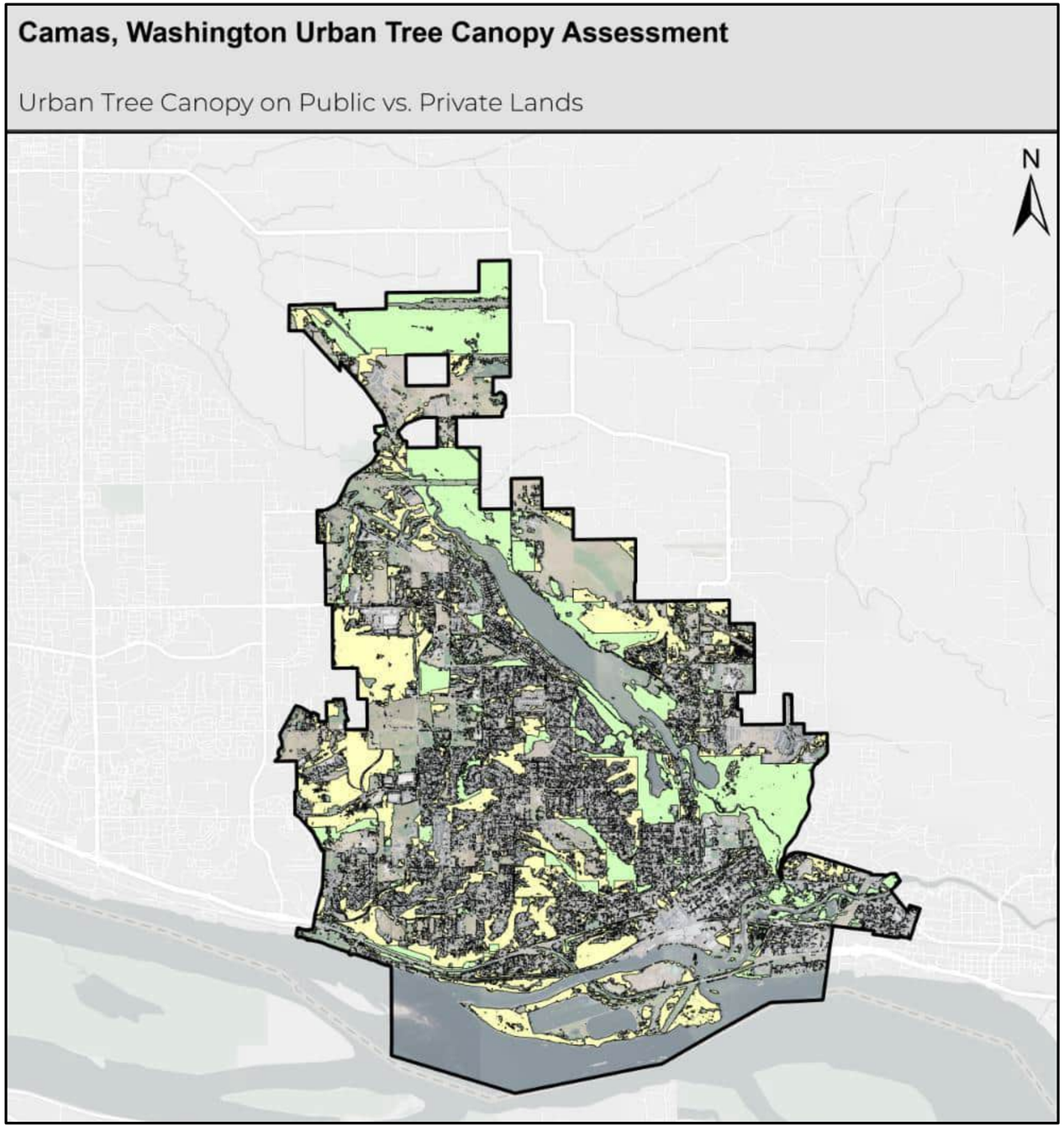
Land Type	Area
City Limits	3,399 acres
City Limits + County Open Space	4,205 acres

EXISTING

Percent canopy coverage within city limits as compared to other local communities.
Camas has more coverage than many urban areas, but less than more rural and suburban ones.



URBAN TREE CANOPY COMPARISONS



Land Type (City Limits & Clark County Open Space)	%	Area
Tree canopy on private lands	54.91%	2,293 acres
Tree canopy on public lands	45.09%	1,883 acres
All tree canopy (within POSMP area)	100%	4,176 acres

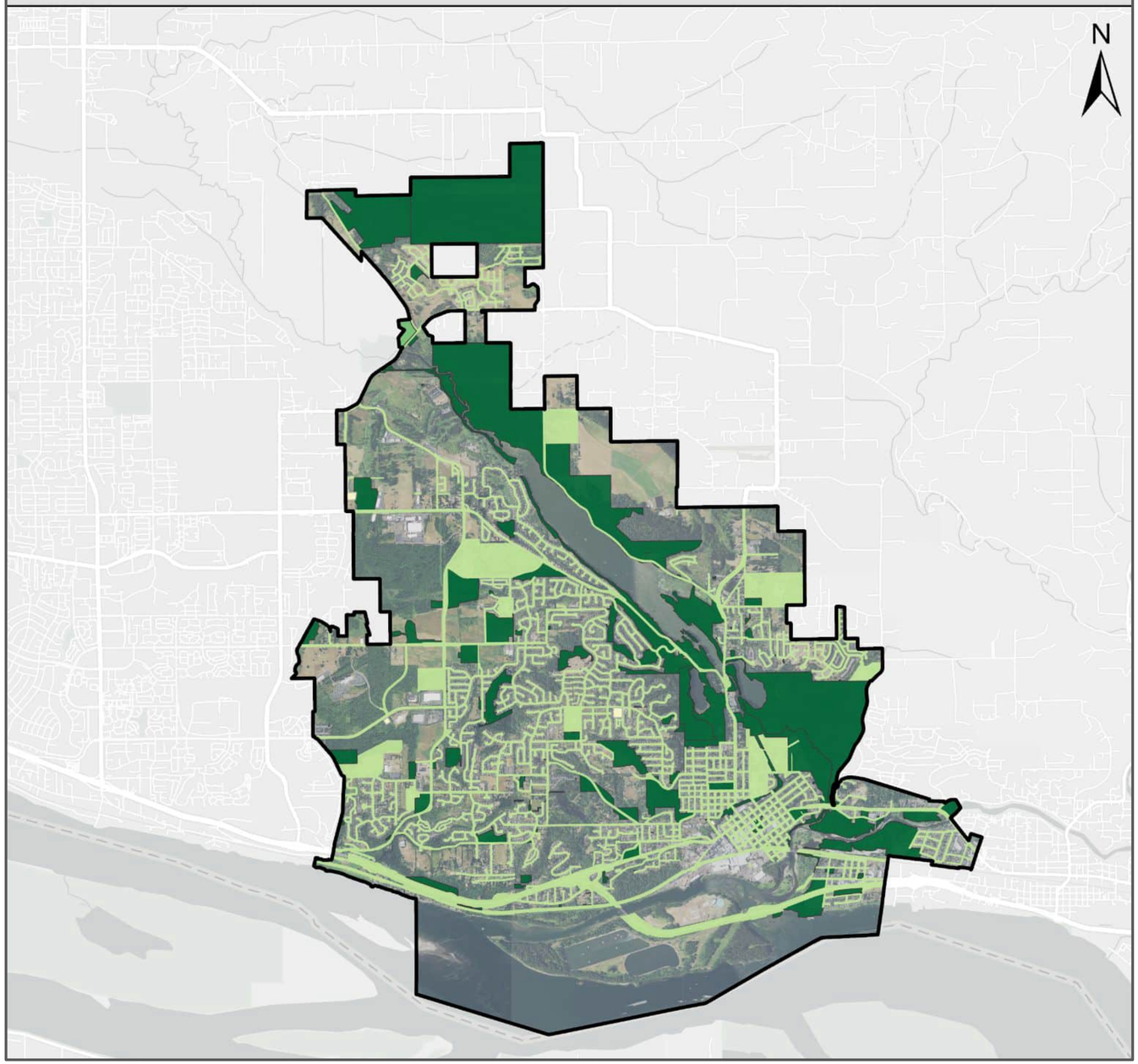
About half of all urban tree canopy in Camas is on private property.

EXISTING - URBAN TREE CANOPY

Camas, Washington Urban Tree Canopy Assessment

Urban Tree Canopy Percent by Public Land

PlanIT Geo™
developers of TreePlotter



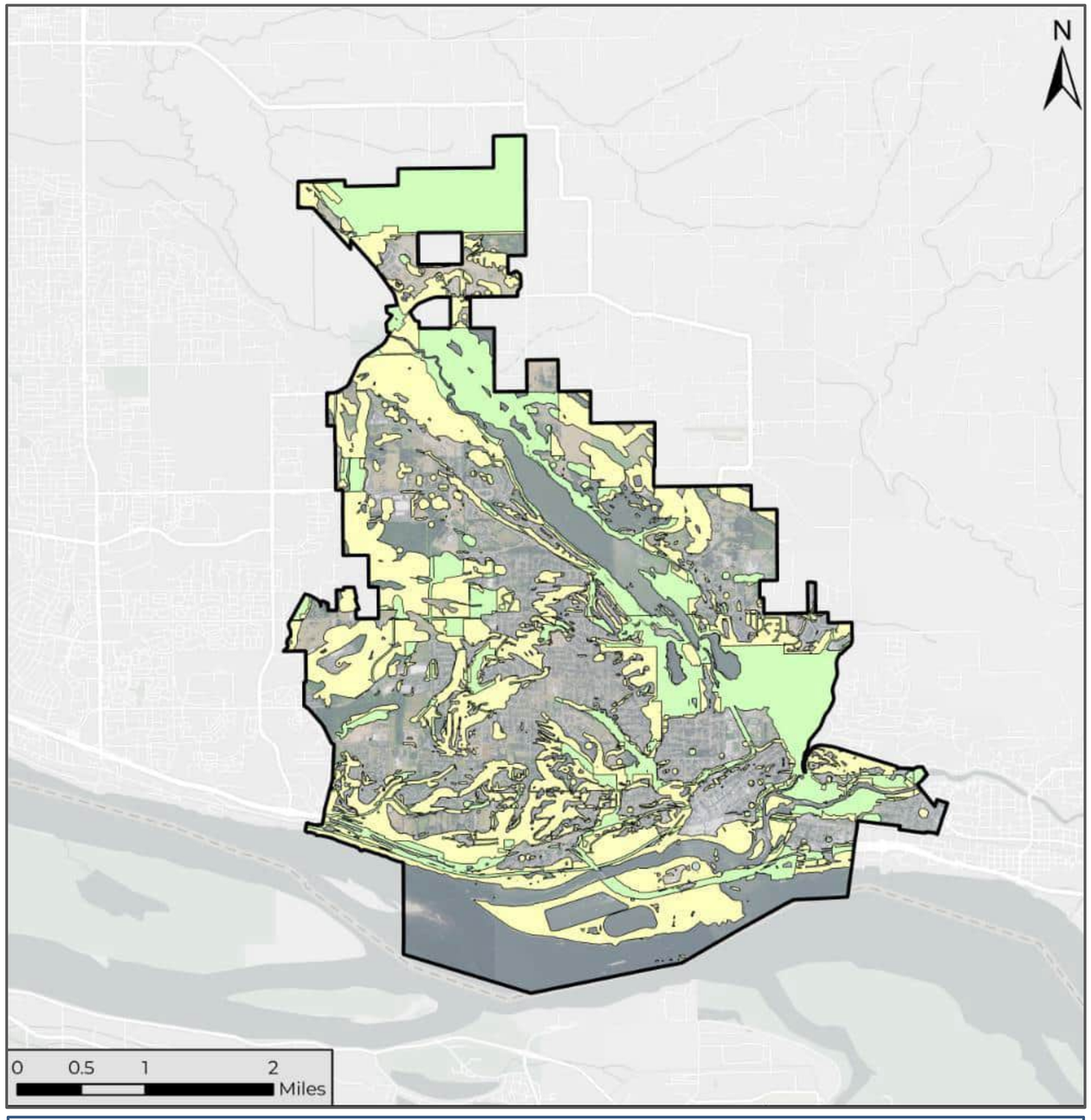
Urban Tree Canopy %

(City Limits & Clark County Open Space)

- 0% - 15%
- 16% - 25%
- 26% - 35%
- 36% - 45%
- 46% - 96%

Much of the public tree canopy is concentrated around Lacamas Lake and Green Mountain. Developed parks and street trees provide coverage throughout the city.

EXISTING - PUBLIC LANDS



About half of all critical areas in Camas are on private property.

	Land Type (City Limits & Clark County Open Space)	%	Area
	Privately-owned critical lands (within POSMP area)	53.96%	3,425 acres
	Publicly-owned critical lands (within POSMP area, includes bodies of water)	46.04%	2,922 acres
	All critical lands (within POSMP area)	100%	6,347 acres

Wetlands | Steep Slopes | Sensitive Habitat

Shoreline Master Program:

The City finds that critical areas provide a variety of valuable and beneficial biological and physical functions that benefit the City of Camas and its residents, and/or may pose a threat to human safety, or to public and private property.

Goals:

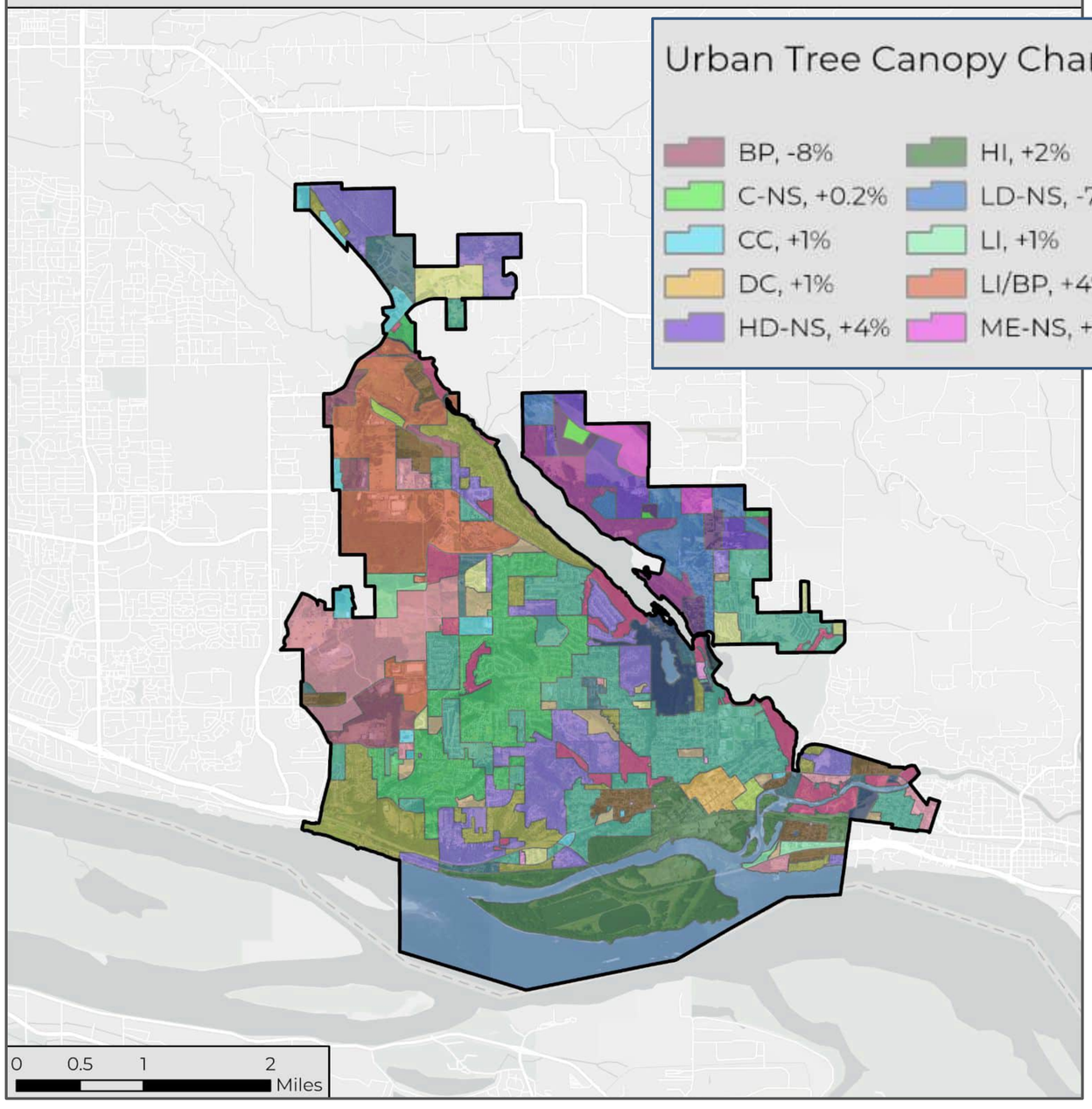
1. Protect members of the public and public resources and facilities from injury, loss of life, or property damage due to landslides and steep slope failures, erosion, seismic events, or flooding;
2. Protect unique, fragile, and valuable elements of the environment, including ground and surface waters;
3. Direct activities not dependent on critical area resources to less ecologically sensitive sites, and mitigate necessary impacts to critical areas by regulating alterations in and adjacent to critical areas; and
4. Prevent cumulative adverse environmental impacts to critical aquifer recharge and frequently flooded areas.

EXISTING - CRITICAL AREAS

Camas, Washington Urban Tree Canopy Assessment

Urban Tree Canopy Change Percent by Zoning

PlanIT Geo™ developers of TreePlotter



Total change of canopy coverage from 2011-2021

City + County Lands: -0.32% City Limits: -0.14%

Urban Tree Canopy Change % by Zoning Designation (descriptions)

BP, -8%	HI, +2%	MF-10, -4%	NP, +5%	R-15, 0%	Water, +7%
C-NS, +0.2%	LD-NS, -7%	MF-18, -9%	OS, +4%	R-6, -1%	
CC, +1%	LI, +1%	MX, +5%	POS-NS, 0%	R-7.5, -5%	
DC, +1%	LI/BP, +4%	MX-NS, +1%	R-10, -1%	RC, +3%	
HD-NS, +4%	ME-NS, +2%	NC, -4%	R-12, +4%	SU, +1%	

This analysis did not include an assessment of individual parcels or land types and their potential reasons for gain or loss.

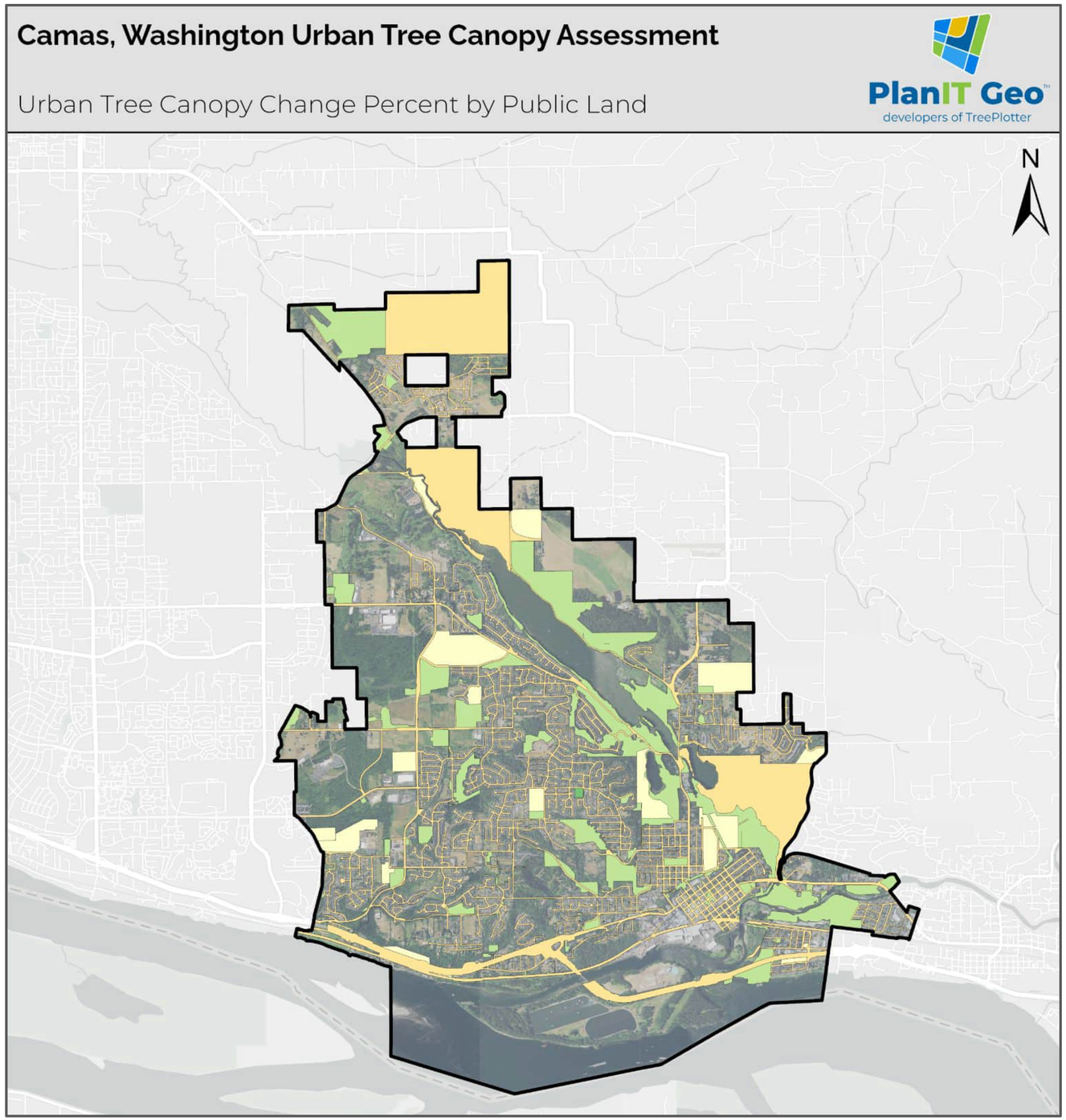
Common Reasons for %Gain

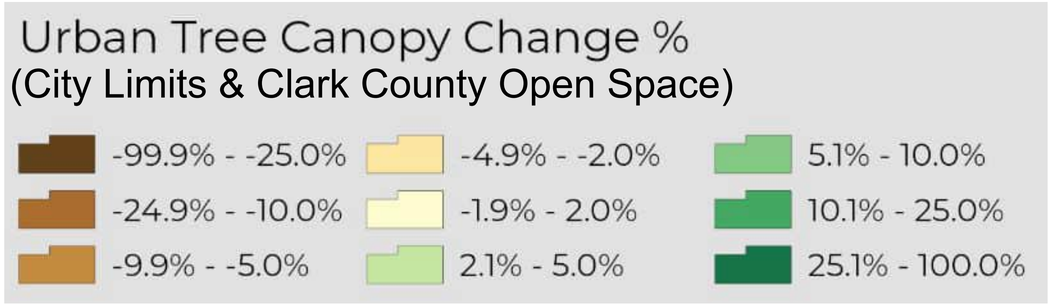
- Fallow field establishment
- Natural canopy expansion
- Restoration or infill

Common Reasons for % Loss

- Development
- Wildfire
- Expansion of land type
  - i.e. Right of Way added with small trees.

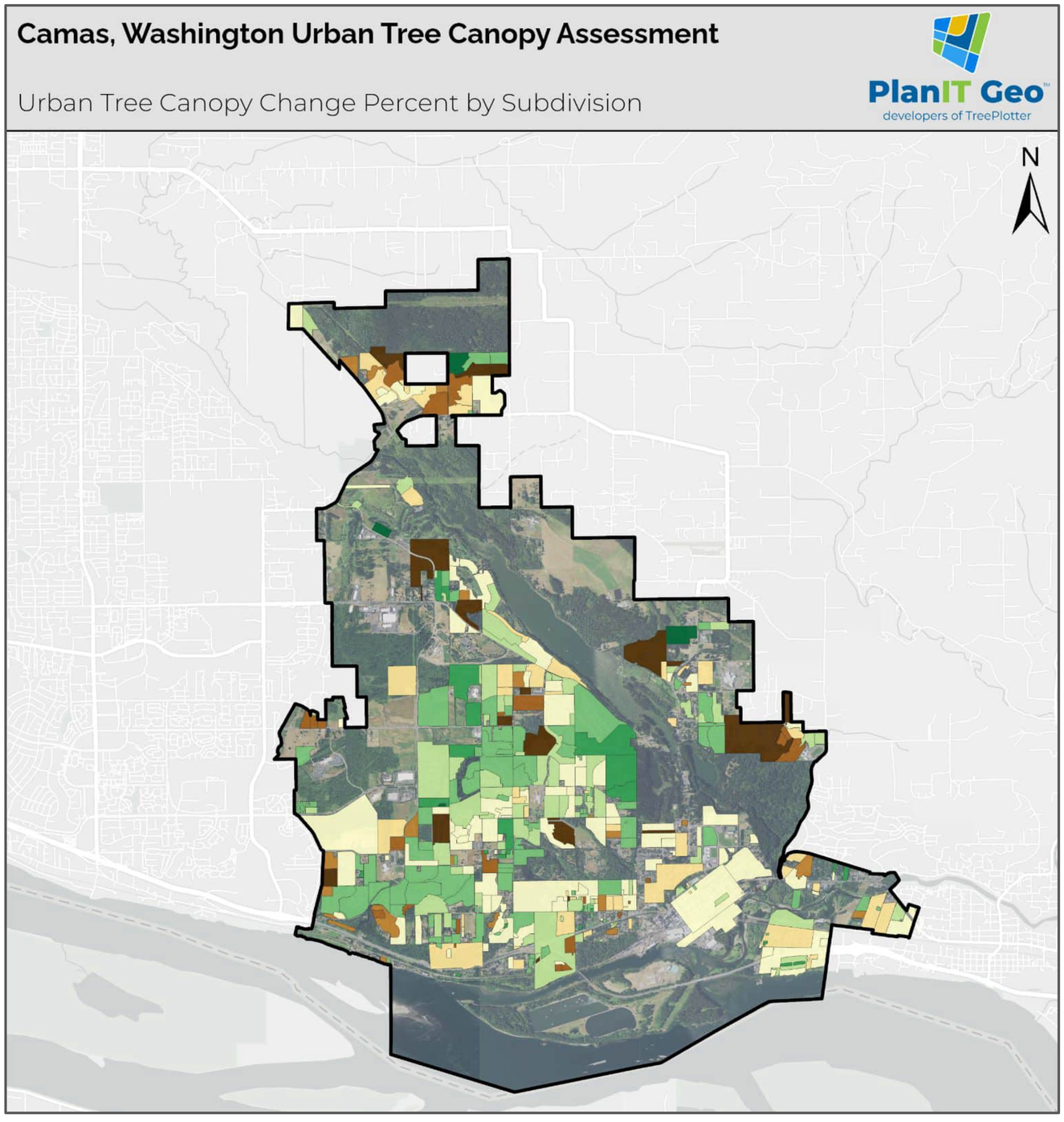
CHANGE (2011 - 2021)

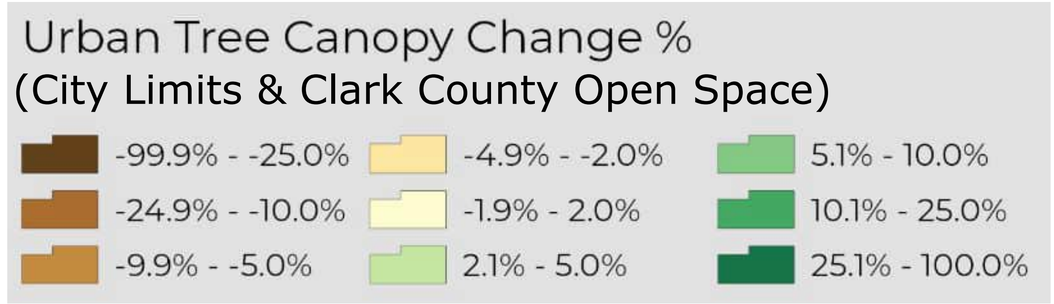




Low to moderate gains and losses occurred on public lands

CHANGE (2011 - 2021): PUBLIC LAND

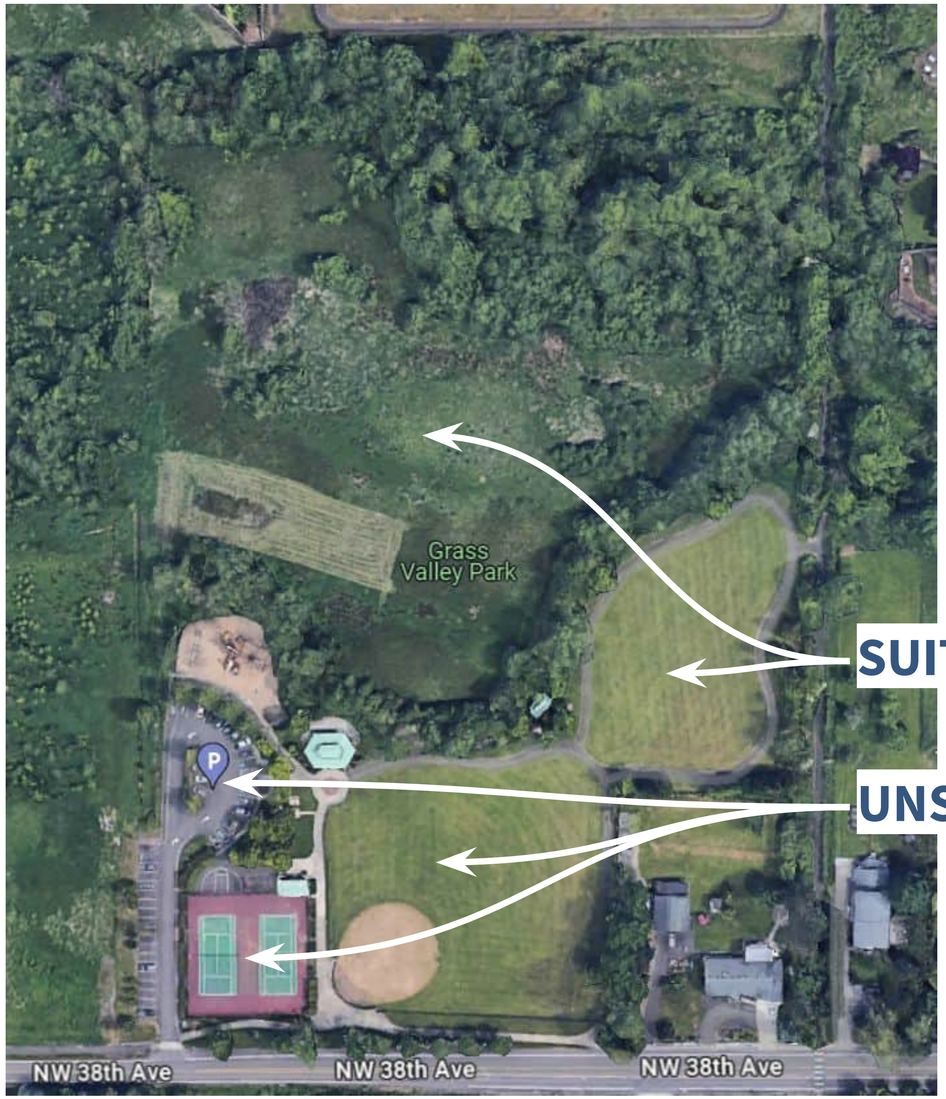




Biggest losses on subdivision land is likely due to private land development.

CHANGE (2011 - 2021): SUBDIVISIONS

All land areas in the City of Camas that were not currently tree canopy were classified as either possible planting areas (PPA) or unsuitable for planting.



POTENTIAL PLANTING AREAS

- Lawn, open fields, or grass areas
- Shrub and ground cover vegetation
- Bare or fallow soils

UNSUITABLE AREAS

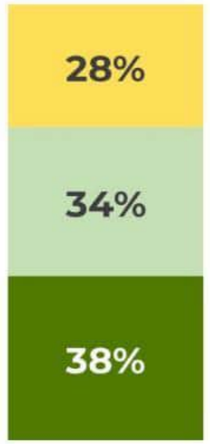
- Recreation fields
- Utility corridors
- Stormwater facilities
- Roadways
- Building Structures

POSSIBLE PLANTING AREA: EXAMPLE

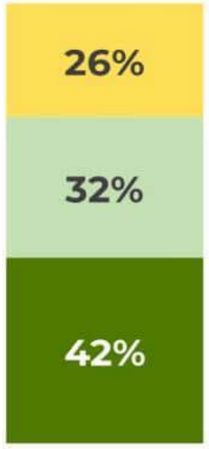
Results Charts

Key: Canopy | Total PPA | Unsuitable UTC

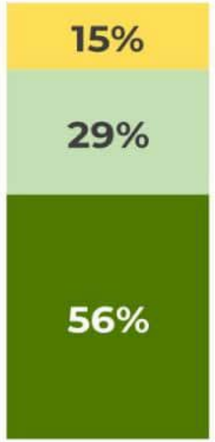
City Boundary



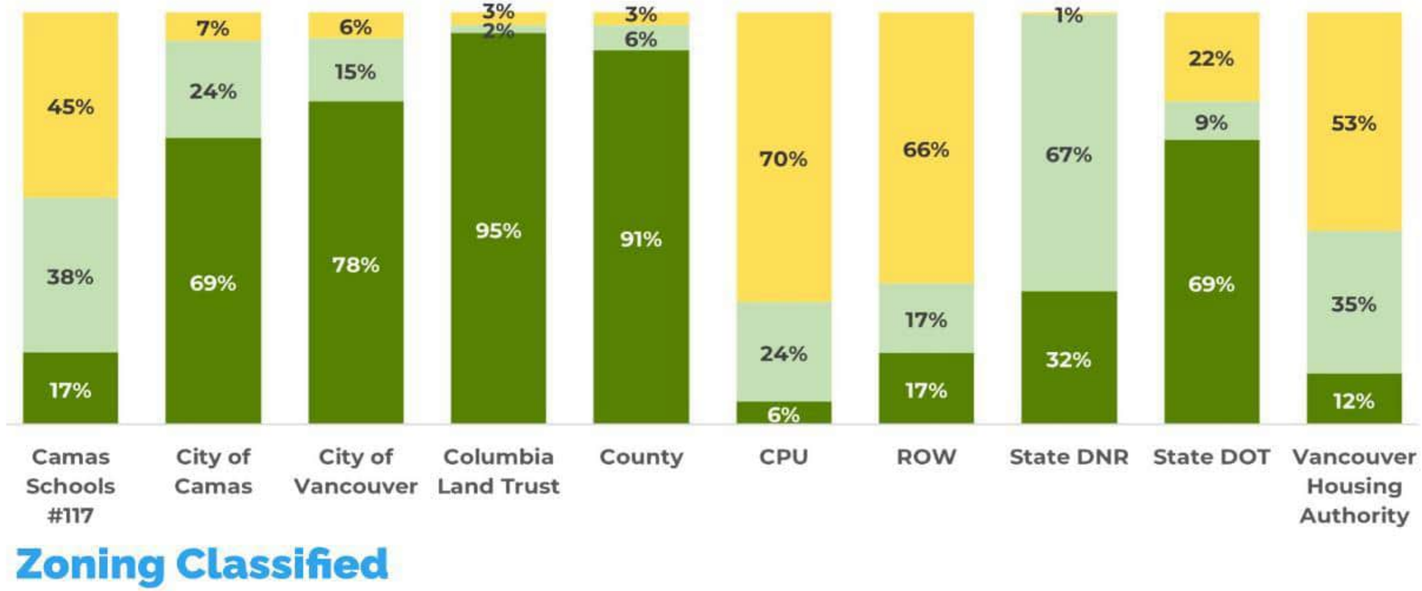
AOI



Critical Places



Public Lands

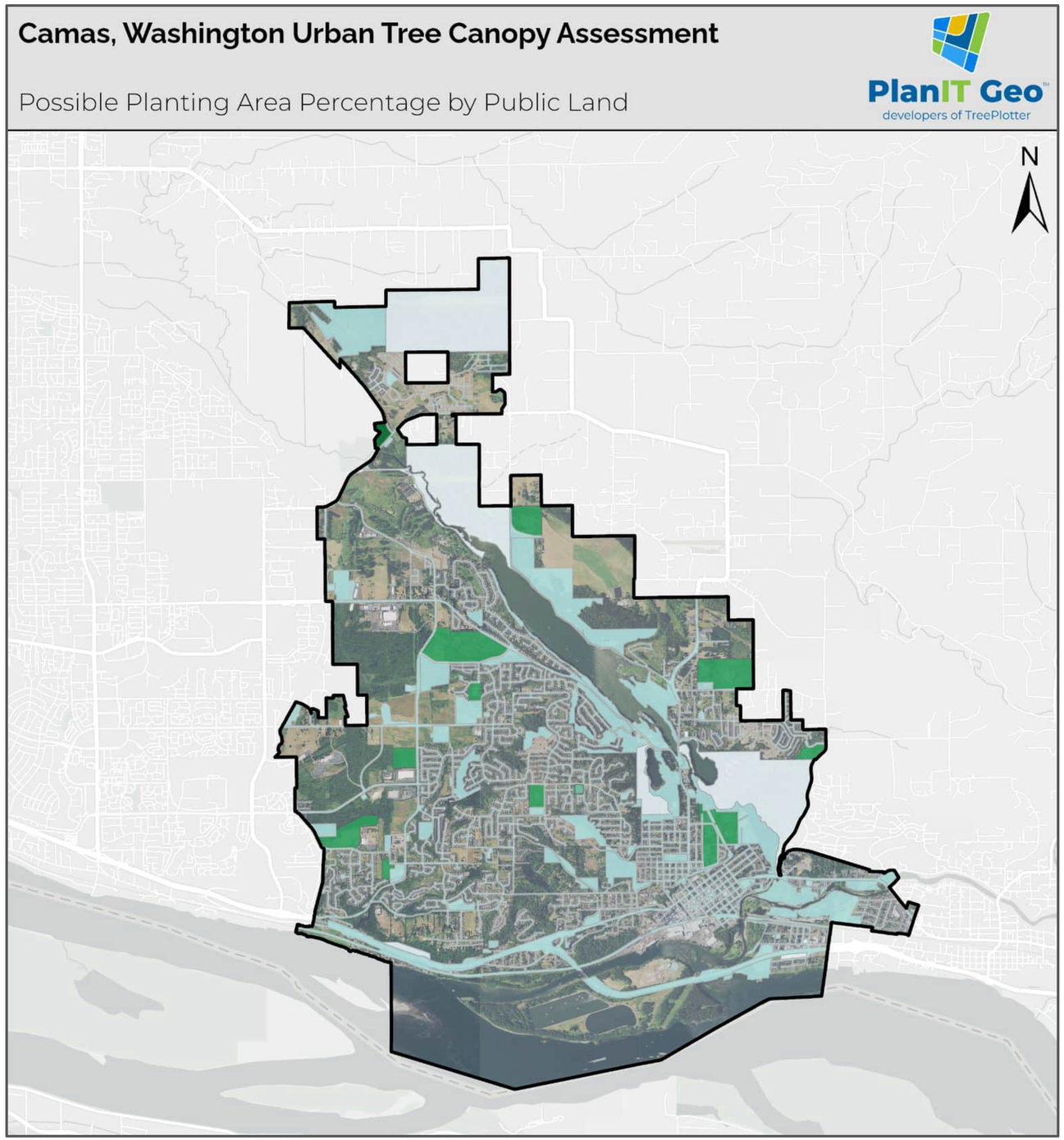


Zoning Classified



Existing tree canopy, potential planting area, and unsuitable areas for planting broken out by land use and ownership

POSSIBLE PLANTING AREA: SUMMARY

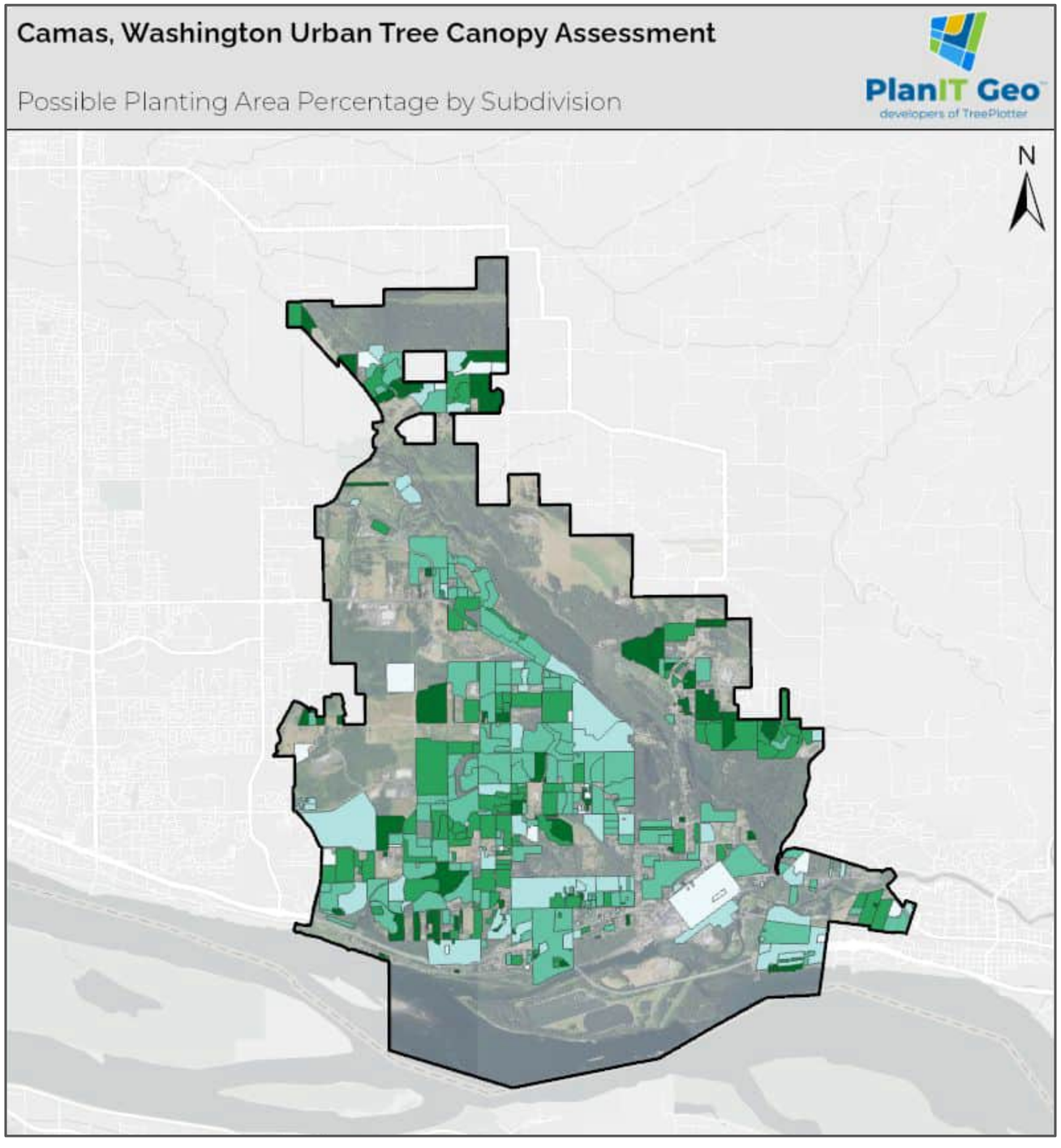


Possible Planting Area %
(City Limits & Clark County Open Space)

0% - 15%
16% - 25%
26% - 35%
36% - 45%
46% - 98%

Schools present the biggest opportunity for increased canopy coverage on public lands.

POSSIBLE PLANTING AREA: PUBLIC LANDS



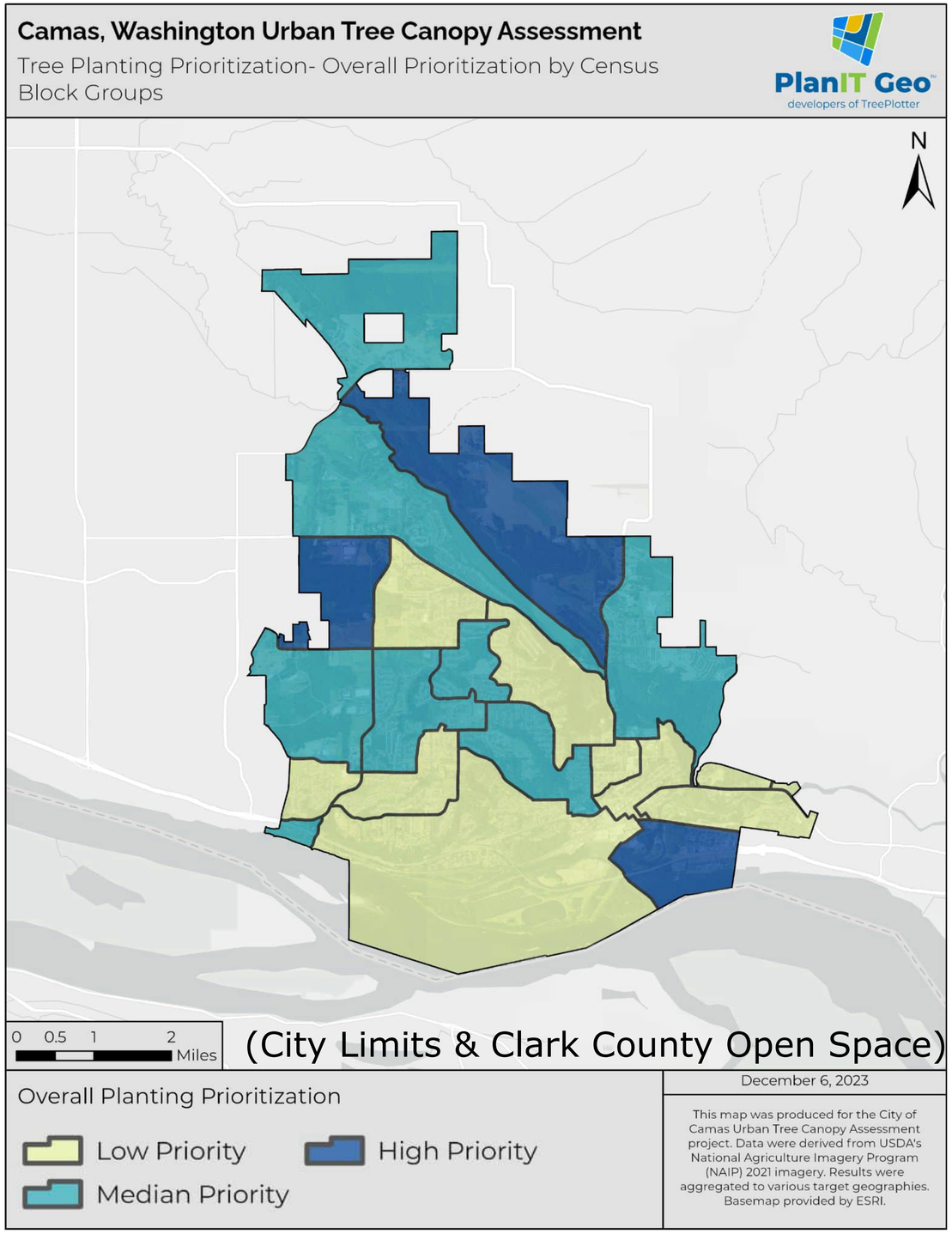
Possible Planting Area %

(City Limits & Clark County Open Space)

0% - 15%
16% - 25%
26% - 35%
36% - 45%
46% - 98%

HOAs carry a lot of potential to contribute to canopy gain.

POSSIBLE PLANTING AREA: SUBDIVISIONS



An assessment was done to determine priority areas for future planting. It was based on the following factors, equally weighted, which align with many grant applications with equity requirements:

- **Low UTC** - areas currently low in canopy cover
- **High PPA** - areas currently high in possible planting area
- **Economic vitality** - average annual household income
- **Poverty %** - percentage of population living below poverty line
- **Vulnerable population %** - percentage of residents under 18 or over 65
- **% unemployed** - percentage of residents considered unemployed
- **Educational attainment** - percentage of the population w/o GED or HS diploma
- **People of color** - percentage of residents of color

DEMOGRAPHIC PRIORITY AREAS

Plan for Adaptability

Urban areas around the world are facing dramatically intensifying extreme weather and climate impacts including drought, long-term water shortages, flooding, extreme weather events, and prolonged heat. Urban trees can play a significant role in making Camas, Washington resilient to weather and climate extremes, and in protecting human and ecosystem health and safety.

Increased temperatures and prolonged heat have a dramatic effect on urban trees. Urban trees already face many struggles of the urban environment, including competition for space, elements of an urban environment, vandalism, and harmful pests and diseases. Some of Camas's established trees are unlikely to survive the changes in the climate and weather patterns over the next 50-75 years. Planting the right trees for Camas today and in the future will play a vital role in the resiliency of the City's urban forest as well as overall community sustainability.

In pursuit of a sustainable and resilient urban forest, the City of Camas may seek to apply climate adaptation strategies to urban forest management planning. Building toward this objective, the City maintains a recommended tree list of small, medium, and large trees and trees that are prohibited for planting in public areas or through private development projects as a requirement of City Code. The Camas Urban Forest Vulnerability Report provides a summary of the changing climate, an analysis of urban tree species vulnerability to changing climate, and considerations for new tree species to integrate into Camas's urban forest over time. See Appendix for full report.

Climate Change Vulnerability Ratings for Northwest Urban Trees

Table Key:					
Urban Adaptability:		**Zone Suitability:**		**Vulnerability:**	
+	High: Species may perform better than modeled	√	Suitable	▼	Low: Suitable zone, high adaptability
●	Medium	X	Not Suitable	●	Low-moderate: Suitable zone, medium adaptability
–	Low: Species may perform worse than modeled			⊟	Moderate: Suitable zone, low adaptability or zone suitable, high adaptability
				○	Moderate-high: Zone not suitable, medium adaptability
				△	High: Zone not suitable, low adaptability

*Invasive species

Table 8. Climate vulnerability and suitability of urban trees in the Pacific Northwest (Source: Climate Change Response Framework, NIACS)

		HEAT ONLY		HEAT & HARDINESS	
Common Name (Alphabetized)**	**Urban Adapt-ability**	**Zone Suitability**	**Vulnerability**	**Zone Suitability**	**Vulnerability**
Aleppo pine	●	√	●	√	●
Alleghany serviceberry	+	√	▼	√	▼
American basswood	●	√	●	X	○
American beech	●	√	●	√	●
American elm	●	√	●	√	●
American hornbeam	+	√	▼	√	▼
American smoke tree	●	√	●	X	○
American sycamore	●	√	●	√	●
American witch-hazel	●	√	●	X	○
Amur maackia*	+	√	▼	X	⊟
Apricot	●	√	●	X	○
Arizona cypress	●	√	●	√	●
Austrian pine	●	√	●	X	○
Bald cypress	+	√	▼	√	▼
Big leaf maple	●	√	●	√	●
Birch bark cherry	●	√	●	X	○
Black cherry	–	√	⊟	√	⊟
Black locust*	●	√	●	X	○
Black maple	●	√	●	X	○
Black poplar	●	N/A	N/A	√	●
Black walnut	–	√	⊟	√	⊟
Boxelder	●	√	●	√	●
Callery pear*	●	√	●	√	●
Cherry plum	●	√	●	√	●
Chinese chestnut	●	√	●	X	○
Chinese elm	+	√	▼	√	▼

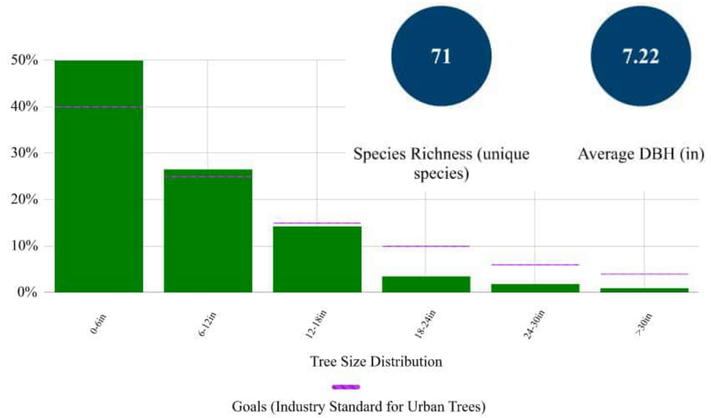
Example tree species list. See report for full list.

Measure What You Have

As part of assessing the urban tree canopy, this project inventoried over 9000 individual trees on public land across the city. This effort is a start to understanding the species and size diversity, health, and potential long- and short-term maintenance issues that may occur. The City will be adding to and managing this database in order to track changes over time in order to align more with the recommendations of this plan.

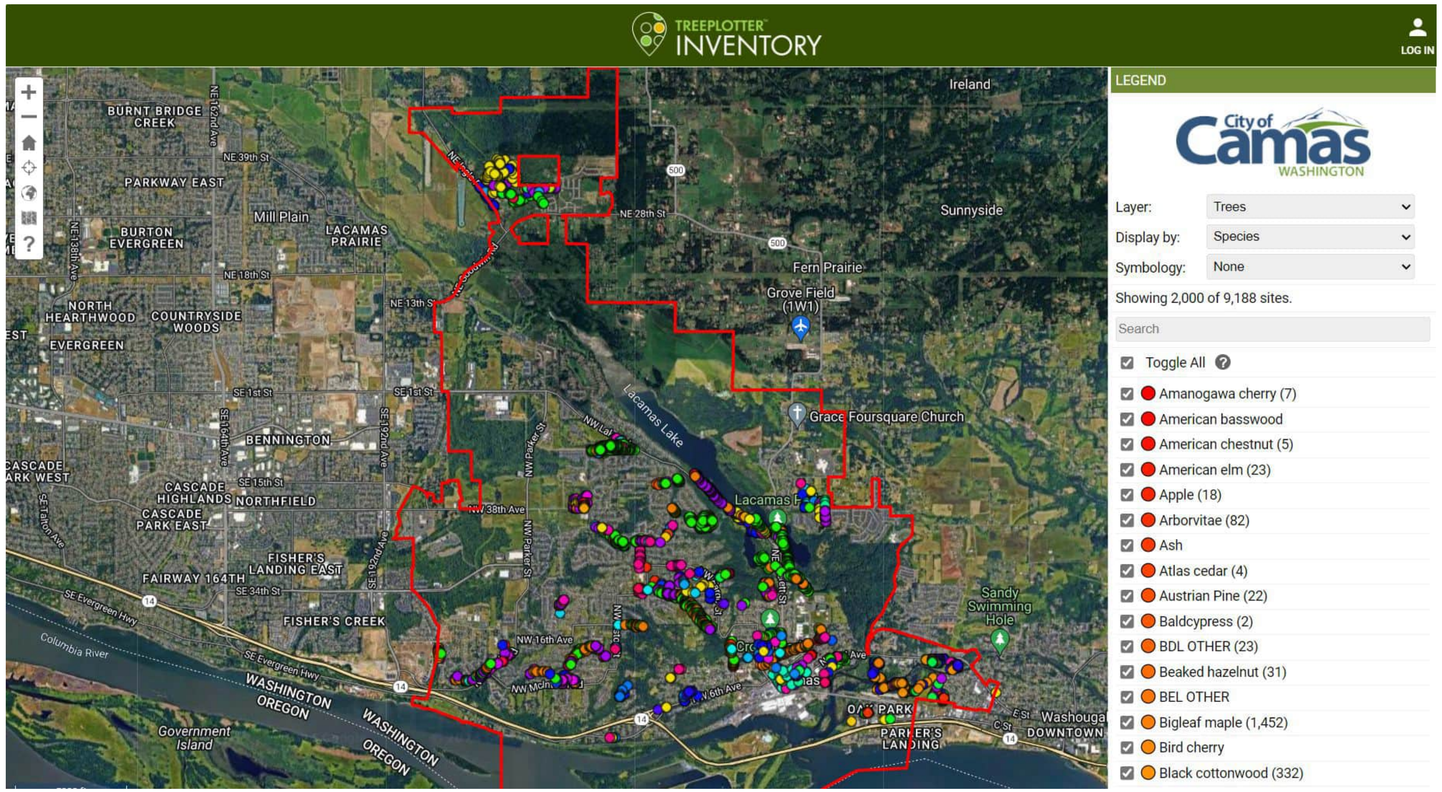
Street Trees

While not all street trees were inventoried, a snapshot of the diversity in species and size provides an overview of the overall conditions and can set a baseline for tracking future conditions. Many new trees were recently added, so care should be taken to allow them to mature and adapt to a changing climate.



Richards, N. A. 1983. "Diversity and Stability in a Street Tree Population." Urban Ecology 7(2):159–171.

Richards, N.A. 1993. Reasonable guidelines for street tree diversity. Journal of Arboriculture 19:344–349.



Visit [TreePlotter (pg-cloud.com/CamasWA/)](pg-cloud.com/CamasWA/) to see more details on the inventoried trees on Camas public lands. The first 9000 trees were prioritized to include downtown street trees, developed parks, and trail and open space corridors that might pose potential hazards to recreational uses. It also included a few sample Right of Way areas in residential neighborhoods.

Value & Resource Use

The POSMP used budget and spending data over the past several years to get a sense of existing resource allocation. These were compared to other local agencies and best practices to produce recommendations for re-aligning to meet Camas' Community Values.

Current Practices and Allocated Resources Assessment

Identifying gaps and opportunities in service delivery

In order to shift operations towards a long-term management and stewardship model, this plan summarized and assessed existing staffing, time and resource use, and relationships with other organizations. Understanding the gaps and strengths helped to focus recommendations on potential methods of improvements.

Best Practices focused on these three key areas. Finding a balance across these goals can lead to alignment with the priorities of this plan:

More efficient service delivery and resource allocation.
Changes to service delivery methods that reduce costs, level of staff effort, and timelines can more efficiently use public funding and resources, and typically lead to a greater quantity of services provided.

More equitable distribution of and access to services in the community.
A more equitable distribution of public resources can address deficiencies within communities that have been historically underserved by public programs, investments, and processes.

Higher quality ecosystem services and social benefits.
Public-sector agencies are recognizing parks, trails, and open space as critical infrastructure. Improving services in the context of natural resources can mean improving outcomes directly for the ecosystem (e.g. air and water quality) and social benefits (e.g. recreation and improved health outcomes).

Recommendations Summary

STRENGTHEN COLLABORATION WITH PARTNERS

- Create full time position focused on development, coordination, and implementation of a partnership and volunteer program that engages with HOAs, community-based groups, volunteers, and other government entities.
- Establish management standards that can give clear guidance to City staff and private landowners to help meet the goals of climate resiliency, best management practices, and effective resource allocation.
- Establish agreements with HOAs and other partners for collaborative management of ecosystem services and recreational resources.
- Create ongoing channels with state and county level partners.

ALIGN INTERNAL ORGANIZATION AND METRICS WITH POSMP FRAMEWORK

- Reorganize maintenance staff by land type and train or hire champions to provide overall stewardship practices and goals.
- Implement per-capita and/or per-acre spending targets and tracking metrics to ensure adequate funding levels for maintaining high-quality parks and recreation amenities that meet the needs of the community in Camas.

Service Delivery: Department Spending

In terms of spending per acre and level of service, Camas provides more acres per 1,000 residents than any comparable district while spending the second lowest amount per acre.

PARK PROVIDERS	POPULATION ESTIMATE	PARKS BUDGET	PARKLAND ACRES	PER-CAPITA SPENDING	PER-ACRE SPENDING	ACRES/1000 RESIDENTS
City of Tumwater	27,100	$7,608,421	514.5	$280.8	$14,788	19.0
City of SeaTac	31,740	$8,317,584	352	$262.1	$23,630	11.1
City of Port Angeles	20,240	$3,914,100	270	$193.4	$14,497	13.3
Park Districts of Si View	42,060	$6,250,632	890	$148.6	$7,023	21.2
PenMet Park District	40,000	$5,866,627	570.9	$146.7	$10,276	14.3
City of Camas	**27,420**	**$3,437,438**	**1,064**	**$125.4**	**$3,231**	**38.8**
City of Mercer Island	25,800	$2,127,581	479	$82.5	$4,442	18.6
City of Kenmore	24,230	$1,873,638	146	$77.3	$12,833	6.0
City of Longview	38,130	$2,170,690	488	$56.9	$4,448	12.8
City of Mountlake Terrace	23,810	$1,306,090	269	$54.9	$4,855	11.3
City of Maple Valley	29,250	$1,069,653	370.8	$36.6	$2,885	12.7

WA State Comparisons

In its 2022 Parks, Recreation, and Open Space (PROS) Plan, Camas identified comparisons with other cities in Washington with similarities to Camas to understand the variation in operations. The PROS Plan found that in 2018 data reviewed, Camas had considerably lower spending and operating budget on parks and recreation services compared with peer cities, allocating the equivalent of $78.65 per person. The PROS Plan used 2018 data to avoid pandemic distortions in local budget data. An updated comparison using 2023 data of park providers in Washington, Camas fell in the middle of per-capita spending looking at a broad section of cities but was still less than half of the cities with the greatest spending (the Cities of Tumwater and SeaTac). Total budget numbers include all O&M including recreational services.

Strengths, Weaknesses, Opportunities, and Threats

Summary of existing conditions to provide context for efficient service delivery related to operations and allocating resources

Strengths:
- Large and growing inventory of parks and open spaces
- High level-of-service acreage with 38.8 acres per resident (the highest among comparison districts analyzed)
- Skilled Parks and Recreation staff
- Diverse schedule of recreation activities for residents accessible for different ages
- Currently leveraging County resources to expand portfolio (Legacy Lands program) and other grant resources for capital projects
- Community member interest in parks and open space stewardship and greater involvement; existing Camas Parks Foundation and Ivy League for fundraising and invasive plant removal volunteers

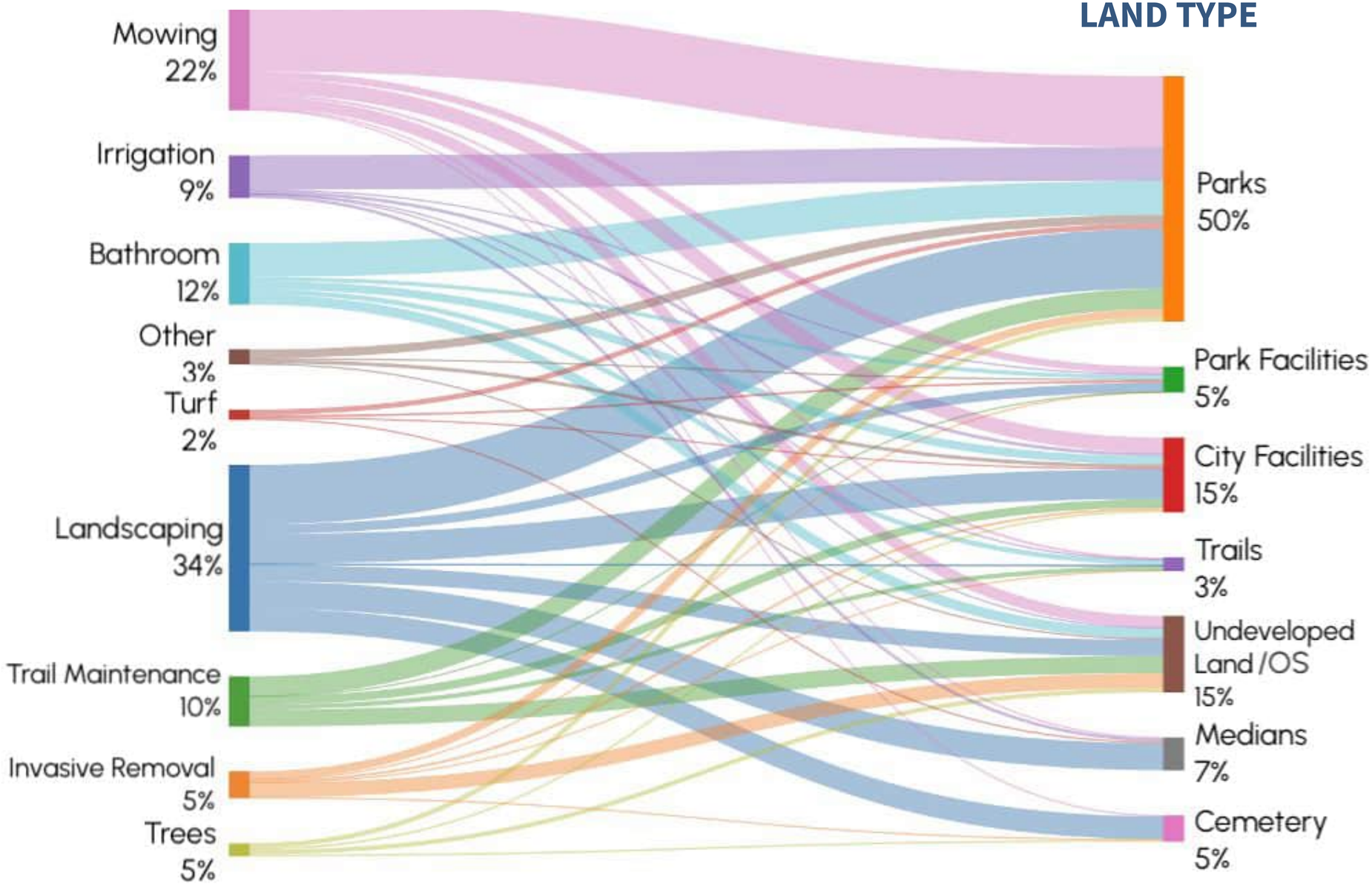
Weaknesses:
- City subsidizes community use through low facility-rental fees and charges
- High amount of effort towards mowing/landscaping
- Significant time and resources spent on non-Parks and non-Open Space facilities
- Need for additional invasives removal in open spaces (citywide)
- Resources spent on reactive management to extreme weather events
- Lack of specialized stewardship experience for different land types or natural systems
- Lack of established standards, agreements or ongoing conversations with private entities (HOAs) about parks and natural system expectations

Opportunities:
- Increase staff capacity to grow partnerships with community-based groups and leverage potential volunteer efforts
- Identify opportunities for joint training for both staff and community members to improve knowledge and best practices
- Work with Homeowners Associations (HOAs) to collectively address natural area needs on private property (e.g. invasives removal, trail maintenance, replanting of native plants/trees)
- Identify best design practices that reduce need for ongoing maintenance to free up staff time to address long-term or proactive issues

Threats:
- Lack of additional external resources (grants) for maintenance and ongoing operations with new assets
- Low capacity at current staff levels to engage with volunteer/community partners
- Increasing need for more specialized contract services (e.g. arborists) to handle reactive issues
- Unpredictable weather patterns associated with climate change that create unexpected costs and maintenance needs and increase system-wide vulnerabilities.

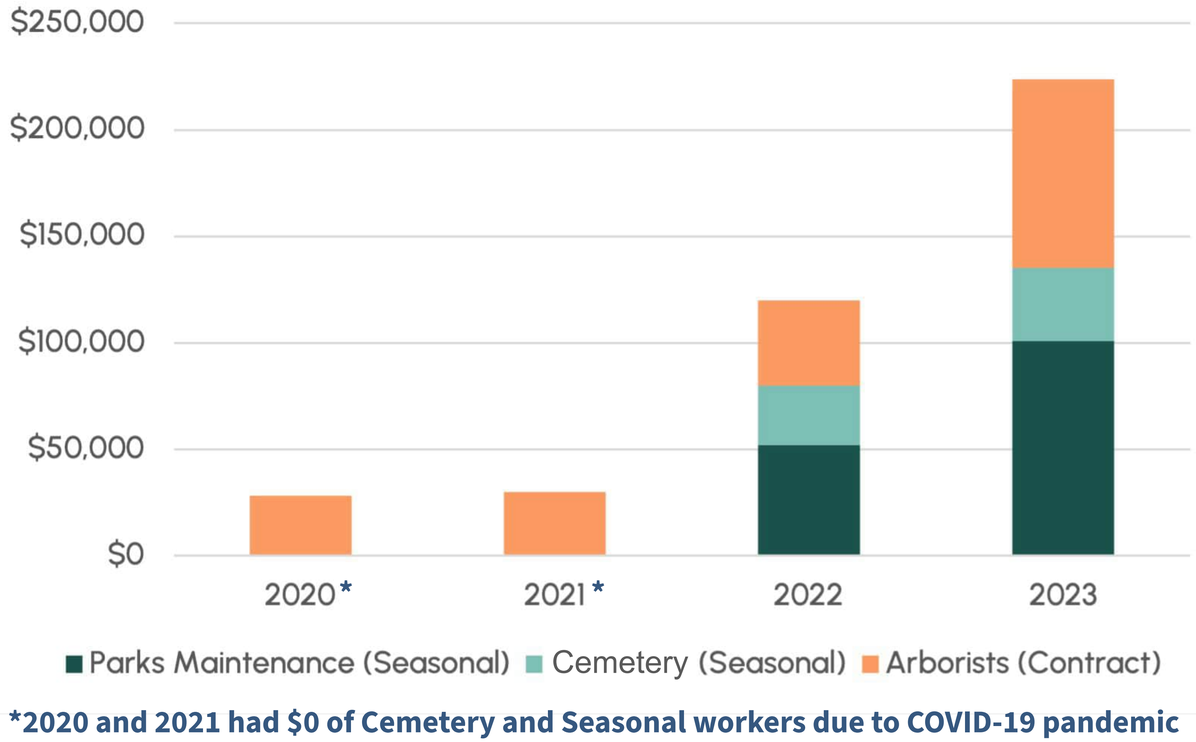
TIME SPENT PER ACTIVITY

TIME SPENT PER LAND TYPE



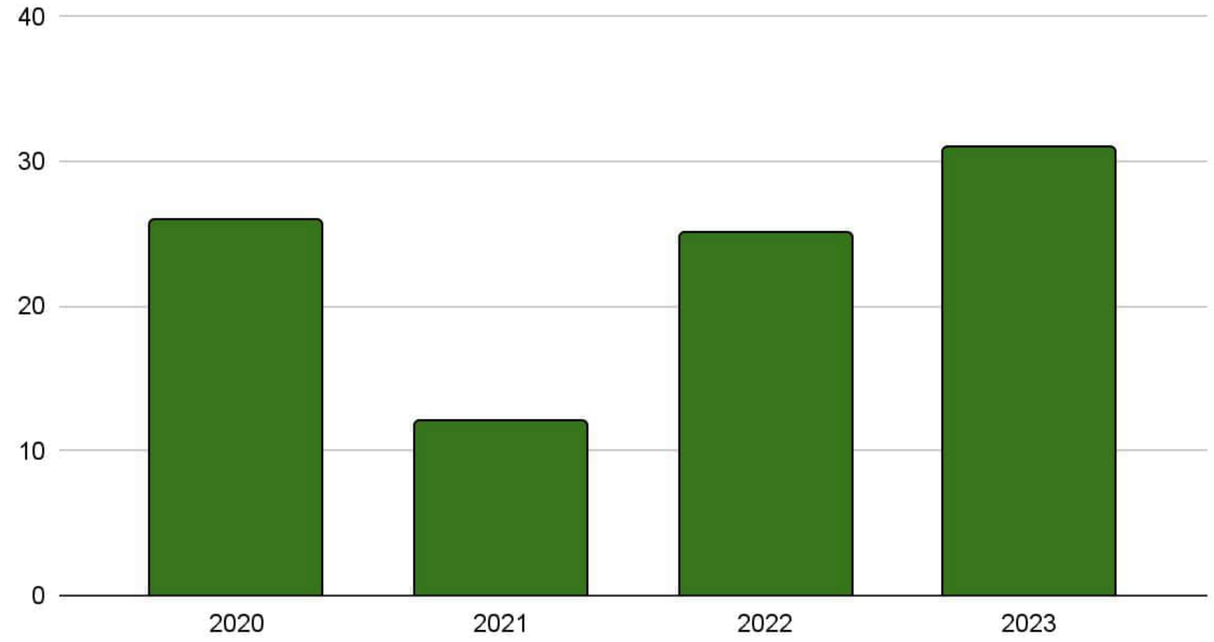
Parks and Recreation staff maintenance hours for the 2023 year were also assessed as part of this process in order to understand how time and resources were being prioritized. As the graph indicates, about a third of the time was being spent on maintaining lawns and irrigation, with another third on more detailed landscaping. About half of all time spent was on developed parks, while much of the time was also spent on non-Park facilities.

Annual Contract Employee Costs



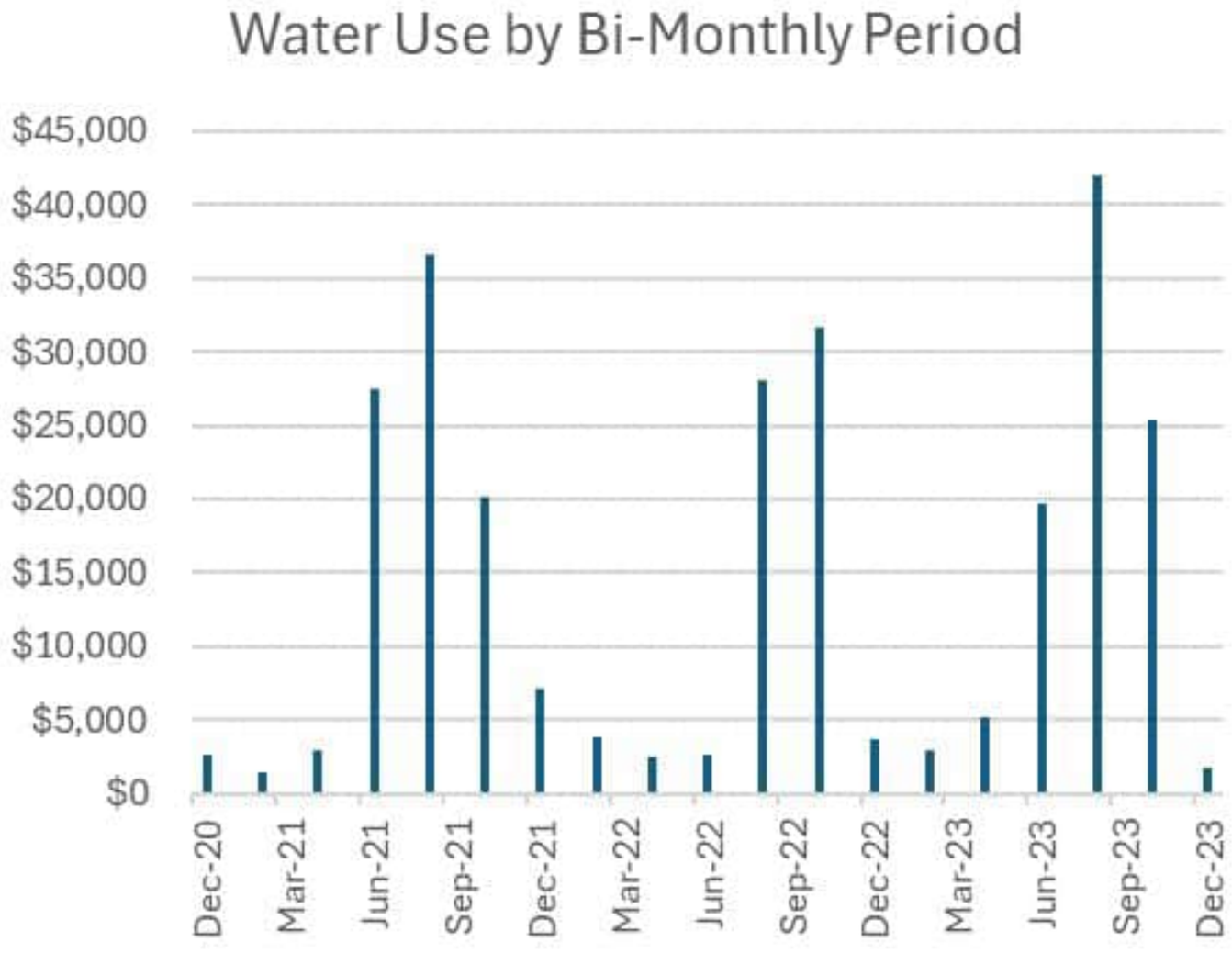
***2020 and 2021 had $0 of Cemetery and Seasonal workers due to COVID-19 pandemic**

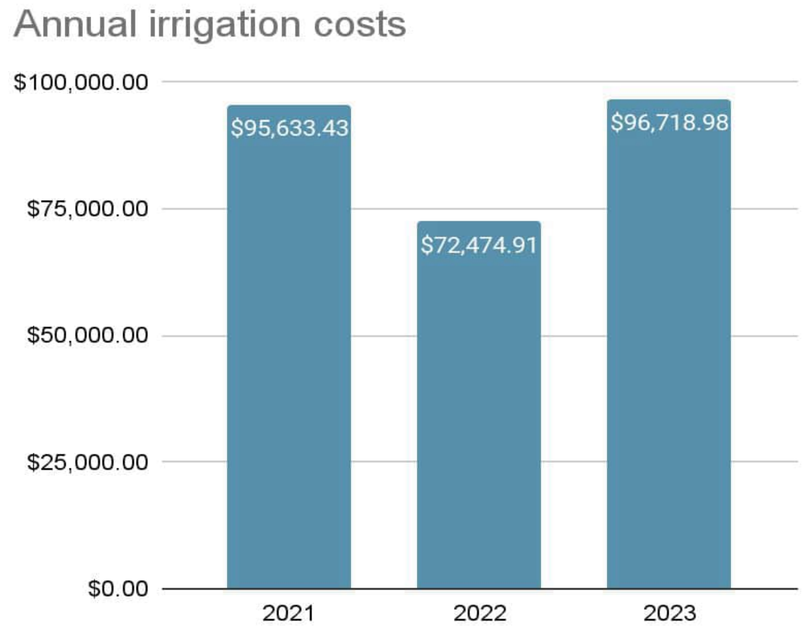
Number of Public Tree Requests

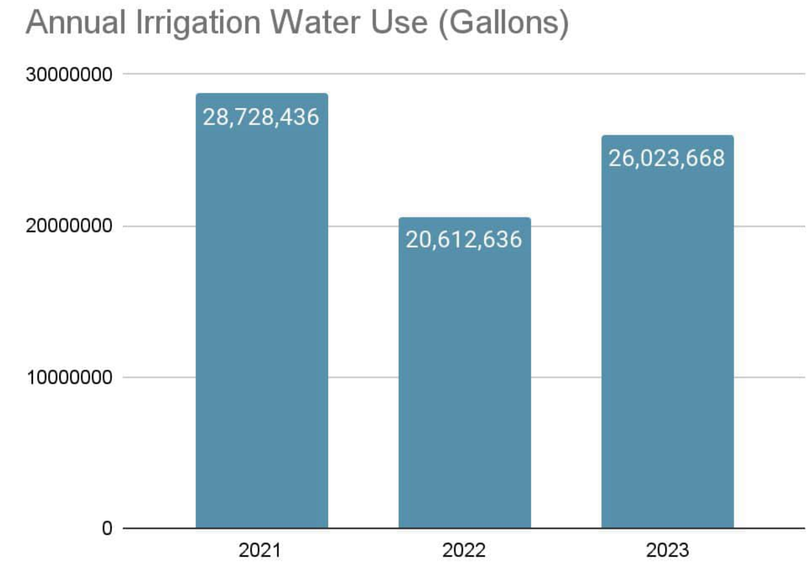


As extreme weather events and tree health and structural issues cause branch failures or risks, the number of public tree maintenance requests and other instances have increased. As public safety is a top priority, the city has been reactionary with the resources they have had, but mostly have contracted out arborists to handle these instances with costs increasing over the last several years.

ANNUAL CONTRACT EMPLOYEES: 2020-2023





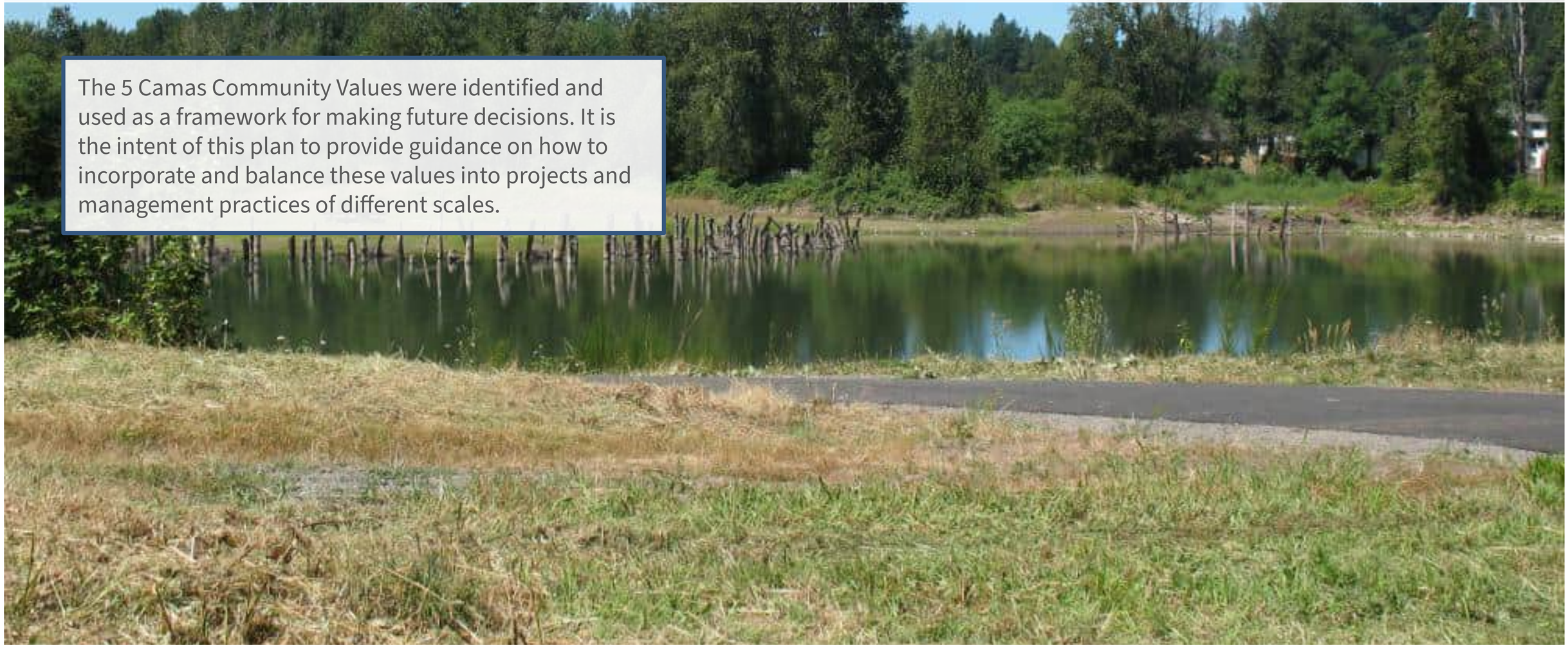


A significant portion of time and money goes into watering the public landscapes of Camas. The best practice recommendations look to find ways to reduce water use through use of native and adaptive vegetation.

ANNUAL IRRIGATION WATER USE: 2021-2023

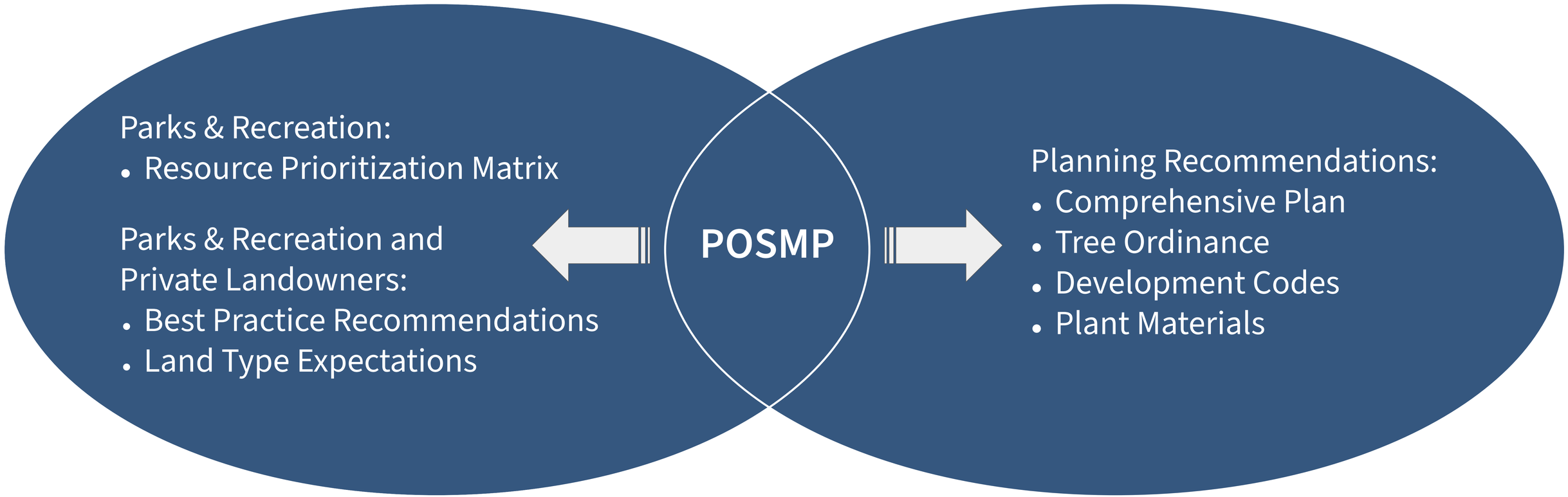
Resource Prioritization

The 5 Camas Community Values were identified and used as a framework for making future decisions. It is the intent of this plan to provide guidance on how to incorporate and balance these values into projects and management practices of different scales.

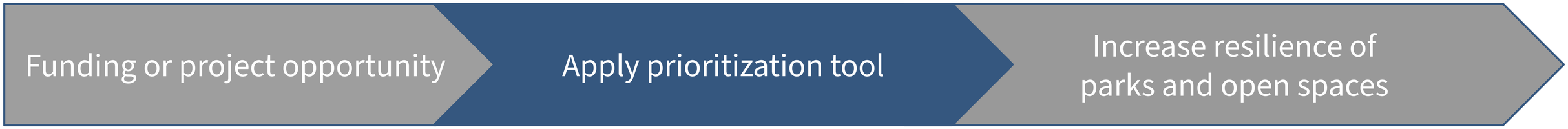


Recommendations

Based on the community values and existing conditions analysis performed by this plan, several types of recommendations were developed in order to find better alignment between the POSMP goals and the public and private practices that influence the resilience of the Parks and Open Spaces of Camas.



Building a prioritization tool



How can we use our resources strategically to support our parks and open spaces when a funding source or project opportunity becomes available?

We can use a set of criteria to make good management decisions and prioritize opportunities.

By using a data-backed prioritization tool, we can effectively use resources and increase the resilience of our parks and open spaces.

Project Approach Matrix: Overview

Values	Goal
Financial and Resource Allocation	Optimize value and resource use in order to best balance the long-term performance goals with immediate needs for parks and public open space.
Outreach and Education	Provide opportunities for learning to gain efficiencies, institute best practices, and engage the community.
Natural Character	Maintain the existing natural character of Camas in ways that bolster community identity.
Equitable Access	Ensure that all community members have access to Camas' parks and natural resources and the benefits they provide.
Asset Protection + Public Safety	Protect ecosystems, human health, safety, and public and private assets through the management of natural systems to limit the effects of extreme weather, climate change, and other potential impacts .

Legend



Establishes system-wide resilience



Considers connectivity and impacts to other sites or organizations



Makes site or process improvements

Status Quo Current practices

Roadblocks Obstacles to implementation

Where most cities are required to focus and start from

Additional values Camas wants to incorporate into decision making and resource allocation

It is the intent of this tool to use these 5 community values as a guide to prioritize resources and projects in order to maximize the potential impact of the work. The following matrix should be used by each project team to initiate a conversation and develop an intentional approach for how each project is addressing these values. Each value can be addressed in a variety of ways to contribute to the project site, the surrounding area, and the system as a whole.

Community Value: Financial and Resource Allocation

Goal: Optimize value and resource use in order to best balance the long-term performance goals with immediate needs for parks and public open space.

Challenges with available resources have led to some misalignment between public expectations and the abilities of current staff to keep up with the needs across the management portfolio. These resource challenges have also been amplified as the City of Camas has acquired a substantial amount of land in the last 10 years. While additional funding opportunities may become available through the treatment of parks and open spaces as valuable infrastructure, decisions have to be made to shift time and resources to the most impact tasks in order to align with the community values and POSMP goals.

Key Opportunities for Allocating Resources

- **Incorporate the value of ecosystem services**
- **Expand decision making to intentionally incorporate the 5 community values**
- **Align goals with grant funding requirements**

Recommended Project Approaches

System	Connectivity	Local Improvements	Status Quo → Roadblocks	
• Do the goals and strategies open up opportunities for additional ongoing funding sources? • Does it reduce liability? • Can it utilize current practices or resources? • Are operational savings or ecosystem services quantified to support future assessments and tracking?	• Are off-site ecosystem services, trade-offs, or mitigation being considered? • Do the goals and strategies open up opportunities for supplemental grant funding?	• Does it reduce resource use or operational costs? • Are on-site ecosystem services included in the project goals and value discussions? • Does it reduce the need to hire outside vendors?	• Not currently funded or intentionally pursuing resources • Maintains status quo in funding for maintenance and operations • Is reactive to comprehensive ecosystem services.	• Increase maintenance costs or resource use. • Removes ecosystem services without mitigation.

Community Value: Outreach and Education

Goal: Provide opportunities for learning to gain efficiencies, institute best practices, and engage the community.

With so much natural land to manage, it will take public, private, and non-profit collaboration and efforts to meet the long-term management goals of the POSMP. The City is constantly looking for new partnering opportunities to improve skills, increase capacity, or supplement funding or resources. This plan also looks to provide alignment across organizations for goals and identify needs for training and knowledge gaps.

Priority Education and Training Needs

- **Tree hazard identification**
- **Tree pruning strategies**
- **Invasive identification**
- **Value of retaining existing mature trees and protecting natural systems**
- **Maintenance guidelines for HOAs**
- **Maintenance practices for residential wildfire prevention**
- **Maintenance for stormwater facilities**
- **Benefits of using native species vs ornamentals or lawns**
- **Pest management and chemical use**
- **Soil health**

Recommended Project Approaches

System	Connectivity	Local Improvements	Status Quo → Roadblocks	
• Does it enable a path for long-term community stewardship or collaborative partnerships? • Does it establish or implement a pilot program to test practices and capture learnings.	• Does it collaborate with outside organizations or volunteers? • Does it build public-private partnerships or shared knowledge, goals, or expectations?	• Does it include public educational opportunities to learn about a resource, site, or culture? • Does it adjust practices or provide training for staff or the public on innovative or Best Management Practice methods that improve performance?	• Utilizes existing internal staff to perform a routine task. • Supplement with contractor for tasks that require specific training and/or technical skills.	• Requires resources for extra staff training.

Community Value: Natural Character

Goal: Maintain the existing natural character of Camas in ways that bolster community identity.

The natural features of Camas contribute to a sense of beauty and place that makes it a great place to live, work, play, and visit. There are many different types of features, each requiring their own care, attention, and stewardship to maintain their character and functionality.

Types of Features

- Street Trees and Medians
- Park and Open Space Tree Canopy
- Habitat and Wildlife
- Creeks and Wetlands
- Bodies of Water and Shorelines
- Trails
- Forest Understory
- Meadows
- Wooded Hillsides
- Open Lawns
- Manicured Landscapes
- Sports Facilities
- Cemetery

Recommended Project Approaches

System	Connectivity	Local Improvements	Status Quo → Roadblocks	
• Does it incorporate and honor community connection to place? • Does it prioritize natural features over built ones? • Does it help to retain or enhance city-wide natural systems?	• Does it provide consistency that aligns with native ecosystems? • Does it consider impressions from arrival and departure?	• Does it preserve or protect significant natural features beyond code? • Does it replace or improve out of character or invasive landscapes?	• No additional considerations during planning or development to exceed existing code to benefit and/or preserve ecological systems.	• Does not align with the ecological or cultural context of Camas. • Removes significant features that have community value without mitigation.

Community Value: Equitable Access

Goal: Ensure that all community members have access to Camas' parks and natural resources and the benefits they provide.

Obstacles to resources can exist in many forms. Considerations should be made to avoid or remove barriers due to mode of transportation, connectivity, physical abilities, demographics, schedule, type of recreational activity, or feeling welcome or safe. All community members and guest of Camas should be able to experience and enjoy the natural environment and associated programming in ways that align with their needs and abilities.

Access for Who?

- **Children**
- **Parents**
- **Elderly**
- **Mobility impairments**
- **Sensory impairments**
- **Racial and Cultural Diversity**
- **Mixed-age groups**

Recommended Project Approaches

System	Connectivity	Local Improvements	Status Quo → Roadblocks	
• Does it fill a major gap or provide significant connectivity in the system. • Does it preserve large areas of natural resources in neighborhood of need?	• Does it support multi-modal transportation? • Does it provide connectivity between adjacent public and private lands?	• Does it maintain or enhance existing recreational amenities, programs, or resources? • Does it preserve recreational opportunities? • Does it improve site wayfinding?	• Service to neighborhood or demographic in need will be reactive and on an as needed basis.	• Is remote and does not serve a neighborhood or demographic in need. • Cuts off access to an existing resource.

Community Value: Asset Protection + Public Safety

Goal: Protect ecosystems, human health, safety, and public and private assets through the management of natural systems to limit the effects of extreme weather, climate change, and other potential impact.

Parks and open spaces are valuable infrastructure that can help mitigate effects of disruptions or stresses to the community. Projects should understand what potential vulnerabilities exist and plan on how to address them through planning, design, and management. Resources should ultimately shift from less reactionary to more preventative efforts

Key Assets to Protect

- Community and Human Health
- Trails and Recreation Amenities
- Urban Tree Canopy
- Public Facilities and Private Structures
- Road and Utility Infrastructure
- Natural Ecosystems
- Habitat and Wildlife

Priority Concerns

- Water quality
- Hazard trees due to ice or wind storms
- Disease, pests, and invasive species
- Facility closure due to extreme weather
- Wildfire
- Drought
- Climate change

Recommended Project Approaches

System	Connectivity	Local Improvements	Status Quo → Roadblocks	
• Does it significantly reduce the risk or liability of asset loss or damage due to stress or disruption? • Does it implement best practices to reduce or prevent long-term stressors, risks, or health issues?	• Does it assess the potential for risks to assets or humans across property lines? • Does it create collaboration between neighbors to address larger issues?	• Does it address a durability or wellbeing concern through routine maintenance and replacement program. • Does it eliminate a significant hazard or liability to human safety or health?	• Reactive to future disruptions, hazards or ongoing stressors to assets or people. • Reactive to addressing human safety and/or health needs.	• Takes priority. Reduces resources for other activities

Community Values: Project Approach Summary Matrix

	System	Connectivity	Local Improvements	Status Quo → Roadblocks	
Financial and Resource Allocation	• Do the goals and strategies open up opportunities for additional ongoing funding sources? • Does it reduce liability? • Can it utilize current practices or resources? • Are operational savings or ecosystem services quantified to support future assessments and tracking?	• Are off-site ecosystem services, trade-offs, or mitigation being considered? • Do the goals and strategies open up opportunities for supplemental grant funding?	• Does it reduce resource use or operational costs? • Are on-site ecosystem services included in the project goals and value discussions? • Does it reduce the need to hire outside vendors?	• Not currently funded or intentionally pursuing resources • Maintains status quo in funding for maintenance and operations • Is not intentional about valuing all ecosystem services. • Is reactive in responding to and mitigating hazards from extreme weather events and other effects of climate change.	• Increase maintenance costs or resource use. • Removes ecosystem services without mitigation.
Outreach and Education	• Does it enable a path for long-term community stewardship or collaborative partnerships? • Does it establish or implement a pilot program to test practices and capture learnings.	• Does it collaborate with outside organizations or volunteers? • Does it create new collaborations with outside organizations or volunteers? • Does it build public-private partnerships or shared knowledge, goals, or expectations?	• Does it include public educational opportunities to learn about a resource, site, or culture? • Does it adjust practices or provide training for staff or the public on innovative or Best Management Practice methods that improve performance?	• Utilizes existing staff to provide ad-hoc outreach and education to the public. • Supplement with contractor for tasks that require specific training and/or technical skills. • Partner with community and volunteer groups for invasive species removal.	• Requires resources for extra staff training. • Requires additional staff resources to provide and outreach and education program to the public.
Natural Character	• Does it incorporate and honor community connection to place? • Does it prioritize natural features over built ones? • Does it help to retain or enhance city-wide natural systems?	• Does it provide consistency that aligns with native ecosystems? • Does it consider impressions from arrival and departure?	• Does it preserve or protect significant natural features beyond code? • Does it replace or improve out of character or invasive landscapes?	• No additional considerations during planning or development to exceed existing code to benefit and/or preserve ecological systems.	• Does not align with the ecological or cultural context of Camas. • Removes significant features that have community value without mitigation.
Equitable Access	• Does it fill a major gap or provide significant connectivity in the system. • Does it preserve large areas of natural resources in neighborhood of need?	• Does it support multi-modal transportation? • Does it provide connectivity between adjacent public and private lands?	• Does it maintain or enhance existing recreational amenities, programs, or resources? • Does it preserve recreational opportunities? • Does it improve site wayfinding?	• Service to neighborhood or demographic in need will be reactive and on an as needed basis.	• Is remote and does not serve a neighborhood or demographic in need. • Cuts off access to an existing resource.
Asset Protection + Public Safety	• Does it significantly reduce the risk or liability of asset loss or damage due to stress or disruption? • Does it implement best practices to reduce or prevent long-term stressors, risks, or health issues?	• Does it assess the potential for risks to assets or humans across property lines? • Does it create collaboration between neighbors to address larger issues?	• Does it address a durability or wellbeing concern through routine maintenance and replacement program. • Does it eliminate a significant hazard or liability to human safety or health?	• Reactive to future disruptions, hazards or ongoing stressors to assets or people. • Reactive to addressing human safety and/or health needs.	• Takes priority. Reduces resources for other activities

Land Types and Minimal Expectations

There are many types of land that make up the parks and open spaces of Camas. Each type of land brings its own set of characteristics, values and management considerations.

Privately-owned properties

Privately owned properties play a key role in the parks and open space system by contributing to connectivity and management patterns within the larger landscape. Accountable management and stewardship of these lands are a crucial part of establishing a city-wide resilient system.

Homeowners associations

A homeowners association is an organization established within a residential community to manage and enforce rules and regulations. Homeowners associations manage common areas, which can include open spaces such as trails and stormwater facilities.

Minimum Maintenance Expectations: Alignment with expectations of other land types plus opportunity to partner with the City to improve overall ecosystem performance.

Private landowners

Private landowners own and manage significant portions of natural areas within or adjacent to critical areas. They are key partners in contributing to stewardship of our ecosystems.

Minimum Maintenance Expectations: Opportunity to align with the overall network and improve ecosystem performance.

Steep slopes

Hillsides having a 15 foot, or greater, vertical rise over 100 feet of horizontal run, or 15% slope

Minimum Maintenance Expectations: Human access should be limited and vegetation managed in order to minimize erosion. Development should be mindful of stability and impacts downslope, including beyond the property line.

Stormwater facilities

Stormwater facilities play a crucial role in managing runoff by capturing and treating rainwater to prevent flooding and pollution.

Minimum Maintenance Expectations: Facility inlets and outlets should be regularly cleaned of waste and sediment. Dead vegetation should be replaced in rain gardens. Grass should be mowed and saplings removed in detention ponds.

Open spaces

Open space is left primarily in its natural environment.

Minimum Maintenance Expectations: Maintenance of natural system functionality should take priority over recreational activities.

Publicly-owned properties

Publicly owned properties provide essential resources for conservation, recreation, and enjoyment. These properties often serve as the foundation for establishing protected areas and demonstrating best practices for management.

Trails

Pathways that provide access into natural areas and linkages across properties.

Minimum Maintenance Expectations: Safety hazards (including tree branches at-risk of falling) and waste should be removed. Uneven surfaces should be repaired.

Wetlands

Wetlands are transitional ecosystems that manage flood waters, create unique habitats and protect water quality. They are subjected to regulations by public agencies at the state, local, federal and tribal level.

Minimum Maintenance Expectations: Remove waste and invasive species. Prevent intrusion of contaminated water or excessive sediment.

Rights-of-way

A public right of way is land that is set aside for transportation purposes. This can include public roads, sidewalks, or medians.

Minimum Maintenance Expectations: Safety hazards (including tree branches at-risk of falling) and waste should be removed. Uneven surfaces should be repaired. Weeds should be removed or killed, and planting beds mulched. Dead plantings (especially trees) should be replaced.

Shorelines

Shorelines are linear spaces along bodies of water, managed in accordance with the state Shoreline Management Act.

Minimum Maintenance Expectations: Ensure access points are safe and devoid of hazards. Remove waste.

Parks

Parks are publicly accessible spaces that are developed to support recreational activities and programming.

Minimum Maintenance Expectations: Inspect equipment for safety. Assess and maintain trees and vegetation for health. Remove waste and repair furnishings. Maintain lawns to support recreational uses.

Recommendations

Best management practices for planning, operations, and site development were organized by system and aligned with each land type to provide guidance for moving beyond minimal expectations and towards systems-level resilience.

A systems approach

A systems approach to management involves understanding and optimizing the benefits each component can contribute to the overall community, while understanding potential trade-offs and synergies.

We are organizing the Management Plan Recommendations into these components in order to work towards giving each the attention they need to help the overall system thrive.



Best Practice Recommendations

In order to move beyond minimal expectations towards the goals of the city-wide system approach, the following recommendations are proposed to be considered for each project. Recommendations are organized by system and laid out by the template below. Utilizing these strategies can unlock the potential for more optimal management of resources that align with the 5 Camas Community Values.

HOW TO USE: Each project team should identify the applicable **Project Type** and **Land Types** that align with the project objectives and outcomes. The team should discuss and intentionally weigh the applicability of each relevant recommendation across the 7 systems as they apply to the project's goals, scope, and budget. A balance should be applied in order to equitably address the 5 Camas Community Values, and the Summary **Project Approach Matrix** should be referenced to ensure alignment.

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Best practices to unlock the most potential…		•••	•••	•••	•••	•••

Best management practices are listed here for the following **Project Types** for each system:

- **Operations & Maintenance -** Ways to manage established resources
- **Planning & Programming -** Ways to plan for future resources
- **Site Development -** Ways site design can impact management

The **Land Types** that can be managed using this practice are shown here using icons.

See Land Types page for descriptions and minimal expectations. These recommendations go beyond these expectations and work toward the community values at the site, organization, and system levels.

Each management practice is evaluated using the **Project Approach Matrix** and the alignment with each community value**.**



System



Connections



Improvements

SQ

Status Quo

N/A

Not Applicable

See Summary Matrix for criteria.

Water

Water is essential for life. Managing water in our parks and open spaces is vital for preserving natural ecosystems, ensuring access to clean water, and providing cooling and recreational opportunities for the community.



How does water impact us?

Stormwater
Stormwater management plays a crucial role in preventing flooding, recharging groundwater and mitigating pollution.

Irrigation
Irrigation is a valuable resource that provides a consistent water supply to vegetation when rainwater is scarce.

Water Quality
Water quality directly affects the health of humans, pets, vegetation, and wildlife.

Water Access
Water can be a calming presence and provide cool relief, a place for recreation, and sense of community - especially during extreme heat events.

What are the risks and concerns?

Flood Control
Floods can result in displacement of communities, damage to infrastructure, erosion and vegetation damage, and increased costs of living.

Drought
Droughts have adverse effects on ecosystems and communities such as tree and vegetation health, water scarcity, food shortages and economic losses.

Water Costs
High water costs can lead to disparities in water access, affecting both individual well-being and community development.

What are some key strategies?

Green infrastructure
Allowing rainwater to infiltrate the ground reduces runoff, prevents flooding and filters pollutants.

Stormwater facility sediment removal
Effective drainage systems ensure the longevity of stormwater infrastructure and prevent downstream pollution.

Water conservation practices
Reduce overall water consumption and promote efficient water use through use of native plantings, reduction in lawn, and efficient irrigation systems.

Engage Water
Improve access to water for drinking, cooling down, and supporting wildlife.

Privately-owned lands

Support water management through water-saving practices and integrating green infrastructure solutions.

Publicly-owned lands

Manage lands that absorb, celebrate, and provide access to clean and safe water.

Recommendations: Water

Operations & Maintenance

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Manage sediment before it impedes infiltration capacity. Remove sediments from drains, rain gardens, etc. annually, before the rainy season.		Opportunity to collaborate with HOAs.	Promote the use of green infrastructure.	Use resources proactively instead of reacting to stormwater facility failures. Improves natural infrastructure functionality.		Reduce flooding risks.
Apply filtration bags at storm drains before major storms, especially in the autumn to prevent leaves from clogging the system.				Reduce maintenance resources needed to clean out debris.		Reduce flooding risk.
Reduce chemical fertilizer and pesticide use to protect water quality downstream.	**All**	Opportunity to collaborate with private landowners.	Maintain healthy lakes, streams, and other bodies of water. Reduces potential damage to habitat and wildlife.	Reduce costs and labor for purchasing and applying chemicals.		Reduce risk of algal blooms and other water quality hazards.
Assess existing recreational water access points for safety, accessibility, and durability issues.			Increase engagement with natural water bodies for enjoyment.	Catch issues early to avoid full replacement of infrastructure.	Ensure recreational opportunities are maintained for all.	Reduce liability and risk of injury.
Designate lawn areas to go dormant during summer months to reduce water use.		Opportunity to educate public about water conservation practices.	Requires cultural shift in expectations to support desired uses.	Save on irrigation costs as well as mowing labor costs.		
Promote city-led inspection, guidelines, and education to private landowners and HOAs on ways to manage stormwater facilities.		Opportunity to collaborate with private landowners to improve system performance.	Promote the use of green infrastructure.	Improves natural infrastructure functionality.	Promote use of natural infrastructure on both public and private land.	Reduce flooding risk.

HOA Private land Steep slopes Stormwater facilities Open spaces Trails Wetlands ROW Shorelines Parks

Recommendations: Water

Planning & Programming

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Size stormwater facilities to handle 100-year (1%) storms.				Reduce recovery costs and efforts to flooded areas.		Reduce flooding risk.
Ensure that shoreline and wetland trails account for future changes to water levels.					Protect future access to shorelines and wetlands.	Reduce potential for future damage.
Utilize water access to provide opportunities for cooling during hot days.					Ensure all community members have access to cooling resources.	Support public health.
Assess critical areas within the floodplain and ensure the plantings, soil, and materials can withstand flooding events.			Improve habitat and natural resources.	Save on rebuilding costs.		Plan for future floods to protect current resources.
See Lacamas, Round, and Fallen Leaf Lakes Management Plan for further actions						

HOA Private land Steep slopes Stormwater facilities Open spaces Trails Wetlands ROW Shorelines Parks

Recommendations: Water

Site Development

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Look for opportunities to use a captured or recycled water source for irrigation use.		Opportunity to collaborate with private landowners.		Reduce irrigation costs.		Preserve water resources during extended drought.
Divert water running perpendicular to pathways from uphill sources into culverts or other durable structures.				Reduce costs of replacing paths and trails.	Increase longevity of paths and trails.	Increase safety of paths and trails.
Use drought-tolerant and/or adaptive plant species and cluster plantings by water use to reduce over-watering.		Opportunity to collaborate with private landowners.	Native planting supports habitat and wildlife.	Reduce irrigation costs.		
Celebrate the experience of rain water through ground surface treatments, artwork, and daylit water conveyance channels.		Stormwater education opportunity.	Promotes nature engagement with all ages.	Reduces the need for underground utilities.		
Ensure runoff is minimized and all stormwater is treated and infiltrated on site when possible. Consider the use of pervious surfaces.	**All**		Reduces impacts to downstream habitats.	Reduce future costs of repairing erosion impacts.		Reduces risk to adjacent property owners. Replenish local groundwater.
Plant trees adjacent to stream banks to provide shade, keep the water cool and reduce erosion into streams.			Protects habitat. Increases tree canopy cover.			Reduces erosion risks.
Protect waterways by not installing wood chip mulch below the ordinary high-water mark.						Reduce impacts to water quality.
Incorporate water sources to provide wildlife with a place to drink or cool down.		Opportunity to collaborate with private landowners to provide habitat connectivity.	Promote wildlife viewing and enhance enjoyment of natural spaces.			
Provide access to emergency water to protect non-irrigated trees and vegetation from extreme heat events.			Preserves tree canopy.	Reduce replanting costs.		Protects vegetation during extreme heat events.
Additional Best Practices found in the Rain Garden Handbook for Western Washington						

HOA Private land Steep slopes Stormwater facilities Open spaces Trails Wetlands ROW Shorelines Parks

Operations

Effective operations through stewardship and conversation can ensure optimized use of public funding, foster community engagement, promote safety and accessibility, and enhance the experience of these spaces.



How do operations impact us?

Safety
Well-maintained parks and open spaces are accessible and safe.

Enhanced experience
Visitors and community members will have a better experience in spaces that are functional, safe and well-kept.

Longevity
Taking care of assets ensures that they are still around in the future.

What are the risks and concerns?

Resource availability
Scarcity of resources limits the ability to maintain infrastructure, provide adequate programming and ensure visitor safety.

Lack of specialty knowledge
The lack of specialty knowledge can result in ineffective decision-making as well as missed opportunities for enhancement of parks and open spaces. It can also pose safety risks.

Loss of Recreational Opportunities
Inability to meet all of the maintenance tasks may lead to closures or reduced usage in parks and open spaces.

What are some key strategies?

Partnerships
Work with businesses, nonprofits and other community groups to establish project/program goals and partnerships.

Volunteer Coordinator
Hire a volunteer coordinator in order to best utilize volunteer groups to help focus on Management Plan goals.

Community engagement
Foster community engagement and connection to place in order to support long-term stewardship, a sense of ownership and investment in public spaces.

Privately-owned lands

Private landowners can partner with the City and learn from each others' operations practices, benefitting from shared knowledge and resources.

Publicly-owned lands

Public entities can provide opportunities for the community to participate in maintenance and learn about best practices.

Recommendations: Operations

Operations & Maintenance

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Consider reorganizing maintenance staff by land or system type and training or hiring champions to provide overall stewardship strategies, practices and goals.	**All**	Provide specialized knowledge to staff to align with systems approach.	Preserve and enhance the natural elements, features, and systems that contribute to the community identity.	Take a proactive approach to management and land stewardship.		System knowledge helps to identify issues early and work towards preventative measures.
Consider performing observations, evaluations, and surveys to help determine how spaces are currently used and capture ideas for potential improvements.		Engages community members to help form future efforts and priorities.	Allow management to focus on efforts that support current uses.	Allocate resources strategically.	Facilitate use of spaces by Camas residents. Help identify obstacles to desired uses.	
Hire city urban forester to provide overall stewardship, strategy, monitoring, and education to staff and the community.	**All**	Can coordinate educational opportunities for staff and community.	Support long-term health of tree canopy.			Address hazard trees and mitigate risk.
Hire a volunteer and/or HOA coordinator to organize and focus non-profit and community groups to align with POSMP goals.	**All**	Improve coordination and knowledge sharing amongst public and private groups.		Increase capacity for maintaining natural resources.		
Explore more potential funding sources that promote natural resources, parks, and open spaces as valuable, resilient infrastructure.	**All**	Align with other agencies on the value that nature can bring to communities.		Increase funding sources.		Explore resilience funding to reinforce natural infrastructure.
Partner with the Landscape Architecture Foundation and/or other institutions to create case studies or research to support ongoing monitoring and data-collection.	**All**	Bolster data-backed research and education around natural systems.		Better inform decision making and resource allocation.		

Recommendations: Operations

Planning & Programming

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Work with local businesses, nonprofits and other community groups to establish project goals, programs and partnerships.	**All**	Align with other agencies on the value that nature can bring to communities.	Align on expectations and provide consistency across the community.			
Establish agreements with HOAs and other partners for collaborative management of ecosystem services and recreational resources.			Align on expectations.	Maintain and enhance performance of ecosystem services.	Maintain and enhance trail and open space access through HOAs.	
Create ongoing channels with state and county level partners. Align and integrate ecosystem services with other City, County and State department goals, initiatives, funding sources, plans, and projects.	**All**	Align with other agencies on the value that nature can bring to communities.		Incorporate the valuation of ecosystem services into project planning across Washington.		Improve preparedness for inclement weather, fire, and other potential hazards.
Considering partnering with Camas School District as well as regional universities for citizen science programs or ongoing environmental monitoring initiatives.	**All**	Build partnerships and collect metrics that can inform decision making.		Collect data that can lead to more efficient utilization of available resources.		
Provide more volunteer orientation sessions to help familiarize them with the natural systems and expectations.	**All**	Increase hands-on experience and nature immersion to improve knowledge of natural systems.	Create opportunities for more connection to place.			
Obtain Tree City USA certification from the Arbor Day Foundation and pursue Growth Awards through innovative urban forest management efforts.	**All**	Increase awareness of efforts and progress through 3rd party organizations.				
Identify opportunities for joint training for both staff and community members to improve knowledge and best practices.	**All**			Use resource effectively though consolidating training efforts and promoting best practices.		Strengthen safety by creating shared understanding of operational and emergency procedures.
Engage tribal communities to build long-term relationships and understand best land management practices that could be incorporated into operations.	**All**	Opportunity for staff to move towards a stewardship model of land management.	Could lead to improved habitat and restoration of native ecosystems.	Could lead to increased ecosystem service perform across systems.	Is inclusive of tribal groups, practices, and knowledge.	

HOA Private land Steep slopes Stormwater facilities Open spaces Trails Wetlands ROW Shorelines Parks

Recommendations: Operations

Site Development

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Provide staff review of design projects to identify potential maintenance efficiencies or improvements.				Ensure new designs align with maintenance expectations and capacity.		

Materials and equipment

Materials and equipment selection and maintenance directly impact the functionality, durability, safety and aesthetic quality of parks and open spaces.



How do materials and equipment impact us?

Circulation and Gathering
Hardscapes allow for vehicular parking, pathways and open spaces to support programming.

Aesthetics and Character
Materials and furniture contribute to the overall character of Camas' parks and open spaces. Color selection, materiality and finish can provide consistency or a unique sense of place for each site.

Places for Recreation and Rest
Playground equipment, benches and picnic tables provide places for both active and passive recreation.

What are the risks and concerns?

Heat island effect
The heat island effect, characterized by elevated temperatures in urban areas, underscores the importance of selecting materials that minimize heat absorption.

Safety
It is critical to select materials that minimize potential hazards, reduce the risk of accidents or injuries and ensure the well-being of users.

Wear and Tear
Many materials degrade over time due to outdoor exposure to sun, water, soil, and frequent use.

What are some key strategies?

Consistent sourcing
Utilize a short list of standard furnishings, materials and colors to simplify replacement and maintenance costs and provide a consistent character across spaces.

Durability
Selecting durable materials ensures long-term functionality and minimizes the need for frequent maintenance or replacement.

Universal access
Provide universal access to program areas and for equipment options for people of all ages and abilities.

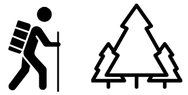
Privately-owned lands ← → **Publicly-owned lands**

Private landowners can provide durable surfaces for any publicly accessible trails or amenities.

Public lands can provide durable and accessible products to ensure long-term use for all.

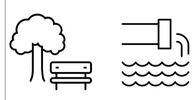
Recommendations: Materials and Equipment

Operations & Maintenance

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Continue to perform safety assessments annually to ensure that playground and other equipment is durable and safe for use.				Reduce liability risks.	Identify challenges to universal access and assess potential for universally accessible equipment.	Ensure safety of community members.
Provide recycling options next to all trash receptacles.		Support responsible habits for resource management.	Reduce impacts of landfills.			
Use materials for maintenance and repair of paving that reduce harm to environmental and human health, such as low-emitting sealants.		Set example of best practices.	Reduce risk of habitat contamination.			Protect health and safety of staff and end-users.
Pave existing highly-used soft-surface trails in popular areas.				Reduce liability from degradation.	Improve accessibility.	Provide long-term durability.

Recommendations: Materials and Equipment

Planning & Programming

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Provide universal access to program areas and equipment options for people of all ages and abilities.		Expand reach and impact of programming and educational signage.	Allow all community members to appreciate natural features and habitats of Camas.		Ensure that everyone can enjoy outside activities equitably.	
Design facilities to handle extreme events with minimal effects on continued functionality.		Promote disaster preparedness of community members.				Preserve building functionality overtime. Facilities could act as a resource for community members in an emergency event.

HOA  Private land  Steep slopes  Stormwater facilities  Open spaces  Trails  Wetlands  ROW  Shorelines  Parks 

Recommendations: Materials and Equipment

Site Development

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Use contrasting material at stair nosing to promote visibility.						Increase safety of stairs.
Use durable materials that can handle UV exposure and flowing and standing water.				Reduce replacement costs.		Increase resistance to wear and tear.
Consider the use of high albedo materials to reduce heat absorption. Manage potential glare impacts.						Reduce urban heat island effect.
Select exterior luminaires that reduce light pollution.			Preserve connection to the night sky and reduce impacts to habitat.	Reduce energy costs for illumination.		
Select nature-based play equipment, seating, and climbing areas.			Aligns with the natural character of developed playgrounds and parks.			
Utilize a short list of standard furnishings, materials and colors.			Provide a consistent character across spaces.	Simplify replacement and maintenance costs		

Access and amenities

It is critical to ensure that people of all ages and abilities can access and enjoy the variety of parks and open spaces that Camas has to offer.



How do access and amenities impact us?

Equity
Managing parks and open spaces to ensure everyone can access and enjoy them creates inclusive spaces that benefit the entire community.

Program
Amenities provide essential infrastructure and resources to support visitor experience. This creates spaces where people can recreate and gather.

Wayfinding
Wayfinding bolsters sense of place by guiding visitors through the parks and open spaces, and facilitates meaningful interactions with natural and cultural elements.

What are the risks and concerns?

Safety
Inadequate or poorly maintained facilities can compromise visitor safety and lead to underutilization of the place.

Exclusion
Lack of access creates barriers that prevent community members from fully participating in recreational activities, limiting their ability to enjoy and benefit from parks and open spaces.

Lack of amenities
Inadequate amenities such as lack of seating or restroom facilities may deter visitors from diverse backgrounds, increasing disparities in access to parks and open spaces.

What are some key strategies?

Avoid hazards
Lay out pathways to avoid hazards and sensitive or protected areas, and reduce bike and pedestrian conflicts with vehicles.

Universal access
Incorporate universally accessible pathways, amenities, and access to the extent practicable.

Education
Provide educational, wayfinding, and interpretive signage. Use multiple languages to address potential language barriers.

Privately-owned lands ← → **Publicly-owned lands**

Private landowners can build partnerships to contribute and connect to the city-wide network of open spaces.

Public lands can ensure amenities accomodate the needs of all community members.

Recommendations: Access and Amenities

Operations & Maintenance

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Add or improve amenity spaces for gathering, playing or resting.		Increase community engagement.	Strengthen opportunities for connecting with natural spaces.		Prioritize in areas that lack similar amenity or feature.	Promote social and physical health.
Provide a higher level of maintenance to trailheads and main entrances to enhance visibility as well as visitor sense of safety.					Enhance visitor experience and attract new visitors.	Reduce crime and vandalism.
Utilize best management practices and caution when performing maintenance tasks that use excavation in areas with high probability of cultural, archeological, or historical resources.		Preserve and protect cultural resources.		Reduce project delays and costs.	Respect process and history of indigenous cultures.	
Improve ADA accessible pathways and access into parks and open spaces.		Increase community engagement.			Make parks and open spaces accessible to all by accommodating all levels of mobility.	Decrease risk of accidents and hazards.

Recommendations: Access and Amenities

Planning & Programming

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Provide low-impact access to natural areas and wetlands.		Opportunity for visitors to understand the value and purpose of natural resources.	Opportunity to experience wildlife and natural systems.		Diversify recreational opportunities.	Preserve critical areas from impacts of human use.
Identify public lands or facilities to act as community gathering and resource distribution in an emergency.		Increase community awareness and preparedness.		Increase eligibility for resilience-based grants.	Provides resources in an emergency where it is needed most.	Enhance emergency preparedness and increase community resilience
Incorporate universally accessible pathways, amenities and access to all program areas.					Expand user base and access.	Reduce liability risk.
Consider trail connectivity enhancements when planning subdivisions.			Provide increased opportunities for experience nature.		Increased recreational opportunities. Expand network connectivity.	
Consider multimodal transportation access when planning parks and trails.					Increased recreational opportunities.	Promote physical activity and public health.
Ensure that some amenities remain accessible year-round.		Increase community engagement.	Support experiences of natural systems in different seasons.	Maximize utilization of amenities and increase of rental revenue.	Opportunities to enjoy spaces all year.	
Develop a difficulty scale for trails and provide maps and/or signage to indicate appropriate skill levels - consider surface material, slope, and elevation gains.		Provide clarity on expectations and current conditions.			Ensure users are matched to the appropriate activities.	Protect health and safety of users.
Develop a consistent signage standard for use on public and private trails that define rules, etiquette, and trail conditions.		Ensure city-wide consistency on expectations, behavior, and management.	Provide consistent conditions and alignment on goals.			Protect health and safety of users.
Develop trail grade standards for both public and private lands that provide consistency of width, material, maintenance, and other supporting features.		Ensure city-wide consistency on expectations and management.	Provide consistent character and alignment on goals.		Ensure all trails are equitable and safe.	Protect health and safety of users.

Recommendations: Access and Amenities

Site Development

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Locate parking to minimize intrusion into open spaces and avoid pedestrian conflicts.			Maximize utilization of open space.	Reduced maintenance and infrastructure costs.	Provide safe and efficient access to recreation opportunities.	Increase pedestrian safety.
Provide educational and interpretive signage.		Promote stewardship and community engagement.	Share value of preserving natural systems and features.		Enhance visitor experience.	
Look for small opportunities to provide comfort or interest along trails - seating, potable water, fitness equipment, shade, etc.			Create moments to appreciate natural surroundings.		Increase utilization of parks and open spaces.	Improve public health and wellness.
Provide clear visibility and wayfinding at key intersections.		Provide orientation and promote options.			Enhance visitor experience.	Provide effective emergency response.
Place signs in and around open spaces and critical areas, clearly identifying permitted and restricted uses.		Clarifies intent of public spaces and balance between human uses and natural functions.	Protects sensitive areas and natural features.	Reduce costs for enforcement and repair of misused assets.	Enhance visitor experience.	Prevent property damage and liability claims.

HOA  Private land  Steep slopes  Stormwater facilities  Open spaces  Trails  Wetlands  ROW  Shorelines  Parks 

Soil

Implementing appropriate soil management practices is essential for supporting vegetation growth, regulating water infiltration and drainage, and influencing ecosystem health and resilience.



How does soil impact us?

Water infiltration and quality
Soils that can absorb and filter water help to mitigate flooding, reduce erosion, and support healthy ecosystems.

Tree and vegetation health and stability
By supporting nutrient cycling, supporting microorganisms, and providing space for root growth, soils are a critical part of plant health.

Carbon storage
Healthy soils are typically able to sequrester and store more carbon than the vegetation they support.

What are the risks and concerns?

Erosion
Erosion can degrade landscapes, disrupt pathways and trails, harm vegetation, increase sedimentation in water bodies and compromise ecosystem health and recreational opportunities.

Soil loss and Contamination
Loss of healthy topsoil through removal or pollution can harm plant health and soil microorganisms.

Compaction
Compacted soils have a decreased ability to infiltrate water. They also impact ecosystem health by limiting root growth of plants, especially when surrounded by hardscape and heavy foot traffic.

What are some key strategies?

Soil protection zones
Protect soil areas during construction and operations to reduce compaction or contamination.

Increase soil volumes for trees
Provide trees with adequate space for root growth to ensure long term health and stability.

Plantings
Use dense plantings to discourage walking through planting areas and reduce compaction. Amend soils as needed to ensure long-term health.

Privately-owned lands

Private landowners can restore soils after disturbance to provide long-term plant health.

Publicly-owned lands

Public lands can protect soils by limiting access through sensitive conditions.

Recommendations: Soil

Operations & Maintenance

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Consider natural and/or constructed bank stabilization techniques in conjunction with any crossing projects.			Preserve and protect natural resources.	Increase asset longevity and reduce replacement costs.	Enhance recreational opportunities and user experience.	Risk and liability reduction.
Establish soil protection zones during construction projects to minimize compaction of adjacent areas.			Preserve and protect natural resources.	Reduce soil restoration costs.		Minimize erosion and sedimentation risk.
Use a single access route to work zones and minimize trips through the access route in order to decrease soil compaction and erosion.			Preserve and protect natural resources.	Reduce restoration and maintenance costs.		Minimize erosion and sedimentation risk.
Limit access routes across steep slopes and install access routes parallel to slope contours and perpendicular to water flow.			Preserve and protect natural resources.	Reduce restoration and maintenance costs.		Minimize erosion and sedimentation risk.
Limit crew size in wet areas and establish a project staging area outside of the wet areas.			Enhance wetland and water quality.	Increase crew efficiency and productivity.		Protect critical areas and worker safety.
Identify and address potential hazards or erosion concerns, especially after large storm events.				Reduced replacement and maintenance costs.		Protect infrastructure and property.
Increase soil areas of existing street trees through hardscape removal.			Protect character of large mature trees.	Preserve ecosystem services from tree canopy in urban areas.		Protect critical urban tree canopy.

HOA Private land Steep slopes Stormwater facilities Open spaces Trails Wetlands ROW Shorelines Parks

Recommendations: Soil

Planning & Programming

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Prioritize the location of stormwater treatment facilities away from structures, at site low points, and where infiltration is likely to be effective.				Reduced stormwater management costs.		Reduce stabilization risks.
Use a phased approach to weed removal and restoration to minimize exposed soils and erosion.	**All**		Preserve aesthetic appeal of the space. Prevent return of invasive species.	Reduced stormwater management costs.		Mitigate erosion risks.
Find alignments that allow for <5% slopes for pathways through open spaces. Incorporate switchbacks when needed.					Provide accessible circulation.	Reduce bank destabilization risks.
Limit development and disturbance on steep slopes greater than 15%. Consider protecting them as publicly-owned critical areas.		Ensure land owners understand the potential risks and downstream impacts involved when building on steep slopes.	Preserve sensitive habitat areas.			Reduce bank destabilization risks.

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Recommendations: Soil

Site Development

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Maximize vegetated ground coverage as early as possible to reduce erosion impacts.			Preserve natural resources.	Cost savings on erosion control measures.		Protect infrastructure and property.
Use dense plantings, tree grates, other barriers, and/or signage to discourage walking through planting areas to avoid compaction, especially in high traffic areas.			Maintain attractive and well-preserved landscapes.	Reduce replanting and maintenance costs.		Protect long-term health of trees in urban spaces.
Utilize proper soil amendments to improve health and increase water storage. Perform a soil analysis as needed.		Develop an understand of soil health in public spaces.	Maintain healthy vegetation.	Reduced irrigation and maintenance costs.		Resist drought.
Allow for adequate soil volumes to support trees adjacent to hardscape paving. Allow for 8’ wide planting areas for large trees unless other measures are taken to provide the needed soil volumes and protection (see references).			Maintain mature tree canopy.	Reduce replacement costs.		Protect long-term health of trees in urban spaces.

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Vegetation and habitat

Proper vegetation management provides vital habitat, reduces risks, and contributes to the overall quality of Camas' natural aesthetic.



How does vegetation impact us?

Biodiversity
Plants support biodiversity by providing suitable conditions for a variety of organisms to thrive and serving as habitat for wildlife. Biodiverse ecosystems are more resilient and provide support for human health and wellbeing.

Ecosystem services
Healthy plant communities purify the air, water and soil, stabilize soils and regulate temperature.

Aesthetic appeal
Vegetation provides colors, textures and shapes throughout the landscape. Plants provide shade and can support recreational activity such as hiking, nature appreciation and birdwatching.

What are the risks and concerns?

Fire management
Vulnerability to wildfires increases the risk of harm to infrastructure, human communities and wildlife.

Invasive species
Invasive species compete with native plants and disrupt ecosystem processes. They also result in increased management costs to control their spread and mitigate ecological impacts.

Improper pesticide use
Improper pesticide use harms non-target organisms, can contaminate soil and water resources and have negative impacts to human health.

What are some key strategies?

Preserve and re-establish key plant communities
Prioritize native and adaptive plant species that enhance ecosystem resilience and biodiversity. Protect and create key forest structures that are important habitat features for multiple wildlife strategies.

Integrated pest management
Utilize established integrated pest management plans and prioritize no-chemical pest control options when appropriate. Prioritize careful removal of invasives.

Support pollinators
Integrate native pollinator restoration to the greatest extent possible. Convert passive turf areas to native naturescaping.

Privately-owned lands

Private landowners can shift plant species selection to more native palettes and minimize the use of chemical inputs. They can be aware of and implement fire management best practices around their homes and businesses.

Publicly-owned lands

Public lands can establish and protect large-scale and connected native and adaptive plant communities to provide long-term habitat opportunities.

Recommendations: Vegetation and Habitat

Operations & Maintenance

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Protect and create key forest structures (standing dead trees/snags, downed logs, old trees, open gaps) that are important habitat features for biodiversity.	HOA, Private land, Parks, Shorelines, Wetlands		Enhance natural character and provide homes for wildlife.	Decrease maintenance costs of removing forest structures.	Enhance recreation opportunities such as birdwatching.	Work with arborists and other specialists to ensure safety.
Develop an integrated pest management plan and prioritize non-chemical pest control options as appropriate. Include regular tree inspection for pests and disease to reduce spread.	**All**			Reduce pesticide costs and staff time.		Increase resilience of ecosystems and landscapes.
Ban the use of neonicotinoids.	**All**	Communicate the value of protecting pollinator health.	Protect wildlife health.	Reduce pesticide costs and staff time.		Protect public health and water quality.
Take precautions to avoid spreading noxious weeds or invasive species between work/restoration sites. Designate "haul and drag" routes for removing plant material to minimize disturbance.	**All**			Reduce future invasive species removal costs.		
Consider using a mulching mower and leaving plant material in place over winter.	Parks, HOA, Private land, Open spaces	Share strategies for different ways to provide habitat.	Provide winter habitat to support biodiversity.	Enhance the health of turf and reduce maintenance costs.		
Provide educational material for fire mitigation maintenance practices including minimizing fire fuels, species to avoid, spacing, materiality, and defensible space zones	HOA, Private land, Open spaces, Steep slopes	Educate Camas residents about wildfire resilience.	Balance expectations around safety and vegetation density.			Increase resilience to wildfires, and reduce fire spread potential across natural areas.
Provide training or educational materials on invasive species identification, monitoring, and removal.	**All**	Educate Camas residents about invasive species management.	Reduce competition with native plant species	Weed removal reduces competition for water with desired vegetation, reducing water use.		Protect health and functionality of native ecosystems.
When manually removing noxious weeds or invasive species from areas near waterways, prevent sediment and vegetative debris from entering the waterway.	Shorelines, Wetlands, Stormwater facilities		Enhance aesthetic appeal of recreation areas.	Reduce future invasive species removal costs downstream.		Protect native habitat.

Recommendations: Vegetation and Habitat

Planning & Programming

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Partner with local nurseries to find alignmentment with native plant lists, prohibited species, and plant availability.	**All**	Builds partners to support native and adaptive plant goals	Supports wildlife.		Increases availability of native plant species.	
Preserve and enhance large, connected patches of undeveloped native vegetation.			Preserve key habitat patches and corridors. Retain urban tree canopy.		Increase access to recreational opportunities.	Mitigate flood risk. Improve air and water quality. Reduce urban heat island effect.
Use succession planning to identify species that will thrive in Camas as the climate changes.	**All**	Identify climate-adaptive plantings to encourage use.	Ensure natural character of Camas persists for future generations.	Reduce long-term maintenance costs.		Reduce tree mortality, fall hazards, and wildfire fuels.
Perform a needs assessment based on surrounding neighborhood densities and service area to determine how much open lawn space is needed in developed parks to support the community.		Work with residents to understand use needs and balance of natural spaces.	Right size turf use to allow space for native plant communities.	Reduce the need for lawn care and water use for under-utilized turf.	Ensure communities have amenities that supplement home uses.	
Integrate native pollinator restoration into urban design and municipal open space plans.		Share value of support pollinators.	Increase aesthetic value of space. Encourage wildlife.	Reduce maintenance costs from water use.		

Recommendations: Vegetation and Habitat

Site Development

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Support crime prevention through environmental design by planting trees with high canopy, preserving view corridors, and utilizing vegetation with transparency.			Balance expectations around safety and vegetation density.		Increase use of existing spaces.	Increase public safety.
Use plant stock from multiple seed zones for a given species to increase genetic diversity and enhance long-term survival.	**All**			Reduce long-term arborist and maintenance costs for removal and replacement.		Biodiversity provides resilience to pests and changing climate conditions.
Convert existing underutilized lawn area to native naturescaping (i.e. meadow or forest understory).		Share potential value for wildlife habitat.	Increase habitat and wildlife value.	Reduce maintenance costs.		
Provide interpretive signage for native/adaptive plantings or restoration areas.	**All**	Educate visitors about ecological best practices. Encourage native plant use on private property.				
Provide appropriate plant materials to shade stormwater facilities and other shallow water bodies to reduce temperature impacts downstream.			Preserve quality habitat in and around water bodies.	Reduce cost of downstream interventions to reduce stream temperature.	Enhanced recreational opportunities.	Mitigate urban heat island effects.
Integrate native flowering plants and habitat structure into vegetated stormwater infrastructure.			Increase aesthetic value of natural areas. Improve habitat.			
Increase turf diversity by seeding passive turf areas with drought-tolerant flowering perennials.			Increase aesthetic value of space.	Reduce water use.		

Tree Canopy

The tree canopy is the keystone to the natural character of Camas while also providing essential ecosystem services to benefit the community.



How do trees impact us?

Shade and cooling
Trees help to mitigate the urban heat island effect and enhance comfort by providing shade and cooling.

Air and Water purification
Trees absorb pollutants and carbon dioxide, improving air and water quality as well as human health.

Natural character
Trees are a major contributor to the natural character of Camas and its location within the Pacific Northwest.

What are the risks and concerns?

Fall hazards
Unhealthy or storm-damaged trees may fall unexpectedly, potentially causing damage or injury.

Development
While new construction is needed to accommodate the growth of the Camas community, it sometimes comes at the cost of land clearing and canopy loss.

Disease, Pests, and Die off
Disease, pests, or extreme climate events can weaken the health of trees and reduce their resilience to other environmental stresses.

What are some key strategies?

Revise planning regulations
Adjust planning codes and work with private landowners and public property to at least maintain the amount of tree canopy city-wide as land continues to develop.

Training and education
Provide training and education for staff and the public on forestry and tree health.

Adaptive tree palette
Develop a plant palette and succession plan strategy to establish a diverse canopy that reduces vulnerabilities to climate change.

Privately-owned lands

Private landowners can preserve large clusters of mature trees and work with best practices to maintain their health and reduce hazards.

Publicly-owned lands

Public lands can provide opportunities to expand canopy coverage, transition to adaptive species, and improve the health of right of way trees.

Recommendations: Tree Canopy

Operations & Maintenance

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Remove or prune hazard or dead trees or branches where they pose a risk to safety or property damage.	**All**		Maintain tree canopy health.	Reduce liability.		Protect people and property from damage.
Ensure newly installed trees have a minimal watering period of two years to ensure establishment	**All**		Ensure succession and healthy establishment.	Reduce replacement costs.		
Replace trees adjacent to hardscapes when they get removed or die off. Consider removing some hardscape around tree well.			Retain Camas' identity as a tree-friendly city.	Preserve critical urban ecosystem services over time.		Ensure long-term resistance to natural hazards from canopy coverage.
Provide training for staff and public on forestry and tree health. Include protocols and procedures for public tree risk assessments, pruning, risk mitigation, and emergency preparedness and response.	**All**	Educate Camas residents and staff to promote tree health.	Maintain tree canopy health.	Increase maintenance capacity through partnerships.	Increase access to knowledge to be applied locally.	Identify issues before they become hazards.
Remove invasive species and provide training for the public on how to identify and remove invasive species.	**All**	Educate Camas residents about invasive species management.	Create healthier environment for native plants to survive.			
Utilize climate-adaptive species for new or replacement plantings.	**All**		Ensure long-term succession of healthy ecosystems.	Decrease long-term replacement costs.		Resist die-off from extreme weather and climate change.
Prioritize protection, maintenance, and restoration of at-risk species or plant communities.	**All**	Opportunity to partner with nonprofits or community stewardship groups.	Preserve most valuable ecosystems and habitat.			Ensures longevity for vulnerable resources.
Establish a free tree planting program to increase canopy coverage and promote community engagement.		Partner with nonprofit for funding and outreach.			Support tree canopy coverage in at-risk communities.	
Complete a comprehensive tree inventory of public trees and maintain and update data over time.		Support public education with data-backed assessments.	Identify trends to help preserve existing canopy.	Use data to track long-term health and influence decision making.	Identify gaps in canopy.	Identify trends and issues holistically.
Partner with HOAs to generate tree inventories to track health and adaptability over time.		Support public education with data-backed assessments.	Identify trends to help preserve existing canopy.	Use data to track long-term health and influence decision making.	Identify gaps in canopy.	Identify trends and issues holistically.

HOA · Private land · Steep slopes · Stormwater facilities · Open spaces · Trails · Wetlands · ROW · Shorelines · Parks

Recommendations: Tree Canopy

Planning & Programming

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Work with local nurseries to adjust supplies to meet future needs and remove invasives or problem species.	All	Increase public awareness about problem species. Look for opportunities to subsidize through partnerships.	Shift market to align with native natural character.		Increase availability of native trees for more land owners.	Reduce ecosystem impacts from invasives.
Introduce tree infill planting on public lands.			Offset canopy loss.	Mitigate ecosystem services lost from development.		
Align trails, pathways, and amenities to avoid impacting mature trees and other sensitive habitat.	All		Preserve key specimen trees that promote connection to place.	Reduce damage and replacement costs.		Protect existing resources.
Work with schools to identify opportunities for additional canopy cover or educational opportunities.			Promote natural identity in public areas		Provide canopy in public areas	
Require ecosystem service mitigation for reduction in tree canopy for new development.		Promote value that nature provides to built environment.	Relocate key natural features when lost.	Require compensation for loss of infrastructure	Retain natural systems on private lands.	Reduce stress on remaining natural infrastructure.
Develop succession plans to establish a species, age, and structurally diverse canopy that reduces vulnerabilities to climate change.	All		Ensure long-term succession of healthy ecosystems.	Decrease long-term replacement costs.		Resist die-off from extreme weather and climate change.
Reduce the required DBH size for preservation/significant tree designation. Pair with a heritage tree program that includes both public and private specimen.	All		Maintain a diversity of canopy ages and mature tree coverage.	Preserve ecosystem services performed by largest existing trees.		
Establish a tree canopy project preservation goal beyond code requirements for any project where existing canopy is above the city average			Offset canopy loss and preserves mature canopy coverage.	Reduce ecosystem services lost from development.		
Prioritize new tree plantings in areas that have low existing canopy coverage and a high possible planting area percentage.	All		Expand natural character across Camas.		Improve access to benefits of tree canopy.	Reduce heat island effect.

Recommendations: Tree Canopy

Site Development

Management practice	Land types	Outreach and Education	Natural Character	Financial and Resource Allocation	Equitable Access	Asset Protection + Public Safety
Introduce a minimum tree well size/width for when trees are planted adjacent to paved surfaces.			Maintain mature tree canopy over time.	Reduce replacement costs.		Ensure longevity of trees in urban areas.
Ensure pathways, gathering, and resting areas are shaded to reduce surface and air temperatures.			Provide enjoyment of natural areas in multiple seasons.		Support recreation for a variety of user needs.	Protect public health and safety.
Plant trees quickly after site disturbance, such as construction or invasive removal.	**All**		Reduce chance of invasive establishment.	Reduce erosion impacts and rework.		
Implement a species diversity requirement for new plantings.	**All**		Biodiversity supports wildlife.			Resist pests, disease, and climate vulnerability.
When feasible, use a soil cell system to provide more growing space for trees.			Maintain mature tree canopy over time.	Reduce replacement costs.		Ensure longevity of trees in urban areas.

HOA Private land Steep slopes Stormwater facilities Open spaces Trails Wetlands ROW Shorelines Parks

Monitoring and Performance Metric Recommendations

What are realistic and implementable ways of measuring progress and success?

One of the goals of this plan was to establish a data-driven process to help make more-informed decisions. While decisions cannot be made on numbers alone, there are some ways to help better inform the process to understand how progress is being made towards the goals, priorities and values in the POSMP.

Recommended metrics to incorporate into Operational practices:

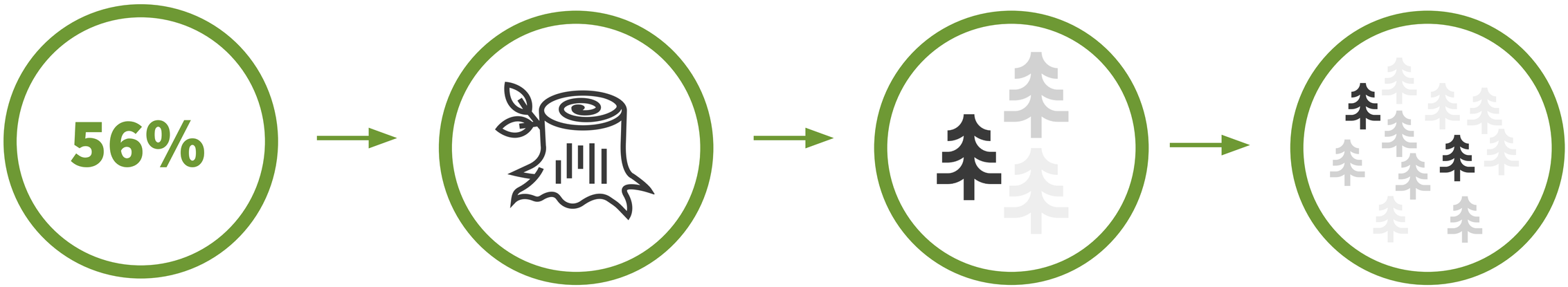
- Coordination with Comprehensive Plan and future PROS Plan updates
- Annual tracking and review of staff hour allocations by task and land type
- Annual tracking and review of water use
- Annual tracking and review of contract worker expenses
- Annual tracking and review of volunteer hours by project type or system (i.e. invasive removal)
- Perform city-wide canopy assessment every 10 years
- Maintain and expand tree inventory database
  - Completion of public tree canopy inventory
  - Coordination with HOA's and private land owners to perform tree canopy inventory
- Implement per-capita spending targets and tracking metrics to ensure adequate funding levels for maintaining high-quality parks and recreation amenities that meet the needs of the community in Camas.
- Require master plans and site development projects to propose site-base performance metrics to align with POSMP goals and prioritization criteria
  - Based on different land uses and ecosystem types
- Regular assessments of planted tree species should be conducted to identify any issues and take necessary corrective measures. This could involve adjusting watering schedules, providing additional care during extreme weather events, and replanting trees that fail to thrive.
  - Camas could establish a dedicated team or partner with existing organizations to monitor and manage the program. Utilizing technology like remote sensing and data analysis tools can aid in effectively tracking the health and progress of the planted trees. By continuously adapting to the changing environment, Camas can ensure the sustainability and success of its tree planting program, contributing to a greener and more resilient future for the City.

Planning Recommendations

In order to achieve alignment with the goals of this plan, updates to planning, code, and ordinance documents are recommended. These will help supplement the management practices on public land with adjustments to private development practices.

Planning Recommendation Path

The current city-wide tree canopy coverage is ~38%. As the population of Camas continues to grow, development could have significant impacts. If no changes to current regulations or practices are made, tree canopy losses will accumulate over time. Understanding existing code and development patterns reveals several opportunities to adjust planning approaches and change the trajectory.



About half of canopy is on private lands

While the City can do their best to maintain and enhance canopy on public lands, it will take efforts on the private side to make sure city-wide canopy retains its value and benefits to the community.

Canopy on private lands is being lost

For example, residential lots had a net loss of tree canopy of **99 acres** from 2011-2021 (or a 5.8% loss in canopy area in those zones).

Tree ordinance requirements are not preserving existing canopy

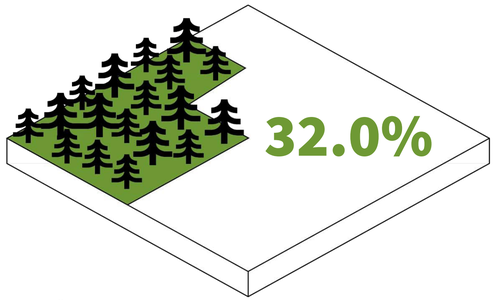
The current tree ordinance only replaces/preserves a portion of lost existing canopy because it allows the removal of large trees, while mitigating some losses with much smaller new trees (see next page).

These losses will be compounded over time

As development on private land continues and canopy is lost, the canopy will see an immediate reduction in coverage and value. It will take decades for mitigation of removed trees with smaller trees to regain their benefit as mature trees.

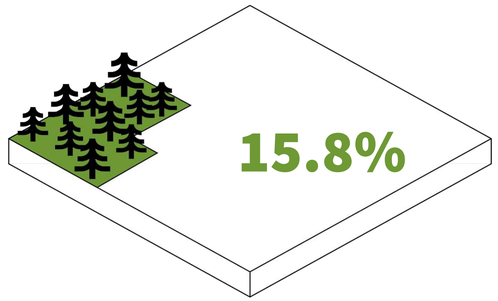
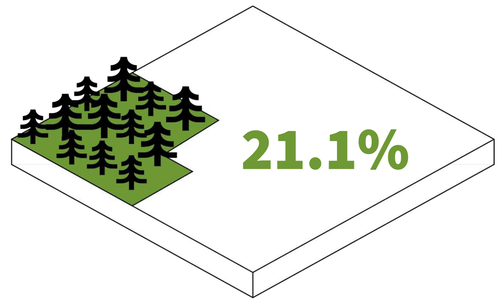
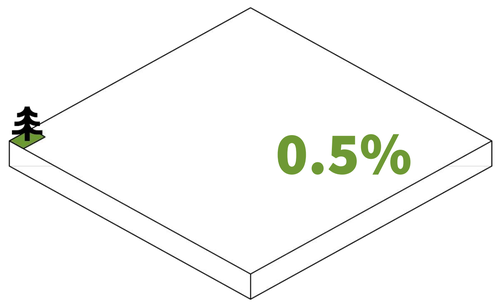
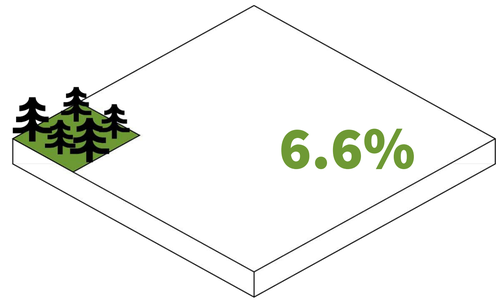
Tree Density Requirements

Comparing existing conditions to tree code minimal requirements, there is potential for significant immediate tree canopy loss as lands develop. Mitigation with new trees will increase canopy over decades if species are adaptive and well maintained, but immediate ecosystem services are mostly lost with removal of existing mature trees.



City-wide Average Canopy Coverage of Existing Residential Zones (40 - 80 tree units per acre)

Many existing, undeveloped, private properties are at or above the city average for canopy coverage. If those developments stick to the code minimum, the chart to the right shows the best- and worst- case scenarios for immediate canopy coverage after development.

	Potential Development (per acre)	
	Standard tree code (20 units)	**North Shore tree code (30 units)**
Best-case immediate scenario	 **Maximum Immediate Canopy Coverage - Preserve a few large existing trees**	 **Maximum Immediate Canopy Coverage - Preserve a few large existing trees**
Worst-case immediate scenario	 **Minimum Immediate Canopy Coverage - (20) New 2” Trees**	 **Minimum Immediate Canopy Coverage - Half new 2” trees, half preserve existing**

Planning Recommendations: Tree Ordinance

Issues, Lack of Clarity or Misalignments with POSMP Goals	Recommendations	Notes
Tree Unit quantities do not relate to canopy area	Adjust tree units to reflect tree canopy area in addition to DBH	Adjust to give higher tree unit value to larger trees. This would only be effective if the total tree unit requirement is raised proportionately.
Tree Unit requirements are not defined for public parks	Define tree density requirement specifically for parks and open spaces. Units should be greater than other developed areas and align with canopy goals.	
Tree Unit requirements lower than existing conditions could result in significant canopy reduction over time	Increase total Tree Unit requirements to reflect canopy goals.	Could provide overlay zones in the Comp Plan for areas with existing higher coverage.
Preservation of significant trees is confusing and loosely defined and at only a higher DBH	Redefine significant tree size and require a higher tree unit replacement for damaged or removed significant trees. Develop a Heritage Tree Program that restricts all removal above a certain size for certain species. Require all properties (not just North Shore) to include the preservation of existing trees as a portion of the total Tree Unit requirement.	Replacement could be a 1:1 for DBH removed. If larger trees are used for replacement (not a requirement), extra care should be given to them for establishment as they are typically more challenging to keep alive.
Preservation or mitigation of native / adaptive species is not recommended or required	Give more value to native and adaptive species and/or prohibited/non-adaptive trees get a value of 0.	This could come in the form of a higher tree unit value or be part of a Heritage Tree program that values mature native trees.
No value or guidance is given regarding tree removal or preservation strategies for stability	Provide guidance and recommendation language on preservation and removal of clusters of trees.	The goal is to preserve clusters as-is to keep stability of the root system. If a tree needs to be removed in a cluster, it is recommended to leave the stump if possible.
Planter widths are given, but there is no guidance on soil volumes in Rights of Way. Many trees are planted in spaces that are too small to promote long-term health	Provide guidance and requirements on minimum soil volumes in Rights of Way	Require 8’ wide widths for all large trees unless other measures are taken to provide adequate soil volumes, stability, and protection.

Planning Recommendations: Plant Materials

Issues, Lack of Clarity, or Misalignments with POSMP Goals	Recommendations
Current Plant Materials List identifies species name, size, form, and some character descriptions (deciduous for some trees but not others). Some additional info would be helpful to align with code and POSMP goal expectations to help in decision making and long-term success.	Include more info for each species to help guide plant selection to meet planning development code and POSMP goals. Add the following columns for recommended plantings: • Evergreen • Drought-tolerance • Native • Sun exposure • Fire resistance/hazard • Climate change heat and hardiness vulnerability rating (per Urban Tree Canopy Vulnerability Report)
Private residents or developers may have a difficult time selecting the right tree species from a long list of options.	A tree selection tool could be developed that streamlines species that meet site-specific criteria in order to simplify decision making and ensure proper adherence to the criteria. Care should be taken to still promote diversity in selection.
Some species listed are projected to not adapt to climate change	Consider moving some or all of the non-adaptive, non-native species to prohibited list.
The shrubs, grasses, and groundcovers lists contain many non-native species and few native ones	Expand shrubs, grasses, and groundcovers lists to include native species and their benefits.
Some tree species listed will have a difficult time growing and staying healthy in the planter width allocated for them without many other supportive measures.	Revise planter widths for tree species as appropriate.

Planning Recommendations: Development Code

Issues, Lack of Clarity, or Misalignments with POSMP Goals	Recommendations
18.13.050 B provides a good list of the benefits of trees, but reads like tree species should be selected specifically for these functions.	Existing development code could be revised to clarify direction versus benefits, and be supported by additional information on species to help with selection. Clarify if evergreen requirement is for trees, vegetation, or both and how percentage requirements are counted (i.e. % species, % plants, % area coverage).
Parking lot are significant contributors to urban heat island effect and stormwater runoff.	18.13.060 H - Consider increasing planting and tree requirements to achieve a higher percent coverage. Reduce number of spaces between landscape dividers.
Desired ecosystem service mitigation may not be feasible on sites where building density is needed to support community needs.	18.13.052 C - Set up mitigation banks for invasive removal, wetland restoration, or tree planting if unable to meet requirements on-site.
It is common practice to use a small variety of trees in the right of way and in large developments. This can lead to vulnerability to pests and disease and does not align with habitat goals.	Include direction, requirements, or incentives for utilizing a variety of native tree species in rights of way or large development.

18.13.050 Standards for landscape, tree and vegetation plans.

A. The property owner shall be responsible for any future damage to a street, curb, or sidewalk caused by landscaping.

B. Landscaping and trees shall be selected and located to deter sound, filter air contaminants, curtail erosion, minimize stormwater run-off, contribute to living privacy, reduce the visual impacts of large buildings and paved areas, screen, and emphasize or separate outdoor spaces of different uses or character.

C. Landscape, Tree and Vegetation Plan must include a combination of trees, shrubs, and ground cover to achieve the purposes of this chapter.

1. Required landscaping shall be comprised of a minimum of sixty percent native vegetation (or adapted to northwest climate), or drought-tolerant vegetation, and fifty percent evergreen.

Existing code language

17.19.030F Tract, block and lot standards: Landscaping

2. The city council finds that the existing mature landscaping of trees, and shrubs provide oxygen, filter the air, contribute to soil conservation and control erosion, as well as provide the residents with aesthetic and historic benefits. For these reasons,the city encourages the retention of existing trees that are not already protected as significant trees under the Camas Municipal Code. Generally, the city may allow the tree requirements under subsection (F)(1) of this section to be reduced at the request of the developer, by a ratio of two new trees in favor of one existing tree, provided such trees have been identified on approved construction plans.

Existing code language

Planning Recommendations: Comprehensive Plan

Section	Recommendations
Natural Environment Element Overview	Revise Natural Environment element language to include the concept of natural systems as valuable infrastructure.
NE-1.1: Consider the immediate and long-term environmental impacts of policy and regulatory decisions.	Incorporate the use of ecosystem services as a reference point for these discussions and evaluations.
1.4.4 Natural Environment	Develop tree preservation overlay zones for priority canopy areas to be maintained ● Increase tree unit requirement ● Require preservation or steep mitigation for trees above **X** DBH
1.4.4 Natural Environment	Develop an urban forestry program that works to implement the best practice recommendations that are a part of this POSMP in order works towards system-wide stewardship and resilience.
3.4.2 Critical Areas	Consider designating large areas of connected tree canopy as critical areas to be preserved.
3.4.3 Shorelines	Consider adding a goal that addresses providing the community with safe and accessible ways to engage with shorelines that balances recreation with ecological needs.
3.4.4 Landscape Enhancement and Tree Preservation	Include heat island reduction, improved air quality, and stormwater management as additional added values for protecting the urban tree canopy.
3.4.4 Landscape Enhancement and Tree Preservation	Identify public lands that can act as mitigation banks to counteract canopy loss over time. Spread throughout the city to make sure replacement is within ½ mile of development site ● Prioritize more urban conditions to maximize ecosystem service value ● Provide incentives for private land to preserve existing or mitigate losses
4.4.4 Design and Low-Impact Development	Consider adding a goal that addresses tree canopy coverage, health, and replacement.
5.7.3 Park Impact Fees	Consider the Level of Service needed as large areas of land develop and population density increases (i.e. North Shore)
5.7.3 Park Impact Fees	Assess specialized amenities and programming as a system and consider repurposing land based on density and walkability vs driving - i.e. ball fields (specialized use) vs parks (universal use) near dense housing

Community Outreach

The planning process included outreach and education events in order to capture community feedback and raise awareness of the plan.

Public Participation & Education Strategy

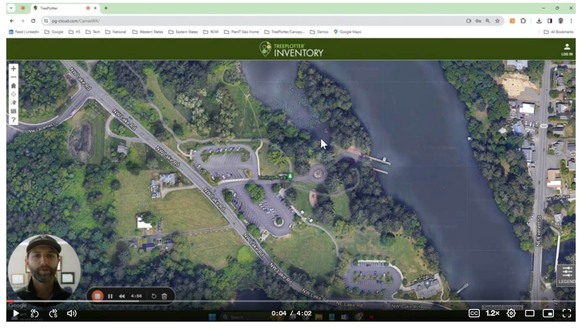
The POSMP builds off of previous planning efforts in Camas around parks, open spaces, and recreation. Community feedback and priorities from efforts like the PROS plan were reviewed, summarized, and built upon to lead to the 5 Camas Community Values that provided a framework for this plan. The POSMP provides a pathway on how to prioritize and implement those values. Drafts of the plan and its strategies were reviewed with the Camas Parks and Recreation Commission 2/28/24 and 7/31/24) and City Council (5/6/24 and 8/5/24) to ensure alignment with other city goals and collect feedback.

Education, training, and public feedback was a key part of the plan development process. A project website was set up to keep the community informed about the process and engagement opportunities.

Camas Parks and Open Space Management Plan | Engage Camas

The team hosted an open house to share progress of the plan, answer questions, and collect feedback on the overall approach. There were interactive sessions that explained the system-based approach to management and gathered ideas around impacts, risks, and strategies to inform the best practices recommendations. Feedback was collected on the 5 Community Values in order to inform the project approach matrix. An online survey was set up and posted on the project website to duplicate these activities and a recording of the presentation was included to provide the background context.

Finally, a public tree inventory session* was co-hosted by the City of Camas, PlanIT Geo, and Washington Department of Natural Resources (DNR). It was held the day after the open house on Earth Day weekend to align with other community events. On-site training was provided on how to use the the inventory tool as well as education on tree health and maintenance. Plan IT Geo's arborists verified the data in order to include it in the city-wide inventory database for future use.



Camas Volunteer Inventory Training Video
provided to the community before the event through the website to prepare for the inventory.

*The original plan was to work with local students to provide education and a sample inventory. Due to the local teachers strike at the onset of the project, student availability and class curriculum didn't align with the time of year to perform the inventory. It was decided to open it up to the public later on in the project timeline.



This flyer was used to advertise the public events, as well as social media, and local newsletter postings.

Camas Parks and Open Space Management Plan

Community Open House

April 19th, 2024

Agenda

Presentation (30 minutes)

- Project overview and goals
- Tree Canopy Analysis
- Financial and Operations Assessment
- A Systems Approach, Valuing Nature
- Resource Prioritization

Activity #1 - Poster feedback (30 minutes)

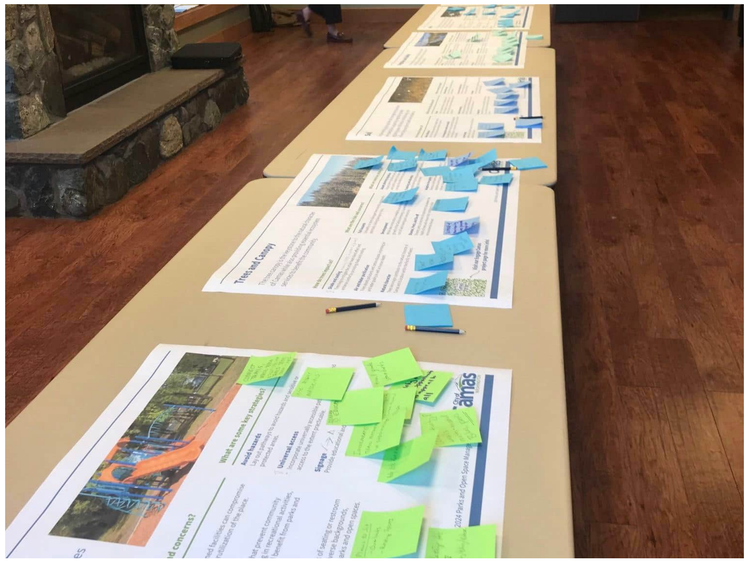
Activity #2 - Table discussions (30 minutes)

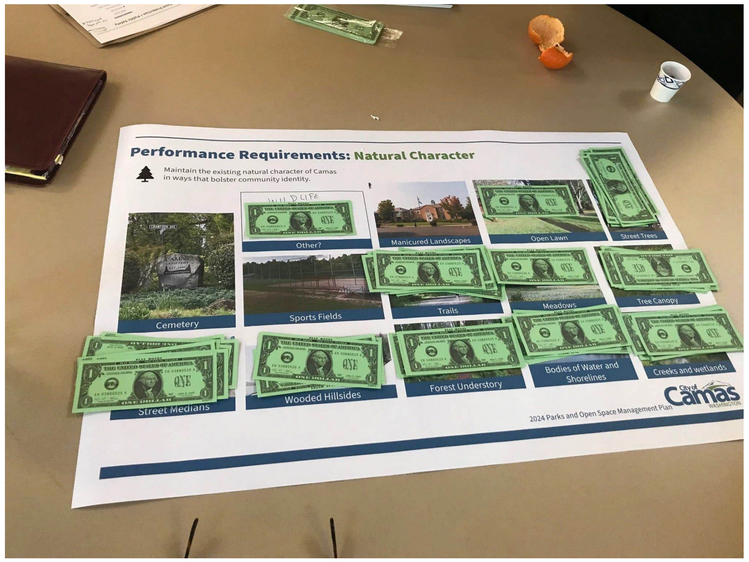
Community Feedback

Community Open House

An open house was held at Lacamas Lodge on April 19, 2024. Participants provided feedback on the systems through discussions and through annotating posters. Group activities were used to obtain feedback on the performance requirements identified for the Parks and Open Space management plan.







Online survey feedback

An online survey was provided through Engage Camas. The survey was open until May 5, 2024. There were 9 survey responses. The survey questions explored the following:

- **Outreach & Education:** What are potential gaps in knowledge that require training for land management practices for public and/or private landowners?
- **Natural Character:** What does natural character mean to you and which features contribute most to the identity of Camas?
- **Equitable Access:** What are the biggest obstacles to access natural resources and park amenities?
- **Financial & Resource Allocation:** How else does nature benefit you and the community?
- **Asset Protection & Public Safety:** What are your priority natural impacts, human activity, and safety concerns that (will) have impacts on Camas?

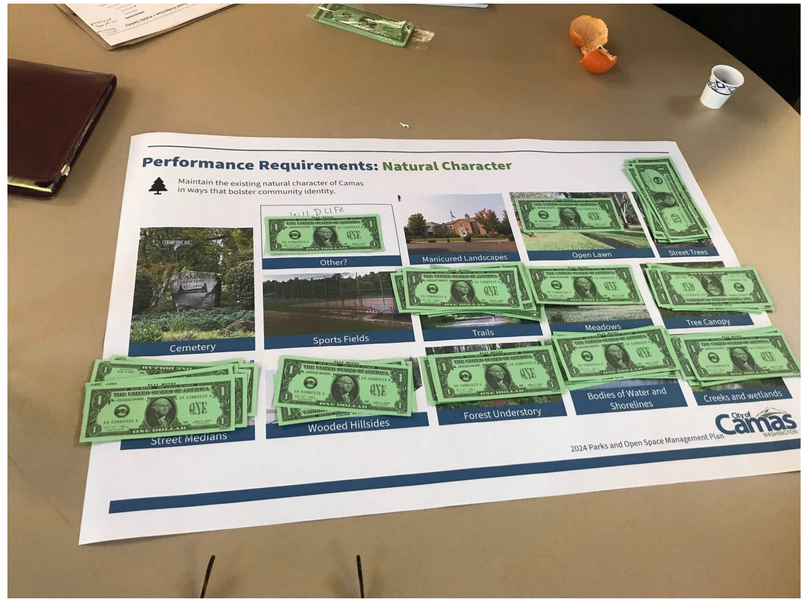
- **Systems Approach:** Is there anything missing or other ideas to consider as it relates to the following systems?
  - Water
  - Operations
  - Materials & Equipment
  - Access & Amenities
  - Soil
  - Vegetation & Habitat
  - Trees & Canopy

Open House Feedback Summary

Key Takeaways:

- This will be a large change initiative for the city and community.
- Camas' natural resources, parks, and open space are a **valuable asset** and serve as **key infrastructure** to the city.
- Clear incentives, restrictions, and guidelines should be put in place for basic maintenance tasks, tree preservation, and appropriate planting practices.
- Program, amenities, and assets should be looked at from a system-wide perspective and located based on diversity of uses, population density, and adjacencies to other land uses and natural resources.
- There's a lot of potential in the volunteer organizations and HOA residents if organized and educated properly
- There was a long-term desire to progress from reactive maintenance to systemic stewardship.





Community Feedback: Performance Requirements



Online survey feedback

The ecosystem services graphic above identifies the many ways our parks and open space system provides benefits and value to our community. How else does nature benefit you and the community?

- Opportunities to learn more about nature
- Social/emotional wellbeing and resilience to stress, particularly stress from climate change
- Enhanced community connection
- Physical health
- Access to nature and developing sense of place
- Environmental benefits: carbon storage, cooling
- Economic benefits: tourism destination, attract investment

Community Feedback: Performance Requirements



Online survey feedback

What does natural character mean to you and which features contribute most to the identity of Camas?

- 5 mentions: Trails, Tree Canopy
- 4 mentions: Bodies of Water and Shorelines, Creeks and Wetlands
- 3 mentions: Forest Understory, Meadows, Street Trees
- Other comments:
  - Buildings and other urban features seen as elements that detract from the natural character of Camas.
  - Bike paths contribute to natural character of Camas, as do wooded hillsides that are not built upon.

Community Feedback: Performance Requirements



Online survey feedback

What are your priority natural impacts, human activity, and safety concerns that (will) have impacts on Camas?

- Water quality was mentioned frequently in the survey results. Safe and clean household water was mentioned as a concern. Toxic bacteria in Lacamas Lake was also specifically mentioned as a concern.
- Wildfire was mentioned frequently in the survey results. Respondents noted that climate change brings increasing threat of wildfire, and that there is a need for education and management of fuels.
- Invasive species and their threats to tree health and native vegetation were mentioned. Blackberries were specifically mentioned as an invasive species of concern.
- Several respondents were concerned about the impacts of development; specifically, that development might come at a cost of investment in existing assets. There were additional concerns about the potential strains on existing infrastructure and natural ecosystems that might occur as a result of future development.
- Loss of outdoor programming and wilderness education was shared as a concern by several respondents.
- Climate change was mentioned as a major threat, including impacts such as extreme changes in heat and water availability.
- Tree canopy loss was also a concern mentioned repeatedly in the survey responses.

Community Feedback: Systems

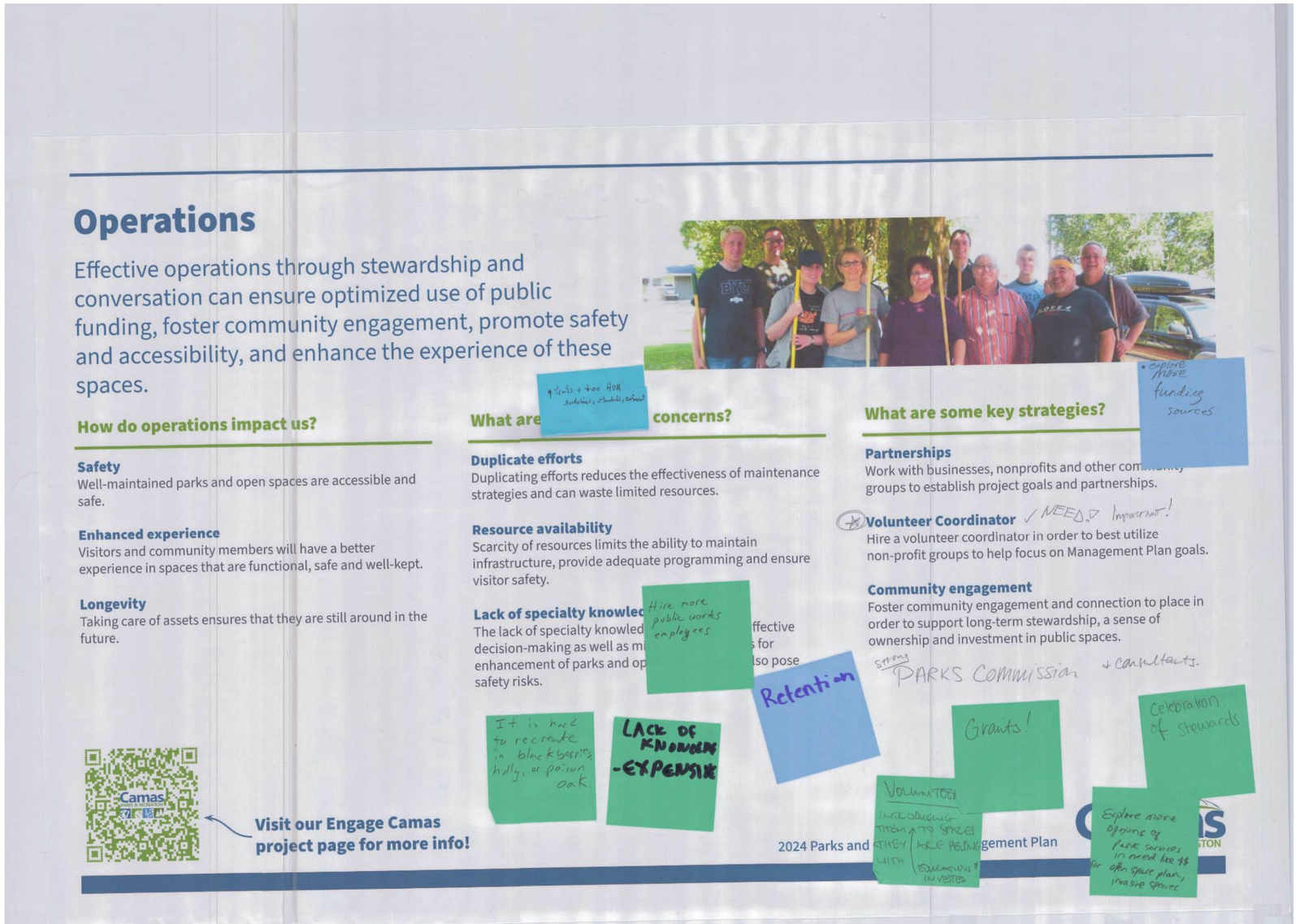


Online survey feedback

Managing water in our parks and open spaces is vital for preserving natural ecosystems, ensuring access to clean water, and providing cooling and recreational opportunities for the community. Is there anything missing or other ideas to consider as it relates to water?

- Access to clean and safe water is critical.
- Increase outreach to homeowners and private landowners to educate them about best practices for managing water quality. Work with them to address water quality issues upstream of stormwater infrastructure.
- Consider reducing irrigation as well as reducing lawns.
- What long-term measures is Camas taking to enhance climate resilience, beyond just focusing on climate mitigation?
- Lacamas Lake water quality is a concern.
- Could a user fee at lakes and boat ramps provide fiscal support for maintaining water quality?

Community Feedback: Systems

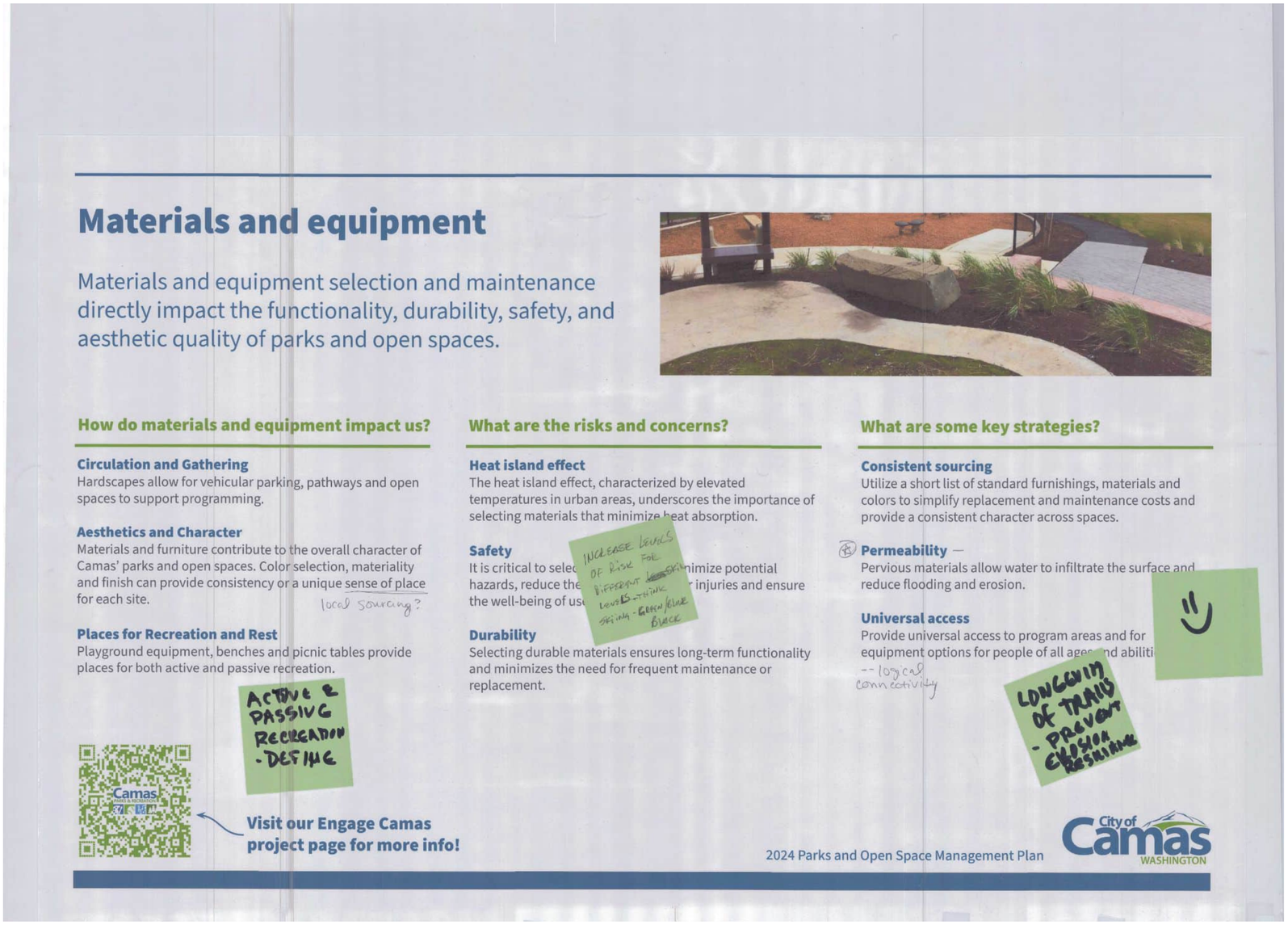


Online survey feedback

Effective operations through stewardship and conversation can ensure optimized use of public funding, foster community engagement, promote safety and accessibility, and enhance the experience of these spaces. Is there anything missing or other ideas to consider as it relates to operations?

- Continue efforts to engage Camas citizens in stewardship events and parks cleanups - these have been successful so far.
- Consider partnerships with universities as well as local K-12 schools.
- Lots of support for a volunteer coordinator position. Are there other opportunities to support community volunteer efforts?
- Funding is a concern when it comes to implementing operational changes through the Parks and Open Space Management Plan.

Community Feedback: Systems



Materials and equipment

Materials and equipment selection and maintenance directly impact the functionality, durability, safety, and aesthetic quality of parks and open spaces.

How do materials and equipment impact us?

Circulation and Gathering
Hardscapes allow for vehicular parking, pathways and open spaces to support programming.

Aesthetics and Character
Materials and furniture contribute to the overall character of Camas' parks and open spaces. Color selection, materiality and finish can provide consistency or a unique sense of place for each site.
local sourcing?

Places for Recreation and Rest
Playground equipment, benches and picnic tables provide places for both active and passive recreation.

ACTIVE & PASSIVE RECREATION - DEFINE

What are the risks and concerns?

Heat island effect
The heat island effect, characterized by elevated temperatures in urban areas, underscores the importance of selecting materials that minimize heat absorption.

Safety
It is critical to selec inimize potential hazards, reduce the r injuries and ensure the well-being of us

INCREASE LEVELS OF RISK FOR DIFFERENT LEVELS OF ACTIVITY - BRANCHING BACK

Durability
Selecting durable materials ensures long-term functionality and minimizes the need for frequent maintenance or replacement.

What are some key strategies?

Consistent sourcing
Utilize a short list of standard furnishings, materials and colors to simplify replacement and maintenance costs and provide a consistent character across spaces.

Permeability –
Pervious materials allow water to infiltrate the surface and reduce flooding and erosion.

Universal access
Provide universal access to program areas and for equipment options for people of all ages nd abiliti
-- logical connectivity

LONGEVITY OF TRAILS - PREVENT EROSION RESISTANCE

Visit our Engage Camas project page for more info!

2024 Parks and Open Space Management Plan

City of Camas WASHINGTON

Online survey feedback

Materials and equipment selection and maintenance directly impact the functionality, durability, safety, and aesthetic quality of parks and open spaces. Is there anything missing or other ideas to consider as it relates to materials and equipment?

- Prioritize access when selecting materials. Camas has a large aging population, so this will continue to be a critical consideration.
- Retain natural character to the greatest extent possible, balancing this with needs for equitable access. Incorporate naturescaping and sustainable materials.
- Consider paving high-use trails to decrease degradation and enhance access in the long term.
- Maintain existing materials and equipment to a sufficiently high standard.

Community Feedback: Systems

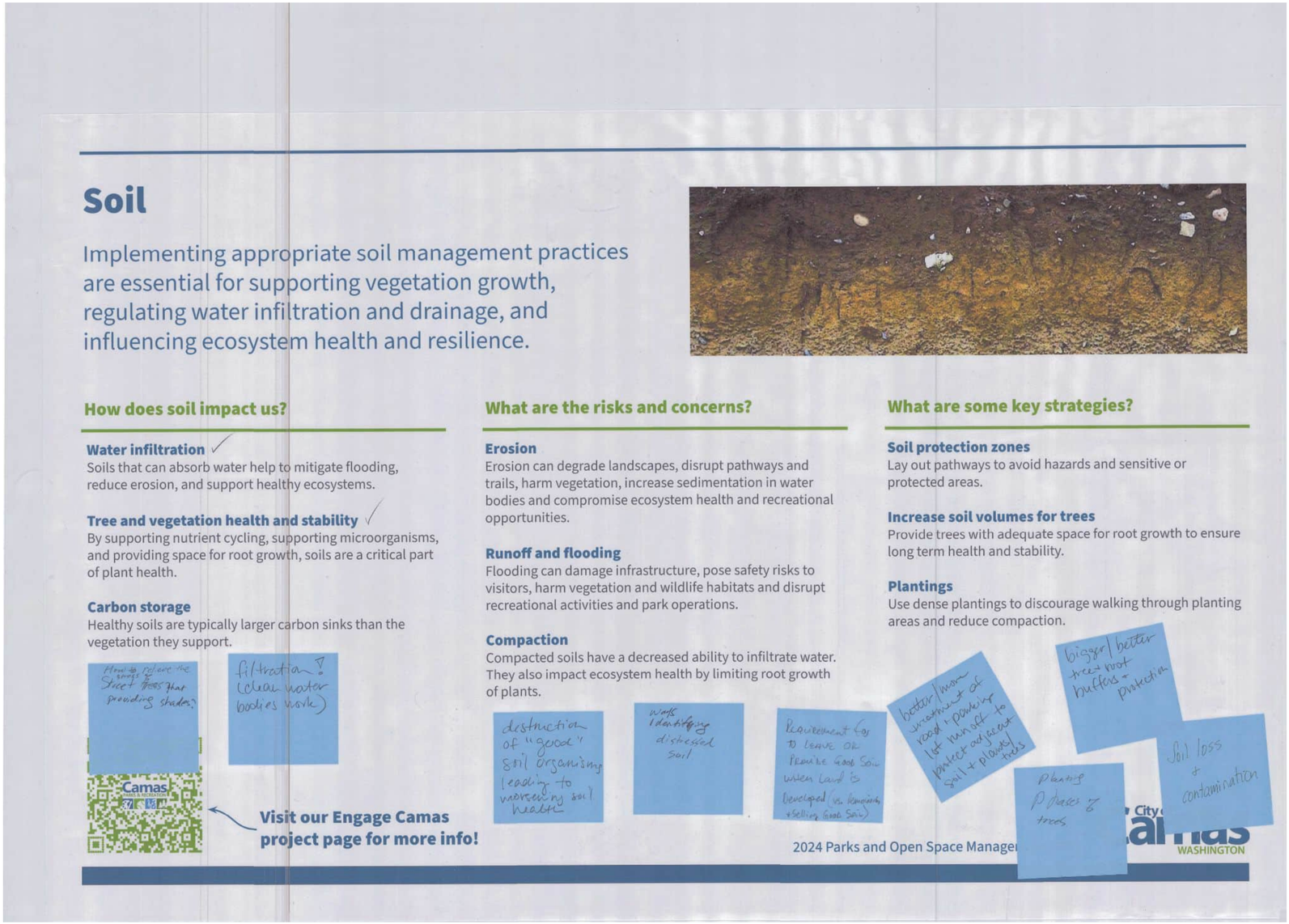


Online survey feedback

It is critical to ensure that people of all ages and abilities can access and enjoy the variety of parks and open spaces that Camas has to offer. Is there anything missing or other ideas to consider as it relates to access and amenities?

- Providing more information on amenity options as well as their costs and benefits would increase buy-in from the community.
- Safety and vandalism are concerns.
- Consider signage options that can be used by individuals with vision limitations.
- Explore ways that signage can be integrated into the existing natural character, as well as ways that signage can complement opportunities for education and outreach.
- Improve connections and wayfinding through the City.
- Incorporate universal access into parks and amenities.
- Ensure that people of all backgrounds can feel welcome in parks and open spaces.

Community Feedback: Systems



Soil

Implementing appropriate soil management practices are essential for supporting vegetation growth, regulating water infiltration and drainage, and influencing ecosystem health and resilience.

How does soil impact us?

Water infiltration ✓
Soils that can absorb water help to mitigate flooding, reduce erosion, and support healthy ecosystems.

Tree and vegetation health and stability ✓
By supporting nutrient cycling, supporting microorganisms, and providing space for root growth, soils are a critical part of plant health.

Carbon storage
Healthy soils are typically larger carbon sinks than the vegetation they support.

How do we protect the small trees that providing shade?

filtration ? (clean water bodies work)

Camas PARKS & RECREATION

Visit our Engage Camas project page for more info!

What are the risks and concerns?

Erosion
Erosion can degrade landscapes, disrupt pathways and trails, harm vegetation, increase sedimentation in water bodies and compromise ecosystem health and recreational opportunities.

Runoff and flooding
Flooding can damage infrastructure, pose safety risks to visitors, harm vegetation and wildlife habitats and disrupt recreational activities and park operations.

Compaction
Compacted soils have a decreased ability to infiltrate water. They also impact ecosystem health by limiting root growth of plants.

destruction of "good" soil organisms leading to worsening soil health

work identifying distressed soil

Requirement for to leave OR Provide Good Soil when Land is Developed (vs. Removing + Selling Good Soil)

better/more treatment of road runoff to protect adjacent soil + plants/trees

bigger/better tree root buffers + protection

Soil loss + contamination

Planting Phases of trees

2024 Parks and Open Space Manage

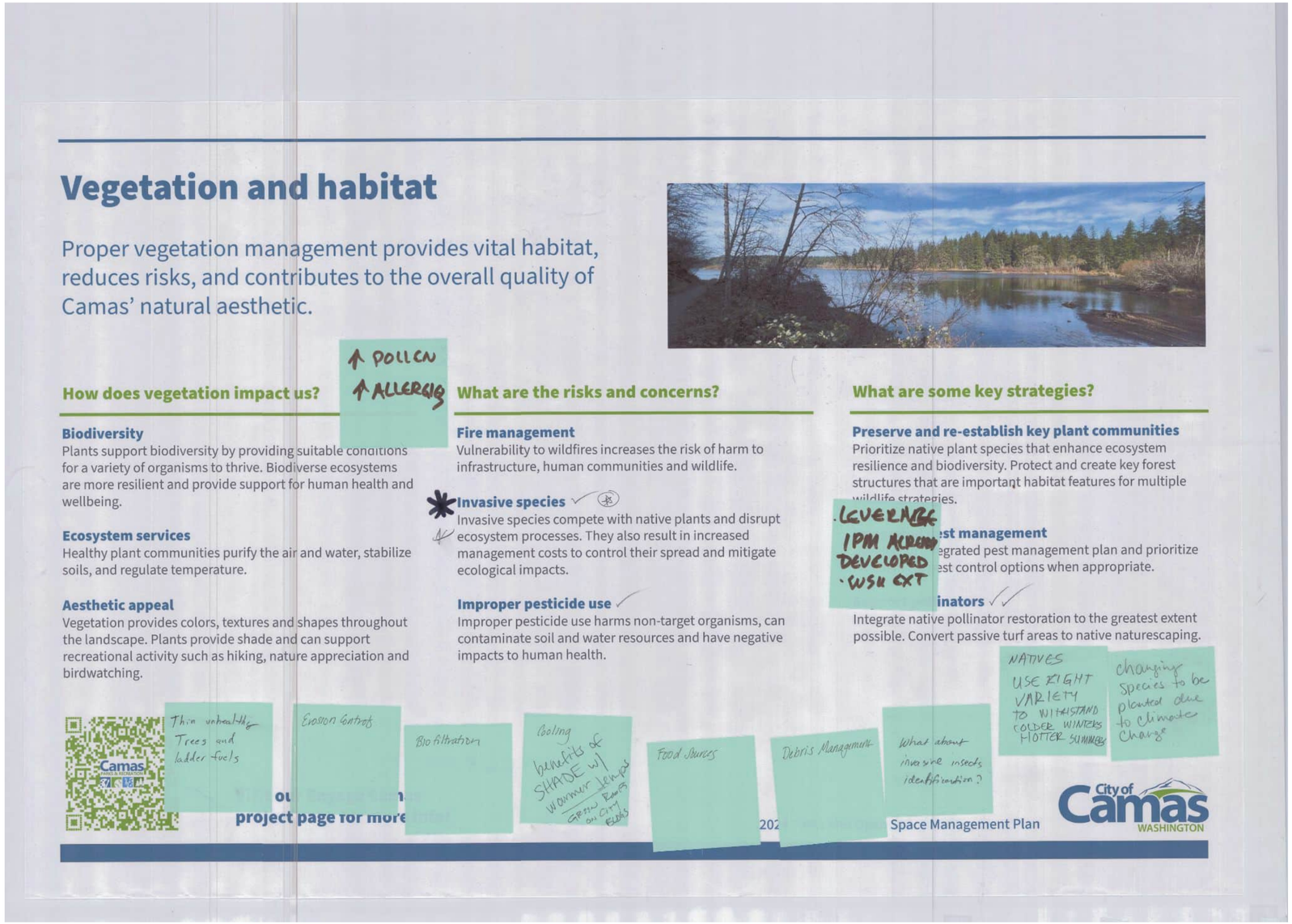
City of Camas WASHINGTON

Online survey feedback

Implementing appropriate soil management practices are essential for supporting vegetation growth, regulating water infiltration and drainage, and influencing ecosystem health and resilience. Is there anything missing or other ideas to consider as it relates to soil?

- Enhanced wayfinding and signage could help keep people and trails and reduce compaction in sensitive areas.
- Consider long-term resilience when selecting and placing plantings.
- Enhance planting vaults for street trees.
- Support composting. This could include a City compost facility as well as infrastructure for residents in apartment complexes and new developments who wish to compost.

Community Feedback: Systems

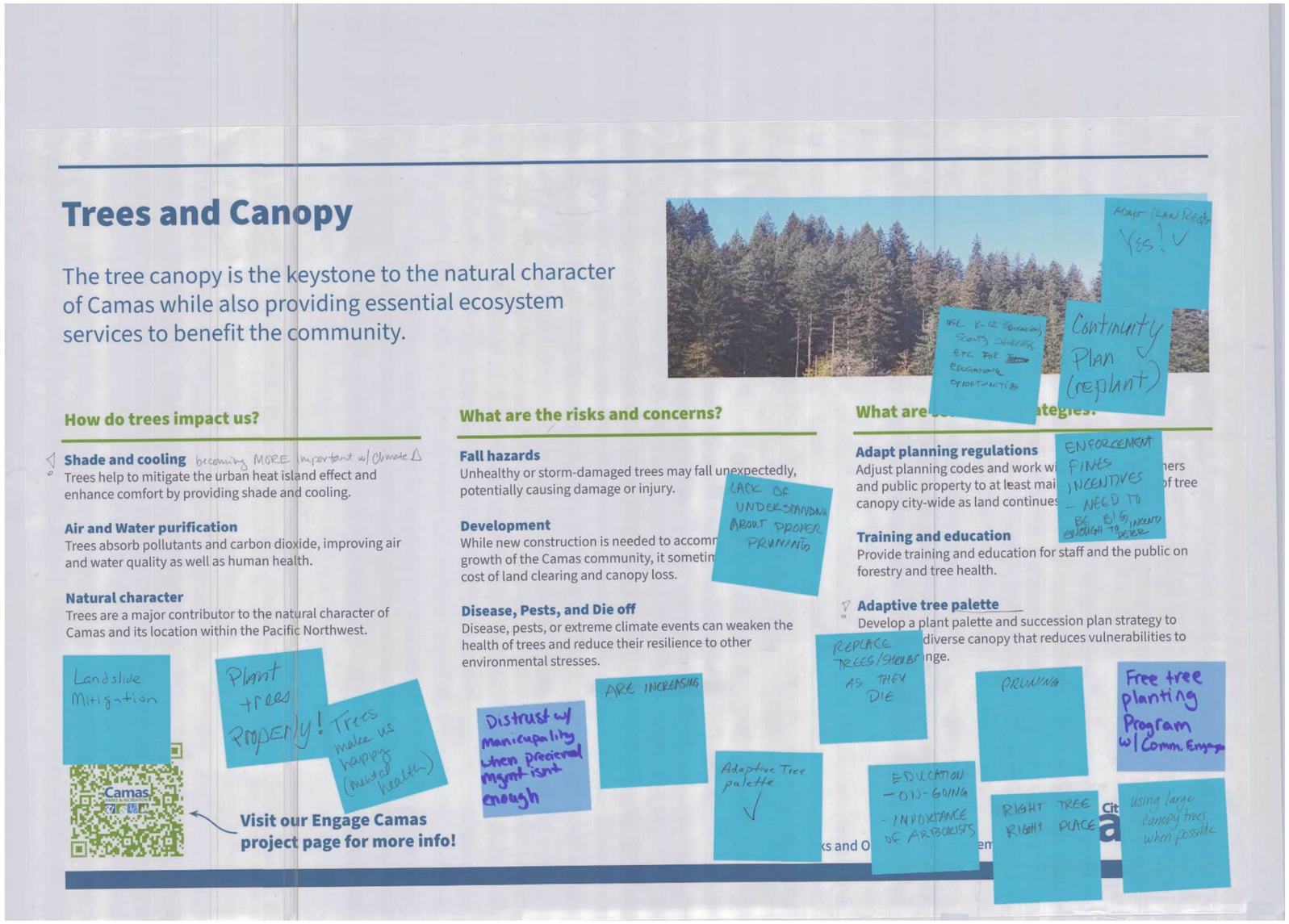


Online survey feedback

Proper vegetation management provides vital habitat, reduces risks, and contributes to the overall quality of Camas' natural aesthetic. Is there anything missing or other ideas to consider as it relates to vegetation and habitat?

- Emphasize wildfire prevention and management practices.
- Consider changing maintenance practices such as reducing mowing frequency or leaving areas unmowed.
- When selecting plants, account for the impacts of climate change - "native species" may need to be redefined.
- What efforts are being made to reintroduce native plants that have been previously displaced?
- Establish a maintenance schedule that allows for proactive management of vegetation.

Community Feedback: Systems



Online survey feedback

The tree canopy is the keystone to the natural character of Camas while also providing essential ecosystem services to benefit the community. Is there anything missing or other ideas to consider as it relates to trees and canopy?

- Wildfire is a major threat to trees and canopy.
- How will environmental justice be incorporated into how the City manages trees and canopy?
- Seek guidance of foresters or forest management experts to balance selective thinning of trees with the need to preserve biodiversity.
- Canopy is a huge part of what makes Camas a wonderful place.
- Provide clearer guidance to private landowners about managing trees and use tree permits to avoid unnecessary removal of trees.
- Use planning and code to shift development away from sites that require land clearing and to prioritize retention of existing mature trees.
- Young trees used in mitigation plantings cannot replace the many benefits of mature trees.
- Trees in sidewalk strips have been removed by homeowners because of their impacts on the sidewalk. Permeable sidewalks and more planning for trees could address this problem.

References and Resources

Other

- SITES Rating System
- Landscape Planning for Washington's Wildlife (WDFW)

Trees

- Tree shift prediction tool (Washington Post)
- Climate Resilience Guide for Small Forest Landowners in Western Washington
- Portland's Tree Damage, through the Eyes of an Arborist

Access and Safety

- 7 Principles of Universal Design, Centre for Excellence in Universal Design
- ADA Accessibility Standards, US Access Board
- Best Management Practices for Crime Prevention Through Environmental Design in Natural Landscapes, Green Seattle Partnership
- Crime Prevention Through Environmental Design (CPTED)
- Public Playground Safety Handbook, U.S. Consumer Product Safety Commission
- Standards, Illuminating Engineering Society Standards

Operations and Management Plans

- Green Seattle work crew specifications
- Storm Mitigation Planning - Green Infrastructure Center
- Urban Forest Management Plan - City of Wilsonville, OR
- Urban Forest Management Plan - Renton, WA
- Community Forest Storm Mitigation Planning Template - USFS

Soil

- Urban Soil Management for Climate Resilience
- Specifying Soil Volumes to Meet the Water Needs of Mature Urban Street Trees and Trees in Containers
- Soil for Urban Tree Planting

Table 1: Stewardship calendar

STEWARDSHIP CALENDAR	1 JAN	2 FEB	3 MAR	4 APRIL	5 MAY	6 JUNE	7 JULY	8 AUG	9 SEPT	10 OCT	11 NOV	12 Dec	NOTES
planting considerations:													
primary planting season	go	go	go	go	go	stop	stop	stop	stop	stop	stop	stop	optimal planting is when plants are dormant during the rainy season
wetland planting season	stop	stop	stop	stop	proceed with care	go	go	go	go	stop	stop	stop	applies to soils that dry out during part of year
wetland planting season	stop	stop	stop	stop	stop	proceed with care	proceed with care	go	go	go	go	go	applies to soils that are saturated year-round
wildlife considerations:													
primary bird nesting season	go	go	go	go	go	stop	stop	stop	stop	stop	stop	stop	includes majority of songbird species; some birds nest later into end of August
early bird nesting season	go	go	proceed with care	proceed with care	proceed with care	stop	stop	stop	stop	go	go	go	includes larger species such as herons, geese, raptors, and hummingbirds
duck nesting season	go	go	go	stop	stop	stop	stop	go	go	go	go	go	avoid shoreline/adjacent areas
amphibian reproduction	stop	stop	stop	stop	stop	stop	go	go	go	go	go	stop	applies to sites with 10 cm standing open water, avoid 25 feet from waters edge
professional crew considerations:													
steep slope work	stop	stop	stop	stop	proceed with care	proceed with care	go	go	go	proceed with care	stop	stop	do not carry out activities that have potential for soil disturbance in winter without BMPs in place
knotweed herbicide treatment	stop	stop	stop	stop	stop	stop	stop	go	go	proceed with care	stop	stop	early or late applications may be acceptable to avoid impacts to pollinators
ivy herbicide treatment	stop	stop	stop	stop	proceed with care	proceed with care	proceed with care	go	go	stop	stop	stop	early applications may be acceptable, but not as effective for long-term control
blackberry herbicide treatment	stop	stop	stop	stop	proceed with care	proceed with care	proceed with care	go	go	stop	stop	stop	do not make applications to fruiting vegetation

Legend: go; proceed with care; stop

Source: Green Seattle work crew specifications

Vegetation and Habitat

- Landscape Plants, Oregon State University
- Great Plant Picks, Elisabeth C. Miller Botanical
- Gardening in Washington State, Washington State University Extension Master Gardeners
- Noxious Weeds Program, USDA Animal and Plant Health Inspection Service
- Washington State Noxious Weed Control Board
- Noxious Weeds, Washington State Department of Agriculture
- The Native Pollinator Habitat Restoration Guide (EarthCorps)
- Integrated Pest Management, Washington State University
- Urban Forest Pest Readiness Playbook - Washington

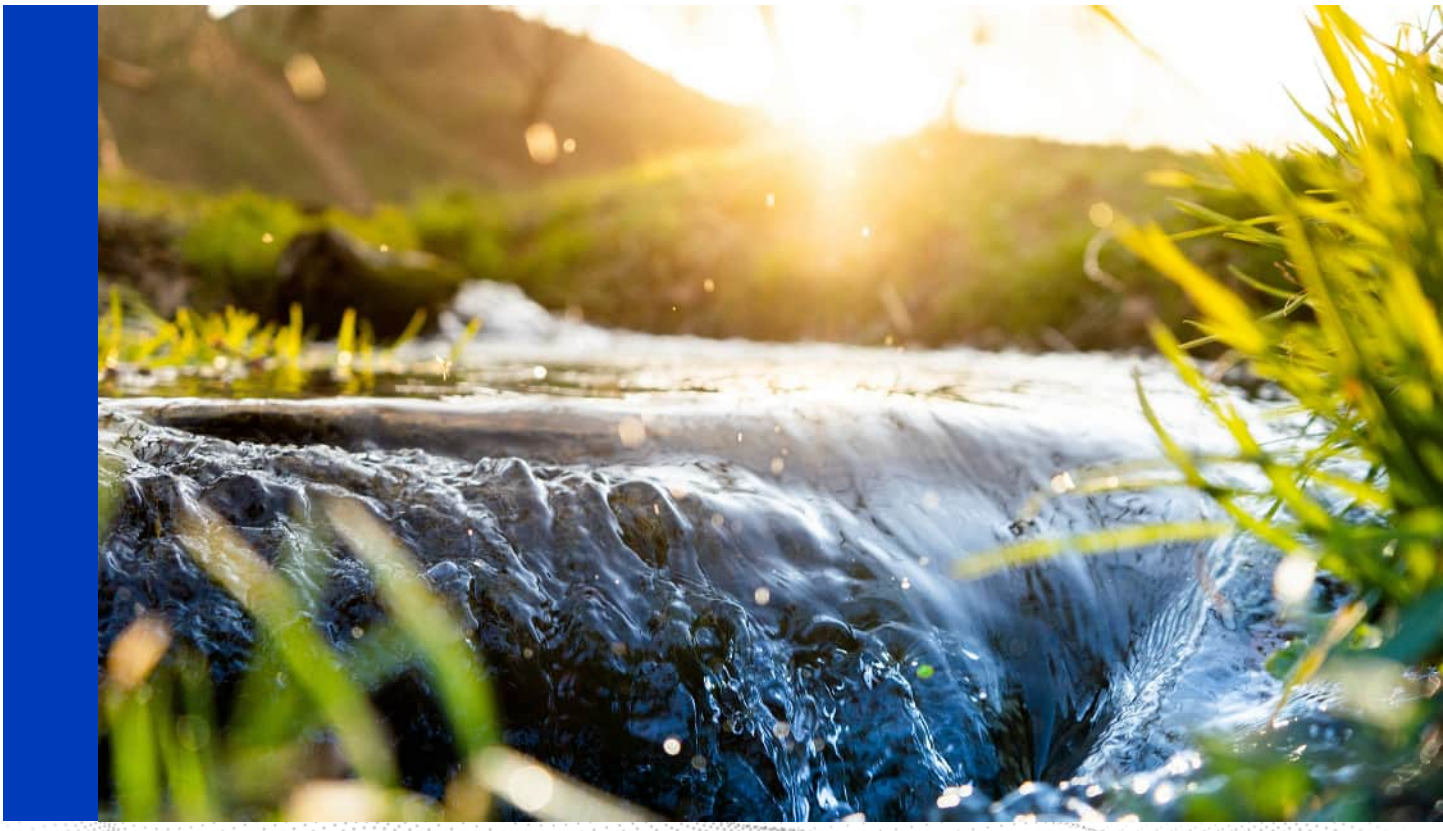
Fire Management

- Preparing Homes for Wildfire, National Fire Protection Association
- Fire Adapted Ashland, City of Ashland

Steep Slopes

- Steep Slopes, Integrated Transportation and Community Planning

Appendix N: Camas Water System Plan



Water System Plan Update

September 2026 / DRAFT

Water System Plan Update

September 2026 / DRAFT

This document is released for the purpose of information exchange review and planning only under the authority of Matthew Huang, September 2026, State of Washington PE No. 54002.

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Abbreviations

µg/L	micrograms per liter
2010 WSP	City of Camas 2010 Water System Plan
2019 WSP	City of Camas 2019 Water System Plan
ADD	average day demand
ADU	accessory dwelling unit
AFY	acre-feet per year
AL	action level
ALE	action level exceedance
AMI	advanced metering infrastructure
Army	United States Army
ASR	Annual Summary Report
AWIA	American Water Infrastructure Act
AWWA	American Water Works Association
BAT	Backflow Assembly Testers
BPS	booster pump station
Carollo	Carollo Engineers
CCC	Cross-connection control
CCL	Contaminant Candidate List
CCR	Consumer Confidence Report
CCS	Cross-Connection Control Specialist
CCT	corrosion control treatment
CDC	Centers for Disease Control and Prevention
CEU	Continuing Education Units
CFR	Code of Federal Regulations
cfs	cubic feet per second
CI	Cast Iron
CIP	Capital Improvement Plan
City	City of Camas
CMC	City of Camas Municipal Code
CMP	coliform monitoring plan
Corps	United States Army Corps of Engineers
CPU	Clark Public Utilities
Cr(VI)	hexavalent chromium
CT	contact time
CWA	Clean Water Act
CWSP	Coordinated Water System Plan
D	Distribution System Improvements

DBP	disinfection byproducts
DBPR	Disinfection Byproducts Rule
DI	ductile iron
DOH	Washington State Department of Health
DSL	distribution system leakage
DSN	determination of non-significance
Ecology	Department of Ecology
EDC	endocrine disrupting compounds
EIS	Environmental Impact Statement
ELA	Engineering, Legal, and Administration
EPS	extended period simulation
ERP	Emergency Response Plan
ERU	equivalent residential unit
ESA	Endangered Species Act
ESWTR	Enhanced Surface Water Treatment Rule
FBRR	Filter Backwash Recycling Rule
FF	fire flow
fps	feet per second
FSS	Fire-suppression storage
FTE	full-time-equivalent
G	General
G&O	Gray & Osborne
GenX or HFPO-DA	hexafluoropropylene oxide dimer acid
GIS	Geographic Information System
GMA	Growth Management Act
GME	Green Mountain Estates
GP	Georgia Pacific
gpd	gallons per day
gpm	gallons per minute
GWI	Groundwater under the Direct Influence of Surface Water
GWR	Groundwater Rule
HAA5	haloacetic acids
HAL	health advisory level
HGL	hydraulic grade line
HI	Hazard Index
HPA	hydraulic project approval
HPC	heterotrophic plate count
IDSE	Initial Distribution System Evaluation
IMT	Industrial Metal Technology

IOC	inorganic contaminants
IRIS	Integrated Risk Information System
LCR	Lead and Copper Rule
LCRI	Lead and Copper Rule Improvements
LF	linear feet
LID	low impact development
LPH	Lower Prune Hill
LRAA	locational running annual average
LSL	Lead Service Line
LT1ESWTR	Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR	Long Term 2 Enhanced Surface Water Treatment Rule
LWWF	Lower Washougal Wellfield
MCC	Motor Control Center
MCLG	maximum contaminant level goals
MDBP	Microbial and Disinfection-by-Products
MDD	maximum day demand
MFR	Multifamily Residential
MG	million gallons
mg/L	milligrams per liter
mgd	million gallons per day
mL	milliliters
MPA	microscopic particulate analysis
MRDL	Maximum Residual Disinfectant Levels
MRDLG	Maximum Residual Disinfectant Level Goals
MWS	municipal water suppliers
N/A	not applicable
NDMA	Nitrosamines/N-nitrosodimethylamine
NEPA	National Environmental Policy Act
ng/L	nanograms per liter
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDWR	National Primary Drinking Water Regulation
NTU	nephelometric turbidity unit
NWPR	Navigable Water Protection Rule
O&M	operations and maintenance
PAA	Project Approval Application
PCB	Polychlorinated biphenyls
pCi/L	picocurie per liter

PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctyl sulfonate
PHD	peak hour demand
PNR	Public Notification Rule
PPCP	pharmaceutical and personal care products
ppt	parts per trillion
PRV	pressure reducing valve
PS	pump station
psi	pounds per square inch
PVC	polyvinyl chloride
PWS	public water systems
PZ	pressure zone
Qa	annual water right
Qi	instantaneous water right
R	Annual Repair and Replacement Programs
R&R	Repair and Replacement
RAA	running annual average
RCW	Revised Code of Washington
RRA	risk and resilience assessments
RTCR	Revised Total Coliform Rule
RTL	rule trigger level
RUL	Remaining Useful Life
RWSA	retail water service area
S	Supply and Treatment
SAL	State Action Levels
SCA	Sanitary Control Area
SCADA	supervisory control and data acquisition
SDC	system development charges
SDWA	Safe Drinking Water Act
SEPA	State Environmental Policy Act
SFR	single-family residence
SMA	Satellite Management Agency
SMCL	secondary maximum contaminant levels
SMP	Shoreline Master Program
SOC	synthetic organic chemicals

SRF	State Revolving Fund
SS	Standby storage
SS	Standby storage
SSF Plant	slow sand filtration treatment plant
ST	Storage
SWTR	Surface Water Treatment Rule
T	Transmission Pipe
TAZ	transportation analysis zones
TCR	Total Coliform Rule
TL	trigger level
TNW	traditional navigable waters
TOrC	Toxic Organic Chemicals
TSMC	Taiwan Semiconductor Manufacturing Company
TTHM	trihalomethanes
UCMR	Unregulated Contaminant Monitoring Regulation
UCMR	Unregulated Contaminants Monitoring Rule
UGA	urban growth area
UPH	Upper Prune Hill
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Services
Vancouver	City of Vancouver
VBLM	Vacant Buildable Lands Model
VOC	volatile organic compounds
WAC	Washington Administrative Code
WDM	Water Distribution Manager
WFI	Water Facilities Inventory
WHP	wellhead protection
WHPA	wellhead protection area
WHPP	wellhead protection plans
WLCAP	Water Loss Control Action Plan
WQM	water quality monitoring
WQMS	Water Quality Monitoring Schedule
WQP	water quality parameter
WRIA	Water Resource Inventory Areas
WRIA Plan	Salmon-Washougal and Lewis Watershed Management Plan
WSDM	Water System Design Manual
WSDOT	Washington Department of Transportation
WSP	Water System Plan
WSPU	Water System Plan Update

WTPO	Water Treatment Plant Operator
WUE	Water Use Efficiency
WWTF	wastewater treatment facility
WWTP	wastewater treatment plant

EXECUTIVE SUMMARY

ES.1 Introduction

This Water System Plan Update (WSPU) updates the City of Camas' (City) 2019 WSPU. It was developed collaboratively by City staff, Carollo Engineers (Carollo), Strata Geosciences, and FCS Group. This WSPU documents the water system's current status and evaluates the water City's future needs. The data used for this WSPU was current as of 2024. The WSPU was developed between November 2024 and September 2026 for approval in 2026. This WSPU will be used as a guide for maintaining and improving the water system in the short-term over the next 10 years, while also providing a framework for the 20-year, long-term planning horizon.

The purpose of this WSPU is to document changes to the City's water system, identify required system improvements, and appropriately outline capital improvement projects to meet future water demands. Maintaining a current Water System Plan is required to meet the regulations of the Washington State Department of Health (DOH) and the requirements of the Washington State Growth Management Act. The WSPU complies with the requirements of DOH as set forth in the Washington Administrative Code (WAC) 246-290-100, Water System Plan.

This WSPU contains timeframes, which are the intended framework for future funding decisions and within which future actions and decisions are designed to occur. However, these timeframes are estimates and depending on factors involved in the processing of applications and project work, as well as the availability of funding, the timing may change. The framework presented in this WSPU does not represent actual commitments by the City.

Key points of the WSPU including analysis results and recommendations are summarized below, with more details provided in the specific chapters.

ES.2 Planning Considerations

Chapter 2 summarizes the City's water planning considerations that influence the WSPU, including background on the study area, policies, criteria, and related documents. The City maintains a Duty to Serve customers within the retail water service area (RWSA):

> *The City will exercise reasonable diligence and care to furnish and deliver a continuous and sufficient supply of pure water to the customer, and to avoid any shortage or interruption of delivery of the same. The City will meet all regulatory requirements for management of its water system and provision of water to its customers, including water quality, system pressure, and adequate supply. The City will conserve and protect groundwater resources to provide safe, clean, high-quality drinking water to residents.*

The City's Retail Water Service Area is shown in Figure ES.1. Retail service area is the specific area, defined by the municipal supplier, where the supplier has a duty to provide service to new service connections, as set forth in Revised Code of Washington (RCW) 43.20.260, if:

1. Its service can be available in a timely and reasonable manner;
2. The municipal water supplier has sufficient water rights to provide the service;
3. The municipal water supplier has sufficient capacity to serve the water in a safe and reliable manner as determined by the department of health; and
4. It is consistent with the requirements of any comprehensive plans or development regulations adopted under chapter 36.70A RCW or any other applicable comprehensive plan, land use plan, or development regulation adopted by a city, town, or county for the service area and, for water service by the water utility of a city or town, with the utility service extension ordinances of the city or town.

Water system planning is based on a careful analysis of a water utility's responsibility to comply with applicable regulatory requirements while providing service to existing and future customers. These laws are monitored and enforced by a number of federal, state, and local agencies. The WSPU incorporates several regional and local plans of the southwest region of Washington, such as Clark County, that affect the water utility.

The City has adopted many resolutions regarding water system planning that are included in the City Code. The City manages its water utility in accordance with established water system policies. The policies provide a consistent framework for the design, operation, maintenance, and service of the water system for appropriately implementing programs, designing new infrastructure, and serving additional customers. The Plan summarizes many of these policies and provides criteria needed to evaluate the water system.

ES.3 Existing System

The City owns and operates a multi-source municipal water system- summarized in Chapter 3 - which includes supply, treatment, storage, and distribution of potable water to residential and commercial customers. The City currently obtains its water from 10 groundwater wells and two surface water sources that are treated to provide high quality water to customers. The City owns over 159 miles of pipelines in its water transmission and distribution system. Service is provided to customers across 26 pressure zones, 10 booster pumping stations, and seven storage facilities with a combined total of 9.95 million gallons (MG) to provide storage for normal and emergency conditions, such as fire suppression. Additionally, distribution system includes numerous meters, isolation valves, and hydrants. Major elements of the water system are shown in Figure ES.2.

ES.4 Operations and Maintenance

The water system is operated and maintained (O&M) by the City staff, with contractors providing services that City staff are not trained or equipped to perform. O&M of the water system requires the combined effort of the Public Works Department, Engineering Department, and Finance Department. The City's water system operators are experienced and well trained, exceeding the minimum state requirements (WAC 246-292-050). The City provides opportunities for staff professional growth and training to maintain up-to-date knowledge. The City has a well-operated and maintained system, as documented in Chapter 4. Additionally, the City has updated their system wide O&M manual as part of this WSPU, which describes the assets, operations, and preventative maintenance for each of their major distribution system facilities.

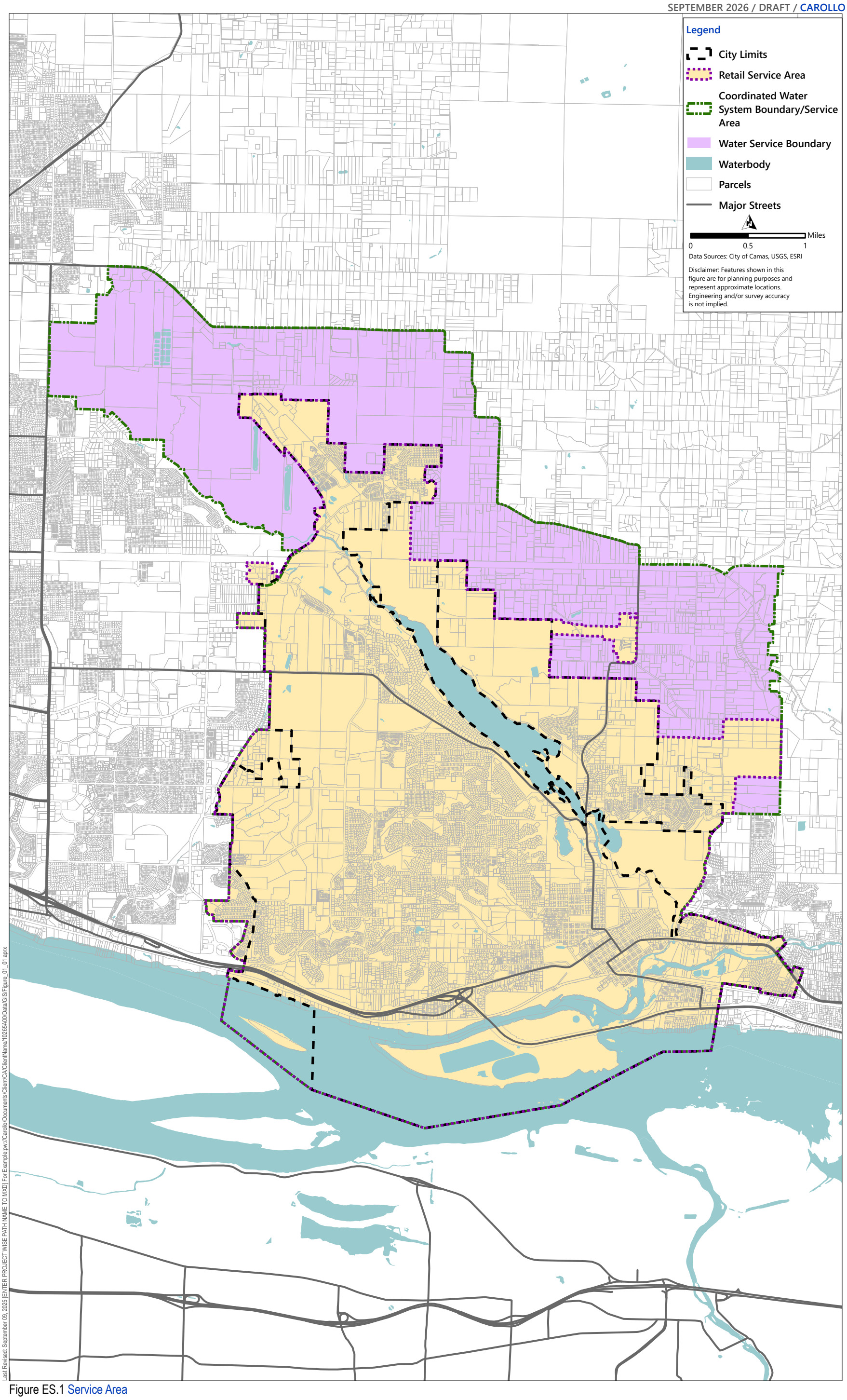

Figure ES.1 Service Area

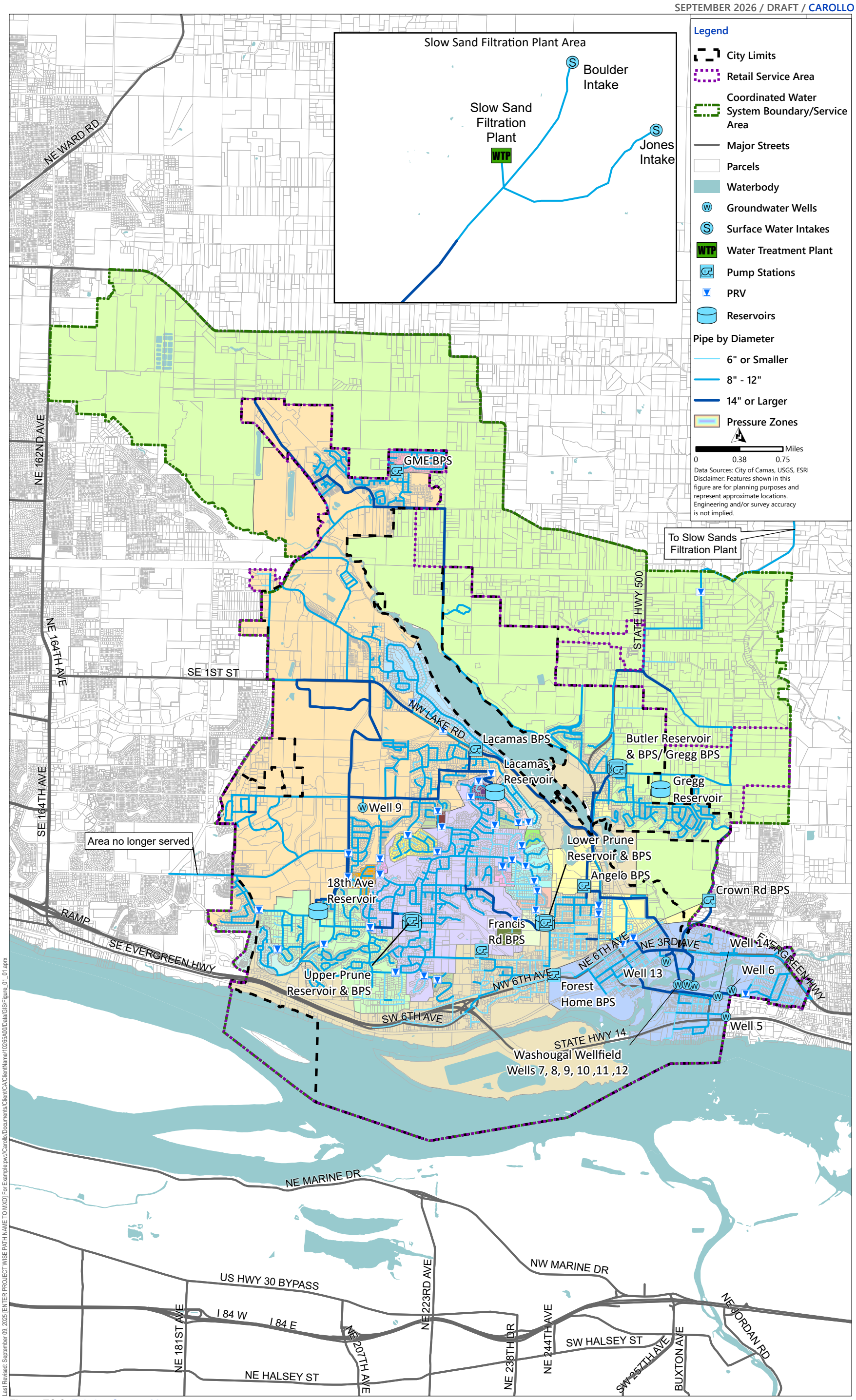

Figure ES.2 Existing System Map

ES.5 Water Requirements

Projecting realistic future water demand is necessary for planning infrastructure projects and securing adequate water supply to meet future growth. Chapter 5 projects the water system requirements, i.e., demand, for the next 20 years. Demographic projections were used to predict where and how much growth will occur in the water system based on the City's comprehensive planning. The resulting future accounts were converted to projected demands using the historical water use patterns and parameters.

Three future water demand scenarios (low, medium, and high) were projected for the planning period between 2026 to 2046 for the City's established RWSA. The medium scenario's predictions most closely resemble the City's future demands, while the low and high demand projection scenarios provide a range within which the City's future water demands are expected to fall. The medium scenario was used for the distribution system analysis in Chapter 9, which identifies future pumping, storage, and distribution system requirements. The high scenario was used for the supply evaluation in Chapter 8, which identifies future water rights and supply capacity requirements. Demand projections were expressed as average day demand (ADD), and maximum day demand (MDD). The ADD is typically used in operational evaluations. The MDD represents the single largest day water demand during the year and is a key parameter for infrastructure sizing.

Figure ES.3 is a chart of the system-wide demand projections for the 20-year planning period. By 2036, the City's ADD is projected to be between 6.2 and 7.4 million gallons per day (mgd) and with MDD projected to be between 11.6 and 15.1 mgd for the low and high scenarios, respectively. By 2046, the City's ADD is projected to be between 7.4 and 9.6 mgd and with MDD projected to be between 14.2 and 20.2 mgd for the low and high scenarios, respectively.

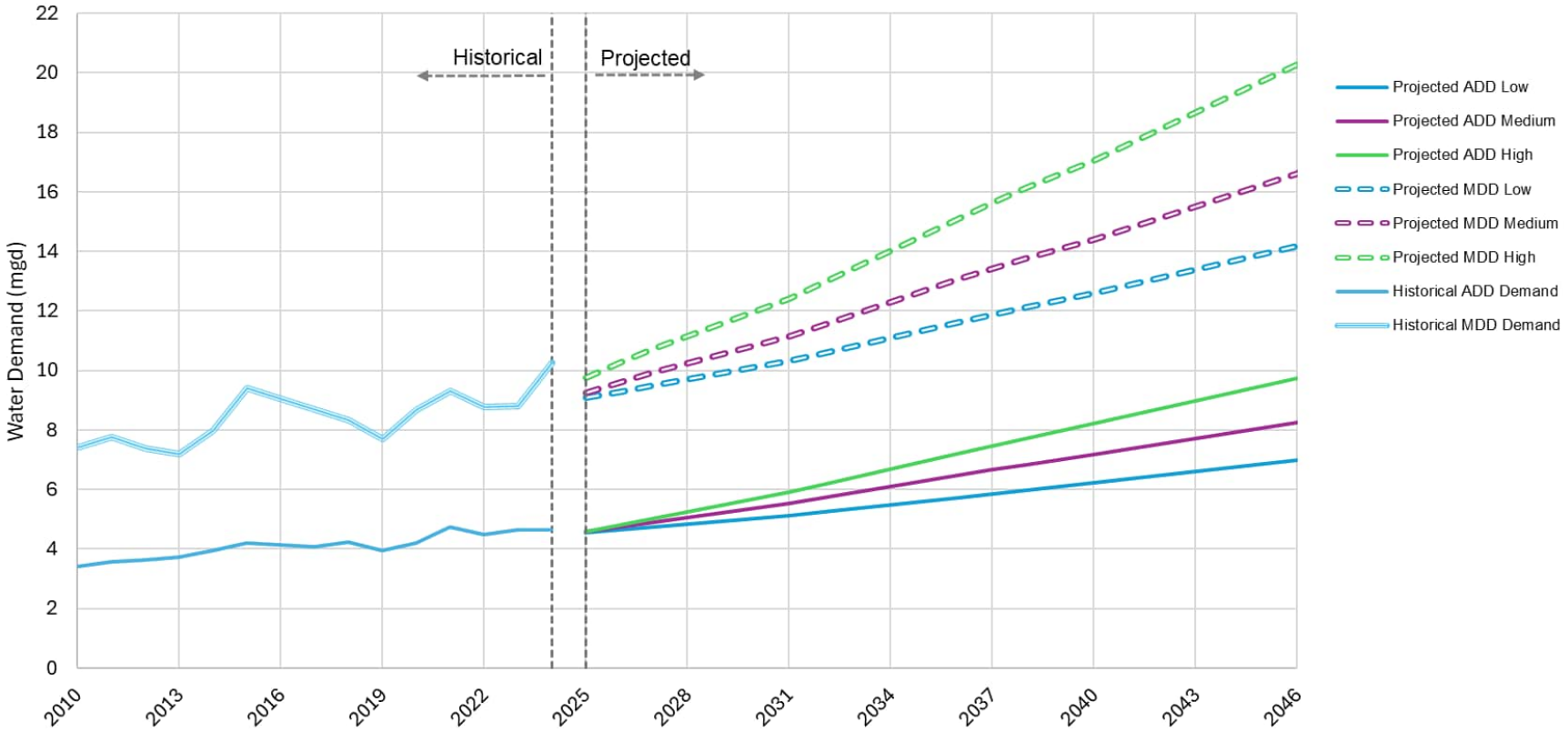

Figure ES.3 Average and Max Day Demand Projections

ES.6 Water Use Efficiency

In 2003, the Washington State Legislature passed the Engrossed Second Substitute House Bill 1338, known as the Municipal Water Law or the Water Use Efficiency (WUE) rule, to address the increasing demand on Washington's water resources. This law established that all municipal water suppliers (MWS) must use water more efficiently in exchange for water right certainty and flexibility to help them meet future demand.

Table ES.1 summarizes the mandatory WUE measures the City completes. As part of this WSPU, the City has completed a Water Loss Control Action Plan (WLCAP) as historical billing data has indicated that distribution system leakage (DSL) is above the DOH standard of 10 percent. Background of the City's current and future WUE programs are detailed in Chapter 6.

Table ES.1 WUE Mandatory Measures

WUE Mandatory Measure	Status
Must implement the following WUE measures:	
Install production (source) meters	Implemented
Install consumption (service) meters	Implemented
Perform meter calibration	Implemented/Ongoing
Implement a WLCAP to control leakage if exceeds 10%	Ongoing
Educate customers about water efficiency at least once per year	Implemented/Ongoing
Must evaluate or implement these WUE measures:	
Evaluate rates that encourage water demand efficiency	Implemented
Evaluate reclamation	Implemented

ES.7 Water Quality

The City is defined as a Group A - Community Water System and must comply with the drinking water standards of the federal Safe Drinking Water Act and its amendments, as regulated by the United States Environmental Protection Agency. The DOH adopted the updated federal standards under WAC 246-290, of which the most recent version became effective June 17, 2025.

The quality of the City's drinking water is of primary concern to the City. As described in Chapter 7, the City is in compliance with all monitoring and reporting requirements. Additionally, the City publishes an annual consumer confidence report that keeps their customers informed of the quality of their water. Based on available water quality, the City has not had issues meeting current regulatory requirements and does not anticipate any issues meeting future regulatory requirements with the exception of per- and polyfluoroalkyl substances (PFAS). Preliminary risk assessments and mitigation screenings indicate uncertainty about PFAS impacts on the City's water supply. As a result, the City will likely need some form of treatment to meet future maximum contaminant levels. To support planning and budgeting, source development and PFAS mitigation will be incorporated into the Capital Improvement Plan (CIP), detailed in Chapters 8 and 10. These projects typically require significant capital investment and will guide the City in securing necessary funding sources.

ES.8 Water Resources

An evaluation was conducted on the City's current water resources to identify deficiencies and propose improvements related to the City's water supply. Chapter 8 outlines the City's sources of supply and existing water rights and makes recommendations for future supply-related improvements. The City expects to have sufficient annual water rights (Qa) and physical capacity to serve projected High scenario ADD over the 20-year planning period. However, to serve project High scenario MDD, the City will need to acquire additional instantaneous water rights (Qi) and increase physical supply capacity as shown in Figure ES.4.

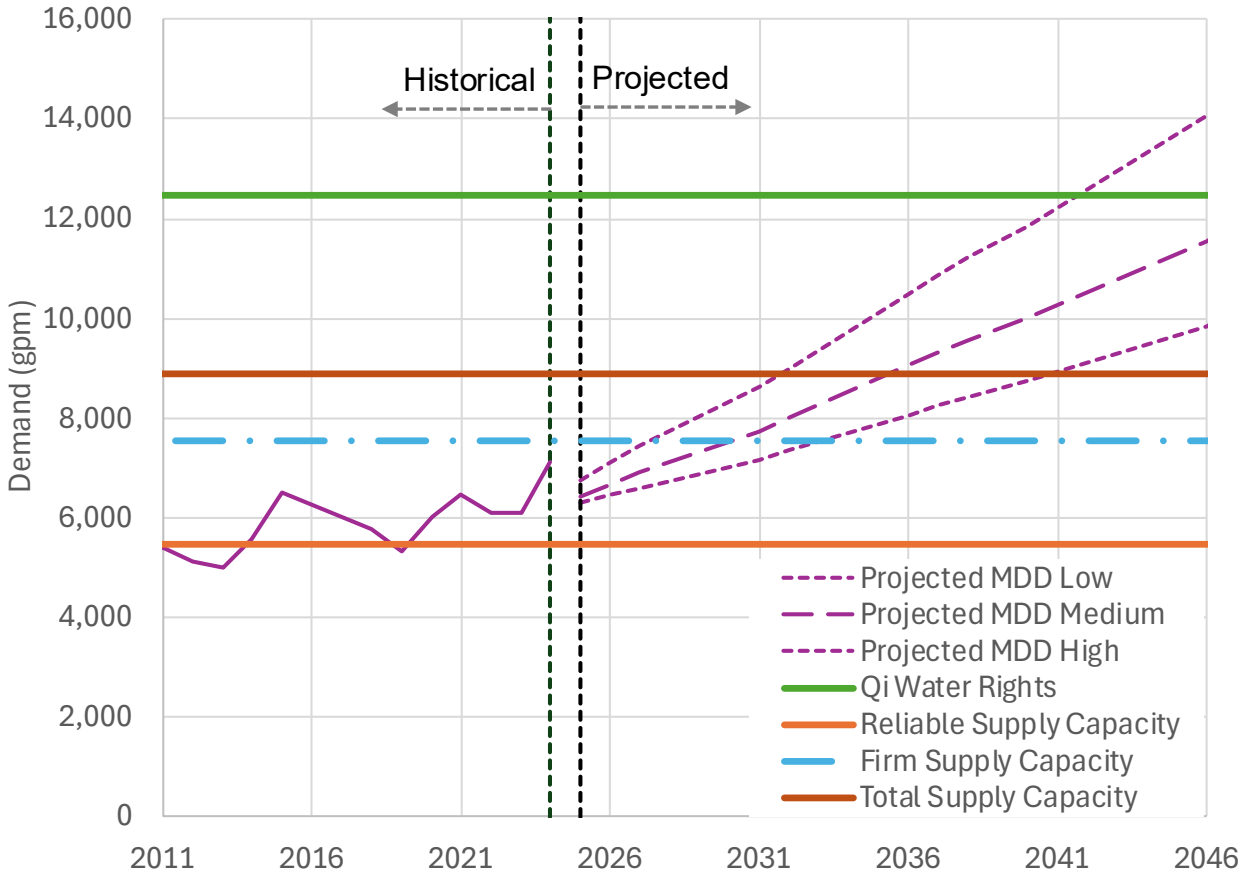

Figure ES.4 MDD Ability to Pump

To address supply related deficiencies, a water supply strategy was developed and is comprised of four parts:

- Lower Washougal Wellfield Expansion.
- Construct Wells for Existing Water Rights.
- Secure Additional Water Rights.
- Continue a WUE Program.

The City anticipates additional supply capacity may be available in the Lower Washougal Wellfield. As such, the water supply strategy focuses efforts on acquiring additional water rights and developing additional physical supply in the Lower Washougal Wellfield (LWWF). However, the development of physical capacity in the LWWF will be dependent on the availability of additional water rights for the wellfield. Should additional water rights in the LWWF be unavailable, a water resources decision making framework summarizes potential next steps to address the City's supply capacity deficits. Both the water supply strategy and water resources decision making framework are further discussed in Chapter 8.

ES.9 System Analysis

The City's water system was evaluated for its ability to meet both DOH and City specific performance criteria under existing, 2031, 2036, and 2046 demand projections. The distribution system analysis identified existing and potential future system deficiencies in the City's water system. Based on the results of the analysis, improvements were recommended to address these deficiencies. Capacity of the pipelines within the distribution system were evaluated under peak hour demands (PHD) and MDD + fire flow (FF) using the City's updated and calibrated hydraulic model. Evaluations of storage reservoirs, booster pump stations and supply sources were conducted in Microsoft Excel. The supply evaluation is discussed previously in Section ES.8. The system analysis identified a number of recommended improvements for pump stations, storage reservoirs, distribution system pipelines and pressure zones, which are shown in Figure ES.5.

ES.9.1 Distribution System Model Analysis

Under projected 2046 demands, several areas of low pressure and fire flow deficiencies were identified. In general, the majority of these deficiencies occurred on dead-end mains or areas of high elevation. These deficient areas will be addressed through distribution pipeline and booster pump station projects, which are outlined in Chapter 9. Additionally, within the planning period the City expects development in their North Shore area. Future pipelines were sized for this development and included in the distribution system model analysis.

ES.9.2 Pumping Analysis

To evaluate pump station capacities, the City's water distribution system was divided into seven different pumping areas containing nine total pump stations. The 343 pumping area is supplied by groundwater wells and although not considered a pump station, was evaluated under both supply specific and pumping criteria. Three pumping areas were flagged as deficient and three different pump station projects are described in Chapter 9 to meet future pumping capacity needs. The 343 pumping area was identified as deficient, however these deficiencies are related to the City's water supply capacity and are described in Chapter 8.

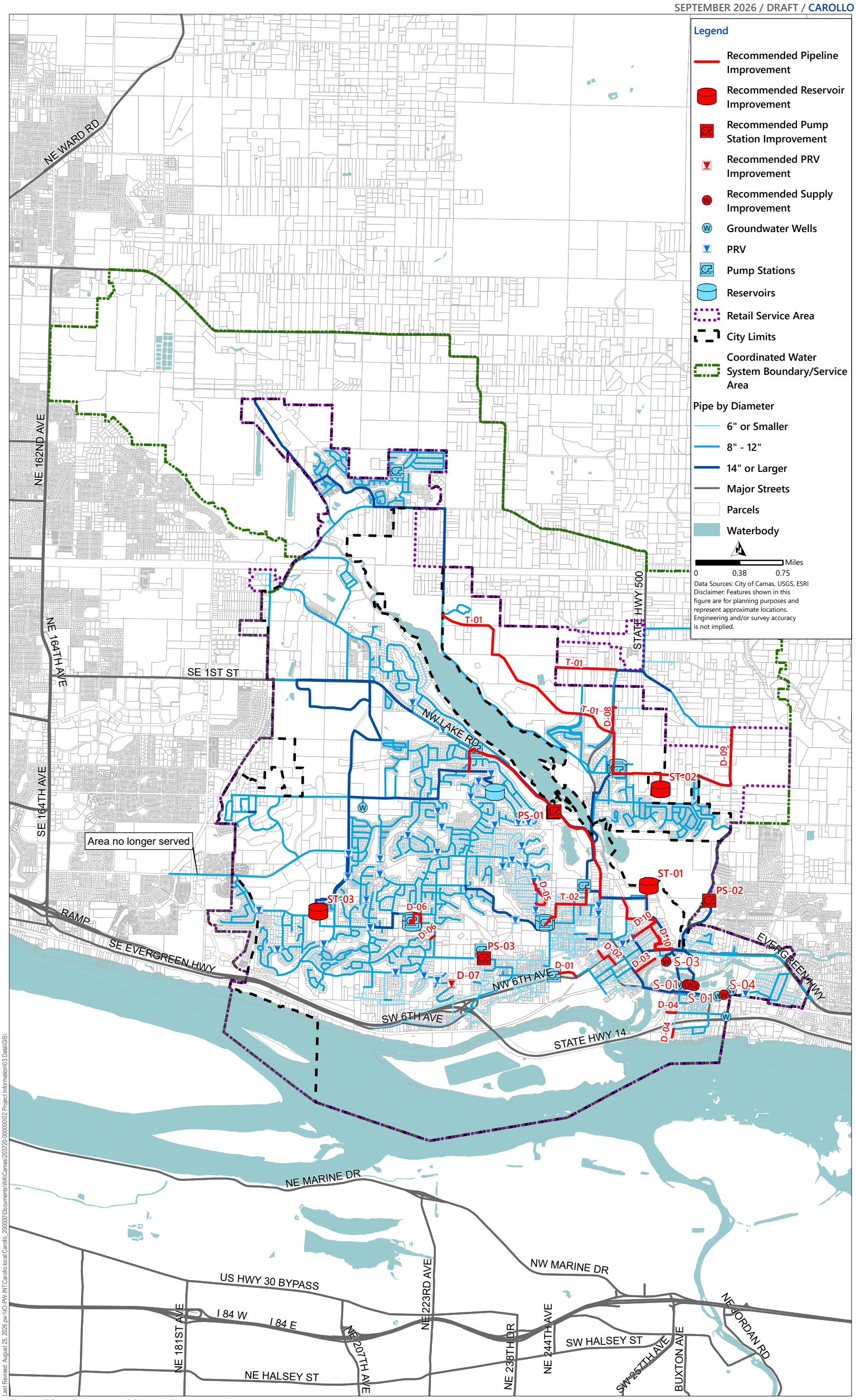

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Figure ES.5 Summary of System Recommendations

ES.9.3 Storage Analysis

The City's reservoir storage requirements depend on the water system's configuration, seasonal and daily variations in water-use patterns, and the reliability of various water system components. Water storage volumes are comprised of five components:

- Operational storage.
- Equalizing storage.
- Fire-suppression storage (FSS).
- Standby storage (SS).
- Dead storage.

DOH requires that operational and equalizing storage are available to all customers at a residual pressure of at least 30 pounds per square inch (psi) under PHD flow conditions. The City has an increased level of service goal to provide standby and fire suppression storage to all customers at a residual pressure of at least 30 psi under MDD, which is above the DOH requirement of 20 psi. Therefore, all reservoir volumes above the 30 psi hydraulic grade line are considered available storage. Dead storage is the volume in the reservoir that cannot be used to serve the highest customer in the storage area with a pressure of at least 30 psi. The City also combines fire and standby into a single band for planning (i.e., nesting) and only the larger of the two volumes is used for analysis.

To evaluate storage capacities, the City's distribution system was divided into five different storage areas containing 26 total pressure zones. A summary of existing storage and storage needs in the 5-, 10-, and 20-year planning periods is shown in Table ES.2. Storage deficits were identified in the 343, 542, and 544 storage areas. Additional storage will be needed in these storage areas to address the deficits. All recommended storage projects are summarized in Chapter 9.

Table ES.2 Storage Requirements by Planning Year

Storage Area	Total Available Storage at 30 psi (MG)	2031		2036		2046	
		Required Storage (MG)	Storage Surplus/Deficit (MG)	Required Storage (MG)	Storage Surplus/Deficit (MG)	Required Storage (MG)	Storage Surplus/Deficit (MG)
343	1.20	1.20	0	1.22	-0.02	1.24	-0.04
455	1.50	0.5	1.0	0.51	0.99	0.52	0.98
542	0.05	1.05	-1.0	1.11	-1.06	1.33	-1.28
544	3.46	2.87	0.59	3.25	0.21	4.09	-0.63
852	2.42	1.85	0.57	1.91	0.51	2.06	0.36

Notes:
MG - million gallons.

ES.10 Capital Improvement Plan

The City's CIP summarizes the recommended improvements over the 10- (short-term) and 20-year (long-term) planning period with the purpose of providing the City with a guideline for the planning and budgeting of their water system. The improvements developed in the CIP address the deficiencies identified as part of the supply and distribution analysis described above in Sections ES.8 and ES.9.

The CIP is projected to cost approximately $317 million over the course of the next 20 years. Tables ES.3, ES.4, and ES.5 summarize the CIP projects by project category, priority and allocation, respectively. Figures ES.6, ES.7, and ES.8 summarize the percent of each project identified by project category, priority, and allocation, respectively. Additionally, Figure ES.9 presents a breakdown of annual costs for the City's CIP for each year of the 20-year planning period. Specific project details are discussed further in Chapter 10. The cost allocation designation differentiates how CIP projects may be funded. In general, CIP projects needed to support future growth and development are funded by developers and connection fees while projects needed to support existing infrastructure deficiencies or repair and replacement are funded by existing rate payers.

The WSPU's CIP projects are categorized as follows:

- Distribution System Improvements (D).
- Transmission Pipeline (T).
- Annual Repair and Replacement Programs (R).
- Pump Station (PS).
- Storage (ST).
- Supply and Treatment (S).
- General (G).

The CIP cost estimates presented in this chapter are consistent with American Academy of Cost Engineers Class 5 estimates, which are considered planning level estimates. Actual costs may vary from -50 percent to +100 percent of the estimated cost. These costs were determined based on the City and Carollo's perception of current conditions at the project locations.

Table ES.3 CIP Summary Table by Cost Category

Project Category	Total Cost	Average Annual Cost	Percentage
Distribution System	$4,340,000	$220,000	1.4%
Annual Programs	$87,000,000	$4,350,000	27.4%
Transmission Pipeline	$23,200,000	$1,160,000	7.3%
Pump Station	$42,020,000	$2,100,000	13.3%
Storage	$63,800,000	$3,190,000	20.1%
General	$1,500,000	$80,000	0.5%
Supply and Treatment	$95,130,000	$4,760,000	30.0%
Total Cost	**$317,000,000**	**$15,860,000**	**100.0%**

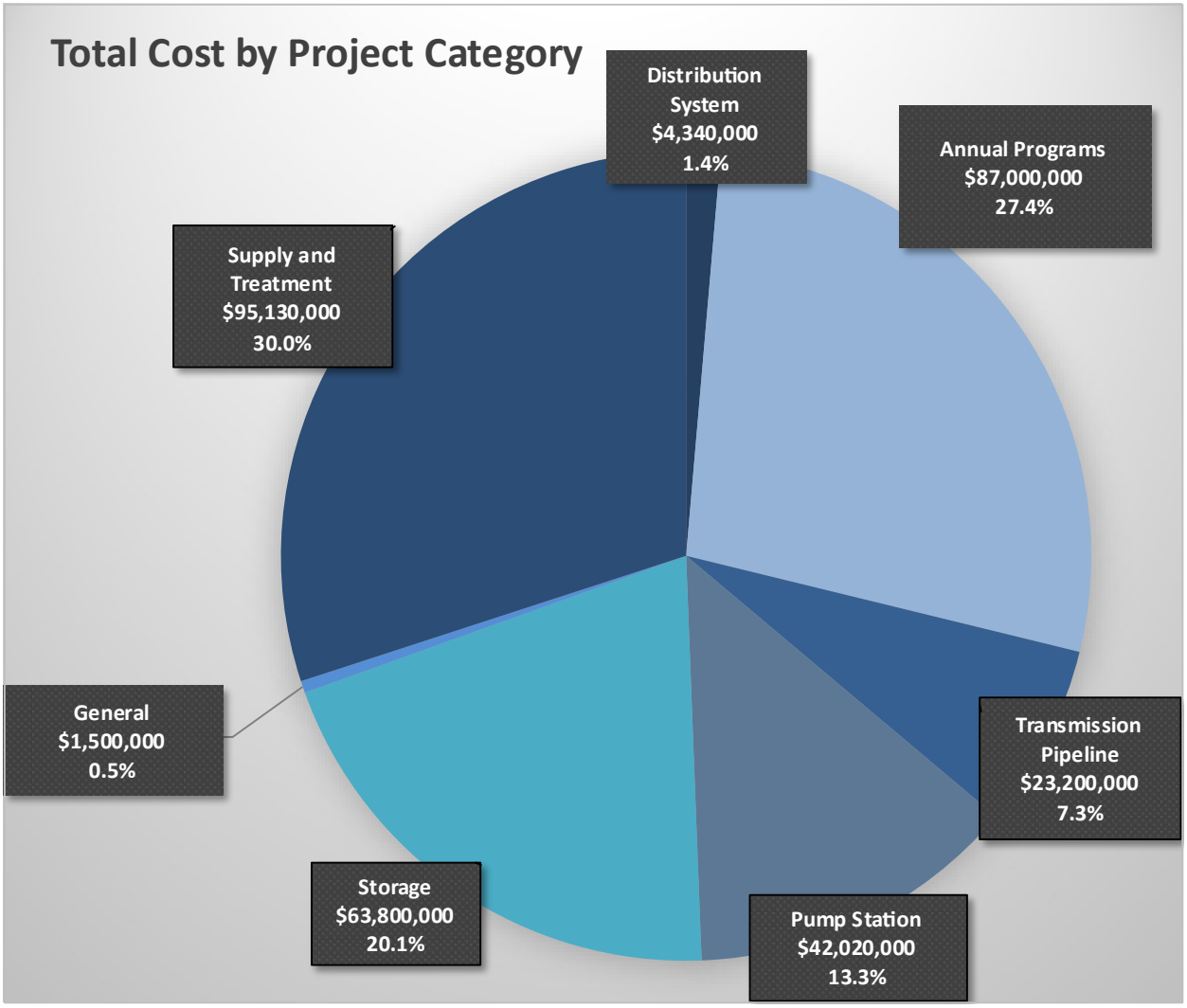


Figure ES.6 CIP Summary Table by Project Category

Table ES.4 CIP Summary Table by Project Priority

Project Priority	Total Cost	Percentage
0-10 years	$177,000,000	55.8%
10-20 years	$53,000,000	16.7%
Annual	$87,000,000	27.4%
Total Cost	**$317,000,000**	**100.0%**

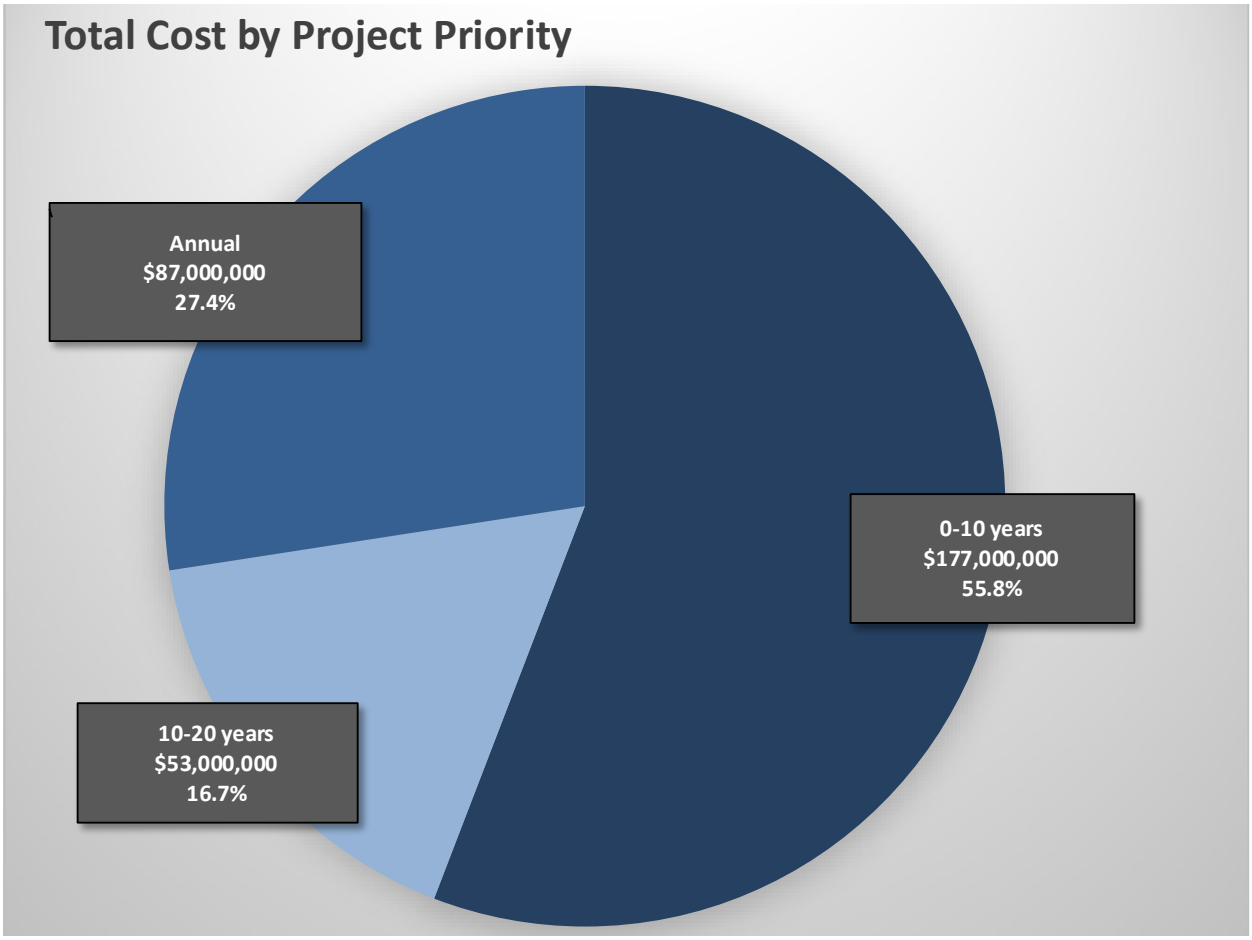


Figure ES.7 CIP Summary Table by Project Priority

Table ES.5 CIP Summary Table by Cost Allocation

Cost Allocation	Total Cost	Percentage
SDC	$148,900,000	47.0%
Rates	$168,100,000	53.0%
Total Cost	**$317,000,000**	**100.0%**

Notes:
SDC - system development charges.

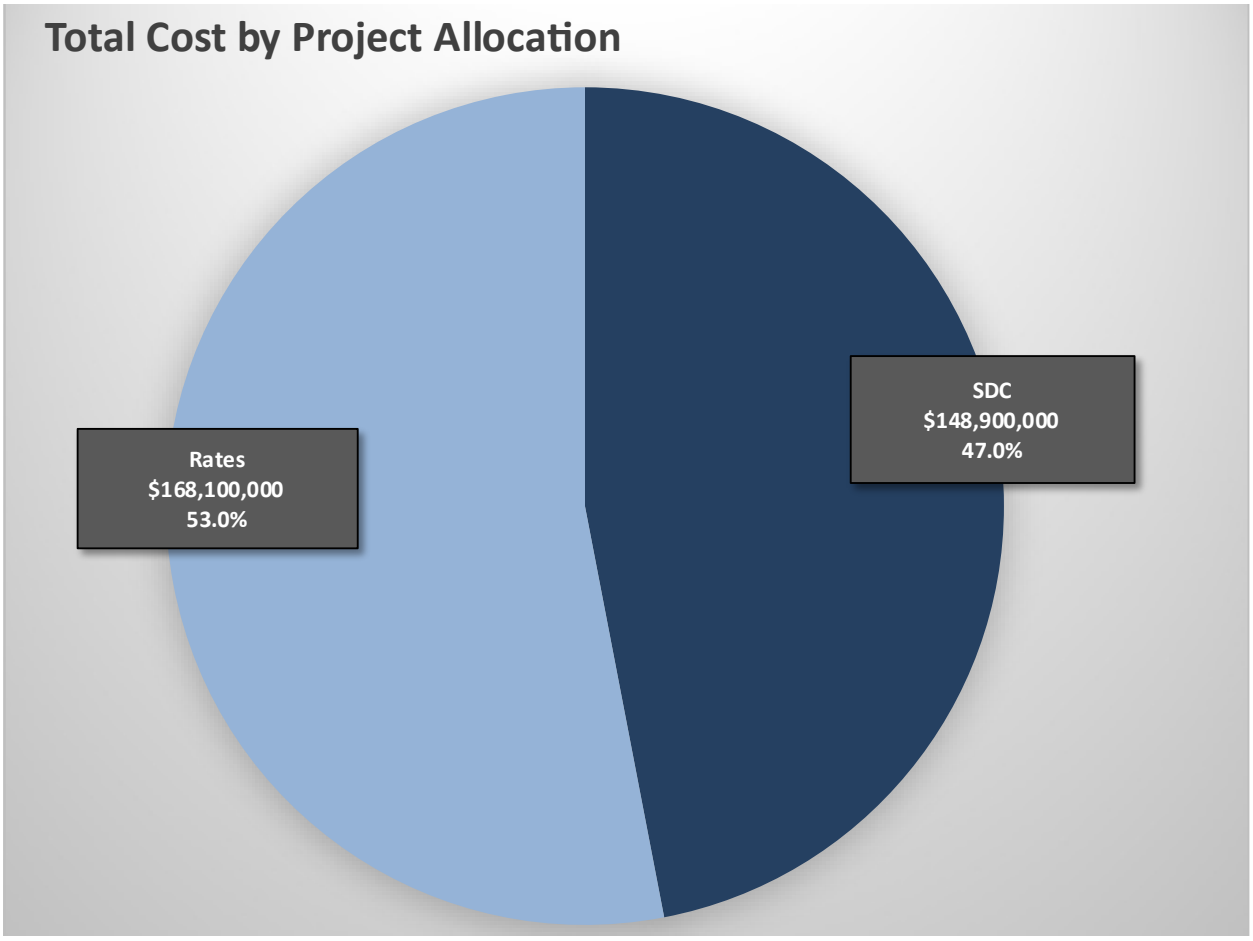


Figure ES.8 CIP Summary Table by Cost Allocation

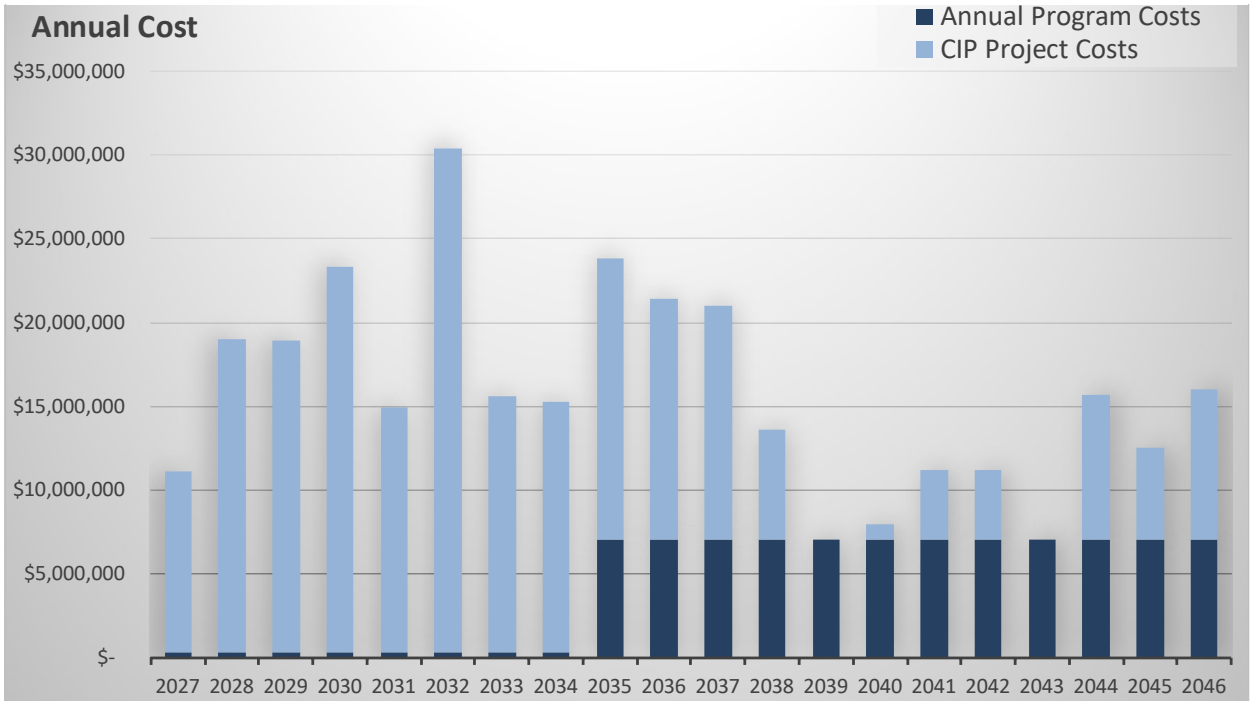


Figure ES.9 CIP Annual Cost

The major projects to be completed in the next several years of this WSPU include the following:

- Well 8, 11, and 12 expansion, and PFAS treatment of LWWF.
- 343 Zone storage improvements.
- 544 Pumping area improvements (with 343 zone transmission pipeline).
- 542 Zone storage improvements (and pipelines).
- North Shore transmission pipeline.

ES.11 Financial Plan

This chapter is still in progress and is not included in this draft of this WSPU.

CHAPTER 1 INTRODUCTION

1.1 Purpose

This Water System Plan Update (WSPU) updates the City of Camas' (City) 2019 WSPU. It was developed collaboratively by City staff, Carollo Engineers (Carollo), Strata Geosciences, and FCS Group. This WSPU documents the water system's current status and evaluates the City's future water needs. The data used for this WSPU was current as of 2024. The WSPU was developed between November 2024 and September 2026 for approval in 2026. This WSPU will be used as a guide for maintaining and improving the water system in the short-term over the next 10 years, while also providing a framework for the 20-year, long-term planning horizon.

The purpose of this WSPU is to document changes to the City's water system, identify required system improvements, and appropriately outline capital improvement projects to meet future water demands. Maintaining a current Water System Plan is required to meet the regulations of the Washington State Department of Health (DOH) and the requirements of the Washington State Growth Management Act. The WSPU complies with the requirements of DOH as set forth in the Washington Administrative Code (WAC) 246-290-100, Water System Plan.

This WSPU contains timeframes, which are the intended framework for future funding decisions and within which future actions and decisions are designed to occur. However, these timeframes are estimates and depending on factors involved in the processing of applications and project work, as well as the availability of funding, the timing may change. The framework presented in this WSPU does not represent actual commitments by the City.

1.2 Authorization

Recognizing the importance of planning, developing, and financing water system facilities to provide reliable service for the existing customers and to serve anticipated growth, the City initiated the preparation of this WSPU. In November 2024, the City selected the Carollo team to assist in the preparation of the WSPU in accordance with applicable rules and regulations governing planning for water utility systems.

1.3 Objectives

This WSPU has been prepared to serve as a guide for the planning and design of future water system facilities. Identified in this WSPU are system improvements intended to meet the needs for expected growth in the City. Specific objectives of this WSPU are addressed within individual chapters presented herein and include the following.

- Develop a document that can be updated periodically as additional information on the water system is obtained.
- Planning Considerations (Chapter 2): Establish the study area, policies and criteria, standards, and documents relating to water service within the City's water system.

- Existing System (Chapter 3): Document the existing water system supply, storage, and distribution facilities.
- Operations and Maintenance (Chapter 4): Provide a comprehensive review of operations and maintenance of the City's water system facilities.
- Water Requirements (Chapter 5): Identify and estimate the effect of future land uses and population trends on the water system. Document historical water use and project future demands based on growth projections.
- Water Use Efficiency (Chapter 6): Determine the City's current and proposed actions to comply with conservation planning requirements and to promote using water efficiently.
- Water Quality (Chapter 7): Summarize water quality regulations, monitoring, and reporting requirements. Evaluate the City's historical water quality against regulatory requirements, summarize violations, and recommend improvements, if necessary to meet anticipated or future water quality regulations.
- Water Resources (Chapter 8): Conduct a water supply evaluation that describes the City's available sources of supply and existing water rights. Develop a water supply strategy with recommendations to develop the supply capacity needed to satisfy the City's future water system demands. Update the wellhead protection plan for the City's groundwater supply sources.
- Distribution System Analysis (Chapter 9): Evaluate the capacity of the distribution system using the City's updated and calibrated hydraulic model. Conduct a desktop analysis to evaluate the capacity of storage reservoirs and booster pump stations against DOH criteria. Summarize existing and potential future system deficiencies in the City's distribution system and offer recommended improvements to the system.
- Capital Improvement Plan (Chapter 10): Develop a program of capital improvements, including priorities for design and construction.
- Financial Analysis (Chapter 11): Develop a plan for financial backing of required system improvements.
- Prepare the WSPU in accordance with the DOH Water System Plan Checklist in Section 1.8 to comply with all requirements of DOH and WAC.

Additionally, the DOH Project Approval Application (PAA) Form for this WSPU is included in Appendix F.

1.4 Location

The City is located in Clark County, WA and is considered part of the greater Portland, OR metropolitan area. The City is bordered to the south by the Columbia River, the west by the City of Vancouver, WA water system, the City of Washougal, WA water system to the east, and unincorporated Clark County to the north.

1.5 Ownership and Management

The City owns and manages its water system for municipal water supply purposes, including a broad range of water uses, including residential, commercial, industrial, irrigation, and government. The DOH water system identification number for the City's system is 108002.

The City is governed by a mayor and seven council members, all of which are elected officials and manages its water system through its Public Works Department. The Public Works Director is hired by the mayor and city administrator and oversees the entire Public Works Department, which is divided into two branches: Engineering and Operations. Daily maintenance and operational responsibilities fall under the Water Division of the Operations branch within the Public Works Department.

Contact information for the City's Public Works Department is provided below:

- Public Works Address: 616 NE 4th Avenue, Camas, WA 98607.
- Operations Center Address: 1620 SE 8th Avenue, Camas, WA 96807.
- Email: publicworks@cityofcamas.us.
- Phone: (360) 817-1563.

1.6 Environmental Assessment

The State Environmental Policy Act (SEPA), chapter 43.21C Revised Codes of Washington (RCW), requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. A SEPA Checklist and determination of non-significance (DNS) have been prepared for this WSPU in Appendix B and C. The City anticipates the WSPU does not have probable significant adverse impacts on the environment in accordance with the DNS under WAC 197-11-340(2). Many of the projects proposed within the WSPU will require subsequent project specific environmental review and SEPA checklists as part of their design process.

1.7 Approval Process

This WSPU is required to meet state, county, and local requirements. The City will submit the WSPU to DOH, Clark County, and adjacent utilities as part of the Agency Review process. See Appendix D for Agency comment letters, responses, and approvals. As required by WAC 246-290-108, a local government consistency review checklist has been prepared and is included in Appendix E. The Adopting Resolution will be included in Appendix A, upon City Council approval of the WSPU.

1.8 DOH Water System Plan Checklist

To assist in review of the WSPU, the DOH Water System Plan checklist from the pre-plan agreement meeting in May 2025 is provided in Table 1.1 with references to the required information. A copy of the checklist will be provided in Appendix G.

Table 1.1 DOH Water System Plan Checklist

Required	Content Description	WSPU Location
(✓)	Project Approval Application (PAA, DOH Pub 331-149 F)	Appendix F
(✓)	Signed and dated stamp from a Professional Engineer licensed in the State of Washington	
Description of Water System		
(✓)	Ownership and management, including Satellite Management Agency (SMA), if applicable	1.5, 2.2.2
(✓)	System history and background	2.2.1
(✓)	Related Plans	2.6
(✓)	Service area and land uses: ▪ Service area map including retail service area, service area, future service area, water rights place of use. ▪ DOH Pub. 331-432 – Service Area Guidance ▪ Existing zoning map(s) for all jurisdictions within future service area ▪ Future land use map(s) for all jurisdictions within future service area (Coordinated Water System Plan [CWSP] Counties Only)	2.2.3
(✓)	Service area and other applicable policies	2.7
(✓)	Duty to serve statement for the retail service area ▪ How does the system define “timely and reasonable”? ▪ Are there appeals processes for when a customer disagrees with a timely and reasonable determination?	Table 2.3
(✓)	Consistency with the watershed plan for Salmon/Washougal Water Resource Inventory Areas (WRIA) No. 28	2.6.8
Basic Planning Data		
(✓)	Existing population, service connections, and equivalent residential units (ERU) ▪ ERUs must be based on full-time residential connections only	Chapter 5
(✓)	Existing production/usage: monthly/annual per source, annual usage by customer class, distribution system leakage (DSL) ▪ Authorized Use and DSL, rather than “unaccounted-for water”. ▪ Additional information is available in our WUE Guidebook, Chapter 6, beginning on page 28 (PDF page 33)	5.1
(✓)	Season variations in use by customer class (1000+ connections)	5.2
(✓)	Water supply characteristics	3.3
(✓)	Water supply reliability evaluation: Include depth-to-water measurements	3.3
(✓)	Interties: agreements, existing/proposed, emergency, metering	3.9
(✓)	Plan approval period and 20-year projections for: Population, service connections, and ERUs (recommend 13- and 23-year)	5.5, 5.6
(✓)	Projections and land use discussion	5.4
(✓)	Future water demand without water use efficiency savings	5.6
(✓)	Water rights self-assessment: Consult with the Department of Ecology (Ecology) prior to plan submittal ▪ Describe water rights and complete water rights self-assessment form for existing, plan approval period, and 20 years.	**Need to complete**
System Analysis		
(✓)	Provide assumptions and basis of analysis:	
(✓)	System design standards	9.2.2
(✓)	Policies on operations and expected level of service (such as standby storage, pumping restrictions and emergency back-up power)	9.3, 9.4
(✓)	Fire flow requirements and if nesting is allowed. May need confirmation from local fire authority.	9.2.2.2, 9.4.1.3, Figure 9.2,
(✓)	Asset Management Inventory: text description and facilities map of major assets, asset management table or spreadsheet	Chapter 3
(✓)	Asset condition assessment and criticality ratings (recommended) – RCAC Template (optional format)	Chapter 3
(✓)	Water quality analysis	Chapter 7
(✓)	Capacity analysis (Must include WSDM Worksheet 4-1, ERU Capacity Summary)	9.5
(✓)	Hydraulic analysis	9.2
(✓)	Summary of system deficiencies	9.6
Water Use Efficiency (WUE)		
(✓)	Metering Program: sources, services, and non-emergency interties	6.1.1.1
(✓)	Distribution System Leakage (DSL) ▪ Summarize DSL and compare to WUE annual reports; discuss DSL calculation methodology, leak detection plan	6.1.2
(✓)	Water Loss Control Action Plan (WLCAP) ▪ If DSL exceeds 10 percent (3-year average), submit the WLCAP per WAC 246-290-820(4) ▪ Include implementation schedule and budget items, as applicable	Appendix O
Water Use Efficiency (WUE) Program		
(✓)	▪ Describe the current WUE program	6.1
(✓)	Updated WUE goal(s). Document public adoption process (include public notice, signed minutes, signed resolution). ▪ Consider doing this after DOH review of first draft	At a later date
(✓)	Describe measure(s) that will be implemented to achieve the goal(s). Include schedule and costs in the budget – 10,000 to 49,999 connections requires 9 additional measures	6.2
(✓)	Describe the process used to evaluate WUE measure(s) you did not implement	6.2
(✓)	Describe or provide an example of yearly consumer education (cannot count as a measure)	6.2
(✓)	Estimate projected water savings from selected WUE measure(s)	6.2.4
(✓)	Describe process that will be used to determine effectiveness of the WUE program	6.2.5
(✓)	Additional WUE for systems with 1000+ Connections ▪ Estimate water saved from implemented WUE measure(s) during the previous plan approval period ▪ Water demand forecast (if all cost-effective WUE measure(s) are implemented) ▪ For WUE measure(s) evaluated but not implemented: » Quantitative evaluation of WUE measure(s) cost-effectiveness, including marginal costs of water production » Evaluate WUE measure(s) for cost-effectiveness if shared with other systems » Quantitative/qualitative evaluation of measure(s) to determine cost-effectiveness from societal perspective ▪ Explore reclaimed water opportunities	Appendix P

Required	Content Description	WSPU Location
Source Water Protection		
(✓)	Sanitary Control Area (SCA): description of physical and legal protections for each groundwater source, including deeds, covenants, easements, restrictions, fencing, signage, etc.	8.4
(✓)	Wellhead protection program/update: must include updated Time-of-Travel map, contaminant source inventory, and notifications ▪ WAC 246-290-135: Source Water Protection ▪ 331-106 Wellhead Protection Requirements	8.4
(✓)*	Watershed control program for all surface water/GWI sources ▪ Include watershed and other information relative to the City's two emergency surface water sources (Boulder and Jones Creek)*	8.4
Operation and Maintenance (O&M) Program		
(✓)	Water system management and personnel, including operator certification and Cross-Connection Control Specialist (CCS)	4.1, 4.2
(✓)	Operations and preventative maintenance schedule	4.5
(✓)	Comprehensive water quality monitoring: ▪ Water Quality Monitoring Schedule (WQMS) ▪ Provide Lead and Copper Rule (LCR) and disinfection byproduct (DBP) monitoring schedule(s), map(s), and letters ▪ Coliform monitoring plan, including addresses and map. Update for Revised Total Coliform Rule (RTCR)	Chapter 7
(✓)	Emergency response program, including Water Shortage Response Plan per WAC 246-290-420 ▪ Consider Tier 1 Public Notification process, and multiple channels for notification	4.8
(✓)	Cross-connection control (CCC) program ▪ Systems with 1000+ connections: provide a copy of your CCC annual summary report form	4.9
(✓)	Sanitary survey findings	4.7
(✓)	Recordkeeping, reporting, and customer complaint program	4.4
(✓)	Water treatment (surface, disinfection, contaminant) operations	4.6
(✓)	Summary of O&M deficiencies; include cost in budget	4.11
Distribution Facilities Design and Construction Standards		
(✓)	Project review procedures	Appendix X
(✓)	Policies and requirements for outside parties	Appendix X
(✓)	Design and construction standards for distribution-related projects	Appendix X
(✓)	Construction certification	Appendix X
Capital Improvement Program (CIP)		
(✓)	CIP summary and schedule for the plan approval period (discuss prioritization, project assessment and value planning) ▪ Include any items that were identified as required for addressing capacity-related deficits	Chapter 10
(✓)	20-year (minimum) CIP for projects beyond the plan approval period	Chapter 10
Financial Program		
(✓)	Financial viability (discuss full cost of service, cost recovery, reserves)	Chapter 11
(✓)	Summary of past income and expenses, sufficient to establish trends (previous plan approval period or minimum 3 years)	Chapter 11
(✓)	Balanced operational and capital budget projections for plan approval period	Chapter 11
(✓)	Show operational, capital, and emergency reserve goals. Describe the revenue requirements to achieve them. Demonstrate annual progress toward goals.	Chapter 11
(✓)	Debt-financed capital improvements	Chapter 11
(✓)	Water rate evaluation: ▪ Describe current rate structure: Block rate based on meter size and rate class. (Not inclining block rate.) ▪ Evaluate the feasibility of implementing a rate structure that encourages water demand efficiency. ▪ Evaluate rate affordability and customer assistance programs. Provide rate that would be unaffordable, income below which current and future rates are unaffordable, and programs available for low income customers.	Chapter 11
Miscellaneous Documents		
(✓)	Updated Water Facilities Inventory (WFI) with authorized signature	Appendix R
(✓)	Local Government Consistency Determination Forms: City and County planning departments.	At a later date
(✓)	Informational meeting for the consumers (include public notice and signed minutes)	At a later date
(✓)	Adjacent utilities notice, review, and comment of draft Water System Plan. Attach notice and comments received.	At a later date
(✓)	SEPA: Signed Environmental Checklist and Threshold Determination. The water system is lead agency.	At a later date
(✓)	Agreements: SMA, intertie, service area, franchise, wheeling, mutual aid, inter-local and other agreements	Appendix H
(✓)	Correspondence	
(✓)	Supporting documents	
Miscellaneous Documents - Post DOH Review		
(✓)	Plan approval by water system governing body. Include signed meeting minutes or signed resolution. NOTE: DO NOT approve the plan until after the draft review is completed and you have received authorization to proceed with approval from the Regional Planner.	At a later date

CHAPTER 2 PLANNING CONSIDERATIONS

2.1 Introduction

The objective of this chapter is to document the City water system planning considerations that influence the WSPU including background on the study area, policies, criteria, and related documents.

2.2 Study Area

The study area for this WSPU encompasses the municipal boundaries of the City covering all residential, commercial, and industrial zones. It also extends to adjacent regions within the retail water service boundary, which are anticipated to be incorporated due to comprehensive land use changes over the next 20 years as shown on Figure 2.1.

2.2.1 Water System History

The first known settler, David Parker, came to the City in 1845. In 1883 the Lacamas Colony Company of Portland purchased 2,600 acres encompassing Lacamas, Round, and Dead Lakes (renamed as Fallen Leaf Lake), the stream connecting them to the Columbia River, and constructed dams for hydropower for new flour and paper mills, a sawmill, and a furniture factory in the area. The City was incorporated in 1906. In 1913, the City's first water system was storing Jones Creek supply in Butler Reservoir. The system has continued to expand and adapt to new challenges and regulations, as described in Table 2.1. This WSPU provides a roadmap to continue to provide high-quality water into the future.

Table 2.1 Water System Historical Timeline

Water System Historical Timeline	
1845	Camas first settled
1913	Jones Creek Intake constructed
1913	0.6 MG Butler Reservoir, South Half
1923	0.6 MG Butler Reservoir, North Half (1.2 MG total)
1931	Boulder Creek Intake constructed
1935	0.5 MG Lower Prune Hill Reservoir
1936	Wells 1 and 2 constructed
1945	Well 3 constructed
1948	Butler BPS - 800 gpm
1949	Forest Home BPS- 450 gpm
1952	Chlorination Plant - injects chlorine into water from Jones Creek and Boulder Creek before it goes to the Filter Plant
1959	Well 4 constructed
1965	Filter Plant - 1,200 gpm - filters water from Jones Creek and Boulder Creek intakes
1965	10th Street BPS

Water System Historical Timeline	
1968	Well 5 constructed
1969	Well 6 constructed
1971	Well 7 constructed
1971	1.5 MG Lower Prune Hill Reservoir
1971	0.75 MG Upper Prune Hill Reservoir
1971	Lower Prune Hill BPS - 500 gpm, 500 gpm, 750 gpm
1977	Well 8 constructed 1,350 gpm
1978	0.1 MG Gregg Reservoir
1978	Old Gregg BPS - 500 gpm
1988	SCADA System installed
1993	2.0 MG La Camas Reservoir
1993	La Camas BPS - 500 gpm, 500 gpm, 1,500 gpm
1998	Forest Home BPS Upgrade - 1,000 gpm
1999	Butler BPS Upgrade
2000	Well No. 9 constructed - 650 gpm
2001	Angelo BPS constructed - 3,000 gpm capacity
2001	Lower Prune Hill BPS Upgrade - 1,000 gpm replacement pump
2002	Upper Prune Hill Reservoir (2.4 MG) and BPS (2,900 gpm capacity) construction
2002	New Gregg Zone BPS Constructed, 1,500 gpm
2002	Lower Prune Hill Upgrade, 2,000 gpm
2002	Jones and Boulder Creek intake metering
2002	Chlorine and CT improvements
2002	Well 1 and 2 abandoned
2003	Well 3 decommissioned
2003	Well 11 (1,200 gpm) and Well 12 (900 gpm) constructed, Washougal Wellfield Chemical Feed Facility installed
2003	New Gregg BPS - 1,500 gpm
2004	Well 10 constructed - 900 gpm
2007	Well 4 decommissioned
2008	Well 13 constructed, 1,325 gpm
2008	Washougal River 24-inch pipe crossing installed
2008	Ostenson Canyon Pipeline installed
2008	City and Ecology sign agreement regarding use of service water sources and increased water rights associated with groundwater
2009	Well 14 constructed - 1,000 gpm
2009	Sodium hypochlorite disinfection system installed at Well 5 and 9
2011	Crown Road BPS installed - 1,600 gpm
2015	Slow Sand Filtration Plant constructed

Water System Historical Timeline	
2021	2.0 MG 18th Avenue Reservoir constructed
2026	Lower Prune Hill Reservoir and BPS replaced and upgraded

Notes:
BPS - Booster Pump Station; CT - contact time; gpm - gallons per minute; MG - million gallons; SCADA - supervisory control and data acquisition.

2.2.2 Ownership and Management

The City's water system is owned and operated by the City. The City is governed by a mayor and seven council members, all of which are elected officials. The Public Works Director is hired by the mayor and city administrator, and oversees the entire Public Works Department, which is divided into two branches: Engineering and Operations. Water system responsibilities fall under the Water Division of the Operations branch within Public Works.

The City has both surface water and groundwater sources. The surface water sources, Boulder and Jones Creeks, are located on the south side of Larch Mountain, northeast of Camas. The ground water sources include nine wells near the Washougal River, and one well in Grass Valley. The City treats all of its water with chlorine for disinfection and fluoride. Water pressure and fire flows are maintained throughout the service area with seven distribution reservoirs, 10 BPS, and over 159 miles of piping to serve their approximately 29,000 and growing customers.

2.2.3 Service Area

In accordance with the Municipal Water Law, the City is required to designate a retail service area within that it has a duty to serve all customers meeting the City's stated conditions of service - the City's service policies are summarized in Table 2.3 - and also designate a service area. The City's retail water service area and service area are shown in Figure 2.1. The City is temporarily serving the area northwest outside of the service area boundary under an agreement with the City of Vancouver (Vancouver), until Vancouver installs its own pipeline. Additional details of this interlocal agreement are provided in Appendix **[X]**. The retail water service area is largely defined by the City's urban growth boundary. The City's service area, defined by the Clark County CWSP, expands the retail service area to the urban growth boundary. The Regional planning does not anticipate the entire service area to develop during the planning period (next 20-years); however, the City reserves the first right of refusal for providing water service to developments in its service area.

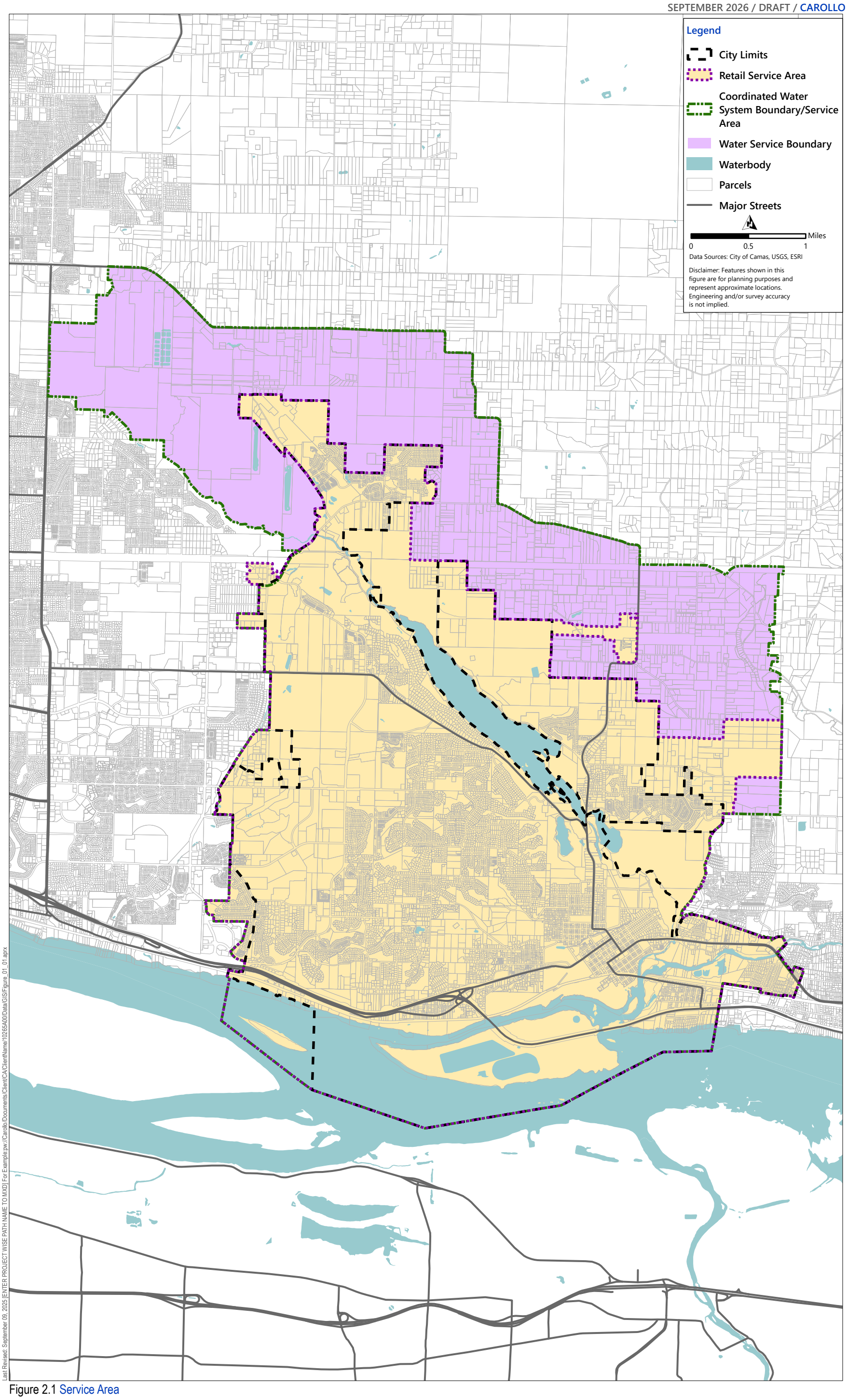


Figure 2.1 Service Area
CITY OF CAMAS
WATER SYSTEM PLAN UPDATE

2.2.4 Regional Environment

2.2.4.1 Climate

The climate in the City and the surrounding greater Clark County area is influenced by the Coast Mountain Range to the west and the Cascade Mountain Range to the east. The Coast Mountain Range provides some limited protection from the direct influence of the Pacific Ocean. Moist heavy air from the Pacific is cooled as it rises over the Coast Mountain Range and releases moisture as rainfall. The air is further cooled as it approaches the Cascade Mountain Range, resulting in moderate rainfall for lower lying area, and heavier precipitation along the west slopes of the Cascades. This results in a large variation of rainfall across the county. The Cascade Mountains also provide a barrier against continental air masses originating over the Columbia Basin to the east.

According to the Weather Atlas, Clark County has wet, mild winters and warm, dry summers. The City of Camas receives an average of about 37 inches of precipitation annually, while the northeastern portion of the county can receive averages approximately 150 inches per year, based on the data from the Washington Department of Transportation (WSDOT). Approximately 80 to 85 percent of the precipitation occurs between the months of October and May, and the City receives 173 days of sunshine per year.

Based on data from National Oceanic and Atmospheric Administration (NOAA), the average January temperature across Clark County between 2000 and 2025 was 40.2 degrees Fahrenheit, increasing to a 78-degree high in July. Winter storms come generally from the southwest, with infrequent snowstorms originating from the Gulf of Alaska. Fall and winter storms can be accompanied by high winds, resulting in power outages.

2.2.4.2 Topography

Clark County is located in the Willamette-Puget Trough, a geographic basin formed by the Cascade and Coast Mountain Ranges. The county is bounded on the south and west by the Columbia River, on the north by the Lewis River, and on the east by the foothills of the Cascades. The City itself resides in the Southeast side of the county, with Vancouver to the west and Washougal to the east.

The ground slope and natural drainage features within the City play a significant role in the planning and design of the water distribution storage facilities. The elevation within the City ranges from about 20 feet above sea level along the shores of the Columbia and Washougal Rivers, to approximately 752 feet (NGVD 29) at the Upper Prune Hill Standpipe located at the top of Prune Hill. The terrain in the City includes a flat plateau in the Downtown area and generally increasing elevations to the North, except where Lacamas Lake forms a valley through the City as shown in Figure 2.2.

2.2.4.3 Surface Water

The surface water features within the City urban growth area (UGA) boundary include the Columbia River, Washougal River, Little Washougal River, Lacamas Creek, Lacamas Lake, Fallen Leaf Lake, and Round Lake. The City also owns the majority of the watershed for the Jones and Boulder Creeks north of the City's intakes for these sources. Jones and Boulder Creek are tributaries of the Little Washougal River, which is a tributary of the Washougal River. The basin characteristics for the creeks, streams, and rivers discussed below were obtained from stream gauging published by the U.S. Geological Survey.

The Columbia River begins in Canada, enters the United States in northeastern Washington, continues traveling southwest through eastern Washington, where it travels over a series of dams until it empties into the Pacific Ocean. The Columbia River forms the border between the states of Washington and Oregon from the point where it crosses the 46th Parallel until it empties into the Pacific Ocean. The Columbia River drainage area is approximately 241,000 square miles, with an average flow of 603,000 cubic feet per second (cfs).

The Washougal River flows southwest from the Cascade Mountains to the City, where it empties into the Columbia River. The Washougal River drainage basin is approximately 108 square miles in size and historical records report average flows at approximately 9,000 cfs.

The Little Washougal River, of which Jones and Boulder Creeks are tributaries, flows to the southwest out of the Cascade Mountains. The Little Washougal turns to the southeast before it crosses into the City UGA and empties into the greater Washougal River. The Little Washougal drainage basin covers approximately 23 square miles with historical average daily peak flows of approximately 1,317 cfs.

Lacamas Lake is over 60 feet deep in places. It receives flow from Lacamas Creek and Dwyer Creek. The Lake then discharges into Lacamas Creek, which flows into the Washougal River. The water level is controlled by dam located at the south end of the lake. Round Lake is a reservoir and is a smaller part of Lacamas Lake, separated from Lacamas Lake by Everett Street.

2.2.4.4 Critical Areas

Critical areas within the City include those classified as Critical Aquifer Recharge Areas, Fish and Wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas and wetlands. Given its importance to the water system, the City's Critical Aquifer Recharge area map is included as Figure 2.3. Please refer to the City's website for the up-to-date description and mapping of its Critical Areas.

2.2.4.5 Geology

The Clark County area exhibits traces of its geologic history, including repeated inundation by fluctuating sea levels during glacial epochs, the sedimentary processes of repeated flooding of the Columbia River, volcanic activity, periodic earthquakes, and other tectonic activity. The geologic units in Clark County reflect this varied history and can be placed into two general categories: older consolidated rocks and volcanic rocks. These include Columbia River Basalts and Skamania and Goble volcanic series, and sedimentary rocks incorporating unconsolidated gravels, silts, sands, and clays created by glacial and alluvial processes.

The main geological feature of Camas is Prune Hill, which is an extinct volcanic vent that much of the residential area resides on. Prune Hill is at the Northwest end of Camas, and the City elevation drops off to the west and the Columbia River Gorge to the south. Lady Island, in the Columbia River Gorge, is separated from the mainland by the Camas Slough, and is mostly used for industrial purposes.

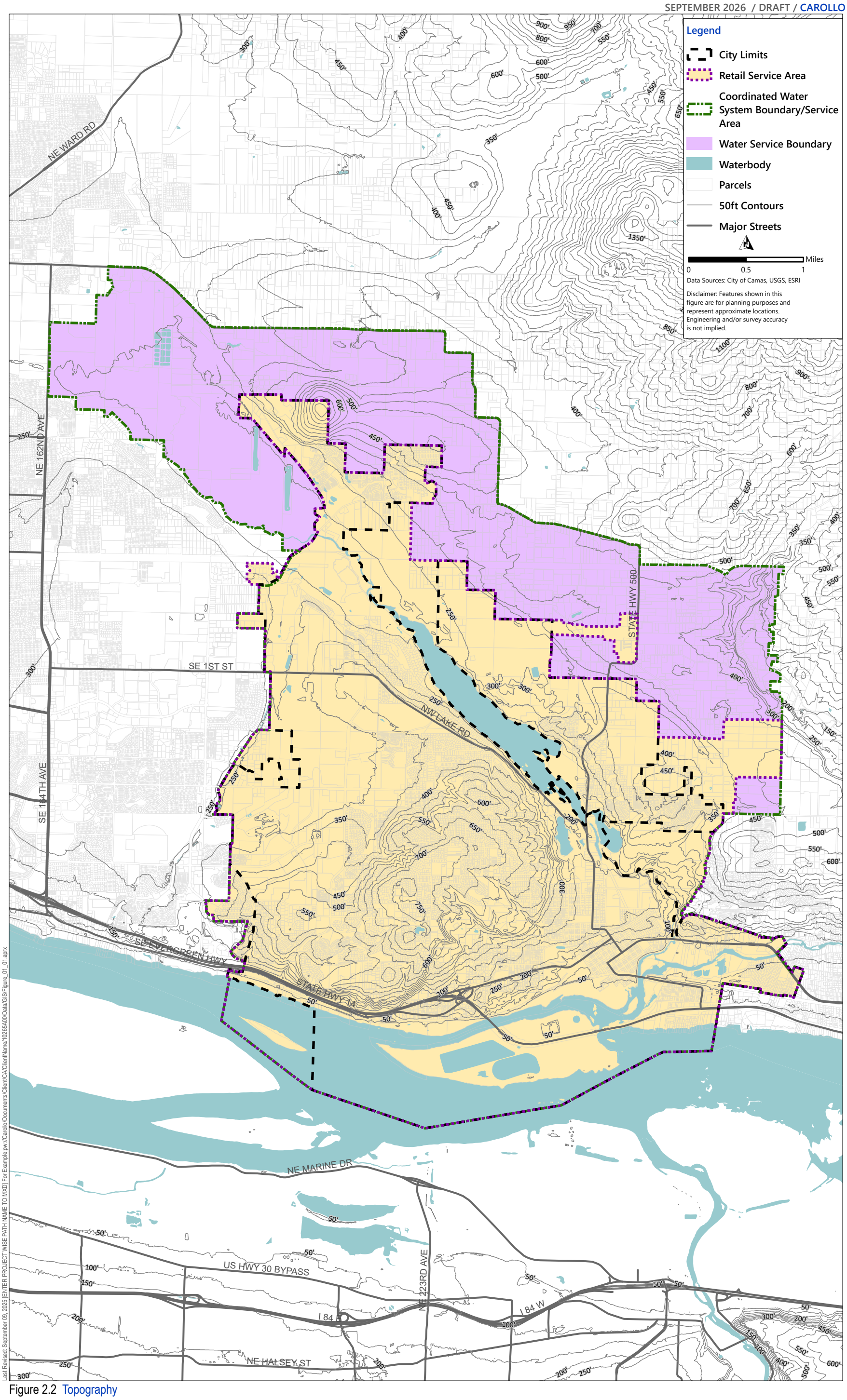
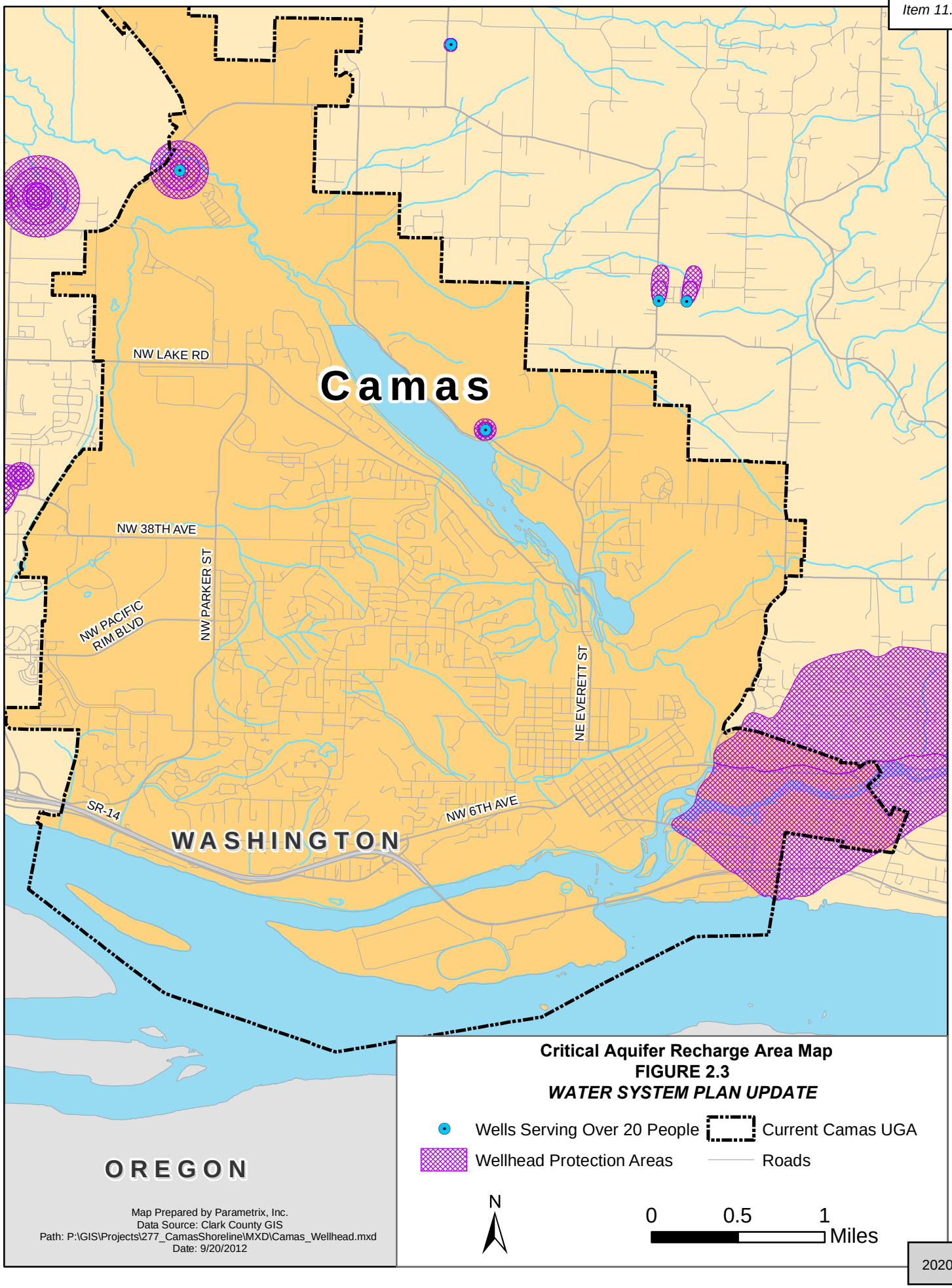


Figure 2.2 Topography


Camas
NW LAKE RD
NW 38TH AVE
NW PARKER ST
NW PACIFIC RIM BLVD
NE EVERETT ST
NW 6TH AVE
SR-14
WASHINGTON
OREGON
Critical Aquifer Recharge Area Map
FIGURE 2.3
WATER SYSTEM PLAN UPDATE
Wells Serving Over 20 People
Current Camas UGA
Wellhead Protection Areas
Roads
N
0
0.5
1
Miles
Map Prepared by Parametrix, Inc.
Data Source: Clark County GIS
Path: P:\GIS\Projects\277_CamasShoreline\MXD\Camas_Wellhead.mxd
Date: 9/20/2012
2020

2.3 Legislation, Regulations, and Permits

Water system planning is based on a careful analysis of a water utility's responsibility to comply with applicable regulatory requirements while providing service to existing and future customers. These regulatory requirements are the result of a number of state and federal laws. These laws are monitored and enforced by a number of federal, state, and local agencies.

In this section, the various state and federal legislation that may affect City operations are discussed, as well as other relevant permits, programs, and regulations.

2.3.1 Federal Clean Water Act

The Federal Water Pollution Control Act is the principal law regulating the water quality of the nation's waterways. Although originally enacted in 1948, it was significantly revised in 1972 and 1977, when it was given the common title of the "Clean Water Act." (CWA) The CWA has been amended several times since 1977. The 1987 amendments replaced the Construction Grants program with the State Revolving Fund (SRF) which provides low-cost financing for a range of water quality infrastructure projects.

A CWA Section 401 Water Quality Certification is required for any activity that may result in discharge to surface waters including excavation activities that occur in streams, wetlands, or other Waters of the United States. In Washington State, CWA Section 401 responsibility has been assumed by Ecology, and is required for projects with CWA Section 404 Permits.

Section 404 of the CWA regulates discharges of fill or dredged materials in wetlands, including any related draining, flooding, and excavation. Pipeline and pump station projects in wetlands will require a Section 404 Permits, in addition to any related local permits. CWA Section 404 Permits require Endangered Species Act (ESA), Section 7 consultation with the United States Fish and Wildlife Services (USFWS) and the National Marine Fisheries Service (NMFS) as a result of recent listings of salmonids. Biological Assessments, Biological Opinions, and their review have significantly lengthened the time required for issuance of CWA Section 404 Permits.

The Navigable Water Protection Rule (NWPR), implemented by the United States Environmental Protection Agency (USEPA) and the United States Department of the Army (Army) recognizes and outlines four clear categories of waters that are considered “waters of the United States”. These four categories protect the nation’s navigable waters and the core perennial and intermittent tributary systems that flow into those waters. These categories are territorial seas and traditional navigable waters (TNW), tributaries, lakes, ponds, and impoundments or jurisdictional waters, and adjacent wetlands.

2.3.2 Safe Drinking Water Act

The Federal 2.3.2Safe Drinking Water Act (SDWA) was passed in 1974 and amended in 1986 and 1996. The DOH adopted the federal standards under WAC 246-290, which became effective April 27, 2003. All public water systems as defined by the USEPA are affected by the SDWA. A public water system is defined as one that serves piped water to at least 25 people, or 15 connections for at least 60 days per year. The SDWA contains regulations regarding water quality, sampling, treatment, and public notification requirements that are applicable to the City. Water quality regulations are discussed further in Chapter 7.

The American Water Infrastructure Act (AWIA) was signed into law on October 23, 2018, and amended sections of the SDWA. Under Section 2013 of the AWIA, water systems serving more than 3,300 people are

required to develop or update risk and resilience assessments (RRA) and emergency response plans (ERP). An RRA looks at risks to a system and a system's resilience to those risks. An ERP covers strategies to improve system resilience as well as plans, actions, and procedures to be implemented to mitigate or lessen the impact of an emergency event. Submission cycles for RRAs and ERPs are every five years, and the deadlines are based on the size of the population served by the water system. The next five-year RRA submission cycle deadline for the City is June 30, 2026, and the ERP update deadline is December 31, 2026. It is important to note that ERP certifications are due six months from the date of the RRA certification.

2.3.3 Endangered Species Act

The purpose of the 1972 ESA is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved…" In pursuit of this goal, the ESA authorizes USFWS and NMFS to list species as endangered or threatened, and to identify and protect the critical habitat of listed species. USFWS has jurisdiction over terrestrial and freshwater plants and animals such as bull trout and cutthroat trout, while NMFS is responsible for protection of marine species including anadromous salmon. Under the ESA, endangered status is conferred upon "any species within the foreseeable future throughout all or a significant portion of its range." The ESA defined critical habitat as the "geographical area containing physical and biological features essential to the conservation of species."

The Table 2.2 lists the Evolutionarily Significant Units of salmonid species present in the Camas area listed, or proposed for listing, under the authority of the ESA.

Table 2.2 Evolutionarily Significant of Listed Salmonid Species

Species	Listing Status	Date Listed
Columbia River Bull Trout	Threatened	June 1998
Lower Columbia River Chinook	Threatened	March 1999
Lower Columbia River Chum	Threatened	March 1999
Lower Columbia River Coho	Threatened	June 2005
Lower Columbia River Steelhead	Threatened	March 1998

Once a species is listed as endangered or threatened, the ESA makes it illegal for the government or individuals to "take" a listed species. "Take" has been interpreted by the federal courts to include "significant modification or degradation of critical habitat" that impairs essential behavior patterns. For species listed as endangered, the blanket prohibitions against "take" are immediate. However, threatened species may be protected through a more flexible Section 4(d) rule describing specific activities that are likely to result in a "take."

Since 2007, The City has updated its ordinance on critical areas and has adopted the Shoreline Master Program (SMP). These updates helped to clarify the specific activities in Section 4(d) and to increase the focus on migratory species.

2.3.4 Reclaimed Water Standards

The standards for the use of reclaimed water are outlined in the Revised Code of Washington (RCW) Section 90.46 and in a separate document published by Ecology and DOH entitled "Water Reclamation and Reuse Standards." Reclaimed water is "the effluent derived in any part from sewage from a

wastewater treatment system that has been adequately and reliably treated, such that it is no longer considered wastewater and is suitable for a beneficial use or a controlled use that would not otherwise occur" (Water Reclamation and Reuse Standards). The legislature has declared that "the utilization of reclaimed water by local communities for domestic, agricultural, industrial, recreational, and fish and wildlife habitat creation and enhancement purposes (including wetland enhancement) will contribute to the peace, health, safety, and welfare of the people of the State of Washington."

2.3.5 National Environmental Policy Act

The National Environmental Policy Act (NEPA) was established in 1969 and requires federal agencies to conduct environmental review or assessments of projects to determine impacts on all projects requiring federal permits or funding. If the project is determined to be environmentally insignificant, a Finding of No Significant Impact is issued, otherwise an Environmental Impact Statement (EIS) is required. City activities requiring CWA Section 404 permits fall under the jurisdiction of NEPA.

The National Historic Preservation Act (NHPA) regulates federal activities with the potential to impact materials of historic, cultural, or archaeological significance under Section 106, which requires consultation with affected Native American Tribes and the Washington State Department of Archaeology and Historic Preservation. Documentation of this consultation is included in NEPA Environmental Reports and Assessments. Recent decisions by the United States Army Corps of Engineers (Corps) require an independent NHPA Section 106 consultation process for projects permitted by the Corps, which can result in significant delays to project implementation.

The State of Washington regulates state funded projects with the potential to impact material of historic, cultural, or archaeological significance under Governor's Executive Order 05-05, which requires consultation with the Department of Archaeology and Historic Preservation and affected Tribes similar to the NHPA Section 106 process.

2.3.6 State Environmental Policy Act

The SEPA that environmental issues are taken into consideration during the planning and process for Non-Federal projects. An EIS is required if a project will have a significant adverse environmental impact. The EIS looks at potential environmental problems that would be caused by the project; ways the project could be changed to minimize the impact; and mitigation options. The City is currently pursuing alternate source of supply, which may require an EIS depending on the type of projects that are involved. Most projects, including water right applications and transfers, typically do not require an EIS. A SEPA checklist is prepared, and a Determination of Non-significance is issued instead. This WSPU will fall under the SEPA Checklist Non-Project Action requirement. The water system projects listed in the capital improvement plan will each be completed under a separate SEPA checklist. A SEPA checklist and DNS for the WSPU is indicated in Appendix B.

2.3.7 Growth Management Act

The Washington State Growth Management Act (GMA) was enacted in 1990 and requires certain local governments to plan for the population growth that will occur over the next 20 years within an established UGA. The GMA also requires cities to classify critical areas (wetlands, aquifer, recharge areas, fish and wildlife habitat areas, geologically hazardous areas, and frequently flooded areas) and to establish

development regulations to protect these areas. Clark County is updating its current plan, which will be adopted in December 2025, to extend through 2045. The update will include changes regarding population and employment growth for the next 20 years.

2.3.8 Shoreline Management Act Permit

A Shoreline Permit is required on all projects of $8,500 or more that are located on the water or shoreline area. Shorelines are lakes of reservoirs of 20 acres or greater, streams with a mean annual flow of 20 cfs or greater, marine waters, and an area within 200 feet of the ordinary high water mark. Areas within the City that are classified as shoreline are those areas along Lake Lacamas, Washougal River, Little Washougal River, and Columbia River.

2.3.9 Floodplain Development Permit

Local governments that are participating in the National Flood Insurance Program are required to review projects (including water system facilities) in a mapped flood plain and impose conditions to reduce potential damage from flood water. A Floodplain Development Permit is required prior to construction.

2.3.10 Hydraulic Project Approval

Under WAC 220-110, the Washington State Department of Fish and Wildlife requires a hydraulic project approval (HPA) for activities that will "use, divert, obstruct, or change the natural flow or bed" of any waters of the state. For City activities such as pipeline crossings of streams or outfall and intake improvements, an HPA will be required, and must include provisions necessary to minimize project specific and cumulative impacts to fish.

Because of ESA listings throughout Washington, the Washington State Department of Fish and Wildlife and the NMFS revised the Hydraulic Code to protect species listed as threatened or endangered. The revisions to the code specifically aimed to "incorporate up-to-date fish science technology, simplify the permitting of certain types of projects, improve procedural and administrative requirements to better align with statutory changes and, establish a structure for adaptive management that responds to changing science and technology and/or the results of effectiveness monitoring".

If NMFS determines that the revisions are sufficient to protect listed species, the State hopes the revised Code will constitute an accepted Habitat Conservation Plan under Section 10 of the ESA. If the Habitat Conservation Plan is approved, NMFS may issue an Incidental Take Permit allowing incidental take of a listed species if the permittee has complied with the Habitat Conservation Plan. This Incidental Take Permit expires after an agreed upon period of time, and may then be revised by NMFS.

2.3.11 Local Permits

The City has agreements with Clark County for the construction and maintenance of facilities in their respective rights-of-way. Under these agreements, an Encroachment Permit is issued that specifies construction standards such as traffic control, work hours, and safety issues, as well as design and restoration standards.

2.4 Water Rights

A water right is the legal authorization to use a specified amount of public water for a certain beneficial purpose. Washington State law requires that permission in the form of a water right permit or certificate be granted for most appropriations of public water. Water rights are issued by Ecology and are required to ensure proper allocation and management of water resources. The following sections provide definitions of key terms with regards to water rights.

2.4.1 Water Right Claim

A water right claim is a statement of claim to water use that began before the State Water Codes were adopted and is not covered by a permit or certificate. A claim may represent a valid water right if it describes the use of a surface water source that began before 1917 or the use of groundwater source that began before 1945. It can also represent a water right claim that was filed with the State during an open filing period designated under RCW 90.14 or is covered by the groundwater exemption.

2.4.2 Water Right Permit

A water right permit is issued by the State for water right applicants to begin developing their water right. A water right is developed when the applicant follows the provisions outlined in their permit such as using the water for the purposes and limits stated in the permit. A water right permit will remain in effect until the water right certificate is issued, if all terms of the permit are met, or the permit is canceled.

2.4.3 Water Right Certificate

A water right certificate is issued by Ecology to certify that the water user has the authority to withdraw a specific amount of water under certain conditions. The conditions are based on the beneficial use of the water under the water right permit. The water right certificate is a legal document recorded at the county auditor's office. Issuance of the water right certificate is the final step in obtaining a water right.

2.5 Regulatory Agencies

The above regulations, permits, and programs are administered by various local, state, and federal agencies. The history, purpose, and authority of these agencies are discussed below.

2.5.1 United States Environmental Protection Agency

The stated mission of the USEPA is to protect human health and to safeguard the natural environment upon which life depends. The USEPA's purpose includes protecting all Americans from significant human health risks, ensuring that national environmental efforts are based on the best available scientific information, ensuring that federal laws are enforced fairly, and that the environmental protection contributes to making our communities and ecosystems diverse, sustainable, and economically productive. Ecology currently administers the SRF loans for the USEPA.

2.5.2 United States Fish and Wildlife Service

Under the ESA, USFWS is responsible for the protection of all non-marine life including birds, mammals, and non-anadromous fish, including bull trout and sea-run cutthroat. Although USFWS may choose to invoke the blanket prohibitions of Section 9, the "threatened" status of Bull Trout allows more flexibility to establish regulations designed to protect these species. These regulations, known collectively as Section 4(d) rule, online activities likely to result in a "take" of a threatened species, as well as exempted activities.

2.5.3 The National Marine Fisheries Service

Under the ESA, the NMFS is responsible for the protection of marine life, including anadromous salmon such as the Columbia River Chinook, Chum, and Steelhead. When a species is listed as "endangered" the prohibitions against "take" of the species are immediate under Section 9 of the ESA of the Act. Although NMFS may choose to invoke the blanket prohibitions of Section 9, the "threatened" status of the Columbia River Chinook, Coho, Chum, and Steelhead allows more flexibility to establish regulations designed to protect these species. These regulations, known collectively as a Section 4(d) rule, outline activities likely to result in a "take" of a threatened species, as well as exempted activities. The final 4(d) Rule was adopted on June 20, 2000.

2.5.4 United States Army Corps of Engineers

Under Section 404 of the CWA, the Corps is authorized to regulate discharge of fill and dredged material to waters of the United States, including wetlands. A similar review process is employed for projects with the potential to impact navigable waters, including the Columbia River, under Section 10 of the Rivers and Harbors Act of 1899. This process applies to any work on outfalls to the Columbia River. The Corps employs a system of General or Nationwide Permits for blanket authorization of activities such as utility lines that have minimal adverse impact on the environment. In situations where projects are large and complex, or adverse impact is probable, the Corps may issue an Individual Permit after reviewing an alternatives analysis. Enforcement actions may be brought by the Corps or the USEPA. Activities subject to Corps jurisdiction require NEPA and ESA review and consultation.

2.5.5 Washington State Department of Health

DOH has three primary functions: to regularly assess the State's health needs and resources; to develop and implement sound public policy; and to ensure the capacity of public health agencies to manage daily operations and respond to public health emergencies. The DOH was granted full authority and responsibility for the regulation and enforcement of the SDWA by the federal government in 1976. DOH also publishes guidelines for the preparation of water system plans, water conservation programs, design and drinking water quality standards, and watershed control programs. Water system comprehensive plans must be reviewed and approved by DOH. Construction plans and specifications must also be reviewed by DOH unless they are the transmission or distribution improvements included in the Water System Comprehensive Plan, CIP.

2.5.6 Washington State Department of Ecology

The mission of the Ecology Water Quality Program is to protect, preserve, and enhance the State's surface and ground water quality and to promote the wise management of water for the benefit of current and future generations. Ecology performs various functions under State and federal authority and has both local and regional offices. Ecology oversees the allocation of water rights.

2.5.7 Washington State Department of Fish and Wildlife

Under the updated Hydraulic Code Rules WAC 220-660, and RCW 75.20, any form of work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water of the State requires hydraulic project approval from the Department of Fish and Wildlife. Approval would be required for all City construction projects that cross or otherwise take place in streams or shorelines.

2.5.8 Watershed Resource Inventory Area

Under WAC 173-500-040, Washington State was divided into 62 geographic areas, defined on the basis of surface water resource. These 62 geographic areas are defined as WRIA. The purpose of WRIA is to implement effective planning involving all jurisdictions that fall within WRIA, including county, city, and other local, state, and national agencies.

The City and the Jones and Boulder Creek watersheds reside within WRIA 28. The City owns and controls a majority of the Jones and Boulder Creek watersheds, Figure 1.2, which are both tributaries of the Washougal River. The City is an active participant in regional watershed planning efforts.

2.5.9 Local Health Departments

The Clark County DOH is the local health department governing the City. In general, local health departments may adopt and enforce local regulations when they are consistent with and more stringent than state regulations.

2.5.10 County Planning Policies

City planning policies should be consistent with those of Clark County. Accordingly, this WSPU will require approval by Clark County.

2.6 Related Planning Documents

The City recognizes that planning activities of governmental entities can affect the water utility. These include several regional and local plans of the southwest region of Washington, such as Clark County. Some related plans affect how Camas operates its water system and how it plans to meet future growth. The following section summarizes these related plans.

2.6.1 Clark County Coordinated Water System Plan

Amended and adopted in 2012, the CWSP serves as a primary planning document for water purveyors within Clark County. Since the adoption of the 2012 CWSP, an addendum was incorporated in 2021 to reflect a 2017 interlocal agreement between the Cities of Camas and Vancouver. This agreement adjusted

the water services boundaries and water service shut-offs provisions, as referenced in Exhibit 2 of the 2012 CWSP. The CWSP was developed to fulfill the requirements of the 1977 Public Water System Coordination Act (RCW 70.116) and the 1971 Water Resource Act (RCW 90.54). The plan is in accordance with the Lewis and Salmon-Washougal Water Resources Management Program rules (WAC 173-527 and WAC 173-528). These acts work together to create a framework for water utilities, which allows for coordinated planning and construction programs among adjacent water utilities. Also, these acts allow utilities in a specified geographical area to reserve water rights required to meet projected municipal and industrial needs for a 50 year period. In order for reservation of water rights and coordination of water system planning to occur, a CWSP is required to be developed.

A Clark County Water Utility Coordinating Committee was created in 1977 and requested that the DOH assess the need for a designation of a Critical Water Supply Service Area. Such designation represents the first step toward the development of a CWSP. The assessment, which was completed in 1980, addressed problems within the county related to inadequate water quality, unreliable service, and the lack of coordinated planning by the water utilities. Based on the findings of the assessment, the County Commissioners declared Clark County a Critical Water Supply Service Area. Following that determination, development of the 1983 CWSP was initiated.

The Coordination Act requires that the CWSP be reviewed and updated by the water utility coordinating committee, if the water utility coordinating committee feels it necessary; the last major update occurring in 2012. The update serves as the regional supplement to local water system plans that have been or will be approved by DOH.

The 2012 CWSP:

- Addresses local legislative and CWSP policies.
- Updates water utility service area boundaries.
- Requires consistent water utility design standards.
- Adopts a utility service review procedure.
- Establishes a satellite system management agency.
- Assesses water resources.
- Reviews water supplies.

The 2012 CWSP addressed recent changes to Washington State's satellite system management agency regulations and the Lewis and Salmon-Washougal Water Resources Management Program rules.

2.6.2 Clark County Comprehensive Plan (2015-2035)

In response to rapid growth and growth-related pressures in the late 1980s, the State Legislature enacted the Washington State GMA to establish a framework for comprehensive planning efforts by local governments to accommodate anticipated growth and development. Under the GMA, each county is required to adopt a comprehensive plan and to do so in consultation with its cities.

The intent of the comprehensive plan is to build on the Community Framework Plan and the 20-Year Plan revised in 1997, 2004, 2007, and 2016 to present a clear vision for Clark County's future through 2035. The Clark County Comprehensive Plan Update is anticipated to be completed by December 2025.The plan includes comprehensive planning elements addressing issues of land use, housing, rural and natural

resources, environmental goals, transportation, capital facilities and utilities, parks and open space, historic preservation, economic development, school policies and goals, community design, annexation, SMP goals and policies, and procedures for planning for a twenty-year planning horizon. For each element included there is an introduction, a discussion of that element's relationship to other elements, a description of existing conditions, estimates and projections of future needs, and goals and policies. Additionally, the plan contains strategies for implementation of these goals and policies.

The Vacant Buildable Lands Model (VBLM) is a planning tool developed to analyze residential, commercial, and industrial lands within UGA. The model serves as a tool for evaluating urban area alternatives during Comprehensive Plan updates and for monitoring growth patterns during interim periods. The most recent data available online is from 2023. However, current efforts to update the Clark County Comprehensive Plan in coordination with the cities includes more recent analyses using the VBLM. The demographic analysis and water demand projections, documented in Chapter 5, were developed based on the best available VBLM information at the time (2025).

2.6.3 Clark County Public Utilities Water System Plan

Clark Public Utilities (CPU) 2024 Water System Plan (Consor) evaluates the long-term water supply needs and resources available for CPU. The following studies and investigations are included in the CPU Plan: an inventory of existing wells, water supply systems, and interties in the County; an analysis of the population, history, and water needs to the year 2042; and supplies to serve future water needs. Future supplies are expected to come from CPU's Well 36, Carol J. Curtis and Paradise Point Wellfields.

2.6.4 Metropolitan Transportation Plan for Clark County

The Southwest Washington Regional Transportation Council is the region's principal transportation planning organization. As a means to link transportation and land use, the Council periodically produces a regional transportation plan for the metropolitan area of Clark County. The plan is developed through a coordinated process between local jurisdictions in order to develop regional solutions to transportation needs for the next 20 years and to direct the metropolitan transportation planning process.

In order to establish transportation needs over the 20-year planning period, the Council used a regional travel forecasting model. The model is based on historic and future demographic data allocated by Clark County to 2,162 individual transportation analysis zones (TAZ) within Clark County. Each TAZ was populated with 2020 and future (2040) population, household, and employment demographic data. Historic demographic data was obtained from Census 2020 and future data was based on the results of forecasts performed by the Washington State Office of Financial Management.

2.6.5 City of Vancouver Comprehensive Water System Plan

Vancouver's Comprehensive Water System Plan is updated every 10 years; most recently in 2015. The next updated plan is expected to be adopted in 2026. The purpose of the plan is to develop a planning strategy for the city's retail water service area by evaluating the existing system and its ability to meet the anticipated requirements for water source, quality, transmission, storage, and distribution over a 20-year planning period. Water system improvements were identified to meet changes in regulatory impacts, and population growth, as well as infrastructure repair and replacement. The plan also identified planning level

costs of the improvement projects and provided a financial plan for funding the projects. The plan was prepared in accordance with DOH WAC 246-290 requirements.

2.6.6 City of Washougal Water System Plan Update

The City of Washougal's WSPU was completed in 2021. The Plan states its purpose "is to document key water system information and provides analysis and recommendations that inform infrastructure development and operational decisions by City staff". This plan includes an inventory of existing facilities, establishing criteria for water system analysis and analyzing the hydraulic capacity of the system, developing a CIP based on the hydraulic analysis and developing a financial plan to fund the proposed CIP and assess existing revenue and expenses. This plan also includes an assessment of the City of Washougal's groundwater resources, water rights, and water use efficiency program." The plan was prepared in accordance with DOH WAC 246-290 requirements.

2.6.7 Salmon-Washougal and Lewis Watershed Management Plan (Lower Columbia Fish Recovery Board, July 21, 2006)

The Watershed Management Act (RCW Chapter 90.82) provides a framework to address and resolve water resource issues in each of the state's 62 WRIAs. Planning units created for each WRIA are responsible for developing a watershed plan. The planning units consist of citizens, tribes, interest groups, and government agencies where appropriate. Camas's water system boundaries and the boundaries of surrounding water providers are within the Salmon-Washougal and Lewis watersheds (WRIAs 27 and 28). The Salmon-Washougal and Lewis Watershed Management Plan (WRIA Plan) was adopted in 2006. The WRIA Plan addresses a range of issues related to water resources, including water supply, stream flow management, water quality, and fish habitat. It reviews alternative approaches for managing water resources in the area and recommends select strategies for implementation.

The Salmon-Washougal and Lewis Water Resources Management Program rules were adopted in 2008 (WAC 173-527 and WAC 173-528). These rules were based on the WRIA Plan and had five key elements:

- Setting Instream Flows.
- Closing sub-basins to future withdrawals.
- Designating "regional supply areas" for future water supply.
- Establishing reservations for water for future use, and
- Specifying conditions of use for access to the water reserves.

2.6.8 City of Camas 2019 Water System Plan Update (Carollo Engineers)

Camas' Water System Comprehensive Plan was developed to meet the City's water system needs for a 20-year planning period. The plan was prepared in accordance with DOH WAC 246-290 requirements and includes:

- A water system description.
- Historical and future water use.
- Service area population and water demand projections.
- Water quality and SDWA impacts.

- A water system analysis, including a computer simulation model.
- CIP.

The base 6-year CIP includes pipeline, pumping, control, storage, and source improvements. These improvements include the development of multiple well sites and future sources, developing or replacing storage reservoirs throughout the system, transmission and distribution improvements, and booster station improvements. New water sources will be required by the end of the planning period to provide redundant supply to its customers. The elements and the direction of Camas' plan were consistent with activities and plans of this WSPU.

2.6.9 Jones and Boulder Creek Watershed Forest Management Plan

The City Boulder Creek and Jones Creek watershed consists of roughly 1,700 acres of forest where the City collects its water. There has been minimal work done in the area to keep it managed. The largest work was in 2011 when AKS Engineering and Forestry performed a timber inventory. This document summarizes the work that was done so that the City could periodically receive timber income while still protecting and maintaining water quality. The contents consist of an assessment of existing resources, a timber harvesting plan, an access and road plan, and implementation methods, guidelines and management recommendations.

2.7 Policies, Criteria, and Standards

The City manages its water utility in accordance with established water system policies. The policies provide a consistent framework for the design, operation, maintenance, and service of the water system for appropriately implementing programs, designing new infrastructure, and serving additional customers. The policies and planning considerations set forth herein pertain solely to the water system; the City has additional land use, development, and finance policies that may specify additional requirements for development or extension of a water service.

The following documents were reviewed for this update of the City's water policies:

- The City of Camas Municipal Code (CMC).
- The City of Camas 2010 Water System Plan (2010 WSP).
- The City of Camas 2019 Water System Plan (2019 WSP).
- The City of Camas Design Standards.
- The City Draft Comprehensive Plan 2045.
- Clark County CWSP.
- Clark County Coordinated Water System Minimum Standards and Specifications. (Appendix V-A to the CWSP).
- Clark County Code.
- RCW.
- Uniform Plumbing Code.
- International Fire Code.

2.7.1 Service Policies and Standards

The service policies and standards outlined in Table 2.3 consist of policies relating to the growth, management, and service of the water system. The extension of water service to any future service area would only occur in accordance with the policies and standards detailed in this section.

Table 2.3 Service Policies and Criteria

Subject Name	Policy and Criteria	Reference	Action Items
Duty to Serve	The City will exercise reasonable diligence and care to furnish and deliver a continuous and sufficient supply of pure water to the customer, and to avoid any shortage or interruption of delivery of same The City will meet all regulatory requirements for management of its water system and provision of water to its customers, including water quality, system pressure, and adequate supply. Conserve and protect groundwater resources to provide safe, clean, high quality drinking water to residents. The City will respond to parcels requesting service within 120 days beginning on the date the applicant and water system complete a formal agreement.	CMC 13.16.010, 2025 WSP, Comprehensive Plan 2045 Policy PFS-4.8	
Government Consistency	The City's Water System Comprehensive Plan will be consistent with local, county, and state land use authorities and plans and will comply with the Washington State GMA.	2019 WSP	
Retail Water Service Area	The City will provide water service to all customers within its RWSA meeting the City's requirements.		City to update text to be consistent with Comp Plan.
Future Water Service Area	The City's future water service area shall be determined through the CWSP and adopted through the "Interlocal Agreement for Adjusting or Confirming Future Water Service Area Boundaries Between The Cities of Battle Ground, Camas, Ridgefield, Vancouver, and Washougal, and Clark Public Utilities".	2019 WSP	
Condition of Service	It is unlawful for any person, except duly authorized city employees, to make connections with any water main or water pipe belonging to the municipal water supply system, without first obtaining written permission to do so from the public works director or his designated representative.	CMC 13.32.030	
Annexation	Do not extend utilities without annexation or commitment for annexation. Exceptions may be made in cases where human health is threatened. In areas where utilities presently extend beyond City limits, but are within UGAs, plan development jointly with the County. A joint development must be consistent with City standards.	Comprehensive Plan 2045 Policy PFS-4.4	
Service to customers outside of UGA boundary	The City will continue to provide water service to [existing] customers outside of the City's UGA Boundary but within the established Water Service Area. The City is not required to provide fire flow to such customers. The City reserves the right to deny service to new customers outside the UGA that do not meet City requirements.	2010 WSP	City to review highlighted text.
Water Main Extensions	All extensions shall extend to and across the full width of the property served with water. No property shall be served with City water unless the water main is extended to the extreme boundary limit of the property line extending the full length of the front footage of the property. ▪ Extensions to water mains will be made only upon proper petitions to the City. The City shall have the right to reject such petitions or enter into contract with the petitioners under such conditions as the City may elect. ▪ All water main extensions installed, whether within or without the corporate limits of the City, shall be ~~six~~ [eight] inches in diameter or larger. ▪ All extensions of mains required to serve new customers shall be constructed at the expense of such customers. Ensure water infrastructure is designed to City standards and is in place prior to land development.	CMC 13.48.010, 2016 WSP recommended change, Comprehensive Plan 2045 Policy PFS-4.9	City to review and update "to and through" language
Oversizing	The City Council may enter into a development agreement pursuant to RCW 36.70(b).170 whereby it agrees to set aside and reserve capacity in the municipal water system for a prospective development. Such development agreement shall be permitted only if the city council makes a specific finding that the public good and general welfare will benefit by such agreement.	CMC 13.12.085 (A)	
	If in the judgment of the water department of the city, it is in the best interest of the City and of the general area where a new main is contemplated to install a larger main than that required by the immediate development, the city may install such larger main and shall pay the increased difference in cost between installation of the smaller and of the larger main. ▪ The City may participate to the extent permitted by law, through SDC credits, Local Improvement District, or other payback agreements to assist in the financing of such improvements. ▪ Water system extensions needed to serve new development shall be built prior to or simultaneous with such development, according to the size and configuration identified by the Comprehensive Water Plan as necessary to serve future planned development. ▪ The location and design of these facilities shall give full consideration to the ease of operation and maintenance of these facilities by the City. ▪ Wherever any form of City finance is involved in a water line extension, lines that promote a compact development pattern will be favored over lines traversing large undeveloped areas where future development plans are uncertain.	CMC 13.48.010 (D), 2016 WSP	City to review and update to be consistent with current practices.
Latecomer Agreements	The City may choose to allow reimbursement contracts in exchange for permission to develop and allow for reimbursement to the initial developer by future users in the area who will benefit from the system expansion. The developer must be willing to front the initial expense of system expansion.		

Subject Name	Policy and Criteria	Reference	Action Items
Satellite Management Area	The City may assume the operation of a water district or private water system within the City limit, at the water system's request, if the following conditions are met and subject to approval of the City Council: ▪ The district or private system is adjacent to or within the City's current or future RWSA as identified in the City's comprehensive plan. ▪ The assumption of the district or private system is permitted by State law. ▪ The district's or private system's facilities meet the City's performance criteria and engineering standards, or a plan is in place to assure that they will be brought up to City standards without adversely impacting City's existing customers financially or with regard to level of service. ▪ Any extension of the City's system to connect the newly accepted system will be paid for by the district or private system. ▪ The City shall require the district or private system to transfer the ownership of its water supply sources and associated water rights to the City. Water rights must be successfully transferred to the City and approved for municipal water use by Ecology prior to commitment from the City for water service.	2019 WSP	City to review and update to be consistent with current practices
Developer Extensions outside of City UGA Boundary	The City will provide water service to developer extensions outside the City's existing UGA but within the established RWSA whenever reasonably possible. Developer extensions shall adhere to the established SDC.	2010 WSP	
New Customers with Existing Wells	Developer extensions shall adhere to the established SDC and shall abandon all private wells and relinquish associated water rights to the City as a provision of the SDC. Water rights procured in this manner will be used to accommodate growth in the Retail Water Service Area.	2010 WSP	
Metering	All services to the water system shall be metered.	CMC 13.40.010 (A)	
Source Metering	All supply sources will be metered either at individual wells or at a common flow meter.	2019 WSP	

Notes:
RWSA - Retail Water Service Area.

2.7.2 Coordination with Other Agencies

Table 2.4 summarizes policies regarding the City's coordination with other agencies, which includes but is not limited to Vancouver, City of Washougal, Clark County, federal and state agencies, other public and private utilities.

Table 2.4 Coordination with Other Agencies

Subject	Policy	Reference
Coordination with Other Agencies	Coordinate with Clark County and other purveyors to eliminate private systems in accordance with the Clark County CWSP.	Comprehensive Plan 2045 Policy PFS-4.10
	Coordinate with the County and the cities of Vancouver and Washougal to protect groundwater from contamination.	Comprehensive Plan 2045 Policy PFS-4.11
Intergovernmental Cooperation	To adequately plan for growth and implement policies for the GMA, Clark County has implemented the Coordination Act which provides a legal mechanism for municipalities, special purpose districts and private water utilities to establish future water service areas within unincorporated areas.	Clark County CWSP Update 2011

2.7.3 Environmental Policies and Criteria

Table 2.5 summarizes the City's environmental policies, criteria, and goals that relate to the City's water system.

Table 2.5 Environmental Policies

Subject	Policy/Goal	Reference
SMP	Shorelines are a specifically designated environmental feature and are protected and managed by the City's SMP. Adopted in 2013, the SMP implements the Washington State Shoreline Management Act and its policies. These policies include protecting the ecological function of the state's shorelines and their associated natural resources by identifying areas for preferred uses and economic development, restoring previously impacted shorelines, and providing opportunities for the general public to have access to and enjoy shorelines.	Camas SMP 2021
Goal NE-1 Environmental Stewardship	Preserve Camas' natural environment citywide by developing a sustainable urban environment and protecting natural areas and open space, including critical areas.	Comprehensive Plan 2045
Policy NE-1.1	Support a cleanup of the Camas Mill and other contaminated sites to protect natural resources and the city's water supply.	Comprehensive Plan 2045
Policy NE-1.2	Support programs and regulations that monitor, maintain, conserve and protect water quality in Camas, including watersheds, Lacamas Lake Basin, Columbia River Basin, and Washougal River Basin.	Comprehensive Plan 2045
Policy NE-1.4	Support and implement actions identified in adopted plans, including adaptive management of natural resources that is consistent with best available science and climate guidance to improve climate resiliency.	Comprehensive Plan 2045
Policy NE-1.5	Protect and restore natural resources, valuable historic and cultural areas, climate refugia, habitat areas and corridors to provide biological and hydrological connectivity that fosters resilience to climate impacts.	Comprehensive Plan 2045

Subject	Policy/Goal	Reference
Policy NE-1.6	Create and support natural resource management plans that consider climate change impacts and guide adaptive management.	Comprehensive Plan 2045
Policy NE-1.7	Include immediate and long-term environmental impacts in the policy and regulatory decision-making process. Identify and quantify the ecosystem services benefits of natural systems and include these natural capital assets in cost-benefit assessments for community and development planning.	Comprehensive Plan 2045
Policy NE-1.9	Regulate land use and development to protect natural topographic, geologic, vegetative, and hydrologic features of undeveloped properties.	Comprehensive Plan 2045
Policy NE-1.10	Promote soil stability and minimize and control soil erosion using best management practices, best available science, ecologically sustainable site design, natural drainage systems and protection of existing native vegetation.	Comprehensive Plan 2045
Policy NE-2.1	Use best management practices and best available science to preserve, protect, and restore the biological health and diversity of Camas' critical areas.	Comprehensive Plan 2045
Policy NE-2.2	Preserve and restore aquatic and riparian habitats consistent with applicable regulations.	Comprehensive Plan 2045
Policy NE-2.4	Ensure that development throughout the City meets or exceeds standards and practices for long-term wetland protection and mitigation.	
Policy NE-3.1	Adopt the goals and policies as outlined in the current Camas Shoreline Master Program.	Comprehensive Plan 2045
Goal NE-3 Shorelines	Use the full potential of shoreline in accordance with the opportunities presented by their relationship to the surrounding area, their natural resource values, and their unique aesthetic qualities offered by water, topography, and views. Develop a physical environment that is both ordered and diversified, and which integrates water and shoreline uses while achieving a net gain of ecological function.	Comprehensive Plan 2045

2.7.4 System Reliability and Maintenance Policies and Standards

Table 2.6 outlines the City's maintenance standards and policies, as well as system reliability policies.

Table 2.6 System Reliability and Maintenance Policies and Standards

Subject	Policy/Standard	Reference
Water Shortage Response Plan	The City created a City ordinance CMC Chapter 13.14. This allows the City to promote the public interest by conserving the city's water supply in order to protect the health, welfare and safety of water users. To accomplish this declared purpose, the city reserves the right to exercise its police powers through emergency measures as set forth in this chapter.	2019 Camas WSP
Water System ERP	The City has a Disaster Manual, which identifies the emergency response functions within the City using an "all hazards" approach. Within the City's emergency response framework, the City has developed a Water System ERP which describes alternative operations for the interruption of each major water supply facility (i.e., loss of a well, reservoir, or booster pump station).	2019 Camas WSP
System Maintenance	The City proactively operates and maintains its water system as an effective means of system management. The City has an O&M manual which gets updated regularly and adds material as necessary. The manual provides detailed information on operator certification and training, water quality monitoring, operation and control, cross-connection control, and emergency planning/response.	2019 Camas WSP

Subject	Policy/Standard	Reference
Cross Connection	The control or elimination of cross-connections shall be in accordance with the rules and regulations of the Washington State Board of Health regarding public water supplies, WAC 248-54-285 as it now exists or as it may hereinafter be amended, and with any requirements set forth by the "U.S. EPA" as authorized by the "SDWA" PL 93-523, as it presently exists or as it may hereinafter be amended, and with any manual of standard practice pertaining to cross-connection control approved by the public works director or his designated representative.	CMC Section 13.32.04 Cross Connection Control or elimination
Pump Station Redundancy	With the largest pump in each booster pump station out of service, the remaining pumps should provide MDD whole concurrently replenishing fire suppression storage within 72 hours.	2019 Camas WSP
Pump Station Reliability	Wells and booster pumps with back-up power should be capable of supplying max day demand for the water system while concurrently replenishing fire suppression storage within 72 hours.	2019 Camas WPS
Supply Reliability	Wells should be capable of supplying MDD for the water system while concurrently replenishing fire suppression storage within 72 hours	2019 Camas WPS
Supply Redundancy	Largest source out of service	2019 Camas WSP

Notes:
MDD - max day demand.

2.7.5 Financial Policies

The City's financial policies related to the Water Utility are summarized in Table 2.7

Table 2.7 Financial Policies

Subject	Policy	Reference
Combined residential and commercial uses	Where a single service is provided to a combination of residential and commercial uses, the commercial rates shall be charged for all water and sewer service.	CMC Section 13.36.030
Monthly service charge and rate for automatic sprinkler systems	The monthly flat-rate charge for automatic sprinkler systems with fire hydrants and for standpipes in conjunction with fire protection shall be as provided in CMC Section 13.36.010.	CMC Section 13.36.040
Connection charges	1. Charges for connection to the city water system including setting the meter, installing a service line and tapping the water main shall be computed as follows: a. Except as hereinafter provided, the connection charge shall be the cost of materials, the labor costs for city personnel billed at then existing rates for such personnel, and any fees or charges that were necessary to be paid to third parties in order to make such connection. b. For installing a water meter for services one inch or smaller, the connection charge shall be as per the fee schedule established by the city council per resolution. c. For installing a water meter, service line, and tapping the water main for a service one inch or smaller, the connection charge shall be as per the fee schedule established by the city council per resolution or the actual cost to the city calculated in accordance with subsection (A)(1) of this section, whichever is greater. 2. There shall be no charge for connecting a sprinkler system to a water main for fire protection other than the installation cost of the same, providing that such system shall include a detector to record water usage.	CMC Section 13.36.050
Temporary water service	For temporary irrigation or commercial hydrant use, all connections shall pay a deposit as per the fee schedule established by the city council per resolution, with the nonrefundable amount established as per the fee schedule established by the city council per resolution. Water usage shall be deducted from the deposit of the then current applicable commercial rate per Section 13.36.010 of this chapter. The city reserves the right to remove the meter for nonuse or misuse at its discretion. Any remaining deposit will be returned to the applicant, or the remaining balance will be billed to the applicant. The applicant shall notify the city when use is complete. The applicant will be responsible for any damage to the equipment, and shall be invoiced for repairs or replacement of the equipment.	CMC Section 13.36.060
Utility charge – Governmental Users	The following designated governmental users shall pay for water and sewer utilities as follows: 1. Rental by the Camas fire department of all fire hydrants within the city shall be as per the fee schedule established by the city council per resolution. 2. Rental of fire hydrants, per hydrant, outside the limits of the city by any other municipality or fire district shall be as per the fee schedule established by the city council per resolution. 3. All other utility services for governmental users shall be charged at the regular meter rate.	CMC Section 13.36.070
Meters – Installation – Reading – Accuracy	1. All services to the water system shall be metered. 2. All meters up to and including one inch in size will be owned, installed and maintained by the city water department. Meters larger than one inch shall be paid for by the customer. All services shall have the meter installed before the service is connected. The type and make of all meters purchased and paid for by any customer or applicant must be approved by the water superintendent before being installed. 3. The city will not furnish or read auxiliary or submeters used for the customer's convenience. 4. The city will keep an accurate account on its books of the reading of meters, and such account, so kept, shall be offered at all times, places and courts as prima facie evidence of the use of water service by the customer, and shall be the basis on which all bills are calculated. 5. Should any meter fail to register correctly the use of that part of the water service which the meter should properly register, the service shall be estimated by the city from a corresponding period. 6. The city will, upon written request, test any customer's meter, and where circumstances require, adjust for wrong charges for a period not to exceed three months' previous. 7. When a customer requests a meter test, a deposit as per the fee schedule established by the city council per resolution to cover the cost of the test may be required of the customer. 8. The amount so deposited will be returned to the customer if the meter is found upon test to overregister more than two percent under conditions of normal operation. 9. A customer shall have the right to require the city to conduct the test in his presence, or if he so desires, in the presence of an expert or other representative appointed by him. 10. All meters will be tested before installation, and no meter will be placed in service or allowed to remain in service which is known to have an error in registration in excess of two percent under conditions of normal operation. 11. For the purpose of making charges, all meters serving the customer's premises will be considered separately, and the readings will not be combined, except that where the city, for operating necessity, elects to install two or more meters instead of one at a central location to service the customer's premises, the readings of two or more meters will be combined for the purpose of making charges. 12. The location of the meter or meters used in measuring the customer's use of water must be in a place satisfactory to the city before service will be supplied. Ordinarily, this site shall be the property line and curb. Where meters are at present or may be installed within a building, the city will not be held responsible for damage from water seepage through the wall, nor for damage from leaking meter, pipe or fittings. 13. No rent or other charge whatever shall be made by the customer against the city for placing or maintaining meters upon the customer's premises. 14. If a meter underregisters the amount of water due to tampering with the meter, and/or piping, or in any other way causing underregistration, the service may be discontinued and will not be reconnected until the customer immediately makes the necessary corrections in his own water lines to prevent further damage to the city's meters. 15. Meter readings are to be averaged during any period when it will be impossible or impracticable to read any meter on the regular reading date. 16. It is unlawful to place any material on or to otherwise obstruct any water meter. a. Separate water meters shall be installed for each dwelling unit in a townhouse, condominium or other multifamily dwelling configuration where individual dwelling units are separately owned. Single meters may be installed to serve multifamily residential structures when said structures and the units therein remain under a single ownership. b. Water connection shall be charged beginning on the date of installation. All connections will be billed continuously for the base charge even during periods of non-use, including vacancy and disconnection for nonpayment.	CMC Section 13.40.010
Meter – Reading	1. Meters shall be read as nearly as possible at regular thirty-day intervals or sixty-day intervals, and the bill rendered will be based on consumption to the nearest hundred cubic feet. 2. Other than regularly scheduled reading of water meters, water meters may be read by the city on the day a notice of change of tenancy or ownership is delivered to the city or as close as possible to such day as required in CMC 13.44.040.	CMC Section 13.40.020
Meter – Multiple - Determination	When one customer is served by more than one meter on separate service lines, the minimum for each service or the meter minimums for each meter and the surcharges for water supplied may be calculated and billed separately.	CMC Section 13.40.030

Subject	Policy	Reference
Meter – Shared - Liability	When more than one family, business or other customer receives water through one service line in one building and it is found impractical to separate the water piping for each customer, the owner of the premises shall be responsible for payment of all water served to the premises. In the event of a delinquent bill where several consumers receive water from a common service, the water superintendent shall not cause the service to be shut off until ten days after mailing written notice of such fact to all the joint consumers and owner of the premises.	CMC Section 13.40.040
Meter – Shared – Notice to separate service - Shutoff	When two or more houses, buildings or other premises occupied by separate consumers are supplied from a single-service connection, the owner or owners shall immediately, upon notice from the water superintendent, separate each customer's line and connect up to individual services and if separate services are not established within a reasonable time thereafter, the service shall be shut off and further service refused. The joint service may, however, be continued at the option of the water superintendent, providing one owner is responsible and agrees to pay the total water bill for both premises. Computation of the total bill for the services shall be by adding the total of the separate use classifications of the premises.	CMC Section 13.40.050
Charges – Meter service – Billing intervals	1. All residential and most commercial water services shall be billed at regular intervals and shall be due and payable on the twenty-first day of each month following billing. Such billings shall be delinquent on the twenty-sixth day of the month following billing. 2. All industrial and some commercial services shall be charged monthly and shall be due and payable on the tenth day of each month following billing. Such billing shall be delinquent on the eighteenth day of each month following billing. 3. A customer shall be charged the sum as per the fee schedule established by the city council per resolution for each nonsufficient fund check, or a check written on a closed account and returned by the bank to the city. 4. There shall be a penalty on all delinquent accounts assessed at the rate of five percent of the outstanding balance.	CMC Section 13.44.010
Billing liability – rental properties	1. The record owner of any real property provided utility services by the city shall be and act as the sole customer of the city. All utility services provided to the real property shall be the responsibility of the record owner of the subject property. The city shall not be responsible for unpaid billings resulting from tenants moving in or out without paying charges due, nor the collection thereof, and said charges shall be a lien on the real property until paid. 2. Except as hereinafter provided, all billings for utility services provided by the city shall be mailed to the record owner of the subject property at the record owner's address. In the event that billings are sent to a tenant or agent of the owner, the billing will become the responsibility of the tenant or agent as well as the property owner, and each can be held jointly and severally liable for such billing. 3. In the event a record owner requests billings of non-owner occupied real property be mailed to an address other than that of the record owner, including, but not limited to, any management company or to the premise address, the record owner must complete, sign, and have notarized a form provided by the finance department agreeing to the regulations and provisions associated with the request for an exception. Such form shall provide in part that the record owner agrees to be responsible for any prorating of utility billings between any tenants or lessees, any utility billings which remain unpaid, and any disconnect charges otherwise imposed pursuant to the Camas Municipal Code that may be due in the event of any delinquency associated with any tenancy.	CMC Section 13.44.015
Nonpayment—Shutoff—Hearing—Disconnection fees.	1. Whenever any charge for furnishing water and/or sewer services to any premises is not paid in full by the twenty-sixth day of the month following billing, the finance department shall give notice to the person or persons billed for such services at the address shown in the city's billing records of the city's intent to discontinue service if payment is not made. Such notice shall contain the following information: a. The amount of the charges owing. b. A statement that the person billed may request a hearing to contest the amount or validity of the charges. c. A statement that if the charges are not paid in full or a hearing requested within ten days of the notice, the city will disconnect the service of water to such premises. 2. The notice of intent to disconnect shall also contain a request for hearing form to be utilized by any person desiring to contest the amount or validity of such charges. Any person desiring such a hearing shall file the request for hearing with the finance department within ten days of the date of the notice, and shall accompany such request with a tender of the amount of charges billed. Failure to file a request for hearing and tender the amount of charges owing within such time limit shall be deemed a waiver of the right to a hearing. 3. In the event the charges are not paid, or a hearing requested accompanied with a tender of the amount owing within 10 days of the date of the date of the notice, or if the customer's check is tendered and then is returned unpaid by the bank, then the city shall proceed to disconnect the water service to the premises. 4. In the event a hearing is requested, the amount tendered by the customer shall be deposited into the customer account. If all or a portion of the charges are found not to be owing, such amount shall be refunded to the customer or credited to the customer's account. 5. Whenever a disconnection is made at the owner's request, the sum as per the fee schedule established by the city council per resolution shall be charged for the cost of disconnecting. Whenever a disconnection is made for nonpayment, the sum as per the fee schedule established by the city council per resolution shall be charged for disconnecting. 6. If service personnel is required to go to the premises for the purpose of disconnecting the service for nonpayment, the disconnection fee shall be charged even if the service has not been physically disconnected. 7. There shall be an additional charge as per the fee schedule established by the city council per resolution for each time a service is found wrongfully or illegally reconnected after being disconnected for nonpayment. 8. If a meter or spacer must be removed, padlocked, or other means used to prevent illegal reconnection of a service, then there shall be an additional charge as per the fee schedule established by the city council per resolution for removal of such meter or spacer 9. All disconnection charges and outstanding obligations for water and/or sewer furnished to such premises must be paid in full prior to reconnection. 10. If a customer's meter has been turned off for nonpayment and the customer requests reconnection after the hours of five p.m. or on a weekend or holiday, the customer shall be charged an additional turn-on fee as per the fee schedule established by the city council per resolution.	CMC Section 13.44.020

Subject	Policy	Reference
Adjustments for broken pipes	When a property owner, in any given billing period because of a broker water pipe on the owner's premises, has used, according to the meter, a quantity of water which is more than double the most recent average without leak as set forth in Section 13.64.060(A), a written application may be made to the finance director for a reduction in said billing. If the application states that the main underground service line between the meter and house or inside a crawlspace was broken on the owner's premises which caused the large consumption of water, and it is established that such broken pipe has been repaired and documentation in the form of a bill from a certified plumber or receipt for parts is attached, the finance director shall authorize a credit to such billing as follows: 1. Average water consumption will be determined by the customer's most recent winter average without leak as set forth in Section 13.64.060(A). Customers with no winter average will have the most recent two meter reads without leak used to define an average. Customers with no prior billing, or whose prior reads are zero, will use the city's default as set forth in Section 13.64.060(B). 2. The average consumption will then be deducted from the consumption which occurred at the time of the broken water pipe. 3. A credit shall be permitted only once per customer account in a five-year period. The credit shall apply to a single billing cycle and only up through the day of repair. No additional credit shall be given for a delay in repair of pipes beyond one billing period. 4. The reduction provided for by this section shall not be allowed if such excess water consumption is due to the owner's neglect or failure to repair the water system of the premises. A reduction shall not be permitted if such excess consumption is due to leaking faucets, other plumbing fixtures or irrigation systems.	CMC Section 13.44.030
Service termination	1. Each customer about to vacate any premises supplied with water service by the city shall give notice of their intended removal at least two days prior thereto; specifying the date change-in-ownership or tenancy actually occurred, otherwise, they will be responsible for all water supplied to the premises until the city water department has notice of such removal. 2. At the time specified by the customers of the termination of the service, a reading of the water meter will be made and a bill shall be rendered based on the proportionate days of usage.	CMC Section 13.44.040
Water System Development Charges	13.52.010 - Purpose. Pursuant to the authority conferred upon cities and towns by RCW 35.92.025, the city council of the city finds that property owners who seek to connect their property to the water works system of the city should be assessed a charge in order that such property shall bear its equitable share of the cost of the water works system. The city council further finds that the charge should be based upon the property owners' anticipated use of the water works system as related to the historical cost of the water works system's capacity available to meet their demands. It is the intent of the city council that the charge imposed by this chapter shall be derived from the historical cost of the system as measured by the undepreciated value of the water works system and plant in service at the time the charge is imposed and the projected cost of additions to the system to meet new demands. The charge imposed by this chapter shall be denominated a "water system development charge" and shall be in addition to any water connection, installation, or permit fees imposed by other ordinances of the city. 13.52.020 - Definitions. Unless otherwise specifically defined, the terms used in this chapter shall have the following meanings: 1. "Accessory dwelling unit" means one or more rooms with a private bath and kitchen facilities comprising an independent, self-contained dwelling unit within or attached to a single-family dwelling or in a detached building on the same lot as the primary dwelling unit. An accessory dwelling unit is distinguishable in that it is clearly subordinate to the primary dwelling unit, both in use and appearance. 2. "Industrial or unusual requirement customer" means that use classification of a nonresidential property owner who uses a meter equal to or greater than three inches in size and has a non-standard peak flow, uses a significantly large daily volume of water that is in excess of the City's typical commercial customer, or who otherwise have an unusual water usage pattern. 3. "Water system" means all facilities for collecting, transporting, pumping, treating and providing water. 13.52.030 - Imposition. 1. Except as provided herein, there is imposed on all properties in the city and all properties outside the boundaries of the city that connect to the water system of the city a water system development charge, which charge shall be assessed in accordance with the rates set forth in Section 13.52.070. 2. There shall be no water system development charge imposed for the installation of an additional meter installed to an existing residential customer service line which meter is installed for irrigation purposes. 3. Property owners that install a residential fire sprinkler system, which requires that the water meter size be increased to make the fire sprinkler system operational, shall not be charged the increased system development charge for the larger meter. 13.52.040 - Credits. 1. Development credit: a. A developer (as defined in CMC 3.88.030.K) shall be entitled to a credit against the applicable system development charge for the dedication of land or for the design or engineering or construction of an "eligible improvement". For purposes of this section, an eligible improvement shall mean an improvement or real property that is: required as a condition of development approval; identified in the water system plan or capital improvement plan; and included in the current system development charge calculation as being funded by system development charges. b. The amount of the credit shall be the dollar amount assigned to the improvement or to the land in the system development charge calculation. Where only a portion of the improvement is constructed, or a portion of the land is dedicated, the amount of the credit shall be pro-rated. c. Credits earned for one category of system development charge, e.g. water, may not be applied against a different system development charge, e.g. sewer. d. Approval from the city council shall be required prior to the start of construction or dedication of any eligible improvement. "Approval" in the context of this subsection shall be satisfied if the city requires the construction or dedication of the eligible improvement as a condition of approval for a land use application. If a developer wishes to construct an eligible improvement that is not otherwise a condition to an approved land use application, prior approval must be obtained from the city council. No system development charge credit shall be granted until either the eligible improvements have been designed, engineered, or constructed by the developer, and such work has been accepted by the city; or until the land has been dedicated by the developer and such dedication has been accepted by the city. e. If system development charges become due and payable prior to the developer becoming eligible for the issuance of credits as provided in section (4), the developer may apply to the public works director to defer collection of the charges until construction or dedication is completed. The public works director may condition deferral upon: i. The developer posting a bond or other financial security satisfactory to the city in an amount equal to one hundred twenty-five percent (125%) of the deferred system development charges, which bond or other financial security shall be conditioned upon the developer either paying the deferred system development charges or completing construction or dedication within a specified time, ii. The withholding of an occupancy permit. iii. Such other conditions acceptable to the city. f. If the developer is dissatisfied with the decision of the public works director, the developer may seek to have that decision reviewed by the city council	CMC Chapter 13.52

Subject	Policy	Reference
	2. Upon acceptance of the eligible improvement, the developer may submit an application for the system development charge credit to the public works department. After submission of the application and verification of entitlement thereto, the public works director shall submit to the City Council for concurrence. Upon ratification, the finance department shall issue a credit voucher to the developer specifying the amount of the system development charge credit and the type of credit. 3. The credit may, at the option of the developer, be applied all or in part to the system development charges owing for the developer's project. 4. To the extent the credit exceeds the amount of the system development charges owed by the developer, or the developer chooses not to apply the credit to the developer's project, the unused credit may be applied to a different project of the developer or to the project of a different developer. 5. Before the system development charge can be transferred to a different project or a different developer, the holder of the system development charge credit shall file with the finance department an application to transfer the credit on a form to be created by the finance department. The application shall identify the transferee, and the amount of the system development charge credit being transferred. The transfer application shall be accompanied by an administrative fee in an amount as may be set by resolution of the city council. 6. When credits are to be redeemed, the holder of the system development charge credit shall file an application for redemption on a form to be created by the finance department. Redemption shall be permitted only in increments equal to a whole system development charge, or when redemption will exhaust the entire system development charge credit. The application for redemption shall be accompanied by an administrative fee in such amount as may be set by resolution of the city council. When system development charge credits are being redeemed, such redemption shall not allow for system development charge credits to be pro-rated among more than one residential lot in amounts that are less than the existing system development charge per lot. For example, where system development charges are five thousand dollars per residential lot and a developer wishes to redeem eleven thousand dollars' worth of credits, the developer shall not be allowed to apply one thousand dollars per residential lot over eleven lots. The developer may apply five thousand dollars to two residential lots and the remaining one thousand dollars to one residential lot. 7. The finance department shall be responsible for maintaining appropriate records documenting the issuance, transfer, and redemption of system development charge credits. 8. Expiration of credits. Any credits issued after the effective date of this ordinance shall expire and become null and void ten years from the date of approval of the original credit by the city council. Transfer of credits or partial use of credits shall in no event extend the expiration date of those credits. 13.52.050 - Accessory dwelling units. 1. There shall be no water system development charge for connection of accessory dwelling units to the city water system. 13.52.060 - Application for connection—Use classification of property. 1. Any property owner seeking to connect his property to the water system of the city shall file with the city an application to be on a form provided by the city. The application shall contain the name and address of the property owner, the location of the property to be connected to the water system, the nature of the structure to be constructed on the subject property, the proposed use of the subject property, and any relevant information deemed necessary by the city to process the application. 2. Upon receipt of the completed application, the applicant shall then be informed by the city of the amount of the water system development charge, which shall be based upon the use classification of the property and shall be in accordance with the rates set forth in section 13.52.070. 13.52.070 - Rates. 1. The rates for water system development charges shall be determined based on the meter size installed as set forth in Table 13.52.070. 2. The water system development charge shall be indexed yearly on January 1st to address inflation based on the Engineering News Record Construction Cost Index for the City of Seattle. Effective January 1, 2020, and annually thereafter, the water system development charge shall be adjusted pursuant to the adopted cost index as set forth herein. 3. The water system development charge for properties classified as industrial or unusual requirement customer shall be based on a separate engineering study completed by the applicant and approved by the city. The factors used in the study to determine the system development charge shall include the size of meter, the average and peak volumes of water used by the customer, seasonal variations, the calculated meter customer equivalents as compared to the city's current system development charge calculation and other pertinent factors deemed necessary by the city. 13.52.080 - Payment of water system development charge. 1. The water system development charge owing under the provisions of this chapter shall be paid by the applicant at the time of issuance of the plumbing permit or building permit, whichever shall first occur, or as scheduled by a separate agreement with the city. The amount of the charge shall be based on the system development charge in effect at the time of permit application. 2. No water service shall be furnished to the property of any person seeking to connect to the water system of the city until the water system development charge imposed by this chapter has been paid to the city or until such time as the city and the applicant have entered into a separate agreement providing for the payment of such water system development charge. 13.52.090 - Revenue disposition. 1. All revenues collected pursuant to this chapter shall be paid into the water and sewer capital reserve fund and shall be used for the purpose of financing system improvements. Such revenues shall not be used to offset current operation or maintenance costs. 13.52.100 - Appeals. 1. Any applicant aggrieved by the amount of the water system development charge found by the city to be required under the provisions of this chapter, may appeal to the board of adjustment from such finding by filing a written notice of appeal with the city clerk within twenty days from the time such property owner is given notice of such amount. The chairman of the board of adjustment shall cause a notice of the time and place of hearing to be mailed to the applicant. At such hearing, the applicant shall be entitled to be heard and to introduce evidence on his own behalf. The board of adjustment shall thereupon ascertain the correct amount of the water system development charge, and the city clerk shall immediately notify the appellant thereof, by mail, which amount, together with the costs of appeal, if appellant is unsuccessful therein, must be paid within ten days after such notice is given. 2. The chairman of the board of adjustment may, by subpoena, require him to produce any pertinent books and records. Any person served with such subpoena shall appear at the time and place therein stated, and shall produce the books and records required, if any, and shall testify truthfully under oath administered by the chairman in charge of the hearing on appeal, as to any matter required of him pertinent to the appeal, and it is unlawful for him to fail or refuse to do so.	

2.7.6 Design Standards

Table 2.8 describes the City's general design standards associated with the management of the water utility and design of the water system.

Table 2.8 General Design Standards

Subject Name	Standard	Reference
Pipeline Material	Water mains shall be ductile iron.	City of Camas Water Details Water Construction Notes
Minimum Pipeline Size	Water mains shall be 8-inch diameter minimum line size. Larger line sizes may be required.	City of Camas Water Details Water Construction Notes
Valve Spacing	Valves are to be installed at all branches, for long main runs, inline valve spacing not to exceed 500 feet.	City of Camas Water Detail No. W13
Fire Hydrant Spacing	Fire hydrant spacing number and spacing shall be minimum 500 feet spacing and based on International Fire Code Appendix C, Table C.102.1.	City of Camas Code of Ordinances Chapter 17.19.040, Section C.4.a.
Fire Hydrant Specification	Hydrants shall be designed per standard detail No. W11.	City of Camas Water Detail No. W11
Looping	Water mains shall be looped wherever possible. Keep dead ends to a minimum.	City of Camas Water Details Water Construction Notes and Detail No. W13

2.7.7 Distribution System Criteria and Standards

The City's distribution system criteria and standards are summarized below in Table 2.9.

Table 2.9 Distribution System Criteria and Standards

Subject Name	Standard	Reference
Supply Components and Government Criteria	Following the Washington State DOH storage volume requirements (WAC 246-290-235(3)) and the WSDM, Chapter 9, the five components of storage listed below and illustrated in Figure 9.6 must be considered for any water system: 1. Operational storage. 2. Equalizing storage. 3. Standby storage. 4. Fire Suppression storage. 5. Dead storage.	2019 WSPU
Standby Storage	Following the Washington State DOH storage volume requirements (WAC 246-290-235(3)) and the WSDM, Chapter 9, the five components of storage listed below and illustrated in Figure 9.6 must be considered for any water system: 1. Operational storage. 2. Equalizing storage. 3. Standby storage. 4. Fire Suppression storage. 5. Dead storage.	2019 WSPU

Subject Name	Standard	Reference
Service Pressure and Fire Flow	The distribution system was evaluated for the following criteria, which match the requirements of the DOH WSDM and WAC 246-290. 1. PHD Pressure. a. Minimum allowed pressure is 30 psi during PHD. 2. Available Fire Flow. a. While delivering the required fire flow during MDD conditions, system pressures must remain above 20 psi.	2019 WSPU
Maximum Pipeline Velocities	Water main non-fire condition maximum velocity is limited to 8 feet per second according to the DOH WSDM	DOH WSDM
Minimum System Pressure	In accordance to the DOH WSDM, the City must design a water system to provide PHD while maintaining a minimum pressure of 30 psi throughout the distribution system (WAC 246-290-230(5)).	DOH WSDM
Excess Pressure	Excessive water system pressure can increase the risk of pipe failure and result in increased distribution system leakage. Working pressure in the distribution system should be limited to 80 psi unless the design engineer can justify the need for higher pressure (to reduce capital and/or pumping costs, increase fire flow reliability, or for other reasons), and verify that the pipe material is appropriate for the design working pressure.	DOH WSDM

Notes:
PHD - peak hourly demand; psi – pounds per square inch; WSDM - Water System Design Manual.

CHAPTER 3 EXISTING SYSTEM

3.1 Introduction

The City owns and operates a multi-source municipal water system (DOH) System Number 108002), which includes supply, treatment, storage, and distribution of potable water to residential and non-residential customers. Service is provided to customers across 26 pressure zones (PZ). The locations of PZ and key elements of the water system are shown in Figure 3.1. A detailed hydraulic profile of the City's water system, including each PZ are shown in Figure 3.2A and Figure 3.2B. A simplified hydraulic profile showing only key facilities and PZ is shown in Figure 3.3. This chapter reviews all of the system components incorporated in the water supply system and provides a brief summary of each facility as shown below:

- PZ.
- Sources of Supply.
- Water Treatment.
- Storage Facilities.
- Transmission and Distribution Facilities.
- BPS.
- Interties.
- SCADA.

3.2 Pressure Zones

The City's water system has 26 distinct PZ. The hydraulic profile shown in Figure 3.2A and Figure 3.2B displays how PZ are connected and illustrates water moves throughout the system between each pressure zone. Although the system has 26 distinct PZs, not all of them have separate storage facilities. A PZ that does not have a storage reservoir located in it is classified as a "closed" PZ, while a PZ that does have a storage reservoir is classified as an "open" PZ. Zones that are served by a pressure reducing valve (PRV) from a PZ with gravity storage are also classified as an "open" PZ. Table 3.1 describes each PZ, noting minimum and maximum elevations served within each zone and boundaries for each PZ are delineated in Figure 3.4.

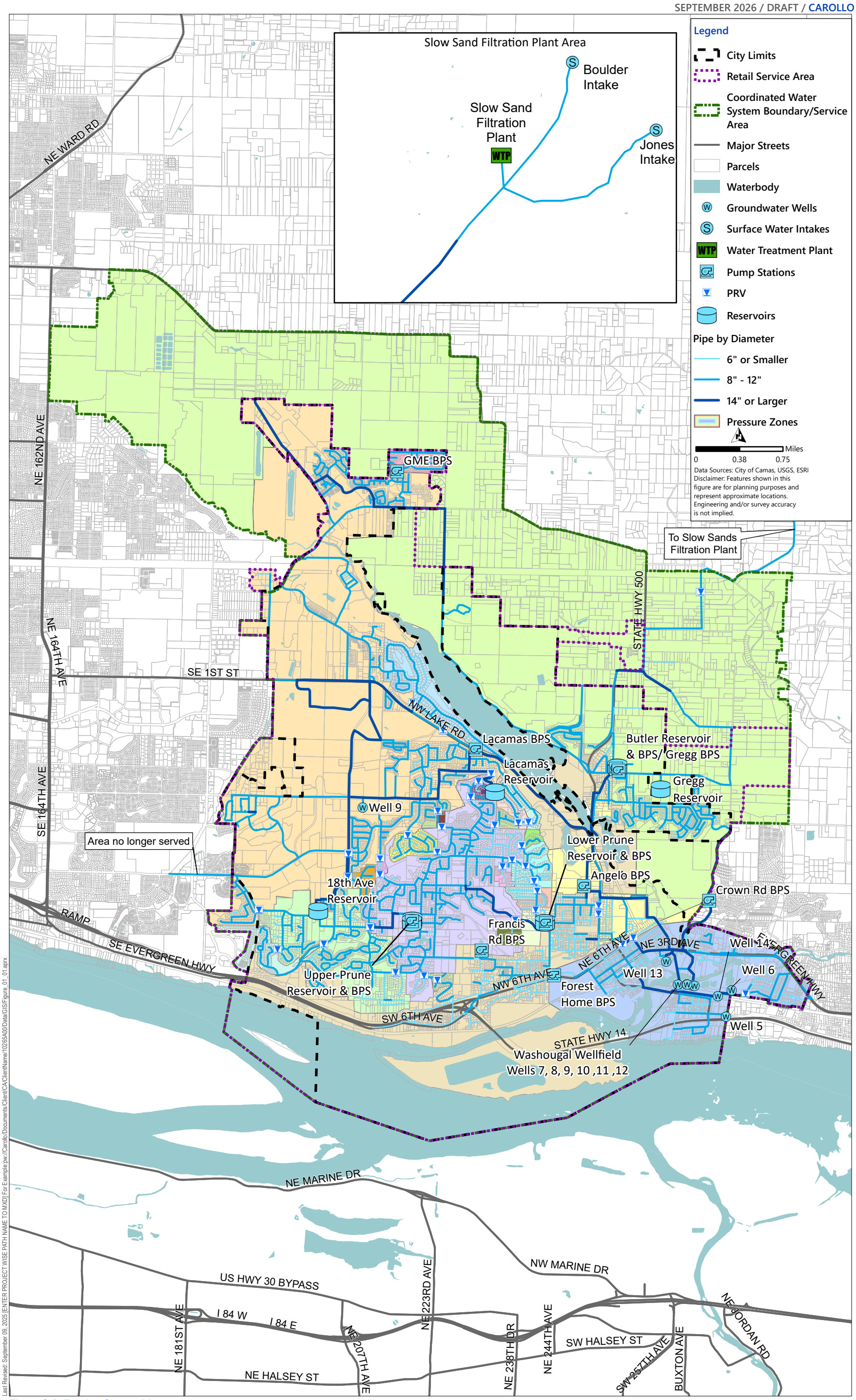
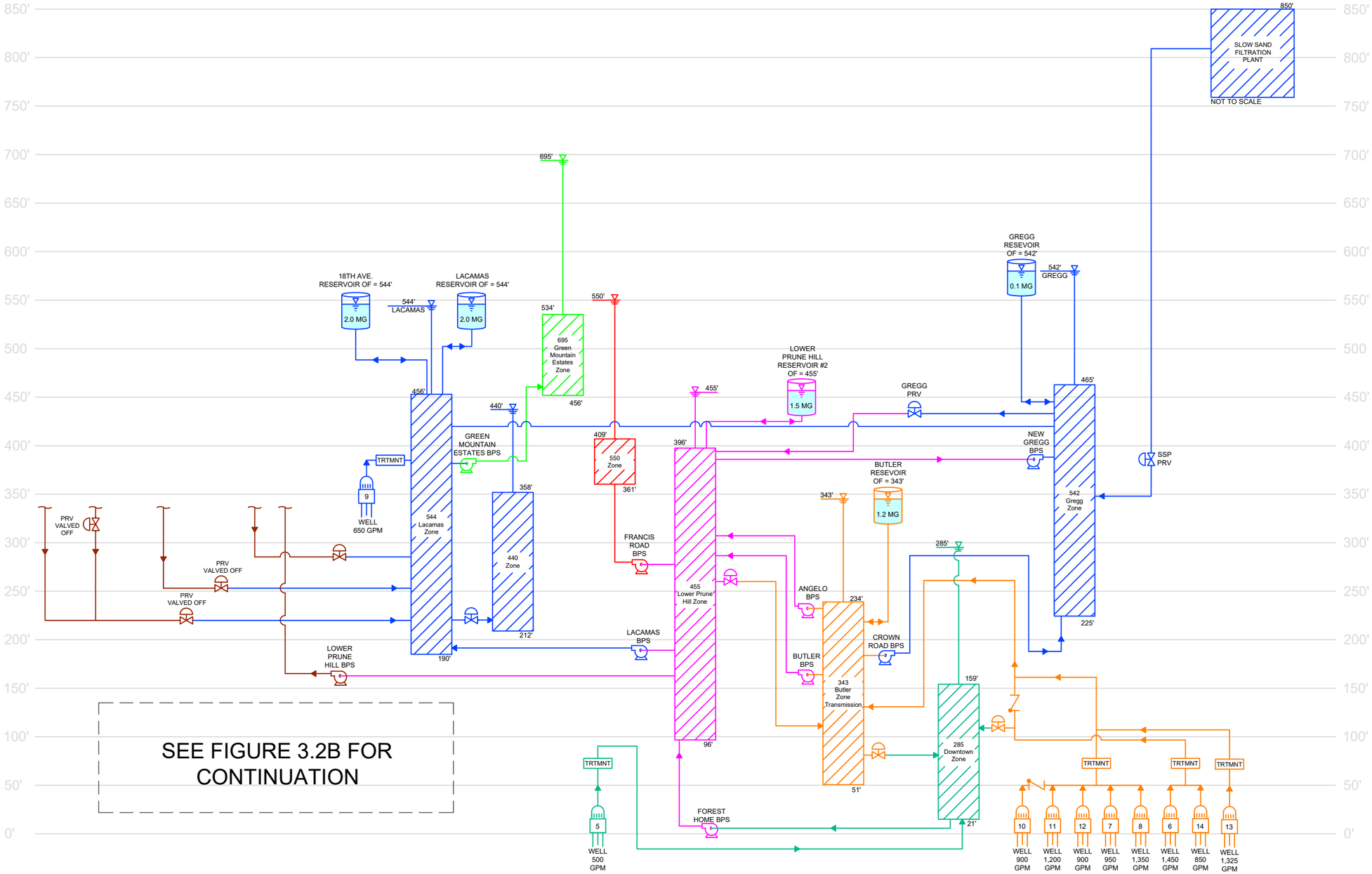


Figure 3.1 Existing System Map

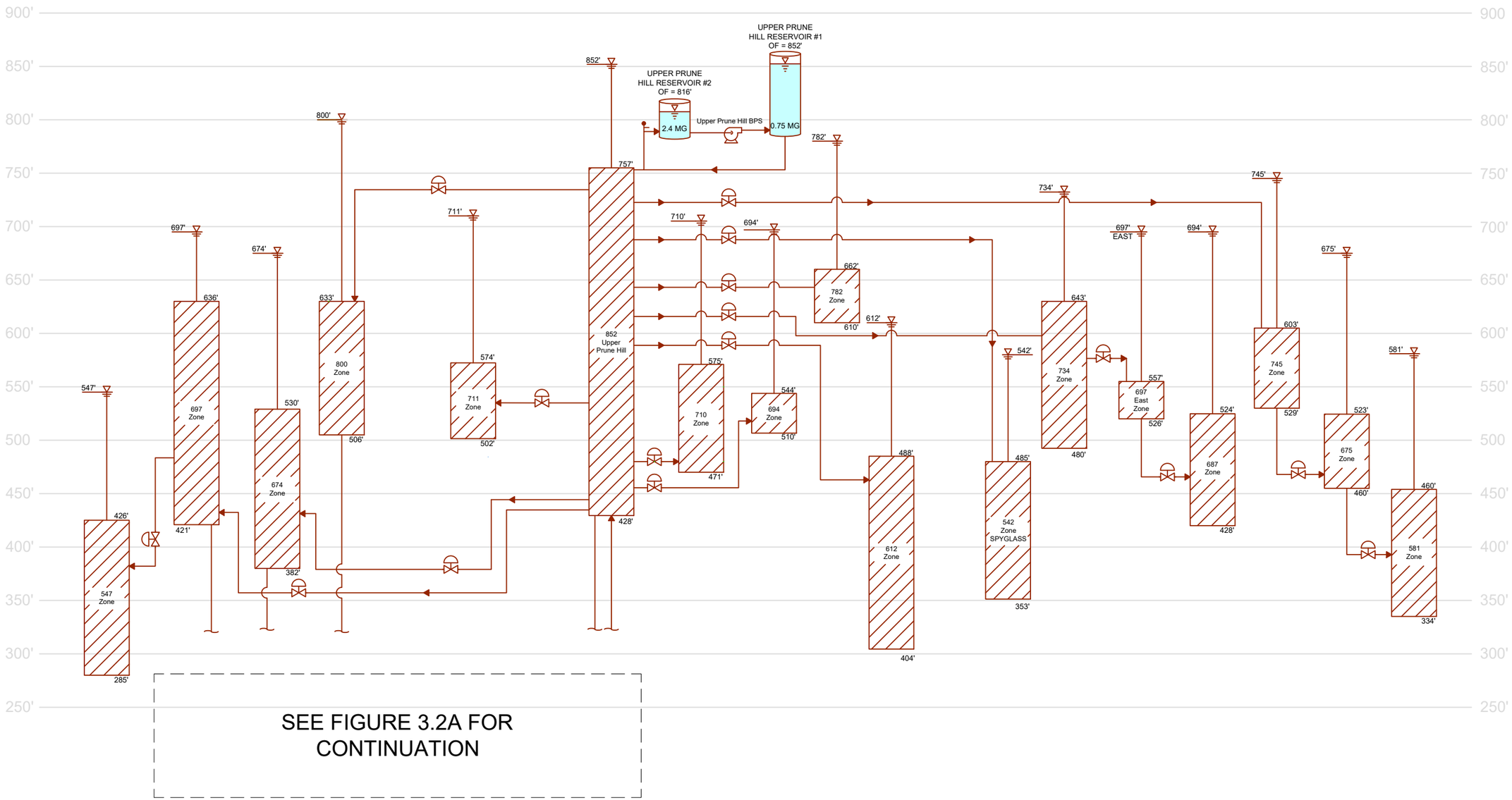


LEGEND

- RESERVOIR (1.0 MG) — VOLUME INSIDE TANK; OVERFLOW (OF) ABOVE TANK
- GROUNDWATER WELL
- BOOSTER PUMPING STATION
- PRESSURE REDUCING VALVE
- PRESSURE ZONE (HGL, HIGH, ZONE, LOW) — HIGH: HIGHEST ELEVATION SERVED IN ZONE; LOW: LOWEST ELEVATION SERVED IN ZONE; HGL: HYDRAULIC GRADE LINE FOR ZONE
- SWING CHECK VALVE
- FILL VALVE
- 285 - DOWNTOWN OPERATIONAL AREA
- 343 - BUTLER (TRANSMISSION) OPERATIONAL AREA
- 455 - LOWER PRUNE HILL OPERATIONAL AREA
- 542 - GREGG/ 544 - LACAMAS OPERATIONAL AREA
- 550 - ZONE
- 695 - GREEN MOUNTAIN ESTATES OPERATIONAL AREA
- 852 - UPPER PRUNE HILL OPERATIONAL AREA

Figure 3.2A
Simplified Hydraulic Profile Schematic
City of Camas

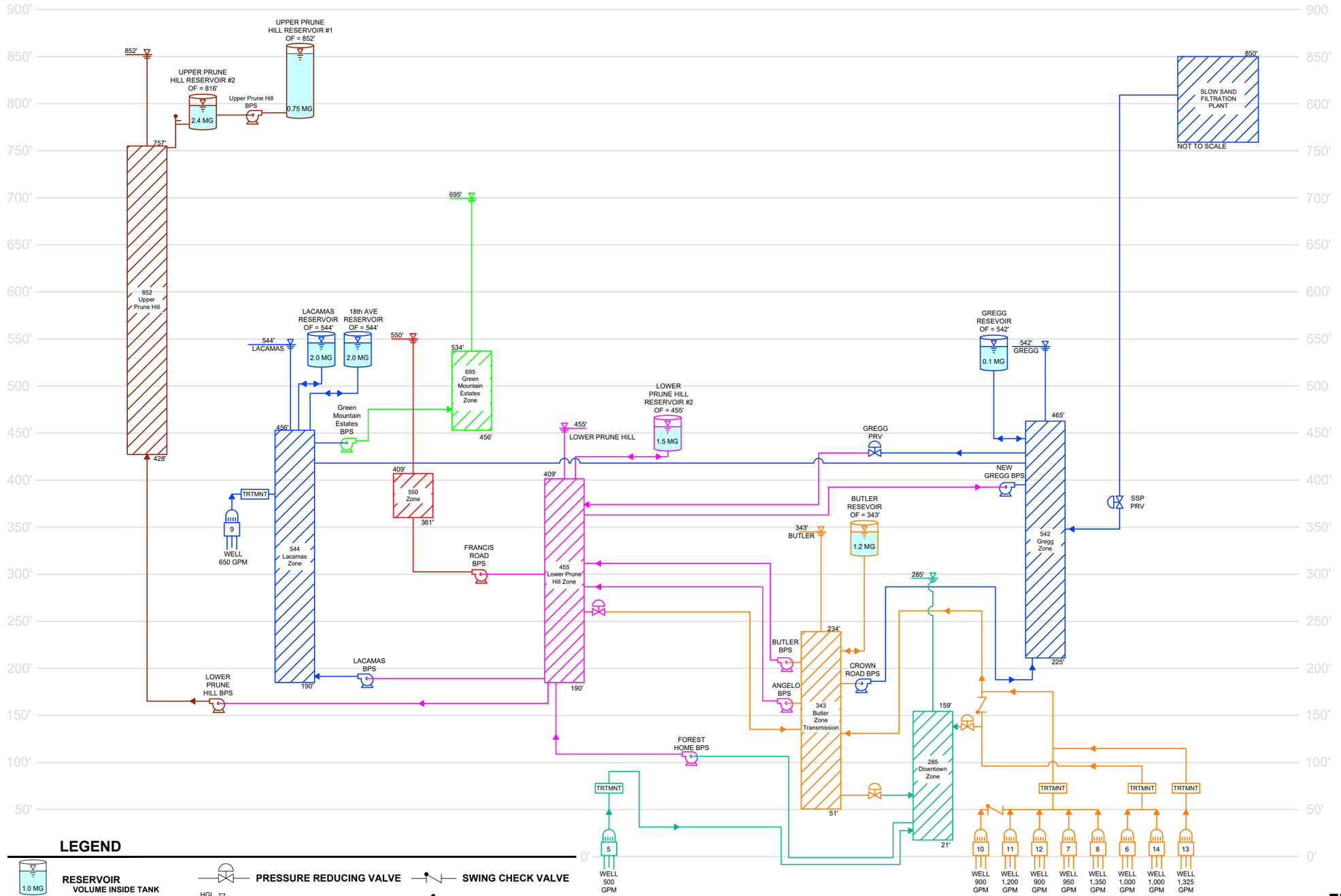
Fig_3.3-3.2A-3.2B.dwg 9/12/25 RINGLE



LEGEND

- RESERVOIR — VOLUME INSIDE TANK; OVERFLOW (OF) ABOVE TANK
- GROUNDWATER WELL
- BOOSTER PUMPING STATION
- PRESSURE REDUCING VALVE
- PRESSURE ZONE
  - HIGH: HIGHEST ELEVATION SERVED IN ZONE
  - LOW: LOWEST ELEVATION SERVED IN ZONE
  - HGL: HYDRAULIC GRADE LINE FOR ZONE
- SWING CHECK VALVE
- FILL VALVE
- 852 - UPPER PRUNE HILL OPERATIONAL AREA

Figure 3.2B
Simplified Hydraulic Profile Schematic
City of Camas



LEGEND

- RESERVOIR
  - VOLUME INSIDE TANK
  - OVERFLOW (OF) ABOVE TANK
- GROUNDWATER WELL
- BOOSTER PUMPING STATION
- PRESSURE REDUCING VALVE
- PRESSURE ZONE
  - HIGH: HIGHEST ELEVATION SERVED IN ZONE
  - LOW: LOWEST ELEVATION SERVED IN ZONE
  - HGL: HYDRAULIC GRADE LINE FOR ZONE
- SWING CHECK VALVE
- FILL VALVE
- 285 - DOWNTOWN OPERATIONAL AREA
- 343 - BUTLER (TRANSMISSION) OPERATIONAL AREA
- 455 - LOWER PRUNE HILL OPERATIONAL AREA
- 542 - GREGG/ 544 - LACAMAS OPERATIONAL AREA
- 550 - ZONE
- 695 - GREEN MOUNTAIN ESTATES OPERATIONAL AREA
- 852 - UPPER PRUNE HILL OPERATIONAL AREA

Figure 3.3
Simplified Hydraulic Profile Schematic
City of Camas

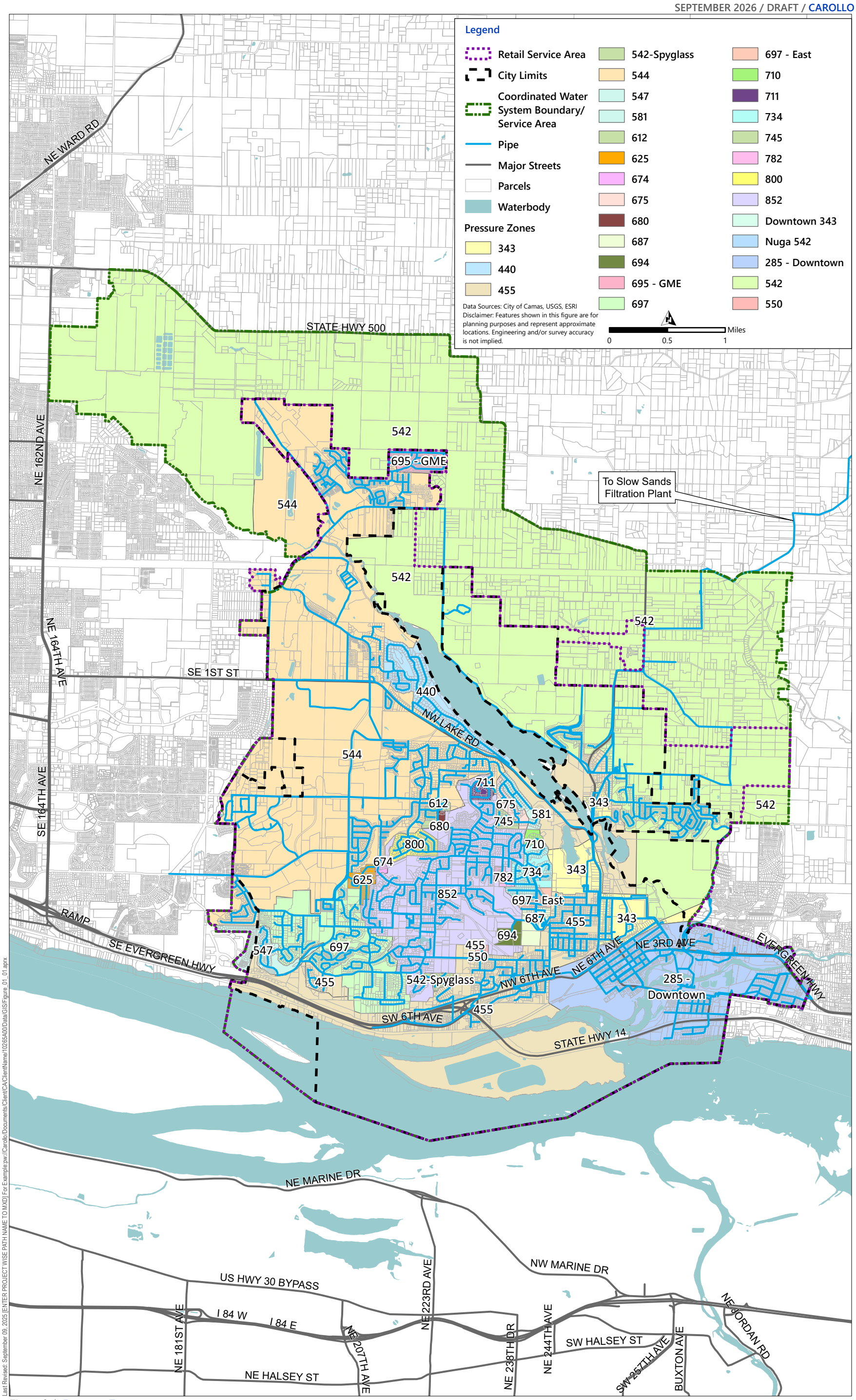


Figure 3.4 Pressure Zones

Table 3.1 Pressure Zones

Zone ID[1] (feet)	Supplying Pressure Zone	Open or Closed?	Minimum Elevation[2][3] (feet)	Maximum Elevation[2][3] (feet)
285 - Downtown	343 – Butler (Transmission)	Open	21	159
343 - Butler (Transmission)	N/A	Open	51	234
455 - LPH	N/A	Open	96	409
542 - Gregg	N/A	Open	225	465
544 - Lacamas	N/A	Open	190	456
440 - Lacamas Shores	544 – Lacamas	Open	212	358
852 - UPH	N/A	Open	428	757
542 - Spyglass	852 - UPH	Open	353	485
547	852 – UPH	Open	285	426
550	455 - LPH	Closed	361	409
581	852 – UPH	Open	334	460
612	852 – UPH	Open	404	488
625	852 – UPH	Open	399	549
674	852 – UPH	Open	382	530
675	852 – UPH	Open	460	523
687	852 – UPH	Open	428	524
694	852 – UPH	Open	510	544
695 - GME	542 – Gregg / 544 - Lacamas	Closed	456	534
697	852 – UPH	Open	421	636
697 - East	852 – UPH	Open	526	557
710	852 – UPH	Open	471	575
711	852 – UPH	Open	502	574
734	852 – UPH	Open	480	634
745	852 – UPH	Open	529	603
782	852 – UPH	Open	610	662
800	852 – UPH	Open	506	633

Notes:
(1) Zone ID is based on HGL.
(2) Elevation data based on interpolation of 3 foot contours.
(3) Location of service connections based on hydraulic model junction location.
GME - Green Mountain Estates; HGL - hydraulic grade line; LPH - Lower Prune Hill; N/A - not applicable; UPH - Upper Prune Hill.

3.3 Sources of Supply

The City currently obtains its water from ten groundwater wells and two surface water sources. Nine of the ten groundwater sources are located in the downtown area, in the Downtown 285 Zone, and Well 9 is

located in the Lacamas 544 Zone. The City's seasonal surface water sources are from Jones and Boulder Creeks to the north of the City as shown in Figure 3.1.

3.3.1 Surface Water Sources

Jones Creek has been providing the City of Camas with water since 1913. The Boulder Creek source was added in 1931. The intakes at Boulder and Jones Creeks consist of small settling basins and screens. Surface water sources may be operated between November 1st and May 15th. Seasonal raw water from the Boulder and Jones Creek intakes is conveyed to the recently constructed slow sand filtration treatment plant (SSF Plant) where the water is filtered prior to chemical treatment and discharge to the distribution system.

The SSF Plant has the capacity to treat the entire permitted flow of 1,570 gpm from the City's surface water sources. The surface water sources have lower operating expenses because they can provide flow toward two PZ without pumping, and have low silica content, which makes these sources more desirable to light industrial customers and their water quality sensitive industrial processes. However, these surface water sources are not available during peak water demand months. The City calls its groundwater sources only after demands cannot be met by production from the SSF Plant.

3.3.2 Groundwater Sources

The City currently operates ten groundwater wells. All of these wells are physically located in the Downtown 285 Zone except for Well 9. Wells 7, 8, 10, 11, and 12 are located on SE 6th Avenue, in the eastern downtown area, and are referred to as the Washougal Wellfield. Wells 6 and 14 are located further east along SE 6th Avenue near the Camas/Washougal border. The wellfield supply is conveyed across the Washougal River via a 14-inch diameter steel line under the river and a 24-inch diameter ductile iron (DI) pipe on a bridge over the river. The two pipes join, and an 18-inch diameter 343 Zone transmission line carries water from the Washougal Wellfield up toward the Angelo BPS. Well 5 is located south of Well 6 on SE 8th Street and pumps directly into the Downtown 285 zone. Well 13 is located in the Downtown 285 Zone on SE Cramer Lane and pumps into the same 18-inch diameter transmission line as the Washougal Wellfield. Well 9 is located in the 544 Zone on NW 38th Avenue near Parker Street. Table 3.2 lists the City's groundwater sources and the typical pumping rates observed in SCADA data. The City is currently investigating additional groundwater sources within its service area in anticipation of future demands.

Several of the City's groundwater sources must be operated with a booster pumping station in service to prevent over pressurization:

- When Well 5 is called into service, the Forest Home BPS must also be called on to prevent over-pressurization of the downtown zone.
- Washougal Wellfield operations are matched by pumping at the Angelo BPS. For each well that is called on at the wellfield, for up to four total wells, a corresponding pump must be called on at the Angelo BPS. The City will be adding a 5th temporary pump as a backup to the four pumps at Angelo while an additional booster station is designed and construction along Lake Road.
- There are currently piping restrictions that prevent the City from operating Well 6 and Well 14 at the same time. A planned waterline project to connect these wells to allow them to operate at the same time will be completed by the summer of 2026.

Table 3.2 Groundwater Sources

	Depth(1) (feet)	Rated Capacity (gpm)	Motor (hp)	Casing (inch)	Control Valve	Auxiliary Power
Well 5	71	675	75	8	3-inch waste valve	No
Well 6	85	1,200	150	16	4-inch waste valve	No
Well 7	84	950	100	14	3-inch waste valve	No
Well 8	87	1,250	150	14	4-inch waste valve	Yes
Well 9	253	575	100	16	4-inch waste valve	No
Well 10	92	900	150	16	8-inch	No
Well 11	106	1,000	150	16	8-inch	Yes
Well 12	106	1,000	150	16	8-inch	Yes
Well 13	103	1,350	200	20	8-inch	Yes
Well 14	75	850	200	20	8-inch	Yes
Total Groundwater Source Capacity				9,750 gpm		

Notes:
(1) Drilled depth of completed well below ground surface.
hp - horsepower.

3.4 Water Treatment

The City currently has approximately 15.5 million gallons per day (mgd) of total source water treatment capacity. A discussion of the treatment facilities is provided in the following sections. A summary of treatment facilities is provided in Table 3.3 and facility locations are shown in Figure 3.1.

3.4.1 Surface Water

The City's surface water is chlorinated and filtered. Chlorination of the surface water occurs at the City's slow sand facility with 0.840 percent sodium hypochlorite. The distance between the slow sand plant and the first customer provides 2.5 hours of CT.

In 2013, the City began construction of the SSF Plant. This plant has a design capacity of 1,570 gpm and filter beds are comprised entirely of sand. The City also treats with sodium fluoride for dental benefits.

3.4.2 Groundwater

Treatment of the City's groundwater sources includes on-site chlorination, fluoridation, and caustic soda addition. A single chemical feed facility provides treatment for Wells 7, 8, 10, 11, and 12 due to their proximity to one another. Water from Wells 6 and 14 are treated at the Well 14 site. The remaining wells each have individual treatment facilities at the well locations. Fluoridation always occurs downstream of the well pump and sodium fluoride is used at all facilities. Sodium hydroxide, also known as caustic soda, is added for corrosion control at each of the treatment facilities except for Well 9 due to natural pH. The existing treatment facilities for the City's sources are shown in Table 3.3. The residual chlorine target for all facilities is 0.8 milligrams per liter (mg/L) with alarms if the concentration is above 2 mg/L or below 0.2 mg/L. The fluoridation target for all facilities is 0.7 mg/L for all facilities with alarms if the concentration is above 2.5 mg/L or below 0.25 mg/L.

Table 3.3 Treatment Facilities

Treatment Facility	Sources Treated	Filtration	Chemical Addition
SSF Plant	Boulder Creek, Jones Creek	Yes	▪ Sodium Hypochlorite ▪ Sodium Hydroxide ▪ Sodium Fluoride
Washougal Wellfield - Site 519	Well 7, Well 8, Well 10, Well 11, and Well 12	No	▪ Sodium Hypochlorite ▪ Sodium Hydroxide ▪ Sodium Fluoride
Well 14 - Site 518	Well 6 and Well 14	No	▪ Sodium Hypochlorite ▪ Sodium Hydroxide ▪ Sodium Fluoride
Well 13 Site	Well 13	No	▪ Sodium Hypochlorite ▪ Sodium Hydroxide ▪ Sodium Fluoride
Well 9 Site	Well 9(1)	No	▪ Sodium Hypochlorite ▪ Sodium Fluoride
Well 5 Site	Well 5	No	▪ Sodium Hypochlorite ▪ Sodium Hydroxide ▪ Sodium Fluoride

Notes:
(1) Well 9 pH is above the treatment limit.

3.4.3 Groundwater Under the Direct Influence of Surface Water

The federal definition of ground water under the direct influence of surface water (GWI) is a groundwater source located near a surface water such that it has significant occurrence of contamination from pathogens such as Giardia lamblia which is not normally found in groundwater. A GWI receives direct surface water recharge and is subject to rapid changes in water characteristics that correlate to surface water conditions. Sources determined as GWI are required to achieve 99.9 percent removal of Giardia lamblia and viruses by filtration and disinfection.

A hydraulic connection to nearby surface water is a potential GWI source. In order to determine if a hydraulic connection exists, a water system may conduct a hydrogeologic investigation or use the water quality monitoring (WQM) method. The WQM method requires monitoring the groundwater and surface water source for 1 year for temperature and conductivity. If a significant correlation is determined from statistical analysis of the data, then the source is determined to be hydraulically connected to surface water. Less demanding requirements are required for hydraulically connected sources. These include eliminating the surface water influence, developing an alternate source, meeting criteria to remain unfiltered, or installing filtration.

A microscopic particulate analysis (MPA) is conducted in order to determine if a groundwater source is a GWI source. The City has completed MPA testing on Wells 6, 7, 8, 10, 11, 12, and 14 which indicate that these sources are hydraulically connected to surface water. Therefore, these sources are required by DOH to achieve a CT of 6. An evaluation by Pacific Groundwater Group in 2006 states that Well 13 is not under the direct influence of surface water but is hydraulically connected to surface water. Wells 5 and 9 are not hydraulically connected to surface water, so no CT is required.

3.5 Storage Facilities

The City currently maintains and operates seven storage facilities with a combined total of 9.95 MG. A discussion of each storage facility is provided in the following sections. A summary of the storage facilities is provided in Table 3.4. A map showing the location of the key elements of the City's water system is provided as Figure 3.1.

Table 3.4 Existing Storage Facilities

Reservoir	Capacity (MG)	Diameter (feet)	Base Elevation (feet)	Overflow Elevation (feet)	Year Constructed and Type
Butler	1.2	100x100	328	343	1913, Concrete
LPH No. 2	1.5	105	432	455	1971, Concrete
UPH No. 1	0.75	36	752	852	1971, Steel
UPH No. 2	2.4	78	748	816	2002, Steel
Gregg	0.1	16	472	542	1978, Steel
Lacamas	2.0	84	496	544	1993, Steel
18th Avenue	2.0	94	504	547	2020, Steel

3.5.1 Butler Reservoir

The Butler Reservoir consists of two adjacent, partially buried concrete reservoirs. The two reservoirs share a common wall, with the north half being constructed in 1913, and the south half being completed in 1923. The reservoirs are covered and have a total storage capacity of 1.2 MG. The base elevation of the reservoir is approximately 328 feet, and the overflow elevation is 343 feet. The entire capacity of the Butler Reservoir is usable storage. Under normal operating conditions, the Butler Reservoir is supplied through 6,420 lineal feet of 12-inch diameter cast iron (CI) transmission main. This transmission main connects with the 18-inch diameter main from Wells 6, 7, 8, 10, 11, 12, 13, and 14 at NE 22nd Avenue and NE Everett Street. The Butler Reservoir is shown in Figure 3.5 and capacity details are summarized in Table 3.4.



Figure 3.5 Butler Reservoir

3.5.2 Gregg Reservoir

The Gregg Reservoir, a 100,000-gallon capacity steel standpipe, was constructed in 1978. It has a base elevation of approximately 472 feet, an overflow elevation of 542 feet, and is the only storage facility for the 542 Zone. The reservoir provides equalization and operational storage for the 542 Zone but does not provide fire suppression storage. Fire flow demand is instead supplied by the two 1,500 gpm fire pumps at the New Gregg BPS. The Gregg Reservoir is typically supplied by a small jockey pump at the New Gregg BPS and the Crown Road BPS. The Gregg Reservoir can also be supplied by the City's SSF Plant, when it is operated during the winter months. The Gregg Reservoir is shown in Figure 3.6 and capacity details are summarized in Table 3.4.



Figure 3.6 Gregg Reservoir

3.5.3 Lacamas Reservoir

The Lacamas Reservoir, constructed in 1993, has a total capacity of 2.0 MG. It has a base elevation of approximately 496 feet, and an overflow elevation of 544 feet. The Lacamas Reservoir is a ground level reservoir. The Lacamas Reservoir is primarily supplied from the LPH Zone via the Lacamas BPS or from Well 9. PRV stations from the UPH zone can also provide fire flow to the Lacamas Zone. The Lacamas Reservoir is shown in Figure 3.7 and capacity details are summarized in Table 3.4.



Figure 3.7 Lacamas Reservoir

3.5.4 18th Avenue Reservoir

The 18th Avenue Reservoir, constructed in 2020, is a ground level steel reservoir that has a total capacity of 2.0 MG. It has a base elevation of approximately 504 feet and an overflow elevation of 547 feet. The 18th Avenue Reservoir is primarily supplied by the Lacamas Reservoir through a fill valve that opens once the Lacamas Reservoir is full. The 18th Avenue Reservoir is shown in Figure 3.8 and capacity details are summarized in Table 3.4.



Figure 3.8 18th Avenue (Anderson) Reservoir

3.5.5 Lower Prune Hill Reservoirs

Storage in the LPH Zone is currently provided by a single concrete ground level reservoir (LPH Reservoir 2) with a base elevation of 423 feet and overflow elevation of 455 feet. LPH reservoir 2 was constructed in 1971 and has a total capacity of 1.5 MG. LPH Reservoir 1, a 0.5 MG concrete ground level reservoir

originally constructed in 1935 was recently taken offline to be replaced. Once construction is completed, the new welded steel reservoir will provide an additional 0.57 MG of storage and will be plumbed together with LPH Reservoir 2 to act as one reservoir, increasing total storage capacity for the LPH Zone to 2.07 MG. Storage in the LPH Reservoir is accessible via gravity to the 455 Zone, or is pumped to the UPH Zone through the LPH BPS. Under normal system operation, water from the SSF Plant supplies the 455 Zone and the reservoirs. The 455 Zone can also be supplied through pumping from the 343 Zone via the Forest Home, Butler, and Angelo BPS. The LPH Reservoirs can also supply the 544 Zone through the Lacamas BPS. When SSF is running the surface water can supply the 544 Zone through Lacamas BPS. The LPH Reservoir 2 is shown in Figure 3.9 and capacity details are summarized in Table 3.4.



Figure 3.9 LPH Reservoirs

3.5.6 Upper Prune Hill Standpipe and Reservoir

The UPH Reservoir 1 and Reservoir 2 were constructed in 1971 and 2001, respectively. Reservoir 1 has an overflow elevation of 852 feet, stands 100-feet tall, and has a total capacity of 0.75 MG. This reservoir sets the HGL for the 852 Zone. The UPH Reservoir 2 is below the HGL of the 852 Zone and serves the zone by pumping through the UPH BPS to the UPH Reservoir 1. It has an overflow elevation of 816 feet, stands 68-feet tall, and has a total capacity of 2.4 MG. The BPS has a total pumping capacity of 2,900 gpm. Including the standpipe and reservoir, the 852 Zone is supplied by the LPH BPS, 12-inch diameter transmission line, and 16-inch diameter Ostenson Canyon transmission line. The UPH Reservoirs are shown in Figure 3.10 and capacity details are summarized in Table 3.4.



Figure 3.10 UPH Reservoirs

3.6 Pipe Network

The City owns over 159 miles of pipe in its distribution system. An inventory of existing pipelines in the system, as reported from the City's hydraulic model, is summarized in Table 3.5. The system is predominately looped and located within public rights-of-way, giving the City access for repair and maintenance. The City replaces aging and undersized pipes to serve the City's growing demands on an ongoing basis. Pipe materials within the City currently include the following:

- CI Pipe.
- Polyvinyl chloride (PVC) Pipe.
- DI Pipe.
- Steel (ST) Pipe.

Table 3.5 Pipe Diameter and Material

Diameter	DI (feet)	CI (feet)	ST (feet)	PVC (feet)	Unknown	Total (feet)	Percent
6-inch	77,204	69,979	20,210	903	9,108	180,065	21%
8-inch	156,044	20,937	7,943	0	7,943	365,424	43%
10-inch	7,560	0	2,014	0	10,690	20,264	2%
12-inch	67,301	21,432	1,922	3,891	63,523	162,810	19%
14-inch	11,923	0	6,934	5,037	7,207	32,881	4%
16-inch	1,170	2,467	0	0	9,641	13,278	2%
18-inch	37,679	0	179	0	12,394	50,251	6%
20-inch	0	0	0	1,859	57	57	< 1%
24-inch	1,817	0	0	0	14,455	16,272	2%
Total	360,697	114,815	39,203	11,612	277,723	841,303	100%
Percent	43%	14%	5%	1%	33%	100%	

3.7 Pressure Reducing Stations

The City maintains numerous pressure reducing stations as shown in Table 3.6 and Figure 3.1 to help maintain pressure in low elevations and minimize potential risks from high pressures. In most cases, there are two PRVs at each station. The smaller valve operates to provide the average daily demand to the zone that it serves. The larger valve, which is generally set 5 psi lower than the small valve, is primarily used for fire protection or large demand situations. The City's PRVs have pressure sustaining features, which are set to ensure that upstream pressures are maintained. The City has a contract with GC Systems to service the 71 PRVs located within the water system. This contract allows GC Systems to perform general maintenance and ensure that the valves are operating correctly, both on an individual and system-wide level.

Table 3.6 PRV

PRV Station	PRV Model ID	Size (inches)	Downstream Zone	Downstream Setting (psi)	Upstream Pressure (psi)
NW McIntosh	PRV-1	6	697	27	120
	PRV-2	2	697	32	120
NW Payne Road. and SE 201st Avenue	PRV-3	8	544	Closed	Closed
	PRV-4	4	544	Closed	Closed
NW 16th Avenue and Klickitat	PRV-5	10	697	12	105
	PRV-6	4	697	22	105
NW Ivy and Fargo	PRV-7	4	734	45	90
NW 22nd and Fargo	PRV-8	4	697E	65	130
NW 19th Avenue and Fargo	PRV-9	6	687	70	157
NE 21st and Everett	PRV-10	8	343	45	110
NE 19th and Everett	PRV-11	6	343	40	110
2349 NW 32nd Circle	PRV-12	8	680	25	120
	PRV-13	2	680	30	120
NW Brady Road and Deer Creek	PRV-14	8	547	25	105
	PRV-15	3	547	30	105
NW Parker Street and Linear	PRV-16	8	544	Closed	Closed
NW Astor and 36th (Applewood)	PRV-17	8	612	55	90
	PRV-18	2	612	65	90
NW 43rd and Sierra	PRV-19	8	544	30	190
NW 23rd Avenue and Fargo	PRV-20	4	734	45	130
2666 NW Logan Street off NW 28th	PRV-21	6	782	50	90
	PRV-22	2	782	55	90
2929 NW 31st and NW Dahlia Drive	PRV-23	6	544	Closed	Closed
	PRV-24	2	544	Closed	Closed
NW 29th Avenue and NW Astor Street	PRV-25	2	800	58	90
	PRV-26	6	800	53	90
NW Sierra Drive and NW 38th Avenue	PRV-27	6	711	35	115
	PRV-28	2	711	40	115
Currawong Court and NW 40th Avenue	PRV-29	6	711	75	145
	PRV-30	2	711	80	145
NW 23rd Avenue and Iris	PRV-31	8	656	58	130
	PRV-32	2	656	63	130
NW Julia Street	PRV-33	8	544	Closed	Closed
	PRV-34	2	544	Closed	Closed
NW Fern Ridge Drive	PRV-35	2	547	40	110
	PRV-36	8	547	35	110
NE 6th and NE Hayes Street	PRV-37	4	343	68	94
	PRV-38	12	343	58	94

PRV Station	PRV Model ID	Size (inches)	Downstream Zone	Downstream Setting (psi)	Upstream Pressure (psi)
East End Walden	PRV-41	2	442	37	84
	PRV-42	6	442	32	84
West End Walden	PRV-43	1.5	442	72	118
	PRV-44	6	442	67	118
NE 6th and Joy	PRV-45	6	343	55	92
Goot Park	PRV-46	3	343	115	138
	PRV-47	10	343	110	138
Lake Ridge Lower	PRV-48	2	581	55	98
	PRV-49	6	581	50	98
Lake Ridge Middle	PRV-50	2	675	63	91
	PRV-51	6	675	58	91
Lake Ridge Upper	PRV-52	2	745	68	123
	PRV-53	6	745	63	123
702 NW View Ridge Strett (Dovehill) Upper	PRV-54	2	542S	30	100
	PRV-55	6	542S	25	100
NW 7th and Valley (Dovehill) View Ridge Lower	PRV-56	2	542S	40	110
	PRV-57	6	542S	35	110
NW Fargo and 27th (Drewf's Farm Upper)	PRV-58	2	734	Open	63
	PRV-59	6	734	Open	63
905 NW 30th Avenue and NW Ivy Lane (Drewf's Farm Lower)	PRV-60	2	710	60	130
	PRV-61	6	710	55	130
NW Ivy and Ostenson Canyon	PRV-62	2	694	65	140
	PRV-63	6	694	60	140
NW 24th Avenue and NW Brady Road	PRV-64	6	625	70	124
	PRV-65	2	625	75	124
2011 NW Larkspur Street	PRV-66	6	625	45	132
	PRV-67	2	625	50	132
Wellfield East	PRV-69	12	343	100	125
	PRV-70	4	343	Closed	Closed
NE 277th and NE 14th Street	PRV_SSP	6	542	78	140
	V9093	3	542	88	140

3.8 Booster Pumping Stations

The City currently maintains and operates ten booster pumping stations to move water between PZ. A description of each BPS is included in the following sections. Table 3.7 provides a summary of each pump station and details the rated capacity of each pump. Locations for each of the City's BPS are shown in Figure 3.1.

Table 3.7 BPS Summary

Name	From Zone	To Zone	Year Constructed	Auxiliary Power	Pump Information		
					Pump No.	Power (hp)	Design Capacity (gpm)
Angelo BPS	343 Transmission	455 - LPH	2001	Yes	1	75	1,000
					2	75	1,000
					3	75	1,000
					4	75	1,000
Butler BPS	343 – Transmission	455 - LPH	1948(2)	No	1	50	800
					2	60	600
Crown Road BPS	343 – Transmission	542 - Gregg	2011	Yes	1	75	800
					2	75	800
					3	75	800
Forest Home BPS	343 - Lower (Downtown)	455 - LPH	1949(3)	No	1	50	1,000
GME BPS	544 - Lacamas	695 - GME	2023	Yes		15	180
					2	15	180
					3	15	180
					4	60	650
					5	60	650
New Gregg BPS	455 - LPH	542 - Gregg	2003	Yes	1	100	1,500
					2	100	1,500
					3	15	500
Lacamas BPS	455 - LPH	544 - Lacamas	1993	Yes	1	25	500
					2	25	500
					3	100	1,500
LPH BPS	455 - LPH	852 - UPH	1971(4)	Yes	1	150	1,000
					2	150	1,000
					3	100	750
UPH BPS	852 - UPH	852 - UPH	2002	Yes	1	20	750
					2	20	750
					3	40	1,400
					4	40	1,400
Francis Road BPS	455 - LPH	550	1942	No	1	7.5	80

Notes:
(1) Source: The City.
(2) Pumps were replaced in 1998.
(3) Pump was replaced in 1999.
(4) Pumps were replaced in 2002 and 2004.

3.8.1 Butler Booster Pump Station

The Butler BPS is located at the Butler Reservoir site and pumps from the 343 Zone to the 455 Zone. The Butler BPS has one end suction centrifugal 50-hp pump and one end suction centrifugal 40-hp pump that are capable of supplying 800 and 600 gpm, respectively. When one of the larger two pumps in the New Gregg BPS is called on, one of the Butler pumps is also turned on to feed the 14-inch diameter suction line of the New Gregg BPS. This station does not have the capacity for an additional pump. Figure 3.11 shows the interior of the Butler BPS and capacity details are summarized in Table 3.7.



Figure 3.11 Butler BPS

3.8.2 New Gregg Booster Pump Station

The New Gregg BPS is also located at the Butler Reservoir site and pumps water from the 455 Zone to the 542 Zone. The New Gregg BPS is equipped with two 100-hp double end suction split case pumps, each with a capacity of 1,500 gpm. In 2013 a third 500 gpm pump was added for domestic service and to maintain the level in the Gregg Reservoir. The two larger pumps are typically only called on when fire flow demands occur. The New Gregg BPS has suction side flow limitations due to insufficient head provided by the Butler Reservoir. When one of the larger two pumps in the New Gregg BPS is called on, a pump in the Butler BPS must also be called on to supply adequate pressure for the Station's 14-inch diameter suction line. Figure 3.12 shows the interior of the New Gregg BPS and capacity details are summarized in Table 3.7.





Figure 3.12 New Gregg BPS

3.8.3 Forest Home Booster Pump Station

The Forest Home BPS, located at 418 NW 10th Avenue, pumps from the Downtown 343 Zone to the 455 Zone. This station contains one pump with a rated capacity of 1,000 gpm. When Well 5 is called into service, this BPS is also called on to prevent over-pressurization of the Downtown 285 Zone. Figure 3.13 shows the Forest Home BPS and capacity details are summarized in Table 3.7.



Figure 3.13 Forest Home BPS

3.8.4 Lower Prune Hill Booster Pump Station

The LPH BPS is located at the LPH Reservoir site and pumps water from the 455 Zone to the 852 Zone. This station has three pumps with two 150-hp split case double end suction pumps capable of providing 1,000 gpm each and a 100-hp vertical turbine pump capable of providing 750 gpm for a total rated station capacity of 2,500 gpm. This station has does not have capacity for an additional pumping unit. With the improvements to LPH Reservoir 1, the City is also replacing the LPH BPS. Construction is expected to be completed in 2026. Once operational, the new LPH BPS will utilize three 250-hp vertical turbine pumps capable of providing 1,600 gpm each to supply the 852 Zone. The upgrades at LPH BPS will increase the total station capacity to 4,800 gpm. The LPH BPS is shown in Figure 3.14 and current capacity details are summarized in Table 3.7.



Figure 3.14 LPH BPS

3.8.5 Lacamas Booster Pump Station

The Lacamas BPS, located at 4620 NW Sierra Street, pumps water from the 455 Zone to the 544 Zone. This station has two 25-hp turbine pumps that are capable of supplying 500 gpm each and one 100-hp turbine pump equipped with a VFD capable of supplying up to 1,500 gpm. The VFD is required for the largest pump due to suction side limitations. The Lacamas BPS is shown in Figure 3.15 and capacity details are summarized in Table 3.7.



Figure 3.15 Lacamas BPS

3.8.6 Angelo Booster Pump Station

The Angelo BPS is located at Fallen Leaf Park and is the primary BPS supplying the 455 Zone. It pumps from the 18-inch diameter transmission main in the 343 Zone to serve the 455 Zone and feeds the suction side of the Lacamas BPS. This station has four 75-hp split case double end suction pumps capable of pumping 1,000 gpm each. A selected well is called on with the first pump of the Angelo BPS to provide adequate suction side supply. If additional wells are called on to meet demand, a corresponding pump is also called on at the station to prevent over pressurization of the 343 Zone. The Angelo BPS is shown in Figure 3.16 and capacity details are summarized in Table 3.7.



Figure 3.16 Angelo BPS

3.8.7 Upper Prune Hill Booster Pump Station

The UPH BPS is located at 2822 NW 18th Avenue and is used to maintain level in the UPH Standpipe, which sets the HGL for the 852 Zone. This station has four pumps with two 20-hp split case double end suction pumps capable of providing 750 gpm each and two 40-hp split case double end suction pumps capable of providing 1,400 gpm each. The UPH BPS suction line is fed from the 2.4 MG reservoir. The 2.4-MG reservoir is fed from the LPH BPS. The UPH BPS is shown in Figure 3.17 and capacity details are summarized in Table 3.7.



Figure 3.17 UPH BPS

3.8.8 Crown Road Booster Pump Station

The Crown Road BPS is located at 3700 SE Crown Road and pumps from the 343 Zone to the 542 Zone. This station has three pumps capable of providing 800 gpm each for a total station capacity of 2,400 gpm. There is one pedestal open for an additional pumping unit within the station. When the station is called into service, a selected well is called on simultaneously to provide sufficient suction side supply. The Crown Road BPS is shown in Figure 3.18 and capacity details are summarized in Table 3.7.



Figure 3.18 Crown Road BPS

3.8.9 Green Mountain Estates Booster Pump Station

The GME BPS is the City's newest BPS and is located at 9046 N Hargrave Street. This station pumps from the 542/544 Zones to the GME Zone through three pumps capable of providing 180 gpm each and two fire pumps each capable of providing 650 gpm for a total station capacity of 1,840 gpm. This station is the sole source of supply for the GME Zone (closed zone), which has no storage instead utilizes a hydropneumatic tank to prevent constant cycling of pumps and maintain a constant discharge pressure downstream of the pumps. The GME BPS is shown in Figure 3.19 and capacity details are summarized in Table 3.7.



Figure 3.19 GME BPS

3.8.10 Francis Road Booster Pump Station

The Francis Road BPS is located at the intersection of 1514 NW 10th Avenue and NW Francis Road. This station was constructed in 1942 and has one 7.5-hp pump capable of supplying 80 gpm to a few customers in the 455 LPH Zone at higher elevations. The Francis Road BPS is shown in Figure 3.20 and capacity details are summarized in Table 3.7.



Figure 3.20 Francis Road BPS

3.9 Interties

The City currently has emergency intertie agreements with the City of Washougal and the City of Vancouver, which are detailed in Table 3.8. The City has two one-way emergency PRV interties with Washougal, located on SE Shepherd Road and at the intersection of SE 3rd Street and Whitney Street. These interties provide water from the City of Camas to the City of Washougal under low pressure conditions. The City's intertie with Vancouver is located at the intersection of SE Columbia Palisades Drive and SE Brady Road. Additionally, the City has an agreement for emergency use of two fire hydrants located at SE 1st and Friberg for firefighting purposes. Intertie locations are shown on Figure 3.21 and interlocal agreements are provided in Appendix C.

Table 3.8 Interties

Location	Other System	Flow Direction	Valve/Meter Size (inches)	Max Flow Rate (gpm)	Type of Service
SE Shepherd Road	City of Washougal	To Washougal	8 1.5	1500 gpm at 100 psi	Emergency
SE 3rd Street and Whitney Street	City of Washougal	To Washougal	8 1.5	1500 gpm at 100 psi	Emergency
SE Columbia Palisades Drive and SE Brady Road	City of Vancouver	To Vancouver			Emergency
SE 1st and Friberg	City of Vancouver	N/A	N/A	N/A	Emergency

Notes:
(1) Not a physical intertie. Agreement is for the emergency use of two fire hydrants owned/maintained by the City of Vancouver.

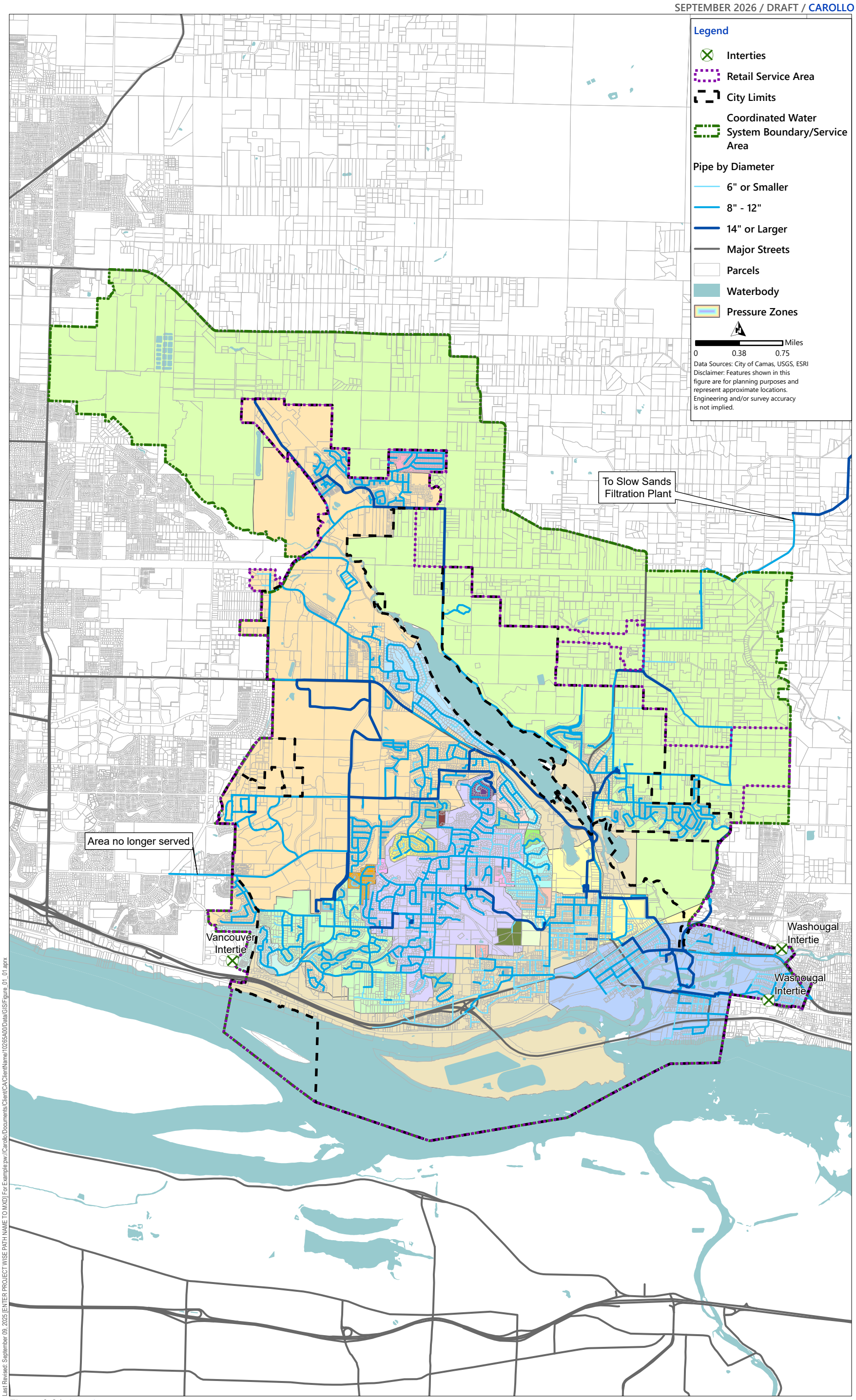


Figure 3.21 Interties

3.10 Supervisory Control and Data Acquisition

The City has a SCADA system with master control located at the City Operations Center. The system uses programmable control software, which can be controlled by a personal computer at the operations center, or from remote by a modem connected to a remote computer. The system monitors reservoir levels, well status, well flow rate, booster pump flow rates, pump status, run time, power usage, and alarm conditions. The system is able to record and display trending data for everything the City monitors. The City continually rotates well and booster pump calls to exercise the pumps and to evenly distribute wear on the pumps.

CHAPTER 4 OPERATION AND MAINTENANCE

4.1 Water System Management and Personnel

The water system is operated and maintained by the City staff, with contractor-provided services that City staff are not trained or equipped to perform. The organization of the City's water utility is shown in Figure 4.1. This section includes a brief discussion of the responsibilities of positions in the Public Works Department.

The City is governed by a mayor and seven council members, all of which are elected officials. The Public Works Director reports to the mayor and council and directs the City's utilities, including water. The City's organization combines water and sewer operation to furnish domestic water and sanitary sewage disposal service to industrial, commercial, and residential areas within the City and surrounding areas. The following subsections discuss the roles and responsibilities of the water system personnel.

4.1.1 Public Works Director

The City's water system is operated by the Public Works Department. The Public Works Director is responsible for overseeing Camas' water, sewer, and solid waste services. The Engineering Manager, Operations Manager, and Utilities Manager all report to the Public Works Director.

4.1.2 Capital Engineering

The City's Capital Engineering Department is lead by the Engineering Manager and is responsible for engineering services, including capital planning, project implementation, development review, construction management, and operational support. Field engineering support is supplied by both City staff and contracted private parties such as engineering consultant firms.

4.1.3 Utility Manager

The water system is one of several utilities within the Public Works Department that is managed by the Utilities Manager, who reports directly to the Public Works Director. The Utilities Manager is responsible for the management of the operation and maintenance of the City's water supply, water treatment, water distribution, wastewater collection, and wastewater treatment systems. For the City's water supply system, the Utility Manager has budgetary responsibility and directs the Lead Water System Operator in carrying out daily operations and maintenance, water quality monitoring, and asset management and facility inspection. The Utilities Manager works with the Engineering Manager to develop the City's Water System Plan (WSP) and supports engineering design review. The Utilities Manager is also responsible for all aspects of the water system during an emergency, including damage assessments, assessing customer impacts, coordinating with jurisdictional public health agencies and adjacent water utilities, keeping the public and media informed through the Director of Communications and Public Affairs, and working with the Public Works Engineering Manager for design and construction services required for repair and recovery operations.

4.1.4 Water System Operators

The Water System Operators perform all field maintenance and operation functions for the City's water utility. The Water System Operator responsibilities include the operation, maintenance, and repair of the following assets:

- Pump stations.
- PRVs.
- Reservoirs.
- Wells.
- Treatment systems.
- SCADA systems.

Further responsibilities include, but are not limited to, the following water system activities:

- Main flushing.
- Tank and reservoir cleaning.
- Valve and hydrant maintenance, repair, and replacement.
- Leak detection and emergency water main repairs.
- Meter reading and repair.

4.1.4.1 Cross-Connection Control Specialist

The CCS performs inspections of construction projects and existing facilities to ensure compliance with specification and standards for cross connection control. They perform recordkeeping to ensure that state regulations are met, and results are compiled to meet the appropriate department's standards. As a secondary focus, the CCS performs construction, maintenance, and repair of the City's water distribution system.

4.1.4.2 Water Quality Specialist

Within the water division a water system operator is assigned responsibility for source and distribution water quality monitoring. The responsibilities for water quality monitoring for routine compliance sampling and testing are outlined in the O&M manual. Other responsibilities include water quality data verification, reporting to the DOH, and conducting sanitary surveys. Positive coliform events of the water system require the water quality monitoring operator to follow procedures as outlined in the Emergency Response Plan in Appendix **[D]**.

4.1.5 Emergency Public Communication

The City's Director of Communications and Public Affairs is the designated media contact. Additional responsibilities include issuing a health advisory as part of a Tier 1 public notice during an emergency.

4.2 Operator Certification

The City's operators are experienced and well trained, exceeding the minimum state requirements (WAC 246-292-050). As a Class 3 system (population between 15,000 and 50,000 people) the City is required to have at a minimum, a Water Treatment Plant Operator (WTPO) Level 3, a Water Distribution Manager (WDM) Level 3, and a CCS. The City certified operators are shown in Table 4.1. As staff changes, the Water Works Certification Board is notified of any changes to the mandatory or supporting certificated personnel.

4.2.1 Professional Growth and Training

Public Works Leads and administrative staff ensure operators receive the necessary training and continuing education to effectively operate the water system. The City provides opportunities for staff professional growth and training; planning for approximately 25 hours per year of professional growth and training for each employee. Through these activities, City staff are able to obtain the required continuing education unit (CEU) requirements for their operators' certifications. City staff are regular attendees of training programs sponsored by both Washington Environmental Training Resources Center and the Pacific Northwest Section of the American Water Works Association (AWWA). The professional growth requirement may also be met by advancement by examination or certification by examination to a different classification.

Table 4.1 Certified Operators

Name	Title	Certification			
		WDM	WTPO	Certificate Number	CCS
Brandon Prather	Lead	3	2	11124	Yes
Derek Engler	Senior	2		11703	No
Allen Nelson	Water Operator	4	3	8187	Yes
Will Weglege	Senior	2	2	12451	No
Henry Erickson	MW2	2		11540	Yes
Nick Mettler	CCS	2		16006	Yes

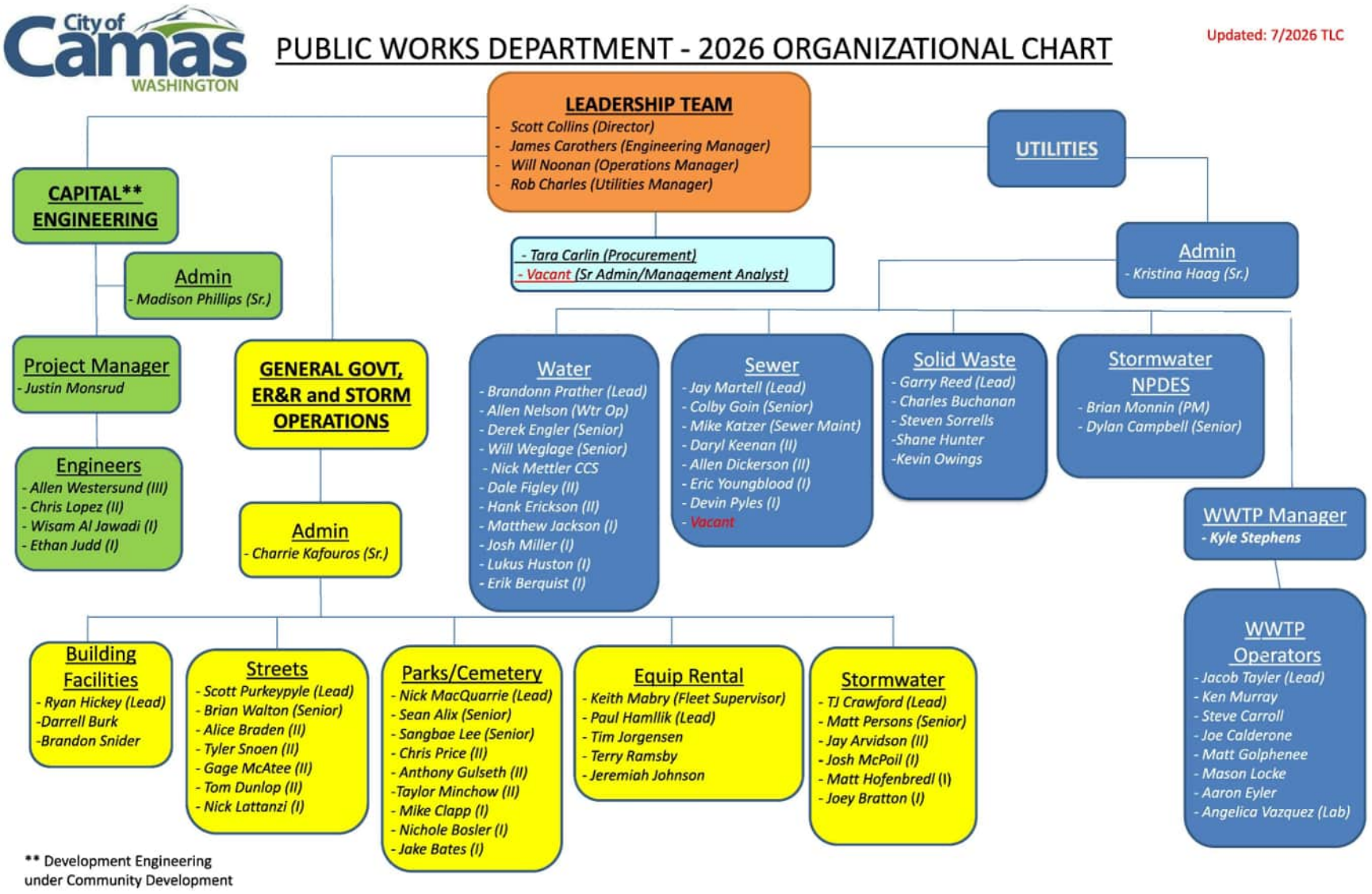


Figure 4.1 2026 Organizational Chart

4.3 Customer Complaint Response Reporting

Customers interact with the City through a variety of methods. Customer service representatives are available by phone and through an online Utility Service Request system on the City's website. Customer service agents are trained to answer typical questions and route service requests (complaints) to the appropriate department (Operations, Finance, Engineering, etc.). Calls are tracked by customer service agents, and the resulting activities are documented in the maintenance management system if a work order is issued. The finance department also tracks billing-related requests.

City operators also routinely interact with customers during maintenance activities. Often, these interactions are directly related to ongoing system maintenance such as hydrant flushing, and customer inquiries or concerns are resolved on the spot. Operators direct additional requests to customer service representatives, as needed. The Utilities Manager is responsible for responding to more complex and time-sensitive customer complaints.

4.4 Record Keeping and Reporting

The City maintains detailed records of the water system. Substantial record keeping activities are required to record and report customer water usage, water production, water quality information, and maintenance activities. All recordkeeping and reporting follows DOH regulations as specified in WAC 426-290-480.

The City's Finance Department is responsible for billing customers for water use. The billing records include customer account data for classes of customers, water use, billing, service, and comments. Water production for the City's surface water sources and wells are tracked in real time via SCADA, which maintains approximately a year of historical data. Operators record production daily and report the production monthly to DOH. Based on these records and water consumption records, the City develops and submits an annual WUE Report to DOH.

The City conducts substantial water quality testing, as summarized in Chapter 7. Hard copies of the water quality laboratory reports from the testing are kept at the City. In addition, analytical laboratories also submit reports directly to DOH. This data is summarized annually in the City's consumer confidence report that is available on its website.

The City maintains a maintenance management system to manage work order requests and document maintenance activities. Historically, the City has recorded work efforts on hard copy maintenance cards that are available for reference to City staff.

The City submits all required construction completion reports to DOH. Construction completion reports for distribution main projects are maintained on file at the City and are available upon request by DOH.

4.5 Routine System Operating Procedures and Preventative Maintenance

Basic system operation and major system components are described in Chapter 3 - Existing System and Chapter 9 - System Analysis. Detailed documentation of the system operation procedures and preventive maintenance can be found in the City's O&M Manual. The manual provides detailed information on operator certification and training, water quality monitoring, operation and control, cross-connection

control, and emergency planning/response. Routine operating procedures and preventative maintenance aspects of the O&M Manual are summarized below.

4.5.1 Routine Operating Procedures

The City is updating its O&M Manual in 2026 to reflect recent changes in the system and capture the institutional knowledge of retiring operators. The O&M Manual provides the following types of operation and control information for wells, reservoirs, pump stations, and pipelines:

- Facility/process components, such as booster pumps, SCADA telemetry, valves, chemical metering pumps, storage tanks, etc.
- Description of facilities/processes, including area served and relationship to other facilities/processes.
- Operation and control, including set points and chemical usage guidelines.
- Guidance on performing maintenance activities such as cleaning, pump isolation, and meter/pump calibration.
- Alarm responses.
- Emergency operation, including use of safety equipment (i.e., emergency showers and eyewash, etc.) and facility operations on auxiliary power.

To aid in accessing the detailed information, the O&M Manual provides annotated pictures identifying all facility equipment.

A hard copy of the O&M Manual is kept at the City's operations center and is available electronically on the City's network. The slow sand filtration plant operations and control are documented in a separate O&M Manual that is kept onsite at the plant and available electronically on the City's network.

4.5.2 Preventative Maintenance

The City staff are responsible for daily operation of the City's surface water sources, wells, treatment facilities, booster stations, PRVs, storage facilities, and distribution system. In addition to daily operation, they also perform preventative maintenance on the system based on City goals. These preventative maintenance goals help the City maintain its assets at an acceptable level of risk, while meeting the City's desired level of service goals. An activity's complexity and level of effort is generally greater the less frequently it is performed. Daily and weekly activities can likely be completed in an hour or less. In general, activities are intended to be grouped (i.e., weekly, semi-weekly, monthly, and quarterly during a single visit) to reduce inefficiencies in travel and site setup (i.e., traffic control at PRVs, etc.). Some activities may take several days and require specialized contractors.

Daily preventative maintenance focuses on inspections of the general condition and function of the facilities and maintaining and recording chemical levels. Frequency of inspections is based on industry practices and professional judgement. Weekly and monthly maintenance activities include more detailed inspections and cleaning of assets, as well as maintenance of the surface water sources. Annual preventative activities include basic maintenance of equipment (i.e., oil and filter changes, exercising infrequently used valves and pumps, cleaning cooling systems on generators, etc.). All activities are completed to the extent possible based on available staff and resources. A more detailed description of the preventative maintenance activities is provided in Appendix **[E]**.

4.6 Facility Maintenance

A high-level condition assessment was prepared for the City's water system facilities in 2016. The assessment included review of information for the existing facilities and inspection of the facilities on January 5 and 6, 2016. The assessment included each supply well and BPS. The City's storage reservoirs, PRV stations, and piping were not included in the assessment.

4.6.1 Booster Pump Stations and Supply Wells

Overall, the City's BPSs and supply wells were found to be in generally good condition. The facilities have been well-maintained with regularly scheduled maintenance and CIP work being performed. Electrical equipment conditions were the most common deficiency observed, primarily due to equipment age.

Table 4.2 lists the projects identified in the 2016 condition assessment that have been completed in the years following.

Table 4.2 Completed CIP Projects from 2016 Condition Assessment

Asset	Project Description	Year Completed
Well No. 6	Replace starter cabinet and RTU	2018
	Well casing, motor, and pump rebuild	2026
Well No. 7	Replace well pedestal grout and install two additional anchor bolts	2024
	Well casing, motor, and pump rebuild	2026
Well No. 8	Replace starter cabinet	2024
	Well casing, motor, and pump rebuild	2024
Well No. 10	Well casing, motor, and pump rebuild	2025
Well No. 11	Well casing, motor, and pump rebuild	2025
Well No. 12	Well casing, motor, and pump rebuild	2025
Well No. 13	Well casing, motor, and pump rebuild	2022
Lower Prune Hill BPS	Replacement	2026
Washougal Wellfield	Chlorine generator replacement	2017
Lacamas BPS	Motor and IR testing	2026

Notes:
RTU - remote terminal unit.

In addition to the improvements noted above, the City constructed the Green Mountain Estates BPS in 2022.

4.6.2 Reservoirs

The City has previously assessed the condition of its reservoirs for the 2010 WSP. The City's reservoirs are generally in good condition. The Butler Reservoir, the City's oldest reservoir, has reached the end of its usable life. The City intends to abandon the Butler Reservoir as soon as a replacement is constructed in the 343 Zone. The City's second oldest reservoir, the 0.5 MG reservoir at the Lower Prune Hill reservoir site was replaced in 2025 per the 2010 WSP's recommendation and is currently in service. Additional upgrades to the City's water storage systems include the new 2.0 MG 18th Avenue Reservoir constructed in 2020 and the implementation of cathodic protection to all steel reservoirs in 2023. Steel reservoirs require regular recoating and is considered routine maintenance.

4.6.3 Recommended CIP Summary

Not all projects identified in the 2016 condition assessment have been planned or completed as of August 2026. A list of the outstanding recommended projects is provided in Table 4.3. Improvement projects have been separated into BPS improvements, which are denoted "RP-" and supply projects, which are denoted "RS-". It should be noted that projects were identified for the Lacamas BPS but seeing as how the City intends to abandon the Lacamas BPS in the next 5-10 years, there does not appear to be much benefit in going through with these upgrades and has therefore be omitted from the CIP summary in Table 4.3. As seen in the table, the remaining condition assessment projects are anticipated to cost approximately $2.1 million. It is anticipated that future project designs will further revise the cost estimates and prioritization of projects. Costs for these projects have been incorporated into the miscellaneous facility projects annual program for reporting in the CIP, which is shown in Chapter 10.

The cost estimates presented in this section are opinions developed from bid tabulations, cost curves, information obtained from previous studies, City estimates, and Carollo's experience on other projects. The cost estimates have been prepared for general planning purposes and for guidance in project evaluation and implementation. Final costs of a project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors.

All costs are escalated from 2016 to 2026 dollars with a 5D Handy Whitman Index factor of 1.89. Cost estimates were developed using a Class 4 budget estimate, as established by the American Association of Cost Estimators. This level of estimate is used for budgeting and feasibility studies and assumes a 1 percent to 15 percent level of project definition. The expected accuracy range is -30 percent to +50 percent, meaning the actual cost should fall in the range of 30 percent below the estimate to 50 percent above the estimate.

Table 4.3 Outstanding Booster Pump Station and Well CIP Summary

Asset	Project ID	Project Type	Estimated Cost	Project Description
Butler BPS	RP - 1	Strategic Replacement	$100,000	Replace or refurbish pumps 1 and 2.
	RP - 2	Condition	$6,000	The motor starter(s) at the Butler BPS were recommended for replacement during the condition assessment.
	RP - 3	Condition	$4,000	The check valve(s) at the Butler BPS were recommended for replacement during the condition assessment.
Angelo BPS	RP - 4	Strategic Replacement	$180,000	Replace or refurbish pumps 1, 2, 3, and 4.
Crown Road BPS	RP - 5	Condition	$9,000	Remove vent caps and install new vent piping for the emergency generator's diesel tank as part of routine maintenance.
	RP - 6	Strategic Replacement	$260,000	Replace or refurbish pumps 1 and 2.
Upper Prune Hill BPS	RP - 7	Condition	$9,000	Add lateral support to the pump discharge header.
	RP - 8	Strategic Replacement	$380,000	Replace or refurbish pumps 1, 2, 3, and 4.
	RP - 9	Condition	$80,000	MCC and RTU require general maintenance.
Gregg BPS	RP - 10	Strategic Replacement	$275,000	Replace or refurbish pumps 1 and 2.
	RP - 11	Strategic Replacement	$105,000	Replace or refurbish pump 3.
Booster Pump Station Projects (RP) Total			**$1,408,000**	
Well 7	RS - 1	Condition	$40,000	Replace panelboard and starter cabinet.
Well No. 9(1)	RS - 2	Strategic Replacement	$100,000	Well casing, motor, and pump rebuild.
	RS - 3	Condition	$45,000	pH, Chlorine, Fluoride.
	RS - 4	Condition	$155,000	Replace Starter cabinet and RTU.
Well 11 and 12(1)	RS - 5	Condition	$12,000	Tie rods across flexible coupling at pump discharge to prevent flexing. Air release is locating on discharge header for wells 11/12 rather than for each well.
	RS - 6	Condition	$12,000	MCC requires general maintenance.
Well No. 14(2)	RS - 7	Strategic Replacement	$100,000	Well casing, motor, and pump rebuild.
Washougal Wellfield Salt Storage Building(1)	RS - 8	Condition	$260,000	Replace existing storage building and provide anchorage for the two NaOH storage tanks.
Supply Projects (RS) Total			**$724,000**	
Total All Projects			$2,132,000	

Notes:
(1) Planned for 2027 or later.
MCC - motor control center.

4.7 Sanitary Survey

A sanitary survey of the City's water system was completed by DOH in January 2025. No significant deficiencies were identified. All recommendations and required submittals by DOH have been completed.

4.8 Emergency Response Program

The City has a Disaster Manual, which identifies the emergency response functions within the City using an "all hazards" approach. Within the City's emergency response framework, the City has developed a Water System ERP following a RRA according to AWIA requirements. The ERP defines risks, water system roles and responsibilities during an emergency, communication procedures, personal safety, alternative water sources, equipment replacement procedures, property protection procedures, and water sampling and monitoring procedures. The ERP also describes alternative system operations for the interruption of each major water supply facility (i.e., loss of a well, reservoir, or booster pump station). Further, it documents an incident specific response plan for major risks, such as drought, earthquake, flood, cyber-attack, etc. The ERP is provided in Appendix **[D]**). The sensitive nature of information included in the RRA necessitated its exclusion from the WSP; however, the RRA is on file with the City and DOH.

4.9 Cross-Connection Control Program

As required by WAC 246-290-490, cross-connection control, utilities have the responsibility to protect customers from water contamination due to cross-connections. A cross-connection is any actual or potential physical connection between a public water system or the consumer's water system and any source of non-potable liquid, solid, or gas that could contaminate the potable water supply by backflow. City Ordinance 10504 addresses cross-connections and their prevention, which can be found as part of the Camas Municipal Code under Water Use Regulations 13.32.

This ordinance and corresponding Municipal Code provide the City's water department the ability to protect the water supply from contamination by prohibiting cross-connections, requiring backflow prevention devices, establishing fees for the inspection of cross-connection assemblies, and adopting State standards for cross-connection regulations. The ordinance and corresponding Municipal Code provides procedures for the abatement of cross-connections and the installation of backflow prevention devices.

The City has four employees certified as cross-connection control specialists. The City's CCC program and records are continually updated and information on each cross-connection device are on file with the City. The Public Works Department and the Building Department coordinate notification to customers who have devices that need to be tested. The City's backflow program management software was upgraded XC2 to SAMS in 2019, which will allow for higher efficiency when entering test report data and sending notifications to water customers regarding their backflow devices.

Per WAC 246-290-490(8), all water systems must complete Annual Summary Report (ASR) forms documenting the status of the water system's CCC program and submit to the DOH upon request. The previous five years of water system ASRs are provided in Appendix **[F]**.

The City maintains the following information on file for its cross-connection control program:

- Date of last inspection.
- Results of inspection.
- Recommended protection.
- List of approved assemblies.
- Test and maintenance reports.
- List of certified testers.
- Customer account number, billing address, service address, phone numbers, device history and maintenance records.

The City's Cross-Connection Control Program requires the inspection of backflow prevention devices at the time of installation. These devices are also scheduled to be inspected annually after installation, after the device is repaired, after the device is relocated or reinstated, and as necessary if tests indicate repeated failure.

Owners of backflow prevention devices are notified by mail that their devices are due for inspection. Three notices are provided, with an example of the first backflow prevention postcard that is sent out to owners being shown in Figure 4.2. However, it is the responsibility of the customer to see that their device is tested. Failure to provide the City with a backflow prevention device inspection report from a certified cross-connection control specialist within 30 days of the third notification will result in the customer's water service being terminated. This termination is then reported to DOH. The City's list of certified backflow testers as of 2025 is provided in Figure 4.3.

The CCS and assistant host an informational backflow booth at the City's annual Camas Days event to educate consumers. They answer questions regarding backflow and provide general knowledge to the public on the issues. Updated informational brochures with current contact information are distributed at the event, online, and at various City facilities. An example brochure is provided in Appendix **[G]**.

ANNUAL BACKFLOW TEST REMINDER

Public Works Department

First Notice: «LTR_Letter_Sent_Date »

Response due by: «LTR_Letter_Response_Date »

«Mailing_Address »

For service address: **«[Facility]Service Address (Full)»**

Camas Water Customer,

Our records indicate that you have a backflow prevention device(s) at the service address above for either lawn sprinkler irrigation or fire suppression. That backflow device listed below is **due or past due** for its annual testing. Please provide the City of Camas with the results of your test no later than **30 days** from the date of this letter.

«LTR_Assembly_List »

Per Washington State Law (WAC 246-290) and Camas Municipal Code (CMC) section 13.32, backflow prevention assemblies are **required to be annually tested** by a Certified Backflow Assembly Tester (BAT). A list of Certified BAT can be found on our website: cityofcamas.us
Please Note: Noncompliance can result in the City taking appropriate actions to protect the drinking water, up to and including terminating your water service to this address, according to Washington State Law, WAC 246-290-490.

City of Camas
1620 SE 8th Ave
Camas, WA 98607
backflow@cityofcamas.us
360-817-1569

City of Camas, 1620 SE 8th Avenue, Camas, Washington 98607 | www.cityofcamas.us | 360.817.1563 | Fax: 360.834.0215

Figure 4.2 Annual Backflow Protection Device Testing First Notification

WASHINGTON STATE CERTIFIED BACKFLOW TESTERS & COMPANIES

The City of Camas makes no representation regarding the abilities, performance, or quality of service of the testers listed below. The City of Camas does not assume of accept any responsibilities for the actions or performances of testers. This list is provided for the convenience of our residents. Customers are to use their own judgement with respect to contracting with these or any other testers.

COMPANY NAME	EMAIL	PHONE
1ST CHOICE BACKFLOWS	office@1stchoicetesting.com	(425)273-3106
A1 BACKFLOWS LLC	a1backflows98601@gmail.com	(360) 907-1519
AAA BACKFLOW NW LLC	aaabackflownw@gmail.com	(360) 263-4840
AC IRRIGATION LLC	acibackflows@gmail.com	(360) 241-9981
ALL PRO BACKFLOW | RON HENDRICKSON, LLC	ron@allprobackflowtesting.com	(360) 448-8285
ASHLAND BROTHERS LANDSCAPING	jordan@ablandscapes.net	(503) 981-6131
BACKFLOWS BY THE BEST	hammrichdale@gmail.com	(360) 606-0870
BACKFLOWS NORTHWEST, INC.	office@backflowsnorthwest.com	(425) 277-2888
BEACON BACKFLOW LLC	beaconbackflow@comcast.net	(360) 694-0587
BRUCE BOYLAN	batbruce57@gmail.com	(360) 993-1772
C & E LAWN SPRINKLERS INC.		(360) 694-2035
CERTIFIED TESTING SERVICES INC.	testing@clarkcobackflow.com	(360) 600-3273
CLARK COUNTY SPRINKLER REPAIR	ccsprinklerrepair@gmail.com	(360) 772-3396
COLUMBIA CROSS-CONNECTION CONTROL	office@columbiacross.com	(503) 235-6141
DRAKE'S 7 DEES, INC.	leads@drakes7dees.com	(503) 292-9121
EMORY SANTACRUZ	emory.santacruz@yahoo.com	(564) 653-1621
FRONTIER LANDSCAPING, INC.	terry@frontierlandscaping.com	(360) 574-8979
JRT MECHANICAL	servicesolutions@jrtmechanical.com	(360) 667-4159
KENNETH EBERT	shaman6891@gmail.com	(562) 673-6741
LANDSCAPE MANAGEMENT & SERVICES INC	irene@landscapemgmt.com	(360) 553-9872
LANDSCAPE MANAGEMENT 2 LLC	andrea@landscapemgmt.com	(360) 256-0706
MATHEWSON'S BACKFLOW	mathewsontgk@gmail.com	(360) 828-8483
PERFORMANCE SYSTEM INTEGRATION	info@psintegrated.com	(877) 857-6174
PNW BACKFLOW	rick.pnwbackflow@gmail.com	(360) 409-3109

Figure 4.3 List of Certified Backflow Testers

4.10 Pipeline Repair and Replacement

The City currently has a modest water main repair and replacement (R&R) program to address O&M and capacity concerns as opportunities arise, such as during redevelopment or in conjunction with other utility projects. While much of the City's distribution system was constructed after 1990, the distribution piping near downtown was constructed in the 1950s and early 1960s and is expected to begin reaching the end of its useful life during the next 20 years.

Useful life is the length of time that a pipe is anticipated to remain in service. Useful life depends largely on the pipe material, but can also depend on soil conditions, water constituents, and installation. When a pipe is in service beyond its useful life, the increasing costs of maintenance associated with a failing pipe typically exceed the cost of replacement. Useful life analyses do not predict exactly when and where failures will occur, rather it is a method to identify the pipes for inclusion in an ongoing R&R program.

Remaining useful life (RUL) is simply the period of time remaining before the end of useful life is reached. A pipeline replacement schedule can be developed by looking at the remaining useful life of all the pipes

in the distribution system. This replacement schedule is often reported in terms of average annual feet of pipe replacement over a ten-year replacement period due to limitations in historical installation records and difficulties in assessing the impact of environmental conditions and other factors limiting useful life. Within a given replacement period, pipes near or exceeding their useful life should be prioritized based on the criticality of the pipe to the system. For example, a large diameter transmission main or pipes that can be included in redevelopment or transportation projects may be a higher priority. By incorporating criticality, the City will be able to address existing priorities and adapt to changing priorities while maintaining an annual replacement program.

4.10.1 Pipe Material and Age

Pipe material was available from the City's records. The information was reviewed by City staff and recent replacement projects were incorporated into the data. The City does not have a reliable pipe age inventory. As a rule of thumb, pipes installed before or during the 1970s were classified as CI pipes installed after the 1970s were classified as DI pipe.

4.10.2 Useful Life

Useful life in combination with pipe age provides the basis for the RUL calculations. The estimated useful life of each pipe material based on industry standards and City staff knowledge, as presented in Table 4.4. The City chose a 75-year useful life for CI pipes, polyvinyl chloride (PVC) and steel pipes. Cast iron and steel useful life were conservatively selected at the lower end of the typical range. The PVC useful life is within industry ranges; however, it has little overall impact given less than 1 percent of the system is PVC. DI pipes were considered to have an 85-year useful life, which was the median of the industry range. It is important to note that the actual useful life of an individual pipe can vary widely due to soil, groundwater, and installation conditions. It is recommended that the condition of pipes being replaced be noted for consideration in future analyses, which will increase the accuracy of the useful life estimates.

Table 4.4 Useful Life of Pipes

Pipe Material	Useful Life (years)
CI	75
DI	85
PVC	75
Steel	75

4.10.3 Remaining Useful Life Analysis

RUL is defined as the length of time left before a pipe's maintenance costs will likely exceed its cost of replacement. The period of time between the end of the useful life and today is the RUL. For example, a DI pipe installed in 2000 has a useful life of 85 years, where it will reach the end of its useful life by 2085. From the current year, 2026, this DI pipe's RUL would be 59 years. Due to the limited pipe age information available, a thorough RUL analysis could not be completed. However, it is understood that much of the City's CI and Steel piping was installed prior to 1960 and therefore, based on the chosen useful life for these materials, are expected to reach the end of their useful life by end of the planning period (2046). It is recommended that all CI and steel piping, approximately 20 percent of the distribution system pipeline,

be replaced over the 20-year planning period. The majority of the City's DI and PVC pipe are not anticipated to reach the end of their useful life until after the planning period.

The pipe recommended for replacement represents the majority of the City's downtown and surrounding areas. Pipes reaching their RUL serve all types of customers, including commercial, industrial, and residential customers. Pipes that exceed their useful life will continue to provide service but are at a greater risk for pipe breaks and may have increased leakage. Therefore, replacement should be prioritized based on criticality to the system to best manage the aging distribution infrastructure within the City's available budget.

4.10.4 Pipeline Repair and Replacement Program

Over the 20-year planning period, the City should replace all the CI and steel piping. This amounts to approximately 20 percent of the entire distribution system, or 1 percent system replacement per year over the 20 years. Further discussion of the pipe replacement CIP is provided in Chapter 10. Additionally, small diameter mains (2-inch to 6-inch) should be upsized to 8-inch to meet current City standards. To gain economies of scale, the City should consider geographically concentrated projects that incorporate other utilities, such as sewer main R&R and roadway resurfacing.

4.11 Operations and Maintenance Improvements

The City has a well operated and maintained system. Condition assessments identified repair and replacement projects for above ground assets (i.e., pump stations, wells, and reservoirs, etc.). The majority of projects were necessary due to aging electrical equipment and normal replacement of pumps and motors. Having recently replaced the Lower Prune Hill reservoir, the Butler reservoir is the only other reservoir built prior to 1940 which has reached the end of its usable life and is due to be replaced. A PRV study conducted in 2024 identified various solutions to fire-flow deficiencies and PRV operational inefficiencies.

It is anticipated that the piping in Downtown and surrounding areas will begin to reach the end of their life in the short-term planning horizon (2026 to 2035). The City's long-term goal is to create a risk prioritized water infrastructure rehabilitation program that addresses above and below ground assets. However, at this time, the City's financial resources are focused on meeting the rapid growth occurring in Camas.

To gain economies of scale during the replacement, the City should consider geographically concentrated projects that incorporate other utilities, such as sewer main R&R and roadway resurfacing.

CHAPTER 5 WATER REQUIREMENTS

Projecting realistic future water requirements, i.e., demand, is necessary for planning infrastructure projects and securing adequate water supply to meet future growth. Future water demands are a key component of the water system analyses presented in this Plan and in the City's CIP. Accurate demand projections require a thorough review of historical water use, predicting where and how much growth will occur, and estimating the future water use for existing and new customers.

Historical data provides the City's unique water use over a long period of time, which captures the range of water use due to weather, economic conditions, conservation practices, and other factors. This Chapter presents an analysis of historical water use from 2017 to 2024 based on customer billing and production records. This data provide information on the City's different types of customers, as well as water use parameters on an average annual basis, seasonally, and for the maximum day. Historical water use patterns and parameters were established from these data to predict future water use for existing and new customers.

The City's draft 2045 Comprehensive Plan was used to predict where and how much demand will occur in the water system. The number and type of future customer accounts were determined based on developable vacant parcels and future land use. The resulting future accounts were converted to projected demands using the historical water use patterns and parameters.

Demand projections were generated for the planning period of 2026 to 2046 for the City's established RWSA. The projections were divided into three planning scenarios:

- Short-term, 5-year (2027-2031).
- Medium-term, 10-year (2032-2036).
- Long-term, 20-year (2037-2046).

Dividing the planning period into three scenarios aids in the development and phasing of improvement projects and the CIP, as well as being consistent with DOH requirements.

Demand projections were expressed as ERU, average day demand (ADD), and MDD. One ERU is defined as the average quantity of water beneficially used by one average, full-time, single-family residence (SFR) per day. The quantity of water used by other customer classes, and by the whole system, can be expressed in terms of ERUs. The ADD is typically used in operational evaluations. It is calculated by dividing the total water produced by the number of days per year (2020 and 2024 were leap years and include 366 days per year). The MDD represents the single largest day water demand during the year and is a key parameter for infrastructure sizing.

Changes in water use, conservation activities, system growth, and other factors may result in higher or lower than projected water use. Planning for the potential changes allows the City to better manage potential risks from these changes. For example, lower than projected water use may be a concern for the City's financial planning, while higher than projected water use may be a concern for water supply planning. Therefore, three demand scenarios were developed: low, medium, and high demand scenarios. The low demand scenario represents future demand with conservation; the high demand scenario generally reflects the highest demands in the last eight years; the medium demand scenario is a

conservative projection between the low and high projections. Details on the historical water use, demographic projections, and demand calculations used to develop these projections are presented in this Chapter.

5.1 Historical Water Use

Historical water use data, i.e., consumption data, was obtained from City records to characterize the demands of the City's customers. Annual water use data for the years 2017 to 2024 were used to develop historical demand patterns and parameters, which represent current and expected future water use. Two key demand parameters were generated from the data: typical water use per customer class, and typical water use per ERU. These parameters were used as the basis of future demand projections.

5.1.1 Historical Accounts

The City customers were divided into seven customer classes. These customer classes are:

- Accessory Dwelling Unit (ADU) Shared.
- City Accounts.
- Commercial.
- Industrial.
- Irrigation.
- Multifamily Residential (MFR).
- SFR.

The number of accounts for each customer class is summarized in Table 5.1. As seen in the table, SFR makes up approximately 91 percent of accounts. The total number of accounts has increased by approximately 21 percent from 2017 to 2024 due to growth and development in the City.

Table 5.1 Historical Number of Accounts by Customer Class

Year	SFR	MFR	Commercial	Industrial	City	Irrigation	ADU Shared	Total
2017	7,539	334	239	30	45	96	8	8,291
2018	7,730	332	249	30	46	109	13	8,509
2019	8,147	337	248	27	46	106	14	8,925
2020	8,489	352	253	24	46	106	15	9,285
2021	8,877	354	264	24	50	121	16	9,706
2022	8,974	356	268	23	48	106	18	9,793
2023	9,031	357	273	22	49	121	22	9,875
2024	9,191	356	272	22	50	122	21	10,034
Average Annual Growth Rate	2.9%	0.9%	1.9%	-4.3%	1.5%	3.5%	14.8%	2.8%
Average Percent per Class	91.3%	3.7%	2.8%	0.3%	0.5%	1.2%	0.2%	100%

5.1.2 Large Users

The City's top 10 water users in 2024, herein termed "large users," were also evaluated in this study. The large users class includes the following customers:

- Taiwan Semiconductor Manufacturing Company (TSMC) Washington (formerly known as "Wafertech Industries").
- Analog Devices (formerly known as "Linear Technologies").
- Georgia Pacific Mill.
- Camas School District No. 117.
- City of Camas.
- Bodycote Industrial Metal Technology (IMT).
- Fisher Creek Investments.
- Hills at Round Lake Homeowner's Associate (HOA).
- Prestige Care and Rehabilitation.
- Clara Street Block Building.

These large users represent 34 percent of the total consumption; therefore, it is typical to separate them (number of accounts and consumption) from the rest of the system as to not skew any system-wide ERU values for these customer classes. Individual demand projections were developed for each large user to provide additional accuracy in the demand projections, as well as the system analyses. The development of the large user demand projections is detailed in Section 5.6.2.

5.1.3 Historical Consumption

The City's historical annual water consumption was provided for each customer class based on City billing data, as presented in Table 5.2 in units of mgd. The table also includes the average, 75th percentile, 3-year average, and maximum statistics on historical consumption. The SFR customer class has the highest water demand and the industrial class has the second highest water demand for all years.

Table 5.2 Historical Water Demand by Customer Class (mgd)

Year	SFR	MFR	Commercial	Industrial	City	Irrigation	ADU Shared	Total(1)
2017	1.85	0.11	0.13	1.21	0.10	0.23	0.003	3.67
2018	1.88	0.10	0.15	1.18	0.07	0.28	0.003	3.69
2019	1.80	0.10	0.15	1.07	0.07	0.24	0.004	3.45
2020	2.00	0.12	0.13	1.06	0.07	0.18	0.005	3.58
2021	2.31	0.14	0.17	1.15	0.10	0.28	0.005	4.17
2022	2.08	0.14	0.17	1.22	0.08	0.22	0.005	3.94
2023	2.29	0.16	0.20	1.16	0.10	0.26	0.007	4.19
2024	2.22	0.14	0.21	1.11	0.19	0.43	0.006	4.33
Average (all years)	**2.06**	**0.13**	**0.16**	**1.15**	**0.10**	**0.26**	**0.005**	**4.25**
75th Percentile	**2.24**	**0.14**	**0.18**	**1.19**	**0.10**	**0.28**	**0.006**	**4.18**
3-Year Average (2022-2024)	**2.20**	**0.15**	**0.19**	**1.16**	**0.12**	**0.30**	**0.006**	**4.16**
Maximum	**2.31**	**0.16**	**0.21**	**1.22**	**0.19**	**0.43**	**0.007**	**4.33**

Notes:
(1) Totals may not equal due to rounding.

The average percentage of accounts and annual water consumption by customer class from 2017 to 2024 are presented in Figure 5.1 and Figure 5.2. Comparing accounts and water consumption illustrates the differences in water use between the customer classes. As seen in these figures, SFR customers represent 91 percent of the accounts yet only comprise 53 percent of the total consumption. By contrast, industrial customers represent less than one percent of the accounts, but account for 30 percent of the total demand. This difference in proportional water use was quantified by comparing the historical water use per account for each customer class (in Table 5.3), as described in Section 5.1.3.

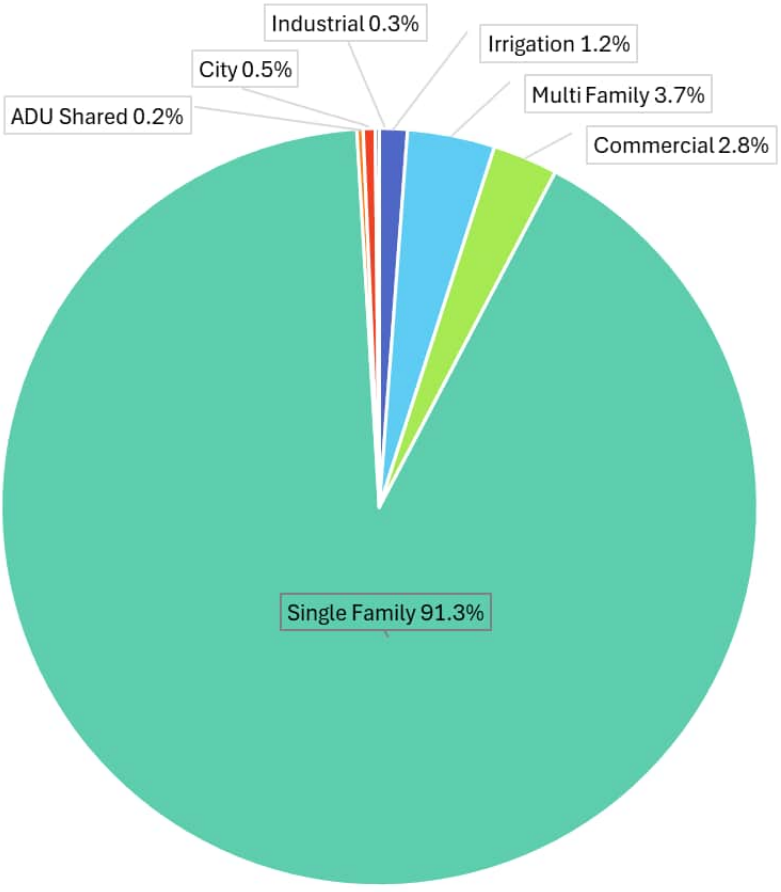


Figure 5.1 Average Number of Accounts by Customer Class

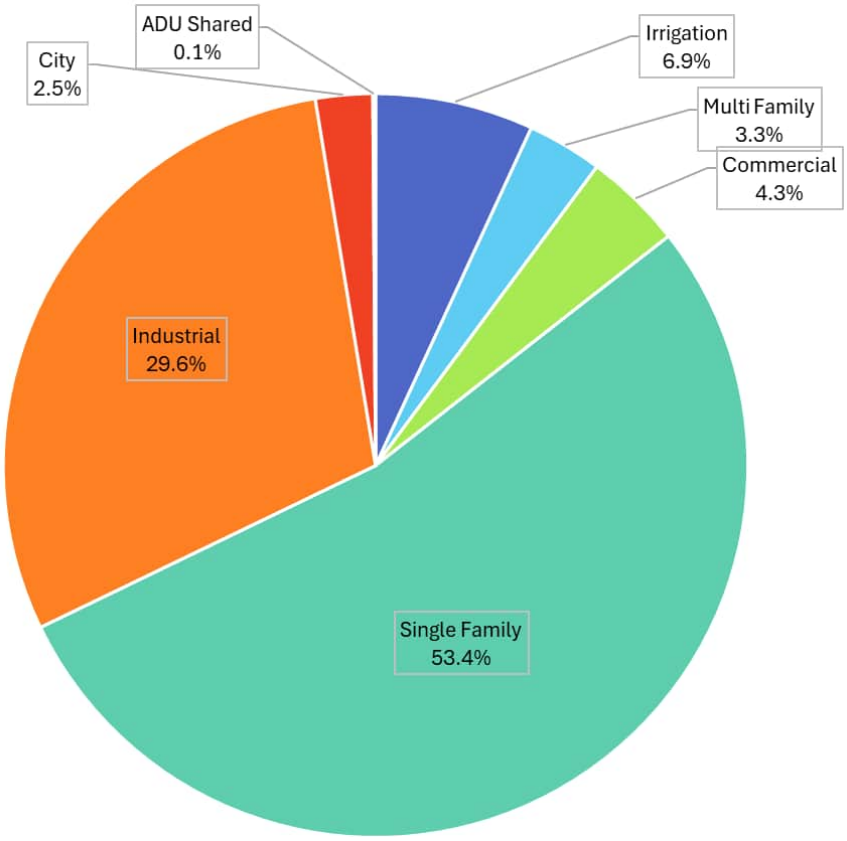


Figure 5.2 Average Amount Consumed by Customer Class

5.1.4 Water Use per Account and Equivalent Residential Units

The demand of each customer class can be expressed in terms of ERUs for forecasting and planning purposes. As discussed previously, one ERU is the amount of water consumed by a typical SFR. According to the Washington Administrative Code 246-290-010, non-residential customer water consumption is expressed as a multiple of SFR ERU. In this case, consumption data from 2017-2024 was used to establish the "single-family residence" ERU. Importantly, the ERU calculation is based on historical consumption (i.e., billing records) and therefore does not include distribution system leakage.

To calculate ADD water use per ERU, the total annual volume of water consumed by SFRs is divided by the total number of active SFR accounts. The resulting value, also called the ERU planning value, is the average SFR's annual water use per account. To determine the number of ERUs in other customer class, the volume of water used by those customer categories is divided by the ERU value.

Table 5.3 shows the historical annual average water consumption by customer class. The table also includes the average, 75th percentile, three-year average, and maximum consumption statistics. The 3-year average (2022 to 2024) quantity of water used by one typical, full-time SFR ERU is equal to 242 gallons per day (gpd). From 2017 through 2024, the 75th percentile of water consumption per ERU was 248 gpd.

Table 5.3 Historical Annual Water Use per Account (gpd/account)

Year	SFR	MFR	Commercial	Industrial	City	Irrigation	ADU Shared
2017	246	315	564	40,338	2,143	2,402	315
2018	244	309	611	39,230	1,459	2,541	198
2019	221	303	624	39,651	1,511	2,247	259
2020	236	338	520	44,258	1,487	1,677	303
2021	260	400	639	48,029	1,988	2,295	332
2022	232	387	628	53,183	1,657	2,082	286
2023	253	437	716	52,933	1,974	2,186	304
2024	242	399	778	50,262	3,711	3,507	297
Average	**242**	**361**	**635**	**45,986**	**1,991**	**2,367**	**287**
75th Percentile	**248**	**400**	**658**	**50,930**	**2,027**	**2,437**	**307**
3-Year Average (2022-2024)	**242**	**408**	**707**	**52,126**	**2,447**	**2,591**	**295**
Maximum	**260**	**437**	**778**	**53,183**	**3,711**	**3,507**	**332**
ERUs per Account(1)	**1.0**	**1.5**	**2.6**	**190.2**	**8.2**	**9.8**	**1.2**

Notes:
(1) ERUs per Account based on average of annual water consumption.

Compared to other Washington utilities evaluated by Carollo, the City's water use per SFR account appears slightly high, possibly indicating larger properties requiring irrigation or lower than usual replacement rates of high-flow appliances and fixtures. Additionally, the City's MFR water use per account appears low, possibly due to a higher percentage of low-density MFR accounts (such as tri-plexes or quad-plexes), or due to monitoring MFR irrigation demands in separate irrigation meters (under the "Irrigation" customer class).

Calculating the City's water use in terms of ERUs provides a means to express water use by non-residential customers as an equivalent number of SFR accounts. The ERUs per account for MFR and all non-residential accounts are obtained by dividing the average water use per account for each customer class by the ERU water use. For example, the average Commercial account uses approximately 2.6 times the water use of an average SFR account; therefore, each Commercial account is equivalent to 2.6 ERUs. Table 5.3 presents the average number of ERUs per account for each customer class based on average historical water use. The number of ERUs per account ranges from 1.2 for ADU accounts to 190.2 for Industrial accounts.

5.2 Seasonal Demands

The pattern of water consumption differs between the customer classes. Figure 5.3 presents average total monthly consumption by customer class from 2017 through 2024. Note that, with exceptions, the City has historically conducted bi-monthly meter reading; therefore, the water consumption was averaged between months to better reflect the actual water consumed in the month. As of June 2025, the City has started monthly reads. SFR and irrigation accounts show a significant peak in total consumption during the summer months. Water use increases significantly during the summer when daylight hours are longer, and lawn and landscape watering is prominent. Other outdoor uses, including car washing and recreation, are also at their highest during summer months. By contrast, industrial users do not demonstrate significant seasonal variation in demand. These monthly variations in demand for each customer class can be used to target water use efficiency efforts and/or to project future water-use patterns for planning purposes.

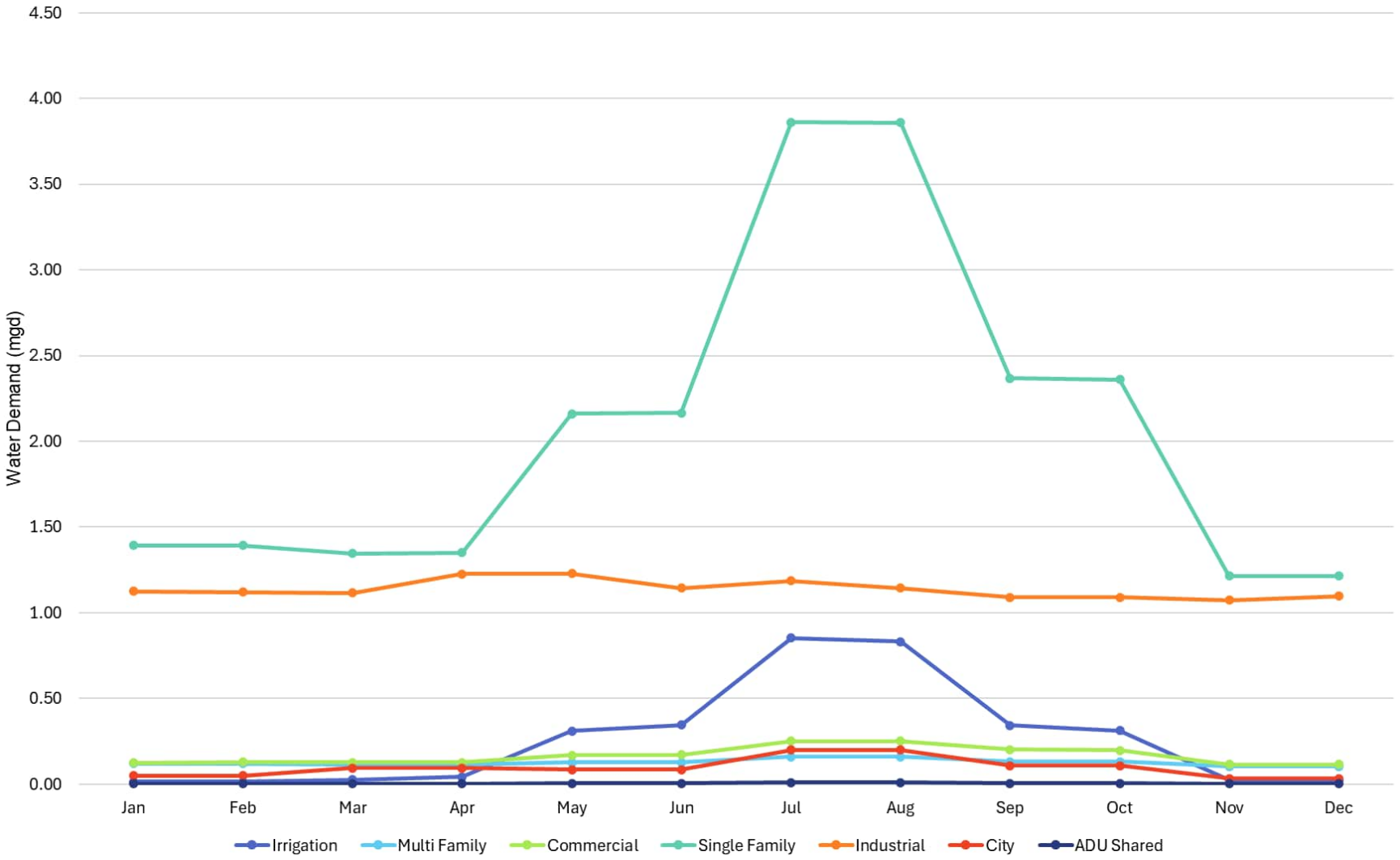


Figure 5.3 Average Seasonal Demand by Customer Class

5.3 Historical Production

The historical average and maximum water demands are important parameters when performing system and supply analyses. The term "water demand" refers to all the water requirements of a system including metered customers, unmetered water use, and unaccounted-for water such as leakage. For this reason, the City's production data, which accounts for all water demand, was used to calculate the ADD and MDD for each year. Additionally, historical production allows the City to track system-wide demands on a daily basis, rather than monthly or bi-monthly as is the case with billing records. Note that as of June 2025, the City has started monthly reads. Table 5.4 lists the historical annual production from 2017 through 2024. As shown, the annual production ranged from 1,448 million gallons (MG) to 1,729 MG.

5.3.1 Distribution System Leakage and Non-Revenue Water

DSL is equal to the total water produced minus the total authorized consumption. Aging water infrastructure leads to real losses such as water main breaks, reservoir leaks or overflows, and general distribution system leakage. It is important to note though that DSL includes apparent losses other than leakage as well, such as data handling errors, water theft, meter inaccuracy or failure, and untracked authorized water use. Authorized Non-Revenue Water that is not metered by the City contributes to the DSL as well.

The City's total water production and consumption in millions of gallons, or MG, as well as estimates of DSL for 2017 through 2024 are shown in Table 5.4 and presented graphically in Figure 5.4. The City's average annual DSL over the three-year period from 2022 to 2024 was 10.3 percent. There is a slight discrepancy in the DSL calculated from the historical billing records and the value reported on the Water Use Efficiency reports submitted annually to DOH. In early 2025, the City transitioned to a new data management and billing software, Tyler Technology's Utilities Pro, to improve data quality, management, and reporting. While the two sources are generally consistent, minor differences are present, which are likely due to errors introduced during the transition of historical data to the new software or to the timing of report preparation and subsequent revisions made to ensure accuracy.

Table 5.4 Historical Distribution System Leakage

Year	Historical Billing Data[1]				Annual Water Used Efficiency Reports[2]			
	Total Production (MG)	Total Consumption (MG)	DSL (MG)[3]	DSL (%)	Total Production (MG)	Total Consumption (MG)	DSL (MG)	DSL (%)
2017	NA	1,338.8	NA	NA	1,493.4	1,339.0	154.4	10.3%
2018	1,541.2	1,346.5	194.7	12.6%	1,545.9	1,348.9	197.1	12.7%
2019	1,447.6	1,259.6	188.1	13.0%	1,447.6	1,253.3	194.3	13.4%
2020	1,537.3	1,309.0	228.3	14.9%	1,537.3	1,314.8	222.5	14.5%
2021	1,729.0	1,522.0	207.0	12.0%	1,733.0	1,478.4	254.6	14.7%
2022	1,639.4	1,439.5	199.9	12.2%	1,639.4	1,406.0	233.4	14.2%
2023	1,699.2	1,530.3	168.9	9.9%	1,699.2	1,524.2	175.0	10.3%
2024	1,697.5	1,547.2	150.3	8.9%	1,697.5	1,540.9	154.6	9.2%
Average				**11.9%[4]**				**12.4%**
3-Year Average (2022-2024)				**10.3%**				**11.2%**

Notes:
(1) Historical production and consumption data were calculated based on the data provided by the City in July 2025.
(2) Historical production and consumption shown are based on the Water Use Efficiency report submitted to Washington's Department of Health (DOH).
(3) Distribution System Loss (DSL) was determined by subtracting total consumption from total production.
(4) 2017 Water Total Production was not provided for this analysis, therefore the DSL's average percentage excluded the year of 2017.

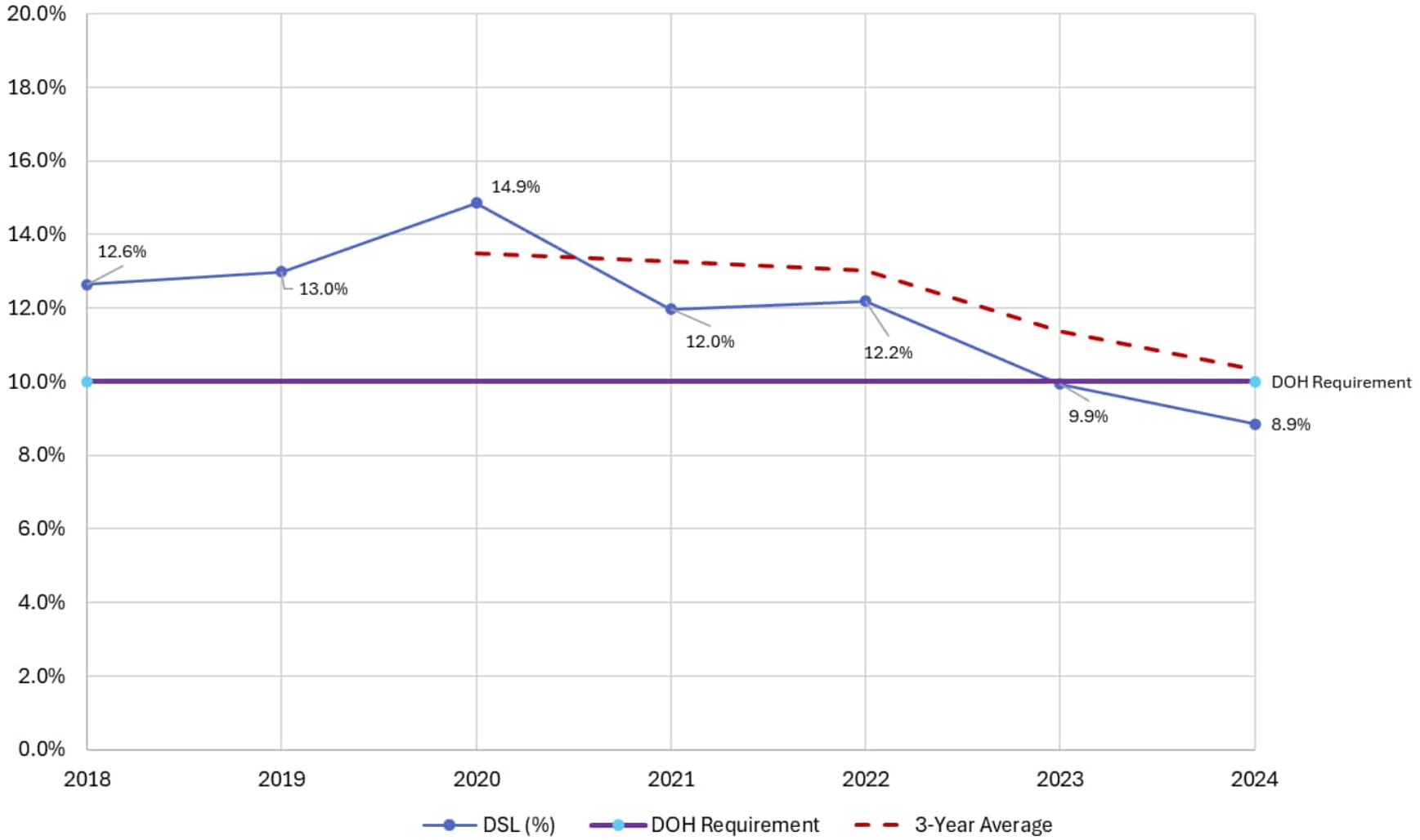


Figure 5.4 Historical Distribution System Leakage Trend

5.3.2 Historical Average and Maximum Demands

The City produces water for its customers through ten wells and two surface water sources. Table 5.5 presents the ADD and MDD (based on production) for the period of 2018 through 2024. The average annual water produced from 2018 through 2024 was 1,613 MG per year. The average ADD over the period was 4.42 mgd. The annual ADD trends increases slightly over this period, reflecting the growing number of City water customers.

Table 5.5 Historical Average Production, Maximum Day Demand, and Peaking Factor

Year	Date of MDD	MDD (mgd)	MDD without Top 2 Large User	ADD (mgd)	ADD without Top 2 Large Users	MDD:ADD Peaking Factor with Top 2 Large Users	MDD:ADD Peaking Factor(1)
2018	July 28	8.3	7.2	4.2	3.3	2.0	2.2
2019	July 15	7.7	6.6	4.0	3.0	1.9	2.2
2020	August 16	8.7	7.5	4.2	3.3	2.1	2.3
2021	July 29	9.3	8.1	4.8	3.8	2.0	2.2
2022	July 29	8.8	7.5	4.5	3.5	2.0	2.2
2023	August 21	8.8	7.6	4.7	3.7	1.9	2.1
2024	July 8	10.2	8.9	4.7	3.6	2.2	2.5
Average		**8.8**	**7.6**	**4.4**	**3.4**	**2.0**	**2.2**
3-Year Average (2022-2024)		**9.3**	**8.0**	**4.6**	**3.6**	**2.0**	**2.2**
75th Percentile		**9.3**	**8.1**	**4.7**	**3.7**	**2.1**	**2.3**
Maximum		**10.2**	**8.9**	**4.7**	**3.8**	**2.2**	**2.5**

Notes:
(1) Peaking factor excludes large user demand. Large user demands were removed from both MDD and ADD values to calculate the peaking factor.
(2) Totals may not equal due to rounding.

The MDD is a key benchmark for supply capability, pump station discharge rates, reservoir capacity, and pump sizes. The MDD is the highest daily production in a given year and typically occurs during the summer when irrigation is prevalent. Table 5.5 presents the historical MDD from 2018 to 2024. MDD is less dependent on indoor water use (which drives the ADD), and more dependent on irrigation. The highest MDD value (10.2 mgd) occurred in 2024, which had record-setting high temperatures and low rainfall. The next highest MDD occurred in 2021, three years earlier during COVID-19, when many individuals were still working from home.

The second to last column of Table 5.5 presents the historical MDD to ADD peaking factor including the top two large users, which reflects systemwide demand patterns. The last column presents the MDD to ADD peaking factor with the top two large users removed, providing a comparison of typical residential and commercial demand trends across different years. Large user demands are excluded from the peaking factor by removing large user demands from both ADD and MDD. This is because large user demands do not typically exhibit the same daily variation and peaks as other customers. Because of their significant demands, including large user demands in peaking factors can skew peaking factors intended to represent the majority of customers. The peaking factor is also a key parameter in developing the future MDD projections, as discussed later in this chapter. The maximum peaking factor of 2.46 occurred in 2024

and the minimum peaking factor of 2.17 occurred in 2021 and 2022. The MDD to ADD peaking factor over the period is shown graphically in Figure 5.5. Figure 5.5 illustrates the variability in the peaking factor over the period. Section 5.6.4 discusses the peaking factor to be used for future projections.

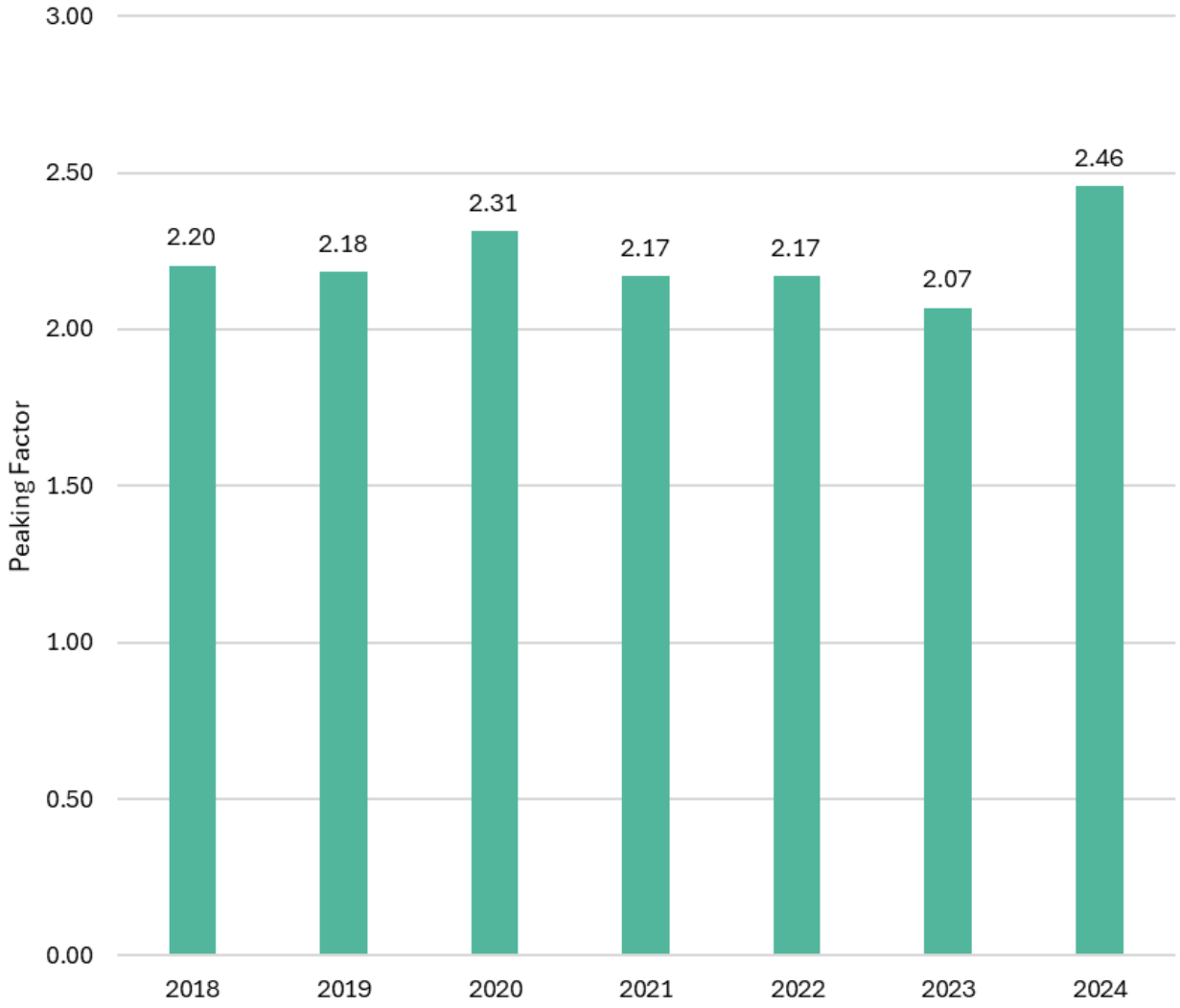


Figure 5.5 MDD/ADD Peaking Factor

5.4 Demographic Forecast

Demand projections depend on the future number of customers to be served by the City's water system. Thus, demographic forecasts of future population and employment must be made to establish an estimate of the future number of customers. A demographic analysis consistent with regional growth planning was performed to estimate the number and type of future customer accounts served by the City's water system. Converting the number of accounts into demand projections is discussed in Section 5.6.

5.4.1 Land Use

Land use designations and regulations provide important information in determining future water requirements. Land use determines the area available for various types of development including both SFR and MFR development, as well as commercial and other types of land use that provide the economic base necessary to support residential development.

5.4.1.1 Existing Land Use

Figure 5.6 depicts the best available data on existing land use based on Clark County Geographic Information System (GIS) data developed for the 1994 GMA and the 2023 VBLM data. While these sources provide the best available information, some parcel records were not up to date. In those cases, a simple check was done to confirm whether the parcels are vacant or developed. Because these GIS data are not up-to-date, existing water customers were derived using the City's billing data and matching it to parcel property IDs thereby providing the geographic location. Each metered account was assigned one of the eight customer classes. Open space, water, agriculture and vacant land uses were also part of the existing land use classes but are not associated with metered accounts.

Figures 5.6 shows the City’s existing land use.

5.4.1.2 Future Land Use

Future land use designations were obtained from the City's 2045 Comprehensive Plan and the Preferred Land Use Alternative Map. (Camas 2025). These future land use designations are depicted in Figure 5.7. The future land use designations are used to evaluate the 20-year development conditions as described below.

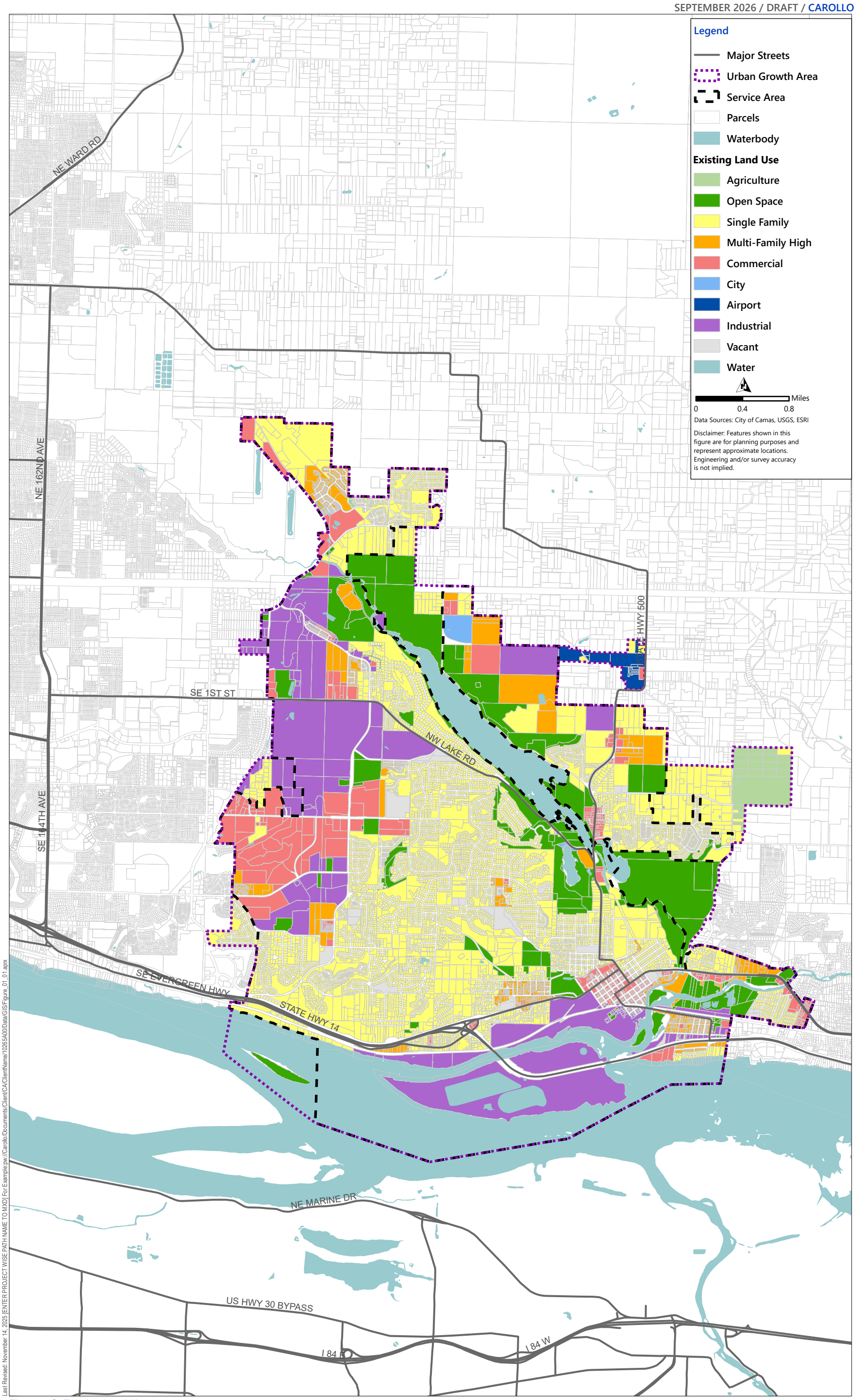


Figure 5.6 Existing Land Use
CITY OF CAMAS
WATER SYSTEM PLAN UPDATE

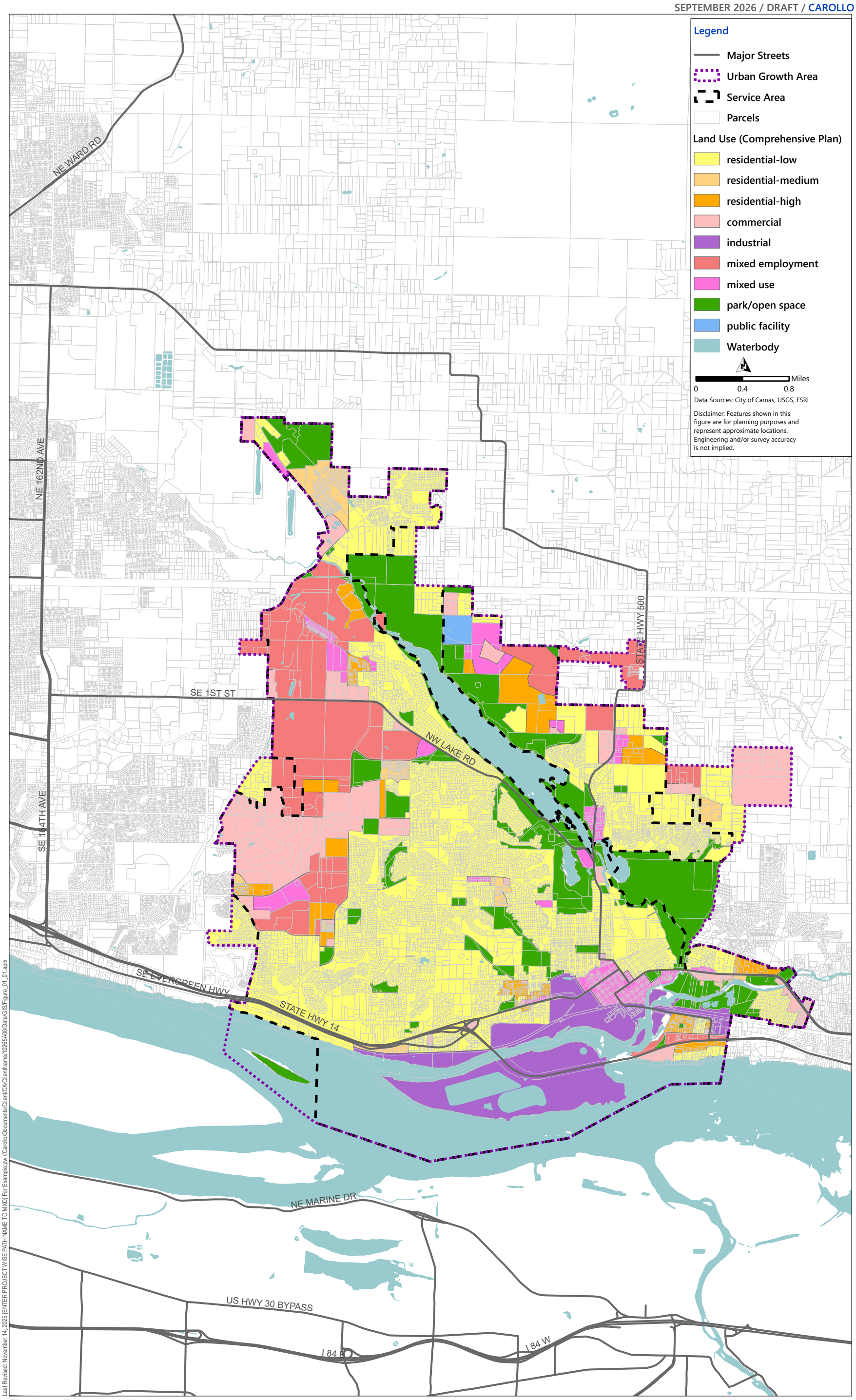


Figure 5.7 Future Land Use
CITY OF CAMAS
WATER SYSTEM PLAN UPDATE

5.4.2 Demographic Projections

To determine future demand for the City's RWSA, current and projected demographic trends provided by the City were used. The number of households in 2025 is based on the number of residential accounts in 2024 provided by the City and an annual growth rate of 2.9 percent. Number of employees in 2025 is from the US Census Bureau data. 2045 projected households and employees were provided by the City's planning department. Years 2036 and 2046 projections are linearly interpolated and extrapolated from the 2031 and 2045 values. Table 5.6 shows the City's household and employment projections.

Table 5.6 System-wide Household and Employment Projections

System-wide Projections	2025	2031(3)	2036(5)	2045(4)	2046(5)
Households	9,824(1)	11,415	12,790	15,443	15,738
Employees	12,600(2)	13,604	18,929	24,098	24,904

Notes:
(1) Existing number of households for 2025 are based on the number of residential accounts in 2024 provided by the City and 2.9% average annual growth rate.
(2) Number of employees in 2025 are estimated based on the U.S. Census Bureau's Data for the 2019-2023 period.
(3) The 2031 Household Projections were based on the City's Current Development Project Dashboard, which identifies parcels currently under review, in construction, on hold, or in the permitting process. Employee projections were estimated based on the anticipated redevelopment of parcels designated for commercial and industrial land uses.
(4) Projections for household and employees for 2045 were provided by the City.
(5) 2036 and 2046 projected values are based on interpolation and extrapolation of the 2031 and 2045 values.

The City's VBLM data does not identify the specific locations where residential and employment growth will occur or when, so projected household and employees were distributed across the service area based on known developments expected to occur within the short term (2031) and using the VBLM parcel constrained/unconstrained classification (2036 and 2046).

- For 2031: Residential units and employments were allocated based on parcels currently under review, in permitting, or under construction per the City's Current Development Project Dashboard, and growth was assigned to these areas.
- For 2036: For residential land uses, approximately 20 percent of each land uses' buildout density was assumed to be added by 2036. 20 percent development of residential demand aligns with the household projections presented in Table 5.6 based on the buildout densities for single family and multifamily parcels obtained from the 2022 Clark County Buildable Lands Report. Buildout densities are 20 dwelling units per acre for MFR and six dwelling units per acre for SFR. For non-residential land uses (commercial, City, and industrial), approximately 50 percent of the 2046 buildout density was assumed to be added by 2035, with commercial and City at 20 employees per acre and industrial at 9 employees per acre. Employment increments for 2036 were calculated as the additional number of employees needed to reach the 2036 total projection, including any employees already accounted for in 2031.
- For 2046: For residential land uses, 95 percent of buildout density was assumed to be added by 2046. Similarly, non-residential land uses were assumed to reach 95 percent of buildout density.

By 2045, the City is expected to have a population of 37,080 people, a 7,729-person increase from the estimated 2023 population of 29,352 (Camas 2045, 2025). This represents an annual average growth rate of 1.2 percent. The 2023 Clark County VBLM information is in Appendix **[X]**. Moreover, projections were prepared specifically for the North Shore area which is expected to add about 1,230 housing units by 2046, which is included in the projected households in 2046. Figure 5.8 shows the City's residential projections for North Shore area.

The City currently serves several accounts located outside the RWSA. These accounts were not grown as expansion of water service in this area is not expected, per the definition of the RWSA. Instead, their 2025 demands were held constant over the entire 20-year planning period.

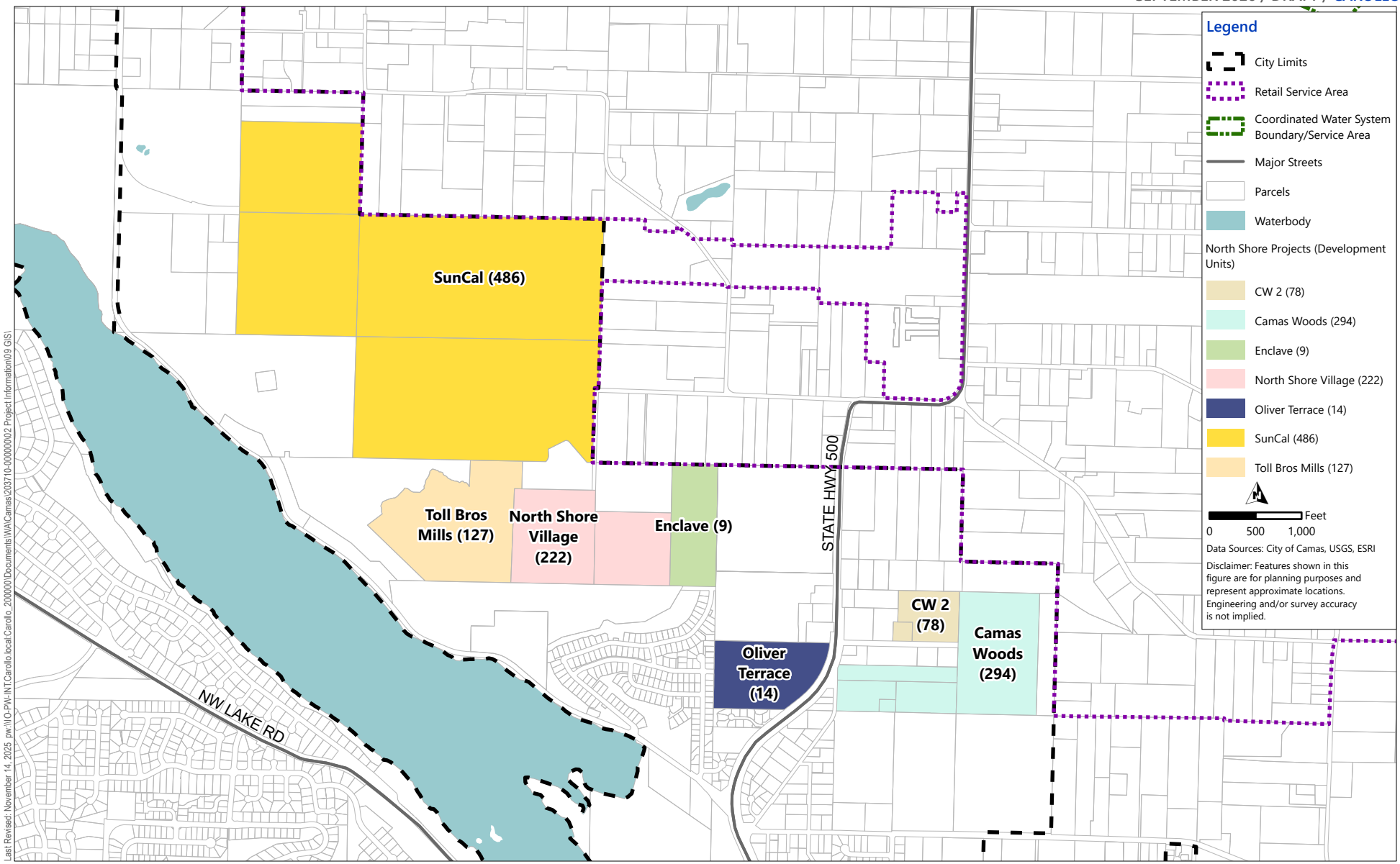


Figure 5.8 Projected Growth in North Shore Area in Number of Units

5.5 Projected Number of Accounts

Water accounts were projected using the GIS data and percent of land developed that meets the household and employee projections presented in Section 5.4. Growth was added to existing accounts to align with the household and employee projections presented in Table 5.6.

Table 5.7 summarizes the projected number of water accounts for each planning year. The projections show increased growth over historical growth in multi-family residential and industrial accounts. These projections form the basis for estimating the City's future water demand. The ERU factors for low, medium, and high demand scenarios were then applied to the account projections to develop the City's future demand estimates.

Table 5.7 Projected Number of Water Accounts

System-wide Projections	2025	2031	2036	2046	Average Annual Growth Rate
Airport	1	1	1	1	0%
SFR(1)	9,350	10,284	11,018	12,808	1.5%
MFR	490	1,303	2,007	3,379	9.6%
Commercial(2)	260	286	347	482	2.9%
Commercial Large Users	12	12	12	12	0%
City	50	50	50	50	0%
Industrial	13	25	68	123	11.5%
Industrial Large Users	10	10	12(3)	12(3)	0.9%
Total of Accounts	10,187	11,971	13,541	16,867	2.4%

Notes:
(1) SFR includes ADU Shared category from historical accounts. ADU Shared are not projected separately from SFR.
(2) Commercial accounts include demand irrigation water demand. The Irrigation category of account from historical accounts are not projected separately.
(3) Two additional large users were assumed to be added, one located in North Shore and one in the STEP Basin.

5.6 Projected Water Demand

Projecting future water demand is one of the key elements of the water system planning process. Identification of system improvements such as supply, pumping, storage, and piping requirements are all related to demand projections. This section summarizes the ERU, ADD, and MDD projections, as well as the potential range in future demands associated with various factors, such as water use per ERU, DSL, and climate change.

5.6.1 Potential Range in Future Water Demand

Numerous factors and assumptions affect the accuracy of projected future water demands. Recognizing that certain assumptions built into the demand projections will vary in the future, the projections were developed for low, medium, and high demand scenarios to provide a range in demands that may be experienced in the future.

The variables considered in developing the range of demand projections are summarized in Table 5.8 and are discussed below.

- **Future Water Accounts:** The future water accounts are shown in Table 5.7 and were projected using VBLM data and planning data from the City. Because the 20-year planning period (2046) of this Water System Plan Update (WSPU) extends beyond the 20-year planning period of the Comprehensive Plan 2045, linear interpolation was used to determine the future water accounts in the planning periods for the WSPU.
- **Water Use per ERU:** Water use per ERU for the low, medium, and high demand projections are based on the City's historical data from 2017 to 2024. The low projection reflects the historical average of 242 gpd/ERU, while the medium projection reflects the 75th percentile value of 248 gpd/ERU. The high demand projection was based on maximum of the historical data presented in Table 5.3, which equals 260 gpd/ERU.
- **ERUs per Account:** The historical ERUs per account by customer class presented in Table 5.3 were used to project the future demands. These ERU per Account values based on the average of the historical data and a water use per ERU value of 242 gpd/ERU.
- **Distribution System Leakage:** The City's three-year running average DSL varied between 10.3 and 13.0 percent of the City's total production between 2022 through 2024, as shown in Table 5.4. For the low demand scenario, a DSL of 9.1 percent was selected to represent the City's conservation goals, based on the most recent 2024 data. For the medium and high demand scenario, 10 percent was used to represent the City's goal of meeting Washington Department of Health threshold.
- **Climate Change Impacts:** Climate models project that the Pacific Northwest will generally experience warmer, wetter winters and hotter, drier summers. To estimate the potential impact on the City's future demands, Carollo evaluated historical and projected maximum temperature data from an ensemble of global climate models under multiple future scenarios.

  A regression analysis was developed between the City's historical consumption and modeled historical climate data. This relationship was then applied to future climate projections. The City elected to assume no change for the low scenario, to use the Shared Socioeconomic Pathway (SSP) 1-2.6 scenario as the basis for the medium demand scenario, and to use the SSP 3-3.7 scenario as the basis for the high demand scenario for its planning assumptions. SSP 1-2.6 represents a sustainably focused future and decreasing rate of change. SSP 3-3.7 represents a world with limited climate policy and higher emissions producing greater warming than SSP 1-2.6 but less than SSP5-8.5. It brackets a plausible upper range of climate stress on demand and supplies for planning.

  Results indicate that by midcentury, climate change may increase overall water demand by approximately 2.93 percent under the SSP 1-2.6 scenario and by approximately 4.49 percent under the SSP 3-3.7 scenario. Seasonal impacts are more pronounced, with the largest increases expected during the spring (February–April) and fall (September–October) shoulder seasons.
- **Maximum Day/Average Day Peaking Factor:** Due to the high projected demands for the City's largest two water users (described in the following section), and the lack of summer peaking in demand, the MDD/ADD peaking factor was not applied to the top two largest users to avoid overly conservative demand projections. Instead, peaking factors for the two largest users were calculated separately and are described in the section below. The MDD/ADD peaking factors developed for all customers excluding the top two large users is based on the historical production data. The MDD/ADD

peaking factors for all customers excluding large users varied from 2.07 to 2.46 between 2018 and 2024 as shown in table 5.5. For the low demand projection, the average peaking factor from 2018 and 2024 of 2.22 was used. For the medium demand projection, the three-year average observed between 2022 and 2024 of 2.23 was used. For the high demand projection, the 75th percentile observed from 2018 and 2024 of 2.31 was used.

- **Large Industrial Users Maximum Day/Average Day Peaking Factor:** The MDD/ADD peaking factor was not applied to large industrial users to avoid overly conservative demand projections. Instead, the two largest users were assigned a peaking factor of 1.25 for the low demand scenarios, which represents a maximum day demand approximately 10 percent above the average day demand. For the medium scenario, a peaking factor of 1.30 was applied to remain consistent with the City's 2022 economic development studies. The high scenario used a conservative peaking factor of 1.50. It is important to note that the remaining eight large users were assigned to the non-large user peaking factor, as their water use pattern aligns more closely with typical business diurnal demands, unlike the top two large industrial users.
- **Future Large Industrial Users:** Additional demand for Future large users was based on individual demand projections that are presented in the following sections.

Table 5.8 Demand Projection Parameters

Demand Scenario	Demographic Growth Scenario	Water Use per ERU (gpd/ERU)	Distribution System Leakage (%)	Maximum Day Peaking Factor	Large Industrial User Peaking Factor(1)
Low	Average	242	9.1%	2.22	1.25
Medium	75th Percentile	248	10.0%	2.23(2)	1.30
High	Maximum	260	10.0%	2.31(3)	1.50

Notes:
(1) The large industrial peaking factors were only applied to the top two large industrial users, as their usage patterns are industrial in nature and do not follow typical business diurnal demand patterns like the other large users.
(2) The three-year average from 2018-2024 was used to determine the maximum day peaking factor for the medium demand scenario.
(3) The 75th percentile from 2018 to 2024 was used to determine the maximum day peaking factor for the high demand scenario.

5.6.2 Large Users Demand Forecast

The City's top 10 water users, or large users, were identified by the City as presented in Section 5.1.1. Low, medium, and high demand forecasts were created for each large user based on historical water use data from 2017 through 2024.

The low demand scenario projections were determined by identifying the lowest projected demand for each large user based on four calculated estimates: the average historical growth rate, the most recent three-year average growth rate, the large users' annual demand with the maximum historic yearly demand held constant, and the current demand. If the current demand is the lowest of these four estimates, it was used as the low demand scenario. The high demand scenario projections were determined by identifying the highest projected demand for each large user based on three calculated estimates: the average historical growth rate, the most recent three-year average growth rate, and the large users' annual demand with the maximum historic yearly demand held constant. The medium demand scenario is an average of the low and high demand projections.

For three large users, however, projections were developed using a different approach. Georgia Pacific demonstrated a decline in average demand from 2017 to 2024 period following a reduction in production and accompanying layoffs in 2018 that eliminated approximately two-thirds of its jobs, according to City staff. Similarly, the City and Camas School District No. 117 have reduced irrigation use due to recent budget cuts. For these three large users, demand projections were conservatively set equal to the maximum observed demand between 2017 and 2024 and applied consistently across all demand scenarios, as increases in demand are not anticipated. Additionally, Clara Street Block Building, LLC presented very limited data with only other data shown in 2021. For planning purposes, it is assumed that its 2024 demand will remain steady over the projection period.

The City has requested future large users demand projections to be included and increase linearly through 2046. Table 5.9 shows the additional future large user demands for 2031, 2036, and 2046.

Table 5.9 Additional Future Large User Demands

Demand Scenario	2031 (mgd)	2036 (mgd)	2046 (mgd)
Low	0.0	0.0	0.25
Medium	0.19	0.375	0.75
High	0.375	0.75	1.50

Additionally, all the existing large users demand projections are presented in Table 5.10. For each of the existing large users, Table 5.10 provides the Service Area, 2025 demand, and the projected 2031, 2036, and 2046 demands.

5.6.3 Projected ERUs

Projected ERUs for single family residential is the projected number of accounts since ERU is defined as water consumption from one single family home. Projected ERUs for all other customer classes is the projected number of accounts multiplied by the number of ERUs per account for that customer class. Table 5.11 presents the projected ERUs for each of the City's Service Areas under different growth scenarios. To spatially allocate demands across the retail water service area, the City's 2023 VBLM data was used to determine whether parcels are constrained or unconstrained, and whether parcels are expected to develop or redevelop by 2045 consistent with the future land use per the Comprehensive Plan 2045.

5.6.4 Projected Average Day and Maximum Day Demands

ADD projections were determined by multiplying the total number of projected ERUs per Service Area by the appropriate water use per ERU for each demand scenario, as listed in Table 5.8. Additionally, the ADD projections incorporate the assumptions for DSL and the unique large users demand projections. To develop MDD projections, the ADD projections for all customers were multiplied by the peaking factors. For the two largest existing users and the future users, the large user peaking factors shown in Table 5.8 were applied depending on the demand scenario.

Tables 5.12 and 5.13 show the projected ADD and MDD, respectively, under the low, medium, and high demand scenarios. These projections, as well as historical ADD and MDD, are visually depicted in Figure 5.8.

Table 5.10 Existing Large Users Demand Projections

Large User	Service Area	Demand - 2025 (mgd)	Demand - 2031 (mgd)			Demand - 2036 (mgd)			Demand - 2046 (mgd)		
			Low	Med	High	Low	Med	High	Low	Med	High
TSMC (formerly "Wafertech Industries")	544	0.74	0.74	0.80	0.87	0.74	0.84	0.94	0.74	0.93	1.12
Analog Devices (formerly "Linear Technologies")	544	0.28	0.28	0.30	0.31	0.28	0.30	0.31	0.28	0.31	0.34
City of Camas	343, 455, 544, 852	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Camas School District No. 117	343, 455, 544, 852	0.10	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Bodycote IMT	544	0.05	0.05	0.07	0.10	0.05	0.09	0.13	0.05	0.12	0.20
Georgia Pacific Mill	343	0.04	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Fisher Creek Investments	544	0.02	0.02	0.02	0.03	0.02	0.03	0.03	0.02	0.03	0.05
Hills at Round Lake Homeowners Association	852	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.03	0.04
Prestige Care and Rehabilitation	343	0.01	0.01	0.02	0.02	0.01	0.02	0.03	0.01	0.03	0.05
Clara Street Blocking Building, LLC	343	0.04	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Total (Existing Large Users)(1)	-	1.44	1.60	1.70	1.80	1.60	1.77	1.95	1.60	1.93	2.28

Notes:
(1) Totals may not equal due to rounding.

Table 5.11 ERU Projections

Service Area	ERUs – 2025	ERUs – 2031	ERUs - 2036	ERUs - 2046
343 - Butler	2,314	3,017	3,430	3,843
455 - Lower Prune Hill	1,653	1,901	1,942	1,983
542 - Gregg	1,198	1,901	3,182	5,413
544 - Lacamas	9,132	11,570	13,223	16,942
695 - Green Mountain Estates	83	289	289	331
852 - Upper Prune Hill	4,876	5,124	5,372	5,909
Total	19,256	23,802	27,438	34,421

Table 5.12 Average Day Demand Projections

Service Area	2025 ADD (mgd)	ADD - 2031 (mgd)			ADD - 2036 (mgd)			ADD - 2046 (mgd)		
		Low	Med	High	Low	Med	High	Low	Med	High
343 – Butler	0.9	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.4
455 – Lower Prune Hill	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
542 – Gregg(1)	0.3	0.5	0.5	0.6	0.8	0.9	1.0	1.2	1.4	1.6
544 – Lacamas(1)	2.0	2.3	2.6	2.8	2.4	2.9	3.4	2.9	3.7	4.6
852 – Upper Prune Hill	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4
695 – Green Mountain Estates	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Demand(1)	4.6	5.6	5.9	6.3	6.2	6.8	7.4	7.4	8.4	9.6

Notes:
(1) Service areas 542 and 544 include additional future large user demand.
(2) Totals may not equal due to rounding.

Table 5.13 Maximum Day Demand Projections

Service Area	2025 MDD (mgd)	MDD - 2031 (mgd)			MDD - 2036 (mgd)			MDD - 2046 (mgd)		
		Low	Med	High	Low	Med	High	Low	Med	High
343 – Butler	1.9	2.2	2.3	2.4	2.4	2.5	2.7	2.7	2.9	3.1
455 – Lower Prune Hill	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1
542 – Gregg(1)	0.7	1.0	1.1	1.3	1.6	1.8	2.2	2.6	3.0	3.6
544 – Lacamas(1)	3.2	3.6	4.2	5.1	4.0	4.9	6.3	4.8	6.5	8.9
852 – Upper Prune Hill	2.4	2.4	2.5	2.6	2.5	2.6	2.7	2.9	3.0	3.2
695 – Green Mountain Estates	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Demand(2)	9.1	10.3	11.1	12.4	11.6	13.0	15.1	14.2	16.6	20.2

Notes:
(1) Service areas 542 and 544 includes additional future large user demand.
(2) Totals may not sum exactly due to rounding.

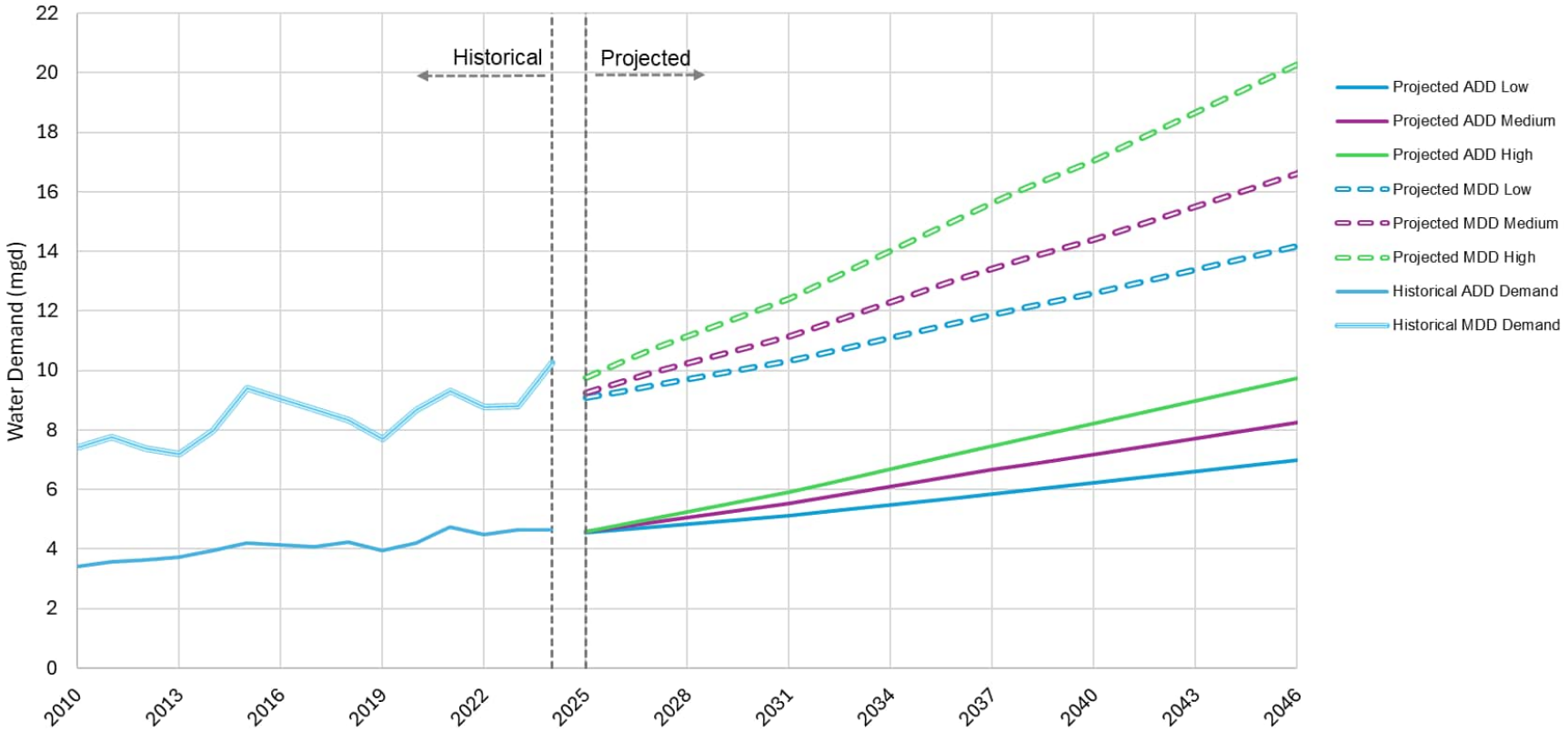


Figure 5.9 Average and Max Day Demand Projections

CHAPTER 6 WATER USE EFFICIENCY

The City promotes efficient water use to conserve and protect their existing water supplies for present and future residents. The City promotes water conservation and efficient use of water through a variety of activities that encompass their WUE Program. The program encourages water conservation and utilizes continued improvements to reduce leakages and water loss in the City's system. This chapter details both the City's existing and future WUE programs.

6.1 WUE Program Background

In 2003, the Washington State Legislature passed the Engrossed Second Substitute House Bill 1338, known as the Municipal Water Law or the WUE rule, to address the increasing demand on Washington's water resources. This law established that all municipal water suppliers (MWS) must use water more efficiently in exchange for water right certainty and flexibility to help them meet future demand.

The WUE rule, which became effective on January 22, 2007, emphasizes the importance of measuring water use and evaluating the effectiveness of the water supplier's WUE program. The intent is to minimize water withdrawals and water use by implementing water saving activities and adopting policies, resolutions, ordinances, or bylaws. This chapter follows the guidelines set forth in the Water Use Efficiency Guidebook, Fourth Edition, (May 2025) as well as the Water System Planning Handbook (June 2025).

6.1.1 Current WUE Program

The City's current WUE Program was established as part of the 2019 WSP. Per the WAC 246-290-830(4)(a), all water purveyors with 1,000 or more connections were required to set efficiency goals through a public process. The established goals promote water use efficiency for internal operations and for water customers. The past WUE Program goals were established in the 2010 WSP and subsequently re-established in 2013 and 2019:

- **Demand-Side Goal:** Reduce customer consumption per ERU by 1 percent or approximately 2 gpd per year over the next six years.
- **Supply-Side Goal:** Continue to reduce distribution loss to or below 10 percent for the next five years.

The following summarizes the current program.

6.1.1.1 Supply-Side Measures

The City implements the following supply-side measures as part of their WUE Program. A number of these measures are mandated by the DOH per the WUE Guidebook. The following summarizes the City's supply-side measures:

1. Record and monitor supply source production (Mandatory).
2. Record and monitor customer demands through customer water meters (Mandatory).
3. Test and calibrate industrial and commercial meters annually (Mandatory).

4. Replace customer water meters with enhanced advanced metering infrastructure (AMI) meters. Once complete, the City will regularly test and repair residential meters per manufacturer recommendations.
5. Perform annual leak detection surveys through a private contractor. Hydrants and valves are checked as part of leak detection surveys (Mandatory).
6. Repair or replace old distribution system piping with defects as budget allows.
7. Reclaimed Water: Treated wastewater is used for washdown and process use and for landscape irrigation at the wastewater treatment plant (WWTP) (Mandatory to evaluate reclaimed water).

6.1.1.2 Demand-Side Measures

The City implements a number of demand-side measures that previously met the DOH requirement for six WUE measures. These measures are similar to many of the example water use efficiency measures presented in Appendix B of the Water Use Efficiency Guidebook. The City provides an overview of their water use efficiency activities on their Water Services website (http://www.ci.camas.wa.us/index.php/pwwater). The City's various public outreach activities meet the DOH requirement for educating customers about water use efficiency. The following provides a summary of the City's demand-side measures:

1. Include water consumption history on customer's utility bills.
2. City staff alert and visit customers where customer leaks are identified.
3. Promote installation of smart controllers and irrigation timers for the school district and industrial users.
4. Educate the public on conservation and water-saving devices at community events and on the City website (http://www.ci.camas.wa.us/images/DOCS/WATER_SEWER/REPORTS/waterconservation.pdf).
5. Distribute water-saving devices such as shower timers at community events.
6. Require xeriscaping and Low Impact Development (LID) to reduce irrigation requirements for new developments.
7. Work with developers to evaluate their irrigation systems to incorporate drip systems or micro sprayers.
8. Promote odd/even day and late night or early morning irrigation for all customers.

The above supply- and demand-side WUE measures are effective in encouraging WUE for the water system. Additional measures have been evaluated since the requirement increased to nine measures due to the City falling in the range of 10,000 to 49,999 service connections. These are discussed further in Section 6.2.3.

6.1.2 Distribution System Leakage

DSL is a significant element of supply-side WUE requirements. DSL above 10 percent on a three year rolling average is considered excessive and necessitates the creation of a WLCAP. DSL is the difference between total water production and metered water use. The estimate of DSL is dependent on the accuracy of meter readings for supply and customer meters. Table 6.1 presents the City's reported three-year rolling average DSL from 2021 through 2025. From 2021 through 2024, the City's three-year rolling DSL average was above their WUE program goal and DOH standard of 10 percent, but the City is making progress in lowering the DSL as seen from 2022 through 2025.

Table 6.1 Distribution System Leakage (Three-year Rolling Average)

Year	3-Year Rolling Average DSL (%)
2021	14.2
2022	14.5
2023	13.1
2024	11.2
2025	6.7

The DSL in Table 6.1 differs from that calculated in Chapter 5 - Water Requirements, where Chapter 5 evaluates historical billing data for consumption. The City cannot account for the differences; however, it is believed to be related to year end meter reading.

Although the 2025 three-year rolling average is below the 10 percent threshold, the City transitioned billing software in 2025, which required consumption data to be compiled from two sources. This may have contributed to higher reported water use. As a result, the City will complete a WLCAP to address its DSL. This can be found in Appendix **[X].**

6.1.3 Historical Effectiveness of Current Water Use Efficiency Program

The City's current WUE Program includes measures for residential, irrigation, commercial, and industrial customers. The effectiveness of the City's program in meeting their WUE goals can be evaluated considering system-wide water use trends.

The 2019 WSP used a planning ERU of 260 gpd based on average residential use from 2013 to 2015. The current planning ERU value of 242 gpd was based on the average of water use from 2022 to 2024. This equates to a decrease of 0.8 percent annually over the nine-year period, close to the City's goal of 1 percent.

Annual water use per account from 2017 to 2024 was detailed previously in Section 5.1.4. Water use across the City's SFR, MFR, commercial, industrial, city, irrigation, and ADU shared accounts have fluctuated since 2017. Overall, SFR and ADU shared water use have decreased from 2017 to 2014 by 2 and 6 percent, respectively. The City believes these decreases were in part from the WUE Program. Some decreases may have been from requirements in the Washington State Plumbing Code, which limits maximum flow rates for faucets, showers, toilets, and urinals. It is acknowledged that other factors may have played a prominent role, such as weather and economic conditions.

The City does not officially track staff time or project costs associated with WUE. The supply-side WUE measures, such as metering and leak detection, are core activities of the Utility and are funded through Utility Capital Improvement and O&M funds. The City estimates that it dedicates approximately 0.5 full-time-equivalents (FTE) of staff time to conduct demand-side measures across its Water Utility, finances department, and development services staff. It is not possible to estimate the cost of each demand-side measure; therefore, a cost-benefit comparison cannot be calculated.

Water consumption in City billing is based on the following most common meter size for SFR and cost per 100 cubic feet:

- Inside City limits:
  - Base rate for 3/4-inch meter: $15.54.
  - Cost per one hundred cubic feet: $2.76 or 0.37 cents per gallon.
- Outside City limits:
  - Base rate for 3/4-inch meter: $23.31.
  - Cost per one hundred cubic feet: $4.15 or 0.55 cents per gallon.

Because the City's water rates are generally comparable to those of neighboring utilities, its WUE Program appears to be implemented in a cost-effective manner.

6.2 Future WUE Program

The City plans to continue its efforts to encourage efficient water use and has updated its WUE Program, which is included in Appendix **[X]**. Going forward, the program will continue to focus on measures targeted at residential customers. The WUE Program goals established in 2026 are:

- **Demand-Side Goal:** Reduce customer consumption per ERU by 1 percent over the next 6 years.
- **Supply-Side Goal:** Continue to reduce distribution loss to 10 percent or less over the next 5 years.

Public comment on the future WUE program was taken at the **[XXXXXX]** City Council Meeting. An agenda and minutes for the meeting are provided in Appendix **[D]**.

6.2.1 Mandatory Measures

The WUE Program requires certain measures to be implemented, some of which can be incorporated as supply-side measures by the utility as described in Supply-Side Measures as well as in Future WUE Program Supply-Side Measures. The City's WUE Program will continue to meet the following mandatory measures in the future:

- Install production (source) meters.
- Install consumption (service) meters.
- Perform meter calibration.
- Implement a water loss control action plan to control leakage if the three year rolling average exceeds 10 percent.
- Educate customers about water use efficiency practices.
- Evaluate rates that encourage water demand efficiency, as discussed in a subsequent section.
- Evaluate reclamation opportunities, as discussed in a subsequent section.

6.2.1.1 Rate Structure

The City's current rate structure bills customers on a uniform volumetric charge. In 2010, the City added a consumption-based element to sewer rates based on average winter water consumption, which was thought to encourage water efficiency. In 2023, a rate study was performed that evaluated a tiered rate structure. Ultimately, it was determined that the current rate structure would remain in place. Future rate studies will continue to reevaluate rate structures to encourage conservation.

6.2.1.2 Reclaimed Water

Per WAC 246-290-100 and WUE requirements, water systems with over 1,000 connections must evaluate reclaimed water opportunities. As mentioned previously, the City currently uses treated wastewater at the WWTP. In addition, the City previously evaluated reclaimed water opportunities in 2006 with costs escalated to 2025 dollars in the concurrent effort of updating the General Sewer Plan, considering a multitude of locations to use the water for irrigation; Figure 6.1 displays locations with irrigation connections. Overall, it was concluded that using reclaimed water as irrigation water was not economically feasible, and therefore, the reclaimed water system will not be expanded at this time.

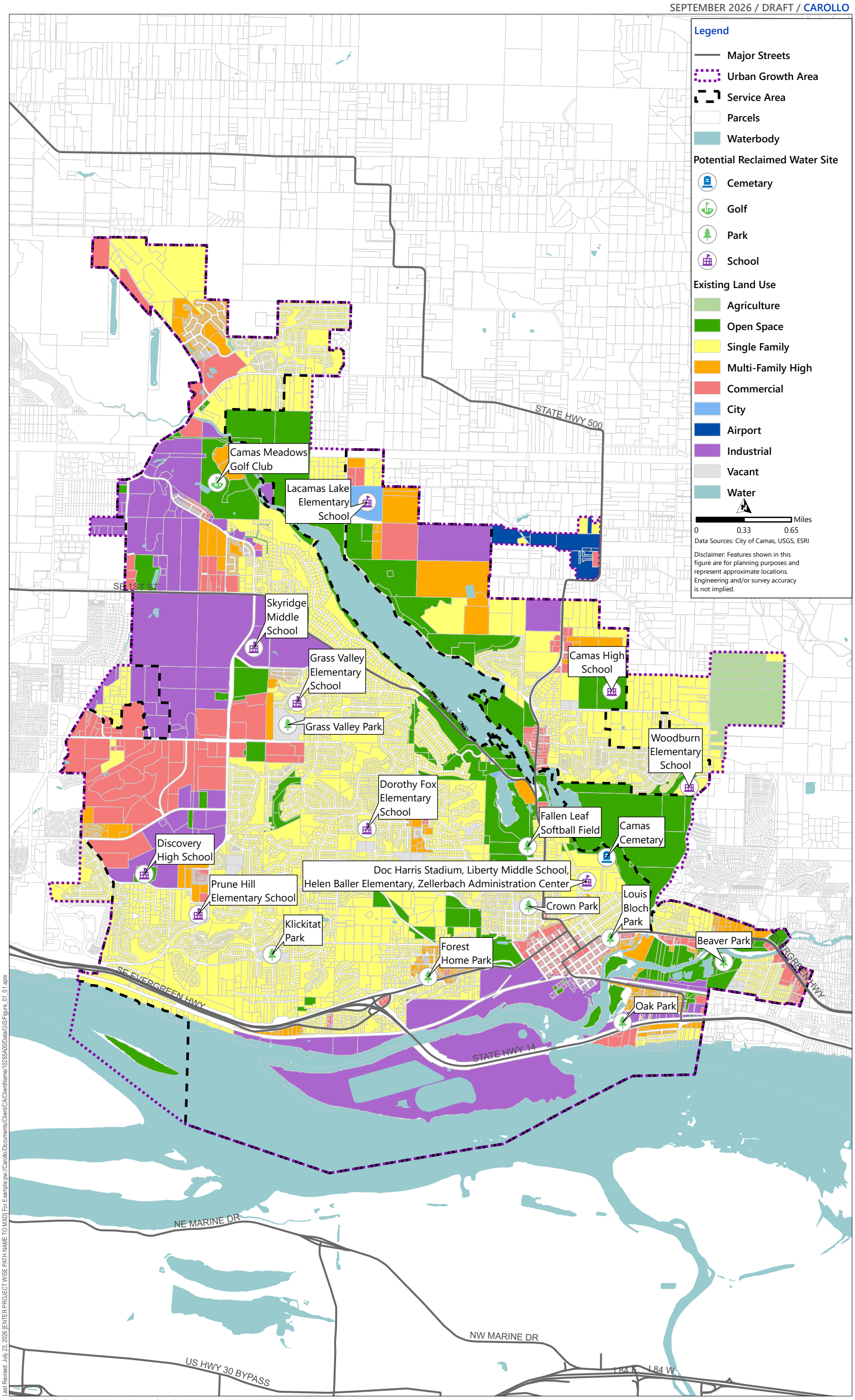


Figure 6.1 Possible Locations for Reclaimed Water Irrigation

6.2.2 Future WUE Program Supply-Side Measures

The City completed replacing 100 percent of customer water meters with AMI meters in 2025. The AMI meters provide operational benefits, reduces data error and helps identify customer-side leaks. Installation of AMI meters is expected to enhance meter accuracy, leak detection and customer education through the detailed water use data and statistics provided by the AMI system. The City will continue the existing supply-side measures as described in Section 6.1.1.1 and updated fourth supply-side measure to be as follows:

- The City will repair and/or replace residential meters per manufacturer recommendations.

6.2.3 Future WUE Program Demand-Side Measures

Due to an increase in connections, the City must have at least nine demand-side measures. Some of the current measures will continue, some are modified, and three new ones were added. The following list provides the new measures:

1. City staff alert and visit customers where customer leaks are identified.
2. Promote installation of smart controllers for City-wide users.
3. Educate the public on conservation and water-saving devices at community events and on the City website (http://www.ci.camas.wa.us/images/DOCS/WATER_SEWER/REPORTS/waterconservation.pdf).
4. Promote xeriscaping and LID to reduce irrigation requirements for new developments.
5. Promote irrigation systems to incorporate drip systems or micro sprayers.
6. Promote odd/even day and late night or early morning irrigation for all customers.
7. Provide monthly billing to all customers.
8. Send water savings tips to customers in the annual water quality report.
9. Onsite irrigation at the WWTP with treated effluent.

6.2.4 Projected Demands with Water Use Efficiency Goals

The projected water demands considering the water savings from the City's WUE Program were represented with the low demand scenario presented in Chapter 5. Projected demands with WUE savings were compared to the medium demand projection. The low demand projection assumes a 2025 demand based on 242 gpd/ERU while the medium demand projections assumes a 2025 demand based on 248 gpd/ERU. The low demand projection also assumes the WUE Program will help to reduce the MDD to ADD peaking factor by approximately 0.45 percent. The low and medium demand projections assume the City's DSL is 9.1 and 10 percent, respectively. Table 6.2 presents the projected ADD and MDD with and without the WUE Program for the 20-year planning period. The projected demands with the WUE Program are also shown in Figure 6.2. For ADD, WUE measures are projected to provide a reduction of 1.0 mgd, or 11.9 percent, by 2046. For MDD, WUE measures are projected to provide a reduction of 2.4 mgd, or 14.6 percent, by 2046.

Table 6.2 WUE Demand Projections

Demand Scenario	2046 Projection with WUE (mgd)	2046 Projection without WUE (mgd)	Water Savings (mgd)	Percent Savings
ADD	7.4	8.4	1.0	11.9
MDD	14.2	16.6	2.4	14.6

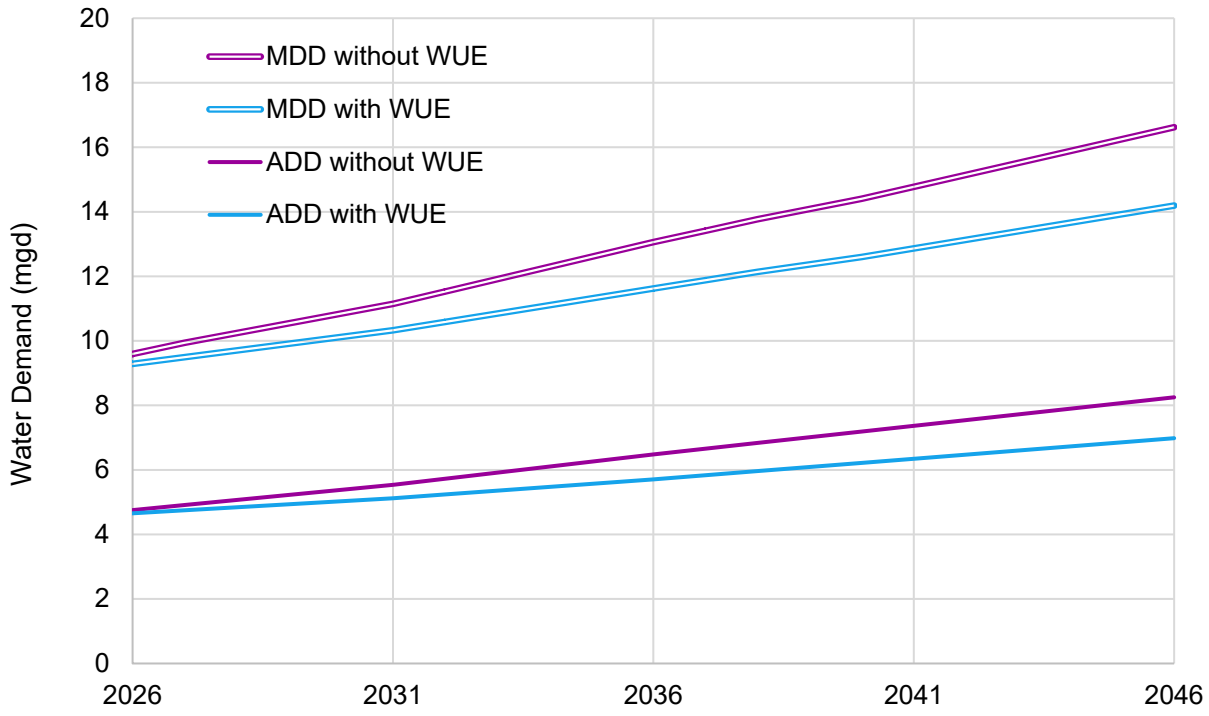


Figure 6.2 Projected Demands With and Without Water Use Efficiency

6.2.5 Future WUE Program Effectiveness

The effectiveness of the existing WUE program was evaluated using system-wide water use data. Measuring the effectiveness of the City's future WUE Program against the established goals could be similarly evaluated using system-wide water use data. Estimating the water savings directly resulting from the City's WUE Program in a single year is difficult. Therefore, long-term trends should be use to more clearly show the impact of the City's WUE Program.

The first step would be to establish a baseline from historical information. The second step is to evaluate the resulting water use after promoting WUE through targeted activities and events to customers. It is recommended that water use be tracked for at least a year to identify trends. Some considerations will need to be given to variations in weather and economic conditions. Another method would be to perform the same before/after water use analysis for WUE Program participants who volunteer and provide their address. The resulting information would be valuable for the City to correlate its WUE Program efforts with direct water savings for its customers.

AMI was implemented in 2025. The City will leverage AMI water usage data in its targeted public education programs to customers in a particular area or user profile, such as heavy irrigators. Using AMI, the City can estimate overall usage, irrigation usage, and peak water use rates.

6.2.6 Budget

The City recognizes the importance of continuing their WUE measures and considers it a core function of the Utility. The WUE program provides cost savings through demand reduction and reduction in DSL. Continuing the WUE Program can assist the City in meeting peak demands and avoiding curtailment periods. The City will continue the following level of effort for demand-side measures: approximately 0.5 FTE of staff time across its Water Utility, finances department, and development services department. Due to AMI capabilities, it is anticipated that the City will further personalize water use communications with customers without increasing staff effort. Future supply-side WUE measures will be funded, as appropriate, through the Capital Improvement and O&M funds. If AMI detects a large number of existing and new leaks, the City will evaluate the need for additional personnel in its meter maintenance group to address leaks.

6.3 Water Shortage Plan

Camas Municipal Code (CMC) Chapter 13.14 has been created to allow the City to impose restrictions during a water shortage. It defines five stages of water emergencies:

- Stage I - Anticipated Water Shortage.
- Stage II - Serious Water Shortage.
- Stage III - Critical Water Shortage.
- Stage IV - Emergency Water Shortage - Mandatory Outdoor Restrictions and Indoor Conservation.
- Stage V - Regional Disaster - Water Rationing.

The Public Works Director is responsible for declaring and implementing the water shortage plans. Stages I or II implement voluntary reductions in water use for customers and some City watering reductions. Stages III and IV further regulate or prohibit nonessential uses of water. Details on the Water Shortage can be found in CMC Chapter 13.14.

CHAPTER 7 WATER QUALITY

7.1 Introduction

The City is defined as a Group A - Community Water System and must comply with the drinking water standards of the federal Safe Drinking Water Act (SDWA) and its amendments, as regulated by the USEPA. The DOH adopted the updated federal standards under WAC 246-290, of which the most recent version became effective June 17, 2025.

The quality of the City's drinking water sources is of primary concern to the City. The City's water is supplied by groundwater aquifers and surface water sources (Jones and Boulder Creeks), which are tested regularly for the presence of contaminants at frequencies prescribed by DOH regulations. The City is in compliance with all DOH reporting requirements, including publication and distribution of an annual Water Quality Report that keeps consumers informed as to the quality of the City's water supply and water delivery systems.

This chapter includes the following components:

- Description of current drinking water quality regulations.
- Summary of anticipated future regulations.
- Summary of current monitoring programs.
- Summary of the City's compliance with USEPA and DOH regulations.
- Recommendations.

This chapter utilizes information from the DOH's website for Drinking Water Regulation and Compliance , the USEPA's website for regulations under the SDWA, the City's annual Water Quality Reports (included in Appendix E), and the City's previous 10 years water quality data.

7.2 Overview of Regulatory Requirements

The SDWA of 1974, amended in 1986 and 1996, established specific roles for the federal government, state government, and water system purveyors, with respect to water quality monitoring. The USEPA is authorized to develop national drinking water regulations and oversee the implementation of the SDWA. State governments are expected to adopt the federal regulations and accept primary responsibility or "primacy" for administration and enforcement of the Act. States can also regulate contaminants and set advisory levels. Public water system purveyors are assigned the day-to-day responsibility of meeting regulations by incorporating monitoring, record-keeping, and sampling procedures into their operation and maintenance programs.

Applicable SDWA regulations are summarized in Table 7.1 and are divided into those that address source water quality, surface water treatment, distribution system water quality, and system-wide requirements, respectively. Monitoring requirements under each rule are noted herein.

Table 7.1 Drinking Water Regulations

Rule	CFR	WAC 246-290	Affected Contaminants	Publication Date of Final Rule
Source Water Quality				
National Primary and Secondary Drinking Water Standards	See below	Part 4, 300, 310, 315 and 320	Bacteriological, IOC, VOC, SOC, Asbestos, Radionuclides, THM, Lead/Copper, Phase II/V	Phases I through V promulgated 1987 through 1992
Radionuclide Rule	40 CFR 141.15 141.25 141.26	Part 4, 300(9) 310(6), and 320	Radionuclides	Promulgated April 4, 1997
Arsenic Rule	40 CFR 141.23 141.24 141.16	Part 4, 300(3) and 310(3)	Arsenic	Promulgated February 2002 Compliance by January 23, 2006
UCMR	N/A		Various contaminants considered for future regulations	UCMR 1 promulgated 1999 UCMR 2 promulgated 2007 UCMR3 promulgated May 2, 2012 UCMR4 promulgated December 20, 2016 UCMR5 promulgated December 27, 2021
Groundwater Rule		Part 4, 300(3) and 320(2)	Fecal indicators in groundwater	Promulgated January 8, 2007
PFAS NPDWR	40 CFR 141.	N/A	PFAS	Promulgated April 10, 2024; features implementation timeline with an initial monitoring phase required by 2027 and compliance with listed MCLs by 2029.
PFAS SAL	N/A	Part 4, 300 (10), 310 (7), 315, 320	PFAS	Promulgated December 8, 2021 Revisions promulgated December 15, 2025.
Surface Water Treatment Rules				
Information Collection Rule	40 CFR, Part 141, Subpart M	Part 6, Subparts A and B	Large Surface Water Systems: Bacteriological, DBP, IOCs	Promulgated June 18, 1996
Interim ESWTR	63 FR 69478	Part 6, Subparts A and B	Large Surface Water Systems: Bacteriological, incorporate *Cryptosporidium* into watershed plans	Promulgated November 1998
LT1ESWTR	40 CFR, Parts 9, 141, 142 67 FR 1812	Part 6, Subparts A and B	Bacteriological, *Cryptosporidium*	Promulgated February 13, 2002, compliance by March 15, 2005

Rule	CFR	WAC 246-290	Affected Contaminants	Publication Date of Final Rule
LT2ESWTR	40 CFR Parts 141, 142 68 FR 47639	Part 6, Subparts A and B	Bacteriological	Promulgated in 2006
Filter Backwash Recycling Rule	40 CFR Parts 9, 141, 142 66 FR 31086	Part 6, Subparts A and B	Bacteriological	Promulgated August 7, 2001, compliance by December 8, 2003
Distribution System Water Quality				
Revised Total Coliform Rule		Part 4, 300, 310(2), 320	Total coliform bacteria	Promulgated February 13, 2013 Compliance by April 2016
Lead and Copper Rule	40 CFR 141.86 141.87 141.88	Part 4, 300(4) and 310(3)	Lead and Copper	Promulgated January 12, 2000 Revised December 4, 2013
Stage 1 Disinfectants/ Disinfection Byproducts Rule	40 CFR, Parts 9, 141, 142 63 FR 69390	Part 4, 300, 310, and 320	THM, HAA5, chlorite, bromate, and disinfectant residuals	Promulgated February 16, 1999
Stage 2 Disinfectants/ Disinfection Byproducts Rule	40 CFR, Parts 9, 141, 142 71 FR 388	Part 4, 300, 310, and 320	THM and HAA5	Promulgated January 4, 2006 Effective March 6, 2006
System-Wide Requirements				
Consumer Confidence Report Rule	40 CFR 141 Part O	Part 7, Subpart B	Reporting only	Published August 19, 1998
Public Notification Rule	40 CFR 141 Part Q	Part 4, 320	Reporting only	Promulgated 2000
Operator Certification Rule		WAC 246-292	N/A	Effective January 4, 2014

Notes:
CFR - Code of Federal Regulations; DBP - disinfection byproducts; ESWTR - Enhanced Surface Water Treatment Rule; HAA5 - haloacetic acids; IOC - inorganic contaminants; LT1ESWTR - Long Term 1 Enhanced Surface Water Treatment Rule; LT2ESWTR - Long Term 2 Enhanced Surface Water Treatment Rule; MCL - maximum contaminant levels; NPDWR - National Primary Drinking Water Regulation; PFAS - per- and polyfluoroalkyl substances; UCMR - Unregulated Contaminants Monitoring Rule; VOC - volatile organic compounds, SAL - State Action Levels; SOC - synthetic organic chemicals; THM - trihalomethanes.

7.3 Source Water Quality

Historically, the City has relied on groundwater supplies from wells and surface water diversions. All of the City's sources are treated with chlorine, fluoride, and sodium hydroxide for pH adjustment (with the exception of Well 9). Surface water is treated via a slow sand filtration plant. Regulations that address source water quality for groundwater and surface water systems are described herein.

7.3.1 National Primary and Secondary Drinking Water Standards

The NPDWRs, established by the USEPA, are legally enforceable primary standards to protect the public from consuming water containing contaminants that present a risk to human health. The current list comprises 87 contaminants, including six microorganisms (two of which are nonpathogenic indictors of potential contamination, total coliform, and Escherichia coli), turbidity, four DBP/byproduct groups, three disinfectants, 16 inorganic contaminants, 53 organic contaminants, and four radionuclides. MCL and maximum contaminant level goals (MCLG) have been set for 73 of these contaminants. Disinfectant MCLs and MCLGs are comprised of Maximum Residual Disinfectant Levels (MRDL) and Maximum Residual Disinfectant Level Goals (MRDLG) have been set for three disinfectants. Ten other contaminants are regulated through treatment technique requirements.

The USEPA has also published secondary regulations which are not legally enforceable and function as guidelines to help utilities provide aesthetically pleasing drinking water (taste, odor, color, etc.). The secondary standards set secondary maximum contaminant levels (SMCL) for 15 compounds. These compounds do not present a health risk at the SMCL. States are not required by the USEPA to enforce any of the secondary standards; however, each state may choose to regulate any or all of the secondary standards. For new community water systems, the DOH requires treatment for secondary MCL exceedances under WAC 246-290-320 (3)(d). For other public water systems, the WAC stipulates that the required follow-up action be determined by the DOH based on the degree of consumer acceptance of the water quality and their willingness to bear the cost of meeting the secondary standard.

Current primary and secondary MCLs for inorganic and organic constituents, respectively, are documented in the following subsections.

7.3.2 Inorganic Chemicals

Regulated IOCs include elemental metals such as mercury, arsenic, and iron. Some non-metallic constituents such as chloride, fluoride, and sulfate are also included in this category. Physical properties of IOCs that affect water quality in this category include turbidity, specific conductivity, total dissolved solids, and color. WAC 246-290-310 specifies primary and secondary MCLs for IOCs, which are summarized in Table 7.2 and Table 7.3, respectively.

Table 7.2 Primary MCLs for Inorganic Chemicals

Chemical	Primary MCL (mg/L)(1)
Antimony (Sb)	0.006
Arsenic (As)	0.01
Asbestos	7 million fibers/liter (length > 10 microns)
Barium (Ba)	2.0

Chemical	Primary MCL (mg/L)(1)
Beryllium (Be)	0.004
Cadmium (Cd)	0.005
Chromium (Cr)	0.1
Copper (Cu)	1.3(2)
Cyanide (HCN)	0.2
Fluoride (F)	4.0
Lead (Pb)	0.015(2)
Mercury (Hg)	0.002
Nickel (Ni)	0.1
Nitrate (as N)	10.0
Nitrite (as N)	1.0
Selenium (Se)	0.05
Sodium (Na)	20(3)
Thallium (Tl)	0.002

Notes:
(1) Source: State DOH Drinking Water Regulations (246-290-310), effective June 2025.
(2) Lead and copper have established Action Levels (AL), rather than MCLs. These are discussed further in the LCR, under the Distribution System Water Quality section.
(3) USEPA has established a recommended level of 20 mg/L for individuals that have restrictions on daily sodium intake. This is not an enforceable standard.

Table 7.3 Secondary MCLs for Inorganic Chemicals

Chemical	Primary MCL (mg/L)(1)
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	Non-corrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Specific Conductivity	700 (umhos/cm)
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

Notes:
(1) Source: State DOH Drinking Water Regulations (246-290-310), effective June 2025.

7.3.2.1 Monitoring Requirements

The City has a waiver for IOC testing that reduces the frequency to once every nine years for all its wells. The next IOC samples are required in 2028.

7.3.2.2 Compliance

The City complies with the requirements for monitoring IOCs and has not exceeded any water quality requirements. Water quality data for inorganic chemicals from 2021-2024 is presented in Table 7.4.

Table 7.4 Inorganic Chemicals Monitoring Results

Contaminant	MCL Goal	MCL	2021	2022	2023	2024
Fluoride (mg/L)	1	4	0.34-1.03	0.16-1.1	0.13-1.11	0.12-1.24
Nitrates (mg/L)	10	10	ND-2.9	ND-2.1	ND-1.7	ND-2.0

7.3.3 Volatile Organic and Synthetic Organic Compounds

VOCs are manufactured, carbon-based chemicals that vaporize quickly at normal temperatures and pressures. VOCs include many hydrocarbons associated with fuels, paint thinners, and solvents. This group does not include organic pesticides, which are regulated separately as SOCs. VOCs are divided into the following two groups:

- Regulated VOCs that have been determined to pose a significant risk to human health.
- Unregulated VOCs for which the level of risk to human health has not been established.

There are currently 21 regulated VOCs and 33 regulated SOCs (excluding PFAS). A list of these compounds and their MCLs is included in Table 7.5.

Table 7.5 Regulated Volatile and Synthetic Organic Chemicals

Organic Chemical	Federal Regulation	Primary MCL (mg/L)(1)	Organic Chemical	Federal Regulation	Primary MCL (mg/L)(1)
Volatile Organic Chemicals					
Vinyl chloride	Phase I	0.002	Monochlorobenzene	Phase II	0.1
Benzene	Phase I	0.005	Ortho-Dichlorobenzene	Phase II	0.6
Carbon Tetrachloride	Phase I	0.005	Styrene	Phase II	0.1
1,2-Dichloroethane	Phase I	0.005	Tetrachloroethylene	Phase II	0.005
Trichloroethylene	Phase I	0.005	Toluene	Phase II	1
Para-Dichlorobenzene	Phase I	0.075	Trans-1,2-Dichloroethylene	Phase II	0.1
1,1-Dichloroethylene	Phase I	0.007	Xylenes (total)	Phase II	10
1,1,1-Trichloroethane	Phase I	0.2	Dichloromethane	Phase V	0.005
Cis-1,2-Dichloroethylene	Phase II	0.07	1,2,4-Trichloro-benzene	Phase V	0.07
1,2-Dichloropropane	Phase II	0.005	1,1,2-Trichloroethane	Phase V	0.005
Ethylbenzene	Phase II	0.7			

Organic Chemical	Federal Regulation	Primary MCL (mg/L)(1)	Organic Chemical	Federal Regulation	Primary MCL (mg/L)(1)
Synthetic Organic Chemicals					
Arochlor	Phase II	0.002	Benzo(a)pyrene	Phase V	0.0002
Atrazine	Phase II	0.003	Dalapon	Phase V	0.2
Carbofuran	Phase II	0.04	Di(2-ethylhexyl) adipate	Phase V	0.4
Chlordane	Phase II	0.002	Di(2-ethylhexyl) phthalate	Phase V	0.006
Dibromochloro-propane	Phase II	0.0002	Dinoseb	Phase V	0.007
2,4-D	Phase II	0.07	Diquat	Phase V	0.02
Ethylene dibromide	Phase II	0.00005	Endothall	Phase V	0.1
Heptachlor	Phase II	0.0004	Endrin	Phase V	0.002
Heptachlor epoxide	Phase II	0.0002	Glyphosate	Phase V	0.7
Lindane	Phase II	0.0002	Hexachlorobenzene	Phase V	0.001
Methoxychlor	Phase II	0.04	Hexachloro Cyclopentadiene	Phase V	0.05
PCBs	Phase II	0.0005	Oxamyl (vydate)	Phase V	0.2
Pentachlorophenol	Phase II	0.001	Picloram	Phase V	0.5
Toxaphene	Phase II	0.003	Simazine	Phase V	0.004
2,4,5-TP	Phase II	0.05	2,3,7,8-TCDD (dioxin)	Phase V	$3x10^{-8}$

Notes:
(1) 40 CFR 141.61(a) and (c); adopted by State DOH, effective April 1999.
PCB - Polychlorinated biphenyls.

7.3.3.1 Monitoring Requirements

Per DOH requirements, VOCs and SOCs must be sampled once every three years, unless a waiver is in place. State waivers requiring no monitoring have been issued for dioxin, endothal, diquat, glyphosate, and insecticides. Additionally, the state grants a waiver if a chemical is not in use or previous monitoring indicates contamination would not occur. The City must apply for waivers through DOH. There are two types of waivers, risk-based or area-wide. The risk-based waiver requires a susceptibility analysis and DOH charges a fee for these waivers (purchased waivers). Area-wide waivers are issued if a chemical is not used within a region, thus DOH does not charge for these waivers. While the state issues both types of waivers, an area-wide waiver is referred to as a "State waiver." A waiver is in place for two years, during which time there are no requirements for monitoring. However, once a waiver expires, monitoring frequency for VOCs and SOCs is one sample every three years.

The City is required to sample for VOCs to once every three years at the eastern wellfield (Well 6 and 14) and has waivers at the remaining wells reducing frequency to every six years. The City also has issued waivers reducing sampling frequency for herbicides and pesticides to nine and three years, respectively.

7.3.3.2 Compliance

A review of the City's previous 10 years of water quality data shows that all the City's source wells test below VOC and SOC MCLs or are not detected at all.

7.3.4 Radionuclides

In December 2000, the USEPA announced updated standards for radionuclides. This rule became effective in December 2003. All community water systems are required to meet the MCLs listed in Table 7.6 and requirements for monitoring and reporting. All systems were required to complete initial monitoring and phase in the monitoring requirements between December 8, 2003, and December 30, 2007. Initially, utilities were required to undergo four consecutive quarters of monitoring for gross alpha, combined radium-226/-228, and uranium. Only systems that were considered "vulnerable" were required to monitor for gross beta (quarterly samples), tritium, and strontium-90 (annual samples). The initial monitoring was used to determine if the system would have to perform reduced or increased monitoring.

Table 7.6 Regulated Radionuclides

Radionuclide	MCL(1)
Radium – 226	3 pCi/L
Combined Radium – 226 and 228	5 pCi/L
Uranium	30 µg/L
Gross Alpha (excluding Uranium)	15 pCi/L
Beta Particle and Photon Radioactivity	4 millirem/year(2)
Tritium	20,000 pCi/L(2)
Strontium-90	8 pCi/L(2)

Notes:
(1) Environmental Protection Agency, 40 CFR 141.66.
(2) According to USEPA 40 CFR 141.66, "average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year." The MCLs for tritium and strontium-90 are assumed to produce body organ doses equivalent to 4 millirem/year.
pCi /L - picocurie per liter.

7.3.4.1 Monitoring Requirements

The WAC states "The purveyor may omit analysis for radium-226 and radium-228 if the gross alpha particle is less than 5 pCi/L." The City is required to sample for radium-228 and monitor gross alpha at all wells every six years. The USEPA has adopted a new schedule of sampling once every three years that has not yet been adopted by DOH. In Washington State, natural occurrence levels of the regulated radionuclides have generally been quite low.

7.3.4.2 Compliance

The City is in full compliance with the monitoring requirements and has no exceedances to date.

7.3.5 Arsenic Rule

In January 2001, USEPA promulgated a new standard that requires public water systems to reduce arsenic levels in drinking water. The final rule became effective in 2002 and required compliance by 2006. The rule applies to all community water systems and non-transient, non-community water systems, regardless of size. The rule not only establishes an MCL for arsenic (0.010 mg/L), based on a running annual average (RAA) of quarterly results and an MCLG for arsenic (zero), but also lists feasible and affordable

technologies for small systems that can be used to comply with the MCL. However, systems are not required to use the listed technologies in order to meet the MCL.

Initial monitoring of arsenic required groundwater systems to take one sample between 2005 and 2007. Monitoring requirements decreased to one sample every three years (for groundwater systems) if the initial result is less than the MCL. Monitoring requirements increased to quarterly samples if the initial results were greater than the MCL. Each entry point to the distribution system should have been tested, unless otherwise specified by the State.

The arsenic rule has been adopted by the Washington DOH as a revision to the arsenic MCL under WAC 249-290-310.

7.3.5.1 Monitoring Requirements

Monitoring requirements are once every three years, per requirements for IOCs. Arsenic must be monitored at each entry point to the distribution system as part of the IOC monitoring framework. If any sampling point is in violation of an MCL, the system is in violation.

7.3.5.2 Compliance

The City is in full compliance with the monitoring requirements and has no exceedances to date.

7.3.6 PFAS NPDWR

The USEPA initially announced a finalized National Primary Drinking Water Regulation (NPDWR) for six PFAS in drinking water on April 10, 2024. The final regulations set MCLs for five PFAS as individual components: Perfluorooctanoic acid (PFOA), perfluorooctyl sulfonate (PFOS), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA), and hexafluoropropylene oxide dimer acid (HFPO-DA commonly known as GenX). Additionally, an MCL was set for PFAS mixtures containing at least two or more of the following: PFHxS, PFNA, GenX, and perfluorobutane sulfonic acid (PFBS). The Hazard Index (HI) is used for the PFAS mixture MCL to account for combined and co-occurring levels of these PFAS compounds in drinking water. MCLGs were also established for these six PFAS compounds.

On May 14, 2025, USEPA announced its intent to modify the already promulgated NPDWR. This change would keep MCLs for PFOA and PFOS but rescind MCLs for the other PFAS under the existing NPDWR. Additionally, the intended changes included an extended timeline for compliance from 2029 to 2031. However, it is unclear at this time if these proposed changes will take effect, as these changes must undergo full rulemaking process under the Administrative Procedure Act, legal review, and potential judicial review. While the USEPA expects to finalize their proposed revision in the spring of 2026, it is unclear if it will ever take effect. The City should plan to operate on the assumption to comply with MCLs by 2029. For the purposes of this document, it is assumed that the currently promulgated NPDWR will remain in effect as it is the more conservative approach to managing the regulations and maintaining compliance.

Prior to issuance of UCMR 5, USEPA concluded there was enough data on the health effects of PFAS to begin the process of regulating certain PFAS compounds. The following describes the sequence of key actions taken by USEPA related to PFAS:

- In February 2021, USEPA issued notice for its intent to enforce limits on PFAS in drinking water to safeguard communities from PFAS contamination, specifically PFOA and PFOS.
- In June 2022, USEPA announced new health advisory levels (HAL) for four PFAS: PFOA, PFOS, GenX, and PFBS. This was the first time HALs had been issued for PFBS and GenX. For PFOA and PFOS, these new HALs are several orders of magnitude below the HAL announced in 2016 (i.e., 70 nanograms per liter [ng/L] for PFOA and PFOS combined). The new HALs for PFOA and PFOS were labelled "interim" because the USEPA's draft analysis of health studies for PFOA and PFOS were still undergoing review by the Science Advisory Board at the time of the announcement.
- On March 14, 2023, USEPA announced a proposed NPDWR to establish legally enforceable levels for not only PFOA and PFOS but also PFNA, GenX, PFHxS, and PFBS.
- On April 10, 2024, USEPA announced the final NPDWR for six PFAS. Under the NPDWR, the USEPA established MCLs for six PFAS in drinking water: PFOA, PFOS, PFHxS, PFNA, and GenX as contaminants with individual MCLs, and PFAS mixtures containing at least two or more of PFHxS, PFNA, GenX, and PFBS using a Hazard Index MCL to account for the combined and co-occurring levels of these PFAS in drinking water. USEPA also finalized health-based, non-enforceable MCLG for these PFAS. A summary of these levels is provided in Table 7.7. An explanation of the HI approach follows the table.

Table 7.7 MCLs and MCLGs for Specific PFAS Compounds in Drinking Water

Compound	Final MCLG	Final MCL (Enforceable Levels)
PFOA	Zero	4.0 ppt(1)
PFOS	Zero	4.0 ppt(1)
PFNA	10 ppt	10 ppt
PFHxS	10 ppt	10 ppt
HFPO-DA (GenX)	10 ppt	10 ppt
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA (GenX), and PFBS	HI of 1.0 (unitless).	HI of 1.0 (unitless).

Notes:
(1) In aqueous matrixes, ppt can also be expressed as ng/L.
ppt - parts per trillion.

While PFOA, PFOS, PFNA, PFHxS, and GenX have their own individual MCLs and MCLGs under the NPDWR, a HI of less than 1.0 must also be met to comply with the rule. The HI is used to reduce the risk of health impacts from a chemical mixture. The HI is calculated via a sum of fractions. Each fraction compares the level of each PFAS measured in the water to the health-based water concentration. The equation below summarizes the HI calculation. It includes indexes for PFHxS, PFNA, and GenX (all of which have their own individual limits as MCLs) and PFBS (which does not have its own individual limit as an MCL).

With the HI approach, the concentration of each of these four PFAS would be divided by a corresponding health-based value (10ppt for PFHxS, PFNA, and GenX; 2000 ppt for PFBS). The sum of these fractions needs to be below 1.0 to comply with the NPDWR. Note, however, that an exceedance must be triggered

by two or more chemicals. For example, a GenX concentration of 11 ppt alone would not cause a HI exceedance, but it would cause an MCL exceedance. A PFBS concentration of over 2,000 ppt alone would not cause a HI exceedance unless another chemical within the calculation exceeded 10 ppt.

$$HI = \frac{[PFHxS]}{10ppt} + \frac{[GenX]}{10ppt} + \frac{[PFNA]}{10ppt} + \frac{[PFBS]}{2000\ ppt}$$ Hazard Index Calculation

7.3.6.1 Monitoring Requirements

Under the NPDWR, public water systems (PWS) will be required to take initial monitoring samples at all entry points to the distribution system based on the frequency outlined in Table 7.8. This initial monitoring must be completed by 2027. The City has already completed this initial monitoring requirement through sampling efforts under the SAL requirements for PFAS, which are discussed more in the following section.

Systems with appropriate, previously acquired monitoring data from UCMR 5, state-led, or other applicable monitoring programs using USEPA Methods 533 or 537.1, will not be required to conduct separate initial monitoring for regulated PFAS.

Table 7.8 PWS Sampling Requirements under USEPA's Proposed PFAS Rule

PWS Type	Monitoring Frequency
Groundwater Systems serving >10,000 persons	Monitor regulated PFAS quarterly within a 12-month period.
Groundwater Systems serving ≤ 10,000 persons	Monitor regulated PFAS twice within a 12-month period, with sampling events conducted at least 90 days apart.
Surface Water Systems	Quarterly within a 12- month period. Samples are required to be collected 2 to 4 months apart.

After initial monitoring, PWS must monitor for rule compliance on a quarterly basis at each entry point to the distribution system. However, based on the initial monitoring results, agencies may reduce compliance monitoring frequency if the monitoring results are below the rule trigger level (RTL). The RTL is half of the MCLs or HI (i.e., 2 ng/L for specific PFAS with an MCL, or an HI of 0.5). Primacy agencies (states) have the flexibility to reduce monitoring to annually or triennially for systems that are consistently below RTLs. Any results above the RTL automatically require a reversion back to quarterly sampling.

For systems required to monitor quarterly, compliance will be determined by running annual averages at the sampling point. When calculating the running annual averages, if a sample result is less than the practical quantitation level for the monitored PFAS, the PWS may use zero as the result on that sample to calculate the average for compliance purposes.

7.3.6.2 Compliance

The PFAS NPDWR has a 5-year compliance window from its year of inception (2024) with specific requirements throughout this timeframe:

- Within three years of rule promulgation (2024-2027):
  - » Initial monitoring must be complete.

- Starting three years following rule promulgation (2027-2029):
  - Results of initial monitoring must be included in Consumer Confidence Reports (i.e., Annual Water Quality Report).
  - Regular monitoring for compliance must begin, and results of compliance monitoring must be included in Consumer Confidence Reports.
  - Public notification for monitoring and testing violations.
- Starting five years following rule promulgation (starting 2029):
  - Public notification for MCL violations.
  - Comply with all MCLs (including performing mitigation measures or installing PFAS treatment as required to comply with the MCLs).

All requirements described in this section will supersede current DOH SALs related to PFAS as per the WAC 246-290-315 Subsection (8) unless the State of Washington enacts more stringent or additional requirements beyond those listed in the PFAS NPDWR.

Due to the timeframe in which the PFAS NPDWR requirements are rolled out, the WAC 246-290-315 is temporarily more stringent than the PFAS NPDWR until 2027. Currently in Washington, PWS must report exceedances of certain PFAS above SALs (summarized previously in Table 7.6.1 and Section 7.3.9.1.). The City of Camas has conducted its required initial monitoring as required by the PFAS NPDWR, but will also continue to comply with monitoring and reporting requirements under WAC 246-290-315 and 246-290-320 until 2027, when the reporting requirements under the PFAS NPDWR become more stringent (unless the State of Washington enacts more stringent requirements).

The City is in full compliance with PFAS monitoring requirements, however sampling data collected have indicated certain wells within the City's water supply exceed MCLs. To comply with the PFAS NPDWR by 2029 some form of PFAS mitigation will be needed at these wells. Additionally, the City has taken action to mitigate PFAS by constructing a treatment facility at Well 13 and evaluate mitigation alternatives at other wells of concern.

7.3.7 Washington State Action Levels for PFAS

The State of Washington's DOH has primacy to establish SALs and state MCLs that set more stringent or more encompassing requirements for public water systems than federal requirements. The basis on which SALs or State MCLs may be established is described in WAC 246-290-315.

DOH set SALs for certain PFAS in December of 2021. DOH considers establishment of SALs when human exposure to the contaminant in question can occur through drinking water, and when the contaminant is known or likely to occur in public water systems at levels of public health concern.

DOH may develop a SAL based on the following:

- Evaluation of available peer-reviewed scientific literature and government publications on fate, transport, exposure, toxicity, and health impacts of the contaminant and relevant metabolites;

- An assessment based on the most sensitive adverse effect deemed relevant to humans and considering susceptibility and unique exposures of the most sensitive subgroup such as pregnant women, fetuses, young children, or overburdened and underserved communities; and
- Technical limitations to achieving the SAL such as insufficient analytical detection limit achievable at certified drinking water laboratories.

SAL exceedance requires follow-up action as described in WAC 246-290-320.

- A State MCL may be established by DOH in specific cases where:
- Regulating the contaminant in question presents a meaningful opportunity to reduce exposures of public health concern for persons served by public water systems.
- Where there is a need for an enforceable limit to achieve uniform public health protection in Group A public water systems.
- The need for an enforceable limit to support source water investigation and clean-up of a contaminant in drinking water supplies by responsible parties.

State MCLs would require treatment for the contaminant in question, whereas SALs require specific follow-up actions as described in WAC 246-290-320. DOH has not yet established any State MCLs but has established a series of SALs that were enacted in late 2021 and became effective in 2022. These specific SALs are described further in the Compliance section below. Note that DOH modified the SALs in December of 2025 to more closely align with the federal USEPA MCLs.

7.3.7.1 Monitoring Requirements

The City is in compliance with all monitoring rules associated with constituents subject to SALs. WAC 246 290-300 describes the monitoring requirements for contaminants subject to DOH SALs. These requirements are summarized in Table 7.9.

Table 7.9 Sampling Requirements for WA SALs

Contaminant or Group of Contaminants	Initial Sampling	Routine Sampling Frequency	Sampling Location
PFAS with prescribed SALs (see compliance section below)	One sample on or before December 31, 2025	Once every three years	Per the locations described in WAC 246-290-300.7b.

While one sample is required before the end of 2025, sampling requirements for UCMR 5 will generally fulfill this requirement for large public water systems, as is the case for Camas. UCMR 5 sampling requirements (described in Sections 7.3.8 and 7.3.8.1) include the five PFAS that are subject of the Washington SALs. However, sampling for contaminants with SALs may bring specific follow-up actions. These follow up actions generally include notification of the result to DOH, and public notification. There are also follow-up requirements for samples that do not exceed the SALs but result in a certain percentage of the SAL.

7.3.7.2 Compliance

The City is currently in compliance with existing state regulations regarding PFAS sampling and public notification requirements under WAC 246-290-320. Some sampling efforts at Well 13 showed PFAS levels above the SALs. As a result, the City has taken follow-up actions, including follow up monitoring and

public notification, in accordance with WAC 246-290-320. Although a SAL exceedance does not trigger the need for treatment, the City is also currently constructing a PFAS treatment system for Well 13.

Washington's SALs for PFAS have been in effect since 2022 and currently govern monitoring and follow-up actions for five PFAS. Utilities must complete initial SAL sampling by December 31, 2025, and continue routine monitoring every three years thereafter. In contrast, the USEPA's PFAS NPDWR was finalized in April 2024, with initial monitoring required by 2027 and enforceable MCLs beginning in 2029. This creates an overlap period where SAL requirements remain in force until federal MCLs become effective. Washington's emergency rulemaking in 2024–2025 clarified that SAL protections will continue through this transition to avoid any regulatory gap.

Washington has indicated through emergency rules and recent updates that SALs will effectively transition to match the federal MCLs when they become enforceable in 2029. However, in December 2025, DOH updated the SALs to align with the MCL values. They are effective January 15, 2026.

The following table shows the SAL values that existed from 2022 through 2025, as well as what the updated SAL values are.

Table 7.10 Washington State Action Levels

Compound	Old SAL – Previously Effective 2022 through 2025 (ppt)	Updated SAL - Effective Jan 15, 2026 (ppt)
PFOA	10	4
PFOS	15	4
PFNA	9	10
PFHxS	65	10
PFBS	345	N/A (part of HI)
HFPO-DA (GenX)	N/A	10
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA (GenX), and PFBS	N/A	HI of 1.0 (unitless).

Notes:
(1) Old SAL exceedances were based on a single sample exceedance (with second sample averaging allowed). Updated SAL exceedances are based on annual running averages to be in alignment with federal MCL rules.
(2) The hazard index calculation is the same as the MCL hazard index calculation.

The City does not anticipate any compliance issues with the updated SALs. The Tier 2 notification requirements remain in place, they are just now required for exceedances of the updated SAL values. The City is actively implementing PFAS treatment at Well 13 and is developing a plan for treatment at other well sites in order to maintain compliance with drinking water regulations when the federal MCL enforcement begins in 2029.

7.3.8 Manganese

The USEPA included manganese, a naturally occurring ion, in UCMR4 to help assess if a primary MCL, in addition to the existing secondary MCL, should be established. Manganese is currently regulated by DOH as a secondary standard; any exceedances trigger follow-up actions as directed by DOH. Elsewhere, in 2019, Canada established two new values regulating manganese in drinking water: A health-based

maximum allowable concentration (analogous to the US's primary contaminant MCL) of 0.12 mg/L and an aesthetic objective (analogous to the US's secondary contaminant MCL) of 0.02 mg/L. The aesthetic objective for manganese is below the USEPA's current secondary MCL of 0.05 mg/L.

Manganese was included in sampling for UCMR4 to help assess if it should be moved from a secondary MCL to a primary MCL. As of March 10, 2020, the USEPA determined there was not enough information to proceed to the regulatory determination assessment phase. Manganese was included in Contaminant Candidate List 5, finalized in 2022.

However, USEPA has established HALs for manganese. HALs establish a specific duration and threshold concentration of exposure below which no health effects are anticipated to occur. For all persons, USEPA has a one-day and 10-day HAL of 1 mg/L and a lifetime HAL of 0.3 mg/L. For bottle-fed infants younger than six months, the USEPA also has a 10-day HAL of 0.3 mg/L.

In December 2023, DOH published updated recommendations pertaining to manganese, which included the following:

- Manganese treatment should be installed if levels exceed the 0.05 mg/L secondary MCL.
- Treatment should reduce manganese levels to below 0.02 mg/L.
- Public notification should be provided if manganese levels exceed 0.3 mg/L, consistent with USEPA HALs discussed above.

7.3.8.1 Monitoring Requirements

The City monitors for manganese as part of its complete inorganic chemical test panel which is required once every nine years.

7.3.8.2 Compliance

The City is in full compliance with the monitoring requirements and has no exceedances to date.

7.3.9 Surface Water Treatment Rules

7.3.9.1 Surface Water Treatment Rule

On December 31, 1990, USEPA promulgated the Surface Water Treatment Rule (SWTR) to establish filtration and disinfection as a drinking water treatment technique in lieu of MCLs for Giardia lamblia, viruses, HPC bacteria, Legionella, and turbidity. The SWTR is based on the premise that all surface water and GWI are at risk of microbiological contamination, and the previous requirements were inadequate to prevent waterborne disease outbreaks. The SWTR requires 99.9 percent (3 log) removal and/or inactivation of *Giardia* cysts, and 99.99 percent (4 log) removal and/or inactivation of viruses. To meet these requirements, surface water systems must disinfect according to strict requirements, must filter water unless certain source water-quality and site-specific conditions are met, and must be operated by qualified personnel. To avoid the filtration requirement, the following criteria must be met:

1. 90 percent of the samples taken from the source water must have fewer than 100 total coliform bacteria per 100 milliliters (mL) and fewer than 20 fecal coliform bacteria per 100 mL.
2. The turbidity level prior to disinfection must not exceed 5.0 nephelometric turbidity unit (NTU).

3. *Giardia* and virus inactivation requirements must be met, providing redundant disinfection components and maintaining required disinfection residuals.
4. An approved watershed control program must be implemented with annual onsite inspections.
5. Total Coliform Rule (TCR) requirements in the distribution system and THM requirements must be met.
6. The water system must be free of waterborne disease outbreaks.
7. The purveyor must have alternative operating plans to address high turbidity levels and other water quality issues.

Utilities that use unfiltered water must maintain a disinfectant residual throughout the water distribution system. At entry points to the distribution system, residual disinfectant concentrations cannot be <0.2 mg/L for more than four hours. At distribution system sample locations, residual disinfectant concentrations cannot be undetectable in greater than 5 percent of samples in a month, for any two consecutive months. Heterotrophic plate count (HPC) ≤ 500/mL is deemed to have detectable residual disinfectant.

GWI is regulated by the SWTR. The intent is to provide the same level of treatment for groundwater sources that are at risk for contamination by pathogens as surface water supplies. Examples of water sources that may be classified as GWI are shallow wells, springs, infiltration galleries, and Ranney wells.

7.3.9.2 Long Term 2 Enhanced Surface Water Treatment Rule

The LT2ESWTR is intended to address a number of deficiencies in the original 1990 SWTR, including the following:

1. Cryptosporidium is not addressed in the SWTR.
2. Pathogen reduction may not be adequate in poorer quality waters.
3. Virus disinfection requirements may be greater than indicated in the SWTR.
4. Disinfectants and Disinfection Byproducts Rule (DBPR) may undermine the SWTR by causing utilities to reduce disinfectant residuals.

USEPA developed the ESWTR in two stages. The proposed Interim ESWTR was published in the Federal Register on 29 July 1994. USEPA finalized the Interim ESWTR and Stage 1 DBPR in November 1998, as required by the 1996 Amendments to the SDWA, Section 1412(b)(2)(C). The final rules resulted from formal regulatory negotiations with a wide range of stakeholders that took place in 1992-93 and 1997. On January 16, 2001, USEPA published final revisions to the Interim ESWTR and Stage 1 DBPR. The LT1ESWTR was promulgated in February 2002 and builds on the requirements of the SWTR. The LT1ESWTR specifies treatment requirements to address *Cryptosporidium* and other microbial contaminants in public water systems serving less than 10,000 persons.

The LT2ESWTR proposed rule was promulgated in August 2003 and published in the Federal Register on January 5, 2006. The LT2ESWTR requires PWSs that use surface water or groundwater under the direct influence of surface water to monitor their source water (influent water prior to treatment) for *cryptosporidium*, *E. coli*, and turbidity for a period of two years starting six months after the rule is finalized. Based on the results of this monitoring, water systems will be classified in one of four risk bins. Systems classified in higher risk bins must provide 90 to 99.7 percent (1.0 to 2.5 log) additional reduction

of *Cryptosporidium* levels. The regulation specifies a range of treatment and management strategies, collectively termed the "microbial toolbox," that systems may select to meet their additional treatment requirements. All unfiltered systems must provide at least 99 or 99.9 percent (2 or 3-log) inactivation of *Cryptosporidium*, depending on the results of their monitoring.

7.3.9.3 Monitoring requirements

Monitoring requirements are dictated by source water quality and the selected treatment processes. The City has recently completed construction of a new SSF Plant for its surface water sources. The City's surface water sources have been listed as Bin 1 sources for *Cryptosporidium* removal and do not require additional treatment beyond slow sand filtration. Specific treatment objectives and monitoring for the slow sand facility include:

- Turbidity reduction as required for slow sand filtration processes, providing finished water turbidity less than 1 NTU in 95 percent of samples each month and no turbidity samples greater than 5 NTU.
- Provide 3-log giardia removal and inactivation through a combination of 2-log removal by filtration and 1-log inactivation by chlorine disinfection.
- Provide a total 4-log virus inactivation and removal through filtration and disinfection.
- Provide a continuous free chlorine residual of not less than 1.0 mg/L entering the distribution system at the water quality station and pressure reducing valve vault at NE 277th Avenue and NE 14th Street.
- Provide treated water pH of 7.5 plus or minus 0.2 units (if the optional caustic feed system is installed and used for pH adjustment).
- Provide a fluoride residual of 0.7 mg/L.

7.3.9.4 Compliance

The City has constructed a new slow sand filtration treatment plant that is in full compliance with all surface water treatment rules.

7.3.9.5 Filter Backwash Recycling Rule

The Filter Backwash Recycling Rule (FBRR) regulates the recycling of filter backwash water within the treatment process of public water systems. The purpose of the rule is to require systems to review their recycle practices and, where appropriate, work with the DOH to make any necessary changes to recycle practices that may compromise microbial control. The City's slow sand filter backwash water is wasted to a detention pond rather than recycled to the head of the plant and thus the FBRR does not apply.

7.3.10 Groundwater Rule

The USEPA enacted the final Groundwater Rule (GWR) January 8, 2007, for the purpose of providing increased protection against microbial pathogens in public water systems that use untreated groundwater. The GWR will apply to public water systems that serve groundwater as well as to any system that mixes surface and groundwater, if the groundwater is added directly to the distribution system and is provided to customers without providing disinfection contact time.

To implement the GWR, USEPA is taking a risk-based approach to protect drinking water from groundwater sources that have been identified as being at the greatest risk of fecal contamination. This strategy includes four primary components:

1. **Sanitary Surveys**. Sanitary surveys must be conducted every three years and meet the provisions of the 1998 Interim ESWTR as it relates to populations served. In addition, the sanitary survey shall implement the eight elements of the USEPA/State Joint Guidance on Sanitary Surveys. These elements relate to source protection; identification of the physical components and their condition; and description and implementation of programs for treatment, distribution, storage, pumping, monitoring, operation and maintenance; and operator certification.
2. **Source Water Monitoring**. Source water monitoring is triggered when a system does not sufficiently disinfect drinking water to achieve 4-log (99.99 percent) virus removal and identifies a positive routine sample during its TCR monitoring and hydrogeologic sensitivity assessment monitoring (at the State's discretion) targeted at high-risk systems. Once a total coliform-positive sample is found within a distribution system, the system is required to collect one source water sample per source and monitor for a fecal indicator. Washington State may choose to issue a waiver if the groundwater source has a hydrogeologic barrier.
3. **Corrective Action**. Corrective action is required for any system with a significant deficiency or evidence of source water fecal contamination. Corrective actions must be taken by "groundwater systems that have a significant deficiency or have detected a fecal indicator in their source water." USEPA guidelines recommend that corrective actions take place within 90 days, or longer if approved by the State. The problem should be solved by eliminating the contamination source, correcting the significant deficiencies, or providing an alternate source of water supply.
4. **Compliance Monitoring**. Compliance monitoring ensures that treatment technology installed to treat drinking water reliably achieves 4-log virus inactivation. Compliance monitoring applies to all groundwater systems that disinfect as a corrective action. Systems serving greater than 3,300 individuals must continuously monitor their disinfection treatment process. If disinfection concentrations are below the required level, the system must restore disinfection concentration within fours hours.

The compliance date for triggered source water monitoring and the associated corrective actions, as well as compliance monitoring, was December 1, 2009. Initial sanitary surveys should have been completed by December 31, 2012. However, for community water systems that have been identified by the State as outstanding performers (generally those that have treatment that provides 4-log virus inactivation or removal at all sources), the initial sanitary survey must be completed by December 31, 2014.

Many of the requirements of the GWR are determined by the individual state agencies. The requirements of the GWR were adopted by the Washington DOH into WAC 246-290 in November 2010. In addition, DOH has provided a Fact Sheet for Group A utilities with recommended actions to prepare for the GWR. These actions include the following:

- Correct deficiencies from the last sanitary survey.
- Install a sample tap at each wellhead.
- Know specifically where each well's water goes. Triggered source water monitoring will require monitoring of all sources, unless it can be shown that the area of concern in the distribution system is only served by a limited number of sources.

- Update the emergency response plan, to be ready to provide alternate water, if needed.
- If currently treating groundwater from a well, contact the regional office engineer to confirm whether you currently achieve 4-log virus inactivation. Systems that treat to this level will not be required to conduct triggered source water monitoring but instead will be required to meet treatment technique monitoring requirements.

7.3.10.1 Monitoring Requirements

The DOH is not requiring all systems to perform assessment monitoring. In addition, DOH has indicated that the sanitary surveys completed under the GWR will not differ significantly from those currently required.

Triggered source water monitoring is required at all sources if a distribution system sample tests positive for total coliform (as collected under the total coliform regulations). The federal GWR includes a provision that positive coliform samples attributed to a distribution system source will not trigger source water monitoring. The DOH has not yet decided on the criteria for determining whether a sample can be attributed to the distribution system but may not require triggered source monitoring if they document in writing that the coliform positive sample was attributed to a distribution system deficiency. Source water monitoring will be required at fewer sources if systems can demonstrate the sources impacting each TCR sample site. However, such a plan would need to be pre-approved by the DOH.

The federal GWR also allowed for reduced source water monitoring after 12 non-detect samples. The DOH has not yet established a reduced monitoring standard.

7.3.10.2 Compliance

The City completed its sanitary survey in 2024. No reduction in monitoring resulted from the survey. The City is in full compliance at this time.

7.3.11 Unregulated Contaminant Monitoring Rule

The primary source of occurrence data used to identify emerging contaminants is collected via UCMR. This data is used to support regulatory decision-making regarding contaminants. The SWDA Amendments of 1996 established the following protocols for the UCMR:

- Monitor no more than 30 contaminants every five years.
- Monitor only a representative sample of public water systems serving fewer than 10,000 people (all public water systems serving more than 10,000 people are required to monitor for the selected contaminants).
- Store analytical results in a National Contaminant Occurrence Database.

The Unregulated Contaminant program requires that every five years, the USEPA issues a list of unregulated contaminants for monitoring. Monitoring under this program is conducted using a tiered approach based on the level of development of the selected analytical method. Large water systems (serving more than 100,000 people) are required to monitor for both List 1 and List 2 chemicals:

- Assessment Monitoring (List 1): is conducted for contaminants that have analytical method technologies that are well established.

- Screening Survey (List 2): is conducted for contaminants with more recently developed analytical methods, which employ technologies that are not as widely used, or for which laboratory capacity required to conduct larger-scale Assessment Monitoring may be insufficient.
- Pre-Screen Testing (List 3): is conducted for contaminants that have very new or specialized analytical methods.

The USEPA identified and published unregulated contaminants for the first direct implementation of the UCMR (UCMR1) in 1999, which required some public water systems to monitor for unregulated contaminants from 2001 to 2005. To date, there have been five UCMRs published by the USEPA. The most recent implementation of this rule (UCMR5) was published on December 27, 2021. The implementation period for UCMR5 is 2022 to 2026 with sampling taking place from 2023 through 2025. The final list of 30 contaminants includes 29 PFAS and lithium.

The 1986 amendments to the SDWA require public water systems to monitor for unregulated contaminants every five years and submit these data to the states. The intent of this program is to gather scientific information on unregulated contaminants to determine if regulations are required to protect human health. Both the 1993 and 1996 amendments to the act added new lists of contaminants, which led the USEPA to develop a revised program for monitoring. The new program became known as the Unregulated Contaminant Monitoring Regulations (UCMR 1999). The new UCMR program began in 2001 and produces a new list of unregulated contaminants for monitoring every five years.

Under the UCMR program, USEPA asks large systems to take two sets of samples for unregulated contaminants at six-month intervals. There are two tiers of contaminants in UCMR 1: List 1 - Assessment Monitoring, and List 2 - Survey Screening. List 1 contaminants are sampled by all water systems serving over 10,000 people. There are 10 List 1 contaminants, consisting of flame-retardants and other priority contaminants (USEPA Method 527), and some explosives (USEPA Method 529). List 2 contaminants are analyzed using less common analytical techniques, and only a portion of the purveyors required to test for List 1 contaminants are required to test for List 2. List 2 contaminants include Acetanilide pesticides and degraded products (USEPA Methods 525.2 and 535), and Nitrosamines/N-nitrosodimethylamine (NDMA) (USEPA Method 521).

The UCMR is used as a tool for the USEPA to collect data, and ultimately establish regulations for contaminants that are suspected to be present in drinking water but do not have health-based standards set under the SDWA.

The second cycle (UCMR 2) of monitoring was published in the Federal Register on January 4, 2007. UCMR 2 required monitoring for 25 contaminants using five analytical methods during 2008- 2010. The third cycle (UCMR 3) of monitoring was published on May 2, 2012. UCMR 3 required monitoring for 30 contaminants: 28 chemicals, and 2 viruses. Monitoring occurred during 2012 to 2015. The fourth cycle (UCMR 4) of monitoring was published on December 20, 2016. UCMR 4 required monitoring for 30 chemicals, which included nine cyanotoxins and one cyanotoxin group; two metals; nine pesticides; three brominated HAA5 DBP groups, three alcohols, and three semi-volatile organic chemicals. Monitoring occurred during 2018 to 2020. The fifth cycle (UCMR 5) was published on December 27, 2021, and is currently ongoing, requiring monitoring for applicable systems between 2023 and 2025. UCMR 5 requires monitoring for 29 different PFAS and lithium.

From 2013 to 2015, USEPA's third installment of UCMR sampling efforts measured for six PFAS. These included PFOS and PFOA, two of the most notable and prevalent PFAS compounds. At the time, there

were limited detections nationwide, but laboratory analysis methods could not measure levels low enough to reflect the presence at very low concentrations of these compounds across the US. For the 2023 to 2025 period, the 29 different PFAS compounds can now be measured at relatively low levels through advancements in laboratory analysis methods.

Results from UCMR 5 are currently being reported and compiled as of the date of this report. As of August 2023, around 20 percent of systems have reported results so far and around 8 percent of those systems have seen detections of PFOA and PFOS. However, these results are from Quarter 1 of four quarterly reporting requirements, so some public water systems with no detections may show detections in later reports.

7.3.11.1 Monitoring Requirements

The City has conducted monitoring as required for the previous UCMRs. For systems required to sample under UCMR 5 with a groundwater source (including the City), sampling must occur two times during a consecutive 12-month monitoring period, where sampling events occur 5-7 months apart. For systems with a surface water source, a groundwater source under the direct influence of surface water, or a mixed-source system, sampling must occur four times during a consecutive 12-month monitoring period. Sampling events must occur 3 months apart (quarterly sampling). The City's efforts for UCMR 5 sampling efforts are currently ongoing.

7.3.11.2 Compliance

The City is in compliance with the UCMR 1 through 4 testing requirements and expects to comply with all monitoring requirements of UCMR 5.

7.4 Distribution System Water Quality

Regulations that address distribution system water quality are described herein.

7.4.1 Total Coliform Rule

Coliform bacteria describe a broad category of organisms routinely monitored in potable water supplies. Though not all coliform bacteria are pathogenic in nature, they are relatively easy to identify in laboratory analysis. If coliform bacteria are detected, then pathogenic organisms may also be present. Bacterial contamination in a water supply can cause a number of waterborne diseases; therefore, these tests are strictly monitored and regulated by DOH.

The TCR specifies two types of MCL violations, "monthly" and "acute." A purveyor is required to notify both DOH and system consumers if either a monthly or acute MCL violation occurs. The TCR also requires secondary disinfection in accordance with the following:

- A minimum disinfectant residual of 0.2 mg/L free chlorine or 0.5 mg/L chloramines measured as total chlorine must be continually present at the entrance of the distribution system, with a detectable chlorine residual maintained throughout the distribution system.
- A sample with HPCs less than 500 colony forming units per 100 mL is assumed to carry the required minimum residual.

The original 1989 TCR rule was revised on February 13, 2013. Water systems must comply with the requirements of the Revised Total Coliform Rule (RTCR) by April 1, 2016. The revision requires public water systems that are vulnerable to microbial contamination to identify and fix problems; and establishes criteria for systems to qualify for and stay on reduced monitoring, which could reduce water system burden and provide incentives for better system operation. The rule changes associated with the RTCR are summarized below:

- Monitoring Changes: The RTCR links monitoring frequency to water quality and system performance.
- Public Notification Changes: The RTCR requires public notification when an *E. coli* MCL violation occurs, or when a utility fails to conduct the required assessment and corrective action.
- MCL Changes and Treatment Technique Violation: The RTCR replaces the MCL and MCLG for total coliforms with a MCL and MCLG for *E. coli*, as well as a treatment technique for coliforms.
- New Assessment Requirements: As part of the new treatment technique requirements, all utilities must conduct an assessment to find and fix any vulnerabilities when a treatment technique trigger occurs. Systems must conduct a Level 1 assessment or a more complex Level 2 assessment depending on the level of concern raised by the results of total coliform sampling.
- Corrective Action Requirements: Utilities are responsible for correcting any sanitary defects found through Level 1 or Level 2 assessments within 30 days or on a schedule approved by the DOH if this timeframe is not possible.

7.4.1.1 Monitoring Requirements

Monitoring requirements are described in the City's coliform monitoring plan (CMP). The City currently collects 30 samples per month from 26 locations based on a residential population of 31,794 as provided by the DOH Water Quality Monitoring Schedule as of October 2025.

7.4.1.2 Compliance

Within the last 10 years the City has had three total coliform exceedances; one total coliform exceedance in 2018, 2020, and 2023. All follow-up tests were negative, and no public notification was required. The City is currently in full compliance with the TCR and its RTCR compliant CMP can be found in Appendix E.

7.4.2 Stage 1 Disinfectants and Disinfection Byproducts Rule

The Stage 1 DBPR was promulgated in December 1998 and regulates the concentration of disinfectants such as chlorine, chlorine dioxide, and chloramines, which are oxidants used to control waterborne disease. The DBPR also regulates DBPs such as TTHMs and HAAs, bromate, and chlorite. DBPs are formed when disinfectants used to control microorganisms react with natural organic matter in water.

The MCLs for THMs and HAAs are 0.080 and 0.060 mg/L, respectively. The four regulated trihalomethanes are chloroform, bromodichloromethane, dibromochloromethane, and bromoform. The five regulated HAAs are monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid. Compliance with the TTHM and HAA MCLs is based on a system-wide RAA of quarterly samples taken in the distribution system. The Stage 1 DBPR also introduced MRDL of 4 mg/L for free chlorine and chloramines, and 0.8 mg/L for chlorine dioxide based on an RAA of samples collected concurrent with TCR monitoring.

7.4.2.1 Monitoring Requirements

Monitoring locations under the Stage 1 DBPR were initially identified in an Initial Distribution System Evaluation (IDSE) prepared by the City in 2004. The City's IDSE explains that chlorine and chloramines are monitored as part of the CMP, which currently tests at 40 sites system wide. The City monitors quarterly for disinfectant residuals at each of these locations. Additionally, the IDSE identifies nine locations representing the longest detention time corresponding to each water treatment plant. The IDSE notes that because the City does not use ozone or chlorine dioxide, monitoring for bromate or chlorite is not necessary. Monitoring for DBPs included a TTHM and HAA sample from each site quarterly.

7.4.2.2 Compliance

The City meets the requirements of the Stage 1 DBPR.

7.4.3 Stage 2 Disinfectants and Disinfection Byproducts Rule

The Stage 2 DBPR was promulgated by the USEPA on January 4, 2006. The key provisions of the Stage 2 DBPR consist of:

- An IDSE to identify distribution system locations with high DBP concentrations. Further information is provided below.
- Site-specific locational running annual average (LRAA) instead of system-wide RAAs to calculate compliance data. LRAAs will strengthen public health protection by eliminating the potential for groups of customers to receive elevated levels of DBPs on a consistent basis.

The MCLs for TTHMs and HAA5 remain unchanged from the Stage 1 DBPR at 0.080 and 0.060 mg/L, respectively, although they will now be calculated as LRAAs.

The IDSE is the first step in Stage 2 DBPR compliance. Its intent is to identify sampling locations for Stage 2 DBPR compliance monitoring that represents distribution system sites with high TTHM and HAA levels. For systems serving more than 500 people, three options were available for the IDSE:

- 40/30 Waiver, which allows systems with no samples exceeding TTHM and HAA concentrations of 40 and 30 micrograms per liter (µg/L), respectively, during eight consecutive quarters to apply to waive the IDSE requirements.
- Standard Monitoring Program, which involves a one-year distribution system monitoring effort to determine locations that routinely show high TTHMs and HAA5 concentrations.
- System-Specific Study, based on historical data and a system model.

The Washington DOH adopted the Stage 2 DBPR on January 4, 2010.

7.4.3.1 Monitoring Requirements

The City was approved for a 40/30 waiver in 2006 and is currently required to collect two samples per year for THM and HAA5.

7.4.3.2 Compliance

The City is in compliance with monitoring requirements for the Stage 2 DBPR. Since April 2021, there have been no samples exceeding the MCL for THM or HAA5 as shown in Table 7.9. The results represent the range of samples from all sources sampled in a particular year.

Table 7.11 Disinfection Byproducts Rule Monitoring Results

Contaminant	MCL Goal	MCL	2021	2022	2023	2024
Haloacetic Acids (µg/L)	48	60	ND-1.4	ND	0.87-1.0	ND
Total Trihalomethanes (µg/L)	60	80	2.5-6.5	5.7-7.6	0.5-4.1	–2.9-3.5

7.4.4 Lead and Copper

The USEPA first promulgated the LCR to control lead and copper levels in drinking water in 1991. The LCR was revised in 2000 and 2007. The LCR sets an AL of 0.015 mg/L for lead and 1.3 mg/L for copper. The AL is exceeded if the concentration in more than 10 percent of tap water samples collected during any monitoring period is greater than the action level. If the 90th percentile value for tap water samples is above the action level, it does not signal a violation but may trigger other requirements that include water quality parameter monitoring, corrosion control treatment, source water monitoring/treatment, public education, and/or lead service line replacement. In 2018, the Centers for Disease Control and Prevention (CDC) revised the blood lead reference value for children to 3.5 micrograms per deciliter.

A revised definition of “lead free” was issued and became effective on January 4, 2014. This defines “lead-free” as <0.25 percent lead, and any new meters, pipe fittings, etc., that are installed will have to meet this new definition as well as any parts that are used in repairs.

In January 2021, the LCR was revised again with the effective date postponed to December 16, 2021, and a compliance deadline of October 16, 2024. In 2021, the revised LCR defined a trigger level of 0.01 mg/L for the system's 90th percentile level, additional actions upon system-wide action level exceedance (ALE), and additional actions upon individual tap sample ALE. Now, when the 90th percentile exceeds the trigger level, systems are required to implement additional planning, monitoring, and reevaluation of current treatment. When the 90th percentile exceeds the AL, systems are now required to notify all customers within 24 hours, begin semi-annual sampling, and either install corrosion control treatment (CCT) or reoptimize their system. Lastly, individual tap sample ALE will require 72-hour notice and "find-and-fix" efforts including identifying the lead source and taking action to reduce lead levels. Under the revised LCR, a Lead Service Line Inventory is required of all service lines on both the system and homeowner side of the meter. At a minimum, service lines must be classified as one of the following:

- Lead, where the line is made of lead.
- Non-lead evidence is required to support this determination.
- Galvanized requiring replacement:
  - Replacement is required where a galvanized service line is determined to be downstream of a current or former lead service line.
- Status unknown, where there is no documentation or evidence of the service line material type.

A Lead Service Line (LSL) Replacement Plan is required for systems with lead service lines, galvanized lines requiring replacement, or service lines where the material is unknown. Additionally, partial lead service

line replacement is no longer allowed. Public-side line replacement is now required when a private-side line is replaced. Table 7.10 summarizes the LCRR.

Table 7.12 Comparison of the Major Provisions of the TCR and the RTCR Rule Requirements

Focus Area	Rule Requirement
Identifying Areas Most Impacted	▪ Complete an LSL inventory. ▪ Systems without LSLs must demonstrate their absence.
Strengthening Treatment Requirements	▪ 10 µg/L TL in addition to the current 15 µg/L AL. ▪ If the TL is exceeded based on 90th percentile lead concentrations, systems must re-optimize CCT or conduct a study if CCT is not currently in place. ▪ Calcium hardness adjustment is no longer a lead CCT option and phosphate inhibitors must be orthophosphate. ▪ Calcium, conductivity, and temperature analyses are no longer required as part of the WQP sampling. ▪ If an individual tap sample exceeds 15 µg/L, systems must collect a follow-up sample, conduct WQP monitoring at or near the site (0.5-mile radius, similar pressure zone), and perform a corrective action. This is termed a "find-and-fix" approach.
Systematically Replacing LSL	▪ Systems with lead above the TL must develop a goal for LSL replacement; 3 percent LSL replaced per year with systems above the AL. ▪ No partial LSLs can be conducted. ▪ Utilities must replace their portion of an LSL within 45 days if the customer replaces their portion.
Increasing Sample Reliability	▪ Prioritize sample collection from sites served by LSLs. ▪ For sites with LSLs, the fifth liter should be collected. ▪ Collect samples in wide-mouth bottles with no cleaning, flushing, etc. prior to sample collection.
Improving Risk Communication	▪ Utilities must notify individual tap sample consumers within 3 days of a 15 µg/L sample detection. ▪ Utilities must inform customers served by an LSL or lead status unknown service line. ▪ Consumer Confidence Report must provide updated health effects language and information regarding LSL replacement programs. ▪ Utilities must notify system-wide customers of lead AL exceedance within 24 hours. ▪ Systems must improve public access to lead information, including LSL locations, and respond to requests for LSL information, deliver educational materials to customers during water-related work that could disturb LSLs, and provide increased information to health care providers.
Protecting Children in Schools and Childcare Facilities	▪ Develop a list of schools and childcare facilities by the 2024 compliance deadline. ▪ Test 20 percent of licensed childcare facilities and elementary schools each year. ▪ Provide testing to secondary schools on request. ▪ Provide information and communicate results to users of the facility, parents, Primacy Agency, and the local or state health department.

Notes:
TL - trigger level; WQP - water quality parameter.

On October 8, 2024, the USEPA issued the final Lead and Copper Rule Improvements (LCRI) that requires the identification and replacement of lead service lines within 10 years. In limited situations, systems with high proportion of lead service lines will be allowed additional time to complete service line replacements.

Additionally, under the LCRI water systems are required to regularly update the LSL Inventory that was required under the revised LCR. This rule also changes tap sampling requirements and lowers the lead action level from 15 µg/L to 10 µg/L.

7.4.4.1 Monitoring Requirements

The City must collect 30 samples every three years, based on the standard monitoring schedule. The most recent set of customer tap samples were collected in 2024.

7.4.4.2 Compliance

The City's monitoring results indicate that the City is in compliance with the requirements of the LCR. The City's LCR monitoring results for 2021 and 2024are presented in Table 7.11. Results represent the 90th percentile of all samples taken within a given period.

Table 7.13 Lead and Copper Rule Monitoring Results

Contaminant	MCL Goal (mg/L)	Action Level (mg/L)	2021 Result (mg/L)	2024 Result (mg/L)
Lead	0	0.015	ND	0.014
Copper	0	1.3	0.93	0.73

7.5 Water Quality Monitoring Program

Federal regulations related to system-wide requirements are discussed herein.

7.5.1 Consumer Confidence Report

The Consumer Confidence Report (CCR) Rule was finalized on September 19, 1998. Each July, community water systems must provide an annual report to customers providing information as to the quality of their drinking water supply. These reports are referred to as "Consumer Confidence Reports" or CCRs. These reports let customers know whether their water meets state and federal drinking water standards. The CCR includes information on the water source, the regulated and unregulated contaminants that have been detected during the year, and their concentrations. The report also provides information on DBPs or microbial contaminants and the potential health effects of the contaminants at concentrations greater than the MCL. The likely source of the contaminants is identified, and a summary of any violations in monitoring, reporting, or record-keeping is included. The reports can assist customers with special health needs to make informed decisions regarding their drinking water. CCRs provide references and telephone numbers as to health effects data and available information about the water system in general.

7.5.1.1 Compliance

The City issues an annual Water Quality Report, which includes a basic description of drinking water contaminants, source description, and annual water quality results. The annual Water Quality Reports for 2021 through 2024 are included in Appendix E.

7.5.2 Public Notification Rule

The Public Notification Rule (PNR) requires that public water systems notify their customers when they violate USEPA or State regulations (including monitoring requirements) or otherwise provide drinking

water that may pose a risk to consumers' health. The original public notification requirements were established in the SDWA; the revised PNR was promulgated in 2000 as required by the 1996 SDWA amendments.

The PNR establishes three notification levels:

- Immediate Notice (Tier 1): In a situation where there is the potential for human health to be immediately impacted, notification is required within 24 hours.
- Notice as Soon as Possible (Tier 2). In a situation where an MCL is exceeded or water has not been treated properly, but there is no threat to human health, notification is required as soon as possible and within 30 days.
- Annual Notice (Tier 3). In a situation where a standard is violated that does not directly impact human health, notice must be provided within one year, likely within the system's CCR.

Notification requirements are described in the City's Emergency Response Plan (ERP), available through City Staff. The ERP includes protocol for notifying the DOH and the public when a positive detection of VOCs/SOCs, IOCs, physical characteristics, or bacteriological presence is determined. The ERP maintains current phone numbers and contact information to all relevant utilities, contractors, government agencies, and local cable and radio stations.

7.5.2.1 Compliance

Since the last WSP update, PFAS has been the City's only violation of the PNR. Proper action was taken to notify the public, and the City is currently undergoing efforts to mitigate PFAS in its sources and distribution system.

7.5.3 Operator Certification

The 1996 SDWA amendments require that states develop and implement an operator certification program. Final guidelines were published in February 1999. The regulations set out minimum guidelines for such a certification program including operator classification and qualifications. These sections of the regulation require that:

- Each treatment facility and/or distribution system is placed under the direct supervision of a certified operator.
- Operator certification must be equal to or greater than the system classification being operated.
- At least one certified operator is available on every shift.
- Operators must sit for, and pass, a validated exam demonstrating skills, knowledge, ability, and judgment necessary for the system classification.
- Each operator must have a high school diploma, GED, or state-approved experience and training.

While the responsibility for developing the program lies with DOH, individual systems must bring all operators up to the level of certification as required. The "grandparenting" clause of the regulation will address existing operators; however, new operators will be required to meet the guidelines of the legislation. Washington State issued revised operator certification guidelines in December 2000 (WAC 246-292). A grandparenting clause is also present in this regulation. However, because this clause expired in 2002, full compliance was required by that date.

On December 4, 2013, the DOH adopted the proposed rule changes for the Waterworks Operator Certification rule. The changes of the rule include strengthening the state's authority to enforce regulations, clarify authority to certify Backflow Assembly Testers (BAT) and Cross Connection Control Specialists (CCSs), and other updates to reflect current program practices, move requirements from guidelines into rules, and improve language and readability. Adopted changes pertinent to PWSs include the following:

- Requires purveyors to designate an operator in responsible charge for each operating shift and each major segment of the system, if applicable.
- Requires purveyors to designate and report all mandatory positions to the department within 30 days of starting operations or when a position is vacated.
- Purveyors shall not require operators to perform work that is beyond their skills, abilities, or level of certification.
- Additional requirements for operators, CCSs, and BATs are included.

7.5.3.1 Compliance

Operation, maintenance, cross-connection control, and water quality monitoring functions for the City are accomplished under the direction of the Water/Sewer Superintendent. As a Group A water system, the City presently meets minimum staff certification requirements. To ensure compliance in the future, all certified staff are provided the necessary expenses and leave time to attend classes and seminars in order to meet requirements for certification renewal. Further details on operator certifications are described in Chapter 4.

7.6 Future Regulatory Requirements

The SDWA and its amendments require that the USEPA reevaluate existing drinking water regulations on a periodic basis and develop and promulgate new standards and regulations as necessary to protect public health. At any given time, there may be many contaminants at various stages of the rulemaking and revision process, such as information gathering, regulation development, public comment, or periodic review. Anticipated future regulatory requirements are summarized in Table 7.12. This table includes ongoing programs to introduce new regulatory requirements, under the UCMR and the Contaminant Candidate List (CCL), as well as specific rules and regulations currently under consideration.

The City does not anticipate issues with meeting the other future regulatory requirements listed in the table based on the limited available information. The City will revisit each proposed rule when specific requirements are published. A brief description of anticipated requirements under each rule is provided herein.

Table 7.14 Future Regulatory Requirements

Proposed Rule	Affected Contaminants	Proposed Publication Date[1]
Unregulated Contaminant Monitoring Rule	▪ Unregulated Contaminants	▪ UCMR 6 – 2026
Fifth Regulatory Determination	▪ Fifth Regulatory Determination	▪ Reg-Det 5 - unknown
Contaminant Candidate List	▪ Unregulated Contaminants	▪ CCL4 - unknown
Hexavalent Chromium	▪ Hexavalent Chromium	▪ August 2027
Nitrosamines	▪ Nitrosamines	▪ Unknown

Proposed Rule	Affected Contaminants	Proposed Publication Date(1)
TOrC	▪ Toxic Organic Chemicals	▪ Unknown
1,4-dioxane	▪ 1,4-dioxane	▪ Unknown
DBPs	▪ DBPs	▪ Unknown
MDBP	▪ MDBP	▪ Summer 2027

Notes:
(1) Effective and compliance dates were obtained from the Federal Register and USEPA's Drinking Water Hotline and represent the best information available as of the date of this report.
MDBP - Microbial and Disinfection-by-Products; TOrC - toxic organic chemicals.

7.6.1 Unregulated Contaminant Monitoring Rule (UCMR 6)

The SDWA requires USEPA to issue a list of no more than 30 priority unregulated contaminants in drinking water once every five years. This requires public water systems to monitor for the selected contaminants. The results of current and previous UCMR As of April 2024, the USEPA has identified 68 potential contaminants that may be included in UCMR 6 sampling, which include chlorinated acids, pesticides and degradates, volatile/semivolatile organics, flame retardants, phenols, organic compounds, and pharmaceuticals. The final rule is expected in 2026 with sampling between 2028 and 2030 to follow.

7.6.2 Fifth Regulatory Determination

Under the SDWA, the USEPA must make regulatory determinations (whether to promulgate a new regulation or remove it from consideration) on at least five contaminants every five years. In the first three Regulatory Determinations (Reg-Det 1, Reg-Det 2, and Reg-Det 3 respectively), the USEPA decided not to regulate contaminants under consideration. In the Fourth Regulatory Determination, the USEPA made final determinations to regulate PFOS and PFOS and to not regulate six other contaminants. The USEPA can make "off-cycle" determinations, such as the positive determination to consider a new perchlorate MCL in 2011. The preliminary fifth regulatory determination was announced in January of 2025 and proposes not regulate nine contaminants on CCL 5. The final determination will be released by the USEPA upon review of the input received during the public comment period.

7.6.3 Sixth Contaminant Candidate List

The SDWA requires the USEPA to review its drinking water regulations every six years in light of advances in the fields of health effects, analytical methodologies, treatment, and occurrence data to determine whether any revisions are needed. Any contaminants provided on the CCL are not subject to any proposed or promulgated regulations but are known to occur in public water systems. The USEPA requested nominations of chemicals, microbes, or other substances for consideration on the draft CCL 6 and is currently evaluating nominations and other contaminant data for inclusion on the draft list.

7.6.4 Contaminants of Emerging Concern

Contaminants of emerging concern are a group of priority pollutants that are not typically regulated by the USEPA. This group includes VOCs, 1,4-dioxane, nitrosamines such as NDMA, hexavalent chromium, and perchlorate. Also, among these contaminants are endocrine disrupting compounds (EDC) and pharmaceutical and personal care products (PPCP).

7.6.4.1 Hexavalent Chromium

Total chromium was regulated in 1991 at 100 µg/L. The USEPA has been working over the past several years to develop a draft risk assessment for hexavalent chromium (Cr(VI)). This assessment was extended from its initial 2012 completion date to incorporate the latest health effects research. Total and Cr(VI) monitoring were also included in UCMR3. The USEPA recently finished conducting an Integrated Risk Information System (IRIS) toxicological assessment of Cr-VI and released the final Cr(VI) IRIS on August 1 2024. As the final risk assessment is now published, USEPA will move forward with determining whether or not to promulgate a Cr(VI) MCL. USEPA is required to make this regulatory determination within three years of the release of the final risk assessment, by August 2027.

7.6.4.2 Nitrosamines

Nitrosamines meet the first two of the three SDWA criteria for regulating a new contaminant:

1. NDMA and other nitrosamines are carcinogens.
2. UCMR2 data showed that NDMA and other nitrosamines occur frequently enough to warrant considering regulatory action.

There is still significant debate as to whether this suite of chemicals meets the third criterion, whether their regulation would provide a meaningful opportunity for risk reduction. The contribution of drinking water to the typical person's nitrosamine exposure is small (<0.1 percent) compared to exposure from foods and from what is produced inside the body (endogenous exposure).

Whether or not nitrosamines are regulated will depend largely upon how the USEPA evaluates if regulation would provide a "meaningful opportunity for risk reduction." The agency has adopted a new "life-stages" approach to risk assessment, which focuses more on at risk populations, like infants and toddlers, who drink more water per body weight.

A total of six nitrosamines, including NDMA, were monitored as part of UCMR2. As of March 2011, UCMR2 data indicate that NDMA is the predominant nitrosamine occurring in drinking water. Further, NDMA was detected three times more frequently in surface waters than ground waters and 10 times more frequently in surface water plants using chloramines versus chlorine alone. NDMA was also detected at higher concentrations at maximum residence time locations in the distribution system as compared to entry points. Six nitrosamines, including NDMA, were listed within CCL4.

Current regulatory discussions have focused around regulating nitrosamines as a group; NDMA would almost certainly be included. More than half of the systems that would be impacted by a nitrosamine rule are chloraminated systems. There are many potential treatment options, but many conflict with other regulations. Also, new treatment research at pilot- or full-scale is needed before the risk assessment can be completed. More information on this topic is anticipated to become available over the next few years, but no regulations are anticipated in the near future.

7.6.4.3 Toxic Organic Chemicals

Whether TOrC like PPCPs and EDCs in the environment pose a significant exposure risk to humans or wildlife is still not well understood and the subject of much investigation and debate. Research on these compounds began in the 1990s and the magnitude of the issue is still not fully defined. The use and subsequent release of antibiotics and natural/synthetic steroids to the environment has generated

controversy to date regarding pharmaceuticals as pollutants. However, a plethora of other drug classes, bioactive metabolites, and transformation products, as well as PPCPs have yet to be examined. Certain physiologically active compounds (for example, caffeine, aspirin, and sex steroids) have been known for over 20 years to enter the environment by a variety of routes, primarily via treated and untreated sewage effluents. Available UCMR3 data indicates endocrine disrupting compounds are largely absent in drinking water sources at even very low levels.

Currently, PPCPs are not regulated by USEPA. The USEPA is studying the effect of PPCPs and has not publicly discussed proposing any regulations. A significant portion of on-going research concerns where and how TOrCs should be treated. Options include drug take back programs, treatment at wastewater treatment plants, and treatment at drinking water plants, with the first option being the most practical and cost-effective.

7.6.4.4 1,4-dioxane

1,4-dioxane is a synthetic organic compound commonly used in a variety of commercial and industrial processes such as stabilization of chlorinated solvents and pharmaceutical manufacturing as well as found as a by-product in goods such as paint strippers, dyes, and greases. The USEPA has classified 1,4-dioxane as likely to be carcinogenic to humans, and the compound has been listed in CCL3, CCL4, and CCL5 as well as monitored under UCMR3. USEPA has no established MCL for 1,4-dioxane however, the latest Drinking Water Specific Risk Level Concentration from USEPA is 0.35 µg/L for the 10^{-6} cancer level (one in a million lifetime cancer risk). The USEPA's health advisory level for noncancer toxicity effects is 0.2 mg/L, so the 0.35 µg/L level for cancer effects is the more conservative level. The notable removal difficulty of 1,4-dioxane is one of the key concerns. While no conventional drinking water treatment technologies can reliably remove it at drinking water levels, ultraviolet light-hydrogen peroxide advanced oxidation process (UV AOP) is effective at treating 1,4-dioxane to below the method reporting limit of 0.1 µg/L.

7.6.4.5 Emerging Disinfection Byproducts

The USEPA continually considers whether additional regulation of DBPs is warranted, as illustrated by the inclusion of several unregulated DBPs on the fourth CCL, the decision to consider revisions to the Stage 1 and 2 D/DBPRs based on the Third Six-Year Review cycle, and inclusion of several classes of unregulated DBPs through the UCMR. A number of potentially significant disinfection by-products continue to be the subject of on-going research. For example, both iodo-substituted HAAs and THMs have been shown to form under certain conditions when drinking water is chloraminated. Nitrosamine is under consideration for inclusion in any new DBP regulations. Bromate has been the subject of scrutiny as well. Since more brominated DBPs can be more toxic, the USEPA required monitoring for HAA9 under UCRM4. No regulations have been proposed as of yet, but as more information emerges, the USEPA may regulate some of these emerging DBPs.

7.6.5 Microbial and Disinfection-by-Products

The National Drinking Water Advisory Council presented recommendations to USEPA in December 2023 on additional MDBP regulations, which may lead to potential rules being promulgated. These rules are expected from USEPA in summer 2025. Items that may be covered in these new rules include:

- Adoption of a positive numeric minimum disinfectant residual requirement, with minimum specific values for free chlorine and chloramines.

- Data and analysis requirements associated with DBPs of emerging concern.
- Source water evaluation screening requirement, plus additional mandatory treatment to reduce DBP formation and disinfectant demand.
- Finished water storage tank inspection and cleaning requirements.
- Improvement of chloramination practices to promote microbial control and DBP formation potential with guidance, monitoring, and nitrification control plan requirements.
- Improvement of water quality and regulatory compliance for consecutive systems (wholesale connections), requiring disinfectant sampling at wholesale and consecutive system connections and processes for addressing DBP control in these systems.

7.7 Summary and Recommendations

The City seeks to maintain high-quality water for its customers from source to tap. While the City currently complies with all DOH monitoring and reporting requirements, the PFAS MCLs described in Section 7.3.6 compel the City to develop and implement a compliance framework by 2029. This section summarizes actions taken to date and outlines a roadmap for future efforts.

Preliminary risk assessments and mitigation screenings indicate uncertainty about PFAS impacts on the City's water supply. As a result, the City will likely need some form of treatment to meet future MCLs. To support planning and budgeting, source development and PFAS mitigation will be incorporated into the Capital Improvement Plan, detailed in Chapters 8 and 10. These projects typically require significant capital investment and will guide the City in securing necessary funding sources.

7.7.1 Recommendations for Compliance with PFAS MCLs

The actions presented in this section summarize framework to assist the City in planning PFAS mitigation measures and compliance with the PFAS NPDWR. The City has taken early action on multiple items described below, though it is recommended that the City continue to implement this framework for system wide PFAS compliance and mitigation.

Based on PFAS sampling data as of the date of this report, Wells 5, 6, 11, 13, and 14 have reported PFAS levels that exceed the PFAS NPDWR MCLs. Well 5 and 13 are individual wells. Wells 6 and 14 combine before their EPTDS, comprising Wellfield East. Wells 7, 8, 10, 11, and 12 combine before their EPTDS, comprising Oak Park Wellfield. For the purposes of developing planning-level estimates for PFAS mitigation, it was assumed that Well 13, Oak Park Wellfield, and Wellfield East would require treatment to achieve PFAS levels below the proposed MCLs. Because only certain wells within Oak Park Wellfield have shown PFAS levels above the MCLs, treatment may not be required for the full flow of Oak Park Wellfield. However, due to the uncertainty around PFAS fate and transport within the aquifer below the wells, the remaining wells at Oak Park may become impacted. For the purposes of cost planning, mitigation costs for Oak Park are presented as a range to cover the mitigation costs that may be required given what the City currently knows about the PFAS levels, and to cover the mitigation costs that may be required if all wells in Oak Park become impacted.

The City is currently under contract to design and construct PFAS treatment at Well 13, given it has shown the highest levels of PFAS throughout the wellfield.

It is recommended that an adaptive PFAS response plan be adopted by the City to strategically plan for PFAS mitigation. The goal of a PFAS response plan will be to develop a roadmap to compliance with the MCLs by USEPA's proposed deadline of 2029. The table below summarizes the major elements of the response plan. The following sections describe these elements in more detail.

Table 7.15 PFAS Response Plan Components

Actions		2024 - 2026	2026 - 2029	
1.	Risk Assessment	Confirm and fast track priority risks, build treatment at Well 13.	Continue to develop and modify risk assessment as PFAS mitigation progresses.	
2.	PFAS Mitigation Screening	Evaluation of alternatives to mitigate PFAS system wide by 2026.	Act on mitigation efforts and adapt plan accordingly based on results from PFAS Monitoring efforts.	
3.	Treatment design and construction	Ongoing efforts for treatment, including design, construction, and operations optimization as needed based on results from Risk Assessment and PFAS Mitigation Screening efforts.		
4.	PFAS Monitoring	Develop PFAS Monitoring Plan, continue sampling.	Continued monitoring.	
5.	Source Management	Source Identification Plan.	Identify Sources.	Source Control (if needed).
6.	Capital Needs Planning	Track funding and financing opportunities.		
7.	Communications	Develop and build upon a communications strategy that conveys efforts and progress to obtain and maintain stakeholder support, including from the public and City Council.		
8.	Advocacy	Partner with other agencies when available to advocate for science-based decisions, funding, and innovative treatment solutions. Help support regional efforts to reduce PFAS treatment costs.		

7.7.1.1 Risk Assessment

It is recommended that the City develop a risk assessment that will serve to identify immediate and near-term actions that can be taken to mitigate PFAS and maintain the City's commitment to providing high-quality water by ranking the highest risks facing the City with respect to PFAS. The risk assessment will incorporate system PFAS goals, infrastructure evaluations from all City wells, and latest hydrogeological information, and PFAS sampling results. The resulting risk register will serve to guide and prioritize efforts moving forward but will be adjustable over time to accommodate new information and the rapidly-changing landscape associated with PFAS.

This effort will work concurrently with design of treatment at Well 13, while establishing actions that could be done in tandem to increase system resiliency against PFAS. It is intended that this risk assessment be updated by the City over time to adapt to changes in PFAS concentration and build upon progress from mitigating the highest risks identified.

7.7.1.2 PFAS Mitigation Screening

This effort includes ongoing evaluations to find the best alternative for PFAS mitigation system wide in a manner that will ensure compliance by USEPA's proposed deadline of 2029. Screening options will generally be divided into the categories of treatment-based mitigation or operational-based mitigation. An evaluation of treatment-based mitigation efforts should include a technology evaluation, comparing the efficacy of typical treatment technologies for PFAS: granular activated carbon (GAC), ion exchange (IX), and reverse osmosis (RO). Treatment efficacy depends on many site-specific factors, including water

quality, system hydraulics, and site constraints. Depending on water quality, pre- or post-treatment may be needed, for example. Operational-based mitigation efforts may include source identification, alternative sources of supply, or upgrading the capacity at well stations if PFAS results are below the USEPA's reporting limit at those well stations. Any impacts to operations will need to consider the impacts to the overall system and allow the City to maintain its high level of service to its customers.

The optimal solution for the City will likely be a combination of both technological and operational-based mitigation measures. The plan to screen alternatives and implement recommendations will likely need support from design services, hydrogeological services, and other support. It is intended that this effort be adaptive and updated over time based on latest PFAS sampling results and successful implementation of fast-track measures described in the Risk Assessment section.

Evaluations that involve changes to the hydraulics of a well (introducing treatment may increase headloss and lower pump yield, for example) should consider impacts and changes to the overall system. These considerations may include upgrading well pumps to maintain capacity with higher headloss, or a change of well operational strategies to maintain the same overall yield.

7.7.1.3 Treatment Design and Construction

This effort plans for and executes tasks necessary for the construction of PFAS treatment systems. Should the Risk Assessment or Mitigation Screening efforts identify treatment to be the optimal solution at a well station, this task will be utilized. The design process may vary depending on the well site, procurement approach, and treatment goals, but will generally include some similar elements.

- Site evaluation efforts will review site hydraulic, electrical, and infrastructure capacities.
- Basis of design reports will develop a treatment plan for the site, including any pre- or post-treatment (corrosion control) requirements based on water quality data.
- Design deliverables, such as 30 percent, 60 percent, 90 percent, and final design packages, including drawings and specifications (deliverables may look different if the procurement approach allows for a fast-track delivery).
- Permitting and regulatory support.
- Engineering services during construction, including supporting startup, commissioning, and operations optimization.
- Ongoing systems integration support. This effort will monitor treatment performance and overall PFAS reduction systemwide to help guide next steps for the system.

7.7.1.4 PFAS Monitoring

The City's existing PFAS Monitoring Plan should be continued and built upon so it allows the City to continue to build insight on the fate and transport of PFAS in the aquifers, while also allowing the City to track progress from mitigation measures that have been implemented. This allows for the overall PFAS response plan to adapt to any changes in PFAS concentration. The monitoring program will also ensure compliance with monitoring requirements listed under the PFAS NPDWR.

7.7.1.5 Source Management

A PFAS source identification plan should be developed to gain insight into any potential sources of PFAS. This plan may include additional sampling efforts and can be modified as needed to the needs of the City. The City can follow guidance provided in the Water Research Foundation Report 5082, "Investigation of Alternative Management Strategies to Prevent PFAS from Entering Drinking Water Supplies and Wastewater" to support source identification or source management measures.

7.7.1.6 Capital Planning Needs

Efforts to track funding opportunities will be important to minimize impacts on ratepayers. These efforts should track all available opportunities and ensure the City is in compliance with funding requirements.

7.7.1.7 Communications

Stakeholder engagement and community outreach will be important throughout these PFAS mitigation efforts to obtain and maintain support. This may include continuing upon the City's public outreach efforts or providing updates to City Council on current PFAS status.

7.7.1.8 Advocacy

The PFAS response plan should also include an advocacy component. Actions under this effort could include developing partnerships with neighboring utilities to coordinate sampling efforts or supporting regional efforts within the industry to advocate for utility support and funding for PFAS.

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Figure 8.4 MDD Ability to Pump with Improvements 8-13

CHAPTER 8 WATER RESOURCES

The City has a diverse water portfolio, which includes groundwater wells and surface water supplies. To meet future demands, the City will need to fully utilize existing water resources and develop new sources to continue to provide high levels of service. The City currently receives its water from 10 groundwater wells and two surface water diversions. This chapter presents an evaluation of these supplies to identify future deficiencies in the City's water rights or in the ability of its supplies to produce reliable water at the levels needed to meet future demands. These deficiencies are addressed by the City's water supply strategy summarized in this chapter.

The City obtains its water from two surface water sources and 10 wells. Eight of the groundwater sources (Wells 5, 6, 7, 8, 10, 11, 12, 14) are located in the City's Lower Washougal Wellfield (LWWF), in the lower Washougal floodplain near downtown Camas. Wells 7, 8, 10, 11 and 12 are often referred to as the City's "Oak Park" wellfield. Well 13 is north and west of the Oak Park wells and is effectively part of the same wellfield pumping center but is not typically referenced as being part of the LWWF. The remaining well (Well 9) is located in the uplands about two miles north of the Columbia River and 1.5 miles west of Lacamas Lake. The City's Boulder and Jones Creek surface water diversions are located in the headwaters of the Washougal River drainage.

8.1 Water Right Analysis

The City relies upon its groundwater wells and surface water sources to meet its current supply needs. Water rights for these sources are administered by Ecology. The DOH regulates source water protection. This section summarizes the City's existing water rights and analyzes the ability of the rights to meet the City's projected demand.

The City has diverted water from Jones Creek since 1913 and Boulder Creek since 1931. Historically, the surface water sources were the City's primary water supply and operated continuously for 24 hours per day with wells being used to meet higher summer peaks. In evaluating options to meet future demands, the City determined that the expansion of existing surface water diversions was not feasible. The City then began expansion of its groundwater supplies, focusing on the productive aquifers in the Lower Washougal River floodplain.

With the issuance of four new groundwater permits in 2008, came the requirement the City cease their surface water operations between May 15 and October 31 of each year. The requirement further stated "At the State's discretion, the water rights associated with these diversions will be placed into the State's Trust Water Program as permanent, seasonal donations." In 2015, the City attempted to place the rights into the Trust Program but was advised by Ecology that the action was not strictly necessary provided they agreed to operate the surface water supply consistent with the intent of the agreement.

Today, the City's focus is on developing new groundwater sources under its existing water right permits. Additional water rights are also being pursued.

8.1.1 Water Rights Summary

The City's water system (DOH ID 108002) currently has two water right claims which have been modified by Certificates of Change, eleven certificated water rights, and five water right permits. A summary of the City's water rights is provided in Table 8.1. Copies of the water right certificates for each well are included in Appendix G. The City's 2023 Water Facility Inventory is provided in Appendix F. Note, in September 2025, the City requested that Ecology extend the development schedule on each of the City's four water right permits to 2031. These extensions were granted by Ecology in May 2026. The City's current plan for developing the wells is presented in Section 8.4.

The City has limitations on its water rights that complicate the calculation of total instantaneous water right (Qi) and annual water right (Qa) as described below:

- Jones and Boulder Creek surface water sources may only be operated seasonally from October 31 through May 15, as directed by Permit G2-30144. The Qa for periods outside of the operating time window are used to maintain instream flow in the Creeks (not for City use).
- Historically, water right permits and certificates with priority dates before 1979 were limited by Ecology to a "total combined maximum Qa of 5,750 acre-feet per year (AFY)". However, modifications to the City's water right claims resulted in the recognition of an additional 550 AFY which increased the total Qa to 6,300 acre-feet/year with priority dates before 1979.
- Withdrawals from Well 9 are considered non-additive. The certificate does not increase the cumulative annual total of all rights but does increase the Qi.
- Certificate CG2-20938 (an irrigation water right allocating 330 gpm and 106 AFY for use between May 1 to October 1) was acquired by the City in 2015 and transferred into permanent trust as instream baseflow support for Lacamas Creek. The City retains the option to request to apply the consumptive use portion of the right (90.3 AFY) as potential mitigation for future water use within the Lacamas Creek drainage downstream of the water right location.

The City's resulting water rights equate to a Qi of 14,045 gpm (20.2 mgd), an additive Qa of 11,090 AFY (9.9 mgd), and a non-additive Qa of 210 AFY (0.3 mgd) as described by Permit G2-30756 (see Page 2) and Certificate G2-27384 (Well 9).

Table 8.1 Water Right Summary

Source	Water Right Number	Priority Date	Instantaneous Qi (gpm)	Annual Qa (AFY)(1)
Claims				
Well 1	Claim 121022 transferred to Well 10(2)			
Well 3	Claim 121023 transferred to Well 11(2)			
Certificates				
Boulder Creek(3)	C-712	08/22/1923	1,120 (2.5 cfs)	977 (A)
	CS2-SWC 712			843 A (Instream Flow)
Jones Creek(4)	C-711	09/05/1930	450 (1.0 cfs)	393 (A)
	CS2-SWC 711			337 A (Instream Flow)
Well 5	G 6636-A G2-*09325C	03/22/1968	600	920(5) (A)
Well 6	G 6635-A G2-*09325C	03/22/1968	1,500	2,400(5) (A)
Well 7	G2-00501	03/22/1971	1,000	530(6) (A)
Well 8	G2-24400	02/04/1977	900	530(6) (A)
Well 9	G2-27384	08/13/1986	650	210 (N)
Well 10(2) (Well 1)	G2-CV1-2P159	06/11/1974	900	320 (A)
Well 12(2) (Well 2)	G2-CV1-2P160	06/11/1974	1,200	230(6) (A)
Well 11(2) (Well 3)	C-85-A G2-*0004C	07/21/1945	900	118 (A)
Well 13(2) (Well 4)	G2-GWC4079 G2-*05130C	02/12/1959	1,325	1,208(6) (A)
Permits				
Lower Washougal Wellfield	G2-30144	08/21/1986(7)	500 (At Well 8)	2,150 (A) (All 8 wells)
Well 14 (Anderson Site)	G2-30145	08/21/1986(7)	1,000	880 (A)
Parkers Landing	G2-30146	08/21/1986(7)	1,000	880 (A)
Treatment Plant Well	G2-30147	08/21/1986(7)	1,000	880 (A)
Umbrella Wellfield(8)	G2-30756	01/08/2020	6,700	11,090 (All 8 wells)
Total			**14,045(9)**	**11,090 (A)(9)** **210 (N)**
Pending Applications				
Steigerwald Regional Supply(10)	G2-30528		17,213	13,555

Notes:
(1) (A) = Additive water right, additive to other rights. (N) = Non-additive water right, not included when summing a cumulative total of all rights.
(2) Original water rights for Wells 1 through 4 have each been re-assigned to their respective replacement Wells 10 through 13. Well 10, 11, and 12 were installed to replace Well 1, 2 and 3, which have failed due to collapsed well casings; see Pacific Groundwater Group report dated June 9, 2003. Well 13 replaced Well 4 after Well 4 was determined to be groundwater under the influence of surface water; see Pacific Groundwater Group report dated August 14, 2006. G2-CV1-2P160 which is now associated with Well 10 allowed for seasonal between May 1st and August 31st. Year-round operation of Well 10 is authorized under Permit G2-30144 for the LWWF.
(3) This source was formerly known as the Little Washougal River. The certificate refers to an instantaneous quantity (Qi) and does not specify an annual withdrawal. An Ecology Report of Examination for Well 7 (G2-00501) summarizes existing water rights, including 1,820 AFY for Boulder Creek (C-712), based on continuous withdrawal at the instantaneous right specified. The withdrawal from surface water sources is limited to May 15 through October 31.
(4) The certificate refers to an instantaneous quantity (Qi) and does not specify an annual withdrawal. An Ecology Report of Examination for Well 7 (G2-00501) summarizes existing water rights, including 730 AFY for Jones Creek (C-711), based on continuous withdrawal at the instantaneous right specified. The withdrawal from surface water sources is limited to May 15 through October 31.
(5) The Permit and Report of Examination preceding this certificate limited water rights to “the total quantity withdrawn or diverted from all sources is not to exceed 3,300 AFY.
(6) The Permit and Report of Examination preceding this certificate limited water rights to “the total quantity withdrawn or diverted from all sources is not to exceed 5,750 AFY.
(7) The original Ecology Report of Examination for these permits indicated a priority date of 08/21/2003. However, Ecology assigned a priority date of 08/13/1986 via amended permits to match with the date of the Clark County Reservation identified by watershed planning for WRIAs 27/28.
(8) Installation of one future well in the LWWF is included under this permit.
(9) Due to permit and certificate restrictions, the total Qi and Qa do not equal the sum of quantities for each column.
(10) Joint application with City of Camas and City of Washougal.

8.1.2 Water Rights Analysis

The City's water rights were compared to existing, 5-year (2031), 10-year (2036) and 20-year (2046) demand projections to establish water right surplus or deficiency. Both Qi and Qa were considered and are summarized in Table 8.2 and Table 8.3, respectively. The City's Water Rights Self-Assessment is provided in Appendix H.

The City currently has surplus water rights based on the actual well pumping in 2024, which was considered to be the existing condition. Note, the reported values reflect the pumping over the entire year, where not all wells were pumped at the same time.

Table 8.2 Instantaneous Water Rights (Qi) Summary

Year	MDD – High Scenario(1) (gpm)	Instantaneous Water Right (Qi) (gpm)	Surplus/Deficiency (gpm)
Existing	6,765(2)	12,475(3)	5,710
2031	8,620	12,475 (3)	3,855
2036	10,490	12,475 (3)	1,985
2046	14,080	12,475 (3)	-1,605

Notes:
(1) Future values based on high MDD demand projection scenario.
(2) Based on actual 2024 maximum day production data.
(3) Instantaneous water rights of 14,045 gpm shown in Table 8.1 minus 1,570 gpm of surface water rights not available during the summer months.
MDD - maximum day demand.

Table 8.3 Annual Water Rights (Qa) Summary

Year	ADD - High Scenario(1) (AFY)	Annual Water Right (Qa) (AFY)	Surplus/Deficiency (AFY)
Existing	5,230(2)	11,090	5,860
2031	6,610	11,090	4,480
2036	8,070	11,090	3,020
2046	10,910	11,090	180

Notes:
(1) Future values based on high ADD demand projection scenario.
(2) Based on actual 2024 annual production data.

For the future water rights evaluation, the forecasted source production was based on the high demand projection scenario. The high demand scenario generally reflects the water use rates from the period of highest demands in the last eight years, as presented in Chapter 5. Use of the highest projected demands is intended to support the City in planning for sufficient physical supplies to meet demands and provide sufficient time for phasing in new supplies, which is typically a multi-year process.

The City is expected to have sufficient Qa through the next 20 years; however, the City is expected to have a Qi deficiency of 1,605 gpm by 2046. As described in the water supply strategy later in this chapter, the City plans to meet this deficiency by a combination of improving pumping yields from existing well facilities, developing all of its existing water rights, and securing water rights for additional supply sources.

Additionally, the City will continue to encourage water use efficiency including the reduction of irrigation use, which is a major driver for the relatively high projected MDD.

8.2 Ability to Pump

In addition to water rights, each of the City's supply sources physical capacity or "Ability to Pump" was evaluated. The resulting Ability to Pump was compared to demands to determine supply surplus or deficiency. The supply evaluation considered both high scenario projections for ADD and MDD conditions. Further, the Ability to Pump was evaluated for three supply scenarios:

- Standard (all supplies) represents the City's ability to meet demands with all sources pumping continuously (24 hours per day).
- Reliability (only supplies with backup power) represents the City's ability to meet demands during a widespread power outage where only supplies with auxiliary power are available.
- Redundancy (largest source out-of-service) represents the City's ability to meet MDD with the single largest source out of service. For the purposes of this analysis, Well 13 is assumed to be the largest source with a capacity of approximately 1,350 gpm.

Table 8.4 shows the supply sources contributing to ability to pump totals for each supply scenario under MDD and ADD demand conditions. Supply improvements to address all identified deficiencies are summarized in Section 8.4.

Table 8.4 Ability to Pump – Supply Summary

Source	Capacity (gpm)	MDD Standard	MDD Redundancy	MDD Reliability(3)	ADD Standard	ADD Redundancy	ADD Reliability(3)
Boulder Creek(1)	1,120	0	0	0	1,120	1,120	1,120
Jones Creek(1)	450	0	0	0	450	450	450
Well 5	675	675	675	0	675	675	0
Well 6(2)	1,200	1,200	1,200	0	1,200	1,200	0
Well 7	950	950	950	0	950	950	0
Well 8	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Well 9	575	575	575	0	575	575	0
Well 10	900	900	900	0	900	900	0
Well 11	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Well 12	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Well 13	1,350	1,350	0	1,350	1,350	0	1,350
Well 14(2)	850	0	0	850	0	0	850
Total	**11,320**	**8,900**	**7,550**	**5,450**	**10,470**	**9,120**	**7,020**

Notes:
(1) The City's surface water sources are unavailable between May 15 and October 31. MDD typically occurs during these months, therefore capacity is assumed to be zero.
(2) A hydraulic restriction prevents the simultaneous operation of Well 6 and 14. The well with the larger capacity (Well 6 at 1,200 gpm) is considered in the existing and redundancy ability to pump scenario, while the well with the smaller capacity (Well 14 at 850 gpm) is assumed to be zero.
(3) Only supplies with backup power are assumed to have reliable capacity.

8.2.1 MDD Ability to Pump

The MDD ability to pump represents the City's ability to pump under maximum day demand periods, typically during summer months. Demands above the MDD (such as peak hour demands or fire flow) are served by storage and evaluated in Chapter 9. The MDD Ability to Pump was compared with the high scenario projected MDD for the planning period to evaluate supply capacity, as shown in Figure 8.1 and Table 8.5. Note, due to water right restrictions, the City's surface water sources are unavailable during the summer; therefore, are not included in the MDD ability to pump analysis.

Table 8.5 MDD Ability to Pump Analysis

Year	MDD (gpm)(1)	Standard Available Supply (gpm)	Standard Surplus/ Deficiency (gpm)	Redundancy Available Supply (gpm)	Redundancy Surplus/ Deficiency (gpm)	Reliability Available Supply (gpm)	Reliability Surplus/ Deficiency (gpm)
Existing	6,765(2)	8,900	2,135	7,550	785	5,450	-1,315
2031	8,620	8,900	280	7,550	-1,070	5,450	-3,170
2036	10,490	8,900	-1,590	7,550	-2,940	5,450	-5,040
2046	14,080	8,900	-5,180	7,550	-6,530	5,450	-8,630

Notes:
(1) Future values based on high MDD demand projection scenario.
(2) Based on actual 2024 annual production data.

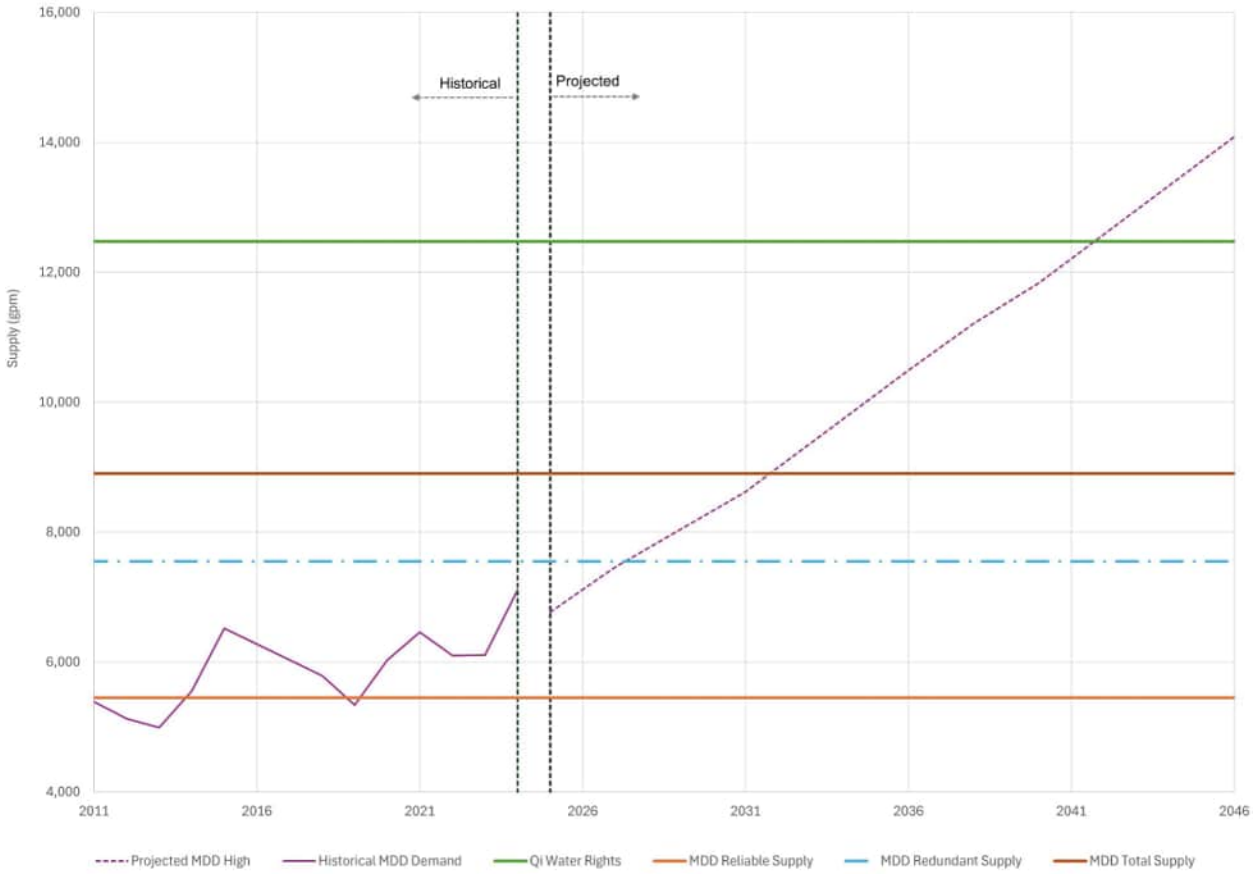

Figure 8.1 MDD Ability to Pump

The City's existing MDD ability to pump is approximately 8,900 gpm (12.8 mgd) in the standard scenario, approximately 7,550 gpm (10.9 mgd) in the redundancy scenario, and approximately 5,450 gpm (7.8 mgd) in the reliability scenario. The MDD Ability to Pump analysis shows a deficiency under the existing reliability scenario and increasing to all scenarios by 2031.

The City needs approximately 5,180 gpm of supply in the standard scenario, approximately 6,530 gpm of supply in the redundancy scenario, and approximately 8,630 gpm of supply in the reliability scenario by the end of the 2046 planning year. Improvements to existing well capacity may increase supply by 3,850 gpm to approximately 12,750 gpm by resolving physical capacity issues in Well 6 and 14 and increasing capacity of Wells 8, 11, and 12. The future construction of Well 18, 19, and 13B add an additional 4,000 gpm of MDD Ability to Pump capacity, allowing the City to meet projected MDD under all scenarios. Additionally, backup power is needed for Wells 5, 6, 7, 9, and 10 to increase reliable MDD Ability to Pump. Recommendations to address MDD supply deficiencies are further detailed in Section 8.4.

8.2.2 ADD Ability to Pump

The ADD Ability to Pump evaluation confirms the City's ability to supply average demand throughout the year. High scenario ADD projections were used to represent typical conditions expected to occur. ADD Ability to Pump was compared with the projected high ADD scenario for the planning period to evaluate supply capacity, as shown in Figure 8.2 and Table 8.7. The City's surface water sources, Jones and Boulder Creek, are included in the ADD Ability to Pump analysis.

Table 8.6 ADD Ability to Pump Analysis

Year	ADD (gpm)(1)	Standard Available Supply (gpm)	Standard Surplus/ Deficiency (gpm)	Redundancy Available Supply (gpm)	Redundancy Surplus/ Deficiency (gpm)	Reliability Available Supply (gpm)	Reliability Surplus/ Deficiency (gpm)
Existing	3,245(2)	10,470	7,225	9,120	5,875	7,020	3,775
2031	4,095	10,470	6,375	9,120	5,025	7,020	2,925
2036	5,005	10,470	5,465	9,120	4,115	7,020	2,015
2046	6,765	10,470	3,705	9,120	2,355	7,020	255

Notes:
(1) Future values based on high ADD demand projection scenario.
(2) Based on actual 2024 annual production data.

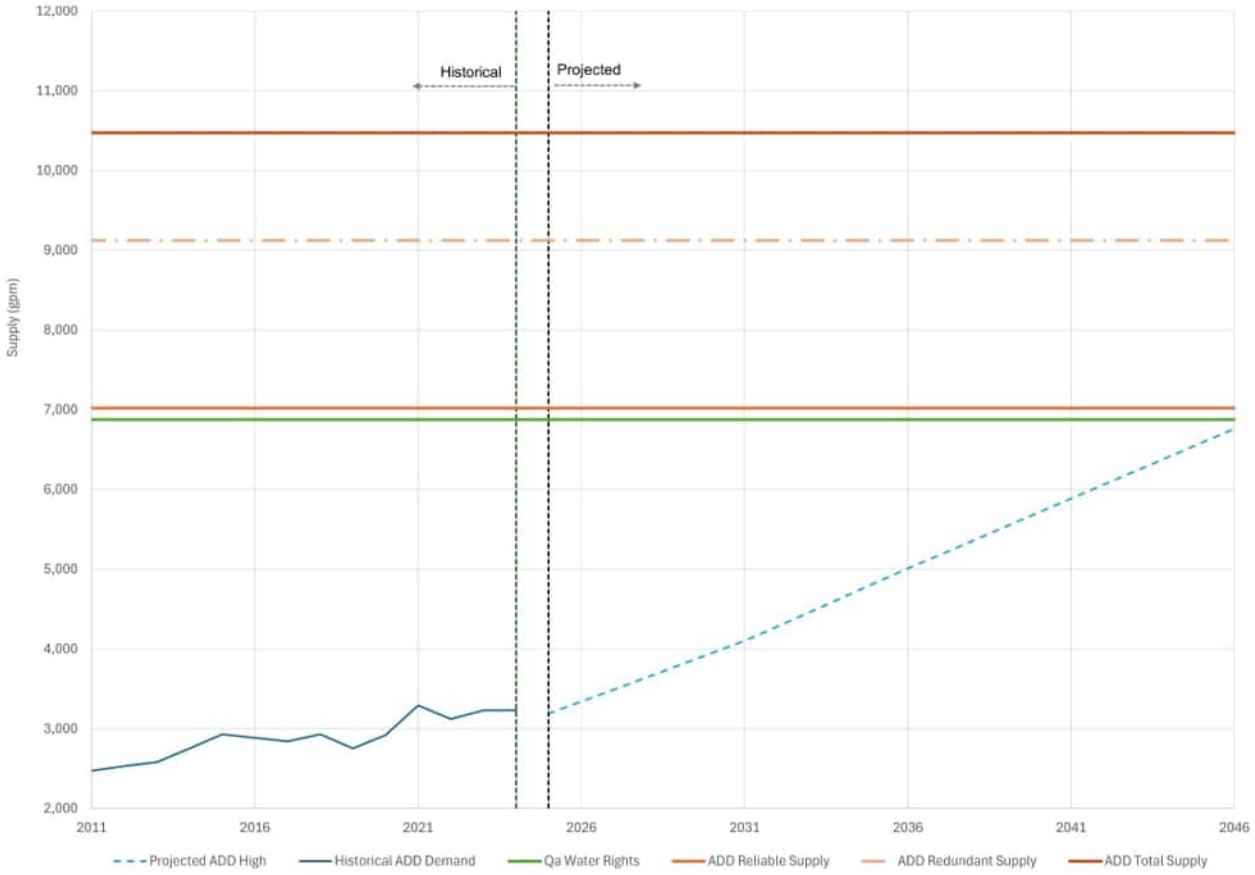

Figure 8.2 ADD Ability to Pump

The City's existing ADD Ability to Pump is approximately 10,470 gpm (15.1 mgd) in the standard scenario, approximately 9,120 gpm (13.1 mgd) in the redundancy scenario, and approximately 7,020 gpm (10.1 mgd) in the reliability scenario. All supply sources have adequate physical capacity under all scenarios and planning years to meet projected ADD.

No additional physical capacity recommendations are necessary to meet future ADD. It is anticipated that projects to address the MDD Ability to Pump deficiencies will concurrently increase ADD Ability to Pump capabilities.

8.3 Water Supply Strategy

The City requires additional supplies or improvements to existing facilities to provide the sought level of service during the planning period, where deficiencies already exist for the MDD ability to pump reliability scenario. To serve the projected 2046 MDD, the City needs a minimum additional supply of 5,180 gpm in the standard scenario, 6,530 gpm in the redundancy scenario, and backup power at all supply facilities to meet reliability level of service goals By the end of the planning period, the City will also need an additional 1,605 gpm of instantaneous water rights (Qi). The City's water supply strategy is comprised of four parts:

- Lower Washougal Wellfield Expansion.
- Construct Wells for Existing Water Rights.

- Secure Additional Water Rights.
- Continue a WUE Program.

The improvements are grouped into either the short-term (2027-2036) or long-term (2037-2046) planning horizons.

8.3.1 Lower Washougal Wellfield Expansion

Improved pumping from existing well facilities to achieve their full water right can provide additional future supply. The Ability to Pump analysis identified 3,850 gpm (5.5 mgd) of MDD supply can be obtained through addressing hydraulic limitations at Well 6 and 14 and increasing pumping capacities through upgrades at Wells 8, 11, and 12. While the pumping capacity will increase, the improved wells will not increase the ADD Ability to Pump due to water right restrictions. The LWWF expansion delays the need for developing additional supply sources.

Potential improvements to existing supply facilities include the following and should be completed by the 2031 planning year:

- The City is currently upsizing the pipeline between Well 6 and Well 14, which resolves an existing transmission deficiency that restricts the wells from operating simultaneously. This project is not included in existing analysis but is assumed to be completed soon as the project is currently in construction.
- Increase the yield of Well 8 to 2,250 gpm (an additional 1,000 gpm) by upgrading existing well screen and pump assemblies. Hydrogeologic investigations indicate additional capacity is available with well redevelopment and upgrades.
- Increase the yield of Wells 11 and 12 to 2,000 gpm each (an additional 1,000 gpm at each well) by upgrading existing pump assemblies. Hydrogeologic investigations indicate additional capacity is available with well upgrades.
- Install backup power for Wells 5, 6, 7, and 10 to increase reliability of the wellfield. It is assumed all new supplies will have backup power available.
- Install per- and polyfluoroalkyl substances (PFAS) treatment for all wells nearing or exceeding federal maximum contaminant levels, with provisions to add wells that may require treatment in the future. Recommendations for projects to address water quality concerns due to PFAS are summarized in Chapter 7.

The City's ongoing O&M program have kept supply facilities in good condition. R&R activities will be triggered by components reaching the end of their usable life. Additional information on the City's O&M and R&R programs is presented in Chapter 4.

8.3.2 Secure Additional Water Rights

The City is actively pursuing new water sources to meet future deficiencies and to improve supply redundancy. A water rights investigation is recommended to evaluate the transfer or acquisition of additional water rights detailed in this section.

8.3.2.1 Transfer or Acquisition of Additional LWWF Water Rights

On January 8, 2020, the City filed application G2-30756 for a new water right permit with Ecology. The application requested authority to withdraw 6,700 gpm and an unspecified annual quantity from the City's LWWF, non-additive to existing rights. The City also requested authorization for an additional point of withdrawal (well) in the LWWF; however, the requested new well (Well 18) will be authorized by adding a point of withdrawal to one or more existing water rights (e.g., G2-0004C and G2-CV1-2P160) through a showing of compliance with RCW 90.44.100(3).

Additionally, a preliminary hydrogeologic analysis indicated the Washougal River and LWWF aquifer may possibly not be in hydraulic connection during the summer. This could potentially allow for the City to transfer surface water rights for use in the LWWF during the summer months to increase available Qi. However, to verify these conditions additional groundwater modeling and monitoring will be required. Since this approach could be speculative, it is recommended the City complete a water rights investigation and discuss feasibility with Ecology.

8.3.2.2 Use of Lacamas Creek Water Rights

In 2015, water right CG2-20938 was placed into the water rights trust program by the City. The water right is a seasonal irrigation right used for past farming of a property located north of the City between NE Ward Road and NE 172nd Avenue. The donated portion is for 330 gpm and 106 acre-feet, of which 90.3 acre-feet is considered the consumptive quantity. The City requested that they be allowed to apply this consumptive quantity as mitigation for future water right requests in the Lacamas Creek basin. New water resource projects that might have impacts to Lacamas Creek or Lacamas Lake could potentially utilize this water right to help offset in-stream impacts to the Lacamas Creek drainage. Utilizing this water right would require site selection and development of a new groundwater well. Additional discussions with Ecology will be needed to verify the applicability to a given project.

8.3.2.3 Steigerwald Regional Supply Source

In the long-term, the City anticipates obtaining supply from the future Steigerwald Regional Supply Source (Water Right Application G2-30528), as discussed in the Detailed Implementation Plan (Lower Columbia Fish Recovery Board 2008) for the Salmon-Washougal and Lewis Watershed WRIAs. Under (WAC) 173-500-040, WRIAs were formalized and the Ecology was given responsibility for the development and management of these planning boundaries. The Salmon-Washougal and Lewis Watershed Management Plan WRIAs 27 and 28 (Lower Columbia Fish Recovery Board 2006) and subsequent Detailed Implementation Plan were created to address a range of issues related to water resources, including water supply, stream flow management, water quality, and fish habitat. The City and the Jones and Boulder Creek surface water supply watersheds reside within WRIA 28.

The completion of WRIA 27 and 28 watershed plans in 2008 eliminated the water rights reservation established by WAC 173-592 and replaced them with regional water supply areas and some stream allocations in WAC 173-527 for the Lewis River Basin (WRIA 27) and WAC 173-528 for the Salmon Creek-Washougal River Basin (WRIA 28).

The Watershed Management Plan discusses the regional water supply areas for Camas, which was designated as the Steigerwald area near Washougal. Ecology has designated water supplies near the City as "Instream Flow with Closures and Reserves." This designation limits the ability of the City to obtain new water rights outside of the regional water source.

The Steigerwald Regional Supply Source will be jointly developed with the City of Washougal. The Cities have applied for a joint water right (Water Right Application G2-30528) for 17,213 gpm of instantaneous water rights and 13,555 AFY of annual water right. The Place of Use has been designated as the water service area for both cities (as defined by each City's most recent water system plan approved by DOH). It is anticipated that the supply source will include up to 10, 20-inch diameter wells with individual well yields of 2,000 gpm or more. As an entirely new supply source, the Cities will need to permit, design, and construction the proposed wells and related facilities, such as disinfection, auxiliary power, and potentially treatment. To convey the water, the City will need several miles of transmission main.

8.3.2.4 Georgia Pacific Water Rights Acquisition

Additionally, the City may consider purchasing or leasing water rights and wells from Georgia Pacific (GP), if available, to develop an additional future water source closer to the City's water system. If production from the GP site proves problematic (due to the costs of treatment for contaminants for example), the water rights could still represent a value to the City as a mitigative offset for a new water right request. However, GP has expressed the desire to keep their water rights and wells for the entirety of the planning period.

8.3.2.5 Columbia River Surface Water Supply

Should the water sources described above not be available or sufficient to meet future needs, the City should explore development of a surface water supply on the Columbia River. Conversations with Ecology indicate water rights for this source are open to appropriation. The feasibility of this alternative should be further evaluated in the next WSP due to the extensive permitting and planning requirements. Development of a surface water supply also requires surface water treatment, leading to significant capital investments.

8.3.3 Develop Wells for Existing Water Rights

The City has existing water rights that allow for the development of additional wells. Hydrogeologic investigations indicate the Lower Washougal Wellfield is recommended site to develop new wells. To meet projected customer demand under this planning period, three wells are recommended for development. By the end of the long-term planning horizon, development of Wells 18, 13B, and 19 should be completed to increase the ability to pump under MDD conditions by approximately 4,000 gpm if the City has obtained sufficient and/or additional water rights prior to the development of these sources.

8.3.4 Continue Water Use Efficiency Program

The final element of the City's supply strategy is to continue to reduce demand through its water use efficiency program. The City has observed declining per account water use for over a decade. The observed drop in the water use and MDD peaking factor can be attributed in part to the City's water use

efficiency program, which is summarized in Chapter 6. WUE gains, including reductions in distribution system leakage, may delay the need for new supplies presented below.

8.3.5 Summary of Improvements

The City water supply strategy outlines the necessary steps to increasing capacity to meet future demands. The focal point of the strategy is to maximize production from existing supply facilities and fully utilizing available water rights before shifting to developing new facilities and pursuing additional water rights. The identified projects to increase the City's supply capacity are summarized below and incorporated in the CIP in Chapter 10. Desktop calculations indicate these projects will address identified physical supply capacity deficiencies under this planning period if sufficient water rights can be obtained; it is recommended the City reevaluate supply needs again in the next WSP. The City's water supply strategy is comprised of the recommended projects summarized below:

1. Well 6 and 14 Transmission Pipeline (in progress).
2. LWWF Expansion and PFAS Treatment (CIP Project S-01).
3. Water Rights Investigation (CIP Project G-03).
4. Well 18 Development (CIP Project S-02).
5. Well 13B Development (CIP Project S-03).
6. Well 19 Development (CIP Project S-04).

Table 8.9 describes each improvement, timing, increase in supply, and resulting MDD Ability to Pump after project completion. By the end of the planning period, the LWWF Expansion project and proposed new wells are expected to effectively make full use of the City's existing and assume proposed LWWF water rights applications are approved. The completion of the LWWF Expansion project delays the City's need for new supplies until the long-term planning horizon (post 2036). It is anticipated remaining supplies will be developed in phases to meet expected demand growth and distribute capital costs.

Table 8.7 Supply Improvements - MDD Ability to Pump

Improvement	Timing	Additional Supply (gpm)	MDD Ability to Pump (gpm)	Reliable MDD Ability to Pump (gpm)	Redundant MDD Ability to Pump (gpm)
	Existing		8,900	5,450	7,550
Well 6 and 14 Transmission Pipeline(1)	Short-term	850	9,750	5,450	8,400
LWWF Expansion	Short-term	3,000	12,750	12,750	10,500(2)
Well 18 Development	Long-term	2,000	14,750	14,750	12,500
Well 13B Development	Long-term	1,000	15,750	15,750	13,500
Well 19 Development	Long-term	1,000	16,750	16,750	14,500

Notes:
(1) The Well 6 and 14 Transmission Pipeline is in progress and is not included in the City's CIP.
(2) Well 8 capacity will be increased to 2,250 gpm during the LWWF Expansion, becoming the largest source out of service in the redundancy scenarios.

The increase in MDD Ability to Pump for these improvements is shown in Figure 8.4. To maintain redundant MDD Ability to Pump, the City will need to complete all recommended supply projects by the end of the planning period. Therefore, well development and PFAS treatment are anticipated to be a

major element of the City's CIP. Since ADD Ability to Pump is sufficient with existing supply facilities, it is assumed supply improvements to address MDD Ability to Pump will provide additional redundancy for the City's system.

If the City cannot obtain sufficient water rights in LWWF to meet the projected need, the City will need to consider additional water sources. Figure 8.3 outlines the water resources decision making framework and the recommended order of prioritization for pursuing water supply outside of the LWWF. A description for each option is provided in Section 8.3.2.2 through Section 8.3.2.5. It is recommended that the City complete an evaluation to determine the feasibility of each water supply option.

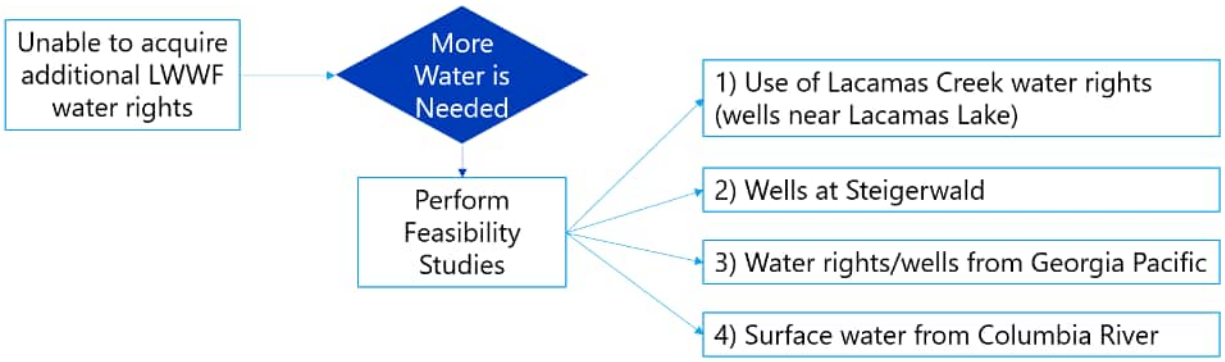

Figure 8.3 Water Resources Decision Making Framework

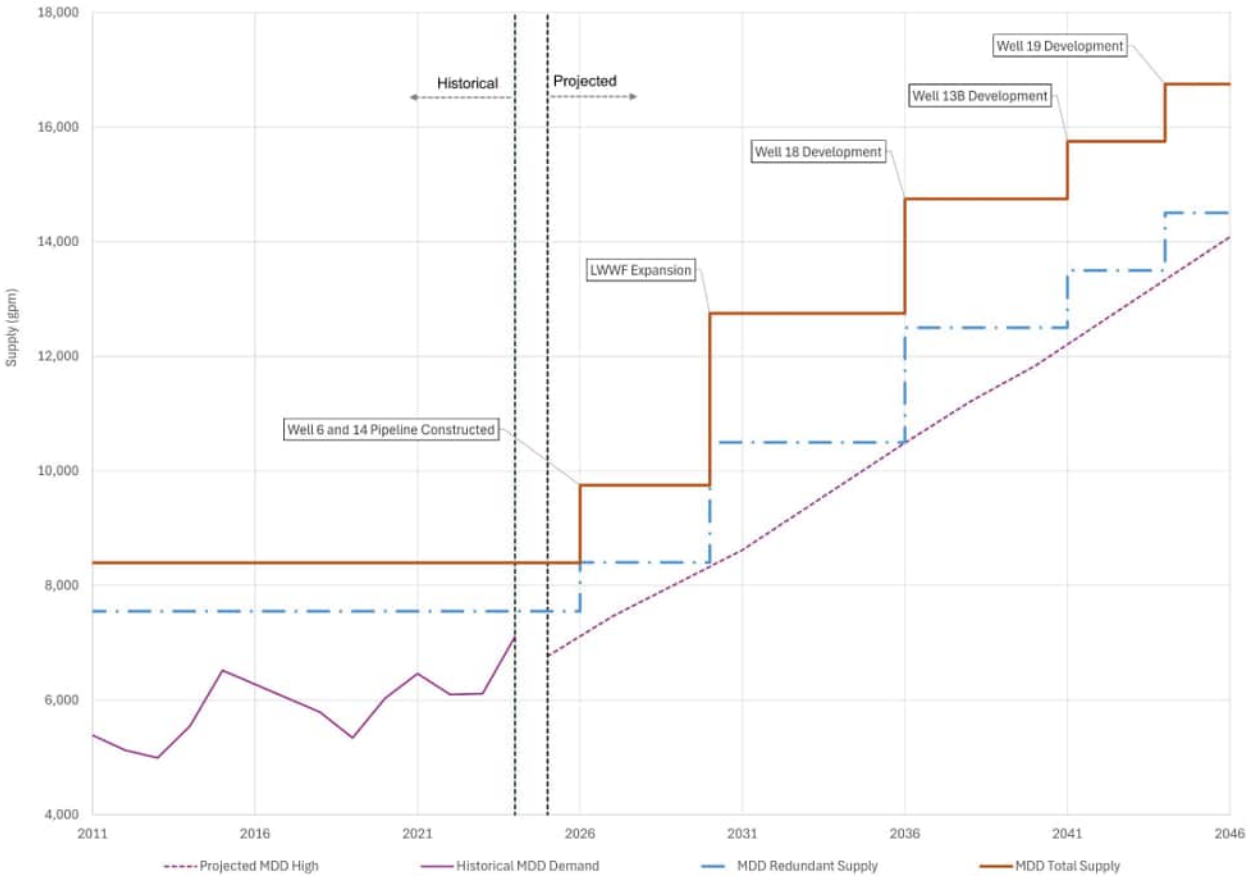

Figure 8.4 MDD Ability to Pump with Improvements

8.4 Groundwater Management

The City's wellhead protection plan was updated as part of the Plan. Section 1428 of the 1986 Amendments to the Federal Safe Drinking Water Act mandates that each state develop a wellhead protection program and that all federally defined public water systems (in Washington, Group A systems) using groundwater as its source implement a wellhead protection plan. In July 1994, the WAC addressed requirements for Group A public water systems (WAC 246-290) and was modified to include mandatory wellhead protection measures. The legislative authority to require wellhead protection (WHP) planning can be found in the RCW Chapters 43.20.050, 70.119A.060, and 70.119A.080.

8.4.1 Wellhead Protection Program

The overall goal of the state WHP program is to prevent the contamination of groundwater used by Group A public water systems. This is to be accomplished by providing management zones around public wells, identifying existing groundwater contamination sources, and managing potential sources of groundwater contamination prior to their entry into the drinking water system. Under the WAC, local public water systems have the primary responsibility for developing and implementing local wellhead protection plans (WHPP). However, due to the limited jurisdictional and regulatory authority afforded most purveyors, coordination with other local, State, and Federal agencies is essential to the successful implementation of a WHPP.

The DOH has developed regulations that require Group A water systems using groundwater sources to develop and implement the WHPP (WAC 246-290-135). The objective is to prevent releases of contaminants to groundwater in areas that contribute water to the public supply systems. The City's Wellhead Protection Report is included in Appendix I.

The basic elements of a WHPP include:

- Assessment of initial groundwater susceptibility for each water supply source.
- Delineation of the wellhead protection area (WHPA) that directly contributes groundwater to each water supply well.
- Inventory of land uses and identification of potential sources of contamination within each WHPA. These include time-of-travel zones (capture zones) representing 6-month, 1-, 5-, and 10-year periods to assess how quickly a potential contaminant might reach a source well.
- Documentation of notification to owner/operators of known or potential hazards.
- Documentation to regulatory agencies and local governments with the known or potential hazards.
- Development of spill prevention plans and water contingency plans that minimize or eliminate the possibility of contamination to the groundwater supply and also development of options for maintaining water supply in the event the aquifer contributing to a source is contaminated.
- Documentation of coordination with local emergency incident responders including notification of WHPA boundaries, susceptibility and inventory findings, and contingency plan.

The State of Washington WHPP applies to the City's wells.

8.4.2 Wellhead Protection Area

The updated WHPP used the WHPA developed in 2016 (PGG 2016). Capture zones for the Lower Washougal Wellfield were estimated using a calibrated MODFLOW groundwater flow model. This included Well 14 and the planned Parkers Landing and Treatment Plant wells. However, these later two wells were not constructed. The model simulations assumed that the City would exercise all of their existing and the two planned future wells. This assumption provides for a fairly conservative assessment of the capture zone extent. In addition, high-range pumping was assumed for the nearby Georgia Pacific Wellfield. Groundwater withdrawals from Georgia Pacific have likely decreased since the 2016 WHPA development due to reduced operations so the interaction between the GP and Camas wellfields may be overstated. In order not to rule out possible contaminant sources to the west of the LWWF, a 'Western Search Area' expansion of the WHPAs was added from the west side of the Washougal River as far west as the Crown Zellerbach Power Ditch (Appendix I). New modeling of the City's WHPAs is underway and may revise some of the assumptions above (Strata Geosciences, in press).

8.4.3 Existing and Potential Contamination Hazard Identification

The City performed a risk assessment within the existing WHPAs and immediate surrounding areas (buffer zone). The inventory of potential contamination sources within the WHPA was performed according to the DOH publication: "Inventory of Potential Contaminant Sources in Washington's Wellhead Protection Areas (1993)." Potential contaminant risks that lie within the vicinity of the LWWF were investigated and mapped using data from multiple sources. The primary source contains data from Ecology's Facility/Site database, including state cleanup sites, federal superfund sites, hazardous waste generators, solid waste facilities, and underground storage tanks. Additional information was gathered from Clark County's (2025) parcel database; septic system and infiltration facilities data on file with Clark County, the City of Camas, and the City of Washougal; Ecology's Environmental Information Management database; DOH's Sentry database; USEPA Enforcement and Compliance History Online PFAS industry sectors analytical tool; and a custom records request from Lightbox Environmental Data Resources. The information from these sources were classified and plotted on GIS coverages to assess whether existing and potential contaminant sources were located within the vicinity of Camas' production wells and WHPA delineations.

Table 7-1a in Appendix A of the WHPP summarizes known environmental sites of potential concern within the LWWF capture zones. Forty-seven contaminant sources of potential concern to the water supply were identified within the wellfield capture zones, and an additional 22 sites of potential concern were identified within the Western Search Area. A previously developed PFAS historic site list (Mott MacDonald 2025) was reviewed in tandem with Table 7-1a and USEPA's PFAS Industry Sectors Analytical tool (USEPA 2025a) to develop a PFAS industry site risk ranking (Table 7-8 in Appendix A). Thirty-six sources of potential PFAS concern to the water supply were identified within the wellfield capture zone, and an additional 18 sites of potential PFAS concern were identified within the Western Search Area.

8.4.4 Contingency Planning Tasks

As described in the WHPP, the nine shallow wells within the LWWF are most susceptible to contaminant risks given the hydrogeology and land surface activities. The capacity of the most productive wells in the Lower Washougal wellfield is about 1,300 gpm. If the supply from one of these wells was lost or compromised, the City would have to rely on a combination of the other sources to meet summertime peak demands (other wells, interties, and emergency use of surface water sources).

Additional risks to the City's supply arise from the fact that five of the City's wells (Wells 7, 8, 10, 11, and 12) are clustered in close proximity to each other. Several, if not all, of these wells could be impacted by a single contaminant release, such as a major railroad spill. Depending on the nature of impact to the wells, the City could perform immediate mitigation with changes in well pumping, treatment, blending of waters between wells, and other operational changes to meet demands; however, should multiple wells become impacted, the City may not be able to support the City's entire water demand on a sustainable basis, particularly during the high demand summer months. If multiple wells are impacted, the City may need to institute short-term rationing and pursue expedited drilling of additional wells.

8.4.5 Management Strategies and Implementation Tasks

[To be added upon completion of the Wellhead Protection Plan.]

CHAPTER 9 DISTRIBUTION SYSTEM ANALYSIS

9.1 Introduction

This chapter summarizes potential future system deficiencies in the City's water distribution system and offers recommended system improvements. Carollo evaluated the capacity of the pipeline system using the City's updated and calibrated hydraulic model. Carollo's hydraulic model development and calibration technical memorandum in Appendix **[X]**, summarizes all model updates made during this plan. Desktop evaluations of storage reservoir and pump station capacities were conducted in Microsoft Excel. Improvements identified in this chapter are summarized in the CIP in Chapter 10.

The analysis presented in this chapter is organized by first identifying high velocity and low-pressure deficiencies through the hydraulic model analysis for PHD and fire flow conditions in Sections 9.2.3 and 9.2.4. Recommendations are then provided to address deficiencies under both conditions. Next, Section 9.3 outlines deficiencies in pumping areas via desktop analysis then discusses pump station recommendations. Then, Section 9.4 outlines the storage deficits determined through desktop analysis. A multi-phased approach to addressing storage deficits is subsequently described, assuming all pumping and low-pressure/dead storage deficiencies have been fixed. The chapter finishes with a summary of all distribution system recommendations that will be included in the CIP.

9.2 Distribution System Model Analysis

The calibrated InfoWater Pro model of the City's distribution system was used to analyze the system for future planning years. Projected system demands (from the medium demand scenario) were added for the 2031, 2036 and 2046 planning years. Projected system demands for 2026 were also added to establish the baseline for existing system deficiencies. The hydraulic model was used to evaluate typical system conditions under MDD with diurnal operations (PHD) and for fire flow availability under MDD conditions.

9.2.1 Modeled Improvement Projects

Since the City expects significant growth, existing supplies do not adequate capacity to meet future projected demands. The hydraulic model will not run under conditions where demand exceeds supply. Therefore, it was necessary to add future supply improvements to the model before the distribution system analysis could be conducted. All supply and booster pumping improvement projects identified in the water supply strategy in Chapter 8 and storage and pumping analysis, including required transmission pipeline improvements associated with these projects were also added to the model. The improvement projects added to the model and used for the distribution system analysis are shown in Figure 9.1.

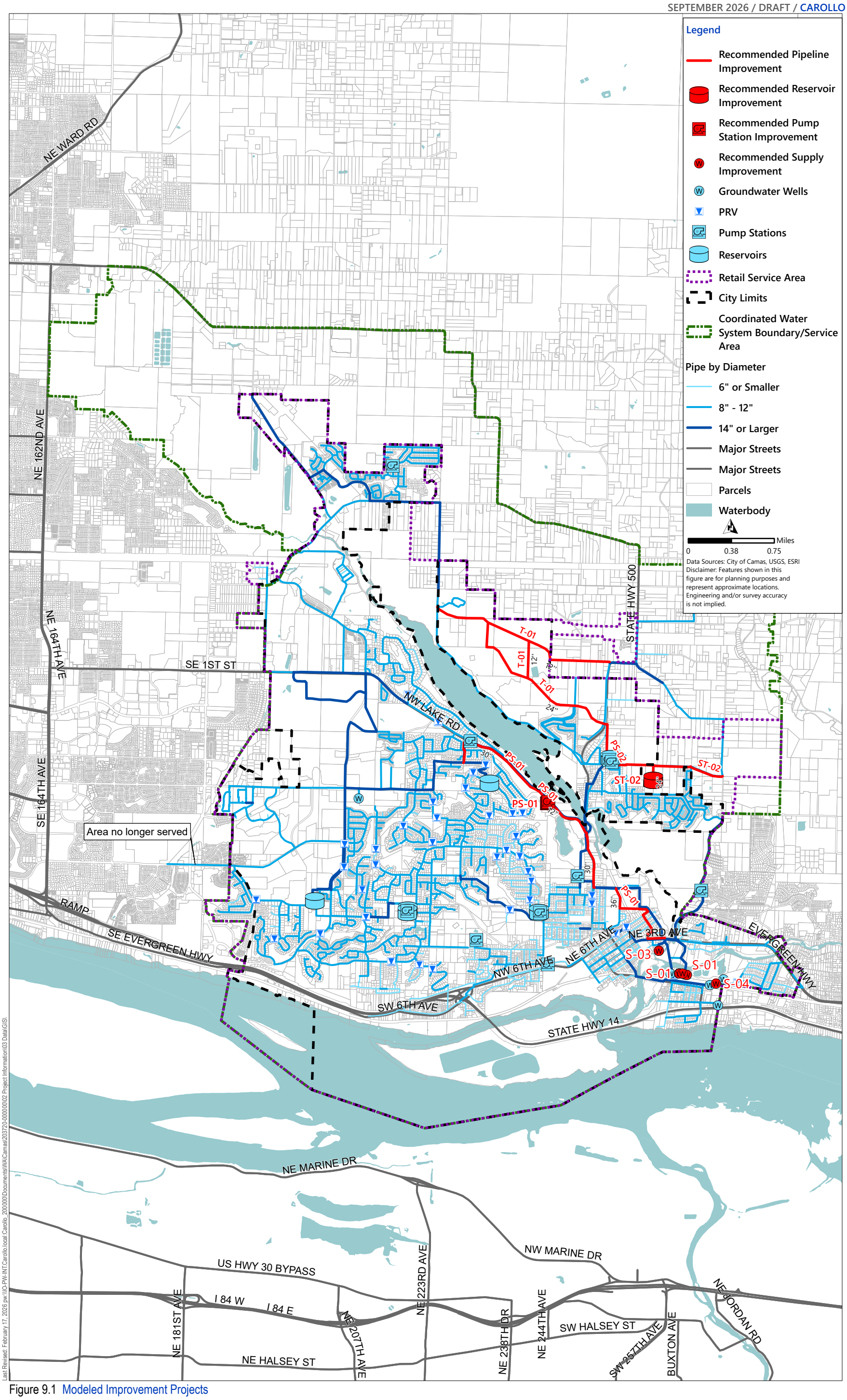

Figure 9.1 Modeled Improvement Projects

9.2.2 System Criteria

9.2.2.1 Peak Hour Flow Criteria

Chapter 2 discussed system policies and criteria in detail. Key parameters evaluated by the model included system pressure criteria during normal operations and fire flow testing of the system.

During normal operations, the minimum pressure as set by the Washington State Department of Health (DOH) during MDD at PHD is 30 psi at the service meter. DOH velocity criterion is to keep pipeline velocities below 8 feet per second (fps).

9.2.2.2 Fire Flow Criteria

Fire flows are typically the largest flows system's experience and often a major factor in pipeline sizing and network configurations. Using the InfoWater Pro fire flow test feature, the hydraulic model evaluated the fire flow capabilities at all hydrants in the system. Specifically, it systematically simulated a fire at each model node representing a fire hydrant for each of the planning years under MDD conditions. All fire hydrant nodes in the model were simulated with a minimum pressure of 20 psi during the point fire demands, meaning once the node reaches 20 psi, no additional fire flow can be provided. Fire flow demands were allocated based on the land use nearest the hydrant and the following assumptions per land use class:

- Residential with Sprinklers: 500 gpm.
- Residential without Sprinklers: 1,000 gpm.
- Non-Residential: 1,500 gpm.
- The City does not have a record of which houses have sprinklers and which do not. Therefore, for system analysis purposes all existing residential areas are assumed to require 1,000 gpm of fire flow. Recently developed neighborhoods such as Green Mountain Estates were assigned a fire flow of 500 gpm because these homes were confirmed to have sprinklers. Additionally, two neighborhoods not receiving required fire flow were confirmed by City staff to have sprinklers and therefore assigned a fire flow of 500 gpm.
- For specific facilities and customers such as schools, industrial campuses, and churches within the City's service area, the local fire marshal requires fire flow up to 5,000 gpm. These site-specific fire flows were assigned to the respective hydrants neighboring these sites in addition to the required fire flow by land use. Figure 9.2 shows the fire flow requirements within the City's service area.

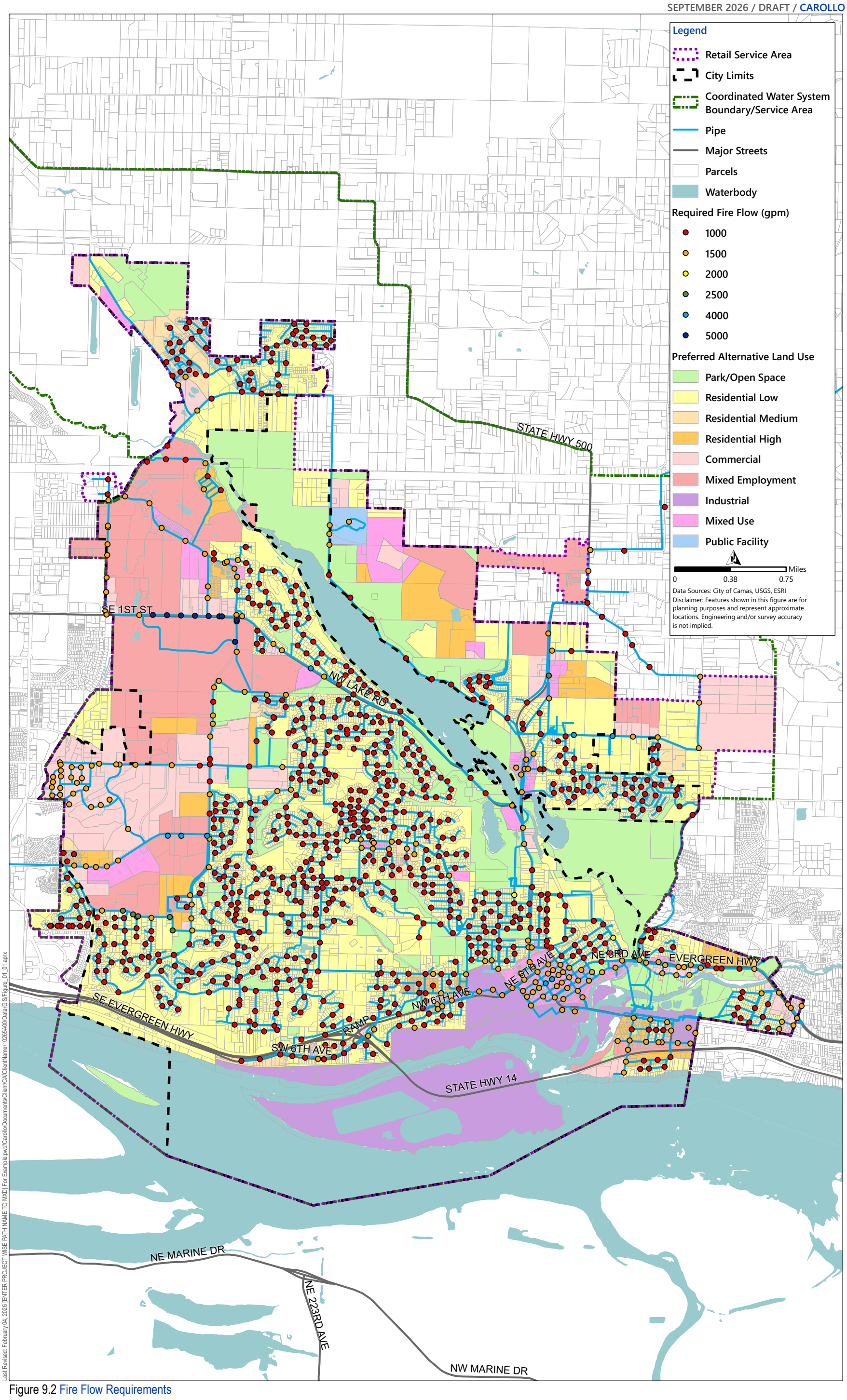

Figure 9.2 Fire Flow Requirements

9.2.3 Peak Hour Flow Evaluation

9.2.3.1 Velocity Results

The model was run in extended period simulation (EPS) for 72 hours at MDD with diurnal operations to evaluate general system velocity conditions for the 2031, 2036 and 2046 planning years. This approach allows the sources, pumps, and reservoirs to operate as their SCADA and controls were set.

Maximum modeled pipeline velocities are shown in Figure 9.3. Note, this figure only shows maximum pipeline velocities for 2046, where existing infrastructure would be most stressed to serve higher demands. Although no pipelines having maximum velocities exceeding DOH minimum criterion of 8 fps were identified, there were multiple transmission pipeline projects needed to serve areas of future development or areas where existing pipelines are undersized causing concerns with high head loss. These pipelines are not shown on Figure 9.3, as they are not deficiencies but are summarized below as recommendations and will be incorporated into the CIP in Chapter 10.

9.2.3.2 North Shore Transmission Pipeline (T-01)

The City expects large development to occur in its North Shore which is located just north of SE Leadbetter Road in the coming years. The development will be a mix of industrial and commercial larger users, as well as single family residences. To serve the projected demands of the area, approximately 6,300 linear feet (LF) of 12-inch diameter pipeline and 12,400 LF of 24-inch diameter pipeline (North Shore Transmission Pipeline) are needed to connect to the existing distribution system. Additionally, to convey water to the development area approximately 4,200 LF of existing pipeline between Gregg Reservoir and the proposed North Shore roundabout needs to be upsized to 24-inch diameter pipeline (Phase 2 Pipeline). The City expects a developer to construct the North Shore Transmission Pipeline by 2030. Since the Phase 2 portion of the pipeline requires upsizing of existing infrastructure, it is recommended for completion in 2033 to evenly distribute CIP funds and further discussed in Chapter 10.

9.2.3.3 Angelo Pump Station Discharge Pipeline (T-02)

Angelo Pump Station is a key facility supplying water to the 455-LPH and 852-UPH pressure zones. The current discharge piping in the distribution system network for this facility consists of various sized pipelines ranging from 6-inch to 14-inch in diameter. These pipelines have been identified as aging, undersized infrastructure causing high head loss and discharge pressures from Angelo Pump Station when demands increase in future planning scenarios. To mitigate these issues, it is recommended to upsize approximately 3,350 LF of various diameter pipeline to 16-inch diameter pipeline. This project is expected to allow more efficient operation at Angelo Pump Station, maximizing available pumping capacity.

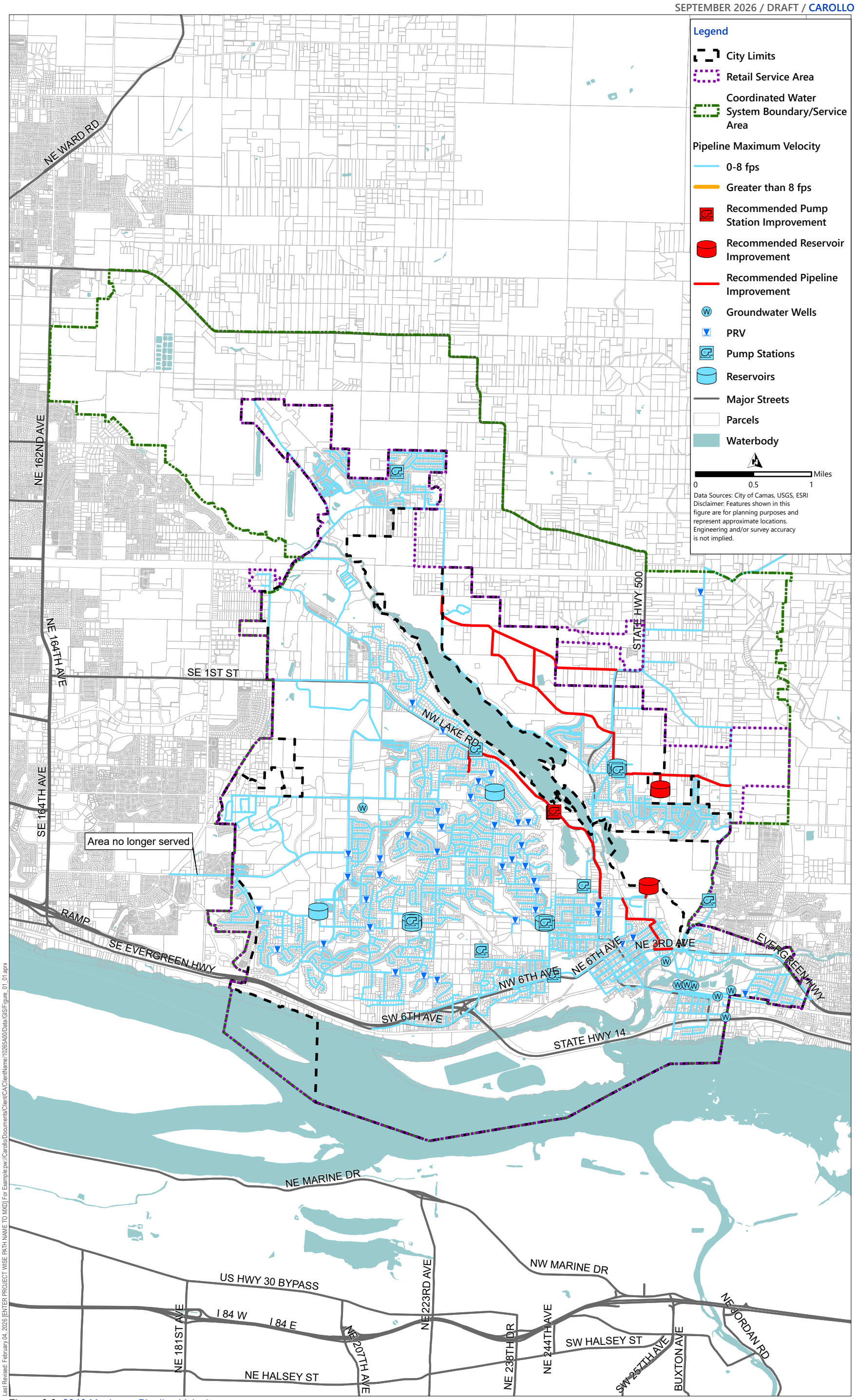

Figure 9.3 2046 Maximum Pipeline Velocity

9.2.3.4 Pressure Results

The same model run described in Section 9.2.3.1 was run to evaluate pressure results. Using the criteria presented in the preceding section, the hydraulic model provides minimum pressures under PHD conditions.

Figures 9.4, 9.5 and 9.6 show the minimum pressures for 2031, 2036 and 2046 PHD conditions respectively.

As seen in Figure 9.6, the system has a few low pressures below 30 psi. Some of the pressure zones cover large elevation ranges, leading to low pressures at high elevations. The City identified some locations where high elevation customers were served from a higher zone. No projects are recommended for such areas and the hydraulic model was updated accordingly to match these conditions. Customers experiencing lower pressures in the 455 – LPH zone are being served from reservoirs that are not at a high enough elevation, which results in low pressures and large amounts of dead storage within the reservoirs. This is further detailed in the storage analysis section below and a recommendation was made to rezone these customers.

9.2.3.5 High Elevation Customer and Low Pressure Recommendations

This section offers recommendations to address the areas where pressures drop below the minimum criteria of 30 psi identified in the previous Section, 9.2.3.4. The improvement for high elevation customers in the Francis Road area of the 455-LPH zone involves modifying pressure zone boundaries to be served by the new pump station recommended in PS-03. To address low pressures near the UPH Reservoirs, pipeline upsizing is recommended to reduce head loss in the area. Each of the recommended improvements requires further site-specific and project-level engineering analysis before implementation. Figure 9.7 outlines the projects necessary to address these deficiencies and projects are summarized in Table 9.1.

Table 9.1 Low Pressure Area Improvement Projects

Low Pressure Area	CIP Name	Original PZ	Revised PZ	Improvement Type
Area 1	D-06	852	-	Upsize pipeline to reduce head loss.
Area 2	PS-03	455	Francis Road	Increase pump station service area.

Notes:
PS - pump station.

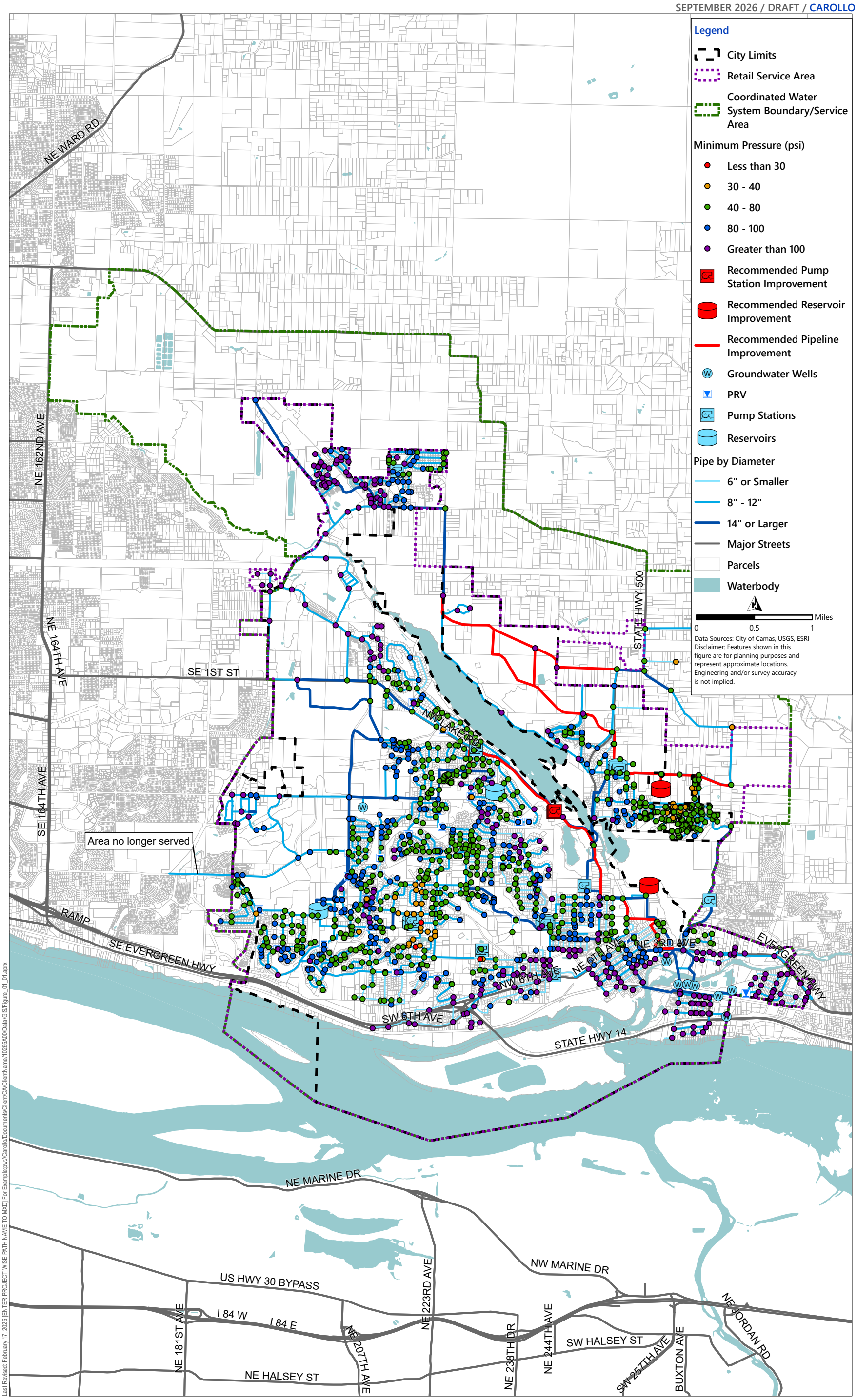

Figure 9.4 2031 PHD - Minimum Pressures

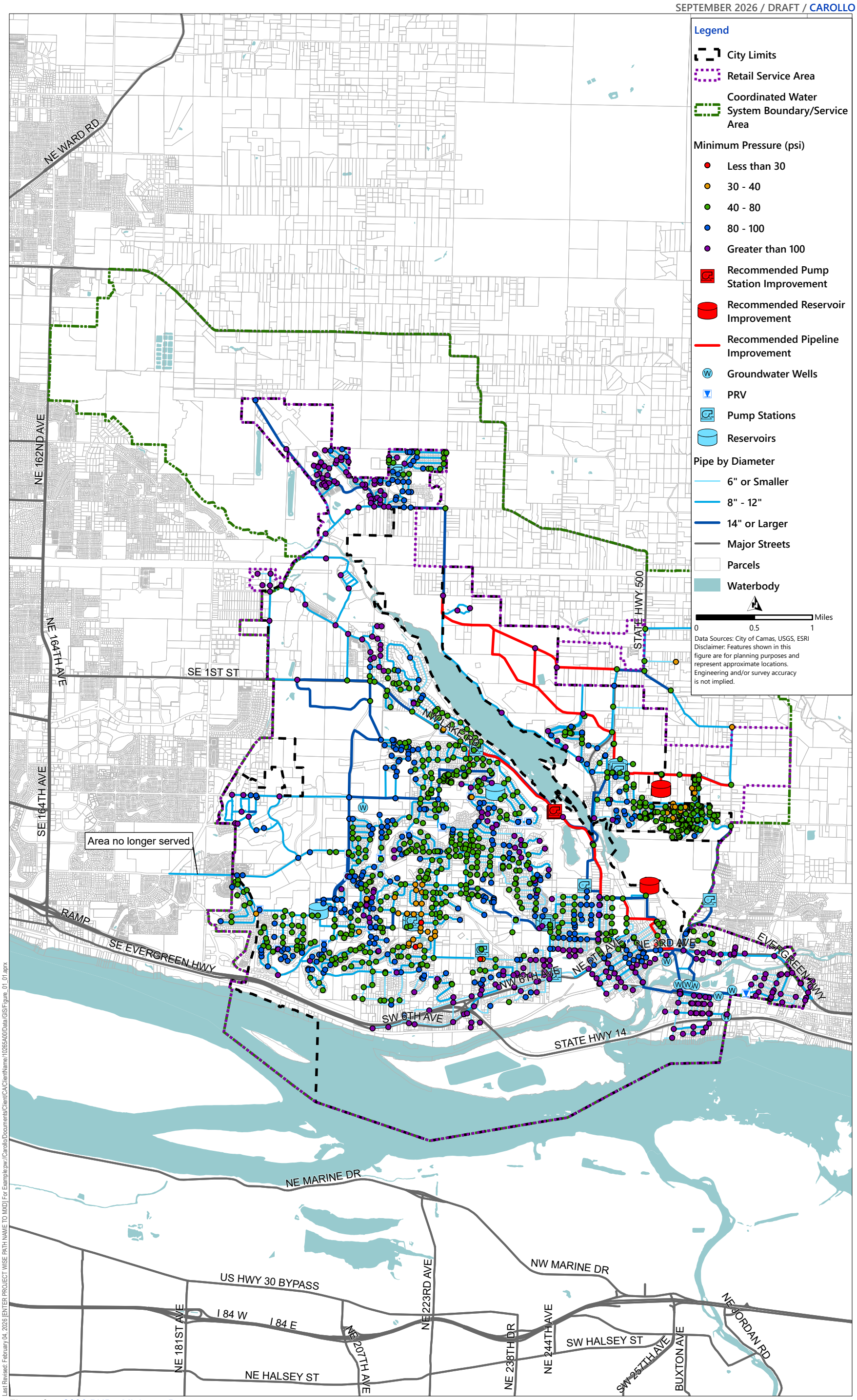

Figure 9.5 2036 PHD - Minimum Pressures

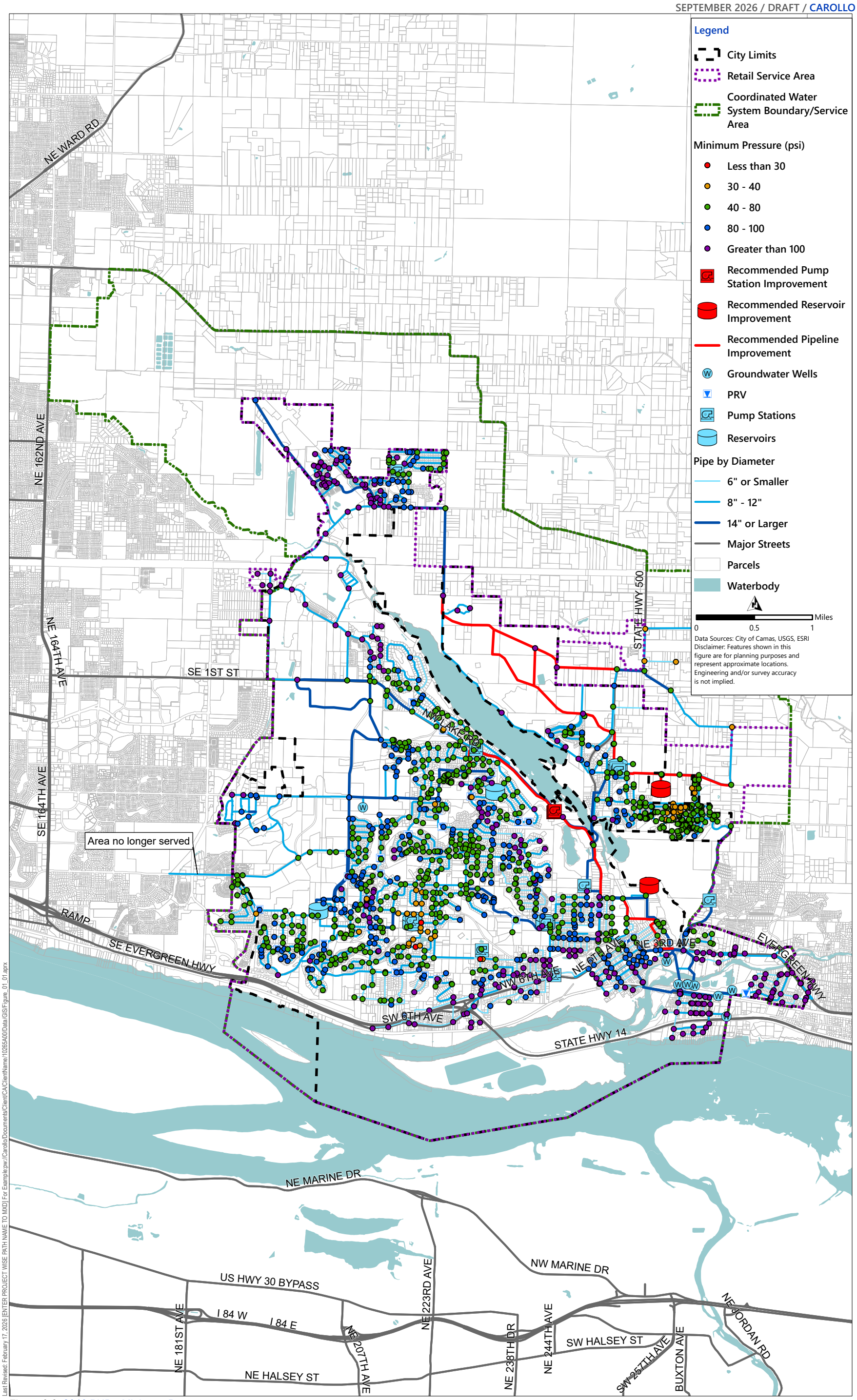

Figure 9.6 2046 PHD - Minimum Pressures

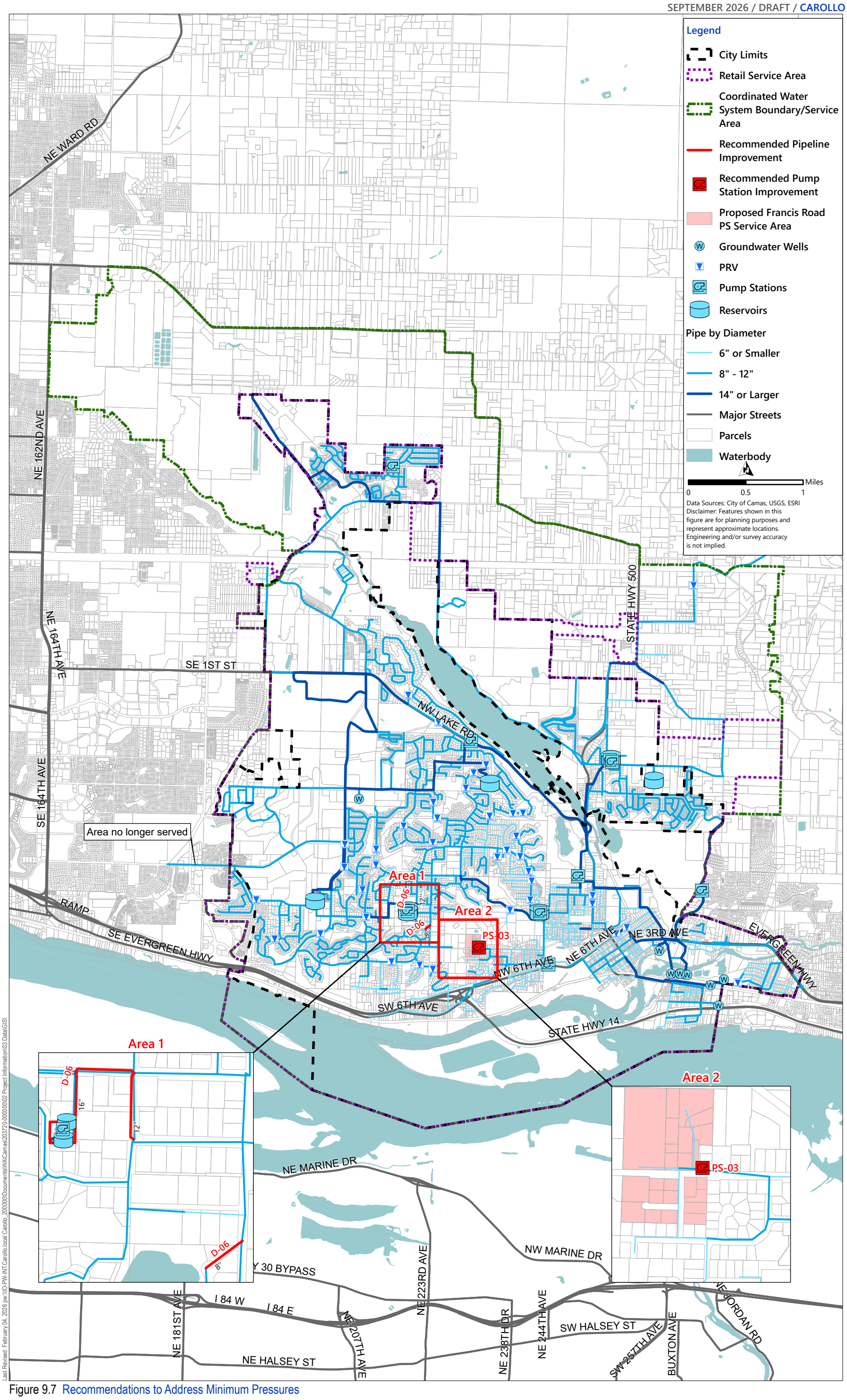

Figure 9.7 Recommendations to Address Minimum Pressures

9.2.4 Fire Flow Evaluation

9.2.4.1 Fire Flow Results

Figures 9.8, 9.9, and 9.10 show the model nodes that do and do not meet the criteria from the fire flow analysis conducted under MDD conditions for the 2031, 2036, and 2046 planning years, respectively.

9.2.4.2 Fire Flow Recommendations

This section outlines the recommendations to address all the fire flow deficiencies predicted in the hydraulic model. Fire flow deficiencies are junctions where the pressure dropped below 20 psi when simulating a fire at their location. Fire flow recommendations are either distribution pipeline upsizing or pump station projects.

- D-01 through D-10: individual distribution system projects upsizing pipeline to address fire flow deficiencies.
- PS-03: pump station project aimed to address fire flow deficiencies and meet the City's level of service goals. This pump station would include the addition of a fire pump with capacity to serve the required fire flow. Additionally, this pump station would have domestic pumps to serve typical demands. More details regarding this project are provided in Section 9.3.

Figure 9.11 outlines all projects recommended to address fire flow deficiencies, showing extent and location for each pipeline upsizing project. Figure 9.12 shows all fire nodes after recommended projects were implemented.

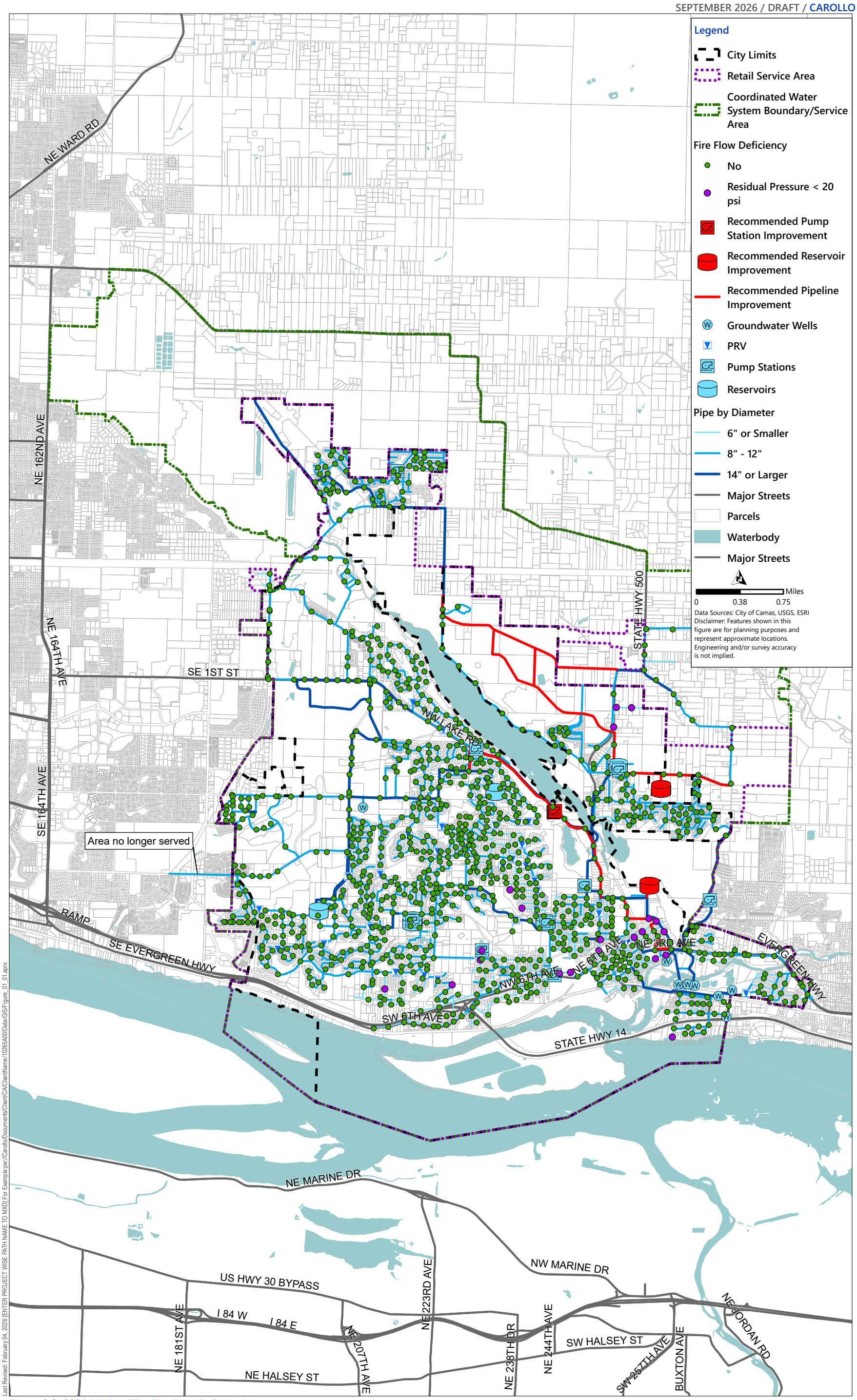

Figure 9.8 2031 MDD + FF – Fire Flow Deficiencies

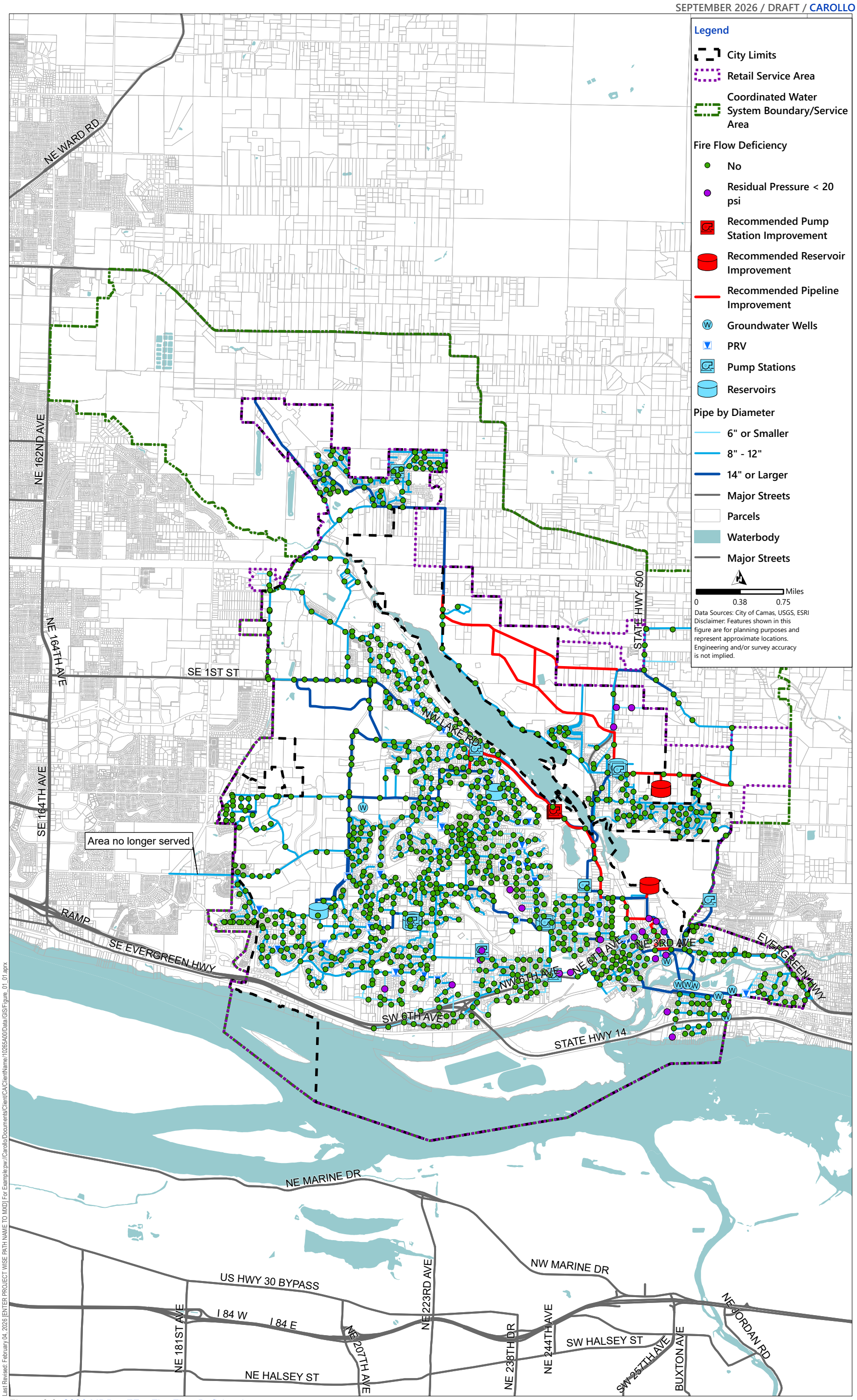

Figure 9.9 2036 MDD + FF – Fire Flow Deficiencies

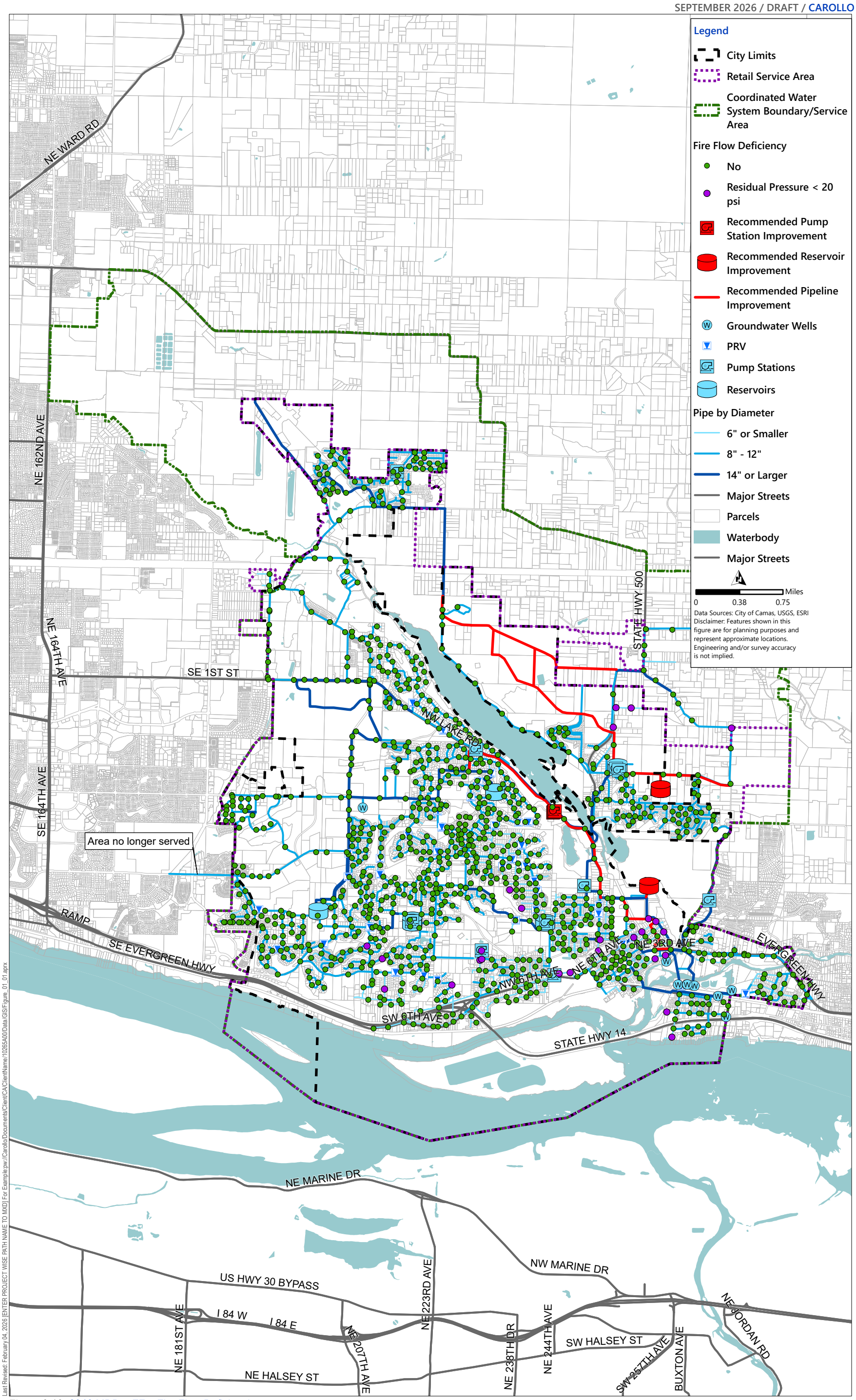

Figure 9.10 2046 MDD + FF – Fire Flow Deficiencies

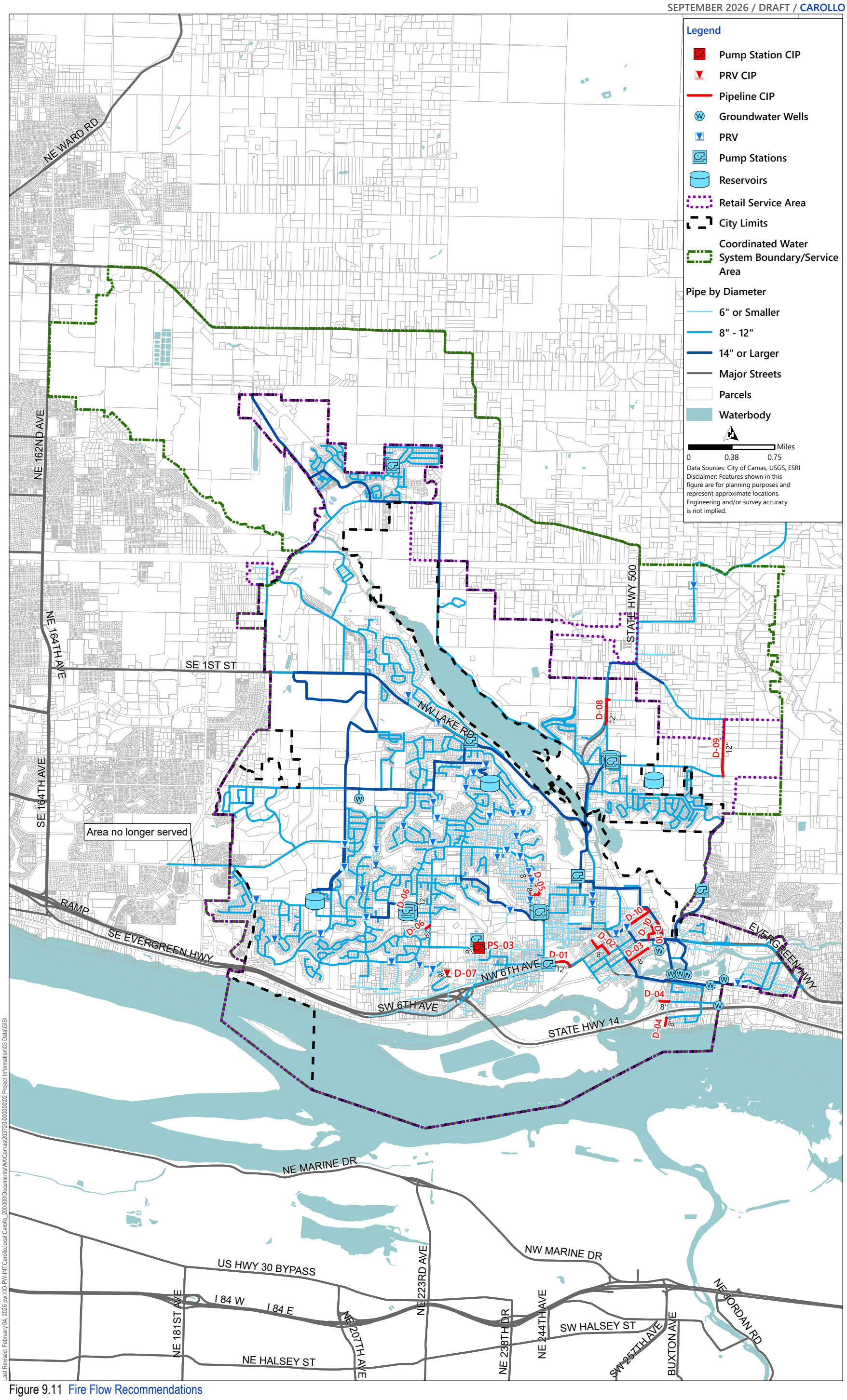

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Figure 9.11 Fire Flow Recommendations

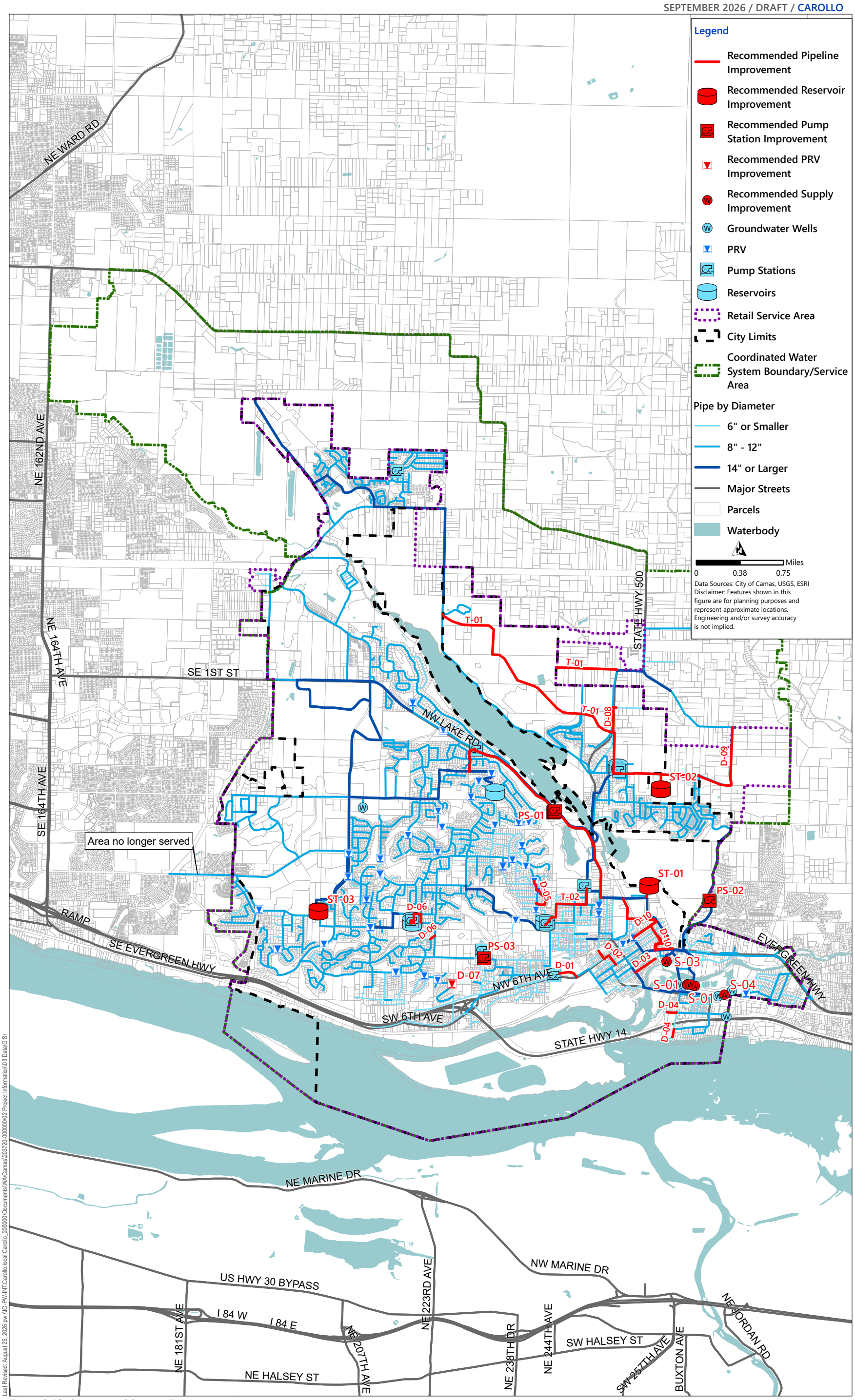


Figure 9.12 Summary of System Recommendations

9.3 Pumping Analysis

To evaluate pump station capacities, the City's water distribution system was divided into seven different pumping areas containing nine total pump stations. The 343 pumping area is supplied by groundwater wells and although not considered a pump station, was evaluated under both supply specific criteria in Chapter 8 and pumping criteria defined herein. For this water system plan update, the City utilized pumping reliability and redundancy criteria described below. A third criterion was added to evaluate wells and/or pump stations supplying closed zones against minimum DOH requirements.

1. Pumping Reliability. Wells and booster pumps with back-up power should be capable of supplying MDD for the water system while concurrently replenishing fire suppression storage within 72 hours.
2. Pumping Redundancy. With the largest pump supplying each service area out of service, the remaining pumps should provide MDD while concurrently replenishing fire suppression storage within 72 hours.
3. For wells or booster pump stations serving closed zones/systems:
    a. Supply MDD + Fire Flow.

Supply PHD with the largest pumping unit out of service. City specific pumping criteria only address MDD conditions. It is assumed if the City meets their MDD pumping reliability and redundancy goals, they will by default also be able to supply ADD reliably and redundantly.

Table 9.2 describes the relationship between pumping areas and pump stations. Pumping areas are defined as open or closed zones. Open zones are ones with adequate equalizing storage, so the pump stations are only required to supply the MDD and replenish fire suppression storage of the pumping area. Closed zones are areas that are supplied solely through a pump station; therefore, the pump station is required to supply PHD and fire flow.

Table 9.2 Pumping Area Summary

Pumping Area	Pump Stations Included	Open or Closed?
343	Lower Washougal Wellfield	Open
455	Forest Home and Angelo	Open
542	Crown Road, Butler, and New Gregg	Open
544	Lacamas	Open
852	Lower Prune Hill	Open
695 – GME	GME	Closed
Francis Road	Francis Road	Closed

9.3.1 343 Pumping Area

The 343 pumping area is an open zone that includes eight production wells: Well 5 (675 gpm), Well 6 (1,200 gpm), Well 7 (950 gpm), Well 8 (1,250 gpm), Well 10 (900 gpm), Well 11 (1,000 gpm), Well 12 (1,000 gpm), Well 13 (1,350 gpm), and Well 14 (850 gpm) with a total pumping capacity of 9,175 gpm. Total firm capacity is reflective of all total pumping capacity less the capacity of Well 13, the largest pump considered offline and Well 14, which was excluded because of a hydraulic limitation restricting the simultaneous operation of Well 6 and Well 14. Since Well 6 has the larger capacity of the two, its production capacity was used in the evaluation. Total reliable capacity is reflective of Well 8, 11, 12, 13, and 14 capacities, which are the facilities with backup power on-site. This pumping area serves the entire

distribution system. Table 9.3 shows the projected demands for the 2031, 2036, and 2046 scenarios compared to the total reliable capacity, with generators, and the total firm pumping capacity, with the largest pump offline. The 343 pumping area supplies show deficiencies for all planning year scenarios. Recommendations to address deficiencies related to the City's water supply are previously detailed in Chapter 8.

Table 9.3 343 Pumping Area Evaluation

343	2031	2036	2046
MDD (gpm)	7,995	9,195	11,685
Fire Replenishment Flow (gpm)	220	220	220
Total Demand(1) (gpm)	8,215	9,415	11,905
Total Firm Capacity (gpm)	6,975	6,975	6,975
Total Reliable Capacity(2) (gpm)	5,450	5,450	5,450
Pumping Redundancy - Surplus/Deficit (gpm)	-1,240	-2,440	-4,930
Pumping Reliability - Surplus/Deficit (gpm)	-2,765	-3,965	-6,455

Notes:
(1) Sum of MDD and Fire Replenishment Flow.
(2) Pumps with backup power. Currently, only Wells 8, 11, 12, 13, and 14 have backup power.

9.3.2 455 Pumping Area

The 455 pumping area is an open zone that includes three pump stations: Angelo, which houses four pumps each with a capacity of 1,000 gpm, Butler, which houses two pumps, one with a capacity of 600 gpm and the other with 800 gpm, and Forest Home, which houses a single 1,000 gpm pump. This pumping area directly serves the 455 pumping area and provides suction to the pump stations serving the 542, 544, 695, and 852 pumping areas. Table 9.4 shows the projected demands for the 2031, 2036, and 2046 scenarios compared to the total reliable capacity, with generators, and the total firm pumping capacity, with the largest pump offline. The 455 area pump stations currently have insufficient capacity for all planning scenarios. Sections 9.3.3.1 and 9.3.4.1 describe the recommended projects and system reconfigurations in the 542 and 544 pumping areas which will eliminate the intermediate pumping demands on this area, therefore, there are no recommendations for the 455 pumping area. Discharge pipeline upsizing described in Section 9.2.3.3 will also increase available pumping capacity at Angelo.

Table 9.4 455 Pumping Area Evaluation

455	2031	2036	2046
MDD (gpm)	6,850	7,890	10,220
Fire Replenishment Flow (gpm)	55	55	55
Total Demand(1) (gpm)	6,905	7,945	10,275
Total Firm Capacity (gpm)	5,400	5,400	5,400
Total Reliable Capacity(2) (gpm)	3,000	3,000	3,000
Pumping Redundancy - Surplus/Deficit (gpm)	-1,505	-2,545	-4,875
Pumping Reliability - Surplus/Deficit (gpm)	-3,905	-4,945	-7,275

Notes:
(1) Sum of MDD and Fire Replenishment Flow.
(2) Angelo PS has backup power to operate at firm capacity (3,000 gpm) and is the only facility in the pumping area with a backup power source.

9.3.3 542 Pumping Area

The 542 pumping area is an open zone including two pump stations: Crown Road and New Gregg, with each containing a total of three pumps. Crown Road has three pumps, each with a capacity of 800 gpm. New Gregg has two fire pumps with a capacity of 1,500 gpm each and a jockey pump with a capacity of 500 gpm. This pumping area serves the 542 pressure zone. Table 9.5 shows the projected demands for the 2031, 2036, and 2046 scenarios compared to the total reliable capacity, with generators, and the total firm pumping capacity, with the largest pump offline. The pump capacities for New Gregg were not considered in this evaluation due to concerns with intermediate pumping from the 455 zone discussed in the previous section. The 542 pumping area shows insufficient capacity for the 2046 redundancy scenario.

Table 9.5 542 Pumping Area Evaluation

542	2031	2036	2046
MDD (gpm)	665	1,130	1,930
Fire Replenishment Flow (gpm)	220	220	220
Total Demand(1) (gpm)	885	1,350	2,150
Total Firm Capacity (gpm)	1,600	1,600	1,600
Total Reliable Capacity(2) (gpm)	2,400	2,400	2,400
Pumping Redundancy - Surplus/Deficit (gpm)	715	250	-550
Pumping Reliability - Surplus/Deficit (gpm)	1,515	1,050	250

Notes:
(1) Sum of MDD and Fire Replenishment Flow.
(2) All pumps at Crown Road have backup power.

9.3.3.1 542 Pumping Area Recommendations - Project PS-02

The 542 pumping area shows insufficient pumping capacity under redundancy criteria in the 2046 scenario. Under normal operating conditions, this area is typically served by the jockey pump at New Gregg PS, which takes suction from the 455 pumping area. As a result, the added demand from the 542 pressure zone creates large deficiencies for the 455 area pump stations.

Additionally, the City has indicated that hydraulic limitations due to undersized pipelines on the discharge side of Crown Road pump station, preventing more than one pump operating at any given time. To reduce the reliance on intermediate pumping from the 455 pumping area and better utilize the available capacity at Crown Road pump station, it is recommended to add an 800 gpm pump in the remaining empty can at Crown Road pump station by 2046 and construct approximately 3,200 LF of 24-inch diameter transmission pipeline from the intersection of SE 283rd Avenue and SE Nourse Road to the new Gregg Reservoir (Phase 1 Pipeline). Phase 1 of the pipeline is recommended for completion in 2031 before the construction of the new storage reservoir in the 542 storage area..

These improvements will address the pumping deficiencies of the 542 area and the 455 area by eliminating intermediate pumping (Crown Road pump station pumps from the 343 zone directly to the 542 zone) and provide capacity for projected growth in the area.

9.3.4 544 Pumping Area

The 544 pumping area is an open zone that includes one pump station, Lacamas, which has three pumps. One pump has a 1,500 gpm capacity while the other two pumps have capacities of 500 gpm each. This pumping area directly serves the 544 pumping area and provides suction to the pump station for the 695 – GME pressure zone. Table 9.6 shows the projected demands for the 2031, 2036, and 2046 scenarios compared to the total reliable capacity, with generators, and the total firm pumping capacity, with the largest pump offline. Lacamas pump station has insufficient capacity for all planning year scenarios.

Table 9.6 544 Pumping Area Evaluation

544	2031	2036	2046
MDD (gpm)	3,530	3,985	5,260
Fire Replenishment Flow (gpm)	280	280	280
Total Demand(1) (gpm)	3,810	4,265	5,540
Total Firm Capacity (gpm)	1,000	1,000	1,000
Total Reliable Capacity(2) (gpm)	2,500	2,500	2,500
Pumping Redundancy - Surplus/Deficit (gpm)	-2,810	-3,265	-4,540
Pumping Reliability - Surplus/Deficit (gpm)	-1,310	-1,765	-3,040

Notes:
(1) Sum of MDD and Fire Replenishment Flow.
(2) All pumps have backup power.

9.3.4.1 544 Pumping Area Recommendation - Project PS-01

The 544 pumping area has insufficient pumping capacity under redundancy and reliability criteria for all planning year scenarios. Like the 542 pumping area, the 544 pumping area relies on intermediate pumping from the 455 pumping area. The City is currently under contract to design a new pump station that will pump directly from the 343 zone to the 544 zone. This project will also include transmission pipeline upgrades needed to increase conveyance capacity for future growth in the area.

9.3.5 695 - Green Mountain Estates Pumping Area

The 695 - GME pumping area is a closed zone that includes one pump station, GME, which contains five pumps. Three pumps are for domestic service and have capacity of 180 gpm each and the remaining two pumps are for fire service and have capacity of 650 gpm each. This pumping area serves the 695 - GME pressure zone. Table 9.7 shows the projected demands for the 2031, 2036, and 2046 scenarios compared to the total pumping capacity and firm capacity, with the largest pump offline. This table shows the GME pump station has adequate capacity for all planning year scenarios.

Table 9.7 695 - Green Mountain Estates Pumping Area Evaluation

695 - GME	2031	2036	2046
MDD + FF Demand (gpm)	1,605	1,610	1,620
PHD Demand (gpm)	520	545	595
Total Capacity (gpm)	1,840	1,840	1,840
Firm Capacity (gpm)	1,190	1,190	1,190
MDD + FF Surplus/Deficit (gpm)	235	230	220
PHD Surplus/Deficit (gpm)	670	645	595

9.3.6 Francis Road Pumping Area

The Francis Road pumping area is a closed zone that includes one pump station, Francis Road, housing a single 80 gpm pump in a small below grade vault. This pumping area serves a few homes along Francis Road. Table 9.8 shows the projected demands for the 2031, 2036, and 2046 scenarios compared to the total pumping capacity and firm capacity, with the largest pump offline. There is a fire hydrant within this pump station's service area therefore fire flow must be provided. Francis Road pump station has insufficient total and firm capacity for all planning year scenarios.

Table 9.8 Francis Road Pumping Area Evaluation

Francis Road	2031	2036	2046
MDD + FF Demand (gpm)	1,001	1,002	1,003
PHD Demand (gpm)	2	3	5
Total Capacity (gpm)	80	80	80
Firm Capacity (gpm)	0	0	0
MDD + FF Surplus/Deficit (gpm)	-921	-922	-923
PHD Surplus/Deficit (gpm)	-2	-3	-5

9.3.6.1 Francis Road Pumping Area Recommendation - Project PS-03

The Francis Road pumping area has insufficient pumping capacity and fire flow capacity for each planning year scenario. Discussion with the City indicated their preference to replace the existing Francis Road pump station with a new above grade pump station. The service area of the new pump station will be expanded to serve nearby customers with low pressures. To meet DOH criteria and the City's level of service goals, the new Francis Road pump station will be equipped with two 75 gpm capacity domestic pumps, two 1,000 gpm capacity fire pumps and a backup generator. These improvements will resolve the current fire flow and pressure deficiencies in this area.

9.4 Storage Analysis

The City's storage facilities were evaluated based on their criteria. To evaluate storage capacities, the City's distribution system was divided into five different storage areas containing 26 total pressure zones. Table 9.9 describes the relationship between pressure zones and storage areas.

Table 9.9 Storage Area

Storage Areas	Pressure Zones
343	285 - Downtown and 343 - Butler
455	455 – LPH and 550 – Francis Road
542	542 - Gregg
544	544 - Lacamas, 695 - GME, and one PRV subzone
852	852 - UPH and 17 PRV Subzones

The City's reservoir storage requirements depend on the water system's configuration, seasonal and daily variations in water-use patterns, and the reliability of various water system components. The following section describes the components of storage, summarizes the existing system's capacity to meet the storage needs of each operational area, and makes recommendations to address any identified storage deficits.

9.4.1 Components of Storage

Following the DOH storage volume requirements (WAC 246-290-235(3)) and the Water System Design Manual, Chapter 7, the five components of storage listed below must be evaluated for all water systems:

- Operational storage.
- Equalizing storage.
- Fire-suppression storage (FSS).
- Standby storage (SS).
- Dead storage.

DOH requires that operational and equalizing storage are available to all customers at a residual pressure of at least 30 psi under PHD flow conditions. The City has an increased level of service goal to provide standby and fire suppression storage to all customers at a residual pressure of at least 30 psi under MDD, which is above the DOH requirement of 20 psi. Therefore, all reservoir volumes above the 30 psi hydraulic grade line (HGL) are considered available storage. Dead storage is the volume in the reservoir that cannot be used to serve the highest customer in the water system with a pressure of at least 30 psi. The City also combines fire and standby into a single band for planning (i.e., nesting) and only the larger of the two volumes is used for analysis. Figure 9.13 schematically shows these components.

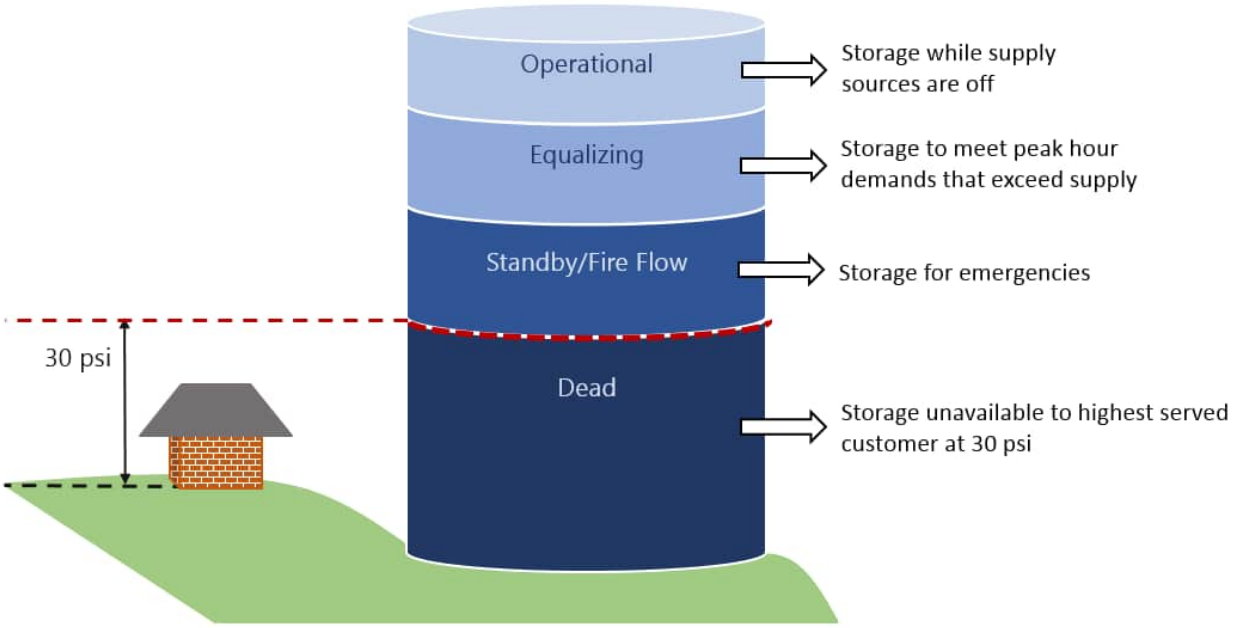


Figure 9.13 Illustration of Storage Components

9.4.1.1 Operational Storage

Operational storage is the volume of water used on a day-to-day basis to supply the water system while the sources of supply are in the "off" position. This volume is dependent on the settings of the water level sensors controlling the pumps and is designed to prevent the pump motors from excessive starts and stops (cycling).

Summarized in Table 9.10, the operational storage volume for reservoirs was determined from SCADA data and pump settings provided by the City and set up within the hydraulic model.

Table 9.10 Operational Storage Volumes

Reservoir	Storage Area	Total Volume (MG)	Operational Band (feet)	Operational Storage (MG)	Percent of Total Storage
Butler	343	1.2	1.3	0.10	9%
Lower Prune Hill #2	455	1.5	0.5	0.03	2%
Gregg	542	0.1	8	0.01	11%
Lacamas	544	2.0	4	0.17	8%
18th Avenue	544	2.0	1.2	0.06	3%
Upper Prune Hill #1	852	0.75	4	0.03	4%
Upper Prune Hill #2	852	2.4	6	0.21	9%
Total		**9.95**		**0.61**	**6%**

9.4.1.2 Equalizing Storage

Equalizing storage is the total volume needed to satisfy the peak hourly demands (PHD) that exceed the supply system's capacity. The WAC 236-290-235 requires that equalizing storage be provided for peak demands.

Equalizing volume requirements were calculated for each reservoir using the following equation using the storage area demands and are summarized in Table 9.11.

ES = (PHD – MDD) x 150 min, but in no case less than zero

Where:

- ES = Equalizing Storage component, in gallons.
- PHD = Peak hourly demand, in gpm.
- MDD = Sum of all installed and active source of supply capacities, except emergency sources of supply, in gpm.

PHD was calculated using the individual pressure zone peaking factors determined from the diurnal patterns used in system analysis.

Table 9.11 Equalizing Storage Volumes

Storage Area	2031 Equalizing Volume (MG)	2036 Equalizing Volume (MG)	2046 Equalizing Volume (MG)
343	0.14	0.16	0.18
455	0.09	0.09	0.09
542	0.08	0.14	0.24
544	0.33	0.37	0.47
852	0.37	0.39	0.43
Total	**1.01**	**1.15**	**1.41**

9.4.1.3 Standby Storage and Fire-Suppression Storage

Standby Storage volumes are required to supply reasonable system demands during a system emergency, such as the disruption of the water supply caused by a transmission pipeline or equipment failure, power outage, valve failure, or other system interruptions (as discussed in Chapter 2). The computation of emergency/standby storage requirements includes consideration of reasonable system disruptions that can be expected to occur within normal planning contingencies, and does not consider major system emergencies, such as earthquakes, which result in shutdown of water supplies and multiple distribution system breaks. These types of emergencies should be covered under emergency system operation planning. Table 9.12 shows the required standby storage capacity for each operational area.

The DOH Water System Design Manual recommends a minimum standby storage volume of no less than 200 gallons per ERU, which is the criteria adopted into City policy. However, as noted above, City policy states that standby storage should be available to the highest customer in the storage area at 30 psi.

Table 9.12 Standby Storage Volumes

Storage Area	2031 Standby Storage Volume (MG)	2036 Standby Storage Volume (MG)	2046 Standby Storage Volume (MG)
343	0.60	0.69	0.77
455	0.38	0.39	0.40
542	0.38	0.64	1.08
544	2.31	2.65	3.39
852	1.03	1.07	1.18
Total	**4.70**	**5.44**	**6.82**

Fire suppression storage is the quantity of water required for firefighting as defined by applicable water system criteria and fire codes. Firefighting often places the largest demand on a water system because a high volume of water must be supplied over a short time period. Such demands require each component of the system to operate at optimal condition.

DOH requires water systems to have storage reservoirs that can meet fire flow requirements while maintaining a level of 20 psi throughout the distribution system. However, City policy states storage reservoirs should have adequate capacity to supply required fire flow while maintaining a minimum of 30 psi at the highest customer. Table 9.13 outlines the required maximum fire flow, duration, and FSS volume for each operational area.

Table 9.13 Required Maximum Fire Flow

Storage Area	Required Fire Flow (gpm)	Required Duration (hours)	Required FSS (MG)
343	4,000	4	0.96
455	2,000	2	0.24
542	4,000	4	0.96
544	5,000	4	1.20
852	2,500	2	0.30

The City plans for single emergency at time per storage area. Either standby storage or fire-suppression storage, whichever volume is smaller, can be excluded from each zone's total storage requirement (this is also known as "nested" storage). Table 9.14 outlines the nested standby storage and fire-suppression storage requirements for each operational area.

Table 9.14 Nested Standby Storage and Fire-Suppression Storage

Storage Area	Volume (MG)			Controlling Factor (FSS or SS)		
	2031	2036	2046	2031	2036	2046
343	0.96	0.96	0.96	FSS	FSS	FSS
455	0.38	0.39	0.40	SS	SS	SS
542	0.96	0.96	1.08	FSS	FSS	SS
544	2.31	2.65	3.39	SS	SS	SS
852	1.03	1.07	1.18	SS	SS	SS

9.4.1.4 Dead Storage

Dead storage is the volume at the bottom of the storage reservoir that cannot reliably be used because it is physically too low to be withdrawn from the reservoir or, if withdrawn from the reservoir, would result in

water pressures in the distribution system below the acceptable criteria of 30 psi. Storage volume is considered dead if it is located below the outlet pipeline and cannot be used because of system's hydraulic limitations or if high elevations cause low pressures at customer connections.

Table 9.15 summarizes the dead volume calculations for each reservoir. Section 9.4.2 outlines the recommendations to mitigate these low pressure and dead storage issues for high elevation customers.

Table 9.15 Reservoir Dead Storage(1)

Reservoir	Storage Area	Storage Volume (MG)	Maximum Elevation Served (feet)	Available Storage at 20 psi (MG)	Percent Available at 20 psi %)	Available Storage at 30 psi (MG)	Percent Available at 30 psi (%)
Butler	343	1.20	234	1.20	100%	1.20	100%
LPH No. 2	455	1.50	392	1.10	73%	0.00	0%
Gregg	542	0.10	440	0.08	80%	0.05	47%
Lacamas	544	2.0	437	2.0	100	1.57	79%
18th Avenue	544	2.0	437	2.0	100%	1.84	95%
UPH No.1	852	0.75	757	0.37	49%	0.19	26%
UPH No. 2(1)	852	2.40	757	2.22	93%	2.22	93%

Notes:
(1) UPH Reservoir No. 2 has pump station to make all storage usable. The City maintains a minimum of 5 feet in the reservoir.

9.4.2 Storage Recommendations

A summary of the existing storage and storage needs in 2046 is shown in Table 9.16. This table assumes the recommended projects to address low pressures identified in Section 9.2.1 have been completed. Storage deficits were identified in the following storage areas: 343, 542, and 544. The identified storage deficits can be mitigated by constructing additional storage space. While adjustments in operational strategy could mitigate some storage requirements, additional storage construction would still be needed to address deficits in all zones.

All recommended projects are summarized in the sections below.

Table 9.16 2046 Storage Summary

Storage Area	Total Storage Volume (MG)	Available Storage at 20 psi (MG)	Available Storage at 30 psi (MG)	Operational Storage (MG)	Equalizing Storage (MG)	Fire-Suppression Storage (MG)	Standby Storage (MG)	Required Storage (MG)	Storage Volume to Add by 2046 (MG)
343	1.20	1.20	1.20	0.10	0.18	0.96	0.77	1.24	0.04
455(1)	1.50	1.50	1.50	0.03	0.09	0.24	0.40	0.52	0
542	0.10	0.08	0.05	0.01	0.24	0.96	1.08	1.33	1.28
544	4.00	4.00	3.46	0.23	0.47	1.20	3.39	4.09	0.63
852(1)	3.15	2.59	2.42	0.45	0.43	0.30	1.18	2.06	0
Total	**9.95**	**9.37**	**8.45**	**1.08**	**1.41**	**3.63**	**6.82**	**9.24**	**1.92**

Notes:
(1) Assumes projects to address low pressures and high elevation customers causing dead storage have been completed.

Table 9.17 outlines the storage requirements and deficits for each planning year, 2031, 2036, and 2046. The sections to follow outline storage recommendations for each storage area to alleviate identified storage deficits.

Table 9.17 Storage Requirements by Planning Year

Storage Area	Total Available Storage at 30 psi(1) (MG)	2031		2036		2046	
		Required Storage (MG)	Storage Surplus/Deficit (MG)	Required Storage (MG)	Storage Surplus/Deficit (MG)	Required Storage (MG)	Storage Surplus/Deficit (MG)
343	1.20	1.20	0	1.22	-0.02	1.24	-0.04
455	1.50	0.5	1.0	0.51	0.99	0.52	0.98
542	0.05	1.05	-1.0	1.11	-1.06	1.33	-1.28
544	3.46	2.87	0.59	3.25	0.21	4.09	-0.63
852	2.42	1.85	0.57	1.91	0.51	2.06	0.36

Notes:
(1) Assumes projects to address low pressures and high elevation customers causing dead storage have been completed.

9.4.2.1 343 Storage Area Recommendations - Project ST-01

By the 2036 and 2046 planning years there are slight storage deficits of 0.02 and 0.04 MG in the 343 area. The storage in this area is currently provided by Butler Reservoir, which is a 1.2 MG partially buried reservoir originally constructed in the early 1900s. The City has indicated Butler Reservoir is reaching the end of its useful life and will be decommissioned once a new 343 zone reservoir is constructed. The replacement reservoir project is currently in preliminary design phase. An alternatives analysis completed by the City's consultant Gray & Osborne (G&O) indicated the preferred alternative would be an elevated reservoir near the Camas Cemetery. The new reservoir would be sized for buildout and provide a minimum of 1.84 MG of usable storage for the 343 area alleviating deficits identified under this planning period. G&O provided preliminary costs for the project in their September 2025 alternatives analysis, which will be included in the City's CIP.

9.4.2.2 542 Storage Area Recommendations - Project ST-02

In 2031, there is a 1.0 MG deficit in the 542 storage area, increasing to a 1.28 MG deficit in 2046. To alleviate deficits in the area, an additional storage reservoir will need to be constructed. There are multiple alternatives for increasing storage capacity in this area. For planning purposes, an elevated reservoir with a nominal capacity of 1.5 MG was recommended and will be incorporated into the CIP as it was the costliest alternative. The City should complete an alternatives analysis before beginning the design phase of this project to identify the most feasible, cost-effective solution. Due to topography the new reservoir will likely need to be located at the existing Gregg Standpipe site which is the highest point in the area. Additionally, Phase 1 of the transmission pipeline project described in Section 9.3.3.1 should be completed with this storage project to mitigate potential hydraulic bottlenecks associated with filling the new reservoir. Phase 1 would include approximately 3,200 LF of 24-inch diameter transmission pipeline from the intersection SE 283rd Avenue and SE Nourse Road to the new Gregg Reservoir.

9.4.2.3 544 Storage Area Recommendations - Project ST-03

At the end of the planning period in 2046, there will be a deficit of approximately 0.63 MG in the 544 storage area. To address this deficit an additional reservoir with a nominal capacity of 0.75 MG is recommended at the 18th Avenue site, which has space on-site to accommodate the additional reservoir.

9.5 Limiting Capacity Analysis

The limiting capacity of the City's physical water system was determined for the 2031, 2036, and 2046 planning years with existing conditions and infrastructure. The limiting capacity was then calculated for the 2046 planning year with the assumption that all recommended improvement projects will be online. The limiting capacity analysis uses the methodology described in DOH Water System Design Manual (2009) Worksheet 6-1 and Table 6-1. Table 9.18 describes the method used to calculate capacity for each component.

Table 9.18 Limiting Capacity Calculations

Water System Component	Equation / Notes
Sources (ADD)	N = $\frac{Firm\ Source\ Capacity}{ADD\ ERU\ value}$ where: Firm source capacity = source capacity with largest source (Well 13) offline.
Sources (MDD)	N = $\frac{Firm\ Source\ Capacity}{MDD\ ERU\ value}$ where: Firm source capacity = source capacity with largest source (Well 13) offline.
Treatment	The City has designed treatment capacity with sufficient capacity to serve its sources.
Equalizing Storage (ES)	N = $\frac{1}{C}[\left(\frac{1440}{MDD}\right)\left(\frac{ES}{150}+Q_s-18\right)-F]$ where: MDD = MDD, gpd/ERUs. C = Coefficient associated with ranges of ERUs. F - Factor associated with ranges of ERUs. Q_s = Total source pumping capacity, gpm.
Standby Storage (SB)	N = $\frac{SB_t}{(SB_i)(t_d)}$ where: SB_t = total volume of water in standby storage component (gallons). SB_i = Design level of standby storage to meet reliability considerations per ERU (gpd/ERU). t_d = time that storage is to be used (days).
Distribution	Not considered capacity limited because the City has planned projects to address all identified deficiencies and design standards confirm all new development meets City standards.
Transmission	Assumed to be addressed as part of source and pumping capacity.

The capacity of many water system components can be expressed as the number of ERUs that can be served. As described in Chapter 5, an ERU for the City's system is one that consumes 242 gpd on an average demand day. On a maximum day, an ERU consumes 490 gpd.

To determine how many ERUs the City's sources can serve on a maximum demand day, the supply to each operational area was divided by the MDD ERU value of 490 gpd. The MDD ERU value was also used to calculate the capacity of the City's equalizing storage in ERUs. The ERU capacity of standby storage was calculated by subtracting out each reservoir's equalizing storage and operational storage under 2046 demand conditions from its total available storage capacity.

The capacity of each operational area is either limited by source supply or standby storage. None of the service areas are limited by the amount of equalizing storage available. In total, based on sources, equalizing storage, and standby storage, the City's water system has a limiting capacity of approximately 18,830 ERUs. This is shown in Table 9.19.

As presented in Chapter 5, the City predicts serving approximately 34,420 ERUs in 2046. Considering sources, equalizing storage, and standby storage, the City's water system is anticipated to have insufficient capacity to meet expected growth within the 20-year planning period due to standby storage and supply source capacity. This confirms the storage recommendations presented in Section 9.4.2 and the supply recommendations presented in Chapter 8.

Fire-suppression storage is not a function of ERUs and therefore is not represented in Table 9.19.

Table 9.19 Calculated Capacity in ERUs for Each Water System Component

Water System Component	2031 System-wide ERUs	2036 System-wide ERUs	2046 System-wide ERUs	2046 System-wide ERUs with Improvements
Projected ERUs	23,800	27,440	34,420	34,420
Sources(1) (ADD)	44,495	44,495	44,495	71,720
Sources (MDD)	24,705	24,705	24,705	42,645
Equalizing Storage	81,670	81,670	81,670	161,425
Standby Storage	20,055	19,665	18,830	49,910
Limiting Capacity	Standby/Sources (MDD)	Standby/Sources (MDD)	Standby/Sources (MDD)	None

Notes:
(1) Average day source capacity assumes supply facilities are operated 18 hours per day.

9.6 Summary of Recommendations

The system analysis yielded a number of recommended improvements for pump stations, storage reservoirs, and pipelines which are summarized in Table 9.20 and Figure 9.14. Supply projects identified in Chapter 8 are also shown on this figure. These recommendations are organized into a CIP with associated costs in Chapter 10.

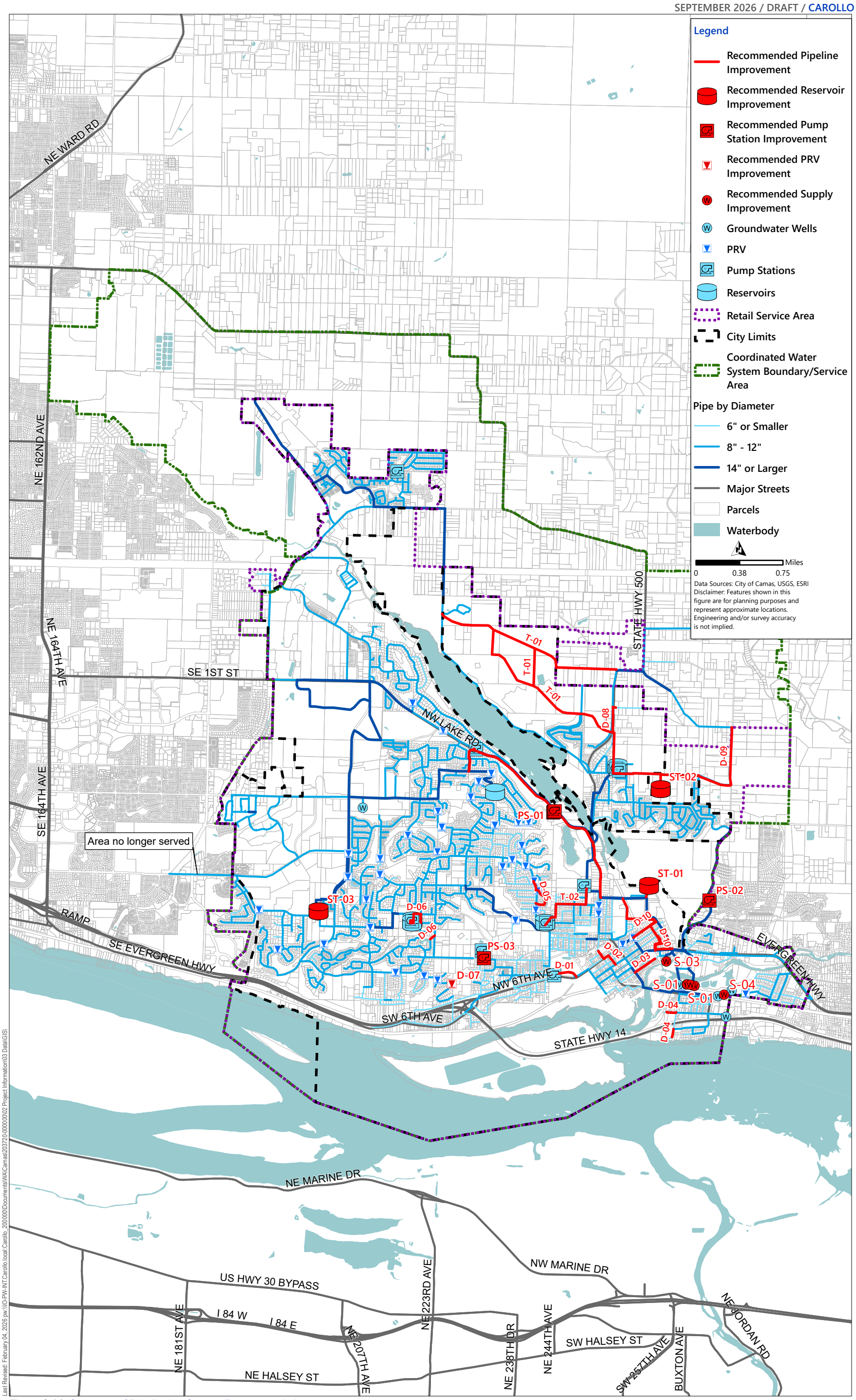


Figure 9.14 Summary of Distribution System Recommendations

Table 9.20 Summary of Recommended Improvement Projects

Project ID	Project Name	Improvement Type	Existing Diameter (inches)	Proposed Diameter (inches)	Description/Purpose
PS-01	544 Pumping Area Improvements	Pump Station and Transmission Pipeline			Construct Lake Road Pump Station, 30-inch suction and discharge pipeline, and 36-inch 343 zone transmission pipeline.
PS-02	542 Pumping Area Improvements	Pump Station Upsize and Transmission Pipeline			Add an additional 800 gpm pump at Crown Road pump station and construct 3,200 LF of 24-inch transmission pipeline.
PS-03	Francis Road Pumping Area Improvements	Pump Station Upsize			Replace Francis Road pump station with a new, above ground pump station sized to serve domestic connections and fire flow.
ST-01	343 Zone Storage Improvements	Storage			A 1.84 MG elevated reservoir in the 343 zone is recommended to address storage deficits in all planning years and replace the aging Butler Reservoir.
ST-02	542 Zone Storage Improvements	Storage			A 1.5 MG elevated reservoir in the 542 zone is recommended to address storage deficits in all planning years.
ST-03	544 Zone Storage Improvements	Storage			A 0.75 MG reservoir in the 544 zone is recommended to address the storage deficit in the 2046 planning year.
D-01	NW 7th Avenue Fire Flow Improvements	Pipeline Upsize	8	12	Upsize approximately 1,300 LF of pipeline from 6-inch to 12-inch to address fire flow deficiencies in the area.
D-02	NE Dallas Street Fire Flow Improvements	Pipeline Upsize	6	12	Upsize approximately 1,150 LF of pipeline from 6-inch to 8-inch to address fire flow deficiencies in the area.
D-03	E 1st Avenue Fire Flow Improvements	Pipeline Upsize	8	12	Upsize approximately 1,150 LF of pipeline from 6-inch to 8-inch to address fire flow deficiencies in the area.
D-04	Operations Center/WWTF Fire Flow Improvements	Pipeline Upsize	6	8	Upsize approximately 850 LF of pipeline from 6-inch to 8-inch to address fire flow deficiencies in the area.
D-05	NW Fargo Street Fire Flow Improvements	Pipeline Upsize	6, 8	12	1,700 LF of pipeline is being upgraded from 6-inch to 8-inch to address fire flow deficiencies in the area.
D-06	Upper Prune Hill Fire Flow Improvements	Pipeline Upsize	4	8	Upsize approximately 750 LF of pipeline from 12-inch to 16-inch and 450 LF of 8-inch pipeline to 12-inch to address fire flow and low-pressure deficiencies in the area.
D-07	Sierra Lane PRV Station	PRV Station	4	8	New PRV station to allow fire flow from the 542_S zone to the 455 zone.
D-08	SE 5th Street and SE Everett Road Fire Flow Improvements	Pipeline Upsize	4	8	Upsize approximately 1,200 LF of pipeline from 10-inch to 12-inch and 50 LF of 8-inch pipeline is recommended to address fire flow deficiencies in the area.
D-09	SE 283rd Avenue Fire Flow Improvements	Pipeline Upsize	16	20	2,700 LF of pipeline is being upgraded from 8-inch to 12-inch to address fire flow deficiencies in the area.
D-10	NE 6th Avenue and NE Nevada Street Fire Flow Improvements	Pipeline Upsize		8	Upsize approximately 3,600 LF of pipeline from 6-inch to 8-inch to address fire flow deficiencies in the area.
T-01	North Shore Transmission Pipeline	Transmission Pipeline		12,24	Construct approximately 6,300 LF of 12-inch pipeline and 16,600 LF of 24-inch pipeline to serve future North Shore development.
T-02	Angelo Pump Station Discharge Pipeline	Transmission Pipeline	Various	16	Upsize approximately 3,350 LF of various diameter pipeline to 16-inch pipeline to address high head loss and discharge pressures at Angelo PS.

CHAPTER 10 CAPITAL IMPROVEMENT PLAN

10.1 Introduction

This chapter combines the various projects recommended in the WSPU for the City's distribution system and presents them as a comprehensive CIP. With this CIP, the City will have guidelines to plan and budget for the distribution system over the next 20 years, along with the recommended timing and cost estimates for each identified project. Project phasing is described as either short-term (0 to 10 years, which corresponds to 2027 through 2036) or long-term (11 to 20 years, which corresponds to 2037 through 2046).

Appendix **[X]** lists each project with cost estimates in 2025 dollars and detailed implementation timing and prioritization.

10.1.1 Capital Project Categories

The WSPU's CIP projects are categorized as follows:

- Distribution System Improvements (D).
- Transmission Pipeline (T).
- Annual Repair and Replacement Programs (R).
- Pump Station (PS).
- Storage (ST).
- Supply and Treatment (S).
- General (G).

The abbreviations presented above were used during project identification to delineate each project category.

10.1.2 Capital Project Types

To support the City's financial evaluation, CIP projects were assigned need based on four types:

- **Growth:** Projects that add system capacity to meet future demand growth. These projects are typically funded with connection fees and are recommended to meet the analysis criteria detailed in Chapter 2.
- **Upgrade**: Projects necessary to improve the level of service (e.g., redundant pumping, backup power, pipe upsizing, fire flow, system reliability) of existing infrastructure. These projects are typically funded with rates and are needed whether demand increases or stays the same.
- **Replace and Repair (R&R)**: Projects that replace or maintain existing infrastructure without increasing capacity or level of service. These projects are typically funded with rates and are meant to renew aging infrastructure that is in poor condition.
- **General/Programmatic**: Projects that are intended to be studies, consisting of future water system plans and water supply feasibility studies.

Individual projects may include elements of multiple capital project types, meaning each project was defined as one or more of the four types and assigned a percentage of the total project cost to each type. The allocations between multiple types were made using professional judgment.

10.1.3 Capital Planning Periods

CIP projects were allocated into the planning periods referenced in previous chapters:

1. Short-term (2027-2036).
2. Long-term (2037-2046).

Projects recommended under this planning period have all been allocated to individual years. To better distribute costs, some larger projects have been spread across multiple years to account for longer design and construction periods. The project timing in this Chapter is subject to change, as the City regularly reviews and updates its CIP based on changing conditions and priorities.

10.1.4 Capital Project Cost Allocation

Discussed in Section 10.1.2, each CIP project was assigned to a capital project type. The allocated project type will help support the City in the development of rates and standard development charges. Each CIP project type was assigned a cost allocation. In general, CIP projects needed to support future growth and development are funded by developers and connection fees while projects needed to support existing infrastructure deficiencies or repair and replacement are funded by existing rate payers.

- Growth: Projects will be funded by developers and SDCs (connection charges).
- Upgrade: Projects will be funded by rates.
- R&R: Projects will be funded by rates.
- General: Projects will typically be funded by rates.

10.2 Cost Estimating Assumptions

10.2.1 Cost Estimate Level

The CIP cost estimates in this chapter are Class 5 (budget-level estimates from a -50 percent to +100 percent range). These costs were determined using both Carollo Engineers' (Carollo) understanding of project locations and current conditions and the City's costs for similar and recently constructed capital projects. Note actual costs may vary by -50 percent to +100 percent from these estimates.

All costs are given in 2025 dollars. The Handy-Whitman Index for Water Utility Construction in the Pacific Region for January 2025 is 1,401. As previously stated, the estimates are subject to change as the project design matures and because costs for labor, materials, and equipment may vary in the future.

10.2.2 Baseline Unit Cost

Baseline construction costs were estimated using unit costs with the assumptions presented in the following subsections.

10.2.3 Cost Estimates Elements

The total CIP cost estimates are based on construction costs that are inflated using cost factors to account for non-construction project elements. The cost factors for the WSPU are shown in Table 10.1. Note for pump station and supply projects, which typically rely heavily on mechanical components, a 25 percent factor for engineering and planning were allocated to account for project complexity. For pipeline and storage projects, 20 percent was allocated for engineering and planning. For pipeline and storage projects, the cost factors would increase the baseline construction costs by 80 percent to represent the total project cost. For pump station and supply projects, the cost factors would increase the baseline construction costs by 85 percent to represent the total project cost, respectively.

Table 10.1 Cost Factors

Adjustment Factors	Description	Factor
Contingency	Costs that may occur due to uncertainty in project scope and conditions.	30%
General Conditions and Overhead	Contractor costs indirectly related to construction.	25%
Engineering/Planning(1)	Cost for planning and design of project.	20%/25%
City Admin	Cost to administer the project.	5%

Note:
(1) Pump station and supply projects were assigned an engineering/planning factor of 25 percent to account for project complexity.

The costs presented in this CIP are high-level planning costs that will help the City make financial decisions.

The sample capital improvement project cost calculation shown below demonstrates how construction contingency as well as design and administrative costs were added to the baseline construction cost to determine the total project cost. The construction contingency plus design and administration costs make up just over 50 percent ($1,015,000/$2,015,000) of the total project cost estimate.

Example, assuming engineering/planning factors for pump stations and supply/treatment:

Baseline Construction Cost	**$1,000,000**
Construction Contingency (30%)	$300,000
Estimated Construction Cost	**$1,300,000**
General Conditions & Overhead (25%)	$325,000
Engineering/Planning (25%)	$325,000
City Admin (5%)	$65,000
Total Capital Improvement Cost	**$2,015,000**

10.2.4 Pipeline Unit Costs

Table 10.2 shows unit cost assumptions for pipelines. These costs were developed using Carollo's understanding of project locations and current conditions and the City's costs of similar and recently constructed capital projects. For planning purposes, these unit costs assume open-trench construction in improved areas. If trenchless construction is possible for some projects, the cost estimates may need to be modified. Costs include pavement cutting, excavation, hauling, shoring, ductile iron pipe, materials (i.e.,

valves, fittings, restraints, etc.) and installation, hydrant assemblies, backfill material and installation, and pavement replacement. The unit costs are for construction in stable soil at standard excavation depths for each pipe size. Additionally, costs reflect increased effort to construct on shallow bedrock that overlays large areas of the City and its Urban Growth Area. Steep slopes, extensive permitting, or acquisition of right of way may result in additional costs. These costs are construction costs only and do not reflect Contingency, General Conditions and Overhead, Engineering/Planning, and City Admin.

Table 10.2 Pipeline Unit Costs

Pipe Size (Inches)	Pipe Unit Cost(1) ($/Linear Foot)
8	$236
10	$268
12	$300
16	$404
20	$481
24	$575
30	$897
36	$1,203

Notes:
(1) Costs represent baseline construction costs and do not include additional cost factors for contingency, general conditions and overhead, engineering/planning, and City admin.

10.2.5 Pump Station Costs

Pump station projects costs were developed based on both site and project specific requirements. The costs account for Carollo's understanding of project locations and current conditions, as well as costs from recently completed Carollo projects.

10.2.6 Well Costs

Well drilling project costs were developed based on typical costs from past Strata Geosciences projects. Costs do not include mechanical equipping of well. Well equipping costs were site specific and developed based on Carollo's understanding of estimated well yields, project location, and the City's ongoing Well 13 construction project. Cost estimates for new well drilling is approximately $150,000.

10.2.7 Reservoir Costs

New reservoir project costs were developed based on typical costs from past Carollo projects. Conceptual costs for reservoirs vary by type: ground and elevated. Costs are estimates based on reservoir volume in gallons, as presented in Table 10.3. Reservoir costs are sensitive to site-specific geotechnical and seismic considerations; therefore, it is recommended that a reservoir siting study that addresses these issues be conducted at the initiation of a new reservoir project.

Table 10.3 Reservoir Unit Costs

Reservoir Type	Cost per gallon(1) ($/gallon)
Ground(2)	$3
Elevated	$10

Notes:
(1) Costs represent baseline construction costs and do not include additional cost factors for contingency, general conditions and overhead, engineering/planning, and City admin.
(2) Unit costs for ground reservoirs are based on welded steel construction.

10.2.8 Additional Costs

Other common costs for the CIP include those associated with onsite generators and PRV stations. Conceptual costs were estimated based on recent Carollo projects and presented in Table 10.4.

Table 10.4 Additional Costs

Reservoir Type	Cost(1)(Lump Sum)
Onsite Generator	$500,000 per generator installation
PRV Station	$400,000 per station

Notes
(1) Costs represent baseline construction costs and do not include additional cost factors for contingency, general conditions and overhead, engineering/planning, and City admin.

10.3 CIP Development and Implementation

The capital improvement implementation was separated into three priorities:

- Short-term: 0 to 10 years.
- Long-term: 10 to 20 years.
- Annual.

Table 10.5 summarizes the priorities associated with all projects and recommendations from this WSPU, based on the City's water system needs.

Table 10.5 CIP Prioritization Summary

Project Types	0-10 years	10-20 years
Pipeline upsize for fire flow only.	X	
Pipeline upsize for fire flow and low pressure.	X	
Pipeline repair and replacement.	Annual	
Transmission pipeline projects	X	X
Pump station projects.	X	X
Storage projects.	X	X
Supply and treatment projects.	X	X
General projects.	X	X

The following sections summarize recommended projects identified in previous chapters and incorporated in the summary in Section 10.5.

10.3.1 Recommended Distribution Projects

Distribution system projects (D) were developed using the hydraulic model and were identified for areas not meeting velocity and pressure criteria, as detailed in Chapter 9. These projects also took City staff input into account during development.

10.3.1.1 D-01 through D-10 - Fire Flow Recommendation Projects

To address the fire flow deficiencies identified in Chapter 9, the projects and recommendations presented in that chapter should be implemented. Namely, projects will upsize pipelines or add piping to create looped piping. Once implemented, these projects will address the identified deficiencies. Appendix **[X]** details each fire flow project and references it according to its respective project identification. In the CIP, these are projects D-01 through D-10.

In summary, these projects will replace or upsize approximately 15,500 LF of pipelines. Projects D-01 through D-05 and project D-10 include replacing aging cast iron or steel pipe to address fire flow deficiencies. Costs for these projects have been incorporated into the pipeline replacement program. The remaining projects, D-06 through D-09 are estimated to be a total of $4.4 million (including all applicable cost factors) and are recommended for completion in 2034 as part of the short-term planning period.

10.3.1.2 Distribution System Recommendations Summary

Table 10.6 summarizes recommended distribution system projects along with their respective priorities and costs. As discussed in the previous section, costs for projects D-01 through D-05 and project D-10 have been incorporated into the pipeline replacement program and therefore are not presented in Table 10.6.

Table 10.6 Distribution System Recommendations

Project Number	Project Name	Timing(2)	Priority	Cost(1)(2)
D-01	NW 7th Avenue Fire Flow Improvements	-	0-10 years	$-
D-02	NE Dallas Street Fire Flow Improvements	-	0-10 years	$-
D-03	E 1st Avenue Fire Flow Improvements	-	0-10 years	$-
D-04	Operations Center/WWTF Fire Flow Improvements	-	0-10 years	$-
D-05	NW Fargo Street Fire Flow Improvements	-	0-10 years	$-
D-06	Upper Prune Hill Fire Flow Improvements	2034	0-10 years	$1.3 million
D-07	Sierra Lane PRV Station	2034	0-10 years	$0.8 million
D-08	SE 5th Street and SE Everett Road Fire Flow Improvements	2034	0-10 years	$0.74 million
D-09	SE 283rd Avenue Fire Flow Improvements	2034	0-10 years	$1.6 million
D-10	NE 6th Avenue and NE Nevada Street Fire Flow Improvements	-	0-10 years	$-

Notes:
(1) The cost includes 30 percent construction contingency and 20 percent Engineering, Legal, and Administration (ELA) contingency.
(2) Costs and timings for projects D-01 through D-05 and D-10 are incorporated into the pipe replacement program and not reported in this table.
WWTF - wastewater treatment facility.

10.3.2 Recommended Transmission Pipeline

Transmission pipe projects (T) were developed using the hydraulic model and input from City staff. Table 10.7 summarizes transmission pipeline projects identified for this planning period.

Table 10.7 Transmission Pipe Recommendations

Project Number	Project Name	Timing	Priority	Cost(1)
T-01	North Shore Transmission Pipeline	2032	0-10 years	$20.5 million
T-02	Angelo Pump Station Discharge Pipeline	2037-2038	10-20 years	$2.7 million

Notes:
(1) The cost includes 30% construction contingency and 20% ELA contingency.

10.3.2.1 T-01 - North Shore Transmission Pipeline

Large development, both residential and commercial, is expected in the City's North Shore area. Geographically located in the area north of Leadbetter Road, the development will be connected to the existing distribution system via transmission pipeline. Detailed in Chapter 9, approximately 1,600 LF of 12-inch diameter pipe and 13,200 LF of 24-inch diameter pipeline will be needed to connect the area to the existing system. Additionally, to convey water to the development area approximately 4,200 LF of existing pipeline between Gregg Reservoir and the proposed North Shore roundabout needs to be upsized to 24-inch diameter pipeline (Phase 2 Pipeline).

The estimated cost for the North Shore transmission pipeline is approximately $20.5 million and recommended for completion when needed to support development in the area. This is expected to be in approximately 2032 as part of the short-term planning period.

10.3.2.2 T-02 - Angelo Discharge Pipeline

Discharge piping for Angelo Pump Station in the distribution system network is undersized for future demands causing concerns with high head loss and discharge pressures. Detailed in Chapter 9, approximately 3,350 LF of 16-inch diameter pipeline will be needed to address these concerns.

The estimated total project cost for the Angelo discharge pipeline is approximately $2.7 million and recommended in the long-term. As this project is due to an existing system deficiency, this project can be completed as soon as funds are available, however, this is a lower priority project. Therefore, to distribute costs for this project across multiple planning years, design is recommended for 2037 and is assumed to be approximately $0.3 million, which is 10 percent of the total project costs. Construction was assumed to be the remaining $2.4 million and would occur the following year in 2038.

10.3.3 Recommended Annual Repair and Replacement Programs

Table 10.8 summarizes the two annual program projects (R) being recommended: pipeline replacement program and miscellaneous facility projects.

Table 10.8 Annual Repair and Replacement Program Recommendations

Project Number	Project Name	Priority	Cost(1)
R-01	Pipeline Replacement Program	Annual	$84 million
R-02	Miscellaneous Facility Projects	Annual	$3 million

Notes:
(1) The cost includes 30% construction contingency and 20 percent ELA contingency.

10.3.3.1 R-01 - Pipeline Replacement Program

The City has approximately 165,000 LF (31.3 miles) of cast iron and steel pipe in their distribution system. These pipes are reaching the end of their useful life and deteriorating conditions have caused the City's distribution system leakage to increase. It is recommended the City implement a pipeline replacement program aimed at replacing these pipes to reduce the risk of failure. Overall, the total estimated cost to replace all cast iron and steel pipe is approximately $84 million. Over the 20 year period of this WSPU, it is recommended the City replace approximately 1.5 miles of pipe and budget approximately $4.2 million per year. However, it was determined that budgeting this amount in the short-term would be difficult given the City's expected short-term CIP project list. To better align the pipeline replacement program with these projects, it is recommended that the City budget $0.2 million for the program per year through 2034. From 2035 through 2046, the City can budget the remaining costs for the program which equates to approximately $6.9 million per year over this twelve year period.

10.3.3.2 R-02 - Miscellaneous Facility Projects

Discussions with the City indicated they complete two R&R type projects annually at major distribution system facilities (wells, reservoirs, pump stations, etc.). On average each of these projects typically cost the City approximately $75,000. The overall CIP allocated $150,000 per year for the completion of two miscellaneous facility "improvement type" projects in each planning year. Over the 20-year period, miscellaneous facility projects are estimated to cost approximately $3 million.

10.3.4 Recommended Pump Station Projects

This section summarizes the recommended pump station projects (PS), identified through the desktop pumping analysis detailed in Chapter 9. Table 10.9 summarizes three PS projects, all of which are prioritized in the short-term.

Table 10.9 Pump Station Recommendations

Project Number	Project Name	Timing	Priority	Cost(1)
PS-01	544 Pumping Area Improvements	Segment 1: 2027-2028 Segment 2: 2031-2033 PS: 2032-2034	0-10 years	$37.9 million
PS-02	542 Pumping Area Improvements	2045	10-20 years	$0.72 million
PS-03	Francis Road Pumping Area Improvements	2035	0-10 years	$3.4 million

Notes:
(1) The cost includes 30% construction contingency and 25% ELA contingency.

10.3.4.1 PS-01 - 544 Pumping Improvements

The 544 pumping area has insufficient pumping capacity for all planning years and scenarios. To address this deficiency, the Lake Road pump station is recommended to pump directly from the 343 Zone to the 544 Zone. Currently in the preliminary design phases, the new pump station will have a firm capacity of 9,000 gpm and include approximately 1,250 LF of 24-inch, 9,850 LF of 30-inch, and 6,000 LF of 36-inch diameter transmission pipeline.

A cost estimate developed by Carollo in summer 2025 for the pump station portion of the project estimated construction costs at $7.3 million. The estimated cost of the transmission pipeline is approximately $31.8 million. Both portions of the project are recommended to be completed in the short-term. Given the City's short-term CIP project list, it will be difficult to construct the entirety of this project in a single phase. Therefore, it was recommended that the pipeline portion of this project be divided into multiple segments to be constructed across various years. Additionally, it was determined that some segments of the pipeline and the pump station could be delayed to allow for other projects to be prioritized. Segment 1 of the pipeline is the highest priority and includes approximately 6,000 LF of 36-inch pipeline between the intersections of NE 3rd Avenue/E 1st Avenue and NE Everett Street/ NE 22nd Avenue. Funds have already been allocated for the design of this pipeline, which is currently in progress. Construction of this segment of pipeline is recommended to start in 2027 and cost approximately $13.7 million with completion in 2028. While the City initially planned on constructing this project in the 2027 and 2028 timeframe, due to other budget priorities, it is recommended that the City considered delaying segments 2 through 4 and the pump station. For purposes of this WSP, approximately $1.8 million has been allocated in 2031 for design of Segments 2 through 4 of the pipeline, which is 10 percent of the cost for these segments. Construction for these segments would occur in 2032 and 2033 and cost approximately $15.7 million. For the pump station portion of the project, approximately $0.7 million would occur in 2032 for design with construction in 2033 and 2034 making up the remaining $6.6 million.

10.3.4.2 PS-02 - 542 Pumping Improvements

The 542 pumping area has insufficient pumping capacity under redundancy criteria in the 2046 scenario. To address this deficiency, an additional 800 gpm pump is recommended at Crown Road pump station.

The total estimated cost of the project is approximately $0.72 million and is recommended for completion in 2045 as part of the long-term planning period.

10.3.4.3 PS-03 - Francis Road Pumping Improvements

The Francis Road pumping area has insufficient pumping capacity and fire flow capacity for each planning year scenario. Discussion with the City indicated their preference to replace the existing Francis Road pump station with a new above grade pump station. The service area of the new pump station will be expanded to serve nearby customers with low pressures. To meet DOH criteria and the City's level of service goals, the new Francis Road pump station will be equipped with two 75 gpm capacity domestic pumps, two 1,000 gpm capacity fire pumps and a backup generator. These improvements will resolve the current fire flow and pressure deficiencies in this area.

As this is an existing deficiency, it is recommended that the City perform this project as budget allows. The estimated cost for the Francis Road pump station replacement is approximately $3.4 million, and for purposes of this WSP is schedule for 2035 as part of the short-term planning period.

10.3.5 Recommended Storage Projects

This section summarizes the recommended storage projects (ST), identified through the desktop storage analysis detailed in Chapter 9. Table 10.10 shows the three recommended storage capacity projects, two of which are prioritized for the short-term and one in the long-term.

Table 10.10 Storage Recommendations

Project Number	Project Name	Timing	Priority	Cost(1)
ST-01	343 Zone Storage Improvements(2)	2030-2031	0-10 years	$25.7 million
ST-02	542 Zone Storage Improvements	Pipeline:2029-2030 Reservoir: 2034-2036	0-10 years	$33.6 million
ST-03	544 Zone Storage Improvements	2045	10-20 years	$4.5 million

Notes:
(1) The cost includes 30% construction contingency and 20% ELA contingency.
(2) The cost was provided in Gray and Osborne's, New 343 Reservoir Alternatives Analysis, September 2025.

10.3.5.1 ST-01 - 343 Zone Storage Improvements

By the 2036 and 2046 planning years there are slight storage deficits of 0.02 and 0.04 MG in the 343 area. The storage in this area is currently provided by Butler Reservoir, which is a 1.2 MG partially buried reservoir originally constructed in the early 1900s. The City has indicated Butler Reservoir is reaching the end of its useful life and will be decommissioned once a new 343 zone reservoir is constructed. The replacement reservoir project is currently in preliminary design phase. An alternatives analysis completed by the City's consultant Gray & Osborne indicated the preferred alternative would be an elevated reservoir near Camas Cemetery. The new reservoir, being sized for buildout conditions, would provide a minimum of 1.84 MG of usable storage for the 343 area alleviating deficits identified under this planning period.

The estimated total project cost for the elevated reservoir (ST-01) is approximately $25.7 million and is expected to be completed in the short-term. Costs for this project were provided in Gray and Osborne's, New 343 Reservoir Alternatives Analysis, completed in September 2025. While the City was planning to construct this project immediately, due to budgetary limitations, this project is scheduled for construction to occur in 2030 and 2031 to balance out the City's CIP, equaling approximately $12.9 million per year. Funds for the design of this project have already been allocated and therefore were not considered in the cost distribution.

10.3.5.2 ST-02 - 542 Zone Storage Improvements

In 2031, there is a 1.0 MG deficit in the 542 storage area, increasing to a 1.28 MG deficit in 2046. To alleviate deficits in the area, an additional storage reservoir will need to be constructed. There are multiple alternatives for increasing storage capacity in this area. For planning purposes, an elevated reservoir with a nominal capacity of 1.5 MG was recommended and will be incorporated into the CIP as it was the

costliest alternative. Additionally, 3,800 LF of 24-inch diameter transmission pipeline is recommended between Crown Road pump station and the new reservoir. This will address the hydraulic limitation and allow for multiple pumps at Crown Road to operate simultaneously to fill the new reservoir.

The estimated cost for the reservoir portion of the project is approximately $29.3 million and approximately $4.3 million for the pipeline. Both elements of the project are recommended for completion in the short-term. However, the pipeline should be prioritized before the reservoir to address the existing hydraulic limitation as previously noted. Since this is an existing deficiency, design of the pipeline is recommended for 2029 and is assumed to be approximately $0.4 million, which is 10 percent of the pipeline cost. Construction was assumed to be the remaining $3.9 million and would occur the following year in 2030. To distribute the total project costs, it is recommended that the design and construction of the reservoir should be delayed, allowing for the completion of other higher priority projects. Under this timeline, design of the reservoir is slated for 2034 and is assumed to be approximately $2.9 million, which is 10 percent of the reservoir cost. Construction of the reservoir is expected to take multiple years, so the remaining reservoir costs are divided across 2035 and 2036, equating to approximately $13.2 million per year.

10.3.5.3 ST-03 - 544 Zone Storage Improvements

At the end of the planning period in 2046, there will be a deficit of approximately 0.63 MG in the 544 storage area. To address this deficit, an additional reservoir with a nominal capacity of 0.75 MG is recommended at the 18th Avenue site, which has space on-site to accommodate the additional reservoir.

The estimated cost for the 544 zone storage improvements (ST-03) is approximately $4.5 million and is recommended in 2045 as part of the long-term planning period.

10.3.6 Recommended Supply and Treatment Projects

This section summarizes the recommended supply and treatment projects that were identified through the supply analysis detailed in Chapter 8 and Chapter 9. Table 10.11 shows the four recommended projects with detailed descriptions in the sections to follow.

Table 10.11 Supply and Treatment Recommendations

Project Number	Project Name	Timing	Priority	Cost(1)
S-01	Well 8, 11, and 12 Expansion and PFAS Treatment	2027-2030	0-10 years	$40.3 million
S-02	Well 18 Development	2037	10-20 years	$9.5 million
S-03	Well 13B Development	2044	10-20 years	$8.7 million
S-04	Well 19 Development	2046	10-20 years	$8.7 million
S-05	LWWF PFAS Treatment Facility Expansion Phase 1	2032-2034	0-10 years	$9.3 million
S-06	LWWF PFAS Treatment Facility Expansion Phase 2	2036-2038	10-20 years	$9.3 million
S-07	LWWF PFAS Treatment Facility Expansion Phase 3	2040-2042	10-20 years	$9.3 million

Notes:
(1) The cost includes 30% construction contingency and 25% ELA contingency.

10.3.6.1 S-01 - Well 8, 11, and 12 Expansion and PFAS Treatment

By 2030, the City will need additional supply capacity to meet projected maximum day demands (MDD). From the water supply strategy detailed in Chapter 8, hydrogeologic investigation identified expansions at Wells 8, 11, and 12 would be capable of providing sufficient capacity and have lower associated risks than developing a new well in the short-term. Additionally, treatment is recommended for wells with the highest PFAS detections. This project is expected to consist of well upgrades, PFAS treatment with an initial capacity of 2,725 gpm, an intermediate reservoir/pump station, chemical facility upgrades, and standby power improvements.

The estimated cost for this project is approximately $40.3 million and recommended for completion in the short-term. This project is expected to be one of the largest projects undertaken by the City to date, and implementation of the project is expected to take multiple years. Due to the need for additional water supply by 2030 and an imminent MCL for PFAS, design is recommended for completion in 2027 and is assumed to be approximately $4 million, which is 10 percent of the total project cost. Construction for this project is expected to occur between 2028 and 2030, making up the remaining $36.3 million. In 2028, it is expected that well upgrades, intermediate reservoir/PS, and chemical facility upgrade components will be in construction, therefore a cost of approximately $11.9 million is expected. In 2029, the well upgrades, intermediate reservoir/PS, and chemical facilities would be completed, and construction would begin on the PFAS treatment and standby power components. Approximately $18.1 million is expected for construction in 2029. In 2030, it is assumed that PFAS treatment and standby power improvements would be completed and therefore the remaining $6.3 million is expected for construction.

10.3.6.2 S-02 - Well 18 Development

By 2037, the City will need an additional supply capacity to meet projected MDD. It is recommended to drill and develop Well 18 in the Lower Washougal Wellfield to increase capacity by approximately 2,000 gpm. This project will include well drilling, mechanical equipping, PFAS treatment, and a generator for backup power.

The estimated cost for this project is approximately $9.5 million and recommended for completion in 2037 as part of the long-term planning period.

10.3.6.3 S-03 - Well 13B Development

By 2044, the City will need additional supply capacity to meet projected MDD. It is recommended to drill and develop Well 13B assumed to be located at the existing Well 13 site or Louis Bloch Park. This project is estimated to increase capacity by 1,000 gpm and will include well drilling, mechanical equipping, PFAS treatment, and a generator for backup power.

The estimated cost for this project is approximately $8.7 million and recommended for completion in 2044 as part of the long-term planning period.

10.3.6.4 S-04 - Well 19 Development

By 2046, the City will need additional supply capacity to meet projected MDD. It is recommended to drill and develop Well 19 assumed to be located near Well 6 and 14, in the City's eastern wellfield. This project

is estimated to increase capacity by 1,000 gpm and will include well drilling, mechanical equipping, PFAS treatment, and a generator for backup power.

The estimated cost for this project is approximately $8.7 million and recommended for completion in 2046 as part of the long-term planning period.

10.3.6.5 S-05 through S-07 - LWWF PFAS Treatment Facility Expansion Phase 1-3

To reduce the initial project cost of the well expansions and PFAS treatment (Project S-01), it was recommended PFAS treatment facility capacity be sized to only treat wells with the highest PFAS detections. Due to the uncertainty around future PFAS detections, the LWWF PFAS treatment facility will be designed to accommodate expansion to an initial buildout capacity of 9,925 gpm. To reach this capacity, expansions to the treatment facility are recommended in three phases, with each phase increasing capacity by approximately 2,400 gpm. Further expansion to ultimate buildout may occur when Well 18 (Project S-02) and Well 19 (Project S-04) are drilled and developed, depending on PFAS concentrations of new wells.

The estimated cost for each phase of expansion is approximately $9.3 million, resulting in a total cost for all three phases of approximately $27.9 million. The implementation for each phase is assumed to take three years, allowing one year for design and two years for construction. For budgetary purposes, design is approximately $0.9 million, which is 10 percent of the cost per phase. Construction for each phase will make up the remaining $8.4 million with $4.2 million allocated per year. For purposes of this CIP, it is assumed that design for Phases 1, 2, and 3 would occur in 2032, 2036, and 2040, with construction occurring in 2033-2034, 2037-2038, and 2040-2041.

10.3.7 Recommended General Projects

Four general projects (G) were recommended for this CIP and are summarized in Table 10.12.

Table 10.12 Recommended General Projects Summary

Project Number	Project Name	Timing	Priority	20-year Total Cost(1)
G-01	2036 WSP	2035-2036	0-10 years	$0.53 million
G-02	2046 WSP	2045-2046	10-20 years	$0.53 million
G-03	Water Rights Investigation	2027-2028	0-10 years	$0.29 million
G-04	Pipe Replacement Prioritization Study	2034	0-10 years	$0.16 million

Notes:
(1) All general project costs include an additional 10% for City costs to administer the project.

10.3.7.1 G-01 and G-02 - Water System Plan Updates

The City's WSP will need to be updated every 10 years to comply with WAC 246-290-100. It is expected an update will occur by 2036 and 2046, respectively. The estimated cost for each WSP update is approximately $0.53 million. These projects are expected to be two year projects, which result in a cost of approximately $0.27 million per year.

10.3.7.2 G-03 - Water Rights Investigation

To fully utilize potential yields from the LWWF, it was recommended the City complete a water rights investigation. The investigation would target acquiring additional groundwater rights for the LWWF or transferring surface water rights to the LWWF for use during the period where surface water withdrawals are prohibited. The estimated cost for the water rights investigation is approximately $0.29 million. This project was recommended to start in 2027 and is expected to be completed by 2028, resulting in cost of $0.15 million per year.

10.3.7.3 G-04 - Pipeline Replacement Prioritization Study

To assist the City in developing a schedule of prioritization of the pipeline replacement program discussed in Section 10.4.3.1, it is recommended a pipeline replacement prioritization study be conducted. The estimated cost for the pipeline replacement prioritization study is approximately $0.16 million and recommended for completion in 2034 under the short-term planning period.

10.4 CIP Program Summary

This section summarizes the City's CIP program described in the previous sections. Tables 10.13 and 10.14 summarize the CIP projects by project category and priority, respectively. Figures 10.1 and 10.2 summarize the percentage of each project identified by project category and project type, respectively.

When considering CIP costs by project category as shown in Table 10.13 and Figure 10.1, the majority of CIP costs are accrued from supply and treatment projects (30 percent) and annual programs (27 percent). Pump station projects and storage projects comprise the other high-cost categories and account for 13 percent and 20 percent of the CIP, respectively.

When considering CIP costs by priority as shown in Table 10.14 and Figure 10.2, approximately 29 percent of the CIP costs are annual programs, as previously stated. The total water CIP cost over the next 20 years is approximately $317 million, which equates to approximately $15.9 million per year for the planning period. Of the total cost, approximately $177 million is budgeted for the short-term, approximately $53 million is budgeted for the long-term, and approximately $87 million is budgeted for the annual category.

When considering CIP costs by cost allocation as shown in Table 10.15 and Figure 10.3, approximately 53 percent of total CIP costs are allocated to existing rate payers. Annual programs account for a large portion of this percentage.

Table 10.13 CIP Summary Table by Cost Category

Project Category	Total Cost	Average Annual Cost	Percentage
Distribution System	$4,340,000	$220,000	1.4%
Annual Programs	$87,000,000	$4,350,000	27.4%
Transmission Pipeline	$23,200,000	$1,160,000	7.3%
Pump Station	$42,020,000	$2,100,000	13.3%
Storage	$63,800,000	$3,190,000	20.1%
General	$1,500,000	$80,000	0.5%
Supply and Treatment	$95,130,000	$4,760,000	30.0%
Total Cost	**$317,000,000**	**$15,860,000**	**100.0%**

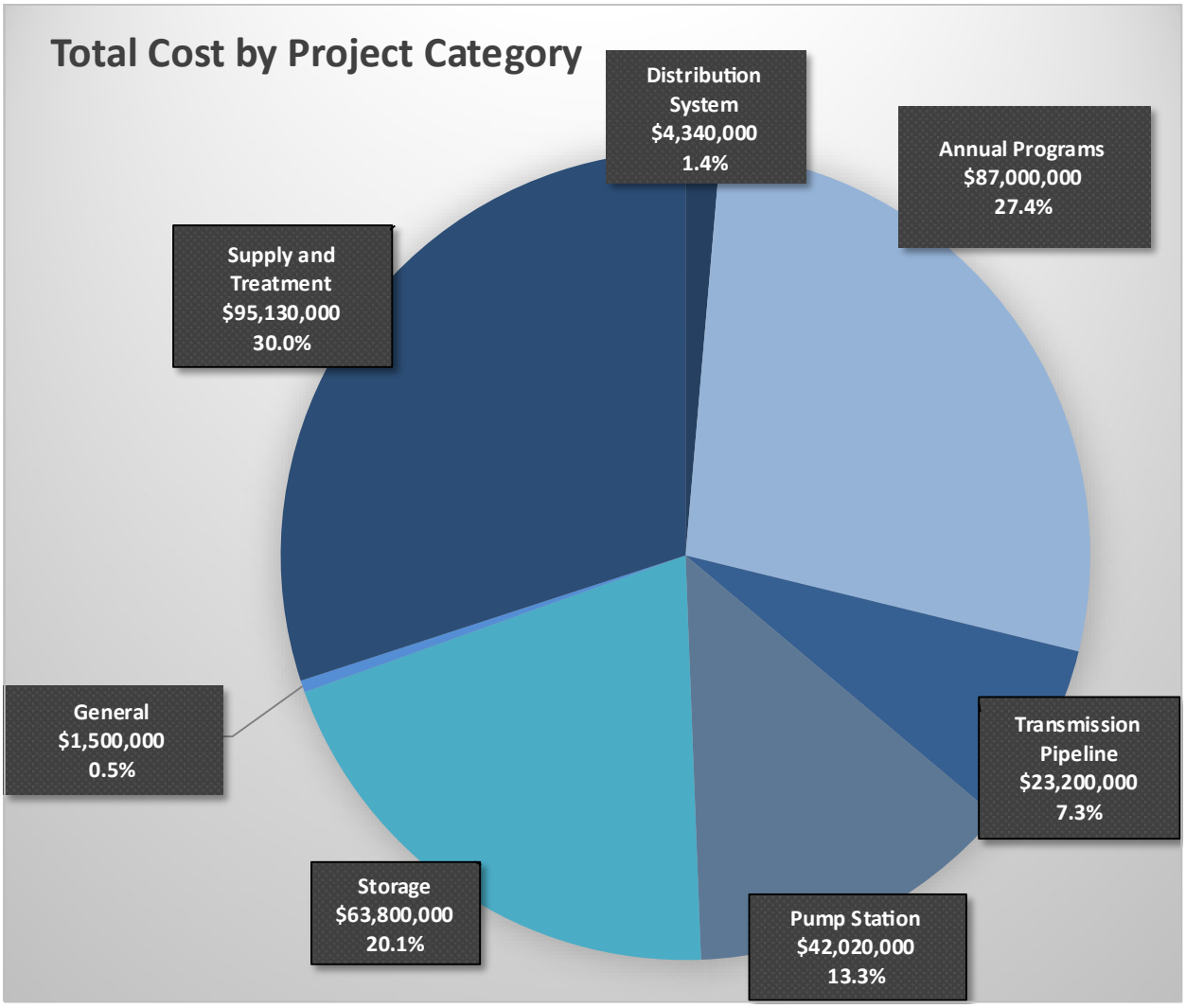


Figure 10.1 CIP Summary Table by Project Category

Table 10.14 CIP Summary Table by Project Priority

Project Priority	Total Cost	Percentage
0-10 years	$177,000,000	55.8%
10-20 years	$53,000,000	16.7%
Annual	$87,000,000	27.4%
Total Cost	**$317,000,000**	**100.0%**

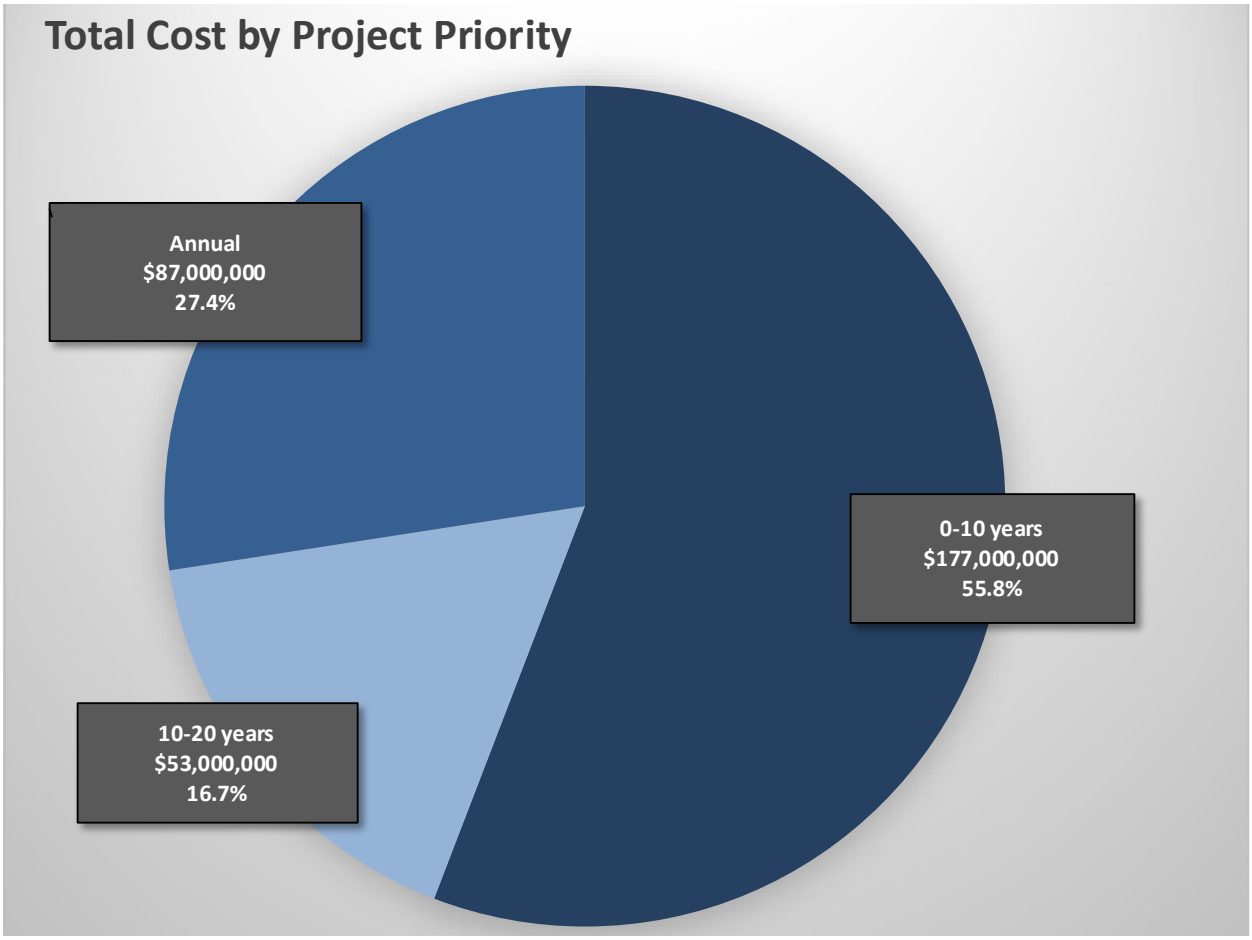


Figure 10.2 CIP Summary Table by Project Priority

Table 10.15 CIP Summary Table by Cost Allocation

Project Priority	Total Cost	Percentage
SDC	$148,900,000	47.0%
Rates	$168,100,000	53.0%
Total Cost		

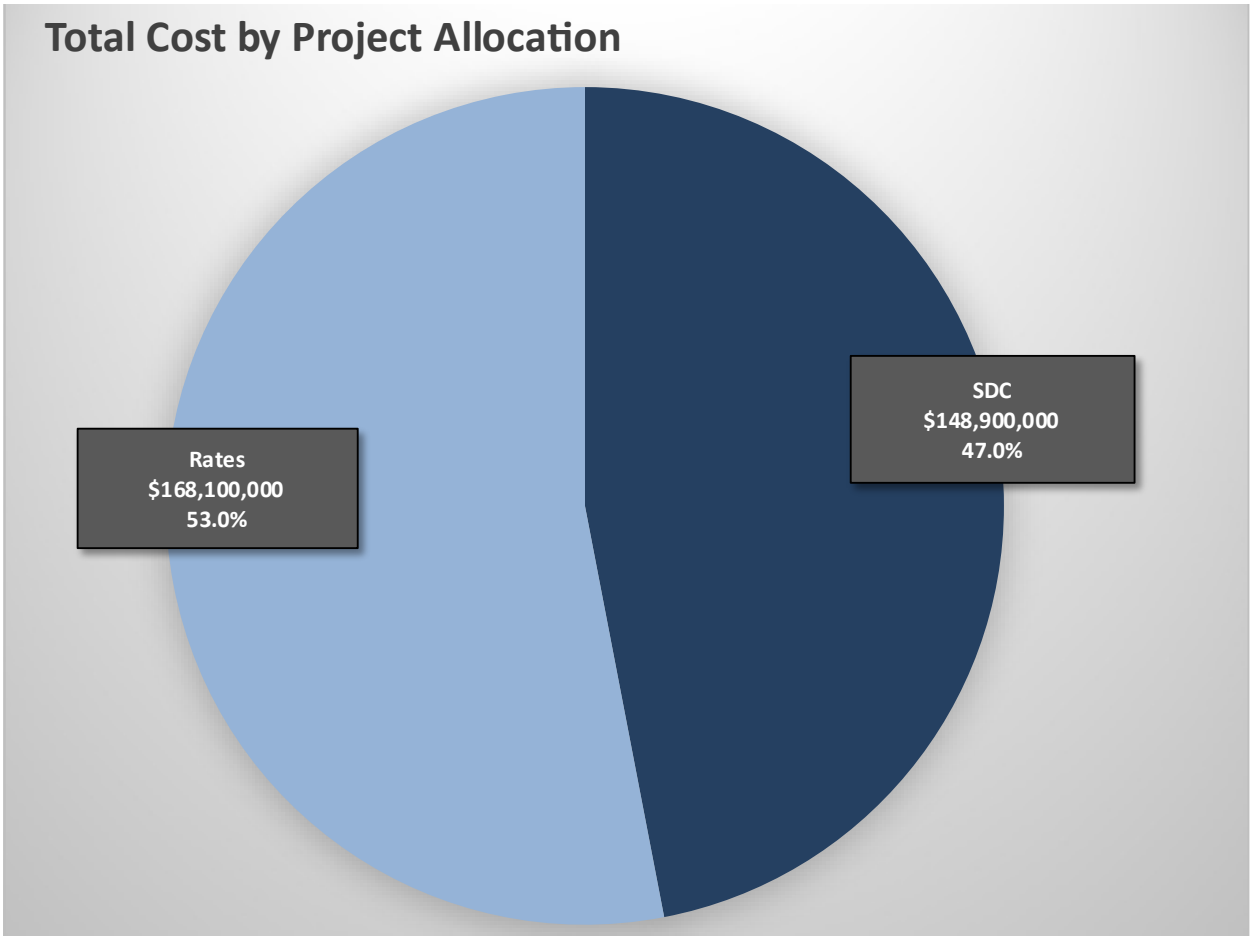


Figure 10.3 CIP Summary Table by Cost Allocation

10.4.1 CIP Project Summary

Section 10.1 summarizes the CIP projects and labels them as D, T, R, PS, ST, S, or G with each project assigned a unique CIP Identification. Table 10.16 shows all CIP projects developed for this WSPU along with associated costs and priority. Figure 10.4 presents annual costs for the City's CIP for each year of this WSPU, while Figure 10.5 illustrates annual cost breakdowns for projects funded by rates and SDCs.

An individual project sheet was generated for each CIP project and includes project identifier, description, costs, project type, timeline, and comments to help with future implementation. To help the City identify individual projects, project sheets are separated by project category. Appendix **[X]** includes all the project sheets.

Table 10.16 CIP Project Summary

Project Number	Project Name	Timing(1)	Priority	20-year Total Cost(1)
D-01	NW 7th Avenue Fire Flow Improvements	-	0-10 years	$-
D-02	NE Dallas Street Fire Flow Improvements	-	0-10 years	$-
D-03	E 1st Avenue Fire Flow Improvements	-	0-10 years	$-
D-04	Operations Center/WWTF Fire Flow Improvements	-	0-10 years	$-
D-05	NW Fargo Street Fire Flow Improvements	-	0-10 years	$-
D-06	Upper Prune Hill Fire Flow Improvements	2034	0-10 years	$1.3 million
D-07	Sierra Lane PRV Station	2034	0-10 years	$0.80 million
D-08	SE 5th Street and SE Everett Road Fire Flow Improvements	2034	0-10 years	$0.74 million
D-09	SE 283rd Avenue Fire Flow Improvements	2034	0-10 years	$1.6 million
D-10	NE 6th Avenue and NE Nevada Street Fire Flow Improvements	-	0-10 years	$-
T-01	North Shore Transmission Pipeline	2032	0-10 years	$20.5 million
T-02	Angelo Discharge Pipeline	2037-2038	10-20 years	$2.7 million
R-01	Pipe Replacement Program	-	Annual	$84 million
R-02	Miscellaneous Facility Projects	-	Annual	$3 million
PS-01	544 Pumping Area Improvements		0-10 years	$37.9 million
PS-02	542 Pumping Area Improvements	2045	10-20 years	$0.72 million
PS-03	Francis Road Pumping Area Improvements	2035	0-10 years	$3.4 million
ST-01	343 Zone Storage Improvements	2030-2031	0-10 years	$25.7 million
ST-02	542 Zone Storage Improvements	Pipeline:2029-2030 Reservoir: 2034-2036	0-10 years	$33.6 million
ST-03	544 Zone Storage Improvements	2045	10-20 years	$4.5 million
S-01	Well 8, 11, and 12 Expansion and PFAS Treatment	2027-2030	0-10 years	$40.3 million
S-02	Well 18 Development	2037	10-20 years	$9.5 million
S-03	Well 13B Development	2044	10-20 years	$8.7 million
S-04	Well 19 Development	2046	10-20 years	$8.7 million
S-05	LWWF PFAS Treatment Facility Expansion Phase 1	2032-2034	0-10 years	$9.3 million
S-06	LWWF PFAS Treatment Facility Expansion Phase 2	2036-2038	10-20 years	$9.3 million
S-07	LWWF PFAS Treatment Facility Expansion Phase 3	2040-2042	10-20 years	$9.3 million
G-01	2036 WSP	2035-2036	0-10 years	$0.53 million
G-02	2046 WSP	2045-2046	10-20 years	$0.53 million
G-03	Water Rights Investigation	2027-2028	0-10 years	$0.29 million
G-04	Pipe Replacement Prioritization Study	2034	0-10 years	$0.16 million

Notes:
(1) Costs and timings for projects D-01 through D-05 and D-10 are incorporated into the pipe replacement program and not reported in this table.

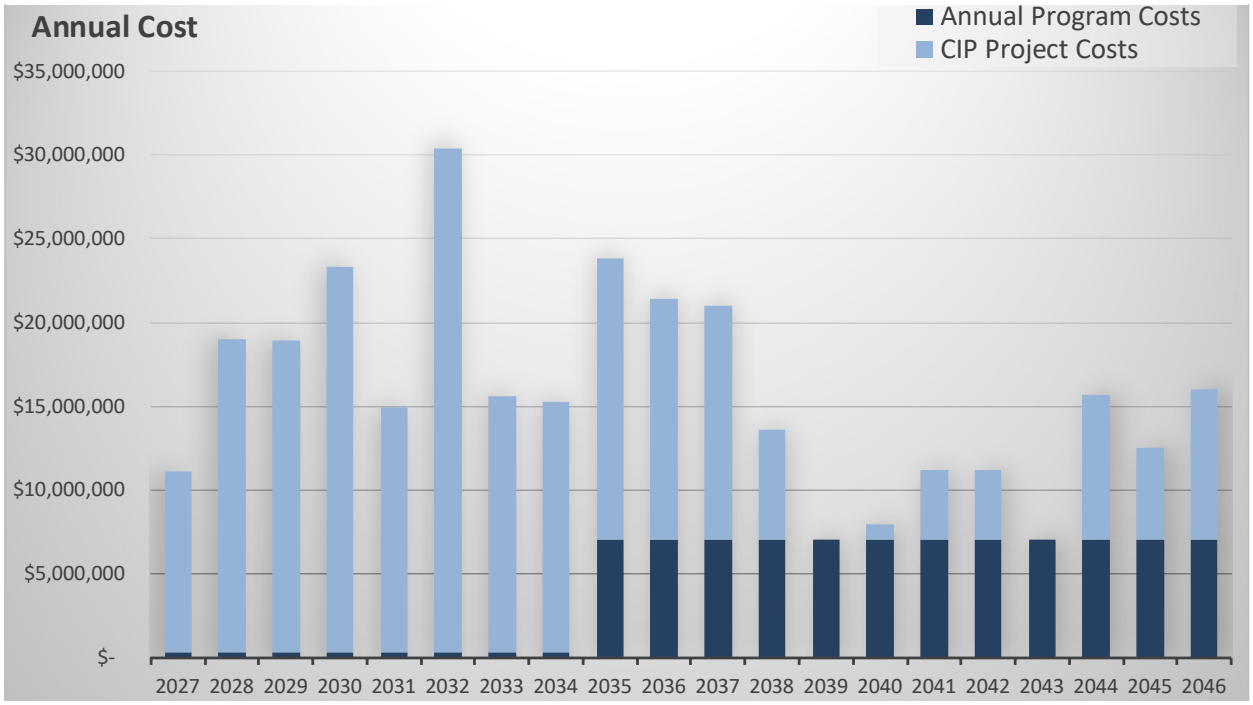


Figure 10.4 CIP Annual Cost

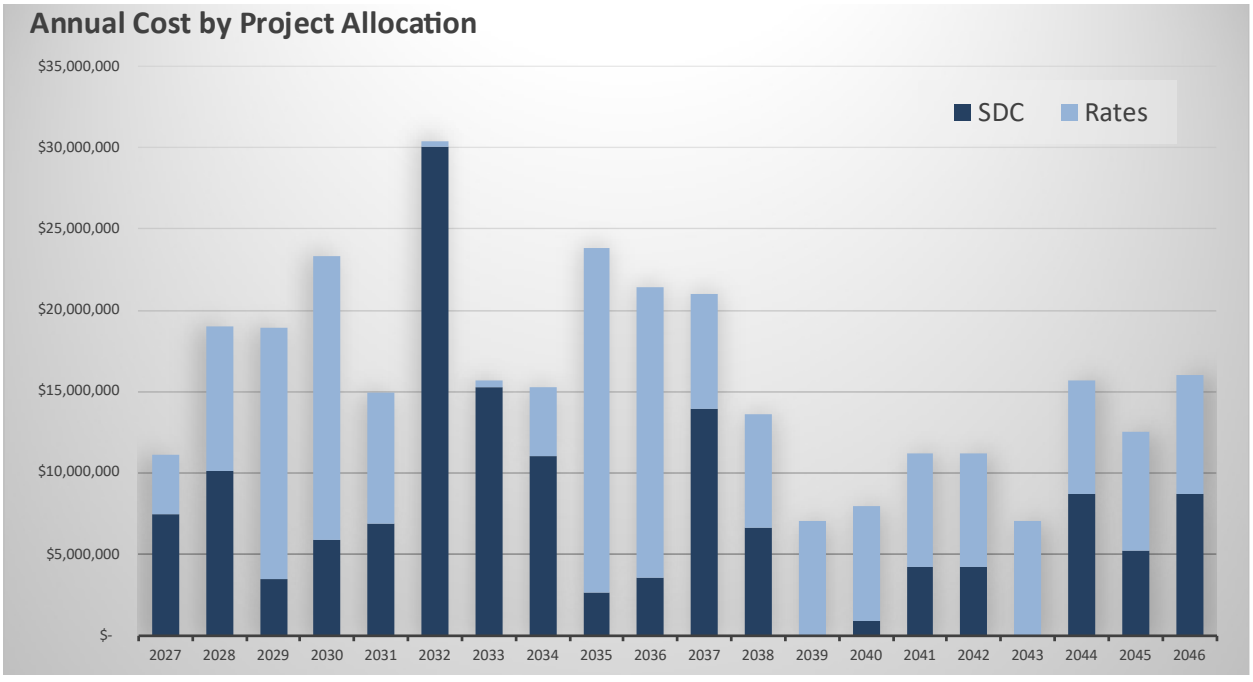


Figure 10.5 CIP Annual Cost by Project Allocation

APPENDIX A

ADOPTING RESOLUTION

~ To be included in a future submittal. ~

APPENDIX B

SEPA - AGENCY COMMENTS

~ To be included in a future submittal. ~

APPENDIX C

NOTICE OF DETERMINATION OF NON SIGNIFICANCE

~ To be included in a future submittal. ~

APPENDIX D

AGENCY COMMENT LETTERS AND RESPONSES

~ To be included in a future submittal. ~

APPENDIX E

LOCAL GOVERNMENT CONSISTENCY DETERMINATION

~ To be included in a future submittal. ~

APPENDIX F

PROJECT APPROVAL APPLICATION (PAA) FORM

Drinking Water

Project Approval Application (PAA) Form

331-149 F • Revised 3/24/2026

Instructions

Please complete all appropriate sections of this application form and include them with your project. You must submit them electronically. Before submitting your documents and the PAA form, please check with your Drinking Water staff contact. An administrative staff member will set up a free Box.com folder to transfer your project documents to us electronically.

Use the interactive map on our Drinking Water Contacts and Office Location webpage to find program staff assigned to your county. Email ODWOperations@doh.wa.gov Phone 360-236-3100

Water System Information

CAMAS MUNICIPAL WATER SEWER SYSTEM	108002
Water System Name	PWS ID #
2026 Water System Plan Update	Clark
Submittal Description	County
A-Community	10,000 or more
Classification	# of Service Connections

Owner Information

City of Camas			108002
Name			Owner ID #
publicworks@cityofcamas.us			360-817-1563
E-mail address			Phone
616 NE 4th Ave.	Camas	WA	98607
Mailing address	City	State	Zip

Project Contact Information

Rob Charles		Utilities Manager	
Name/Position			
RCharles@cityofcamas.us		360-817-7003	
E-mail address		Phone	
1620 SE 8th Ave.	Camas	WA	98607
Mailing address	City	State	Zip

Consulting/Design Engineer Information

Enter text		Carollo Engineers, Inc.	
Name/Firm			
Enter text		Enter text	
E-mail address		Phone	
760 SW 9th Ave., Ste 2000	Portland	OR	97205
Mailing address	City	State	Zip

Satellite Management Agency Information

Enter text		Enter text	
Name/SMA		SMA #	
Enter text		Enter text	
E-mail address		Phone	
Enter text	Enter text	WA	Enter Zip
Mailing address	City	State	Zip

Billing Information*

Rob Charles			
Name			
RCharles@cityofcamas.us		360-817-7003	
E-mail address		Phone	
1620 SE 8th Ave.	Camas	WA	98607
Mailing address	City	State	Zip

General Submittal Information

Does this water system or owner have other projects currently under review with unpaid invoices? ☐ Yes ☒ No

Is this a new water system? *(If so, include a completed Water Facilities Inventory Report Form with your project).* ☐ Yes ☒ No

If submitting an engineering project, is it included in an approved plan? (as applicable) ☐ Yes ☐ No ☒ N/A

Select Submittal General Category

(Complete the corresponding section of this form. Planning and engineering submittals must be submitted separately.)

☐ Engineering Submittal for Group A System

☐ Group B Workbook

☒ Water System Plan (WSP)

☐ Small Water System Management Program (SWSMP)

☐ Satellite Management Agency Plan

Is the submittal DWSRF funding related?

☐ Intention to apply for DWSRF Construction Loan (*Contact a regional planner on the timing for review/approval for funding applications.)*

☐ Existing DWSRF Application ..... Enter Application Number

☐ Existing DWSRF Loan ..... Enter Loan Number

Is the submittal related to formal enforcement?

☐ Enforcement Docket #:..... Enter Docket Number

Engineering Submittal Information

Select Type of Engineering Submittal (select one):

☐ Design Project Report
☐ Pre-Design Project Report
☐ Construction Documents
☐ Bid Documents (for SRF funding)
☐ Combined Design Project Report and Construction Documents
☐ Combined Design Project Report and Bid Documents (for SRF Funding)
☐ Non-Design Submittal (i.e. operations plan, pilot study protocol, or watershed plan)

Select Subject Matter (choose all that apply):

☐ Annual Unfiltered Surface Water Report
☐ Blending Plan
☐ Booster Station
☐ Capacity Analysis
☐ Chemical Addition Only (for groundwater)
☐ Corrosion Control Recommendation
☐ Corrosion Control Study
☐ Distribution Mains
☐ Other (Please Describe): _____
☐ Groundwater Filtration Treatment
☐ Group B System Approval
☐ GWI Determination
☐ Major System Modification
☐ Monitoring Plan (DBP, LCR, Coliform)
☐ Operations Plan
☐ Pilot Study Protocol
☐ Pilot Study Report
☐ Sanitary Control Area Mitigation
☐ Source Approval
☐ Storage Reservoir/Tank
☐ Surface Water/GWI Treatment – New
☐ Surface Water/GWI Treatment – Modified
☐ Tracer Study Plan
☐ Watershed Plan
☐ Well Site Inspection
☐ Wellfield Designation

Planning Submittal Information *(Water System Plans and Small Water System Management Programs)*

Date of DOH preplan meeting 5/6/2025. Does your plan follow the preplan checklist? ☒ Yes ☐ No

Is the system regulated by the Utilities and Trade Commission (UTC)? ☐ Yes ☒ No

Is the system proposing to do any of the following:

- Increase in the number of approved connections? ☒ Yes ☐ No
- Expand the service area or water rights place of use? ☒ Yes ☐ No
  (If yes, the plan must include completed Local Government Consistency Determination Forms from all local governments within the proposed water rights place of use, including Coordinated Water System Plan (CWSP) responsible agency, if located within a CWSSA).
- Add a new intertie to a wholesale customer? ☐ Yes ☒ No
- Request approval for distribution main submittal exception? ☐ Yes ☒ No
- Request an "Unspecified" approval designation? ☐ Yes ☒ No

Has the WSP or SWSMP been sent to the following organizations for review/comment:

- Adjacent utilities for review or a letter notifying them that a copy is available for their review? ☐ Yes ☐ No
- All local governments within the service area? ☐ Yes ☐ No
- County and/or city planning department (as applicable)? ☐ Yes ☐ No
- Federal governments, including tribes (as applicable)? ☐ Yes ☐ No

Is the system located in a Critical Water Supply Service Area with a Coordinated Water System Plan (CWSP)? ☐ Yes ☒ No

- If yes, have you sent a copy of the WSP or SWSMP to the county or agency responsible for the CWSP? ☐ Yes ☐ No

What year are the important projections in the plan dated to (water demands, CIP, and budget)? 2046
(WSPs can be approved for up to 10 years from date of approval [not date of submittal], but approval will be limited to the projections provided in the plan. This does not apply to SWSMPs.)

Satellite Management Agency Plan Information

☐ Ownership only ☐ Management and Operations only ☐ Ownership, Management & Operations

Are you requesting approval as a new SMA? ☐ Yes ☐ No

If the SMA plan is combined with a water system plan submittal, where is the SMA Notice of Intent Form located in the plan? *SMA Notice of Intent* 331-590 Enter Location in Plan

List the counties the SMA is requesting approval to serve: Enter Counties

Washington State Department of HEALTH

To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email doh.information@doh.wa.gov. If in need of translation services, call 1-800-525-0127.

APPENDIX G

DOH WATER SYSTEM PLAN CHECKLIST

Department of Health, Office of Drinking Water
Southwestern Regional Office
Pre-Plan Agreement

Water system name:	Camas Municipal Water Sewer System	**Preplan date:**	May 6, 2025
PWS ID#/County:	108002	**WSP submittal due date:**	May 6, 2026
Planning Purpose:	Large System WAC 246-290-100(2)(a)	**Target year of approval:**	2026-2027
Operating Permit Color:	Green	**Existing WSP expiration date:**	August 1, 2030
Initial/Update/Amend:	Update	**End of "plan approval period":**	up to 2038 (last year of all projections)
Number of Connections:	11842		

WAC 246-290-100 requires purveyors of new water systems, systems in a water coordination act area, systems serving 1,000 or more service connections, systems with an unspecified number of approved connections and systems that are growing or experiencing capacity problems to gain approval for a Water System Plan (WSP). The purpose of this preplan is to determine the level of detail of the WSP and establish an approval schedule. This agreement is valid until the WSP submittal due date above. After that date, the agreement will need to be renegotiated. The operating permit color may change to yellow if the WSP is not approved by the existing WSP expiration date noted above.

Planning forms and other resources, including the current Water System Planning Guidebook and additional information can be found HERE.

Water System Representatives:	Consultants	ODW SW Regional Staff:	External Agency Representatives
Rob Charles, Camas Utilities Manager	Jill Kjellsson, Carollo Engineers	Scott Pollock, Regional Engineer	Matthew Kogle, Dept. Of Ecology
	Max Mozer, Carollo Engineers	Meredith Jones, Regional Planner	
	Matt Huang, Carollo Engineers		

Include in plan	Content Description	*WSP Page #*
Y	Project Approval Application (PAA, DOH Pub 331-149 F)	
Y	Signed and dated stamp from a Professional Engineer licensed in the State of Washington	
Chapter 1 – Description of Water System		
Y	Ownership and management, including Satellite Management Agency (SMA), if applicable	
Y	System history and background	
Y	Related plans	
Y	Service area and land uses: • Service area map including retail service area, service area, future service area, water rights place of use • DOH Pub. 331-432 – Service Area Guidance • Existing zoning map(s) for all jurisdictions within future service area • Future land use map(s) for all jurisdictions within future service area (CWSP Counties Only)	
Y	Service area and other applicable policies	
Y	Duty to serve statement for the retail service area • How does the system define "timely and reasonable"? • Are there appeals processes for when a customer disagrees with a timely and reasonable determination?	
Y	Consistency with the watershed plan for Salmon/Washougal WRIA #28.	

Chapter 2 – Basic Planning Data		
Y	Existing population, service connections & equivalent residential units (ERUs) • ERUs must be based on full-time residential connections only.	
Y	Existing production/usage: monthly/annual per source, annual usage by customer class, distribution system leakage (DSL) • Authorized Use and DSL, rather than "unaccounted-for water". • Additional information is available in our WUE Guidebook, Chapter 6, beginning on page 28 (PDF page 33).	
Y	Seasonal variations in use by customer class (1000+ connections)	
Y	Water supply characteristics	
Y	Water supply reliability evaluation: Include depth-to-water measurements	
Y	Interties: agreements, existing/proposed, emergency, metering	
Y	**Plan approval period & 20-year projections for:** Population, service connections, & ERUs (Recommend 13- and 23-year)	
Y	Projections and land use discussion	
Y	Future water demand without water use efficiency savings	
Y	**Water rights self-assessment: Consult with Ecology prior to plan submittal** Describe water rights and complete water rights self-assessment form for existing, plan approval period, and 20 years.	
Chapter 3 – System Analysis		
Y	Asset Management Inventory: text description and facilities map of major assets, asset management table or spreadsheet	
Y	Asset condition assessment and criticality ratings (recommended)—RCAC Template (optional format)	
Y	Water quality analysis	
Y	System design standards	
Y	Capacity analysis (Must include WSDM Worksheet 4-1, ERU Capacity Summary)	
Y	Hydraulic analysis	
Y	Summary of system deficiencies	
Chapter 4 – Water Use Efficiency (WUE)		
Y	**Metering Program:** sources, services, and non-emergency interties	
Y	**Distribution System Leakage (DSL)** Summarize DSL and compare to WUE annual reports; discuss DSL calculation methodology, leak detection plan	
Y	**Water Loss Control Action Plan (WLCAP) – 3-year average 13.1% (2021, 2022, 2023)** If DSL exceeds 10 percent (3-year average), submit the WLCAP per WAC 246-290-820(4) • Include implementation schedule and budget items, as applicable.	
Y	**Water Use Efficiency WUE Program**	
Y	Describe the current (WUE) program	
Y	Updated WUE goal(s). Document public adoption process (include public notice, signed minutes, signed resolution). • Consider doing this after our review of your first draft.	
Y	Describe measure(s) that will be implemented to achieve the goal(s). Include schedule & costs in the budget – 10,000 to 49,999 connections: 9 additional measures.	
Y	Describe the process used to evaluate WUE measure(s) you did not implement	
Y	Describe or provide an example of yearly consumer education (cannot count as a measure)	
Y	Estimate projected water savings from selected WUE measure(s)	

Y	Describe process that will be used to determine effectiveness of the WUE program	
Y	Plan approval period and 20-year water demand projection with WUE savings (recommend 13- and 23-year)	

Y	**Additional WUE for systems with 1000+ Connections**
	• Estimate water saved from implemented WUE measure(s) during the previous plan approval period
	• Water demand forecast (if all cost-effective WUE measure(s) are implemented)
	• For WUE measure(s) evaluated, but not implemented:
	  ○ Quantitative evaluation of WUE measure(s) cost-effectiveness, including marginal costs of water production
	  ○ Evaluate WUE measure(s) for cost-effectiveness if shared with other systems
	  ○ Quantitative/qualitative evaluation of measure(s) to determine cost-effectiveness from societal perspective
	• Explore reclaimed water opportunities	

Chapter 5 – Source Water Protection		
Y	Sanitary Control Area (SCA): description of physical and legal protections for each groundwater source, including deeds, covenants, easements, restrictions, fencing, signage, etc.	
Y	Wellhead protection program/update: must include updated TOT map, contaminant source inventory, and notifications • WAC 246-290-135: Source Water Protection • 331-106 Wellhead Protection Requirements	
***N**	Watershed control program for all surface water/GWI sources— *Please include watershed and other information relative to your two emergency surface water sources.	
Chapter 6 – Operation and Maintenance Program		
Y	Water system management and personnel, including operator certification and CCS	
Y	Operations and preventative maintenance schedule	
Y	Comprehensive water quality monitoring: • Water Quality Monitoring Schedule (WQMS) • Provide LCR and DBP monitoring schedule(s), map(s), and letters. • Coliform monitoring plan, including addresses and map. Update for RTCR. DOH Guidance and Template	
Y	Emergency response program, including Water Shortage Response Plan per WAC 246-290-420. • Consider Tier 1 Public Notification process, and multiple channels for notification.	
Y	Cross-connection control (CCC) program • Systems with 1000+ connections: provide a copy of your CCC annual summary report form	
Y	Sanitary survey findings	
Y	Recordkeeping, reporting, and customer complaint program	
Y	Water treatment (surface, disinfection, contaminant) operations	
Y	Summary of O&M deficiencies; include cost in budget	
Chapter 7 – Distribution Facilities Design and Construction Standards (optional)		
Y	Project review procedures	
Y	Policies and requirements for outside parties	
Y	Design and construction standards for distribution-related projects.	
Y	Construction certification	

Chapter 8 – Capital Improvement Program (CIP) (Recommend 13- and 23-year CIP info.)		
Y	CIP summary and schedule for the plan approval period (discuss prioritization, project assessment and value planning) • Include any items that were identified as required for addressing capacity-related deficits.	
Y	20-year (minimum) CIP for projects beyond the plan approval period	
Chapter 9 – Financial Program (Recommend 13- and 23-year financial info.)		
Y	Financial viability (discuss full cost of service, cost recovery, reserves)	
Y	Summary of past income and expenses, sufficient to establish trends (previous plan approval period or minimum 3 years)	
Y	Balanced operational and capital budget projections for plan approval period	
Y	Show operational, capital, and emergency reserve goals. Describe the revenue requirements to achieve them. Demonstrate annual progress toward goals.	
Y	Debt-financed capital improvements	
Y	Water rate evaluation: • Describe current rate structure: **Block rate based on meter size and rate class**. (Not inclining block rate.) • Evaluate the feasibility of implementing a rate structure that encourages water demand efficiency. • Evaluate rate affordability and customer assistance programs. Provide rate that would be unaffordable, income below which current and future rates are unaffordable, and programs available for low income customers.	
N	~~Water system regulated by the Utilities and Transportation Commission (UTC)?~~	
Chapter 10 – Miscellaneous Documents		
Y	Updated Water Facilities Inventory (WFI) with authorized signature	
Y	Local Government Consistency Determination Forms: City and County planning departments.	
Y	Informational meeting for the consumers (include public notice and signed minutes)	
Y	Adjacent utilities notice, review, and comment of draft WSP. Attach notice and comments received.	
Y	SEPA: Signed Environmental Checklist and Threshold Determination. The water system is lead agency.	
Y	Agreements: SMA, intertie, service area, franchise, wheeling, mutual aid, inter-local and other agreements	
Y	Correspondence	
Y	Supporting documents	
Miscellaneous Documents – Post review		
	Plan approval by water system governing body. Include signed meeting minutes or signed resolution. NOTE: DO NOT approve the plan until after the draft review is completed and you have received authorization to proceed with approval from the Regional Planner.	

GENERAL INFORMATION AND REQUIREMENTS:

- **Copies – Provide an electronic copy of the WSP. DOH will send to Ecology. Contact DOH SWRO admin for box.com login swro.admin@doh.wa.gov**
- **Provide this document with first draft.** Use the right side column of the checklist to provide page numbers for required content.
- **Fee – The total review fee for the first and second drafts for 10,000 or more connections is $5,484. Additional drafts are an additional $1,371. Fees are subject to change.**
- **REVIEW TIMELINE – Plans are reviewed in the order received.** DOH will respond within ninety (90) days of receiving draft plans (i.e. 90 days after the first draft, and again, 90 days after the second draft). Dept. of Ecology has 60 days to review, and that is concurrent with the DOH 90-day period.

WAC 246-290-100 – Water System Plans
DOH Pub. 331-432 – Service Area Guidance
DOH Pub. 331-438 – Service Area Policies
DOH Pub. 331-366 – Duty to Provide Service
DOH Pub. 331-568 – Local Government Consistency Determination Form
DOH Pub. 331-370 – Water Right Self-Assessment
WAC 246-290-221 – Water Demand Design Criteria
DOH Pub. 331-123 – Water System Design Manual
DOH Pub. 331-375 – Water Use Efficiency Guidebook
DOH Pub. 331-036 – Preparing a Coliform Monitoring Plan
DOH Pub. 331-211 – Emergency Response Planning Guide
DOH Pub. 331-234 – Cross Connection Control Planning Guide
DOH Pub. 331-355 – Cross Connection Control Rules and Definitions

RCAC Asset Management Interactive Spreadsheet
Customer Assistance Programs website
DOH Pub. 331-134 – Small Water System Management Program
DOH Pub. 331-453 -- SCA Fact Sheet
DOH Pub. 331-048 -- SCA Legal Protections
DOH Pub. 331-106 -- Source Water Protection Requirements
DOH Pub. 331-018 -- Wellhead Protection Program Guide
DOH Pub. 331-368 -- Approval Requirement for Water System Plans
DOH Pub. 331-368 -- Timely and Reasonable Water Service
DOH Pub. 331-445 -- Asset Management for Small Water Systems
DOH Pub. 331-634 -- Wellhead Protection Areas: Protecting Drinking Water
DOH Pub. 331-301—Guide for Preparing Water Shortage Response Plans
DOH Pub. 331-327 -- Water Rates Paying for drinking water

Additional Notes:

- What are 3 things the City has accomplished in this past planning period that you're proud of or that have made a positive impact on the system and/or customers?
  - Wrapping up reservoir reconstruction, with booster station.
  - Working on interconnection between wells 6 and 14, which will enable more water going into distribution system.
  - PFAS treatment system. Project has been approved and going to bid soon.
- What are 3 things the City would like to accomplish in the next planning period?
  - Address water rights issues.
    - New source in existing wellfields.
    - Well 13 or Well 13B.
    - Steigerwald.
- What are your top concerns for this upcoming planning period?
  - Other wellfields that will need PFAS treatment.

APPENDIX H

INTERTIE AGREEMENTS

INTERLOCAL AGREEMENT: EMERGENCY INTERTIE BETWEEN WATER SYSTEM OPERATIONS OF THE CITY OF VANCOUVER AND THE CITY OF CAMAS

THIS AGREEMENT is made and entered into this 2nd day of October, 2017, by and between the City of Camas, a municipal corporation of the State of Washington, and the City of Vancouver, a municipal corporation of the State of Washington, hereinafter referred to as the "Parties".

IN CONSIDERATION of the mutual promises, agreements, and covenants contained herein, it is hereby agreed, by and between the Parties, as follows:

RECITALS

WHEREAS, the Parties have developed a Coordinated Water System Plan ("CWSP") pursuant to the Public Water System Coordination Act of 1977, RCW Chapter 70.116; and

WHEREAS, the CWSP designates individual water service areas to avoid unnecessary duplication; and

WHEREAS, the CWSP anticipates the development of physical interconnection of those water systems at points known as interties; and

WHEREAS, water system interties provide mutual benefits to water system operators by creating water supply redundancies; and

WHEREAS, the City of Vancouver and the City of Camas are authorized by Chapter 39.34 RCW, the Interlocal Cooperation Act, to enter into cooperative agreements to jointly exercise their powers, privileges and authorities; and

WHEREAS, the Parties are entering into this Agreement to provide water service to each other during emergency conditions.

NOW THEREFORE, the City of Vancouver and the City of Camas having entered into this Agreement by their signature, agree with the following:

Section 1. PURPOSE

The purpose of this Agreement is to provide emergency water service to the requesting Party at a mutually acceptable intertie location. The intertie location is identified on Exhibit 'A.'

Section 2. CONDITIONS OF SERVICE

A. Metering

A water meter that can serve water flowing in both directions will be installed at the intertie location. The City of Vancouver will set, own and maintain the water meter.

B. Other Infrastructure

Each purveyor will own and maintain the intertie infrastructure on its respective side up to the intertie meter, including all fittings, valves, pressure reducing valves, booster pumps, piping, electrical connections, and pressure gauges. The City of Vancouver will own and maintain the meter and the meter vault and all other associated appurtenances within the vault.

C. Cost of Service

The cost of the water supplied though an intertie shall be based on the supplying Party's then current service rates, as follows:

1. When the City of Camas supplies water to the City of Vancouver, the usage charge will be based on the most current schedule of rates for the size of the meter installed based on the Inside City Commercial rate.

2. When the City of Vancouver supplies water to the City of Camas, the usage charge will be based on the inside city limits commercial rate.

Charges will be limited to water usage. There will be no monthly or system development charges.

D. Service Limitations

The Parties will use the intertie only for emergency water service. Emergency water service is defined as service during any event that requires either Party's water supply to be augmented on a temporary emergency basis and is not intended to supply base or peak supply. Because this Agreement covers only emergency water service, there is no specific time period in which water will be provided; emergency water service may be requested at any time.

Either Party can refuse to provide emergency water service if such use could result in a degradation of water quality. The City of Vancouver and the City of Camas will monitor water quality at the intertie and each water purveyor will continue to be responsible for water quality monitoring within their system. Each Party shall immediately notify the other in the event of any failed coliform bacteria sample within the system and shall discuss any potential necessary actions.

Either Party can refuse to provide emergency water service if the water is needed for their own system.

Each Party shall use reasonable efforts to provide an uninterrupted supply of water. However, neither Party guarantees the availability of water through the intertie at all times because of each Party's respective needs and water demands. Further, either Party may close the intertie until sufficient water supply exists to make water available for use by the other Party.

The volume of water made available by the supplying utility will be dependent on the size of the intertie meter and the capacity available from the supplying water system.

Neither Party will be liable for any loss or damage attributed to their failure to provide water through the intertie.

Either Party can choose to abandon the intertie if the cost to alter, maintain or replace the connection exceeds the benefit to either Party.

The City of Vancouver and the City of Camas will work together to design, construct and maintain future interties where financially feasible.

Operation of the intertie shall be under the mutual consent of the City of Vancouver Water Operations Superintendent and City of Camas Utilities Manager. Each Party shall notify the other Party in writing at least twelve (12) hours in advance of the time either party desires to receive water through the intertie. Such notice shall be delivered in person to ensure it is timely received. If an emergency requires immediate use of the intertie, verbal notification and approval will be permitted, with follow-up written notification to occur as soon as practicable under the circumstances. Follow-up written notification of such emergency request shall be made by each Party to the other party within not more than three (3) days after the initiation of such emergency water usage. Upon receiving a request, the responding Party will provide available water service within a reasonable amount of time.

Section 4. GENERAL TERMS

A. Force Majeure

Notwithstanding anything contained in this Agreement to the contrary, neither Party will be deemed liable or to be in default for any delay or failure in performance under this Agreement deemed to result from acts of God, acts of civil and military authority, acts of public enemy, war, or any like cause beyond the Parties reasonable control.

B. Parties' Interests

Neither Party shall by virtue of this Agreement acquire any proprietary or governmental interest in the water system of the other Party. Each Party shall be solely responsible for the operation and maintenance of its own system of water distribution.

C. Water Use Efficiency Programs

Water use efficiency programs, data collection, water demand forecasting and other operational matters will be coordinated between the City of Vancouver and the City of Camas through the CWSP. Additional coordination activities are not necessary for emergency interties.

D. Severability

Should any provision of this Agreement be held by a tribunal of competent jurisdiction to be invalid or unenforceable, the remainder of the Agreement will remain in full force and effect.

E. Assignment

Neither Party shall assign this Agreement, or any rights under it, or delegate any obligations under it, without first obtaining the written consent of the other Party.

F. Amendments

This Agreement may only be changed, modified, or amended upon the unanimous written approval of both parties.

G. Third Parties

The terms of this Agreement are not intended to establish or create any rights in any persons or entities other than the Parties to this Agreement.

H. Employment Status

In providing services under this Agreement, none of the officers, officials, agents or employees of the parties hereto are employees of the other party to this Agreement for any purpose, including responsibility for any Federal or State tax, industrial insurance, or Social Security liability.

I. Administration

No new or separate legal or administrative entity is created to administer the provisions of this Agreement. This Agreement shall be administered by the respective parties to this

Agreement, which shall each be individually responsible for financing its own actions pursuant to this Agreement.

J. Choice of Law

This Agreement is made and entered in the State of Washington. Any dispute concerning its terms shall be determined by the courts of competent jurisdiction in and for Clark County, Washington.

K. Effective Date and Duration

This Agreement shall become effective upon the occurrence of the approval of this Agreement by the Parties' respective governing bodies, execution of this document by their authorized representatives, and recording with the County auditor. This Agreement shall remain in effect until terminated by either Party in accordance with this Agreement.

L. Termination

Either party may terminate this Agreement by providing sixty (60) days prior written notice to the other party. Upon termination, each party continues to own, is responsible for, and may dispose of the intertie infrastructure for which they are the designated owner through this Agreement.

M. Notices

Any notice to be given or any documents to be delivered by any party to the other shall be delivered in person or, if not urgent, sent by regular U.S. mail and addressed to the parties to this Agreement at the following addresses:

For the City of Vancouver:

Director of Public Works
City of Vancouver
415 W. 6th Street
P.O. Box 1995
Vancouver, WA 98668-1995

For the City of Camas:

Public Works Director
City of Camas
616 NE 4th Avenue
Camas, WA 98607

N. Entire Agreement

This Agreement comprises the entire understanding between the City of Vancouver and the City of Camas with respect to the subject matter hereof, and there are no representations, inducements, promises, or agreements, oral or otherwise, not embodied herein. Any and all prior negotiations, discussions, commitments, and understandings relating hereto are merged herein.

O. Counterparts

This Interlocal Agreement may be executed simultaneously in several counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument.

P. Filing

The Parties agree that there shall be two (2) duplicate originals of this Interlocal Agreement procured and distributed for signature by the necessary officials of the parties. Upon execution, one executed original of this Interlocal Agreement shall be retained by each Party. Within five (5) days from the date of execution of this Interlocal Agreement, the Parties will cause a copy of this Agreement to be filed with the County auditor in accordance with Chapter 32, Laws of Washington 2006 (RCW 39.34.040). Upon execution of the originals and filing of a copy with the County auditor, each such duplicate original shall constitute an agreement binding upon all Parties.

IN WITNESS WHEREOF, the parties have executed this agreement at Vancouver, Washington this 2nd day of September, 2017. October 3

CITY OF VANCOUVER

By: _____
City Manager

CITY OF CAMAS

By: _____
Mayor

Approved as to form:

_____
City Attorney

Attest:

_____
City Clerk

Approved as to form:

_____
City Attorney

Attest:

_____
City Clerk

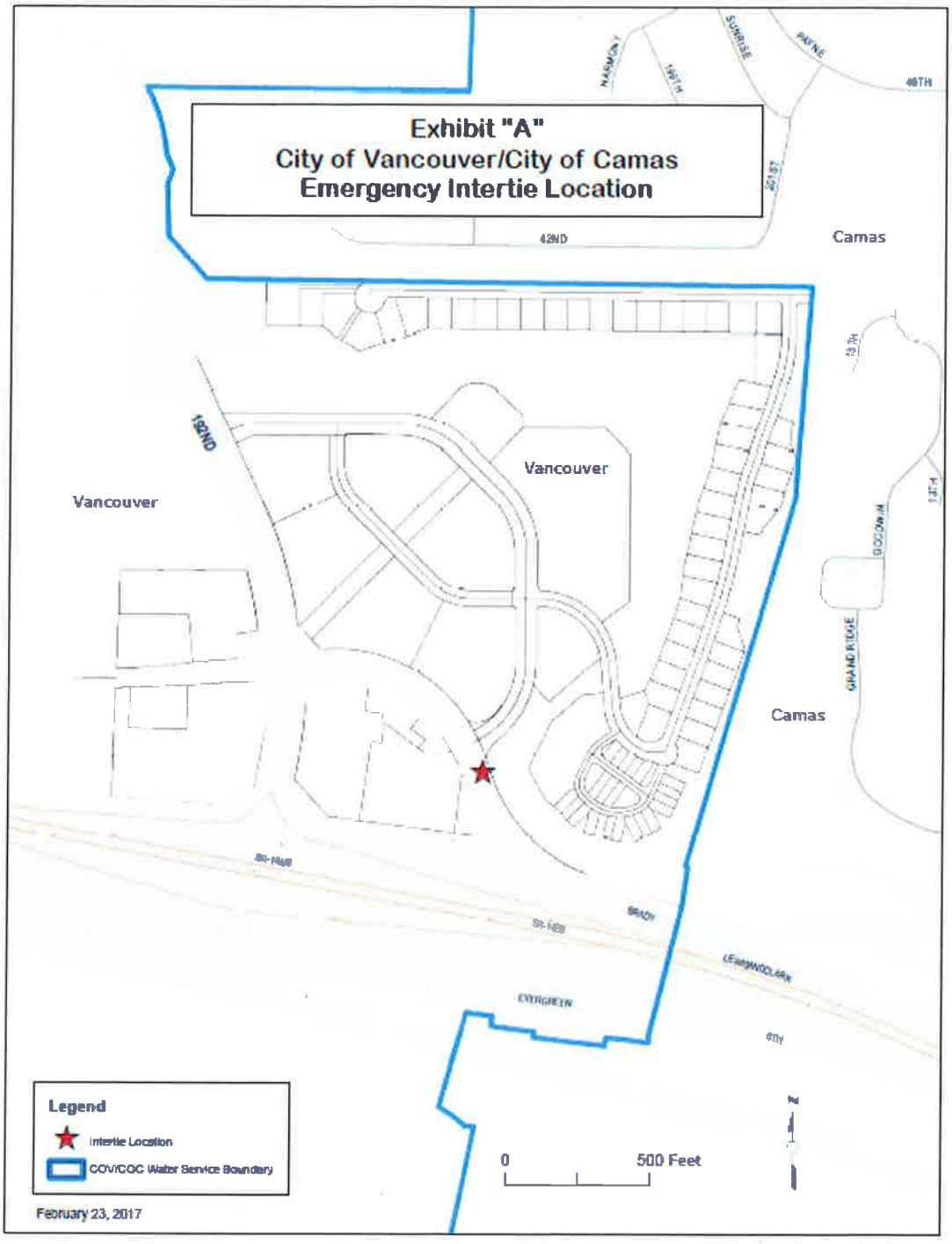


Exhibit "A"
City of Vancouver/City of Camas
Emergency Intertie Location
Camas
Vancouver
Vancouver
Camas
192ND
42ND
Legend
Intertie Location
COV/CGC Water Service Boundary
0
500 Feet
February 23, 2017

INTERLOCAL AGREEMENT FOR ADJUSTING WATER UTILITY SERVICE BOUNDARIES AND WATER SERVICE SHUT OFF

BETWEEN

City of Vancouver and City of Camas

THIS AGREEMENT, entered into by and between City of Vancouver ("Vancouver") and City of Camas ("Camas"), (hereinafter referred to collectively as the Water Purveyors), WITNESS THAT:

WHEREAS, Clark County and the Water Purveyors conduct capital facilities and land use planning under the Growth Management Act as adopted by the State of Washington and subsequently amended; and

WHEREAS, RCW 70.116, *Public Water System Coordination Act*, and WAC 246-293-250 require development of a Coordinated Water System Plan, including establishment of service area boundaries by written agreement among purveyors; and

WHEREAS, the designation of water service area boundaries helps facilitate efficient planning and delivering of water services within Clark County, avoid unnecessary duplication of water services, and provide water operation predictability to the water purveyors, Clark County, and the residents served by the public water system; and

WHEREAS, the designation of water service area boundaries helps assure that available water supply sources of the Water Purveyors will be utilized in an efficient manner; and

WHEREAS, Vancouver and Camas entered an Interlocal Agreement for Adjusting or Confirming Future Water Utility Service Boundaries, effective January 10, 2012, which designated service area boundaries for the east boundary for Vancouver and the west boundary for Camas; and which was reviewed and approved by the Clark County Board of Commissioners pursuant to RCW 70.116.040; WAC 246-293-250; and 246-293-290; and

WHEREAS, without the installation of additional tanks and pumps, Vancouver cannot provide reliable water service at an adequate pressure to a portion of land currently located within Vancouver's water service area boundary, which is shown as the "Area Proposed to be Transferred to Camas" in Exhibit 'A' (hereinafter "Affected Area"); and

WHEREAS, Camas's water system has water supply at adequate pressure to provide the Affected Area with reliable water service; and

WHEREAS, it is in the best interests of Vancouver and Camas to make adjustments to the water service area boundaries such that Camas will now provide water service to the Affected Area; and

WHEREAS, Vancouver will provide sewer, stormwater and other municipal services within the Affected Area; and

WHEREAS, Vancouver engages in a lengthy process including multiple steps and actions to collect delinquent sewer and stormwater service charges. This process consists of the following, (1) past due reminder sent 25 days after the bill date to both the service address and the property owner of record, (2) past due final notice is sent 37 days after the bill date to both the service address and the property owner of record to notify that water service will be shut-off if payment is not received, (3) after the 45th day the account is past due, water service is shut-off, (4) after 12 months of non-payment, a notice of intent to file lien is mailed, (5) 30 days after the intent to file lien is sent, lien is filed with the Clark County Auditor and property owner notified, (8) after 24 months of non-payment, foreclosure process commences; and

WHEREAS, almost all of the delinquent sewer and stormwater service charges are paid during this lengthy collection process, and prior to the filing of a foreclosure action; and

WHEREAS, when other efforts fail, a cost effective mechanism for collecting payment of delinquent sewer and stormwater service charges is Vancouver's ability to shut off (terminate) water service to a property; and

NOW THEREFORE, in consideration of covenants, conditions, performances, and promises hereinafter contained the undersigned Water Purveyors hereto agree as follows:

I. Purpose

The purpose of this Agreement is to adjust Water Service Area boundaries of the Water Purveyors that are parties to this Agreement and to provide a mechanism for shut off of water service by Camas at the request of Vancouver for delinquent sewer and/or stormwater service charges.

II. Effective Date

This Agreement shall become effective upon the occurrence of the approval of this Agreement by the individual Water Purveyors' governing bodies, execution of this document by their authorized representatives, the approval of this Agreement by the Clark County Board of County Council, and recording with the County auditor.

III. Duration

This Agreement shall remain in effect with regard to the individual Water Purveyors until terminated. Such termination shall occur through the establishment of future water service boundaries with the next update of the Coordinated Water System Plan.

IV. Property

Nothing in this Agreement shall create or transfer any interest in real or personal property among Water Purveyors. In the event any adjustment of a Future Water Service Area boundary requires transfer of water facility assets from one Water Purveyor to another Water Purveyor, a separate written agreement shall address the transfer of such assets.

V. Administration

No new or separate legal or administrative entity is created to administer the provisions of this Agreement. This Agreement shall be individually administered by the respective Water Purveyors, which shall each be individually responsible for financing its own actions under this Agreement.

VI. Scope

1. **Service Area Boundaries**. The undersigned acknowledge that the map attached to this agreement identified as Exhibit 'A" clearly identifies the current western water service boundary for Camas and eastern water service boundary for Vancouver as well as the proposed water service boundary to be established through this Agreement. In addition, Exhibits B and C identify the final service boundaries for Vancouver and Camas, respectively, which will become effective upon execution of this Agreement. This signed Interlocal Agreement verifies that there are no service area conflicts with adjacent water utilities.

2. **Boundary Adjustments.** If, at some time in the future, it is in the best interests of the undersigned parties to make service area boundary adjustments, such modifications must have the written concurrence of all involved parties and the proper legislative authority/authorities, and must be noted and filed with Clark County and Washington State Department of Health.

3. **Water Service Shut Off.** After Vancouver has completed its delinquent sewer and/or stormwater service charge collection process for property that has delinquent charges, Vancouver's Public Works Director or designee may file a written request with the Camas Public Works Director or designee to shut off water service for such property. Upon receipt of the request, the Camas Public Works Director or designee will shut off the water service following the Camas procedure and requirements for shutting off water service for nonpayment of Camas water service charges. The water service shall remain shut off until the delinquent sewer and/or stormwater service charges, plus penalties, interest and fees, have been paid in full or the property owner and Vancouver have entered into a payment arrangement. The Vancouver Public Works Director or designee shall notify the Camas Public Works Director or designee when the charges have been

paid in full or the payment arrangement has been entered into. Vancouver estimates that requests to shut off water service will be infrequent.

VII. Interpretation

This Agreement has been and shall be construed as having been made and delivered in the State of Washington and it is mutually agreed and understood by the Water Purveyors that this Agreement shall be governed by the laws of the State of Washington. Venue for any lawsuit arising from or related to this Agreement shall be the Superior Court of Clark County, Washington.

VIII. Amendments/Modification

The provisions of this Agreement may be amended only upon the mutual consent of the Water Purveyors. No amendments to the terms of this Agreement shall be valid unless made in writing and formally approved and executed by the duly authorized agents of the Water Purveyors and Clark County, and recorded with the Clark County Auditor.

IX. Severability

If any section or part of this Agreement is held by a court to be invalid, such action shall not affect the validity of any other part of this Agreement.

X. Entire Agreement

This Agreement contains all of the agreements of the Water Purveyors with respect to the subject matter covered or mentioned herein, and no prior Agreement shall be effective to the contrary.

XI. Counterparts

This Interlocal Agreement may be executed simultaneously in several counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument.

XII. Document Filing

The Water Purveyors agree that there shall be one (1) original of this Agreement procured and distributed for signature by the necessary officials of the Water Purveyors. Upon execution, this Agreement shall be retained by the Clark County Community Planning and each Water Purveyor shall retain one (1) copy. The Parties shall cause a copy of this Agreement to be recorded with the Clark County Auditor.

As specified in WAC 246-293-250, Service Area Agreements-Requirements, this Agreement shall become effective once this document is approved by the Clark County

Board of County Council. The Parties will ensure this Agreement is filed with the County auditor within five (5) days of approval by the Clark County Board of County Council.

This Interlocal Agreement for Adjusting Water Utility Service Boundaries and Water Service Shut Off is hereby approved.

CITY OF VANCOUVER

By: _____
City Manager

CITY OF CAMAS

By: _____
Mayor

Approved as to form:

_____
City Attorney

Approved as to form:

_____
City Attorney

Attest:

_____
City Clerk

Attest:

_____
City Clerk

APPROVED BY CLARK COUNTY BOARD OF COUNTY COUNCIL, CLARK COUNTY, WASHINGTON

_____
Marc Boldt, Chair

_____
John Blom, Councilor

_____
Jeanne E. Stewart, Councilor

_____
Eileen Quiring, Councilor

_____
Julie Olson, Councilor

APPROVED AS TO FORM ONLY:
Anthony F. Golik, Clark County Prosecutor

By: _____
Christine Cook, Senior Deputy Prosecuting Attorney

Resolution No. —

Date: 10-24-17

CLARK COUNTY, WASHINGTON 1844

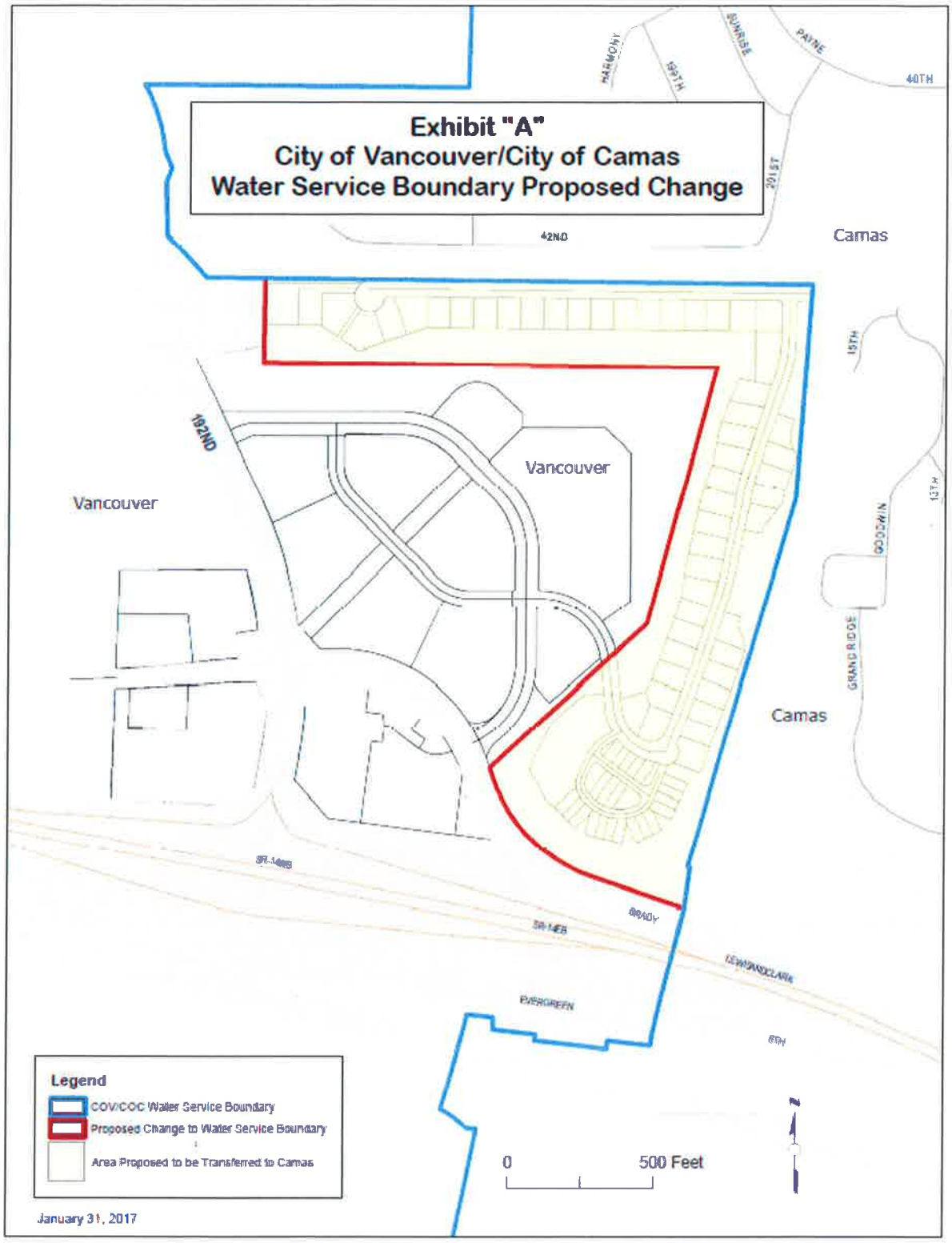
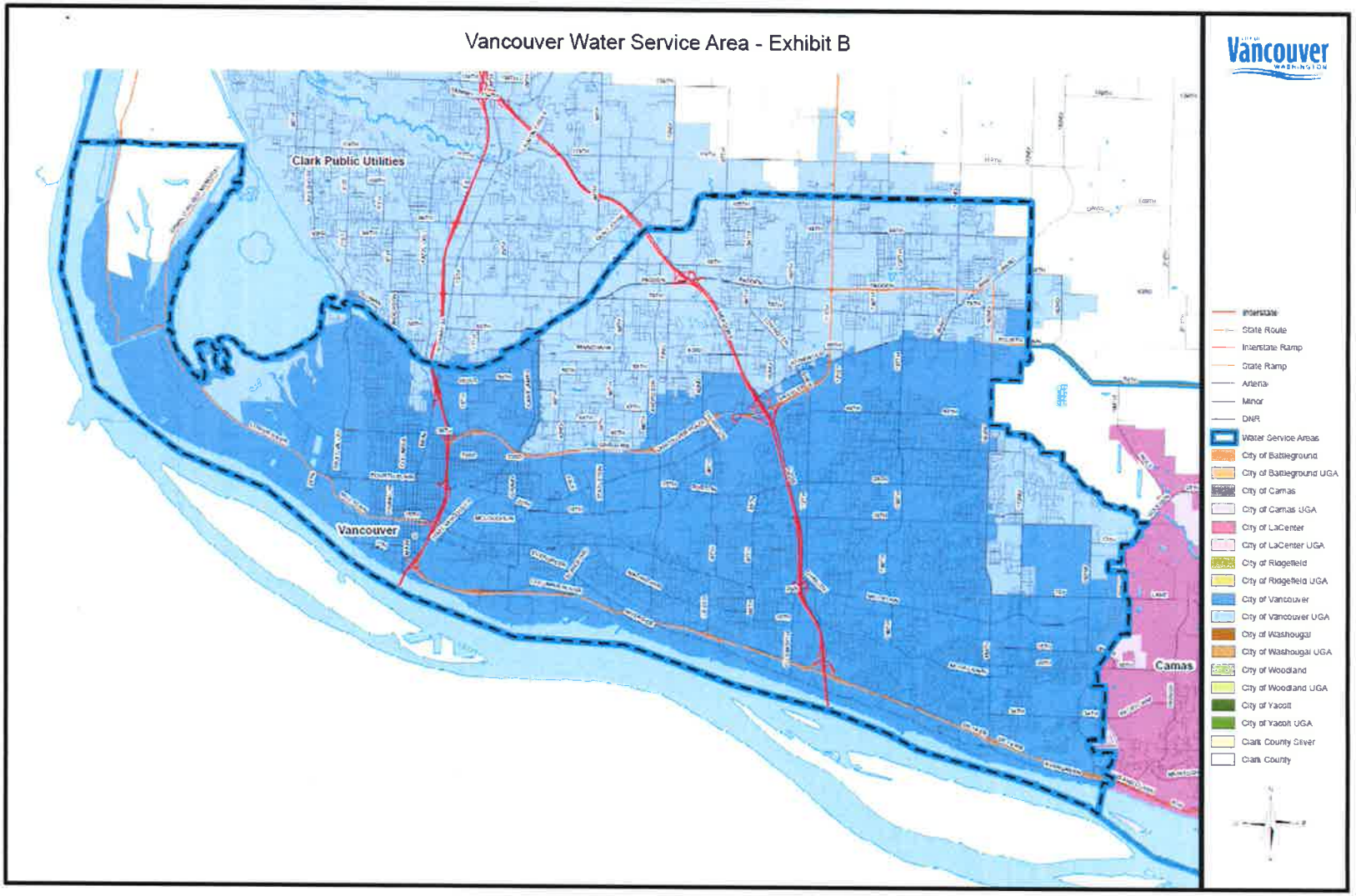
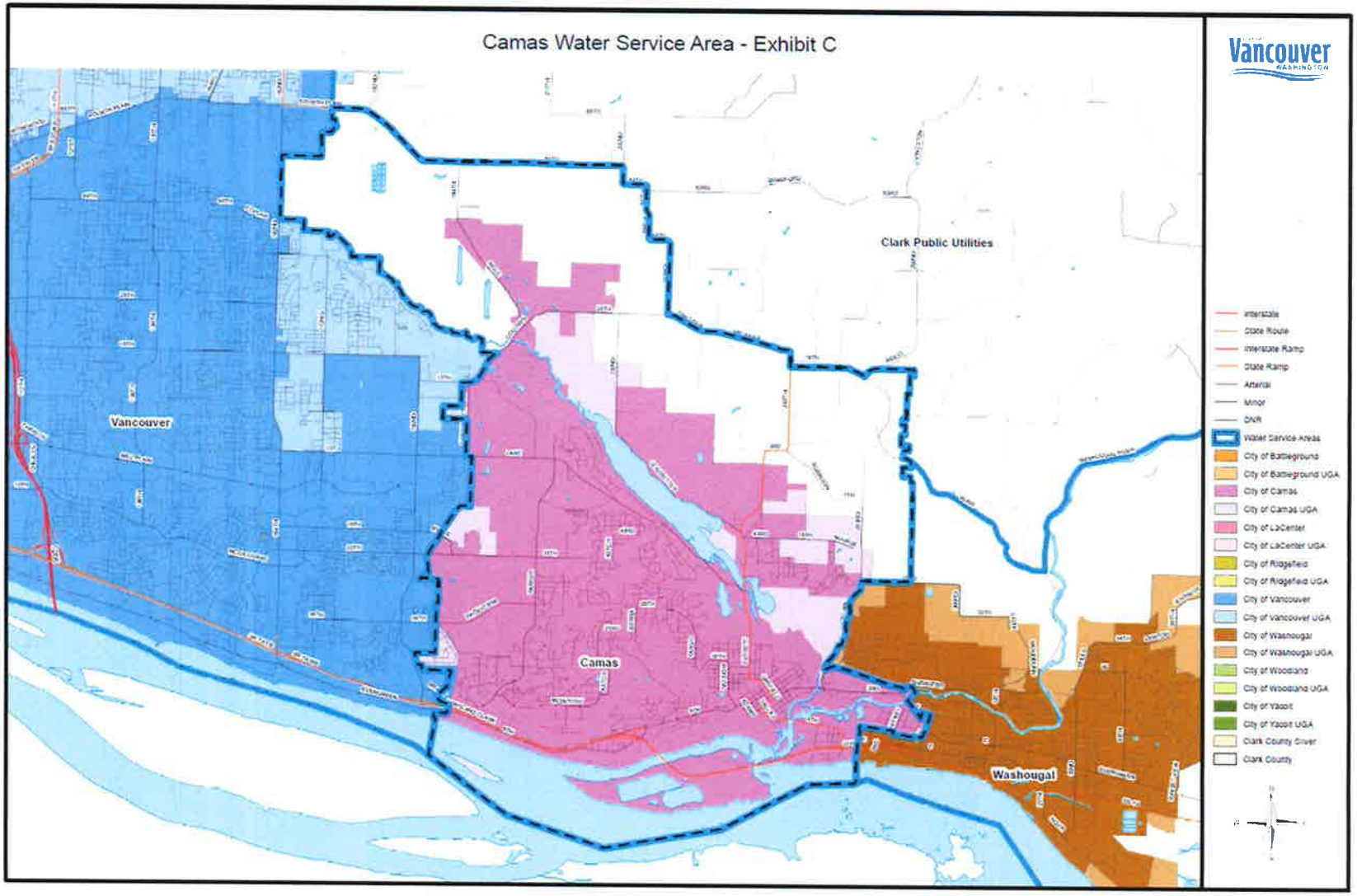


Exhibit "A"
City of Vancouver/City of Camas
Water Service Boundary Proposed Change
Camas
Vancouver
Vancouver
Camas
192ND
42ND
40TH
PAYNE
SUNRISE
HARMONY
199TH
201ST
15TH
137TH
GOODWIN
GRAND RIDGE
BRADY
EVERGREEN
6TH
Legend
COV/COC Water Service Boundary
Proposed Change to Water Service Boundary
Area Proposed to be Transferred to Camas
0
500 Feet
January 31, 2017


Vancouver Water Service Area - Exhibit B
Clark Public Utilities
Vancouver
Camas
Vancouver
Interstate
State Route
Interstate Ramp
State Ramp
Arterial
Minor
DNR
Water Service Areas
City of Battleground
City of Battleground UGA
City of Camas
City of Camas UGA
City of LaCenter
City of LaCenter UGA
City of Ridgefield
City of Ridgefield UGA
City of Vancouver
City of Vancouver UGA
City of Washougal
City of Washougal UGA
City of Woodland
City of Woodland UGA
City of Yacolt
City of Yacolt UGA
Clark County Sewer
Clark County


Camas Water Service Area - Exhibit C
Vancouver
WASHINGTON
Clark Public Utilities
Vancouver
Camas
Washougal
Interstate
State Route
Interstate Ramp
State Ramp
Arterial
Minor
DNR
Water Service Areas
City of Battleground
City of Battleground UGA
City of Camas
City of Camas UGA
City of LaCenter
City of LaCenter UGA
City of Ridgefield
City of Ridgefield UGA
City of Vancouver
City of Vancouver UGA
City of Washougal
City of Washougal UGA
City of Woodland
City of Woodland UGA
City of Yacolt
City of Yacolt UGA
Clark County Other
Clark County

INTER-LOCAL COOPERATION AGREEMENT

THIS AGREEMENT made this day by and between the CITY OF CAMAS, a municipal corporation organized under the laws of the State of Washington, hereinafter referred to as "Camas", and the CITY OF WASHOUGAL, a municipal corporation organized under the laws of the State of Washington, hereinafter referred to as "Washougal",

In accordance with the Inter-Local Cooperation Act (RCW Chapter 39.34), Camas and Washougal, in consideration of the payments, covenants and agreements hereinafter mentioned, to be made and performed by the parties, do covenant and agree as follows:

Section 1. **PURPOSE:** The purpose of this agreement is to allow Camas and Washougal to sell water to the other due to the occurrence of an emergency situation where either city is unable to meet their service demands within internal water sources. The designation of an emergency shall be made by the respective Public Works Directors of each city and shall include, but not be limited to, drought conditions or a break in a water main. The delivery of water upon the designation of an emergency shall be through Inter-Ties between the respective water systems of Camas and Washougal at locations approved by the Public Works Directors of each city.

Section 2. **DURATION:** This agreement shall be for an indefinite duration.

Section 3. **ADMINISTRATION:** No new or separate legal or administrative entity is created to administer the provisions of this agreement. This agreement shall be administered jointly by Camas and Washougal by and through the Public Works Directors of both cities, who shall jointly administer this undertaking in accordance with the terms and conditions of this agreement.

Section 4. **FINANCING:** In the event either Camas or Washougal receives water

pursuant the provisions of this agreement then the receiving city shall remit payment in full for the water received at a rate equivalent to the receiving city's residential, inside city, water volume rate at the time of provision of the water. Invoicing shall be on a monthly basis.

Section 5. **WATER QUALITY:** The water supplied by either Camas or Washougal, in accordance with the terms of this agreement, shall be deemed "finished and treated" drinking water at the point of delivery. The city providing water shall have no responsibility to maintain drinking water quality standards once the water has been provided to the receiving city's distribution system. The receiving city shall be solely responsible to maintain drinking water quality standards upon receipt.

Section 6. **INDEMNIFICATION:** Camas and Washougal shall indemnify and hold harmless the other, its officers, agents, and employees, or any of them, from any and all claims, actions, suits, liability, loss, costs, expenses and damage of any nature whatsoever, by reason of or arising out of any action or omission of the respective employees, officers and agents, in the execution and administration of this agreement.

Section 7. **INSURANCE:** Each city shall obtain and keep in full force and effect liability insurance protecting itself and its employees, officers and agents, and the party, its employees, officers and agents, for claims of any persons for injuries to life, person or property by reason of anything done or permitted to be done or suffered or admitted to be done by the parties in the administration of the project. If either party withdraws from the Washington Cities Insurance Authority, that party shall deliver a certificate of insurance showing compliance with this section.

Section 8. **TERMINATION:** Each party shall have the right to terminate this entire agreement, with or without cause, upon 180 days written notice to the other party. Such notice shall be sufficient if it is in writing and deposited in the United States mail, certified mail, return receipt requested, with postage fully prepaid and addressed to the parties at their last known addresses as follows:

City of Camas
P.O. Box 1055
Camas, WA 98607

City of Washougal
1701 "C" Street
Washougal, WA 98671

Section 9. **FILING:** This agreement shall be filed with the city clerks of Camas and Washougal and with the Clark County Auditor and the Washington Secretary of State.

Section 10. **EFFECTIVE DATE:** This agreement shall be effective upon signing by the respective parties hereto.

DATED this 7 day of August, 2006.

CITY OF CAMAS

By: _____
Mayor

Attest: _____
Clerk

Approved as to form:
_____
City Attorney

CITY OF WASHOUGAL

By: _____
Mayor

Attest: _____
Clerk

Approved as to form:
_____
City Attorney

CITY OF CAMAS
616 Northeast Fourth Avenue
P.O. Box 1055
Camas, Washington 98607

RECEIVED
OCT 09 1997

October 8, 1997

Mike Conway, Director
Department of Public Works
City of Washougal
1701 C Street
Washougal WA 98671

Gentlemen/Mike

Enclosed please find an executed copy of the *INTERLOCAL AGREEMENT BETWEEN the CITY OF WASHOUGAL and the CITY OF CAMAS.* Said agreement designates the City of Washougal as the utility service (water and sewer) provider to the land located north of the intersection of Shepherd Road and 3rd Avenue.

Any questions pertaining to this agreement may be directed to Eric Levison, our Assistant City Engineer, at 834-3451.

Sincerely,

Douglas A. Quinn, P.E.
Director

enclosure

RECEIVED
OCT 09 1997

Administration (360) 834-6864 | Building (360) 834-8860 | Finance (360) 834-2462 | Fire (360) 834-2262 | Library (360) 834-4692 | Police (360) 834-4151 | Public Works (360) 834-3451 | Parks Recreation (360) 834-7092

INTERLOCAL AGREEMENT BETWEEN
the
CITY OF WASHOUGAL and the CITY OF CAMAS

The corporate limits of the cities of Camas and Washougal are irregular along their common boundary. In particular, an area within the Camas corporate limits (herein referred to as "subject area", as described in attached Exhibit "A") located north of the intersection of Shepherd Road and 3rd Avenue is currently surrounded on approximately eighty-four (84) percent of its perimeter by Washougal's corporate limits.

Further, the cities have mutually entered into an Interlocal Agreement which designates the City of Washougal as the utility service (water and sewer) provider to the land located within the subject area.

The City of Washougal is in the process of preparing a Comprehensive Subarea Plan for an area lying north of the subject area, including the land surrounding the subject area. The Subarea Plan will address land uses, environmental protection, storm water drainage and infrastructure impacts for the area. Including the subject area would assure the orderly and logical progression of land development under the jurisdiction of the City of Washougal.

The purpose of this agreement is to establish the City of Washougal as the presiding jurisdiction with respect to land use planning and implementation, including, but not limited to the following:

1. Implementation of land division regulations.
2. Imposition and implementation of zoning regulations
3. Implementation of development standards, including streets, storm and sanitary sewer, water and other utility provision.

Pursuant to this, the City of Washougal and the City of Camas hereby agree to the following:

1. Presiding Jurisdiction. The City of Washougal shall be the presiding jurisdiction in all planning programs, land use designations and land use application processing for land within the subject area.

2. Land Use Planning and Implementation. All land use actions shall be processed under the rules and regulations of the City of Washougal, including but not limited to Titles 15 (Building), 16 (Environmental), 17 (Land Divisions) and 18 (Zoning) of the Washougal Municipal Code, the City of Washougal Engineering Standards for Public Works Construction and any and all provisions of the Woodburn Hill Comprehensive Subarea Plan. No provision of this agreement shall preclude future revisions, amendments or addenda to these regulations from being implemented by the City of Washougal within the subject area without prior written consent of the City of Camas.

3. Annexation. Both the City of Camas and the City of Washougal agree to pursue the necessary routes to transfer true corporate jurisdiction for the subject area from the City of Camas to the City of Washougal.

4. Effective Date and Duration. This agreement shall be effective upon signature by the presiding officer of both the City of Camas and the City of Washougal, and shall be in effect until terminated by one of the following methods:

   a. Ninety (90) day written notice of termination by either party subject to the agreement.
   b. Termination of agreement upon formal annexation of the subject area by the City of Washougal, said termination being effective concurrent with the effective date of the annexation.

5. Application Processing Upon Termination. Upon termination of this agreement, the city of Washougal shall complete processing of any technically complete land use application filed with the City of Washougal pursuant to the provisions of this agreement.

APPROVED this 4th day of August, 1997 by:

City of Washougal

Mayor Charles Crumpacker

City of Camas

Mayor Dean Dossett

Approved as to form:

City of Washougal

Don English, City Attorney

City of Camas

Roger Knapp, City Attorney

f:\eric\woodburn\intrlocl

AFTER RECORDING RETURN TO:

City of Washougal
1701 "C" Street
Washougal, WA 98671

CITIES OF CAMAS AND WASHOUGAL, WASHINGTON

UTILITIES COOPERATION AGREEMENT FOR WATER SYSTEM DEVELOPMENT – PHASE 2

2015

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CITIES OF CAMAS AND WASHOUGAL, WASHINGTON
UTILITIES COOPERATION AGREEMENT
FOR WATER SYSTEM DEVELOPMENT
PHASE 2

1. AGREEMENT

This Utilities Cooperation Agreement for Water System Development ("Agreement") is made by and between the CITY OF CAMAS, a Washington municipal corporation ("Camas"), and the CITY OF WASHOUGAL, a Washington municipal corporation ("Washougal"). Camas and Washougal are each a "Party" and collectively the "Parties" (or "Cities") to this Agreement. The Parties agree as follows.

2. RECITALS

2.1 This Agreement is entered by the Parties under their authority to contract, including but not limited to RCW 35A.11.010 and RCW 35.21.210.

2.2 For a number of years, Camas and Washougal have been jointly addressing the Parties' ongoing water supply needs. The Cities participated in Water Resource Inventory Area (WRIA) planning in the Salmon-Washougal (WRIA 28) and Lewis (WRIA 27) watersheds. Clark, Cowlitz and Skamania Counties adopted the Salmon-Washougal & Lewis Watershed Management Plan on July 21, 2006. The Salmon-Washougal & Lewis Watershed Management Plan guides future water rights development in the community, and identifies the Steigerwald area in Clark County as a regional water source.

2.3 Washougal identifies current average daily water demand of approximately 2.0 million gallons per day, with an estimated 50-year need of 10 million gallons per day. Camas identifies current average daily water demand of approximately 3.7 million gallons per day, with an estimated 50-year need of 15 million gallons per day. To meet these needs, the Parties initiated efforts to develop and operate water system wells and well fields near the Steigerwald Wildlife Refuge to be supplied by the Pleistocene Alluvial Aquifer (the "Project").

2.4 The Parties began Project development efforts at Phase 1, in part, by entering into an Option to Purchase Exclusive Easement for Well Site with the Port of Camas-Washougal ("Port," July 17, 2006 (now expired)), and Inter-Local Cooperation Agreement (July 17, 2006) between the Parties to provide for drilling, testing, and evaluation of drinking water wells in the Steigerwald Lake area. The testing revealed sufficient water supplies for the Project. The 2011 Clark County Coordinated Water System Plan Update identifies the Steigerwald well field as a regional water source and further identifies it as a capital project (SR-11).

2.5 As components of the Project, the Parties now are (i) jointly seeking new water rights sufficient for the Project under an Application for Water Right Permit (Washington Ecology No. G2-30528, August 2009); (ii) acquiring from Port the property rights necessary for the Project; (iii) updating their comprehensive water plans; and, (iv) planning to acquire, develop

and operate necessary water system facilities and improvements. Collectively, these efforts and this Agreement are Phase 2 of the Project.

2.6 The Camas 2010 Water System Plan identifies the Steigerwald well field as a regional water source and further identifies it as a capital project (SR-11). The Washougal Water System Plan identifies the Steigerwald well field as a regional water source and further identifies it as a capital project. Camas intends to update its Water System Plan by 2016. Washougal intends to update its Water System Plan, beginning in 2017.

2.7 The Steigerwald well field site is to be acquired and developed by the Parties, with Washougal acting as lead agency and title holder. The general allocation of rights and responsibility for the Project is 60% to Camas and 40% to Washougal.

2.8 In accordance with their history of cooperation and consistent with the 2006 Inter-Local Agreement for good faith negotiations toward a revised agreement to allocate the costs and distribution of Project water resources, the Parties enter into this Agreement to terminate the 2006 Inter-Local Agreement, except as it relates to unreimbursed costs otherwise allocated thereto which shall be subject to further negotiations, and to set forth the rights and obligations of the Parties for the next phase of the Project. This is another in a series of agreements, and the Parties will consider in the future Phase 3 and other forms of management and/or governance of water systems, including the potential of forming a joint municipal services authority under Chapter 39.106 RCW. This Agreement also provides a protocol in the event future agreements are not reached.

3. DEFINITIONS

3.1 "Capacity Allocation" means the percentage of the Steigerwald Water System's design capacity that a Party is authorized by this Agreement to use. A Capacity Allocation does not convey ownership interest in any of the Steigerwald Water System.

3.2 "Steigerwald Water System" or "Project" means the Real Property and System Facilities subject to this Agreement.

3.3 "Real Property" means that certain real property located in Clark County, Washington, identified as Clark County Tax parcel No. 135307000, consisting of approximately 19.65 acres of land, which is legally described and generally depicted in Exhibit A.

3.4 "System Facilities" means all water system facilities and improvements located on the Real Property and, to the extent agreed upon by the Parties in the future, any other facilities that Camas or Washougal may construct for joint use by the Parties, including without limitation facilities not located on the Real Property.

4. OWNERSHIP OF THE STEIGERWALD WATER SYSTEM

4.1 Capacity Interest and Allocation. Each Party owns a capacity interest in the Steigerwald Water System. The Camas capacity interest and Capacity Allocation is 60% and the Washougal capacity interest and Capacity Allocation is 40%.

4.2 Title to Property. Title to the Real Property shall be held in the name of the City of Washougal. Each Party's interest in the Real Property is defined in this Agreement by its Capacity Allocation.

4.3 Sale of Property. The Real Property, the Steigerwald Water System or any part of either the Property or System may be sold or transferred upon the written approval of both Parties, subject to any rights held by the Port of Camas-Washougal, if then applicable.

5. ALLOCATION OF COSTS, SYSTEM CAPACITY, AND WATER RIGHTS

5.1 Purchase Price. Each Party is obligated to pay its portion of the total purchase price for the Real Property (estimated to be $667,619.90 plus costs), divided as follows: Camas – 60% / Washougal – 40%. The allocable share of the Purchase Price shall be included in each Party's capital contributions if the Real Property is purchased over a term of years. Camas shall pay its share to Washougal under Agreement Section 7. Camas' payments for the real property are an obligation of Camas' water system and shall be considered as junior debt for the water utility.

5.2 Capacity Allocation. Subject to modification in future agreement, each Party's Capacity Allocation is divided as follows: Camas – 60% / Washougal – 40%.

5.3 Water Rights. Subject to modification in future agreement, each Party's interest in the water rights associated with the Steigerwald Water System is divided as follows: Camas – 60% / Washougal – 40%.

6. ADMINISTRATION

6.1 Administration.

6.1.1 Lead Agency. No new or separate legal or administrative entity is created by this Agreement. Washougal serves as lead agency for Project. As lead agency, Washougal shall be responsible for continued process for the Application for Water Right Permit, Real Property acquisition, Project design and Development and other Project related actions, all upon consultation with Camas.

6.1.2 Meetings/System Planning. The Public Works Director of each City shall meet regularly, generally monthly, regarding the Project. Additionally, the Parties shall hold regular meetings, to direct planning related to the Steigerwald Water System and to develop and review future actions, including relevant comprehensive plans, other planning documents and budgets. Each Party shall cooperate with the other Party's water comprehensive planning.

6.1.3 Phase 3. Following the adoption by each Party of the Party's updated water comprehensive plan, or earlier as the Parties determine, the Parties shall begin negotiations for development of a Phase 3 agreement. A Phase 3 agreement is to address the next phase of the water resource development and System Facilities, and System management. A Phase 3 agreement is expected to address such issues as organization and governance; budget and finance; water interties and wheeling; System Facilities planning and development; management and operation; repair and replacement of System Facilities; termination of this

Agreement; and related matters. The Parties intend to enter a Phase 3 Agreement no later than eighteen (18) months following the commencement of negotiations. Each Party commits to good faith and diligent effort to reach a Phase 3 agreement.

6.2 Other Uses. The Real Property is acquired by the Parties for development and operation of well fields and other utility purposes. The Parties may, however, agree to make the Real Property available for either or both Parties' general municipal purposes.

6.3 Water Rights Approval Process. In the event the Parties determine to request accelerated review of their Application for Water Right Permit, all costs of such process shall be allocated between the Parties based on Capacity Allocation.

7. BUDGETING AND INVOICING

7.1 Invoicing and Payment. Monthly, as expenses are incurred, Washougal will invoice Camas for its pro rata share of costs for the Project in accordance with Washougal's standard invoicing procedures for public works projects. Camas must remit payment in full for each invoice no later than thirty (30) days after the receipt of the invoice from Washougal.

7.2 Reimbursement. It is the intent of the Parties that Washougal be reimbursed for (and Camas pay for) only Camas' pro rata share of costs reasonably incurred by Washougal in performing its duties under this Agreement.

7.3 Taxes. Washougal shall not assess its utility tax on revenues from any service to Camas under this Agreement. Other taxes such as state, county and those imposed by other third parties related to the Project shall apply. Each Party retains all rights and authority to levy and collect utility taxes associated with retail or contract water service.

8. DISPUTE RESOLUTION

8.1 Negotiations. The Parties agree to make all reasonable efforts to resolve through informal, good faith negotiations any disputes concerning the terms and conditions or performance of this Agreement. In the event of a dispute, including a claimed breach of this Agreement, notice of the dispute shall be provided in writing and shall be delivered in the manner set forth in Section 12.4. The notice shall set forth with reasonable specificity the factual basis for the claimed dispute. Both Parties shall jointly cooperate to informally resolve any disputes as quickly and efficiently as possible, but in any event not more than sixty (60) days from the date of the notice unless extended by mutual agreement of the Parties.

8.2 Voluntary Mediation. If a dispute cannot be resolved through direct discussions, mediation may, by mutual consent, be initiated. In the event the Parties determine to initiate mediation, a mutually acceptable mediator shall be selected by the Parties for the purpose of facilitating the mediation process. The mediator shall be selected based on his or her expertise with the nature of the matter in dispute and their ability to facilitate a settlement. The Parties agree to provide all documentation and information requested by the mediator and in all other regards to cooperate fully with the mediator. The costs of mediation shall be shared equally between the Parties.

8.3 Other Relief. In the event the dispute is not resolved in mediation, or the Parties do not agree to mediation, the Parties may pursue any other form of relief provided by this Agreement.

8.4 Specific Performance. If a Party continues in default in the performance of any material and substantial covenant or agreement herein contained for a period of thirty (30) days after written notice specifying such default, and following such reasonable time under Agreement Sections 8.1 and 8.2; or as is necessary to cure such default or a Party's failure to commence a cure within sixty (60) days of notice, a Party may, at its option, immediately commence an action for specific performance to compel performance or take any other action available at law or in equity, including an action for damages. The Parties agree that the continued delivery of water from the Steigerwald Water System cannot be terminated without jeopardizing the public health and safety. As a result, termination of the Agreement is not an adequate remedy; and an action for specific performance, in addition to other remedies, is authorized to compel performance under this Agreement.

8.5 Compliance with Order. The Parties shall be bound by the outcome of litigation (or other process) under Agreement Section 8, including all appeals, at the conclusion of the litigation (the "Order"). The first remedy available to a Party under an Order shall be specific performance. If a Party does not comply with the Order within the time specified for compliance in the Order, the prevailing Party may elect to terminate the Agreement without further process under this Agreement. If a Party chooses to not terminate the Agreement, the Party may pursue such other remedies as are available under law or this Agreement.

8.6 Force Majeure. No period of performance required by this Agreement shall run during periods of force majeure.

8.7 No Waiver; Prevailing Party Costs. If a Party incurs attorney fees, costs, or other legal expenses to enforce the provisions of this Agreement against another Party, all fees, costs, and expenses are recoverable by the prevailing Party as against the offending Party. The failure of a Party to exercise any right or enforce any provision of this Agreement is not a waiver of that right or enforcement remedy.

8.8 Jurisdiction and Venue. This Agreement must be interpreted in accordance with the laws of the state of Washington. As against the other Party, Camas and Washougal may file suit to enforce this Agreement only in the Superior Court for Clark County, Washington.

9. ASSETS

9.1 Existing Assets. Subject to Agreement Section 4, this Agreement does not transfer any existing assets between the Parties. The Parties retain all rights, title, and interest in their separate municipal water systems, including without limitation all real and personal property, investments, cash accounts and reserves, and contract and intangible rights.

9.2 Steigerwald Water System Assets. The Parties each have an ownership interest in the assets of the Steigerwald Water System based on Capacity Allocation. Upon termination or dissolution of this Agreement, the Parties will work in good faith toward an asset allocation plan for the Steigerwald Water System and to administer the approved plan. In the event the Parties

cannot reach agreement, then Washougal shall pay to Camas the full amount of prior Camas payments to Washougal for the Real Property and any System Facilities constructed prior to Agreement termination. After payment by Washougal, Camas shall have no interest in the Steigerwald Water System.

10. INSURANCE

10.1 Property Insurance. Washougal must insure, at replacement cost value, any Steigerwald Water System Facilities.

10.2 Liability Insurance. Each Party shall obtain and keep in full force and effect liability insurance protecting itself and its employees, officers and agents, and the party, its employees, officers and agents, for claims of any persons for injuries to life, person or property by reason of anything done or permitted to be done or suffered or admitted to be done by the parties in the administration of the project. If either party withdraws from the Washington Cities Insurance Authority, that party shall deliver a certificate of insurance showing compliance with this section.

10.3 Cost. Any additional cost for liability, property or other insurance required for the System will be included as an operating cost and payable by each Party under Capacity Allocation.

11. UTILITY TAXES

The Parties recognize that the Steigerwald Water System is being developed to provide wholesale water supplies to the Parties. Accordingly, revenues generated by the Steigerwald Water System, if characterized as such, are exempt from certain taxes. Each Party will therefore pay its own share of utility taxes, when owed, for revenue generated by their separate municipal water utilities.

12. GENERAL

12.1 Execution of Documents. The Parties will cooperate fully in executing documents that are necessary to develop and implement the Steigerwald Water System.

12.2 Filing. Prior to or on the Effective Date, the City Clerks of Camas and Washougal must list this Agreement by subject on that city's website or other electronically retrievable public sources. Washougal shall record this Agreement with the deed or other documents transferring title to the Real Property.

12.3 Records.

12.3.1 Washougal must maintain accounts and records that sufficiently and properly document its services and costs under this Agreement.

12.3.2 Upon reasonable notice, each Party may inspect and copy, without charge, all non-privileged records held by any other Party relating to this Agreement.

12.4 Notices. All notices required by this Agreement must be in writing by hand delivery, email, regular U.S. mail, or certified mail, return receipt requested.

If to Camas, notice must be sent to:

City Administrator
City of Camas
616 N.E. 4th Avenue
Camas, WA 98607

If to Washougal, notice must be sent to:

City Administrator
City of Washougal
1701 "C" Street
Washougal, WA 98671

Notice is considered given upon delivery or, if mailed, upon the earlier of actual receipt or three (3) business days after the date of mailing.

12.5 Indemnification. To the maximum extent permitted by law, Camas and Washougal indemnify and hold harmless the other Party and all of its officers, officials, employees, and volunteers from any and all claims, demands, injuries, losses, suits, actions, fines, penalties, and liability of any kind, including attorney fees, to the extent they arise out of or are related to the performance of this Agreement by the indemnifying Party or its officers, officials, employees, volunteers, agents, representatives, consultants, contractors, or subcontractors. This indemnity is not limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the indemnifying Party under workers' compensation acts, disability benefit acts, or other employee benefit acts. This indemnity is specifically and expressly intended to constitute a waiver of the indemnifying Party's immunity under Washington Industrial Insurance (Title 51 RCW) with respect to only the other Party, and only to the extent allowable by law and necessary to provide the indemnified Party with a full and complete indemnity of claims made by the indemnifying Party's employees. This waiver has been mutually negotiated. The provisions of this Subsection 12.5 survive the expiration or termination of this Agreement.

12.6 Non-Waiver. The failure on the part of any Party to enforce its right as to any provision of the Agreement shall not be construed as a waiver of its rights to enforce such provision in the future.

12.7 Force Majeure. If a Party is rendered unable by Force Majeure, to carry out, in whole or part, its obligations under this Agreement and such Party gives notice and full details of the event to the other Party as soon as practicable after such occurrence, the obligations of the Party affected by the event (other than the obligation to make payments due for performance prior to the event) shall be suspended to the extent required. Under this Agreement, "force majeure" shall mean acts of God, wars, strikes, lockouts, labor disputes, civil disorder, acts of terrorism, fires, floods, volcanic eruptions, earthquakes or other causes beyond the reasonable control of the affected Party.

terrorism, fires, floods, volcanic eruptions, earthquakes or other causes beyond the reasonable control of the affected Party.

12.8 Entire Agreement; Amendment. This Agreement contains the entire written agreement among the Parties and supersedes all prior discussions and agreements. This Agreement may be amended only in writing, signed by all Parties.

12.9 Termination of Existing Agreement. On the Effective Date, that 2006 Inter-Local Cooperation Agreement between the City of Camas and the City of Washougal (July 17, 2006) terminates. All cost and responsibility allocations with respect to the Steigerwald Water System are governed by this Agreement.

12.10 Authorship. This Agreement reflects the Parties' joint drafting efforts. In the event any dispute, disagreement, or controversy arises regarding this Agreement, the Parties will consider each other as joint authors and no provision may be interpreted against any Party because of authorship.

12.11 Successors and Assigns. All of the provisions contained in this Agreement are binding upon the successors and assigns of the Parties.

12.12 No Third Party Rights. This Agreement is solely for the benefit of the Parties and does not confer rights to any other individual or person.

12.13 No Joint Venture. This Agreement does not form any joint venture, partnership, administrative entity, or separate municipal corporation between the Parties. Washougal's officers, officials, employees, volunteers, agents, representatives, consultants, contractors, and subcontractors will not be deemed, and may not represent themselves as, employees of Camas.

12.14 Severability. If any section or part of this Agreement is held by a court of competent jurisdiction to be invalid or unenforceable, that action will not affect the validity or enforceability of any other section or part of this Agreement.

13. TERM AND TERMINATION

13.1 Effective Date. This agreement shall be effective upon last signature by the respective Parties hereto.

13.2 Term. The term of this Agreement is ten (10) years plus the remainder of the calendar year in which it becomes effective, ending on December 31, 2025. The term will automatically extend for two (2) consecutive terms of ten (10) years unless at least one Party gives the other Party notice of intent to terminate the Agreement on or before December 31 of the year prior to the year in which the Agreement will expire. Upon expiration of the second extension of ten (10) years, this Agreement will automatically extend for additional calendar-year terms until at least one Party gives the other Party notice of intent to terminate the Agreement on or before December 31 of the year prior to the year in which the Agreement will expire.

13.3 Termination. Either Party may terminate this Agreement for a default by the other Party if the defaulting Party has not cured the default or complied with the Order as provided in Agreement Section 8. Prior to termination, the Public Works Directors of the Parties will propose for approval by the governing bodies of each Party a plan to wind up the Project affairs, allocate assets of the Steigerwald Water System and administer the approved plan. Failure to agree on a plan is governed by Agreement Section 9.2. All applicable costs generated up to and including the date of termination shall be and remain the responsibility of the terminated Party to pay.

13.4 Withdrawal. Either Party may elect to withdraw from this Agreement as follows. The withdrawing Party shall provide at least five (5) years' advance written notice of its intent to withdraw. Such notice shall be delivered consistent with Section 14.4. The effective date of withdrawal shall be 11:59 PM on December 31 of the year following the five (5) years' notice is issued. Withdrawal has the same effect as termination and shall be governed by Agreement Sections and 9.2 and 13.3.

CITY OF CAMAS

By:_____
Mayor

Date: 9-8-2015

Attest:_____
Clerk

Approved as to form:

_____
City Attorney

CITY OF WASHOUGAL

By:_____
Mayor

Date: 8-24-2015

Attest:_____
Clerk

Approved as to form:

_____
City Attorney

EXHIBIT A:
REAL PROPERTY

A tract of land together with an easement for access and transmission main located in portions of Sections 17, 20 and 21, Township 1 North, Range 4 East, Willamette Meridian, Clark County, Washington; said tract is a portion of that particular parcel shown on the official record of survey recorded in Book 43 at Page 9, Records of Clark County, Washington, being more particularly described as follows:

Beginning at the Northwest corner of said Section 21 per said record of survey in Book 43 at Page 9;
Thence South 62°02'18" East a distance of 3,104 . 73 feet to the northerly right of way
line of the dike road as shown in said survey and the point of beginning of this description:
Thence along the following described courses:
North 10°34'45" East a distance of 461 . 58 feet;
South 88°36'01" East a distance of 347 . 39 feet;
South 68°07'52" East a distance of 343.29 feet;
South 73°19'26" East a distance of 198.86 feet;
South 73°26'56" East a distance of 160.51 feet;
North 17°28'45" East a distance of 102.65 feet;
South 67°16'49" East a distance of 31. 65 feet;
South 65°33'04" East a distance of 376.31 feet;
North 63°42 ' 19" East a distance of 112.43 feet;
South 01°23'59" West a distance of 292.78 feet to a point
here and after referred to as Point "A" said point also being located on the northerly dike road right of way line; Thence following along said northerly line the following described courses:
North 88°35'14" West a distance of 850.42 feet to the
beginning of a curve concave to the north having a radius
of 2,782.47 feet;
Thence northwesterly 113.96 feet along said curve through
a central angle of 2°20'10":
Thence North 86°15'03" West a distance of 141.48 feet:
Thence North 03°44'56" East a distance of 30.00 feet;
Thence North 86°15'03" West a distance of 516.09 feet to
the TRUE POINT OF BEGINNING.

Together with an easement beginning at said Point "A"; Thence
South a distance of 35.00 feet to the centerline of said dike road
and the beginning of this easement description: being 20
feet in width and lying 10 feet on each side of the following
described centerline: Following westerly and northwesterly on
and along the centerline of said dike road to a point due South
of said Northwest corner of Section 21: Thence North 38°03'10"
West leaving said dike road centerline a distance of 432 . 82
feet to a concrete monument with brass cap located in the
centerline of Index Street as shown on Record of Survey
recorded in Book 14 at Page 50, Records of Clark County,
Washington, and the terminus of this easement description.

APPENDIX I

EMERGENCY RESPONSE PLAN

OCTOBER 2019

WATER SYSTEM EMERGENCY RESPONSE PLAN

FEDERAL AND STATE REQUIREMENTS

FEDERAL REQUIREMENTS

Under the Public Health Security and Bioterrorism Preparedness and Response Act (Bioterrorism Act), Public Law 107-122 of June 12, 2002, drinking water systems serving more than 3,300 but less than 50,000 customers must complete a vulnerability assessment by June 30, 2004 and an emergency response plan (ERP) by December 30, 2004.

The U.S. Environmental Protection Agency (EPA) considers completion to mean the date on which the vulnerability assessment and certification were sent to EPA. The City submitted its vulnerability assessment on June 30, 2004, and the City completed its ERP certification by December 30, 2004.

The Bioterrorism Act requires the ERP to incorporate the results of the vulnerability assessment and include the following:

- Plans, procedures and equipment that can be implemented or utilized in the event of a terrorist or other intentional attack on the public water system.

- Actions, procedures and identification of equipment that can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals.

STATE REQUIREMENTS

The operations and maintenance section of Chapter 246-290-415 (2)(b) WAC requires public water systems in Washington to have an emergency response plan as part of a water system plan. It also requires that systems employ reasonable security measures to protect the raw water intake facilities, water treatment processes, storage facilities, pump houses, and distribution systems from possible damage or intruders. The State requirements for emergency response must address all applicable hazards that could lead to abnormal operating conditions, such as flood, fire, unscheduled power outages, facility failure and system maintenance.

WATER SYSTEM EMERGENCY RESPONSE PLAN OUTLINE

Both the EPA and Washington State Department of Health (DOH) have prepared guides to develop emergency response plans that will comply with the Bioterrorism Act.

- *Emergency Response Guidance for Small and Medium Community Water Systems to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002*, EPA 816-R-04-002, April 2004.

- *Emergency Response Planning Guide for Public Drinking Water Systems*, DOH Publication 331-211, May 2003.

The City's water system emergency response plan is based primarily upon the EPA guidance document, which establishes eight basic elements for an ERP:

1. System Specific Information
2. Community Water System Roles and Responsibilities
3. Water System Communication Procedures
4. Personal Safety
5. Identification of Alternative Water Sources
6. Replacement of Equipment and Chemicals
7. Property Protection
8. Water Sampling and Monitoring

The DOH planning guidance has been utilized to develop the eight elements of this ERP. Whenever possible, terminology used by the Department of Homeland Security and its sub-agency, the Federal Emergency Management Agency (FEMA) as well as the Occupational Safety and Health Administration (OSHA) and the National Fire Protection Association (NFPA) has been used relative to emergency management principles, hazardous materials response, mass casualty response and emergency medical response.

The following documents from EPA Water Security website were a technical resource for this ERP as well:

(Reference: http://cfpub.epa.gov/safewater/watersecurity/index.cfm)

Planning for and Responding to Drinking Water Contamination Threats and Incidents Response Protocol Toolbox (December 2003)

- Overview and Application
- Module 1: Water Utility Planning Guide
- Module 2: Contamination Threat Management Guide
- Module 3: Site Characterization and Sampling Guide
- Module 4: Analytical Guide
- Module 5: Public Health Response Guide

- Module 6: Remediation and Recovery Guide

EMERGENCY PLANNING AND OPERATION PRECEPTS

To be effective in a resource-constrained environment where multiple response agencies are involved, emergency planning for a water system must be considered in the context of the community's overall planning for emergency operations. The following sections identify and discuss the various plans that the City utilizes in its "all hazards" emergency management program.

CITY OF CAMAS DISASTER MANUAL

The City's Disaster Manual identifies the Emergency Response functions within the City based on a modified Incident Command System. The City Fire Chief is designated as the Incident Commander. The five functions coordinated by the incident commander are as follows:

- Police
- Public Information Officer
- Resource Officer (includes Public Works)
- Communications
- Disaster Control Officer

Emergency Operations Center (EOC)

The EOC is located at the City Police Department Headquarters building and provides overall direction, control and coordination of an incident. The EOC is primarily concerned with resource management and coordination between City Departments and other County/Regional, State and Federal emergency response and management agencies.

On-Scene Emergency Management

On scene management of emergencies is the responsibility of the Disaster Control Officer, who has a number of functions to coordinate, including:

- Suppression (includes rescue and control)
- Safety
- Triage

The City does not have its own hazardous materials response capability. This response capability is available from the City of Vancouver and the Georgia Pacific paper mill through a coordinated response plan that was development by the County Regional Emergency Services Agency.

CLARK COUNTY REGIONAL EMERGENCY SERVICES AGENCY (CRESA)

The City utilizes the Clark County Regional Emergency Services Agency (CRESA) as its emergency management agency. CRESA also serves as the Local Emergency Planning Authority under the Superfund Amendments and Reauthorization Act (SARA) Title III (also known as the Emergency Planning and Community Right to Know Act – EPCRA) for communities in Clark County, including the City of Camas, the City of Washougal and the City of Vancouver. The CRESA website is:

http://www.cresa911.org/

RELATED COUNTY AND REGIONAL PLANS

In the event local capabilities to manage an incident are exceeded, the City will utilize mutual aid partners through the following plans and guidance documents:

- Clark County Regional Hazardous Materials Response Plan
- Washington State Department of Transportation Public Works Emergency Response Mutual Aid Agreement
- Interlocal Agreement between the City of Camas and the City of Washougal for Equipment Acquisition
- Reimbursable Services Agreement between Clark County Department of Public Works and the City of Camas

HAZARD IDENTIFICATION AND VULNERABILITY ANALYSIS

The City of Camas utilizes the Clark County Hazard Identification and Vulnerability Analysis as the primary means for identifying hazards and vulnerabilities. The Clark County HIVA was last updated in 2003.

To comply with the Bioterrorism Act, the City completed a water system vulnerability assessment (WSVA) in June 2004. The results of the WSVA are considered confidential and will not be addressed as to their specific finding and recommendations in the ERP. However, the ERP must incorporate the WSVA results in terms of providing response plans that address the general categories of vulnerabilities identified in the WSVA.

Table 5-1 summarizes all hazards identified in the County HIVA and the City's WSVA that have been considered in the development of the City's ERP; the final column identifies those hazards considered significant enough to address in the City's water system ERP. Clark County has assigned probability, vulnerability and risk levels to each hazard. Each of these parameters is discussed in greater detail below.

Probability

An adjective description (High, Moderate, or Low) of the probability of a hazard impacting Clark County within the next 25 years is assigned to each hazard. Probability is based on an assessment of a hazard's frequency using information provided by relevant sources, observations and trends.

- HIGH: There is great likelihood that a hazardous event will occur within the next 25 years.

- MODERATE: There is moderate likelihood that a hazardous event will occur within the next 25 years.

- LOW: There is little likelihood that a hazardous event will occur within the next 25 years.

Vulnerability

An adjective description (High, Moderate, or Low) of the potential impact a hazard could have on Clark County is assigned to each hazard. It is the ratio of population, property, commerce, infrastructure and services at risk relative to the entire County.

- HIGH: The total population, property, commerce, infrastructure and services of the county are uniformly exposed to the effects of a hazard of potentially great magnitude. In a worst case scenario there could be a disaster of major to catastrophic proportions.

- MODERATE**:** The total population, property, commerce, infrastructure and services of the county are exposed to the effects of a hazard of moderate influence;

  or

  The total population, property, commerce, infrastructure, and services of the county are exposed to the effects of a hazard, but not all to the same degree;

  or

  An important segment of population, property, commerce, infrastructure, or service is exposed to the effects of a hazard. In a worse case scenario there could be a disaster of moderate to major, though not catastrophic proportions.

- LOW: A limited area or segment of population, property, commerce, infrastructure, or service is exposed to the effects of a hazard. In a worse case scenario there could be a disaster of minor or moderate proportions.

Risk Rating

An adjective description (High, Moderate, or Low) of the overall threat posed by a hazard over the next 25 years. It is a subjective estimate of the combination of probability of occurrence and vulnerability.

- HIGH: There is strong potential for a disaster of major proportions during the next 25 years;

  or

  History suggests the occurrence of multiple disasters of moderate proportions during the next 25 years. The threat is significant enough to warrant major program effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be a major focus of the emergency management training and exercise program.

- MODERATE: There is moderate potential for a disaster of less than major proportions during the next 25 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate against hazard. This hazard should be included in an emergency management training and exercise program.

- LOW: There is little potential for a disaster during the next 25 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard need not be specifically addressed in the county's emergency management training and exercise program except as generally dealt with during hazard awareness training.

TABLE 5-1

Hazard Identification and Vulnerability Assessment Summary City of Camas

Hazard Classification	Hazard	Probability	Vulnerability	Risk	Applies to City of Camas Water System
Drinking Water Unique	Bacteriological Contamination	MODERATE	MODERATE	MODERATE	X
Natural Disaster	Drought	HIGH	MODERATE	MODERATE	X
	Earthquake	HIGH	HIGH	HIGH	X
	Flood	HIGH	MODERATE	HIGH	X
	Forest/Wildland Fire	MODERATE	MODERATE	MODERATE	X
	Landslide	HIGH	LOW	MODERATE	X
	Severe Local Storm	HIGH	HIGH	HIGH	X
	Tornado	HIGH	LOW	LOW	X
	Volcano	LOW	MODERATE	LOW	X
Technological Hazards	Airplane Crash	MODERATE	LOW	MODERATE	X
	Dam Failure	LOW	LOW	LOW	X
	Hazardous Materials	HIGH	MODERATE	HIGH	X
	Energy Emergency	MODERATE	MODERATE	MODERATE	X
	Transportation Accident	MODERATE	LOW	MODERATE	X
	Urban Fire	MODERATE	MODERATE	MODERATE	X
Criminal Activity	Terrorist Use of Chemical, Biological, Radiological, Nuclear Agents and Explosives	LOW	MODERATE	MODERATE	X
	Cyber Attack	LOW	MODERATE	MODERATE	X
	Vandalism	LOW	MODERATE	MODERATE	X

SYSTEM SPECIFIC INFORMATION

Chapter 3 of this manual provides a complete description of the City's water system facilities.

Interties

The City currently has an emergency intertie agreement with the City of Washougal to the east. The City has two one-way PRV interties with Washougal, located on SE Shepherd Street and at the intersection of SE 3rd Street and Whitney Street. These interties provide water from the City of Camas to the City of Washougal under low pressure conditions. The City also has an intertie agreement with the City of Vancouver located east of SE 192nd Ave just north of Brady Road in the Columbia Palisades development.

Telemetry and Control System

The City's telemetry system monitors levels in the storage facilities and the status of the booster pump stations and groundwater wells. Installed in 1988 and continually upgraded, the system allows the City to record various systems such as pump runs, reservoir drain and fill and other metering information. The system also has the capability of reading instantaneous flow from individual pumps. The system allows the City to monitor and control the operation of these facilities from the office and over the Internet from home. The chemical feed system for the Washougal wellfield and can be remotely monitored in its operations in the same manner as the wells, reservoirs and booster stations.

Supervisory Control and Data Acquisition (SCADA) System

The City has a SCADA system with master control located at the City Operations Center. The system uses programmable control software, which can be controlled by a personal computer at the operations center or remotely by a modem connected to a remote computer. The system monitors reservoir levels, well status, well flow rate, booster pump flow rate when metered, pump status, run time and alarm conditions. Reservoir levels are recorded on circular charts on a continual basis. The City also has the ability to monitor the drawdown level in the aquifer at Washougal Well field.

WATER SYSTEM ROLES AND RESPONSIBILITIES

PUBLIC WORKS DIRECTOR

The City water system is operated by the Public Works Department. In the event of an emergency sufficient to activate the EOC, the City's Public Works Director or designated representative will locate to the EOC at the Police Department. The Public Works EOC representative is responsible for coordinating all public works functions with other

members of the EOC Operations Group. The Public Works Director also serves as the Public Information Officer for all Public Works matters.

UTILITIES MANAGER

The water system is one of several utilities within the Public Works Department that is managed by the Utilities Manager, who reports directly to the Public Works Director. In the event of an emergency involving the water system, the Utilities Manager will serve as the on-scene Incident Commander until properly relieved by an appropriate Police or Fire Department representative. The Utilities Manager is responsible for all aspects of the water system during an emergency, including damage assessments, assessing customer impacts, coordinating with jurisdictional public health agencies and adjacent water utilities, keeping the public and media informed through the City's Public Information Officer, and working with the Public Works Engineering Manager for design and construction services required for repair and recovery operations.

OPERATIONS LEAD

The water utility has a Lead operator reporting to the Utilities Manager, who is responsible for operating the water system during an emergency. The Lead Operator assists the Utilities Manager in damage assessments and coordinating repair and recovery operations.

WATER QUALITY MONITOR

Within the water division a water system operator is assigned responsibility for water quality monitoring. The responsibilities for water quality monitoring for routine compliance sampling and testing are outlined in the Operations and Maintenance manual. Positive coliform events of the water system require the water quality monitoring operator to follow procedures as outlined in the water sampling and monitoring section within this plan. Intentional contamination of the water system is covered in a separate incident specific plan at the end of this plan.

WATER SYSTEM COMMUNICATION PROCEDURES

The City Disaster Manual establishes communications procedures during an emergency. The City utilizes a 911 call service operated by CRESA, which provides dispatch services for fire police and emergency medical services.

The City maintains emergency phone number lists for use by City personnel. The list contains City staff home phone numbers, addresses and cell phone numbers. The second list includes the numbers for emergency services, generator rentals, adjacent utilities, fuel suppliers, parts supplies, safety equipment, pumper trucks, and contractors. The emergency phone numbers are updated frequently as phone numbers change. These lists are provided in the Appendix G.

The employee on-call will be the first person notified in the event of an emergency, disaster, or incident. The responding party shall report to the command center for a briefing and further instructions. The on-call employee shall be in charge of all Public Works functions until relieved by a higher-ranking Public Works employee.

At the command center, the on-call employee will receive a "Public Works Department Duty Checklist." A copy of this form is provided in the Appendix H. The employee is to fill out the checklist. The employee is to determine if it is within the employee's capabilities to handle the incident requirements of the Public Works Department. If the employee is unable to fill the needs of the incident, the employee shall notify the Water/Sewer Supervisor. The Water/Sewer Lead Operator shall notify the Public Works Utilities Manager of the incident.

The City of Camas Disaster Manual provides additional procedures for Public Works response. A copy of this document can be found in the offices of the Public Works Director and the Public Works Operations Manager. It is an orange manual and all Public Works employees should be familiar with the contents and procedures.

In the event that public notification is required during a water system emergency, the Public Works Director provides information to the media for this purpose.

Liaison with the Washington State Department of Health (DOH) is normally the responsibility of the Public Works Director. An emergency contact list for DOH is presented in Table 5-2.

TABLE 5-2

Emergency Contact List for DOH

Agency/Contact	Contact Telephone Number	Purpose
DOH Hot Line DOH SWRO After Hours	(877) 481-4901 (360) 236-3030	After Hours Emergencies.
DOH/Regional Engineer	(360) 236-3018	Regulatory Assistance
DOH/Coliform Program Manager - SWRO	(360) 236-3044	Coliform Monitoring

The City has entered into a mutual aid agreement with the City of Vancouver and several other public works organizations. The contact names and phone numbers for the responsible individuals for those purveyors are presented in Table 5-3.

TABLE 5-3

Mutual Aid Water Utility and Public Works Contacts

Utility	Contact Person	Contact Number	
		Phone	FAX
City of Vancouver	Tyler Clary	(360) 487-7169 (360) 989-6381	(360) 696-8002
City of Washougal	Trevor Evans	(360) 835-2662 (360) 835-8501	(360) 835-8808
Clark County	Ahmad Quayomi	(564) 397-4358	(360) 397-6051
Clark Public Utilities	Doug Quinn	(360) 992-8022 (360) 992-3000(1)	(360) 992-8027
Washington State Department of Transportation	Bob Kofstad	(360) 905-2007 (360) 921-9119(1)	(360) 905-2075

(1) After hours

PERSONAL SAFETY

EVACUATION PLANS

The City's Disaster Manual provides limited guidance for evacuation operations. The Police Department has overall responsibility for evacuation operations. Each City Department and Division is responsible for developing emergency evacuation plans for its department/division.

The on-scene incident commander will normally direct evacuation operations. The Incident Commander at the scene will initially be the senior City employee at the scene; the on-scene incident commander duties will eventually be assumed by a Police or Fire Department representative depending upon the nature of the emergency.

The Occupational Safety and Health Administration (OSHA) provides guidance on developing evacuation plans for terrorist incidents:

http://www.osha.gov/dep/evacmatrix/index.html

Per the City's Disaster Manual, the Fire Department will be responsible for incident command during a hazardous materials (HAZMAT) release as this duty requires specific training and certification under federal regulations. City and Regional Emergency Plans for terrorist incident response also require that HAZMAT protocols and procedures be followed for incidents involving the intentional release of chemical and biological agents.

EVACUATION ROUTES AND EXITS

Evacuation routes and exits for City facilities are to be posted at each facility. In the event of an evacuation from an area that encompasses more than one facility, the City Police or Fire Department will identify additional evacuation routes as needed. During an incident involving the release of hazardous materials, the Fire Department is responsible for identifying evacuation routes that mitigate hazards to evacuees. In the absence of direction from the Fire Department, the general rule for evacuation during a hazardous materials release is to travel uphill and upwind of the release.

ASSEMBLY AREAS AND ACCOUNTABILITY

Assembly areas for evacuation from City facilities are posted along with evacuation routes and exits at City facilities. In the event of an evacuation from an area that encompasses more than one facility, the City Police or Fire Department will identify additional assembly areas as needed. The senior water division employee is responsible for ensuring that all personnel are accounted for at the assembly area after an evacuation has been conducted.

SHELTER

Sheltering is not addressed in the City's Disaster Manual. The City defers to CRESA for emergency sheltering operations. The City is responsible for sheltering of City employees; this responsibility includes identifying City facilities that may be used for sheltering during a emergency.

TRAINING AND INFORMATION

All water utility employees are provided with the following training:

- Blood borne pathogens
- Cardiopulmonary resuscitation (CPR)
- Defensive driving
- Emergency first aid
- Emergency response awareness (including FEMA ICS - IS195)
- Equipment lock-out/tag-out procedures
- Fall protection
- Fire extinguishers/evacuation
- Hazard communication
- Hearing conservation and testing
- Protection from water borne pathogens

When appropriate for their duties, water utility employees are provided training in:

- Bucket truck
- Confined space (aerial platform)

- Forklift operation
- Respiratory protection and fit testing
- Trenching and shoring

Water utility employees are issued protective equipment appropriate to their job responsibilities including hard hats, safety goggles, work gloves and safety boots.

Recommended training: The water quality monitor should be trained in hazardous materials awareness (reference: 29 CFR 1910.120). This training is available from the City Fire Department.

Emergency Equipment

The water utility has a hoist, harness and gas detection equipment for confined space entry. All employees are issued hard hats and reflective safety vests. All trucks are equipped with emergency first aid kits.

FIRST AID

Water utility employees are trained in emergency first aid that includes the following:

- How to determine the safe response to an emergency situation.
- Recognizing and caring for life-threatening emergencies in adults, such as respiratory, choking, and cardiac problems.
- Caring for injuries including severe cuts and burns, sprains and strains.
- Caring for sudden illnesses such as poisonings, bites, and stings.
- Recognizing and caring for heat- and cold-related emergencies.
- Workplace emergency procedures, including notifications for medical emergencies.

The Fire Department provides emergency medical services for trauma victims whose injuries exceed emergency first aid treatment.

IDENTIFICATION OF ALTERNATIVE WATER SOURCES

INTERTIES

The City has interties with the City of Washougal and the City of Vancouver that would normally be used to supply water to either City. The City has no other interties and therefore, must generally be self-sufficient in the event of a water shortage or water system failure. If necessary, the City would consider attempting to pump (boost) water from either Washougal or Vancouver into the City's system.

REDUNDANCY IN CITY WATER SYSTEM

The City has several wells and a surface water source that provide some redundancy in the event certain elements of the water system fail. For example, if the Washougal Wellfield is flooded, the surface water source may serve as a backup, with water conservation measures in place to offset the loss of the wellfield.

Emergency Water Supplies

Under the County's CEMP, citizens are urged to keep a 72-hour supply of food and water in the event of an emergency. The City will endeavor to supply potable water to support emergency operations within its capabilities.

TRANSPORT OF POTABLE WATER DURING EMERGENCIES

If the City obtains potable water by transporting from another source, DOH has issued guidelines for water system utilities that deliver potable water to the public during emergencies. This guidance is found at the following website and are summarized below:

http://www.doh.wa.gov/ehp/dw/Publications/Truck_Transport.htm

General

- DOH recommends that someone with water treatment expertise be responsible for the operation and management of trucked potable water.

- The City should contact the regional office of the DOH Division of Drinking Water (DOH-DDW) or local health department to discuss current requirements and approve the proposed operation. [see WAC 246-290-415(2)(d) and 246-290-451(4)]. Northwest Regional Office (Kent) – (253) 395-6750.

Truck Container

- The truck container must be contaminant-free and capable of being maintained so that water contamination is prevented.
- If a truck container has been previously used only for potable water and has been protected from possible contamination, it may be used without disinfection and testing for bacteria.
- Truck containers that cannot pass the initial testing criteria after disinfection (i.e. absence of coliforms) shall not be used.
- Trucks previously used for substances other than potable water will be evaluated on an individual basis. Consult with DOH before using trucks that may have previously carried toxic or other non-potable liquids.
- All truck containers must be filled or emptied through an air gap or approved double-check valve assembly, in accordance with WAC 246-290-490.

Initial Truck Disinfection

- The tank and all hoses, pumps, and other equipment used in handling water should disinfected by filling with water containing at least 50 to 60 parts per million (ppm) of chlorine and then held in the tank for at least 24 hours.
- One gallon of liquid bleach is required in every 1,000 gallons of water to produce 50 to 60 ppm. Bleach should be 5.25 to 6 percent hypochorite with no additives. Bleach should be added in proportion to the water as the tank is being filled, e.g., add approximately one-half gallon of bleach with each 500 gallons of water.
- The chlorine solution must be flushed from the tank after 24 hours.
- Once the tank is emptied, refill it with the water to be transported, and test for coliform bacteria. If coliforms are present, repeat the process. If the tank cannot be disinfected to eliminate coliforms, it must not be used.
- Water to be transported by tank trucks should contain a free chlorine residual of about one part per million (1 ppm or 1 mg/L) at the beginning of the haul.

Source of Water

- The source for emergency trucked water must come from an approved public water supply, unless otherwise approved by DOH.

- Every precaution should be taken to ensure that the water remains potable once it is collected and transported.

Receiving Tank

- The water system's receiving tanks must be inspected to assure that water quality issues will not occur during filling and later distribution to consumers.

- Receiving tanks must be cleaned and disinfected using the procedures for truck containers (see "Initial Truck Disinfection" guidelines).

- The receiving tanks must be kept secure and protected from contamination throughout the emergency response.

- The customer's receiving tank must be filled through an air gap or an approved double-check valve assembly in accordance with WAC 246-290-490.

Documentation and Record Keeping

- The receiving water system is responsible for documenting and keeping proper records of the emergency trucked water operation.

- Records should be retained for at least 6 months for review upon request by health agencies, haulers, or the supplying water system.

REPLACEMENT OF EQUIPMENT AND CHEMICALS

EQUIPMENT AND SUPPLIES

A list of equipment suppliers that the City has access to for emergencies is provided in Appendix I.

CHEMICALS

Table 5-4 lists chemicals used by the City in its water treatment processes. Appendix J provides a list of chemical suppliers.

To assist the City in identifying chemicals with emergency planning implications, threshold quantities under EPCRA, the Comprehensive Environmental Response

Compensation and Liability Act (CERCLA), and the Clean Air Act (CAA) are also shown in Table 5-4, where applicable.

The applicability of each regulation is briefly discussed below.

Use and Storage – EPCRA governs reporting requirements for chemicals, either in use or in storage, that pose a significant environmental or health hazard.

Liquid Spill – In the event of a spill where the quantity exceeds the CERCLA threshold, certain reporting requirements will be in effect.

Risk of Air Release – Gaseous chemicals will require a risk management plan if they exceed threshold quantities.

Explanatory notes following Table 5-4 provide greater detail regarding reporting requirements.

The City should coordinate all EPCRA, CERCLA and CAA planning and reporting requirements with CRESA.

Hazardous substance releases should be reported to the Washington State Department of Ecology (Ecology) and responses coordinated with CRESA through the City Fire Department.

CRESA Phone: (360) 737-1911

Ecology 24-Hour Spill Response Phone: (800) 258-5990
National Response Center (800) 424-8802

TABLE 5-4

Water Treatment Chemicals used by the City of Camas

Name[1]	Use[2]	CAS/EPCRA Section 313 Category Codes[3]	EPCRA Section 302 EHS TPQ[4] (pounds)	EPCRA Section 304 EHS RQ[5] (pounds)	CERCLA RQ[6] (pounds)	EPCRA Section 313[7]	CAA 112(r) TQ[8] (pounds)
Sodium fluoride (> 99%)	F	7681-49-4	N/A	N/A	**1,000**	N/A	N/A
Sodium hydroxide (20 – 30%)	CO/pH	1310-73-2	N/A	N/A	**1,000**	N/A	N/A
Sodium hypochlorite (5-12.5%)	DI	7681-52-9	N/A	N/A	**100**	N/A	N/A

All reporting quantities noted in **bold** font n/a = not applicable.

(1) The chemicals listed above were taken from an extensive inventory of chemicals provided in a document titled *List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act (consolidated list), EPA,550-B-01-003, October 2001.* EPA put the list together to help chemical handling firms determine what reporting requirements apply under sections 302, 304, or 313 of EPCRA and if they are subject to the accident prevention regulations under CAA section 112(r). The chemical names are those that are generally used in the regulatory programs developed under EPCRA, CERCLA, and CAA section 112(r)

(2) Use Definitions: Coagulant (CG); Corrosion Control (CO); Disinfection (DI); Fluoridation (F); pH Adjustment (pH).

(3) The chemicals above are organized under the Chemical Abstracts Service (CAS) registry number and the EPCRA Section 313 category codes.

(4) EPCRA Section 302 includes a list of *Extremely Hazardous Substances* (EHSs). The presence of EHSs in quantities at or above the Threshold Planning Quantity (TPQ) require local emergency planning committees to develop emergency response plans and notify State emergency response committees. Facilities with a listed EHS are subject to the reporting requirements of EPCRA section 311. The facility must provide a material safety data sheet or a list of covered chemicals to State and local emergency response committees and the local fire department. The minimum TPQ for section 311 reporting is 500 pounds or the TPQ, whichever is less. EHS TPQ and RQ are represented in pounds.

(5) Under EPCRA Section 304, releases of reportable quantities (RQ) of EHSs are subject to State and local reporting.

(6) Under Section 304 of EPCRA, releases of hazardous substances listed in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) are to be reported to the National Response Center, as well as to the State and local emergency response committees. The CERCLA RQ column shows the reportable quantities (in pounds) for chemicals that are CERCLA hazardous substances as listed in 40 CFR Part 302, Table 302.4. Solid metals listed under CERCLA, with mean diameters greater than 100 micrometers, are not reported. The CERCLA RQs listed above apply to smaller particles.

(7) Under the column titled Section 313, the notation "313" means that the chemical is required to report under section 313 and 6607 of the Pollution Prevention Act. An "X" indicates that this chemical may have a second name or that the same chemical may have the same CAS number listed under a different name. The lower case "c" indicates that a chemical must report under one or more of the EPCRA section 313 chemical categories even though it has no CAS number.

(8) Under CAA section 112(r) EPA identified 77 toxic substances and 63 flammable substances, including their threshold quantities (TQs), which are subject to accident prevention provisions. The requirements for risk management programs for accidental release prevention are found in 40 CFR Part 68. CAA section 112(r) lists several substances in solution that are covered only in concentrations above a specific level. Most of these chemicals are listed above and include ammonia CAS #7664-41-7 (concentrations 20 percent or greater); hydrochloric acid CAS #7647-01-0 (concentrations 37 percent or greater); hydrogen fluoride/hydrofluoric acid CAS #7664-39-3 (concentrations 50 percent or greater); and nitric acid CAS #76997-37-2 (concentrations 80 percent or greater). CAA section 112(r) TQs are in pounds and apply to those quantities within a process and not at the facility as a whole.

PROPERTY PROTECTION

The City controls access to its water facilities using barriers and locks. Reservoirs are fenced, with access controlled by locked gates. Utility vaults are covered and locked. The City maintains strict control over its keys. Employees are issued keys only to those facilities they are required to access to perform their duties. The City has also partnered with residential customers to be vigilant of the areas around its well and reservoir sites to alert the City if they notice any suspicious activity.

WATER SAMPLING AND MONITORING

Water sampling for routine compliance is described in Chapter 2 of this manual.

Water sampling and monitoring for a coliform incident is described below under incident specific plans (bacteriological contamination).

Water sampling and testing for a suspected intentional contamination incident is described below under incident specific plans.

MAJOR WATER SUPPLY INTERRUPTIONS

WATER MAIN BREAKS

Depending on the location where the main break occurs, if susceptible populations are impacted, use contact list in Appendix B (Coliform Monitoring Plan) for notification. City will provide bottled water for lengthy outages. Depending on circumstances, portable toilets may be supplied as well. Trucked potable water may be provided. If the City uses trucked potable water, the guidelines in DOH Publication #331-063 will be followed.

The City maintains an inventory of piping and fittings to address most emergency repair requirements and has a list of vendor telephone numbers to obtain supplies when existing material stocks are inadequate for emergencies. When repairs are too large for City crews to manage, the City will contact contractors from its small works roster.

When water supply interruptions for a pressure zone are expected to be lengthy, the City will consider instituting measures to allow customers to come to a reservoir and obtain water directly from a reservoir. Any water dispensed in this manner will be done under the supervision of a City employee.

BOOSTER STATIONS

The City has developed detailed written procedures for operating the water system when booster stations are not in service and has figures showing locations of pumps, piping, meters, shut off valves and other key features of each facility, such as valve size/type, motor manufacturer/type/hp and pump capacity/type. Copies of these procedures, technical details and figures are kept at each facility.

A brief summary of the booster station emergency procedures follows.

Butler Booster Station

Auxiliary Power

The Butler Booster Station does not have an auxiliary power system.

HOA Setting

Emergency operation of the booster station may require the pump to be operated in the HAND mode to compensate for distribution system problems in other areas of the system during a power outage.

Backup Operations

Angelo Booster Station serves as a backup for feeding the Lower Prune Hill (455) Zone if the Butler Booster Station is out of service. The City has a standby pump for the 455 Zone at the Angelo Booster Station in the event that a pump is out of service. There is sufficient pumping capacity to the 455 Zone to operate with the largest pump out of service under normal system demands, including fire flow.

Gregg Booster Station

Auxiliary Power

The New Gregg Booster Station has a diesel powered 300-kW generator with automatic transfer switch capable of operating the New Gregg Booster Station pumps during a power outage.

HOA Setting

Emergency operation of the booster station may require the pump to be operated in HAND mode to compensate for distribution system problems in other areas.

Backup Operations

There is no back up in the event Gregg Booster Stations are out of service; however, there is sufficient pumping capacity at the Gregg Booster Stations to operate with the largest pump out of service under normal system demands, including fire flow.

Angelo Booster Station

Auxiliary Power

The Angelo Booster Station is equipped with a 200-kW diesel generator with an automatic transfer switch. This generator is capable of providing power to three of the pumps, the lighting, and the HVAC system.

Backup Operations

If Angelo Booster Station is out of service, Butler Booster Station and Forest Home Booster Station serve as back up to feed the upper zones (Lower Prune Hill, Lacamas, Upper Prune Hill) from the lower zone (Butler). The City has a standby pump at the Angelo Booster Station in the event that a pump is out of service. There is sufficient pumping capacity to the 455 Zone to operate with the largest pump out of service under normal system demands, including fire flow.

Lower Prune Hill Reservoir Out of Service

If the Lower Prune Hill Reservoir is out of service, one pump at the station will be placed into hand mode and operated with the reservoir isolated. The pressure relief valve at the station will bleed excess pressure to the inlet piping. This will allow the system to maintain a constant pressure in the zone. During this operation, the pump and pressure need to be monitored every two hours.

Forest Home Booster Station

Auxiliary Power

Auxiliary power is not available for the Forest Home Booster Station.

HOA Settings

During emergencies the booster station may need to be operated in the HAND mode to compensate for distribution system problems in other areas of the system.

Backup Operations

If the Forest Home Booster Station is out of service, Butler Booster Station and Angelo Booster Station serve as back up to feed the upper zones (Lower Prune Hill, Lacamas, Upper Prune Hill) from the lower zone (Butler). The City has a standby pump at the Angelo Booster Station in the event that a pump is out of service. There is sufficient pumping capacity to the 455 Zone to operate with the largest pump out of service under normal system demands, including fire flow.

Lacamas Booster Station

Auxiliary Power

The Lacamas Booster Station has an auxiliary generator with automatic transfer switch available to provide power. This generator is a 60 kW natural gas generator and is capable of running the two 500-gpm pumps, the building lights and ventilation system. This generator is able to provide the Lacamas Booster Station with power as long as natural gas service is not interrupted. If the generator fails during a power outage, water service can be maintained through the pressure reducing valve (PRV) stations that that connected to the system that feeds down from the Upper PruneHill Reservoir. Well No. 9 also serves the area supplied by Lacamas Booster Station, but since it does not have auxiliary power, it is more than likely unavailable during a power outage.

Lacamas Reservoir Out of Service

When the Lacamas Reservoir is out of service, pressure to the Lacamas (544) Zone can be maintained by operating one of the pumps in the Lacamas Booster Station. The pressure relief valve will return excess pressure to the inlet piping while maintaining the downstream pressure. Under this operating condition, the pump operation and pressure need to be checked every 2 hours. The 544 Zone can also be served from Upper Prune Hill through PRV stations.

Backup Operations

When the Lacamas Booster Station is out of service Well No. 9 and the Lower Prune Hill Booster Station can be used to feed the Lacamas (544) Zone.

Lower Prune Hill Booster Station

Auxiliary Power

This facility is equipped with a 300-kW diesel powered generator with an automatic transfer switch to operate the three pumps in the event of a power failure.

Temporary Pump

During high seasonal demands a mobile skid mounted pump is rented by the City to supplement the LPH Booster Station. This pump is installed via connections constructed for this purpose near the entrance to the pump station. It is operated in a manual mode and has a capacity between 600 and 700 gpm. This pump is not powered by the auxiliary power generator. The City also has pumping capacity available at the Upper Prune Hill Booster Station to serve the Upper Prune Hill area for temporary losses of service at the Lower Prune Hill Booster Station, but this is limited and cannot provide supply for extended interruptions in service or extended periods of high demands.

Upper Prune Hill Booster Station

Auxiliary Power

The Upper Prune Hill Booster Station is equipped with a manual transfer switch to allow the City to bring in a portable generator to supply power to the booster station. The portable generator used by the City can operate two of the 20-hp pumps.

RESERVOIR EMERGENCY PROCEDURES

General

The City has developed detailed written procedures for operating the water system when reservoirs are not in service. These procedures are kept at each facility. If a reservoir must be taken off line isolation valves are used to prevent water from being pumped into the reservoirs and the reservoirs are allowed to empty into the distribution system.

A brief summary of the reservoir emergency procedures follows.

Butler Reservoir

Water service is maintained to the system during cleaning / draining / disinfection of the reservoir with the following procedures.

- Connect 6-inch overflow piping to the 12-inch main in the Butler Yard.
- Open the 6-inch overflow valve.
- Open the 4-inch main connecting line valve between the 12-inch and 14-inch mains until water comes out of the 6-inch overflow.
- Close the two 12-inch valves in the reservoir valve pit to take the Butler Reservoir offline.

- Adjust the 4-inch connecting valve to maintain a small amount of water flow from the 6-inch overflow. As long as water flows from the overflow, water service will be maintained to the 343 Zone.

- Depending on the season and the demand, a well may need to be in operation to maintain system pressure in the 343 Zone.

- The pressure reducers on NE 22nd Avenue and NE Everett Street regulate pressure and keep the 343 Zone served.

Reverse the order to place the reservoir back online.

Gregg Reservoir

Water service can be maintained to the Gregg area by running a pump in the HAND position in the Gregg Booster Station. The pressure relief/bypass valve at the Gregg Booster Station will maintain pressure in the service area and also keep it from over pressurizing the zone. The Gregg Reservoir can be isolated after the pump in the Booster Station is placed into operation. Close attention will be paid to the system pressure and the pump to provide uninterrupted service.

Lacamas Reservoir

The Lacamas Reservoir is supplied from the Upper Prune Hill Zone via PRVs, from the Lower Prune Hill Zone via the Lacamas Booster Station, or from Well No. 9. As long as one of these facilities is in operation, the reservoir can be filled.

Water service can be maintained to the Lacamas area (544 Zone) by running a pump in the HAND position in the Lacamas Booster Station or Well No. 9. The pressure relief/bypass valve at the Lacamas Booster Station will maintain pressure in the service area and also keep it from over pressurizing the zone. The Lacamas Reservoir can be isolated after the pump in the Booster Station is placed into operation. Close attention must be paid to the system pressure and the pump to provide uninterrupted service.

Lower Prune Hill (LPH) Reservoirs

Emergency operation of the reservoir would be required if a problem were to occur with one of the reservoirs. If a reservoir were to experience a physical or water quality problem, one reservoir could be taken out of service and the remaining one could be used to supply water until the problem is solved. If the smaller of the two tanks was used alone, the start levels for the Butler, Forest Home, and the Angelo Booster will be raised to keep the reservoir full at all times.

Upper Prune Hill (UPH) Reservoirs

UPH 2.4-MG Reservoir

The 2.4-MG reservoir inlet has an altitude valve that closes to allow the UPH standpipe to fill when the reservoir is full (63-foot level). The UPH 2.4-MG reservoir outlet valve is normally opened, but is seismically controlled and will close in a seismic event. The UPH booster pumps will also be turned off in a seismic event.

If both the Lower Prune Hill and Upper Prune Hill Booster Stations are out of service and the Upper Prune Hill Standpipe level drops low enough, site valves can be opened to allow both the standpipe and the 2.4-MG Reservoir to float on the system.

Two of the booster pumps (No. 2 and No. 3) are equipped with modified pump control valves that employ two valves that are adjusted to drain the UPH 2.4-MG reservoir. Detailed procedures for using these pump control valves are provided at the UPH booster station.

UPH Standpipe

The UPH standpipe inlet valve is a spring-activated altitude valve that is designed to shut off when the standpipe is full. This valve is not controlled by the telemetry system. When the UPH standpipe altitude valve is closed, the UPH booster pumps operate based on the pump discharge pressure.

If the Upper Prune Hill Standpipe is out of service, the UPH area can be supplied by the UPH Booster Station and the LPH Booster Station. The LPH Booster Station operates based on reservoir level in the 2.4 MG UPH Reservoir. If the LPH Booster Station flows exceed system demands, the 2.4 MG UPH Reservoir will fill. If the 2.4 MG UPH Reservoir is full, the LPH Booster Station will shut off and the UPH Booster Station will be called in pressure mode and will supply the system. If system demands exceed the supply of the LPH Booster Station while it is in operation, the UPH Booster Station will be called in pressure mode to provide additional supply. Pressure mode for the UPH Booster Station is discussed below.

At the Upper Prune Hill Pump Control Panel Screen, the operator selects this setting at the pump control panel, which is a six step operating sequence (numbered 0 to 5) that is based satisfying a minimum pressure of the pump discharge. The operator sets the pressure at 40 psi, which simulates a full standpipe.

- Step 0 – no pumps on (40 psi is satisfied)
- Step 1 – pump 1 on and runs till 40 psi is satisfied
- Step 2 – pump 1 and 2 on if 40 psi is not satisfied after Step 1
- Step 3 – pump 1 and 3 on if 40 psi is not satisfied after Step 2
- Step 4 – pump 1, 2 and 3 on if 40 psi is not satisfied after Step 3
- Step 5 – all pumps on if 40 psi not satisfied after step 4

There is a 15 second delay built in between each step. Pumps turn off sequentially in 15 second intervals once 40 psi is satisfied.

WELLS

Detailed written operating instructions are maintained at each well. These instructions cover normal operations as well as response to pump and power failure. For wells with treatment facilities, written descriptions of shutdown and start up of treatment equipment is included with the written procedures. A brief summary of emergency operations at each well is provided below.

Well No. 5

There is neither a generator nor an angle drive to operate Well No. 5 during a power outage. Well No. 5 can be used to maintain pressure in the lower grid when the Butler Reservoir is out of service. Under these conditions, Well No. 5 has to be run from the HAND position from the pump house or the Operation Center master telemetry unit.

Well No. 6

There is neither a generator nor an angle drive to operate Well No. 6 during a power outage. Well No. 6 can be used to maintain pressure in the lower grid when the Butler Reservoir is out of service. Well No. 6 has to be run from the HAND position from the pump house or the Operation Center master telemetry unit.

Well No. 7

There is not a generator or an angle drive to operate Well No. 7 during a power outage. Well No. 7 can be used to maintain pressure in the lower grid when the Butler Reservoir is out of service. Well No. 7 has to be run from the HAND position from the well facility or the Operations Center master telemetry unit.

Well No. 8

During a power outage, Well No. 8 has an auxiliary engine and angle drive. Well No. 8 can be used to maintain pressure in the lower grid when the Butler Reservoir is out of service. Well No. 8 has to be run from the HAND position from the pump house or the Operation Center master telemetry unit during a power outage. The backup chlorination system is also run by the generator.

Well No. 9

There is neither a generator nor angle drive to operate Well No. 9 during a power outage.

Well No. 10

There is neither a generator nor angle drive to operate Well No. 10 during a power outage.

Well Nos. 11 and 12

The Washougal Wellfield Facility has its own diesel powered auxiliary generator with an automatic transfer switch. This generator is 350 kW and is designed to serve the Washougal Wellfield Treatment Facility during a power outage, to include the two well pumps, chemical feed pumps, controls for the well pumps and chemical feed system, HVAC system and lighting.

Well No. 13

The Well No. 13 Facility has its own diesel powered auxiliary generator with an automatic transfer switch and acoustical enclosure. This generator is 250 kW and is designed to serve the Well 13 Facility during a power outage, to include the well pump, chemical feed pumps, controls for the well pump and chemical feed system, HVAC system and lighting.

Well 14

The Well No. 14 Facility has its own diesel powered auxiliary generator with an automatic transfer switch and acoustical enclosure. This generator is 250 kW and is designed to serve the Well 14 Facility during a power outage, to include the well pump, chemical feed pumps, controls for the well pump and chemical feed system, HVAC system and lighting.

SURFACE WATER FILTRATION PLANT

Detailed written operating instructions are maintained at the Slow Sand Water Treatment Facility. These instructions cover normal operations as well as start up and shut down procedures. The plant is equipped with a 45 kW propane powered auxiliary generator in event of a power outage.

INCIDENT SPECIFIC RESPONSE PLANS

Per the hazard assessment summarized in Table 5-1, the following incident specific response plans are outlined below:

- Drinking Water Unique: bacteriological contamination

- Natural Disasters: drought, earthquake, flood, landslide/mudflow/debris flow, severe snow storm, tsunami, volcano

- Technological Hazards: power failure, dam failure, hazardous materials, urban fire, transportation accident

- Criminal Acts: Terrorism, cyber attack, vandalism

BACTERIOLOGICAL CONTAMINATION

WAC 246-290-320 establishes specific procedures for water utilities to follow should bacteriological contamination be detected in the water system. These procedures are outlined in Figure 5-1. If the chlorine disinfection residual in the distribution system is lost, it may be necessary to batch chlorinate the reservoirs and flush distribution piping.

For every 1.0 million gallons of storage, approximately 17 lbs. of 70 percent calcium hypochlorite (HTH) is necessary to provide a 1.0 mg/L chlorine residual. As an alternative, 18 gallons of 5.25 percent sodium hypochlorite, available as household bleach in the supermarket, can be added to 1.0 million gallons to provide a dose of 1.0 mg/L.

In the event of a suspected intentional contamination with a microbial agent, the protocols for intentional contamination shall be followed in addition to the procedures outlined here. Law enforcement authorities will need to be consulted prior to making public notifications as discussed further in the intentional contamination incident plan.

Boil Water Notification

Emergencies such as floods, earthquakes, and other disasters can result in damage to water system infrastructure, thereby warranting a boil water notice as a cautionary measure. A suggested boil water notification form is presented in Appendix K. The City would issue the order through radio, television and newspapers serving the local area. Prior to the issuance of a boil water notice, the City should consider the experience gained by other communities in the past. A summary of pertinent information follows:

- An initial press conference should be held following issuance of the boil water notice to advise the public of the situation. All press releases will go the City's Public Information Officer.

- Consolidated press releases, announced on morning and evening television and radio news broadcasts, can also be used to keep the public informed.

- A 24-hour telephone hotline will be established to respond to public and media inquiries regarding the notice. The hotline should be staffed with knowledgeable representatives from the City and other governmental

agencies. In order to maintain the consistency of information released, hotline operators should be provided with standard question and answer sheets and briefed as new information becomes available. The hotline should remain available for 24 hours after the boil water notice has been rescinded to provide relevant information and reassurance for concerned customers. All media inquiries shall be directed to the Public Information Officer.

- Other State, County, and City agencies will be consulted prior to release of information to the public, including DOH and the Clark County Health Agency. A consensus will be reached among the jurisdictional agencies regarding information to be released and actions to be taken. It is important not to release conflicting information so as not to confuse the public.

- Agencies and hot line phone operators should be aware of difficult questions that could be asked by the public or the press. A few examples follow:

    1. What other utilities are affected?

    2. What should be done about coffee and ice machines that use water directly from the system?

    3. How did the system get contaminated and what is being done about it?

- Protocol should be developed for rescinding the boil water notice. One example includes two consecutive days of no detection of Cryptosporidium, Giardia, or coliform bacteria in the system.

- Once the boil water notice is rescinded, a notice should be developed to inform the public regarding appropriate measures for use of the water supply including flushing of pipes and fixtures as required.

A thorough investigation of the contamination source should be conducted and strategies developed to avoid similar future occurrences. The public should be informed and given updates regarding investigation findings in order to restore confidence in the quality of water provided by the water system.

DROUGHT

The Clark County Hazard Identification and Vulnerability Analysis states that nearly all areas of the county are vulnerable to drought.

History suggests a high probability of occurrence in Clark County. Although the entire population of the county is considered vulnerable to the effects of drought, severity has historically been low. Actual drought conditions have been limited to a few days, even during extended dry periods.

The hazard of a short-term drought will be addressed through water conservation measures outlined in the Water Conservation Chapter of the Water System Plan. The City will need to coordinate with adjacent water users in developing an effective drought response. This type of coordination will become essential with longer drought periods when more stringent water conservation measures may become necessary. Additionally, extended droughts may also increase fire hazards, particularly in the heavily wooded areas of the City.

EARTHQUAKE

The County's assessment indicates that of all potential disasters, the City is most vulnerable to a severe earthquake. However, the ability of the City's water system facilities to withstand a major earthquake has not been fully characterized.

The Northridge earthquake, which struck on January 17, 1994, left the Metropolitan Water District of Southern California (MWDSC) facing a major disaster. Fortunately, the MWDSC had established emergency planning procedures that proved to be essential to restoring water service to its customers. Two essential components were an Emergency Response Center and pre-established reconnaissance patrols that were able to quickly conduct damage inspections. The MWDSC had also stockpiled considerable repair parts and materials in order to be virtually self-sufficient in an emergency. Following the Northridge earthquake, however, the MWDSC found that most parts and equipment were readily available via overnight shipping from around the nation, indicating that stockpiling does not need to be wholly relied on for effecting repairs.

The Pacific Northwest is a very seismically active area. The Clark County HIVA states that potential earthquake sources in Clark County are not well characterized because of their infrequent occurrence compared to California. Estimations of possible earthquake sources are limited to studies of many small earthquakes, investigations of known faults, and other geological surveys.

CRESA indicates that earthquakes in Clark County are most likely to originate from three sources: (1) the Mt. St. Helens seismic Zone; (2) the Portland/Vancouver Seismic Zone; and (3) the Cascadia Subduction Zone. Descriptions of each of these seismic zones are summarized from the Clark County HIVA below.

1. Mt. St. Helens Seismic Zone – This seismic zone is most commonly a source of several small earthquakes (<4 M). The strongest earthquake associated with this zone was the Elk Lake earthquake of February 13, 1981. This was approximately 5.5 M magnitude earthquake. While this

was just a moderate earthquake it was felt over an area of about 104,000 km^2 that ran as far north as Ferndale, Washington and as far South as Salem, Oregon. Geologists suggest that the possibility exist for an earthquake as great as 6.5 M originating from this zone.

2. Portland/Vancouver – The Portland metropolitan area is the most seismically active region in Oregon in historic times. In the past 150 years there have been six earthquakes of magnitude 5 or greater. The Washington side of the seismic area is the second most seismically active area in Washington (the Puget Sound area is the most seismically active area in the state). The area between the Lacamas Creek Fault and the Portland Hills Fault borders this seismic region. The existence of the Portland Hills fault was only recently confirmed by the digging of the light rail tunnel through the West Hills of Portland. This discovery, matched with other geophysical studies suggest that earthquakes as large as 6 M or larger should occur in the Portland region every 300 to 350 years and an event of M 6.5 or larger about every 800 to 900 years. Earthquakes in this area present what may be the worst-case scenario for Clark County because the epicenters may be quite close. Geologists theorize there may be faults directly underneath the cities of Portland and Vancouver. Recent studies suggest that the epicenter for the 5.5 M earthquake in November 5, 1962, was located underneath the City of Vancouver.

3. Cascadia Subduction Zone – The Cascadia Subduction Zone lies about 50 miles offshore, extending from near Vancouver Island to northern California. The zone is where the oceanic Juan de Fuca plate dives beneath the continental North American plate. These plates are converging at a rate of 1 to 1.5 inches per year.

CRESA considers the entire county population, property, commerce, infrastructure and services as vulnerable to an earthquake. The scope of damage will be a function of earthquake magnitude and level of preparedness. Damage could range from minimal to extreme loss of life and destruction of property.

Most injury, death, and property damage in an earthquake result from seismic impacts on structural and non-structural materials. The vulnerability of certain areas partially depends on the types of structures in that area. A wood frame residential structure that is adequately secured to the foundation is relatively safe. An un-reinforced masonry building is at greatest risk from seismic impacts. Most injuries in earthquakes result from non-structural materials such as light fixtures, equipment, and furniture, falling on people and causing injury.

Another factor in earthquake vulnerability is soil type. Water-saturated loose sand and silt lose their ability to support structures in an earthquake. Areas in Clark County that

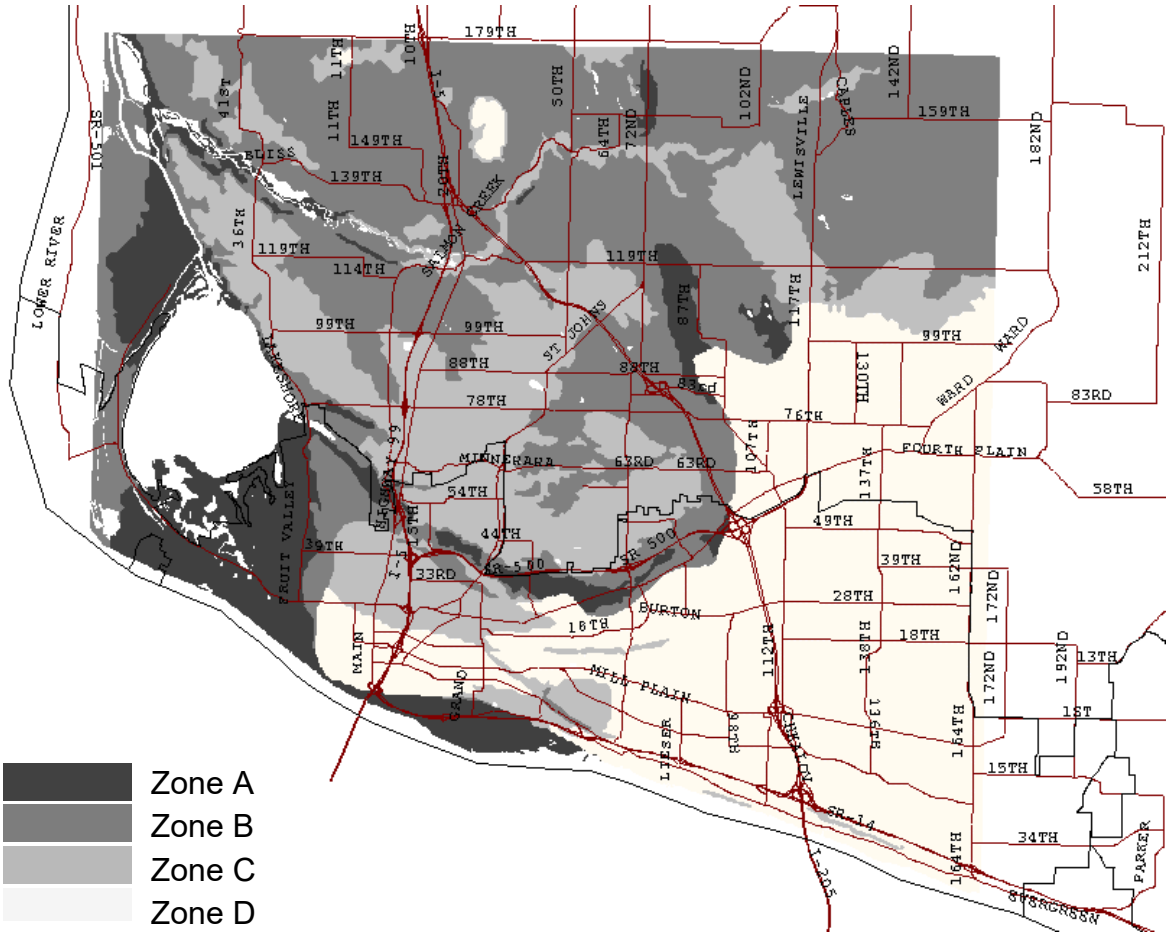
are near flood plains or areas with silt deposits are at the greatest risk during an earthquake.

Within the limits of predictability, CRESA assigns a high probability of occurrence for a damaging earthquake during the next 25 years. A large earthquake could have a catastrophic impact on Clark County suggesting high vulnerability. Accordingly, a high-risk rating is assigned.

Figure 5-2 shows a map of Clark County with zones of relative hazards for earthquakes. Based on evaluation of soil liquifaction, ground amplification, and earthquake induced landsliding hazards. Zone A is area of greatest relative hazard. Zone D is area of least relative hazard. The City of Camas is primarily in Zone D.

FIGURE 5-2

Relative Earthquake Hazard Map, Clark County, Washington



Earthquake response measures for the City's water system are shown in Table 5-5.

TABLE 5-5

Earthquake Response City of Camas Water System

Water System Component	Potential Effects	Recommended Actions
Transmission and Distribution System	Transmission and distribution system mains may be broken and the City's ability to monitor and respond to these incidents may be limited.	Isolate the major broken sections of piping throughout the system as they are located and repair as necessary and possible. Contact DOH.
Storage Facilities	Reservoirs may be leaking or structurally damaged	Inspect each reservoir for structural damage or cracks and leaks. Seal or drain these reservoirs as required. Contact DOH.
Booster Stations	Booster stations may be structurally damaged or mechanical damage to pumps and piping may have occurred.	Check booster stations and shut down pumps as required. If zones can be fed by alternate methods, implement those procedures. Contact DOH.
Wells	Unable to supply additional water to system. Well casings may be broken. Pumping capacity may be lost.	Investigate situation. Determine which wells can be utilized. Determine if surface water source still available. Contact DOH.
Treatment Facilities	Damage may have occurred to the treatment building, piping, or filters at the Slow Sand filter plant. May be unable to supply water from surface water source.	Shut down the equipment at the treatment facility. Attempt to repair. Check possibility of supplying City with groundwater sources. Contact DOH.

FLOOD

The Clark County HIVA states that floods are the most common disaster in Washington State and Clark County. The County's climate, topography, and geology are conducive to flooding. Normal annual precipitation ranges from 38 inches on the western floodplains to over 114 inches in the mountainous northeastern part of the county.

History of Flooding in Clark County and Adjacent Areas

- **December 1933** – The largest flood of record on the Lewis River.

- **May 30, 1948** – Columbia River crested at 34.4 ft. Flood stage at that time was 15 ft. This is the flood that destroyed the City of Vanport. Vanport, with a population at the time of the disaster of 18,500, was the second largest City in Oregon. The destruction of the town occurred when a 600-foot section of dike protecting the settlement from the rising Columbia River broke. Unfortunately, few people evacuated Vanport prior to the dam rupture. Evacuation was hampered by the fact that there were very few good evacuation routes. Fifteen people died in the flood.

- **June 1956** – Columbia River flooded due to snowmelt runoff.

- **January 1972** – A combination of intense rainfall and snowmelt caused major East Fork of the Lewis River floods.

- **December 1977** – Heavy rainfall and snowmelt caused flooding on the East Fork of the Lewis River. Salmon Creek had largest flood since gages were placed on Salmon Creek. The Washougal River also received its largest flood since gages were placed in 1944. This flood was an extremely rare event, greater than a 500-year flood.

- **February 8, 1996** – The Columbia River crested at 27.1 feet on February 9. This flood produced some of the worst flooding seen in the County since 1948. Approximately 1,500 people were evacuated, and 177 homes were destroyed. This flood occurred because of the confluence of several factors. The winter of 1995/96 was extremely rainy. Prior to the flooding period, the region experienced a cold snap with low elevation freezing, ice, and snow. This was followed by a strong warming trend with heavy precipitation.

In Clark County, the weather that produces the most serious flooding events are extensive wet conditions that follow a period of mid and high elevation ice and snow pack development. Many rivers in Clark County historically flood every few years. These include the East Fork of the Lewis River, Washougal River, Salmon Creek, and the Columbia River. Flooding on these rivers usually occurs between October and February. Long periods of heavy rainfall and mild temperatures coupled with snowmelt contribute to flooding.

There are three types of flood threats:

- Riverine
- Tidal
- Flash and Surface

The greatest threat of flooding in the City will be flash and surface flooding due to inundation of stormwater collection and conveyance systems. This may impact the water system operation through a number of mechanisms, including:

- Restricting access to water system facilities due to flooded streets
- Flooded valve and meter vaults
- Flooded City facilities
- Increasing groundwater levels that threaten contamination of leaking underground water lines

Actions the City will consider depending on the extent of flooding and the risks that might be mitigated include:

Pre-Flood

- Sandbagging around City facilities, such as the Public Works Operations Center
- Securing large pieces of equipment and materials that could be carried off by floodwaters
- Raising electronic equipment and computers off the floor
- Moving valuable records to locations expected to remain dry

Post-Flood

- Checking coliform levels in the water system for contamination (see incident specific plan for bacteriological contamination)
- Inspecting meters and PRV stations to ensure proper operation
- Cleaning debris from around reservoirs

Figure 5-3 includes a flood map of the City of Camas. As the flood map indicates areas susceptible to flooding include the Washougal Wellfield (Well Nos. 5, 6, 7, 8, 10 and 12 as well as the new chemical feed building).

Historically, flooding occurs along one or more of the County's waterways every few years, suggesting a high probability of occurrence. Because of the relative land area and population affected, the County is exposed to moderate vulnerability. Although the vulnerability is moderate, the frequency of flooding, the potential for simultaneous flooding events, plus the historical record of recurrent flooding and cumulative costs, all suggest the assignment of a high risk rating.

Table 5-6 lists flood response measures specific to the City's water system.

TABLE 5-6

Flood Response City of Camas Water System

Water System Component	Potential Effects	Recommended Actions
Transmission and Distribution System	Transmission and distribution mains could be affected by landslides or high water levels. City staff transportation for monitoring the system and making repairs may be limited.	Monitor possible areas of concern for waterline conditions. Monitor waterline bridge crossings for possible damage. Prepare to valve off any washed out or damaged waterlines. Contact DOH.
Storage Facilities	Minimum physical/structural impact due to locations. Flooding could cause elevated coliform levels in water system.	Monitor coliform levels. Contact DOH to advise of acute of non-acute coliform violations.
Booster Stations	Minimal operational impact.	None.
Wells	Facilities could be overwhelmed by flood waters.	Prepare to disconnect any well affected by flood waters. Contact DOH.
Treatment Facilities	Heavy rainfall or snow melt may overwhelm the capacity of the water treatment facility. Flooding in the vicinity of the plant is a risk.	Allow the water to bypass the filtration plant by closing intake facilities. Use wells as source of water for City. Contact DOH.

LANDSLIDE/MUDFLOW/DEBRIS FLOW

The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Landslides commonly occur on water-saturated slopes when the base of the slope can no longer support the weight of the soil above it, thus their frequency increases during or after periods of heavy rain and flooding. Though commonly associated with heavy rain and flooding conditions, landslides may also be associated with earthquakes (the 1994 Northridge Earthquake caused an estimated 11,000 landslides) and volcanic activity.

CRESA indicates that Clark County experienced the greatest number of landslides from 1996 to 1997. One of the largest landslides in the area occurred just outside of Clark

County, two miles north of Woodland on February 8 and 9 when 32,000 yd^3 of earth fell across all lanes of I-5 and the adjacent railroad tracks, disrupting traffic until February 19. In the same flooding period there were also several landslides that disrupted railroad operations in the area adjacent to Vancouver Lake. The following year, which was marked by heavy rains but no significant flooding, there were several landslides. Clark County has several areas where landslides have taken place and several areas that are susceptible to landslides. The hills north of La Center and the slopes north of Camas and Washougal are particularly susceptible.

Slides in Clark County generally range in size from thin masses of soil of a few yards wide to deep-seated bedrock slides more than six miles across. Travel rate may range in velocity from a few inches per month to many feet per second, depending largely on slope, material, and water content. The recognition of ancient dormant slide masses is important as they can be reactivated by earthquakes or unusually wet winters. Also, because they consist of broken materials and disrupted ground water, they are more susceptible to construction-triggered sliding than adjacent undisturbed material.

CRESA states that typical effects of landslides include damage or destruction of portions of roads and railroads, sewer lines, pipelines, and water lines, electrical and communications distribution lines, and destroyed homes and public buildings, but the most significant effect of landslides is the disruption of transportation and the destruction of private and public property.

The Clark County HIVA indicates the County has a history of landslides and their numbers are increasing, suggesting a high probability of occurrence. Landslides tend to occur in isolated, sparsely developed areas threatening individual structures and remote sections of the transportation, energy and communications infrastructure suggesting low vulnerability. Because of the high probability of occurrence and the trend to more frequent landslides, a moderate risk rating is assigned.

The risk to the water system is considered low because of the lack of steep slopes in the Camas area. Flooding and Earthquakes will increase the risk of landslides. Refer to Tables 5-5 and 5-6 for response measures that may be appropriate for landslides induced by those event categories.

SEVERE SNOWSTORM

The most significant anticipated impact of a severe snowstorm is limiting access to the City's facilities. City personnel may not be able to access water mains, reservoirs or valves for maintenance and/or manual operation of system components. During a severe snowstorm the City will rely on the telemetry system for information on the major system components. Additional hazards to be considered with severe winter storms include:

- Freezing in City Reservoirs – Mitigated by ensuring continuous turnover.

- Water service line breaks – Mitigated by asking customers to be vigilant for flooding around homes and businesses.
- Roof Collapse on City buildings and reservoirs – Mitigated by observing snow levels and having City crews remove when snow load may be exceeded.

Table 5-7 lists water system response measures associated with winter storms.

TABLE 5-7

Severe Snowstorm Response City of Camas Water System

Water System Component	Potential Effects	Recommended Actions
Transmission and Distribution System	City staff transportation for monitoring system and making repairs will be limited.	Contact City street department to expedite plowing of critical water system component access. Maintain chains and other snow gear for maintenance equipment on hand. Be able to provide accurate locations of valving for maintenance purposes.
Storage Facilities	Snow may prevent access.	Clear snow from access roads. Three 4 x 4 vehicles are available for water department use to access critical sites.
Booster Stations	Snow may prevent access.	Clear snow from access roads. Three 4 x 4 vehicles are available for water department use to access critical sites.
Wells	Snow may prevent access.	Clear snow from access roads. Three 4 x 4 vehicles are available for water department use to access critical sites.
Treatment Facilities	Snow may prevent access.	Clear snow from access roads. Three 4 x 4 vehicles are available for water department use to access critical sites.

TORNADO

Tornadoes are characterized by funnel clouds of varying sizes that generate winds as fast as 500 miles per hour. They can affect an area of 1/4 to 3/4 of a mile and seldom more than 16 miles long. Tornadoes normally descend from the large cumulonimbus clouds that characterize severe thunderstorms. They form when a strong crosswind (sheer) intersects with strong warm updrafts in these clouds causing a slowly spinning vortex to

form within a cloud. Eventually, this vortex may develop intensity and then descend to form a funnel cloud. When this funnel cloud touches the ground or gets close enough to the ground to affect the surface it becomes a tornado. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. Tornado hazards are measured using the Fujita Scale ranging from F0 to F6.

A history of tornadoes in Clark County follows:

- October 1951 – Battle Ground (F0 on the Fujita Scale). 8-miles long and 25-yards wide, which uprooted trees and destroyed a two-story barn.

- August 26, 1953 – Ridgefield (F0 on the Fujita Scale). Lasted 3 minutes and severely damaged a farm.

- April 5, 1972 – Vancouver (F3 on the Fujita Scale). This was the most disaster to occur in Clark County and the most serious tornado in Washington State. Six people died and 300 were injured when a tornado cut a swath of destruction through East Vancouver. The tornado's path was 9-miles long, from the Columbia River, just east of Andresen Road up to Fourth Plain Blvd. Peter S. Ogden Elementary, a shopping center, and a bowling alley were severely damaged.

- December 1974 – Camas (F0 on the Fujita Scale). Windows were broken and walls collapsed but there was no serious damage.

- October 1984 – Woodland (F1 on the Fujita Scale). A funnel cloud touched down several times, snapping and overturning trees, and ripping up fence lines. A barn roof was torn off, corrals flattened and a pump house lifted and exploded.

- June 29, 1989 – La Center (F1 on the Fujita Scale). Uprooted several trees and tossed one car off the road causing minor injuries to the driver.

- May 31, 1997 – Vancouver (F0 on the Fujita Scale). Caused $10,000 in property damage.

- September 15, 1997 – Yacolt (F0 on the Fujita Scale). No reported damage.

- May 11, 2000 – Battleground (F0 on the Fujita Scale). Caused $10,000 in property damage.

- May 27, 2004 – La Center (F0 on the Fujita Scale). No reported damage.

- September 2004 – Ridgefield (F0 on the Fujita Scale). No reported damage.

- January 10, 2008 – Vancouver, (F1 on the Fujita Scale). Damage reports showed widespread downed power lines, malfunctioning traffic lights, and roofing that had been ripped off. Although the majority of damage was light in nature, in at least one case a home was completely demolished. At least 2,500 homes and businesses had lost power because of the storm. Property damage estimated to total $525,000.

- December 2015 – Battle Ground (F1 on the Fujita Scale). Damage reports showed downed power lines, malfunctioning traffic lights, damaged fences and roofing that had been ripped off. Although the majority of damage was light in nature, two businesses were damaged and deemed to be unsafe. No injuries were reported.

Table 5-8 provides definitions of tornado hazards.

TABLE 5-8

Tornado Hazard Scale

F-Scale Number	Intensity Phase	Wind Speed	Type of Damage Done
F0	Gale Tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate Tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant Tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe Tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted.

Tornadoes are not normal occurrence in the Northwest as they require a confluence of warm surface temperatures and warm fronts coming from the south with cold fronts coming from the north. Northwest climates do not normally generate the temperature variations conducive to tornado formation. Washington is ranked 43 in the US for total number of tornadoes. Nonetheless, CRESA states that the tornado threat should be taken very seriously. The conditions conducive to tornado formation may develop in Southwest Washington and it is common for funnel clouds to be reported in this region. During severe thunderstorms it is possible for tornadoes to occur.

With the exception of the April 1972 disaster, tornadoes in Washington and Oregon tend to be light or moderate, with winds ranging from 40 to 112 mph. There are a notable

minority of tornadoes that cause significant to severe damage with winds going as high as 200 mph. The peak season for tornadoes is April through July. However, in Washington tornadoes may occur in the late summer months and, in a few rare cases, may occur in the winter months. While tornadoes are sometimes formed in association with large Pacific storms, most of them are caused by intense local thunderstorms. Tornadoes almost exclusively occur in the late afternoon and early evening.

It is possible for a tornado to occur anywhere in the lower elevations of Clark County. Normally, Pacific Northwest tornadoes are moderate but it is possible for serious tornadoes to develop, causing death and serious injury as well as property damage.

Water systems most vulnerable to tornadoes will be reservoirs, booster stations and treatment facilities. Reservoirs are not designed to withstand the high winds possible with tornadoes and buildings that house well pumps, booster pumps and treatment facilities may be damaged or destroyed by a severe tornado.

VOLCANO

According to the Clark County HIVA, the most likely scenarios for volcanic eruptions that will impact the County are as follows:

- Ashfall and *tephra* (the ash, rock and boulder-sized debris from an exploding volcano) from Mt. St. Helens.

- Ashfall and the generation of *lahars* (volcanic mud/debris flows) from the Sandy River in Oregon due to volcanic activity at Mt. Hood.

The most severe impacts in Southwest Washington from another major eruption from Mt. St. Helens eruption would be in Cowlitz County. In this event, Clark County emergency managers and responders may support Cowlitz County agencies and the Forest Service in assisting in evacuation, perimeter control, search and rescue and other operations. Drawing from these resources may leave the City of Camas potentially vulnerable to an inability to respond should emergencies arise that require local response assets.

The vulnerability to damage from lahars is greatest in southern Clark County, due to potential impacts from lahars in the Sandy River. Since the Sandy River empties into the Columbia across from Camas, lahar deposits could influence the flow of the Columbia River and possibly affect low lying areas of Camas near the Columbia. However, the potential exists for ashfall from volcanic activity to impact the entire county by creating a respiratory hazard and potentially adding weight to the roofs of City facilities (including the water reservoirs) that will increase significantly if it becomes wet. Wet ash also creates a slipping hazard and will create traffic problems and make water system maintenance hazardous.

URBAN FIRE

In the 2019 Water System Plan, a hydraulic analysis was conducted in several areas throughout the system to determine if the water system had adequate capacity to provide fire flow. Deficiencies were noted in the following areas:

- PRV Systems – Lacking pressure-sustaining features to prevent fire flows in lower pressure zones from causing unacceptable service pressures in upper pressure zones.
- West of Fargo (19th thru 22 Ave) – Fire flow limitations.
- Various pockets in Downtown – Fire flow limitations.
- Pacific Rim Blvd near Parker Street – Fire Flow limitations

The modeling of the water system is generally based on single event structural fires. In addition to the areas with fire flow deficiencies noted above, multiple structural fires occurring simultaneously in the same pressure zone could conceivably overwhelm the water system's capacity. If mutual aid agreements are invoked, the City would need to consider the potential for a water shortage in a coordinated fire response.

However, in the event of a fire City personnel monitor reservoir levels and system performance with the telemetry system, which allows the Fire Department to understand the limitations of water supplies available for fire suppression and to operate accordingly. It is also important to note that the City's Municipal Code also requires that all buildings, including residential structures, are required to be sprinklered, which significantly reduces the potential for large structure fires.

Other issues to consider with fires include:

- Creating a vacuum on waterlines due to high fire demand; this may create a cross-contamination hazard.
- Water quality complaints from customers due to high pipe velocities scouring inner pipe surfaces.

Table 5-9 lists water system response measures for urban fires.

TABLE 5-9

Urban Fire Response City of Camas Water System

Water System Component	Potential Effects	Recommended Actions
Transmission and Distribution System	Low pressure may result in the extremities of the system depending on the extent of the fire incident.	Monitor system and adjust pumps if applicable.
Storage Facilities	Draw down will occur in the reservoirs with increased demand.	Monitor reservoir levels.
Booster Stations	Additional pumps called on.	Monitor pump station to ensure proper operation.
Treatment Facilities	Fire in watershed could cause increased sediment in the surface water source. Turbidity levels may exceed acceptable levels.	Use groundwater sources until surface water sources available. Provide silt fences along areas that have lost vegetation due to fire. Contact DOH.

POWER FAILURE

Various types of severe weather can cause loss of electrical power. In order to alleviate the effects of a power outage, the City has installed auxiliary generators at the Chlorination Plant, the Filter Plant, Butler/Gregg Booster Stations, Angelo Booster Station, Lacamas Booster Station and the Lower Prune Hill Pump Station. Well Nos. 8, 11 and 12 also have an auxiliary power source to allow the wells to operate during an electrical outage. The Washougal Wellfield Treatment Facility obtains auxiliary power from the generator for Wells 11 and 12.

Table 5-10 presents the potential effects of a lengthy power failure on the water system components.

TABLE 5-10

Power Failure Response City of Camas Water System

Water System Component	Potential Effects	Recommended Actions
Transmission and Distribution System	No effect	None.
Storage Facilities	Telemetry system may be inoperable.	Manually check reservoir levels. Some reservoirs can provide water to lower areas.
Booster Stations	Booster stations inoperable without auxiliary power.	Operate booster station with auxiliary power.
Wells	Unable to supply additional water to system.	Well Nos. 8, 11 and 12 Auxiliary Power
Treatment Facilities		Auxiliary generator.

DAM FAILURE

Dam failures are the release of impounded water due to structural deficiencies, which can affect lives and property downstream. Dam failures are caused by flooding, earthquakes, lack of maintenance and repair, misoperation, poor construction, vandalism, or terrorism.

According to the Clark County HIVA, several dam failures have occurred in Washington State over the last 40 years, some of which been catastrophic, but none have occurred in or has impacted Clark County.

There are 36 dams in Clark County. These dams are used for hydroelectric power generation, irrigation, and recreation. Table 5-11 shows dams that could potentially impact the City of Camas.

TABLE 5-11

Clark County Dams Upstream of the City of Camas

Name of Dam	Year Built	Type	Nearest City Downstream	Distance in Miles	River	Downstream Hazard Category
Clark Reservoir Dam	1948	RE	Camas	4	Robinson Creek	3
Lacamas and Round Lakes, Lower Dam	1936	BU	Camas	1	Lacamas Creek	2
Lacamas and Round Lakes, Upper Dam	1936	BU	Camas	1	Lacamas Creek	2
Price Reservoir Dam	1950	RE	Camas	3	Tributary - Lacamas Creek	3

Dam Type: BU – Buttressed Dam, RE – Reinforced Earth Dam.
Hazard Category:
1 = High; 2 = Significant; 3 = Low
(reference: Washington State Department of Ecology Dam Safety Guidelines, July 1992, revised Sept 2004)
2 = 1 to 6 lives at risk, appreciable economic loss, limited or short term water quality degradation
3 = No lives at risk, minimal economic losses, no significant water quality impacts

Washington State uses a Downstream Hazard Classification system for dams, which assigns a Low, Significant or High rating for populations at risk of economic loss and environmental damage should the dam fail. In Clark County, most dams are rated low, three are significant and three high. (The three potential high hazard dams are the Merwin Dam on the Lewis River, Erickson on Rock Creek and Tsugawa Brothers Reservoir Dam on Mason Creek.) The three potential significant hazard dams are the Elmer Dam on Mason Creek and the Lacamas and Round Lakes, upper and lower dams on Lacamas Creek; these latter two dams pose a downstream hazard to the City of Camas.

In addition to the dams located in Clark County, the county can also be affected by dam failures of dams on the Columbia River upstream from Clark County. CRESA considers these dams to be well maintained, operated with 24-hour staffing and inspected on a regular basis.

CRESA states that Washington experiences a dam failure on a frequency of approximately once every two years. The majorities of failures were in whole or part the result of a failure to perform adequate maintenance and monitoring of the facilities. Dam failure can have many effects such as loss of life, damage to structures, roads, utilities, and crops. Economic losses can also result from a lowered tax base and lack of power profits.

History suggests a low probability of occurrence. The failure of a high hazard dam would threaten a small segment of the County suggesting low vulnerability. Because there has not been a major dam failure in Clark County, and the three high hazard dams are well maintained and operated providing no reason to suspect a compromise in

structural integrity baring a natural disaster or terrorist action, a low risk rating is assigned.

For response measures in the event of a dam failure, refer to Table 5-7 (flood response).

TRANSPORTATION ACCIDENT (AIRPLANE CRASH)

Although there have been no major airplane crashes in Clark County, the scope of the impact of such an event and the potential complexities of the response require the City to consider how such an incident could impact the water system operation.

The City of Vancouver is across the river from Portland International Airport. The airspace over the Columbia River and Vancouver is heavily used by all types of aircraft flying into Pearson Airpark, Portland Air National Guard Base and Portland International Airport. Most airplane accidents occur during arrival and departure so the City of Vancouver is at a greater risk than any other area in the County. Considering the flight paths of aircraft into and out of Portland International Airport, Vancouver has the potential for a major airplane crash with mass casualties, hazardous materials incidents, and fires. Accordingly, response assets from the City of Camas may be drawn to a crash site and leave the City potentially vulnerable if another emergency arises that requires those assets. Additionally, an airplane crash could cause major transportation routes to be closed for significant periods of time, resulting in significant delays for contractors, equipment and chemical suppliers to access the City of Camas.

TRANSPORTATION ACCIDENT (HIGHWAY OR RAIL)

City water lines cross a number of well-trafficked thoroughfares through the City, including SR 14 and the railroad that runs parallel to SR14. It is conceivable that a major accident on one of these thoroughfares would damage a water line. The Public Works component of the response to a transportation incident includes the following:

- Coordinate damage assessments, emergency road clearing and road repair activities
- Provide contracts for repair and recover work, including damaged utilities
- Provide maps for transportation route planning

The water utility will need to be assessed rapidly in the event of a major transportation incident to determine if water lines have either been damaged or are at risk of being damaged due to the incident. It may become necessary to isolate damaged or at-risk water lines until the incident has been cleared and emergency repairs have been made to allow recovery efforts to proceed.

HAZARDOUS MATERIALS (HAZMAT) INCIDENT

According to the Clark County HIVA, as of 1998, Clark County had approximately 77 entities, at 117 facility locations, which filed an Emergency and Hazardous Chemical Inventory Form (known as a Tier Two Form) with Washington State Department of Ecology. Of these 117 facilities about 58 of them use chemicals on the Environmental Protection Agencies list of Extremely Hazardous Substances.

The City may obtain Clark County Tier Two Hazardous Chemical Inventories from CRESA:

Phone: (360) 737-1911 Email: cresa@clark.wa.gov

Statistics show that nearly half of all hazardous materials incidents occur during transit. Large quantities of HAZMAT are transported through and in the close vicinity of the City via the interstate highway and by rail. In the event of a HAZMAT spill, the Fire Department will be the City's lead department for incident response within the City limits. A large spill will trigger the need for mutual response under the Regional HAZMAT response agreement.

The City of Camas Fire Department has no HAZMAT response capability. A HAZMAT response capability permits offensive operations necessary to perform the following operations:

- Preliminary hazard characterization
- Safely enter the hazardous area
- Mitigate the effects of the release prior to recovery operations
- Exit the hazard area employing a deliberate and thorough decontamination process

The above capabilities can only be provided by HAZMAT teams that are equipped and trained to Occupational Safety and Health Agency regulations (29 CFR 1910.120) and National Fire Protection Association competency levels (NFPA 471 and 472). The City of Vancouver and the Georgia Pacific Mill have such response capabilities. The City Fire Department will coordinate all HAZMAT support with this units working with CRESA under the regional HAZMAT response plan. Telephone numbers for the City of Vancouver and Georgia Pacific HAZMAT teams leaders are as follows:

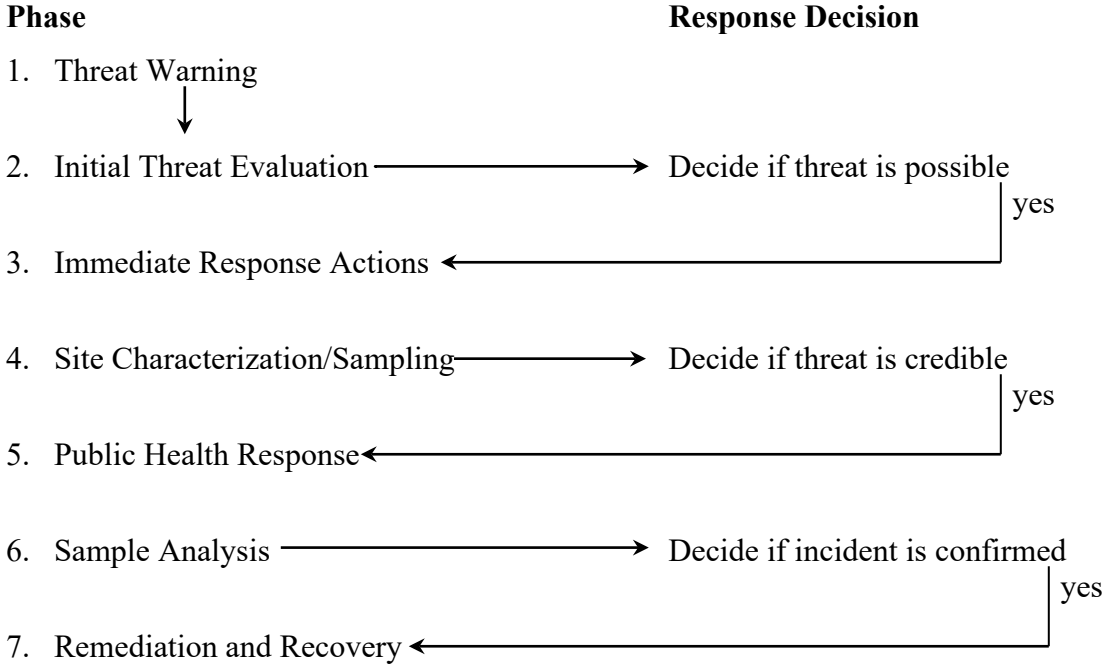
City of Vancouver (360) 619-4165
Georgia Pacific (360) 834-8465

The Public Works and Fire Departments will communicate during a HAZMAT spill to determine if the incident poses a hazard to water system personnel and facilities. It may become necessary to isolate water lines that are at risk of contamination due to a HAZMAT spill in order to prevent contamination of the water system.

INTENTIONAL CONTAMINATION

This type of incident could accompany a terrorist incident involving chemical, biological or radiological agents as well as vandalism. It is treated as a unique class of incident due to the complexities of the response from an operational, public health, law enforcement and physical recovery standpoint.

The EPA recommended protocols for managing a suspected intentional contamination incident are summarized in Figure 5-4. The EPA protocol has seven phases with three response decision points:

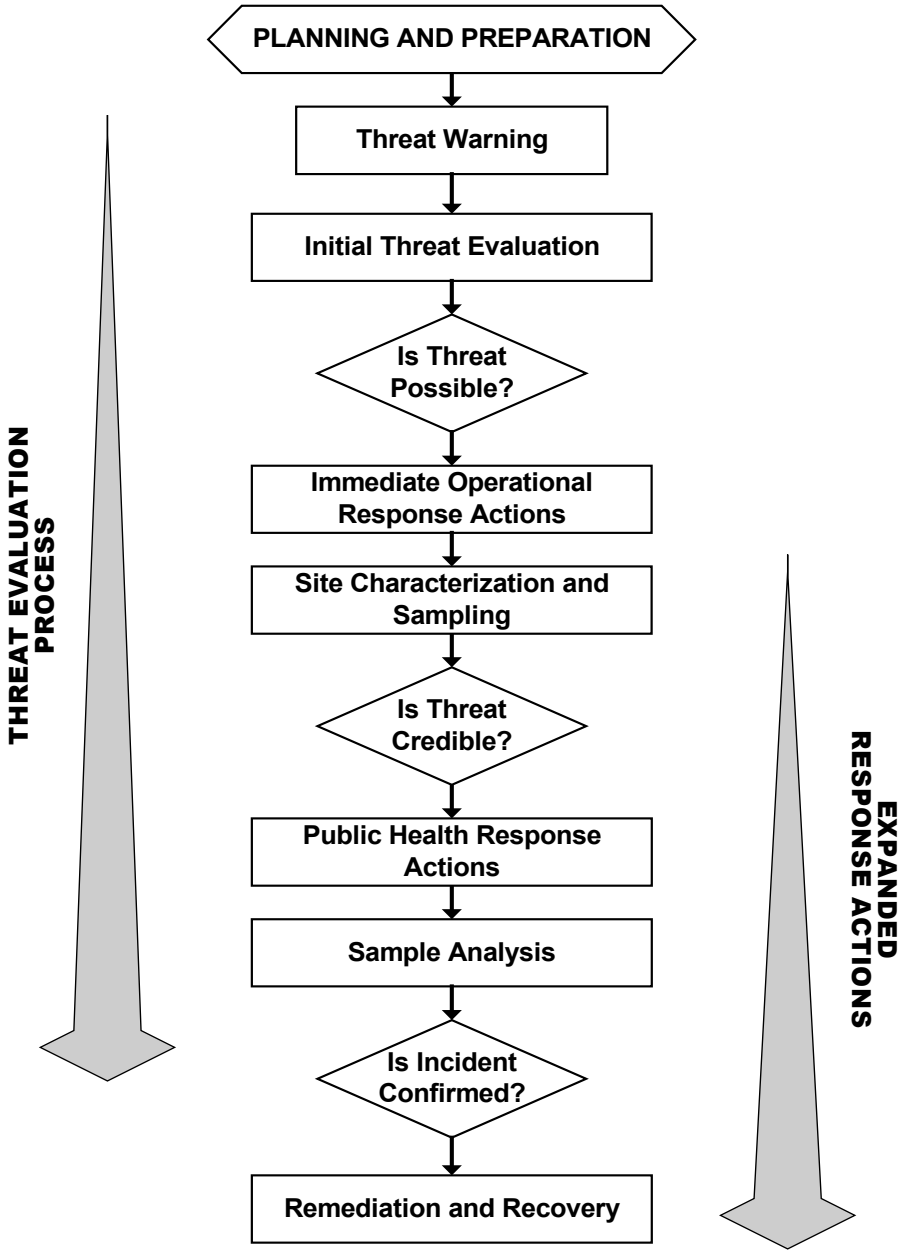


In no case should the utility pursue these actions unilaterally. Jurisdictional law enforcement agencies and public health agencies must be involved in each phase of the process. There are legal and practical requirements for this involvement, including rules of evidence for criminal investigations, balancing the need to protect law-enforcement sensitive information with public-right-to-know provisions in the Safe Drinking Water Act, obtaining specialized technical advice for sampling procedures and protecting the safety and health of water system personnel when taking water samples to test for suspected contamination.

Terrorism is a Federal crime and will require the involvement of federal law enforcement (Federal Bureau of Investigation).

FIGURE 5-4

Protocol for Managing an Intentional Contamination Incident



Reference: Planning for and Responding to Drinking Water Contamination Threats and Incidents Response Protocol Toolbox, USEPA, December 12, 2003.

Additionally, it is always recommended that the water utility consult with the HAZMAT team leader during the characterization and sampling process since, depending on the exposure hazard, it may become necessary for HAZMAT technician trained personnel to perform the site assessment and collect samples wearing OSHA compliant personal protective equipment.

Threat Warning

This is any unusual occurrence, observation, or discovery that indicates a potential contamination incident and initiates actions to address this concern. Such a warning would typically come in the form of an apparent security breach in the water system. Evidence of a security breach could come in the form of a telephone call threatening contamination or stating that intentional contamination has occurred; statements by witnesses who have seen water facilities being tampered with or broken into; physical evidence at a water facility indicating water facilities have been intentionally damaged or tampered with; and reports of increased illnesses from local hospitals or the Clark County Health Department.

Initial Threat Evaluation

This is the part of the threat management process in which all available and relevant information about the threat is evaluated to determine if the threat is possible. This is an iterative process in which the threat evaluation is revised as additional information becomes available. The conclusions from the threat evaluation are considered when making *response decisions*.

Immediate Response Actions

These are actions taken in response to a possible contamination threat in an attempt to minimize the potential for exposure to the potentially contaminated water. Immediate operational response actions will generally have a negligible impact on consumers. These actions will include estimating the potential area(s) within the water system that may have been subject to contamination and isolating these areas from the system to contain the contamination. This process must be performed quickly and generally will not allow modeling tools to be used unless the scenarios have been developed and modeled prior to the suspected contamination event.

Immediate Characterization and Sampling

This is the process of collecting information from an *investigation site* in order to support the evaluation of a drinking water contamination threat. Site characterization activities include the site investigation, *field safety screening*, *rapid field testing* of the water, and sample collection.

Field Safety Screening

Screening performed to detect any environmental hazards (i.e., in the air and on surfaces) that might pose a threat to the *site characterization* team. Monitoring for radioactivity as the team approaches the site is an example of field safety screening.

Rapid Field Testing

Analysis of water during *site characterization* using rapid field water testing technology in an attempt to tentatively identify contaminants or unusual water quality.

Public Health Response

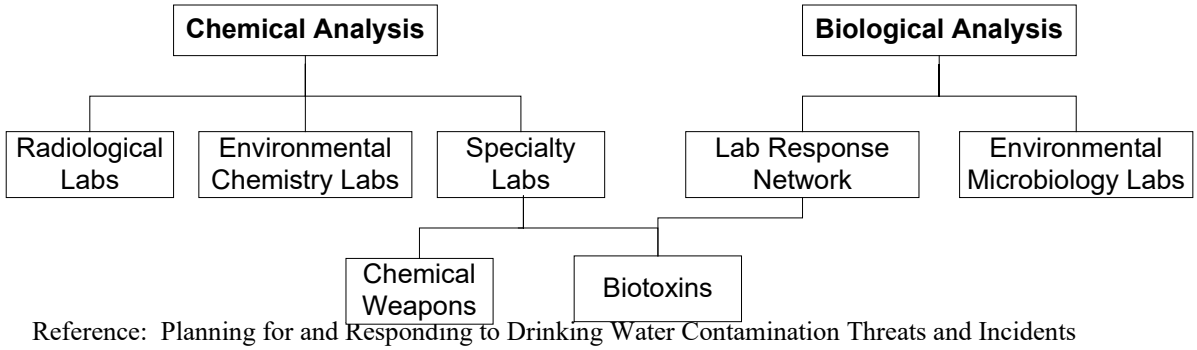
This encompasses all actions taken to mitigate consequences resulting from threats or incidents involving biological, chemical, or radiological contaminants. These actions include public notification, using an alternative water supply, boil water notices and chemical sterilization.

Sample Analysis

This step involves laboratory analysis that is undertaken to confirm the presence/absence of contamination such that specific decisions can be made by law enforcement and public health officials and allow the water utility to proceed with definitive response and recovery actions. It is important to keep in mind that not all labs can definitively confirm a potential contamination agent. Figure 5-5 shows the types of laboratories and their general capabilities.

FIGURE 5-5

Types of Laboratories by Contaminant Class



Reference: Planning for and Responding to Drinking Water Contamination Threats and Incidents Response Protocol Toolbox, Module 4: Analytical Guide, USEPA, December 12, 2003

Definitions for terms used in Figure 5-5 are provided below. The EPA Environmental Laboratory Compendium provides a national listing of laboratories and their capabilities. The City may sign up for this list by going to the EPA's water security website:

http://cfpub.epa.gov/safewater/watersecurity/index.cfm

Environmental Chemistry Laboratory

This is any laboratory, either commercial or government-operated that is able to perform analysis of water samples for compliance with the Safe Drinking Water, Clean Water Acts, or other applicable environmental regulation, as well as other chemical parameters that are important to system operation and overall water quality. These laboratories have the instrumentation necessary to implement methods for chemical analysis of a water sample.

Environmental chemistry laboratories perform water analyses to support regulatory compliance and they are familiar with the need to treat samples with precautions necessary for legal defensibility. Analysis for regulatory compliance purposes, however, may proceed differently than analysis of emergency samples in response to a contamination threat, which has the dual role of both providing an emergency response to protect public health and also providing legally defensible evidence to support a criminal investigation. Additionally, no commercial environmental chemistry laboratories can analyze chemical warfare agents (e.g., nerve, mustard and blood/choking agents); this latter type of analysis can only be performed by a small number of government-operated laboratories in the United States whose access is restricted to law enforcement and military agencies.

Environmental Microbiological Labs

These labs include those of EPA, state environmental agencies, and the commercial sector, that typically perform analyses for waterborne pathogens. Most of these laboratories have the equipment and staff necessary to analyze for indicators of fecal contamination such as fecal and total coliforms and *E. coli*. Culture techniques are available for many of the more common waterborne pathogens such as *Vibrio cholerae, Salmonella enteriditis,* Typhi, and *Shigella* spp.; however, analyses for these pathogens are not routinely performed in most environmental microbiological laboratories. While some environmental microbiological laboratories have expanded capabilities to analyze for parasites such as *Cryptosporidium* and *Giardia* or to perform molecular assays for some organisms, these capabilities are not widespread.

Only laboratories registered for the analysis of select agents are legally permitted to analyze for those agents, and currently most registered labs reside in the LRN. Thus, even if environmental microbiological laboratories develop additional capabilities for pathogen analysis, they could not perform such analyses without registering for select agents.

Laboratory Response Network (LRN)

This is a network of laboratories developed by the Centers for Disease Control (CDC), Association of Public Health Laboratories (APHL), and the Federal Bureau of Investigation (FBI) for the express purpose of dealing with bioterrorism threats, including pathogens and some biotoxins.

Radiological Labs

These laboratories specialize in the analysis and handling of radiological materials. For radionuclides, analytical confirmation may be viewed differently than most chemicals because radionuclide analysis can take the form of screens for gross alpha, beta, or gamma radiation, and/or it can take the form of analysis for the specific radionuclides themselves, such as strontium-90. Thus, analytical confirmation may involve the process of confirming quantity of gross radiation or identifying the radionuclide. The type of analysis that is performed will be based on the analytical goals. For example, radionuclides in drinking water regulation are often characterized by their gross alpha and gross beta emissions.

For the purpose of emergency analysis of water contaminants, a tiered approach is suggested, with screening for gross radiation in the field or upon receipt by the laboratory followed by identification of the radionuclide, which may be important for a more complete understanding of risks to public health as well as potential criminal actions against perpetrators.

Specialty Labs

These are laboratories that are capable of analyzing samples for chemical, biological and radiological agents that cannot be analyzed by commercial laboratories. These labs require special safety certifications for operation and their access is controlled by law enforcement agencies and the military.

Remediation and Recovery

The remediation process involves: system characterization; selection of remedy options; provision of an alternate drinking water supply during remediation; and monitoring to demonstrate that the system has been remediated. This process will follow a process similar to the US EPA's Superfund program's approach to hazardous waste site cleanup to include *risk assessment*, *system characterization*, *feasibility study*, analysis of alternatives, *remedy* selection, *remedial design*, *remedial action*, and post-remedial monitoring and operations.

EXPLOSIVES INCIDENT

A bomb threat will be handled by the City Police Department. If the call is received at the CRESA 911 call center, the call center staff is trained regarding information to be obtained and questioning techniques. If the call is received by a City employee they will follow procedures as shown in Appendix L.

In the event of an attack on the water system with explosive devices, the response will, like a contamination incident, be complex and multidisciplinary (police, fire, public works, emergency medical services (EMS), public information, etc.). Important issues to be considered in the response include:

- Assignment of the Incident Commander (will depend on the situation/risks) – the incident commander is responsible for overall command and control at the incident scene and the health and safety of all response personnel.

- Presence of casualties and proper procedures for casualty extraction and emergency medical treatment at the incident site.

- The risk of fire/explosion presented by flammable materials in the vicinity of the explosion.

- Threat of a secondary device (a device that is placed at the scene to kill or injure emergency responders after their arrival).

- Physical hazards associated with collapsed structures.

- Evidence preservation requirements.

- Respiratory, ocular and skin hazards associated with vapors and fine particulate matter generated by the explosion and subsequent fires and what personal protective equipment (PPE) levels are appropriate for the hazards – note that "escape" respirators (e.g., Quickmask 2000), are not designed for prolonged exposures necessary for intentional entry into a hazardous area, they are designed solely to allow movement away from the incident site to a safer location. Additionally, as of late 2004, no escape masks have received federal certification (the approval agency is NIOSH – National Institute of Occupational Safety and Health) for an independently recognized and tested level of performance.

- The need to maintain communication between all response units (especially police, fire, public works and EMS) to ensure different response units all have the same hazard assessment and understand which response units are being allowed at the incident site, their locations and

basic tasks; this becomes even more critical as mutual aid from other agencies and jurisdictions arrive at the site.

- The need to isolate damaged elements of the water system to make emergency repairs and minimize impact to undamaged elements of the water system.

- The need to maintain a single spokesperson for the City to release information to the public and the news media.

CYBER ATTACK

The City maintains an IT network separate from the water system SCADA network. The network is used for intracity business and is password protected. Firewall protection is used and no outside access for third parties is allowed.

If a cyber attack is successful, the response will require the IT-System Administrator to assess the extent of impact and develop a plan to restore damaged or compromised files and attempt to recover lost files.

If the SCADA system is compromised it will become necessary to monitor the water facilities by periodic and direct visual contact until the system is restored to normal operations.

DOCUMENTATION PROCEDURES

During an emergency, precise documentation of actions taken and materials used will greatly increase the efficiency with which the City handles the situation. Detailed recording and reporting of events, such as shut downs, valve isolations, sampling events and reservoir operations, enables repairs to be made quickly keeping down time to a minimum. The detailed reports are invaluable in making certain that the system is quickly and efficiently returned to pre-emergency operating status. To aid employees, an Operating and Damage Report form is included in Appendix M.

The Federal Emergency Management Agency (FEMA) requires proper documentation of damage for the City to file claims in the event the City is covered by a Presidential Disaster Declaration. Photographic evidence of “before” and “after” an event as well as equipment purchase records will strengthen any justification for compensation from the Federal government.

The FEMA disaster assistance website for public agencies can be consulted for further information:

http://www.disasterassistance.gov/daip_en.portal

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APPENDIX J

MAINTENANCE ACTIVITIES

Daily Maintenance Activities

Well No. 5, 6, 9, 13, 14, and Washougal Wellfield (Wells 7, 8, 10, 11, 12)

- Check motor oil level at each well.
- Verify proper pumping operations.
    - Read upstream and downstream pressure gauges to see if pressures are in normal operating range.
    - Read flow meters for instantaneous and totalized flow to verify flow.
    - Observe well pump and motor while operating for abnormal vibrations.
    - Check for signs of loose fittings (water on floor).
- Record sodium hypochlorite level in drum (Well 5, and 9 only).
- Test chlorine residual and record. Chlorine residual should be between 0.7 and 1.0 mg/L at the sample point.
- Check fluoride level in the saturator and fill as necessary.
- Test fluoride concentration and record. Fluoride concentration shall be between 0.5 and 0.9 mg/L at well sample point and in the distribution system.
- Record totalized flow meter reading from fluoride saturator.
- Check for proper operation of surge valves at each well. Inspect blow off discharge points to check if standing water is accumulating anywhere in the surge discharge system.
- Check for proper operation of chlorinator for each well.
- Check for proper operation of the fluoride system for each well.

Diesel Powered Auxiliary Generators (Washougal Wellfield Facility, Well No. 13, Well No. 14, Crown Road Booster Station, New Gregg Booster Station, Angelo Booster Station, Lower Prune Hill Pump Station)

- Perform general inspection.
- Perform Coolant heater inspection.
- Check oil level.
- Check coolant level.
- Check fuel level.
- Record hour meter.

Weekly Maintenance Activities

Jones and Boulder Creek Surface Water Sources

Twice per week (when in operation)

- Check impoundment structure for stability at both surface water intakes.
- Check for debris accumulation at intake screens at both sources.
- Read and record totalized flow on flowmeter.

Weekly

- Perform security check of facilities.

Reservoirs: Butler, Gregg, Upper & Lower Prune Hill, 18th Avenue, & Lacamas

- Perform full security check.
- Perform full structural check.

Booster Pump Stations: Butler, Old & New Gregg, Upper & Lower Prune Hill, Angelo Forest Home, Green Mountain Estates, Lacamas, & Francis Rd

- Perform full security check.
- Verify proper pumping operations.

- Read upstream and downstream pressure gauges to see if pressures are in normal operating range.
- Read flow meters for instantaneous and totalized flow to verify flow.
- Observe well pump and motor while operating for abnormal vibrations.
- Check for signs of loose fittings (water on floor).

Diesel Powered Auxiliary Generators (Washougal Wellfield Facility, Well No. 13, New Gregg Booster Station, Angelo Booster Station, Lower Prune Hill Pump Station)

- Air cleaner inspection.
- Air pipe inspection.
- Battery charger inspection.
- Drain fuel filters.
- Check block heater connections.

Monthly Maintenance Activities

Well No. 5, 6, 9, Washougal Wellfield (7, 8, 10, 11, 12) and Well 13

- Inspect property for security purposes.
- Check fluoride pump gear oil.
- Inspect pump packing lubrication for proper operation.
- Inspect cooling screens on Vertical Turbine pumps for blockage.

On-Site Sodium Hypochlorite Generation System (Washougal Wellfield and Well 13)

- Clean blower inlet screen.
- Check hardness of water from water softener – should be less than 10 mg/L.

Diesel Powered Auxiliary Generators (Washougal Wellfield Facility, Well No. 13, New Gregg Booster Station, Angelo Booster Station, Lower Prune Hill Pump Station)

- Drain exhaust condensate trap.
- Check starting batteries.
- Check antifreeze and DCA concentration.
- Drive belt inspection.
- Check block heater connections.

Semi-Annual Maintenance Activities

On-Site Sodium Hypochlorite Generation System (Washougal Wellfield and Well 13)

- Level switch – remove and clean calcification.
- Clean cells if needed.

Annual Maintenance Activities

Jones and Boulder Creek Surface Water Sources

- Jones Creek - close inlet valve to screen house so that no water is diverted to surface water filtration plant from May 15th to November 1.
- Boulder Creek - close outlet valve from screen house so no water is diverted to surface water filtration plant from May 15th to November 1.

Well No. 5, 6, 9, Washougal Wellfield (Wells 7, 8, 10, 11, 12) and Well 13

- Change oil on all oil lubricated equipment.
- Clean out fluoride saturator.
- Clean filter bags on ventilation fan.
- Infrared scan electrical panels.

- Exercise pump.
- Sample water.
- Inspect roof and building for maintenance requirements.
- Check control valves and piping for proper operation.

On-Site Sodium Hypochlorite Generation System (Washougal Wellfield and Well 13)

- Temperature switch – confirmation that the bi metal opens at 60º C when immersed in hot water.
- Replace bellows and poppets on water pump.
- Inspect water heater and perform the following as needed:
    - Descale the heating element
    - Change anode rod
    - Change heating element
    - Change thermostat
    - Reset high limit switch

Reservoirs: Butler, Gregg, Upper & Lower Prune Hill, 18th Avenue, & Lacamas

- Visually inspect inside of reservoir using Liquivision and/or Tank Divers.
- Inspect and remove sediment.

Booster Pump Stations: Butler, Old & New Gregg, Upper & Lower Prune Hill, Angelo Forest Home, Green Mountain Estates, Lacamas, & Francis Rd

- Pump and motor maintained per manufacturer's instructions.
- Check control valves for proper operation.
- Check Operations Center files for each of the booster stations for instructions concerning equipment at pump station.

Diesel Powered Auxiliary Generators (Washougal Wellfield Facility, Well No. 13, New Gregg Booster Station, Angelo Booster Station, Lower Prune Hill Pump Station)

- Inspect radiator hoses.
- Change air cleaner element.
- Change crankcase oil and filter.
- Change coolant filter.
- Change fuel filters.
- Clean cooling system.
- Check block heater connections.

Distribution System

- Leak detection survey (as determined by maintenance staff).

Five Year Maintenance Activities

Pressure Reducing Valves

- Perform a comprehensive evaluation of the PRVs in the system. This is contracted through GC Systems.
- Quarterly inspect each station.

The City of Camas has two sources that require disinfection with a CT of 6 per the Washington State Department of Health. These are the Washougal Wellfield, Well No. 13, and the Slow Sand Filtration Treatment Plant. A summary of the CT calculations for each source is provided below.

Wells 7, 8, 10, 11 and 12

The Washougal Wellfield disinfection system must be capable of treating all flows from Wells 7, 8, 10, 11 and 12, which totals 5,300 gpm if all wells are operated at their full capacity simultaneously. In reality the total capacity of these five wells is approximately 4,700 gpm, when Well 6 and 13 are not in operation, due to wellfield and transmission main limitations. For the Washougal Wellfield Treatment Facility, a CT of 6 is obtained from a chlorine residual of not less than 1.0 mg/L and a minimum CT volume of 31,800 gallons in the transmission pipeline up to the connection to the distribution system at NE 22nd Avenue and Everett Street.

$$1.0 \text{ mg/L} \times 31{,}800 \text{ gal} \div 5{,}300 \text{ gal/min} = 6 \text{ mg-min/L}$$

CT Volume from the Washougal Wellfield Treatment Facility to NE 22nd Avenue and Everett Street is calculated as follows:

From Washougal Wellfield Treatment Facility toward Well No. 10:

$$(24\text{-inch}/(2 \times 12 \text{ inch/ft}))^2 \times \pi \times 286.6 \text{ feet} \times 7.48 \text{ gal/ft}^3 = 900 \text{ gallons}$$

North under/across Washougal river to connection with the 12-in line going east to connect to new 24-inch river crossing:

$$(14\text{-inch}/(2 \times 12 \text{ inch/ft}))^2 \times \pi \times 1{,}566.9 \text{ feet} \times 7.48 \text{ gal/ft}^3 = 12{,}512 \text{ gallons}$$

North to the intersection of NE 3rd Ave and E 1st Ave

$$(14\text{-inch}/(2 \times 12 \text{ inch/ft}))^2 \times \pi \times 820.3 \text{ feet} \times 7.48 \text{ gal/ft}^3 = 6{,}550 \text{ gallons}$$

North from NE 3rd Ave and E 1st Ave, to intersection of NE 22nd Ave and NE Everett Street:

$$(18\text{-inch}/(2 \times 12 \text{ inch/ft}))^2 \times \pi \times 5{,}111.7 \text{ feet} \times 7.48 \text{ gal/ft}^3 = 67{,}472 \text{ gallons}$$

$$\text{Total} = 87{,}434 \text{ gallons}$$

Thus the pipeline between the Washougal Wellfield and the first connection at NE 22nd Avenue and Everett Street provides adequate CT volume.

Well No. 13

Water from Well No. 13 and all other groundwater sources from the Washougal wellfield will first enter the distribution system either at the pressure reducing valve on NE 21st and Everett.

$$1.0 \text{ mg/L} \times 7{,}950 \text{ gal} \div 1{,}325 \text{ gal/min} = 6 \text{ mg-min/L}$$

CT Volume from Well 13 to 3rd Avenue is calculated as follows:

12-inch DI line from Well No. 13 injection point to existing 18-inch water line on SE Cramer:

$$(12\text{-inch}/(2 \times 12 \text{ inch/ft}))^2 \times \pi \times 50 \text{ ft} \times 7.48 \text{ gal /ft}^3 = 330 \text{ gal}$$

18-inch DI water line from SE Cramer connection to 18-inch water transmission line on 3rd Avenue:

$$(18\text{-inch}/(2 \times 12 \text{ inch/ft}))^2 \times \pi \times (140 \text{ ft} + 500 \text{ ft}) \times 7.48 \text{ gal}/\text{ft}^3 = 9{,}386 \text{ gal}$$

Total = 9,716 gallons

The total CT volume between the injection point inside the Well No. 13 facility to the connection at the 18-inch transmission line in 3rd Avenue is 9,716 gallons, therefore, the required CT volume of 7,950 gallons is provided prior to the 14-inch transmission line connection when a chlorine dose of 1.0 mg/L is provided.

Slow Sand Filtration Treatment Plant

The transmission mains connecting the new Slow Sand Filtration Treatment Plant to the distribution system will provide a CT of 60. The transmission pipeline will comprise approximately 15,500 feet of existing 10-inch transmission pipeline and approximately 7,300 feet of new 12-inch transmission pipeline. The point of connection to the distribution system will be at the intersection of NE 14th street and NE 277th Avenue. At 1,570 gpm, the transmission pipelines will provide a total of approximately 66 minutes of contact time for disinfection. The required CT is based on a chlorine residual of 1 mg/L at the point of connection to the distribution system.

$$1.0 \text{ mg/L} \times 106{,}122 \text{ gal} \div 1{,}570 \text{ gal/min} = 67 \text{ mg-min/L}$$

CT Volume from the Washougal Wellfield Treatment Facility to NE 22nd Avenue and Everett Street is calculated as follows:

From Slow Sand Filtration Treatment Plant to new 12-inch transmission pipeline:

$$(10\text{-inch}/(2 \times 12 \text{ inch/ft}))^2 \times \pi \times 15{,}500 \text{ feet} \times 7.48 \text{ gal}/\text{ft}^3 = 63{,}236 \text{ gallons}$$

North under/across Washougal river to connection with the 12-in line going east to connect to new 24-inch river crossing:

$$(12\text{-inch}/(2 \times 12 \text{ inch/ft}))^2 \times \pi \times 7{,}300 \text{ feet} \times 7.48 \text{ gal}/\text{ft}^3 = 42{,}886 \text{ gallons}$$

Total = 106,122 gallons

APPENDIX K

ANNUAL SUMMARY REPORTS (2021-2025)

Cross-Connection Control Activities (Blue)
Annual Summary Report (ASR) for 2021

PWS ID: **108002** PWS Name: **CAMAS MUNICIPAL WATER SEWER SYSTEM** County: **CLARK**

Part 1: Designated Cross-Connection Control Specialist (CCS) Information

CCS Name	Allen Nelson	**CCS Phone**	360-817-7287	**CCS Cert. #**	8187	**BAT Cert. #**	
CCS is: PWS owner or employee							

Part 2: Status of Cross-Connection Control (CCC) Program at End of 2021

Provide information about the status of your CCC Program at the end of the reporting year.

PWS has:	**A written CCC Program Plan**[1] ◉ Yes ○ No **CCC implementation activities**[2] ◉ Yes ○ No	**Program Plan Last Updated**[3] 10/04/2019

[1] Enter "Yes" if PWS has **any** type of written CCC Program Plan, policies, or procedures. Written CCC Program Plan must be part of a Water System Plan (WSP) or Small Water System Management Program (SWSMP).

[2] Enter "Yes" if PWS implemented **any** CCC Program activities during the reporting year, such as establishing legal authority, conducting hazard evaluations, requiring installation of backflow assemblies to protect the PWS, requiring assembly testing, maintaining CCC records, or enforcing the PWS's or CCC Program requirements.

[3] PWS can update the CCC Program Plan at any time (independent of WSP or SWSMP update).

Provide information regarding PWS's specific CCC Program Elements

Program Element Number	Description of Element [See WAC 246-290-490(3)]	This Program Element is:	
		Included in Written Program Plan	Being Implemented or Is Completed
1	**Legal Authority Established**	◉ Yes ○ No	◉ Yes ○ No
2	**Hazard Evaluation Procedures and Schedules**	◉ Yes ○ No	◉ Yes ○ No
3	**Procedures/Schedules for Ensuring Installation of Backflow Preventers**	◉ Yes ○ No	◉ Yes ○ No
4	**Certified CCS Provided**	◉ Yes ○ No	◉ Yes ○ No
5	**Backflow Preventer Inspection and Testing**	◉ Yes ○ No	◉ Yes ○ No

6	**Assembly Testing Quality Assurance/Quality Control (QA/QC) Program**	◉ Yes ○ No	◉ Yes ○ No
7	**Backflow Incident Response Procedures**	◉ Yes ○ No	◉ Yes ○ No
8	**Public Education Program**	◉ Yes ○ No	◉ Yes ○ No
9	**CCC Records**	◉ Yes ○ No	◉ Yes ○ No
10	**Reclaimed Water Permit**	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A

Part 3A: PWS Characteristics at End of 2021

Enter the number of connections (new and existing) served by the PWS by type.

Type of Service Connection	Number
Residential (As defined by PWS)	9722
All Other (include dedicated fire lines, dedicated irrigation lines, and PWS-owned facilities such as water and wastewater treatment plants and pumping stations, parks, piers, and docks)	228
Total Number of Connections	9950

Part 3B: Cross-Connection Control for Severe and High-Hazard Premises and High-Hazard Dedicated Lines Served by the PWS

Item 11.

Answer the following questions carefully. These answers control your access to pages 2 and 3 for data entry.

1. Does your PWS serve any severe or high-hazard premises or any high-hazard dedicated fire or irrigation lines? (●) Yes ( ) No

2. Does PWS serve any high-hazard medical premises? (●) Yes ( ) No

- If you answer Yes to both questions, you must enter data in at least one row on page 2 and one row on page 3.
- If you answer Yes to Question 1 and No to Question 2, you must enter data on page 2 only.
- If you answer No to both questions, pages 2 and 3 will be grayed out to prevent data entry.

- Count only premises PWS serves water to.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information.**

Type of Severe or High-Hazard Premises or Dedicated Lines [WAC 246-290-490(4)(b)]	Number of Connections at end of 2021			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Agricultural (farms and dairies)				
Beverage bottling plants (including breweries)				
Car washes	2	2	2	0
Chemical plants				
Commercial laundries and dry cleaners	2	2	2	0
Both reclaimed water and potable water provided				
Film processing facilities				
Dedicated fire lines with chemical addition or using unapproved auxiliary supplies				
Food processing plants (including canneries, slaughter houses, rendering plants)				
Hospitals, medical centers, medical, dental and veterinary clinics, mortuaries, nursing homes, etc., reported on Part 3C page 3 (totals imported from page 3)	20	6	6	0
Dedicated irrigation systems using purveyor's water supply and chemical addition[4]				

Laboratories	1	1	1	
Metal plating industries				
Petroleum processing or storage plants	4	4	4	0
Piers and docks				
Radioactive material processing plants or nuclear reactors				
Survey access denied or restricted				
Wastewater lift/pump stations (non-residential only)	9	9	9	0
Wastewater treatment plants	1	1	1	
Unapproved auxiliary water supply interconnected with potable water supply				
Other				
Commercial	26	26	26	0
Manufacturing	75	75	75	0
Totals	140	126	126	0

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2]Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can't be larger than the number in Column A in the same row.

[3] Count only connections whose premises isolation preventers were inspected (AGs) or tested (RPs) during the reporting year.

[4] For example, dedicated irrigation lines to parks, playgrounds, golf courses, cemeteries, estates, etc.

[5] Premises with hazardous materials or processes (requiring isolation by AG or RP), such as aircraft and automotive manufacturers, pulp and paper mills, metal manufacturers, military bases, and wholesale customers that pose a high hazard to the PWS. May be grouped together in categories, for example:"Other manufacturing" or "Other commercial".

Part 3C: Cross-Connection Control for High-Hazard Medical Premises Served by the PWS

- Count only medical premises PWS serves water to.
- Don't count the same premises more than once. If you serve different medical category premises through a single connection, count the connection under the medical category you consider to pose the highest hazard to PWS.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information**

Type of High-Hazard Medical Premises [WAC 246-290-490(4)(b)]	Number of Connections at end of 2021			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Hospitals				
Hospitals (include psychiatric hospitals and alcohol and drug treatment centers)				
Facilities for Treatment and Care of Patients Not Located in Hospitals Counted Above				
Same day surgery centers				
Out-patient clinics and offices				
Alternative health out-patient clinics and offices				
Psychiatric out-patient clinics and offices				
Chiropractors with water-connected X-ray equipment	6	0	0	0
Hospice care centers				
Childbirth centers				
Kidney dialysis centers				
Blood centers				
Dental clinics and offices	6	1	1	0
Facilities for Housing Patients				
Nursing homes	2	2	2	0
Assisted Living Facilities (formerly Boarding Homes)	3	0	0	0
Residential treatment centers				
Other Medical-Related Facilities				
Mortuaries with embalming equipment	2	2	2	0
Morgues and autopsy facilities (not in hospitals)				

Veterinarian offices, clinics and hospitals	1	1	1	
Totals	20	6	6	0

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2]Count only connections with premises isolation AGs or RPs. Don’t include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can’t be larger than the number in Column A in the same row.

[3]Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises backflow preventers only or connections with premises isolation DCVAs or DCDAs isolation.

Part 4A: Backflow Preventer Inventory and Testing Information for 2021

- Complete all fields. Enter **zero (0)**, if no backflow preventers in a specific category.
- Count only backflow preventers relied on to protect the PWS.
- Count AVBs on *irrigation systems only*. Select No to AVB question above Table 2 if PWS doesn't track AVBs.
- Count multiple tests (or failures) for the same backflow preventer as one test (or failure) for that backflow preventer.
- For multiple service connections or parallel installations, count each assembly separately.
- Count RPDAs and DCDAs as ***single*** assemblies. Count the tests of the mainline assembly and bypass assembly as ***one test***. Count the failure of either the mainline or bypass assembly (or the failure of both) as ***one failure***. Count an entire detector assembly taken out of service as ***one assembly removed from service***.
- Count assemblies installed on dedicated fire or irrigation lines as **Premises Isolation Assemblies** in Table 1.

	Backflow Preventer Category and Inspection/Testing Information	Air Gap	RPBA	RPDA	DCVA	DCDA	PVBA	SVBA	AVB
Table 1: Premises Isolation Preventers (include preventers isolating PWS-owned facilities)									
Existing Premises Isolation Backflow Preventers									
1	In service at beginning of 2021	0	63	1	2201	23			
2	Inspected and/or tested in 2021[1]	0	44	0	1557	18			
3	Failed inspection or test in 2021	0	6	0	14	0			
New Premises Isolation Backflow Preventers									
4	Installed in 2021[2]	0	0	0	26	0			
5	Inspected and/or tested in 2021[1]	0	0	0	26	0			
6	Failed inspection or test in 2021	0	0	0	0	0			
Premises Isolation Backflow Preventers (existing or new)									
7	Removed from service in 2021[3]	0	0	0	16	0			
Total Premises Isolation Preventers at End of 2021		0	63	1	2211	23	0	0	0

Does PWS track AVBs on irrigation systems? ○ Yes ◉ No

	Table 2: In-Premises Preventers (include preventers within PWS-owned facilities)								
Existing In-Premises Backflow Preventers									
8	In service at beginning of 2021	0	126	1	1104	21	10	1	unk
9	Inspected and/or tested in 2021[1]	0	109	1	907	18	10	0	unk
10	Failed inspection or test in 2021	0	8	0	9	0	0	0	

New In-Premises Backflow Preventers									
11	Installed in 2021[2]	0	3	0	167	2	1	0	unk
12	Inspected and/or tested in 2021[1]	0	3	0	164	2	1	0	unk
13	Failed inspection or test in 2021	0	2	0	0	0	0	0	unk
In-Premises Backflow Preventers (existing or new)									
14	Removed from service in 2021[3]	0	0	0	5	0	1	0	unk
Total In-Premises Preventers at End of 2021[4]		**0**	**129**	**1**	**1266**	**23**	**10**	**1**	**0**
Grand Totals at End of 2021		**0**	**192**	**2**	**3477**	**46**	**10**	**1**	**0**

[1] Initial and/or routine annual inspection (for proper installation and approval status) and/or test (for testable assemblies only, using DOH-approved USC field test procedures).

[2] Includes preventers installed on connections where backflow prevention was not previously required and any preventers that replaced those in service at the beginning of the reporting year. Replacement preventers may be of a different type than the originals.

[3] Existing or new preventers taken out of service, whether or not they were replaced by the same or a different type of preventer.

Part 4B: Other Implementation Activities in 2021

Complete all cells. Enter zero if not applicable.

Water Use Questionnaires	
Did your PWS send any water use questionnaires to customers during 2021?	○ Yes ◉ No

On-site Hazard Surveys				
Did your CCS conduct any on-site hazard surveys during 2021?				○ Yes ◉ No
	Service Connection Type			
	New	**Existing**	**Total**	
1. Number of connections surveyed for cross-connection hazards to PWS.			0	
2. Number of connections requiring backflow prevention to protect PWS.[1,2]			0	

New Exceptions to Premises Isolation	
Did your CCS grant any new premises isolation exceptions in 2021 to high-hazard premises?[3]	○ Yes ◉ No

CCC Enforcement Actions	
Did your PWS take any enforcement actions during 2021?[4]	○ Yes ◉ No

[1] Include services where either premises isolation or in-premises preventers were required to protect the PWS.

[2] Include existing services that need new, additional or higher level backflow prevention.

[3] Submit a completed DOH Exception Form (green) for each new exception granted in the reporting year.

[4] "Enforcement actions" means actions taken by the PWS (such as water shut-off, PWS installation or testing of backflow preventer, assessment of fines, etc.) when the customer fails to comply with the PWS's CCC requirements.

Part 5: Backflow Incidents and "Off-Normal" Events in 2021

	Backflow Incidents, Risk Factors, and Indicators during 2021	Number
Backflow Incidents during 2021		
1	Backflow incidents that contaminated the PWS[5].	0
2	Backflow incidents that contaminated the customer's drinking water system ***only***[5].	0

Risk Factors for Backflow during 2021		
3	Distribution main breaks per 100 miles of pipe.	10.00
4	Low pressure events (<20 psi in PWS distribution system).	0
5	Water outage events.	0
Indicators of Possible Backflow during 2021		
6	Total health-related complaints received by PWS.[6]	0
7	Received during BWA or PN events.[7]	0
8	Received during low pressure or water outage events.	0
9	Total aesthetic complaints (color, taste, odor, air in lines, etc.).	6
10	Received during BWA or PN events.[7]	0
11	Number of these complaints received during low pressure or water outage events.	0

[5] Purveyors must submit a Backflow Incident Report form for each backflow incident known to have contaminated the public water system. DOH is also interested in receiving incident report forms for backflow incidents that contaminated the customer's drinking water system only.

[6] Such as stomach ache, headache, vomiting, diarrhea, skin rashes, etc.

[7] **"BWA"** means **Boil Water Advisory** and **"PN"** means **Public Notification** for water quality reasons.

Part 6: Comments and Clarifications

- Enter comments to:
  - Explain or clarify information in this report.
  - Describe challenges faced or accomplishments made in this reporting year.
  - Share your goals and objectives for the coming reporting year.
- Delete comments that are no longer valid.

Part No.	Date Added	Comments
Pt 1	04-18-2019	Updated back flow software to XC2. in March 2019.Still working on migrating and merging.
Pt 1	05-07-2021	The numbers reflecting 2019 service connections is believed to have been an estimate. The actual number of service connections at the end of 2020 were obtained from our financial analyst who deals directly with the tracking of new and existing service connections.
Pt 1	05-07-2021	The actual number of service connections for 2019 is: Residential-8635 All Other: 273 esidential 8635
Pt 1	05-18-2021	Our previous Backflow manager just recently retired. And since I do not yet have a complete understanding of our new XC2 tracking program and I am unable to locate some of the information that may need to be 100% confident in my report for the 2020 ASR. My plan for 2021 is to ensure that we have at least one more CCS on board, dedicated to the cross connection program as well as finding classes for those who are not up to speed with all the regulations pertaining to cross connection control. And to begin conducting surveys at some the various facilities around the City. , in or to be as accurate as possible with our CCC program.
Pt 1	03-18-2022	We are still trying to get up to speed with our CCC program. Previous information beyond 2020 is still being corrected and numbers on record aren't entirely correct with what we are finding in the field when we are able to access. We are still working on building a stronger more stringent program and I hope to have a couple of certified operators this year dedicated to the program and begin overdo hazard assessments as well as working closer with the building department on new construction.

Part 7: Report Certification and Contact Information

I, Allen Nelson , certify that the information in this form is true, complete and accurate to the best of my knowledge.

Last Saved	03/21/2022	**All ASR Forms Certified/Submitted**	03/21/2022

Designated CCS/CCC Program Manager[1]					
Name	Allen Nelson	**Title**	Water Supply Operator	**CCS Cert #**	8187
Email Address	anelson@cityofcamas.us	**Phone**	360-817-7287	**Phone Ext**	

PWS Manager[2]					
Name	Allen Nelson	**Title**	Water Supply Operator	**Operator Cert #**	8187
Email Address	anelson@cityofcamas.us	**Phone**	360-817-7287	**Phone Ext**	

[1] The CCS responsible for developing and implementing the PWS's CCC program (CCC Program Manager).

[2] The person the designated CCS/CCC Program Manager reports to or other manager having direct oversight of the CCC Program.

Cross-Connection Control Activities (Blue)
Annual Summary Report (ASR) for 2022

PWS ID: **108002** PWS Name: **CAMAS MUNICIPAL WATER SEWER SYSTEM** County: **CLARK**

Part 1: Designated Cross-Connection Control Specialist (CCS) Information

CCS Name	Allen Nelson	**CCS Phone**	360-817-7287	**CCS Cert. #**	8187	**BAT Cert. #**	
CCS is: PWS owner or employee							

Part 2: Status of Cross-Connection Control (CCC) Program at End of 2022

Provide information about the status of your CCC Program at the end of the reporting year.

PWS has:	**A written CCC Program Plan**[1] ◉ Yes ○ No	**Program Plan Last Updated**[3] 10/04/2019
	CCC implementation activities[2] ◉ Yes ○ No	

[1] Enter "Yes" if PWS has **any** type of written CCC Program Plan, policies, or procedures. Written CCC Program Plan must be part of a Water System Plan (WSP) or Small Water System Management Program (SWSMP).

[2] Enter "Yes" if PWS implemented **any** CCC Program activities during the reporting year, such as establishing legal authority, conducting hazard evaluations, requiring installation of backflow assemblies to protect the PWS, requiring assembly testing, maintaining CCC records, or enforcing the PWS's or CCC Program requirements.

[3] PWS can update the CCC Program Plan at any time (independent of WSP or SWSMP update).

Provide information regarding PWS's specific CCC Program Elements

Program Element Number	Description of Element [See WAC 246-290-490(3)]	This Program Element is:	
		Included in Written Program Plan	Being Implemented or Is Completed
1	**Legal Authority Established**	◉ Yes ○ No	◉ Yes ○ No
2	**Hazard Evaluation Procedures and Schedules**	◉ Yes ○ No	◉ Yes ○ No
3	**Procedures/Schedules for Ensuring Installation of Backflow Preventers**	◉ Yes ○ No	◉ Yes ○ No
4	**Certified CCS Provided**	◉ Yes ○ No	◉ Yes ○ No
5	**Backflow Preventer Inspection and Testing**	◉ Yes ○ No	◉ Yes ○ No

6	**Assembly Testing Quality Assurance/Quality Control (QA/QC) Program**	◉ Yes ○ No	◉ Yes ○ No
7	**Backflow Incident Response Procedures**	◉ Yes ○ No	◉ Yes ○ No
8	**Public Education Program**	◉ Yes ○ No	◉ Yes ○ No
9	**CCC Records**	◉ Yes ○ No	◉ Yes ○ No
10	**Reclaimed Water Permit**	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A

Part 3A: PWS Characteristics at End of 2022

Enter the number of connections (new and existing) served by the PWS by type.

Type of Service Connection	Number
Residential (As defined by PWS)	9722
All Other (include dedicated fire lines, dedicated irrigation lines, and PWS-owned facilities such as water and wastewater treatment plants and pumping stations, parks, piers, and docks)	228
Total Number of Connections	9950

Part 3B: Cross-Connection Control for Severe and High-Hazard Premises and High-Hazard Dedicated Lines Served by the PWS

Item 11.

Answer the following questions carefully. These answers control your access to pages 2 and 3 for data entry.

1. Does your PWS serve any severe or high-hazard premises or any high-hazard dedicated fire or irrigation lines? (●) Yes ( ) No

2. Does PWS serve any high-hazard medical premises? (●) Yes ( ) No

- If you answer Yes to both questions, you must enter data in at least one row on page 2 and one row on page 3.
- If you answer Yes to Question 1 and No to Question 2, you must enter data on page 2 only.
- If you answer No to both questions, pages 2 and 3 will be grayed out to prevent data entry.

- Count only premises PWS serves water to.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information.**

Type of Severe or High-Hazard Premises or Dedicated Lines [WAC 246-290-490(4)(b)]	Number of Connections at end of 2022			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Agricultural (farms and dairies)				
Beverage bottling plants (including breweries)				
Car washes	2	2	2	0
Chemical plants				
Commercial laundries and dry cleaners	2	2	2	0
Both reclaimed water and potable water provided				
Film processing facilities				
Dedicated fire lines with chemical addition or using unapproved auxiliary supplies				
Food processing plants (including canneries, slaughter houses, rendering plants)				
Hospitals, medical centers, medical, dental and veterinary clinics, mortuaries, nursing homes, etc., reported on Part 3C page 3 (totals imported from page 3)	20	6	6	0
Dedicated irrigation systems using purveyor's water supply and chemical addition[4]				

Laboratories	1	1	1	
Metal plating industries				
Petroleum processing or storage plants	4	4	4	0
Piers and docks				
Radioactive material processing plants or nuclear reactors				
Survey access denied or restricted				
Wastewater lift/pump stations (non-residential only)	9	9	9	0
Wastewater treatment plants	1	1	1	
Unapproved auxiliary water supply interconnected with potable water supply				
Totals	39	25	25	0

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2]Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can't be larger than the number in Column A in the same row.

[3] Count only connections whose premises isolation preventers were inspected (AGs) or tested (RPs) during the reporting year.

[4] For example, dedicated irrigation lines to parks, playgrounds, golf courses, cemeteries, estates, etc.

[5] Premises with hazardous materials or processes (requiring isolation by AG or RP), such as aircraft and automotive manufacturers, pulp and paper mills, metal manufacturers, military bases, and wholesale customers that pose a high hazard to the PWS. May be grouped together in categories, for example:"Other manufacturing" or "Other commercial".

Part 3C: Cross-Connection Control for High-Hazard Medical Premises Served by the PWS

- Count only medical premises PWS serves water to.
- Don't count the same premises more than once. If you serve different medical category premises through a single connection, count the connection under the medical category you consider to pose the highest hazard to PWS.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information**

Type of High-Hazard Medical Premises [WAC 246-290-490(4)(b)]	Number of Connections at end of 2022			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Hospitals				
Hospitals (include psychiatric hospitals and alcohol and drug treatment centers)				
Facilities for Treatment and Care of Patients Not Located in Hospitals Counted Above				
Same day surgery centers				
Out-patient clinics and offices				
Alternative health out-patient clinics and offices				
Psychiatric out-patient clinics and offices				
Chiropractors with water-connected X-ray equipment	6	0	0	0
Hospice care centers				
Childbirth centers				
Kidney dialysis centers				
Blood centers				
Dental clinics and offices	6	1	1	0
Facilities for Housing Patients				
Nursing homes	2	2	2	0
Assisted Living Facilities (formerly Boarding Homes)	3	0	0	0
Residential treatment centers				
Other Medical-Related Facilities				
Mortuaries with embalming equipment	2	2	2	0
Morgues and autopsy facilities (not in hospitals)				

Veterinarian offices, clinics and hospitals	1	1	1	
Totals	20	6	6	0

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2]Count only connections with premises isolation AGs or RPs. Don’t include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can’t be larger than the number in Column A in the same row.

[3]Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises backflow preventers only or connections with premises isolation DCVAs or DCDAs isolation.

Part 4A: Backflow Preventer Inventory and Testing Information for 2022

- Complete all fields. Enter **zero (0)**, if no backflow preventers in a specific category.
- Count only backflow preventers relied on to protect the PWS.
- Count AVBs on *irrigation systems only*. Select No to AVB question above Table 2 if PWS doesn't track AVBs.
- Count multiple tests (or failures) for the same backflow preventer as one test (or failure) for that backflow preventer.
- For multiple service connections or parallel installations, count each assembly separately.
- Count RPDAs and DCDAs as ***single*** assemblies. Count the tests of the mainline assembly and bypass assembly as ***one test***. Count the failure of either the mainline or bypass assembly (or the failure of both) as ***one failure***. Count an entire detector assembly taken out of service as ***one assembly removed from service***.
- Count assemblies installed on dedicated fire or irrigation lines as **Premises Isolation Assemblies** in Table 1.

	Backflow Preventer Category and Inspection/Testing Information	Air Gap	RPBA	RPDA	DCVA	DCDA	PVBA	SVBA	AVB
Table 1: Premises Isolation Preventers (include preventers isolating PWS-owned facilities)									
Existing Premises Isolation Backflow Preventers									
1	In service at beginning of 2022	0	63	1	2677	49			
2	Inspected and/or tested in 2022[1]	0	44	0	2275	22			
3	Failed inspection or test in 2022	0	6	0	109	1			
New Premises Isolation Backflow Preventers									
4	Installed in 2022[2]	0	6	0	419	0			
5	Inspected and/or tested in 2022[1]	0	6	0	419	0			
6	Failed inspection or test in 2022	0	0	0	2	0			
Premises Isolation Backflow Preventers (existing or new)									
7	Removed from service in 2022[3]	0	1	0	25	0			
Total Premises Isolation Preventers at End of 2022		0	68	1	3071	49	0	0	0
	Does PWS track AVBs on irrigation systems? ○ Yes ◉ No								
Table 2: In-Premises Preventers (include preventers within PWS-owned facilities)									
Existing In-Premises Backflow Preventers									
8	In service at beginning of 2022	0	72	1	510	21	10	1	unk
9	Inspected and/or tested in 2022[1]	0	70	1	499	18	10	1	unk
10	Failed inspection or test in 2022	0	2	0	11	0	0	0	

New In-Premises Backflow Preventers									
11	Installed in 2022[2]	0	0	0	11	0	0	0	unk
12	Inspected and/or tested in 2022[1]	0	0	0	11	0	0	0	unk
13	Failed inspection or test in 2022	0	0	0	2	0	0	0	unk
In-Premises Backflow Preventers (existing or new)									
14	Removed from service in 2022[3]	0	0	0	0	0	0	0	unk
Total In-Premises Preventers at End of 2022[4]		**0**	**72**	**1**	**521**	**21**	**10**	**1**	**0**
Grand Totals at End of 2022		**0**	**140**	**2**	**3592**	**70**	**10**	**1**	**0**

[1] Initial and/or routine annual inspection (for proper installation and approval status) and/or test (for testable assemblies only, using DOH-approved USC field test procedures).

[2] Includes preventers installed on connections where backflow prevention was not previously required and any preventers that replaced those in service at the beginning of the reporting year. Replacement preventers may be of a different type than the originals.

[3] Existing or new preventers taken out of service, whether or not they were replaced by the same or a different type of preventer.

Part 4B: Other Implementation Activities in 2022

Complete all cells. Enter zero if not applicable.

Water Use Questionnaires	
Did your PWS send any water use questionnaires to customers during 2022?	○ Yes ◉ No

On-site Hazard Surveys				
Did your CCS conduct any on-site hazard surveys during 2022?				○ Yes ◉ No
	Service Connection Type			
	New	**Existing**	**Total**	
1. Number of connections surveyed for cross-connection hazards to PWS.			0	
2. Number of connections requiring backflow prevention to protect PWS.[1,2]			0	

New Exceptions to Premises Isolation	
Did your CCS grant any new premises isolation exceptions in 2022 to high-hazard premises?[3]	○ Yes ◉ No

CCC Enforcement Actions	
Did your PWS take any enforcement actions during 2022?[4]	○ Yes ◉ No

[1] Include services where either premises isolation or in-premises preventers were required to protect the PWS.

[2] Include existing services that need new, additional or higher level backflow prevention.

[3] Submit a completed DOH Exception Form (green) for each new exception granted in the reporting year.

[4] "Enforcement actions" means actions taken by the PWS (such as water shut-off, PWS installation or testing of backflow preventer, assessment of fines, etc.) when the customer fails to comply with the PWS's CCC requirements.

Part 5: Backflow Incidents and "Off-Normal" Events in 2022

	Backflow Incidents, Risk Factors, and Indicators during 2022	Number
Backflow Incidents during 2022		
1	Backflow incidents that contaminated the PWS[5].	0
2	Backflow incidents that contaminated the customer's drinking water system ***only***[5].	0

Risk Factors for Backflow during 2022		
3	Distribution main breaks per 100 miles of pipe.	7.00
4	Low pressure events (<20 psi in PWS distribution system).	0
5	Water outage events.	0
Indicators of Possible Backflow during 2022		
6	Total health-related complaints received by PWS.[6]	0
7	Received during BWA or PN events.[7]	0
8	Received during low pressure or water outage events.	0
9	Total aesthetic complaints (color, taste, odor, air in lines, etc.).	1
10	Received during BWA or PN events.[7]	0
11	Number of these complaints received during low pressure or water outage events.	0

[5] Purveyors must submit a Backflow Incident Report form for each backflow incident known to have contaminated the public water system. DOH is also interested in receiving incident report forms for backflow incidents that contaminated the customer's drinking water system only.

[6] Such as stomach ache, headache, vomiting, diarrhea, skin rashes, etc.

[7] **"BWA"** means **Boil Water Advisory** and **"PN"** means **Public Notification** for water quality reasons.

Part 6: Comments and Clarifications

- Enter comments to:
  - Explain or clarify information in this report.
  - Describe challenges faced or accomplishments made in this reporting year.
  - Share your goals and objectives for the coming reporting year.
- Delete comments that are no longer valid.

Part No.	Date Added	Comments
Pt 1	04-18-2019	Updated back flow software to XC2. in March 2019.Still working on migrating and merging.
Pt 1	05-07-2021	The numbers reflecting 2019 service connections is believed to have been an estimate. The actual number of service connections at the end of 2020 were obtained from our financial analyst who deals directly with the tracking of new and existing service connections.
Pt 1	05-07-2021	The actual number of service connections for 2019 is: Residential-8635 All Other: 273 esidential 8635
Pt 1	05-18-2021	Our previous Backflow manager just recently retired. And since I do not yet have a complete understanding of our new XC2 tracking program and I am unable to locate some of the information that may need to be 100% confident in my report for the 2020 ASR. My plan for 2021 is to ensure that we have at least one more CCS on board, dedicated to the cross connection program as well as finding classes for those who are not up to speed with all the regulations pertaining to cross connection control. And to begin conducting surveys at some the various facilities around the City. , in or to be as accurate as possible with our CCC program.
Pt 1	03-18-2022	We are still trying to get up to speed with our CCC program. Previous information beyond 2020 is still being corrected and numbers on record aren't entirely correct with what we are finding in the field when we are able to access. We are still working on building a stronger more stringent program and I hope to have a couple of certified operators this year dedicated to the program and begin overdo hazard assessments as well as working closer with the building department on new construction.
Pt 1	01-19-2023	We are looking at a dedicated CCCS to hire this year that will begin a more in-depth investigation on the commercial and industrial side of our customers. We have also begun working closer with our building department regarding new construction.
Pt 1	04-10-2023	There are numbers this year that don't coincide with last year's numbers because we have someone dedidcated to data entry for our CCC program and she has been digging into past information and doing a bit of updating.

Part 7: Report Certification and Contact Information

I, Allen Nelson , certify that the information in this form is true, complete and accurate to the best of my knowledge.

Last Saved	04/10/2023	**All ASR Forms Certified/Submitted**	04/10/2023

Designated CCS/CCC Program Manager[1]					
Name	Allen Nelson	**Title**	Water Supply Operator	**CCS Cert #**	8187
Email Address	anelson@cityofcamas.us	**Phone**	360-817-7287	**Phone Ext**	

PWS Manager[2]					
Name	Allen Nelson	**Title**	Water Supply Operator	**Operator Cert #**	8187
Email Address	anelson@cityofcamas.us	**Phone**	360-817-7287	**Phone Ext**	

[1] The CCS responsible for developing and implementing the PWS's CCC program (CCC Program Manager).

[2] The person the designated CCS/CCC Program Manager reports to or other manager having direct oversight of the CCC Program.

Cross-Connection Control Activities (Blue)
Annual Summary Report (ASR) for 2023

PWS ID: **108002** PWS Name: **CAMAS MUNICIPAL WATER SEWER SYSTEM** County: **CLARK**

Part 1: Designated Cross-Connection Control Specialist (CCS) Information

CCS Name	Allen Nelson	**CCS Phone**	360-817-7287	**CCS Cert. #**	8187	**BAT Cert. #**	
CCS is: PWS owner or employee							

Part 2: Status of Cross-Connection Control (CCC) Program at End of 2023

Provide information about the status of your CCC Program at the end of the reporting year.

PWS has:	**A written CCC Program Plan**[1] ◉ Yes ○ No **CCC implementation activities**[2] ◉ Yes ○ No	**Program Plan Last Updated**[3] 10/04/2019

[1] Enter "Yes" if PWS has **any** type of written CCC Program Plan, policies, or procedures. Written CCC Program Plan must be part of a Water System Plan (WSP) or Small Water System Management Program (SWSMP).

[2] Enter "Yes" if PWS implemented **any** CCC Program activities during the reporting year, such as establishing legal authority, conducting hazard evaluations, requiring installation of backflow assemblies to protect the PWS, requiring assembly testing, maintaining CCC records, or enforcing the PWS's or CCC Program requirements.

[3] PWS can update the CCC Program Plan at any time (independent of WSP or SWSMP update).

Provide information regarding PWS's specific CCC Program Elements

Program Element Number	Description of Element [See WAC 246-290-490(3)]	This Program Element is:	
		Included in Written Program Plan	Being Implemented or Is Completed
1	**Legal Authority Established**	◉ Yes ○ No	◉ Yes ○ No
2	**Hazard Evaluation Procedures and Schedules**	◉ Yes ○ No	◉ Yes ○ No
3	**Procedures/Schedules for Ensuring Installation of Backflow Preventers**	◉ Yes ○ No	◉ Yes ○ No
4	**Certified CCS Provided**	◉ Yes ○ No	◉ Yes ○ No
5	**Backflow Preventer Inspection and Testing**	◉ Yes ○ No	◉ Yes ○ No

6	**Assembly Testing Quality Assurance/Quality Control (QA/QC) Program**	◉ Yes ○ No	◉ Yes ○ No
7	**Backflow Incident Response Procedures**	◉ Yes ○ No	◉ Yes ○ No
8	**Public Education Program**	◉ Yes ○ No	◉ Yes ○ No
9	**CCC Records**	◉ Yes ○ No	◉ Yes ○ No
10	**Reclaimed Water Permit**	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A

Part 3A: PWS Characteristics at End of 2023

Enter the number of connections (new and existing) served by the PWS by type.

Type of Service Connection	Number
Residential (As defined by PWS)	9722
All Other (include dedicated fire lines, dedicated irrigation lines, and PWS-owned facilities such as water and wastewater treatment plants and pumping stations, parks, piers, and docks)	228
Total Number of Connections	9950

Part 3B: Cross-Connection Control for Severe and High-Hazard Premises and High-Hazard Dedicated Lines Served by the PWS

Item 11.

Answer the following questions carefully. These answers control your access to pages 2 and 3 for data entry.

1. Does your PWS serve any severe or high-hazard premises or any high-hazard dedicated fire or irrigation lines? (●) Yes ( ) No

2. Does PWS serve any high-hazard medical premises? (●) Yes ( ) No

- If you answer Yes to both questions, you must enter data in at least one row on page 2 and one row on page 3.
- If you answer Yes to Question 1 and No to Question 2, you must enter data on page 2 only.
- If you answer No to both questions, pages 2 and 3 will be grayed out to prevent data entry.

- Count only premises PWS serves water to.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information.**

Type of Severe or High-Hazard Premises or Dedicated Lines [WAC 246-290-490(4)(b)]	Number of Connections at end of 2023			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Agricultural (farms and dairies)				
Beverage bottling plants (including breweries)				
Car washes	2	2	2	0
Chemical plants				
Commercial laundries and dry cleaners	2	2	2	0
Both reclaimed water and potable water provided				
Film processing facilities				
Dedicated fire lines with chemical addition or using unapproved auxiliary supplies				
Food processing plants (including canneries, slaughter houses, rendering plants)				
Hospitals, medical centers, medical, dental and veterinary clinics, mortuaries, nursing homes, etc., reported on Part 3C page 3 (totals imported from page 3)	20	6	6	0
Dedicated irrigation systems using purveyor's water supply and chemical addition[4]				

Laboratories	1	1	1	
Metal plating industries				
Petroleum processing or storage plants	4	4	4	0
Piers and docks				
Radioactive material processing plants or nuclear reactors				
Survey access denied or restricted				
Wastewater lift/pump stations (non-residential only)	9	9	9	0
Wastewater treatment plants	1	1	1	
Unapproved auxiliary water supply interconnected with potable water supply				
Totals	39	25	25	0

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2]Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can't be larger than the number in Column A in the same row.

[3] Count only connections whose premises isolation preventers were inspected (AGs) or tested (RPs) during the reporting year.

[4] For example, dedicated irrigation lines to parks, playgrounds, golf courses, cemeteries, estates, etc.

[5] Premises with hazardous materials or processes (requiring isolation by AG or RP), such as aircraft and automotive manufacturers, pulp and paper mills, metal manufacturers, military bases, and wholesale customers that pose a high hazard to the PWS. May be grouped together in categories, for example:"Other manufacturing" or "Other commercial".

Part 3C: Cross-Connection Control for High-Hazard Medical Premises Served by the PWS

- Count only medical premises PWS serves water to.
- Don't count the same premises more than once. If you serve different medical category premises through a single connection, count the connection under the medical category you consider to pose the highest hazard to PWS.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information**

Type of High-Hazard Medical Premises [WAC 246-290-490(4)(b)]	Number of Connections at end of 2023			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Hospitals				
Hospitals (include psychiatric hospitals and alcohol and drug treatment centers)				
Facilities for Treatment and Care of Patients Not Located in Hospitals Counted Above				
Same day surgery centers				
Out-patient clinics and offices				
Alternative health out-patient clinics and offices				
Psychiatric out-patient clinics and offices				
Chiropractors with water-connected X-ray equipment	6	0	0	0
Hospice care centers				
Childbirth centers				
Kidney dialysis centers				
Blood centers				
Dental clinics and offices	6	1	1	0
Facilities for Housing Patients				
Nursing homes	2	2	2	0
Assisted Living Facilities (formerly Boarding Homes)	3	0	0	0
Residential treatment centers				
Other Medical-Related Facilities				
Mortuaries with embalming equipment	2	2	2	0
Morgues and autopsy facilities (not in hospitals)				

Veterinarian offices, clinics and hospitals	1	1	1	
Totals	20	6	6	0

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2]Count only connections with premises isolation AGs or RPs. Don’t include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can’t be larger than the number in Column A in the same row.

[3]Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises backflow preventers only or connections with premises isolation DCVAs or DCDAs isolation.

Part 4A: Backflow Preventer Inventory and Testing Information for 2023

- Complete all fields. Enter **zero (0)**, if no backflow preventers in a specific category.
- Count only backflow preventers relied on to protect the PWS.
- Count AVBs on *irrigation systems only*. Select No to AVB question above Table 2 if PWS doesn't track AVBs.
- Count multiple tests (or failures) for the same backflow preventer as one test (or failure) for that backflow preventer.
- For multiple service connections or parallel installations, count each assembly separately.
- Count RPDAs and DCDAs as ***single*** assemblies. Count the tests of the mainline assembly and bypass assembly as ***one test***. Count the failure of either the mainline or bypass assembly (or the failure of both) as ***one failure***. Count an entire detector assembly taken out of service as ***one assembly removed from service***.
- Count assemblies installed on dedicated fire or irrigation lines as **Premises Isolation Assemblies** in Table 1.

	Backflow Preventer Category and Inspection/Testing Information	Air Gap	RPBA	RPDA	DCVA	DCDA	PVBA	SVBA	AVB
Table 1: Premises Isolation Preventers (include preventers isolating PWS-owned facilities)									
Existing Premises Isolation Backflow Preventers									
1	In service at beginning of 2023	0	183	3	4020	48			
2	Inspected and/or tested in 2023[1]	0	147	2	3418	37			
3	Failed inspection or test in 2023	0	21	1	91	3			
New Premises Isolation Backflow Preventers									
4	Installed in 2023[2]	0	3	0	100	0			
5	Inspected and/or tested in 2023[1]	0	3	0	100	0			
6	Failed inspection or test in 2023	0	0	0	6	0			
Premises Isolation Backflow Preventers (existing or new)									
7	Removed from service in 2023[3]	0	0	0	13	0			
Total Premises Isolation Preventers at End of 2023		0	186	3	4107	48	0	0	0

Does PWS track AVBs on irrigation systems? ○ Yes ◉ No

	Table 2: In-Premises Preventers (include preventers within PWS-owned facilities)								
Existing In-Premises Backflow Preventers									
8	In service at beginning of 2023	0	0	0	12	0	22	0	unk
9	Inspected and/or tested in 2023[1]	0	0	0	9	0	17	0	unk
10	Failed inspection or test in 2023	0	0	0	0	0	2	0	

New In-Premises Backflow Preventers									
11	Installed in 2023[2]	0	0	0	0	0	0	0	unk
12	Inspected and/or tested in 2023[1]	0	0	0	0	0	0	0	unk
13	Failed inspection or test in 2023	0	0	0	0	0	0	0	unk
In-Premises Backflow Preventers (existing or new)									
14	Removed from service in 2023[3]	0	0	0	0	0	0	0	unk
Total In-Premises Preventers at End of 2023[4]		**0**	**0**	**0**	**12**	**0**	**22**	**0**	**0**
Grand Totals at End of 2023		**0**	**186**	**3**	**4119**	**48**	**22**	**0**	**0**

[1] Initial and/or routine annual inspection (for proper installation and approval status) and/or test (for testable assemblies only, using DOH-approved USC field test procedures).

[2] Includes preventers installed on connections where backflow prevention was not previously required and any preventers that replaced those in service at the beginning of the reporting year. Replacement preventers may be of a different type than the originals.

[3] Existing or new preventers taken out of service, whether or not they were replaced by the same or a different type of preventer.

Part 4B: Other Implementation Activities in 2023

Complete all cells. Enter zero if not applicable.

Water Use Questionnaires	
Did your PWS send any water use questionnaires to customers during 2023?	○ Yes ◉ No

On-site Hazard Surveys				
Did your CCS conduct any on-site hazard surveys during 2023?				○ Yes ◉ No
	Service Connection Type			
	New	**Existing**	**Total**	
1. Number of connections surveyed for cross-connection hazards to PWS.			0	
2. Number of connections requiring backflow prevention to protect PWS.[1,2]			0	

New Exceptions to Premises Isolation	
Did your CCS grant any new premises isolation exceptions in 2023 to high-hazard premises?[3]	○ Yes ◉ No

CCC Enforcement Actions	
Did your PWS take any enforcement actions during 2023?[4]	○ Yes ◉ No

[1] Include services where either premises isolation or in-premises preventers were required to protect the PWS.

[2] Include existing services that need new, additional or higher level backflow prevention.

[3] Submit a completed DOH Exception Form (green) for each new exception granted in the reporting year.

[4] "Enforcement actions" means actions taken by the PWS (such as water shut-off, PWS installation or testing of backflow preventer, assessment of fines, etc.) when the customer fails to comply with the PWS's CCC requirements.

Part 5: Backflow Incidents and "Off-Normal" Events in 2023

	Backflow Incidents, Risk Factors, and Indicators during 2023	Number
Backflow Incidents during 2023		
1	Backflow incidents that contaminated the PWS[5].	0
2	Backflow incidents that contaminated the customer's drinking water system ***only***[5].	0

Risk Factors for Backflow during 2023		
3	Distribution main breaks per 100 miles of pipe.	7.00
4	Low pressure events (<20 psi in PWS distribution system).	0
5	Water outage events.	0
Indicators of Possible Backflow during 2023		
6	Total health-related complaints received by PWS.[6]	0
7	Received during BWA or PN events.[7]	0
8	Received during low pressure or water outage events.	0
9	Total aesthetic complaints (color, taste, odor, air in lines, etc.).	5
10	Received during BWA or PN events.[7]	0
11	Number of these complaints received during low pressure or water outage events.	0

[5] Purveyors must submit a Backflow Incident Report form for each backflow incident known to have contaminated the public water system. DOH is also interested in receiving incident report forms for backflow incidents that contaminated the customer's drinking water system only.

[6] Such as stomach ache, headache, vomiting, diarrhea, skin rashes, etc.

[7] **"BWA"** means **Boil Water Advisory** and **"PN"** means **Public Notification** for water quality reasons.

Part 6: Comments and Clarifications

- Enter comments to:
  - Explain or clarify information in this report.
  - Describe challenges faced or accomplishments made in this reporting year.
  - Share your goals and objectives for the coming reporting year.
- Delete comments that are no longer valid.

Part No.	Date Added	Comments
Pt 1	04-18-2019	Updated back flow software to XC2. in March 2019.Still working on migrating and merging.
Pt 1	05-07-2021	The numbers reflecting 2019 service connections is believed to have been an estimate. The actual number of service connections at the end of 2020 were obtained from our financial analyst who deals directly with the tracking of new and existing service connections.
Pt 1	05-07-2021	The actual number of service connections for 2019 is: Residential-8635 All Other: 273 esidential 8635
Pt 1	05-18-2021	Our previous Backflow manager just recently retired. And since I do not yet have a complete understanding of our new XC2 tracking program and I am unable to locate some of the information that may need to be 100% confident in my report for the 2020 ASR. My plan for 2021 is to ensure that we have at least one more CCS on board, dedicated to the cross connection program as well as finding classes for those who are not up to speed with all the regulations pertaining to cross connection control. And to begin conducting surveys at some the various facilities around the City. , in or to be as accurate as possible with our CCC program.
Pt 1	03-18-2022	We are still trying to get up to speed with our CCC program. Previous information beyond 2020 is still being corrected and numbers on record aren't entirely correct with what we are finding in the field when we are able to access. We are still working on building a stronger more stringent program and I hope to have a couple of certified operators this year dedicated to the program and begin overdo hazard assessments as well as working closer with the building department on new construction.
Pt 1	01-19-2023	We are looking at a dedicated CCCS to hire this year that will begin a more in-depth investigation on the commercial and industrial side of our customers. We have also begun working closer with our building department regarding new construction.
Pt 1	04-10-2023	There are numbers this year that don't coincide with last year's numbers because we have someone dedidcated to data entry for our CCC program and she has been digging into past information and doing a bit of updating.
Pt 1	04-15-2024	Our new CCCS and data entry person working together found approximately 400 assemblies that were already in the system, that we didn't know about. As we continue to strengthen our program, we will begin to conduct more hazard assessments in 2024 and hopefully start getting a better understanding of what we need to have a more complete program.

Part 7: Report Certification and Contact Information

I, Allen Nelson , certify that the information in this form is true, complete and accurate to the best of my knowledge.

Last Saved	04/15/2024	**All ASR Forms Certified/Submitted**	04/15/2024	

Designated CCS/CCC Program Manager[1]					
Name	Allen Nelson	**Title**	Water Supply Operator	**CCS Cert #**	8187
Email Address	anelson@cityofcamas.us	**Phone**	360-817-7287	**Phone Ext**	

PWS Manager[2]					
Name	Allen Nelson	**Title**	Water Supply Operator	**Operator Cert #**	8187
Email Address	anelson@cityofcamas.us	**Phone**	360-817-7287	**Phone Ext**	

[1] The CCS responsible for developing and implementing the PWS's CCC program (CCC Program Manager).
[2] The person the designated CCS/CCC Program Manager reports to or other manager having direct oversight of the CCC Program.

Cross-Connection Control Activities (Blue)
Annual Summary Report (ASR) for 2025

PWS ID: **108002** PWS Name: **CAMAS MUNICIPAL WATER SEWER SYSTEM** County: **CLARK**

Part 1: Designated Cross-Connection Control Specialist (CCS) Information

CCS Name	Nick Mettler	**CCS Phone**	360-833-3188	**CCS Cert. #**	16006	**BAT Cert. #**	B8057
CCS is: PWS owner or employee							

Part 2: Status of Cross-Connection Control (CCC) Program at End of 2025

Provide information about the status of your CCC Program at the end of the reporting year.

PWS has:	**A written CCC Program Plan**[1] ◉ Yes ○ No **CCC implementation activities**[2] ◉ Yes ○ No	**Program Plan Last Updated**[3] 12/04/2023

[1] Enter "Yes" if PWS has **any** type of written CCC Program Plan, policies, or procedures. Written CCC Program Plan must be part of a Water System Plan (WSP) or Small Water System Management Program (SWSMP).

[2] Enter "Yes" if PWS implemented **any** CCC Program activities during the reporting year, such as establishing legal authority, conducting hazard evaluations, requiring installation of backflow assemblies to protect the PWS, requiring assembly testing, maintaining CCC records, or enforcing the PWS's or CCC Program requirements.

[3] PWS can update the CCC Program Plan at any time (independent of WSP or SWSMP update).

Provide information regarding PWS's specific CCC Program Elements

Program Element Number	Description of Element [See WAC 246-290-490(3)]	This Program Element is:	
		Included in Written Program Plan	Being Implemented or Is Completed
1	**Legal Authority Established**	◉ Yes ○ No	◉ Yes ○ No
2	**Hazard Evaluation Procedures and Schedules**	◉ Yes ○ No	◉ Yes ○ No
3	**Procedures/Schedules for Ensuring Installation of Backflow Preventers**	◉ Yes ○ No	◉ Yes ○ No
4	**Certified CCS Provided**	◉ Yes ○ No	◉ Yes ○ No
5	**Backflow Preventer Inspection and Testing**	◉ Yes ○ No	◉ Yes ○ No

6	**Assembly Testing Quality Assurance/Quality Control (QA/QC) Program**	◉ Yes ○ No	◉ Yes ○ No
7	**Backflow Incident Response Procedures**	◉ Yes ○ No	◉ Yes ○ No
8	**Public Education Program**	◉ Yes ○ No	◉ Yes ○ No
9	**CCC Records**	◉ Yes ○ No	◉ Yes ○ No
10	**Reclaimed Water Permit**	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A

Part 3A: PWS Characteristics at End of 2025

Enter the number of connections (new and existing) served by the PWS by type.

Type of Service Connection	Number
Residential (As defined by PWS)	9645
All Other (include dedicated fire lines, dedicated irrigation lines, and PWS-owned facilities such as water and wastewater treatment plants and pumping stations, parks, piers, and docks)	585
Total Number of Connections	10230

Part 3B: Cross-Connection Control for Severe and High-Hazard Premises and High-Hazard Dedicated Lines Served by the PWS

Item 11.

Answer the following questions carefully. These answers control your access to pages 2 and 3 for data entry.

1. Does your PWS serve any severe or high-hazard premises or any high-hazard dedicated fire or irrigation lines? (●) Yes ( ) No

2. Does PWS serve any high-hazard medical premises? (●) Yes ( ) No

- If you answer Yes to both questions, you must enter data in at least one row on page 2 and one row on page 3.
- If you answer Yes to Question 1 and No to Question 2, you must enter data on page 2 only.
- If you answer No to both questions, pages 2 and 3 will be grayed out to prevent data entry.

- Count only premises PWS serves water to.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information.**

Type of Severe or High-Hazard Premises or Dedicated Lines [WAC 246-290-490(4)(b)]	Number of Connections at end of 2025			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Agricultural (farms and dairies)				
Beverage bottling plants (including breweries)	1	1	1	0
Car washes	1	1	1	0
Chemical plants				
Commercial laundries and dry cleaners	2	1	1	0
Both reclaimed water and potable water provided				
Film processing facilities				
Dedicated fire lines with chemical addition or using unapproved auxiliary supplies				
Food processing plants (including canneries, slaughter houses, rendering plants)				
Hospitals, medical centers, medical, dental and veterinary clinics, mortuaries, nursing homes, etc., reported on Part 3C page 3 (totals imported from page 3)	16	11	11	2
Dedicated irrigation systems using purveyor's water supply and chemical addition[4]				

Laboratories	0	0	0	
Metal plating industries				
Petroleum processing or storage plants	4	4	4	0
Piers and docks				
Radioactive material processing plants or nuclear reactors				
Survey access denied or restricted				
Wastewater lift/pump stations (non-residential only)	9	9	9	0
Wastewater treatment plants	1	1	1	
Unapproved auxiliary water supply interconnected with potable water supply	1	1	1	0
Totals	35	29	29	2

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2]Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can't be larger than the number in Column A in the same row.

[3] Count only connections whose premises isolation preventers were inspected (AGs) or tested (RPs) during the reporting year.

[4] For example, dedicated irrigation lines to parks, playgrounds, golf courses, cemeteries, estates, etc.

[5] Premises with hazardous materials or processes (requiring isolation by AG or RP), such as aircraft and automotive manufacturers, pulp and paper mills, metal manufacturers, military bases, and wholesale customers that pose a high hazard to the PWS. May be grouped together in categories, for example:"Other manufacturing" or "Other commercial".

Part 3C: Cross-Connection Control for High-Hazard Medical Premises Served by the PWS

- Count only medical premises PWS serves water to.
- Don't count the same premises more than once. If you serve different medical category premises through a single connection, count the connection under the medical category you consider to pose the highest hazard to PWS.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information**

Type of High-Hazard Medical Premises [WAC 246-290-490(4)(b)]	Number of Connections at end of 2025			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Hospitals				
Hospitals (include psychiatric hospitals and alcohol and drug treatment centers)				
Facilities for Treatment and Care of Patients Not Located in Hospitals Counted Above				
Same day surgery centers				
Out-patient clinics and offices				
Alternative health out-patient clinics and offices				
Psychiatric out-patient clinics and offices				
Chiropractors with water-connected X-ray equipment	0	0	0	0
Hospice care centers				
Childbirth centers				
Kidney dialysis centers	1	1	1	0
Blood centers				
Dental clinics and offices	6	4	4	2
Facilities for Housing Patients				
Nursing homes	1	1	1	0
Assisted Living Facilities (formerly Boarding Homes)	5	2	2	0
Residential treatment centers				
Other Medical-Related Facilities				
Mortuaries with embalming equipment	2	2	2	0
Morgues and autopsy facilities (not in hospitals)				

Veterinarian offices, clinics and hospitals	1	1	1	
Totals	16	11	11	2

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2]Count only connections with premises isolation AGs or RPs. Don’t include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can’t be larger than the number in Column A in the same row.

[3]Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises backflow preventers only or connections with premises isolation DCVAs or DCDAs isolation.

Part 4A: Backflow Preventer Inventory and Testing Information for 2025

- Complete all fields. Enter **zero (0)**, if no backflow preventers in a specific category.
- Count only backflow preventers relied on to protect the PWS.
- Count AVBs on *irrigation systems only*. Select No to AVB question above Table 2 if PWS doesn't track AVBs.
- Count multiple tests (or failures) for the same backflow preventer as one test (or failure) for that backflow preventer.
- For multiple service connections or parallel installations, count each assembly separately.
- Count RPDAs and DCDAs as ***single*** assemblies. Count the tests of the mainline assembly and bypass assembly as ***one test***. Count the failure of either the mainline or bypass assembly (or the failure of both) as ***one failure***. Count an entire detector assembly taken out of service as ***one assembly removed from service***.
- Count assemblies installed on dedicated fire or irrigation lines as **Premises Isolation Assemblies** in Table 1.

	Backflow Preventer Category and Inspection/Testing Information	Air Gap	RPBA	RPDA	DCVA	DCDA	PVBA	SVBA	AVB
Table 1: Premises Isolation Preventers (include preventers isolating PWS-owned facilities)									
Existing Premises Isolation Backflow Preventers									
1	In service at beginning of 2025	0	39	0	1366	32			
2	Inspected and/or tested in 2025[1]	0	24	0	881	17			
3	Failed inspection or test in 2025	0	1	0	30	1			
New Premises Isolation Backflow Preventers									
4	Installed in 2025[2]	0	5	0	5	3			
5	Inspected and/or tested in 2025[1]	0	5	0	5	3			
6	Failed inspection or test in 2025	0	0	0	0	0			
Premises Isolation Backflow Preventers (existing or new)									
7	Removed from service in 2025[3]	0	0	0	2	0			
Total Premises Isolation Preventers at End of 2025		0	44	0	1369	35	0	0	0

Does PWS track AVBs on irrigation systems? ○ Yes ◉ No

	Table 2: In-Premises Preventers (include preventers within PWS-owned facilities)								
Existing In-Premises Backflow Preventers									
8	In service at beginning of 2025	0	156	3	2909	15	18	0	unk
9	Inspected and/or tested in 2025[1]	0	46	2	1805	8	13	0	unk
10	Failed inspection or test in 2025	0	7	1	43	0	2	0	

New In-Premises Backflow Preventers									
11	Installed in 2025[2]	0	13	0	276	0	0	0	unk
12	Inspected and/or tested in 2025[1]	0	13	0	272	0	0	0	unk
13	Failed inspection or test in 2025	0	1	0	2	0	0	0	unk
In-Premises Backflow Preventers (existing or new)									
14	Removed from service in 2025[3]	0	0	0	9	0	0	0	unk
Total In-Premises Preventers at End of 2025[4]		0	169	3	3176	15	18	0	0
Grand Totals at End of 2025		0	213	3	4545	50	18	0	0

[1] Initial and/or routine annual inspection (for proper installation and approval status) and/or test (for testable assemblies only, using DOH-approved USC field test procedures).

[2] Includes preventers installed on connections where backflow prevention was not previously required and any preventers that replaced those in service at the beginning of the reporting year. Replacement preventers may be of a different type than the originals.

[3] Existing or new preventers taken out of service, whether or not they were replaced by the same or a different type of preventer.

Part 4B: Other Implementation Activities in 2025

Complete all cells. Enter zero if not applicable.

Water Use Questionnaires	
Did your PWS send any water use questionnaires to customers during 2025?	○ Yes ◉ No

On-site Hazard Surveys				
Did your CCS conduct any on-site hazard surveys during 2025?				◉ Yes ○ No
	Service Connection Type			
	New	**Existing**	**Total**	
1. Number of connections surveyed for cross-connection hazards to PWS.	302	28	330	
2. Number of connections requiring backflow prevention to protect PWS.[1,2]	302	10	312	

New Exceptions to Premises Isolation	
Did your CCS grant any new premises isolation exceptions in 2025 to high-hazard premises?[3]	○ Yes ◉ No

CCC Enforcement Actions	
Did your PWS take any enforcement actions during 2025?[4]	○ Yes ◉ No

[1] Include services where either premises isolation or in-premises preventers were required to protect the PWS.

[2] Include existing services that need new, additional or higher level backflow prevention.

[3] Submit a completed DOH Exception Form (green) for each new exception granted in the reporting year.

[4] "Enforcement actions" means actions taken by the PWS (such as water shut-off, PWS installation or testing of backflow preventer, assessment of fines, etc.) when the customer fails to comply with the PWS's CCC requirements.

Part 5: Backflow Incidents and "Off-Normal" Events in 2025

	Backflow Incidents, Risk Factors, and Indicators during 2025	Number
Backflow Incidents during 2025		
1	Backflow incidents that contaminated the PWS[5].	0
2	Backflow incidents that contaminated the customer's drinking water system ***only***[5].	0

Risk Factors for Backflow during 2025		
3	Distribution main breaks per 100 miles of pipe.	0.00
4	Low pressure events (<20 psi in PWS distribution system).	0
5	Water outage events.	0
Indicators of Possible Backflow during 2025		
6	Total health-related complaints received by PWS.[6]	0
7	Received during BWA or PN events.[7]	0
8	Received during low pressure or water outage events.	0
9	Total aesthetic complaints (color, taste, odor, air in lines, etc.).	3
10	Received during BWA or PN events.[7]	0
11	Number of these complaints received during low pressure or water outage events.	0

[5] Purveyors must submit a Backflow Incident Report form for each backflow incident known to have contaminated the public water system. DOH is also interested in receiving incident report forms for backflow incidents that contaminated the customer's drinking water system only.

[6] Such as stomach ache, headache, vomiting, diarrhea, skin rashes, etc.

[7] **"BWA"** means **Boil Water Advisory** and **"PN"** means **Public Notification** for water quality reasons.

Part 6: Comments and Clarifications

- Enter comments to:
  - Explain or clarify information in this report.
  - Describe challenges faced or accomplishments made in this reporting year.
  - Share your goals and objectives for the coming reporting year.
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Part No.	Date Added	Comments
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Pt 1	05-07-2021	The numbers reflecting 2019 service connections is believed to have been an estimate. The actual number of service connections at the end of 2020 were obtained from our financial analyst who deals directly with the tracking of new and existing service connections.
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Pt 1	05-18-2021	Our previous Backflow manager just recently retired. And since I do not yet have a complete understanding of our new XC2 tracking program and I am unable to locate some of the information that may need to be 100% confident in my report for the 2020 ASR. My plan for 2021 is to ensure that we have at least one more CCS on board, dedicated to the cross connection program as well as finding classes for those who are not up to speed with all the regulations pertaining to cross connection control. And to begin conducting surveys at some the various facilities around the City. , in or to be as accurate as possible with our CCC program.
Pt 1	03-18-2022	We are still trying to get up to speed with our CCC program. Previous information beyond 2020 is still being corrected and numbers on record aren't entirely correct with what we are finding in the field when we are able to access. We are still working on building a stronger more stringent program and I hope to have a couple of certified operators this year dedicated to the program and begin overdo hazard assessments as well as working closer with the building department on new construction.
Pt 1	01-19-2023	We are looking at a dedicated CCCS to hire this year that will begin a more in-depth investigation on the commercial and industrial side of our customers. We have also begun working closer with our building department regarding new construction.
Pt 1	04-10-2023	There are numbers this year that don't coincide with last year's numbers because we have someone dedidcated to data entry for our CCC program and she has been digging into past information and doing a bit of updating.
Pt 1	04-15-2024	Our new CCCS and data entry person working together found approximately 400 assemblies that were already in the system, that we didn't know about. As we continue to strengthen our program, we will begin to conduct more hazard assessments in 2024 and hopefully start getting a better understanding of what we need to have a more complete program.
Pt 1	03-27-2025	As I am new to the CCCS position as of last June 2024 there will some changes coming to enforce testing coming the reporting year of 2025. We will be getting new Backflow Management Software installed and running within the next couple months. This outdated XC2 has been glitching and is time to replace. Information from the past has been getting corrected and updated to get the most accurate data. We now have in our municipal code that any non-compliance to test we can send a tester to test then bill the utility account for the test, that should help get our compliance percentage up as well. Looking forward to all the new changes coming into 2025. The 2 new exceptions/ green forms I filled out during some hazard surveys were both from dentist offices that

		both have self-contained chairs not connected to our PWS. I will be checking back on those annually for continued hazard s to ensure nothing has changed.
Pt 1	04-06-2026	this past year I have been correcting information within our backflow prevention management software, trying to get the information as correct as possible for our new software that went live at the beginning of 2026. This last year I have been busy combing through the data correcting information from the past several years of input, also doing several hazard surveys at all the new sites and few dozen existing high/severe health hazard sites. The new software is going to help with the organizing of the customer test reminders and failed assemblies to ensure that customers are staying compliant with the testing and maintenance for passing test reports per WAC and CMC. This last year has been a challenge to stay on top of everything as the software change has been rather time consuming and customer addresses have not been changed over to the new software as of today's date 4/6/2026. This next year (2026) is going to be a transition year for the customers to get used to the new testing schedule and non-compliance enforcement action. Good things are happening to ensure safe water for the City of Camas The new software will make tracking it easier, the Camas Municipal Code will make it easier to keep customers compliant on the Backflow assembly testing.

Part 7: Report Certification and Contact Information

I, Nick Mettler , certify that the information in this form is true, complete and accurate to the best of my knowledge.

Last Saved	04/14/2026	**All ASR Forms Certified/Submitted**	04/14/2026

Designated CCS/CCC Program Manager[1]					
Name	Nick Mettler	**Title**	Cross Connection Control Specialist	**CCS Cert #**	16006
Email Address	nmettler@cityofcamas.us	**Phone**	360-833-3188	**Phone Ext**	

PWS Manager[2]					
Name	Allen Nelson	**Title**	Water Supply Operator	**Operator Cert #**	8187
Email Address	anelson@cityofcamas.us	**Phone**	360-817-7287	**Phone Ext**	

[1] The CCS responsible for developing and implementing the PWS's CCC program (CCC Program Manager).

[2] The person the designated CCS/CCC Program Manager reports to or other manager having direct oversight of the CCC Program.

Cross-Connection Control Activities (Blue)
Annual Summary Report (ASR) for 2024

PWS ID: **108002** PWS Name: **CAMAS MUNICIPAL WATER SEWER SYSTEM** County: **CLARK**

Part 1: Designated Cross-Connection Control Specialist (CCS) Information

CCS Name	Nick Mettler	CCS Phone	360-833-3188	CCS Cert. #	16006	BAT Cert. #	
CCS is: PWS owner or employee							

Part 2: Status of Cross-Connection Control (CCC) Program at End of 2024

Provide information about the status of your CCC Program at the end of the reporting year.

PWS has:	**A written CCC Program Plan**[1] ◉ Yes ○ No **CCC implementation activities**[2] ◉ Yes ○ No	**Program Plan Last Updated**[3] 12/04/2023

[1] Enter "Yes" if PWS has **any** type of written CCC Program Plan, policies, or procedures. Written CCC Program Plan must be part of a Water System Plan (WSP) or Small Water System Management Program (SWSMP).

[2] Enter "Yes" if PWS implemented **any** CCC Program activities during the reporting year, such as establishing legal authority, conducting hazard evaluations, requiring installation of backflow assemblies to protect the PWS, requiring assembly testing, maintaining CCC records, or enforcing the PWS's or CCC Program requirements.

[3] PWS can update the CCC Program Plan at any time (independent of WSP or SWSMP update).

Provide information regarding PWS's specific CCC Program Elements

Program Element Number	Description of Element [See WAC 246-290-490(3)]	This Program Element is:	
		Included in Written Program Plan	Being Implemented or Is Completed
1	**Legal Authority Established**	◉ Yes ○ No	◉ Yes ○ No
2	**Hazard Evaluation Procedures and Schedules**	◉ Yes ○ No	◉ Yes ○ No
3	**Procedures/Schedules for Ensuring Installation of Backflow Preventers**	◉ Yes ○ No	◉ Yes ○ No
4	**Certified CCS Provided**	◉ Yes ○ No	◉ Yes ○ No
5	**Backflow Preventer Inspection and Testing**	◉ Yes ○ No	◉ Yes ○ No
6	**Assembly Testing Quality Assurance/Quality Control (QA/QC) Program**	◉ Yes ○ No	◉ Yes ○ No
7	**Backflow Incident Response Procedures**	◉ Yes ○ No	◉ Yes ○ No
8	**Public Education Program**	◉ Yes ○ No	◉ Yes ○ No
9	**CCC Records**	◉ Yes ○ No	◉ Yes ○ No
10	**Reclaimed Water Permit**	○ Yes ○ No ◉ N/A	○ Yes ○ No ◉ N/A

Part 3A: PWS Characteristics at End of 2024

Enter the number of connections (new and existing) served by the PWS by type.

Type of Service Connection	Number
Residential (As defined by PWS)	10151
All Other (include dedicated fire lines, dedicated irrigation lines, and PWS-owned facilities such as water and wastewater treatment plants and pumping stations, parks, piers, and docks)	308
Total Number of Connections	10459

Part 3B: Cross-Connection Control for Severe and High-Hazard Premises and High-Hazard Dedicated Lines Served by the PW

Answer the following questions carefully. These answers control your access to pages 2 and 3 for data entry.

1. Does your PWS serve any severe or high-hazard premises or any high-hazard dedicated fire or irrigation lines? ◉ Yes ○ No

2. Does PWS serve any high-hazard medical premises? ◉ Yes ○ No

- If you answer Yes to both questions, you must enter data in at least one row on page 2 and one row on page 3.
- If you answer Yes to Question 1 and No to Question 2, you must enter data on page 2 only.
- If you answer No to both questions, pages 2 and 3 will be grayed out to prevent data entry.

- Count only premises PWS serves water to.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information.**

Type of Severe or High-Hazard Premises or Dedicated Lines [WAC 246-290-490(4)(b)]	Number of Connections at end of 2024			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Agricultural (farms and dairies)				
Beverage bottling plants (including breweries)	1	1	1	0
Car washes	2	2	2	0
Chemical plants				
Commercial laundries and dry cleaners	2	2	2	0
Both reclaimed water and potable water provided				
Film processing facilities				
Dedicated fire lines with chemical addition or using unapproved auxiliary supplies				
Food processing plants (including canneries, slaughter houses, rendering plants)				
Hospitals, medical centers, medical, dental and veterinary clinics, mortuaries, nursing homes, etc., reported on Part 3C page 3 (totals imported from page 3)	16	11	11	0
Dedicated irrigation systems using purveyor's water supply and chemical addition[4]				
Laboratories	0	0	0	0
Metal plating industries				
Petroleum processing or storage plants	4	4	4	0
Piers and docks				
Radioactive material processing plants or nuclear reactors				
Survey access denied or restricted				
Wastewater lift/pump stations (non-residential only)	9	9	9	0
Wastewater treatment plants	1	1	1	
Unapproved auxiliary water supply interconnected with potable water supply				
Totals	35	30	30	0

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2] Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can't be larger than the number in Column A in the same row.

[3] Count only connections whose premises isolation preventers were inspected (AGs) or tested (RPs) during the reporting year.

[4] For example, dedicated irrigation lines to parks, playgrounds, golf courses, cemeteries, estates, etc.

[5] Premises with hazardous materials or processes (requiring isolation by AG or RP), such as aircraft and automotive manufacturers, pulp and paper mills, metal manufacturers, military bases, and wholesale customers that pose a high hazard to the PWS. May be grouped together in categories, for example:"Other manufacturing" or "Other commercial".

Part 3C: Cross-Connection Control for High-Hazard Medical Premises Served by the PWS

- Count only medical premises PWS serves water to.
- Don't count the same premises more than once. If you serve different medical category premises through a single connection, count the connection under the medical category you consider to pose the highest hazard to PWS.
- Report data as accurately as possible. **DOH currently bases CCC compliance actions on this information**

Type of High-Hazard Medical Premises [WAC 246-290-490(4)(b)]	Number of Connections at end of 2024			
	A. Being Served Water by PWS[1]	B. With Premises Isolation by AG/RP[2]	C. With Column B AG Inspected or RP Tested[3]	D. Granted Exception from Premises Isolation
Hospitals				
Hospitals (include psychiatric hospitals and alcohol and drug treatment centers)				
Facilities for Treatment and Care of Patients Not Located in Hospitals Counted Above				
Same day surgery centers				
Out-patient clinics and offices				
Alternative health out-patient clinics and offices				
Psychiatric out-patient clinics and offices				
Chiropractors with water-connected X-ray equipment	0	0	0	0
Hospice care centers				
Childbirth centers				
Kidney dialysis centers	1	1	1	0
Blood centers				
Dental clinics and offices	6	4	4	0
Facilities for Housing Patients				
Nursing homes	1	1	1	0
Assisted Living Facilities (formerly Boarding Homes)	5	2	2	0
Residential treatment centers				
Other Medical-Related Facilities				
Mortuaries with embalming equipment	2	2	2	0
Morgues and autopsy facilities (not in hospitals)				
Veterinarian offices, clinics and hospitals	1	1	1	0
Totals	16	11	11	0

[1] Count multiple connections or parallel installations to the same premises as **separate** connections.

[2] Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises preventers only or connections with DCVAs or DCDAs installed for premises isolation. The number in Column B can't be larger than the number in Column A in the same row.

[3] Count only connections with premises isolation AGs or RPs. Don't include connections with in-premises backflow preventers only or connections with premises isolation DCVAs or DCDAs isolation.

Part 4A: Backflow Preventer Inventory and Testing Information for 2024

- Complete all fields. Enter **zero (0)**, if no backflow preventers in a specific category.
- Count only backflow preventers relied on to protect the PWS.
- Count AVBs on *irrigation systems only*. Select No to AVB question above Table 2 if PWS doesn't track AVBs.
- Count multiple tests (or failures) for the same backflow preventer as one test (or failure) for that backflow preventer.
- For multiple service connections or parallel installations, count each assembly separately.
- Count RPDAs and DCDAs as ***single*** assemblies. Count the tests of the mainline assembly and bypass assembly as ***one test***. Count the failure of either the mainline or bypass assembly (or the failure of both) as ***one failure***. Count an entire detector assembly taken out of service as ***one assembly removed from service***.
- Count assemblies installed on dedicated fire or irrigation lines as **Premises Isolation Assemblies** in Table 1.

	Backflow Preventer Category and Inspection/Testing Information	Air Gap	RPBA	RPDA	DCVA	DCDA	PVBA	SVBA	AVB
Table 1: Premises Isolation Preventers (include preventers isolating PWS-owned facilities)									
Existing Premises Isolation Backflow Preventers									
1	In service at beginning of 2024	0	29	0	1962	22			
2	Inspected and/or tested in 2024[1]	0	19	0	1533	15			
3	Failed inspection or test in 2024	0	4	0	32	1			
New Premises Isolation Backflow Preventers									
4	Installed in 2024[2]	0	2	0	4	0			
5	Inspected and/or tested in 2024[1]	0	2	0	4	0			
6	Failed inspection or test in 2024	0	0	0	0	0			
Premises Isolation Backflow Preventers (existing or new)									
7	Removed from service in 2024[3]	0	0	0	2	0			
	Total Premises Isolation Preventers at End of 2024	0	31	0	1964	22	0	0	0
	Does PWS track AVBs on irrigation systems? ○ Yes ◉ No								
Table 2: In-Premises Preventers (include preventers within PWS-owned facilities)									
Existing In-Premises Backflow Preventers									
8	In service at beginning of 2024	0	164	3	2194	28	22	0	unk
9	Inspected and/or tested in 2024[1]	0	101	2	1526	20	13	0	unk
10	Failed inspection or test in 2024	0	24	1	39	1	0	0	unk
New In-Premises Backflow Preventers									
11	Installed in 2024[2]	0	3	0	130	2	0	0	unk
12	Inspected and/or tested in 2024[1]	0	3	0	130	2	0	0	unk
13	Failed inspection or test in 2024	0	0	0	1	0	0	0	unk
In-Premises Backflow Preventers (existing or new)									
14	Removed from service in 2024[3]	0	0	0	8	0	0	0	unk
	Total In-Premises Preventers at End of 2024[4]	0	167	3	2316	30	22	0	0
	Grand Totals at End of 2024	0	198	3	4280	52	22	0	0

[1] Initial and/or routine annual inspection (for proper installation and approval status) and/or test (for testable assemblies only, using DOH-approved USC field test procedures).

[2] Includes preventers installed on connections where backflow prevention was not previously required and any preventers that replaced those in service at the beginning of the reporting year. Replacement preventers may be of a different type than the originals.

[3] Existing or new preventers taken out of service, whether or not they were replaced by the same or a different type of preventer.

Part 4B: Other Implementation Activities in 2024

Complete all cells. Enter zero if not applicable.

Water Use Questionnaires	
Did your PWS send any water use questionnaires to customers during 2024?	○ Yes ◉ No

On-site Hazard Surveys				
Did your CCS conduct any on-site hazard surveys during 2024?			◉ Yes ○ No	
	Service Connection Type			
	New	**Existing**	**Total**	
1. Number of connections surveyed for cross-connection hazards to PWS.	5	12	17	
2. Number of connections requiring backflow prevention to protect PWS.[1,2]	5	12	17	

New Exceptions to Premises Isolation	
Did your CCS grant any new premises isolation exceptions in 2024 to high-hazard premises?[3]	◉ Yes ○ No Number 2

CCC Enforcement Actions	
Did your PWS take any enforcement actions during 2024?[4]	○ Yes ◉ No

[1] Include services where either premises isolation or in-premises preventers were required to protect the PWS.

[2] Include existing services that need new, additional or higher level backflow prevention.

[3] Submit a completed DOH Exception Form (green) for each new exception granted in the reporting year.

[4] "Enforcement actions" means actions taken by the PWS (such as water shut-off, PWS installation or testing of backflow preventer, assessment of fines, etc.) when the customer fails to comply with the PWS's CCC requirements.

Part 5: Backflow Incidents and "Off-Normal" Events in 2024

	Backflow Incidents, Risk Factors, and Indicators during 2024	Number
Backflow Incidents during 2024		
1	Backflow incidents that contaminated the PWS[5].	0
2	Backflow incidents that contaminated the customer's drinking water system ***only***[5].	0
Risk Factors for Backflow during 2024		
3	Distribution main breaks per 100 miles of pipe.	7.00
4	Low pressure events (<20 psi in PWS distribution system).	0
5	Water outage events.	0
Indicators of Possible Backflow during 2024		
6	Total health-related complaints received by PWS.[6]	0
7	Received during BWA or PN events.[7]	0
8	Received during low pressure or water outage events.	0
9	Total aesthetic complaints (color, taste, odor, air in lines, etc.).	8
10	Received during BWA or PN events.[7]	0
11	Number of these complaints received during low pressure or water outage events.	0

[5] Purveyors must submit a Backflow Incident Report form for each backflow incident known to have contaminated the public water system. DOH is also interested in receiving incident report forms for backflow incidents that contaminated the customer's drinking water system only.

[6] Such as stomach ache, headache, vomiting, diarrhea, skin rashes, etc.

[7] **"BWA"** means **Boil Water Advisory** and **"PN"** means **Public Notification** for water quality reasons.

Part 6: Comments and Clarifications

- Enter comments to:
  - Explain or clarify information in this report.
  - Describe challenges faced or accomplishments made in this reporting year.
  - Share your goals and objectives for the coming reporting year.
- Delete comments that are no longer valid.

Part No.	Date Added	Comments
Pt 1	04-18-2019	Updated back flow software to XC2. in March 2019.Still working on migrating and merging.
Pt 1	05-07-2021	The numbers reflecting 2019 service connections is believed to have been an estimate. The actual number of service connections at the end of 2020 were obtained from our financial analyst who deals directly with the tracking of new and existing service connections.
Pt 1	05-07-2021	The actual number of service connections for 2019 is: Residential-8635 All Other: 273 esidential 8635
Pt 1	05-18-2021	Our previous Backflow manager just recently retired. And since I do not yet have a complete understanding of our new XC2 tracking program and I am unable to locate some of the information that may need to be 100% confident in my report for the 2020 ASR. My plan for 2021 is to ensure that we have at least one more CCS on board, dedicated to the cross connection program as well as finding classes for those who are not up to speed with all the regulations pertaining to cross connection control. And to begin conducting surveys at some the various facilities around the City. , in or to be as accurate as possible with our CCC program.
Pt 1	03-18-2022	We are still trying to get up to speed with our CCC program. Previous information beyond 2020 is still being corrected and numbers on record aren't entirely correct with what we are finding in the field when we are able to access. We are still working on building a stronger more stringent program and I hope to have a couple of certified operators this year dedicated to the program and begin overdo hazard assessments as well as working closer with the building department on new construction.
Pt 1	01-19-2023	We are looking at a dedicated CCCS to hire this year that will begin a more in-depth investigation on the commercial and industrial side of our customers. We have also begun working closer with our building department regarding new construction.
Pt 1	04-10-2023	There are numbers this year that don't coincide with last year's numbers because we have someone dedidcated to data entry for our CCC program and she has been digging into past information and doing a bit of updating.
Pt 1	04-15-2024	Our new CCCS and data entry person working together found approximately 400 assemblies that were already in the system, that we didn't know about. As we continue to strengthen our program, we will begin to conduct more hazard assessments in 2024 and hopefully start getting a better understanding of what we need to have a more complete program.
Pt 1	03-27-2025	As I am new to the CCCS position as of last June 2024 there will some changes coming to enforce testing coming the reporting year of 2025. We will be getting new Backflow Management Software installed and running within the next couple months. This outdated XC2 has been glitching and is time to replace. Information from the past has been getting corrected and updated to get the most accurate data. We now have in our municipal code that any non-compliance to test we can send a tester to test then bill the utility account for the test, that should help get our compliance percentage up as well. Looking forward to all the new changes coming into 2025. The 2 new exceptions/ green forms I filled out during some hazard surveys were both from dentist offices that both have self-contained chairs not connected to our PWS. I will be checking back on those annually for continued hazard surveys to ensure nothing has changed.

Part 7: Report Certification and Contact Information

I, [Certified by] , certify that the information in this form is true, complete and accurate to the best of my knowledge.

Last Saved	03/28/2025	**All ASR Forms Certified/Submitted**	

Designated CCS/CCC Program Manager[1]					
Name	Nick Mettler	**Title**	Cross Connection Control Specialist	**CCS Cert #**	16006
Email Address	nmettler@cityofcamas.us	**Phone**	360-833-3188	**Phone Ext**	

PWS Manager[2]					
Name	Allen Nelson	**Title**	Water Supply Operator	**Operator Cert #**	8187
Email Address	anelson@cityofcamas.us	**Phone**	360-817-7287	**Phone Ext**	

[1] The CCS responsible for developing and implementing the PWS's CCC program (CCC Program Manager).

[2] The person the designated CCS/CCC Program Manager reports to or other manager having direct oversight of the CCC Program.

APPENDIX L

EXAMPLE BACKFLOW BROCHURE

WHAT IS A BACKFLOW ASSEMBLY TESTER (BAT)?

A person who has shown competence to test and maintain backflow prevention assemblies and who is certified in accordance with Washington State. Also referred to as Certified or Licensed BAT. The City of Camas makes no representation regarding the abilities, performance, or quality of service of the testers listed below.

ANNUAL REMINDER NOTICES ARE SENT BY THE PUBLIC WORKS DEPARTMENT AND TEST RESULTS MUST BE RETURNED TO THE CITY (WAC 246-290-490).

Submit test reports to backflow@cityofcamas.us

Learn more

Washington Administrative Code: Chapter 246-290
Camas Municipal Code: Chapter 13.32

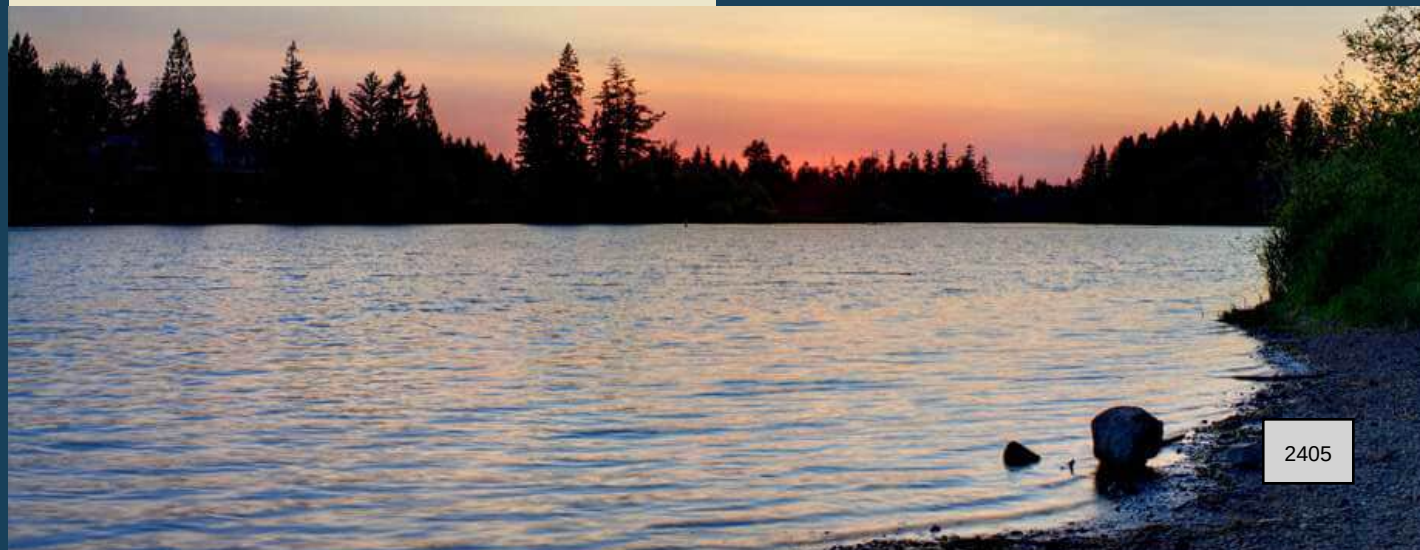
BACKFLOW CONTACTS

1620 SE 8th Ave, Camas, WA 98607
Tel: 360-817-1569

Email: backflow@cityofcamas.us
Website: www.cityofcamas.us/pwwater

City of Camas WASHINGTON

BACKFLOW
& Cross Connection



WHAT IS BACKFLOW?

Backflow may occur due to either "backsiphonage" or "backpressure", in which the flow of water reverses from the normal direction of flow in a piping system. When water or other substances flow in the opposite direction than intended, this allows contaminants to enter the public water system or consumer's plumbing causing a backflow incident.

WHAT IS A BACKFLOW INCIDENT?

A backflow incident occurs anytime there is a water reversal in the drinking water supply (under backflow conditions) via unprotected cross connections. Backflow incidents may cause injury, illness, or death.

WHAT IS CROSS CONNECTION?

A cross connection is any actual or potential physical connection between a "potable water" line and any pipe, vessel, or machine containing a non potable fluid, solid or gas, allowing possible entry to the water system by backflow. This would include, but is not limited to, sewers, drains, conduits, pools, storage reservoirs, plumbing fixtures, or any other device. The non-potable or unapproved water supply system may contain contaminated liquids, solids, or gases, of unknown or unsafe quality. Bypass arrangements such as jumper connections, removable sections, swivel or changeover devices are considered to be a cross connection.

WHAT ARE BACKFLOW PREVENTION ASSEMBLIES?

Backflow Prevention Assemblies are installed on water service lines (or at plumbing fixtures) to prevent backflow of contaminants into drinking water through cross connections. Improper installation or failure to meet testing requirements are grounds for termination of water service. The three basic approved types of assemblies that follow are required to be installed per City of Camas standards and must be tested by a Washington State Certified Backflow Assembly Tester upon installation and yearly thereafter.

REDUCED PRESSURE BACKFLOW ASSEMBLIES (RPBA)

An RPBA is a mechanical backflow preventer that consists of two independently acting, spring-loaded check valves with a mechanically independent, hydraulically operated, spring-loaded pressure differential relief valve between the check valves and below the first check valve.
This assembly is designed to protect against low to high health hazards.

DOUBLE CHECK VALVE ASSEMBLIES (DCVA)

A DCVA is a mechanical backflow preventer that consists of two independently acting, spring-loaded check valves. This assembly should only be used to protect against low health hazards.

PRESSURE VACUUM BREAKER ASSEMBLIES (PVBA)

A PVBA is a mechanical backflow p
that consists of an independently acting, spring-loaded check valve and an independently acting, spring-loaded, air inlet valve on the discharge side of the check valve. This assembly is designed to protect against a low health hazards under backsiphonage only.

WITHOUT PROPER BACKFLOW PROTECTION, YOUR IRRIGATION SYSTEM COULD ENDANGER THE HEALTH OF YOUR FAMILY, NEIGHBORS, AND OTHERS IN THE COMMUNITY WHO ARE USING THE PUBLIC WATER SYSTEM.

NOTE: Atmospheric Vacuum Breaker's (AVB) are not allowed in the City of Camas.

2406

APPENDIX M

2023 CLARK COUNTY VACANT BUILDABLE LANDS MODEL

VBLM 2023
(LandUseAlternative2)

Capacity and Yield by Jurisdiction

Jurisdiction Label	Housing Units	(%)	Jobs	(%)	Gross Acres	(%)	Buildable Acres	(%)
Battle Ground	6,603	*4.3%*	7,571	*10.2%*	3,307	*11.4%*	1,422	*11.9%*
Camas	5,553	*3.6%*	16,201	*21.9%*	3,278	*11.3%*	1,559	*13.0%*
La Center	2,301	*1.5%*	3,011	*4.1%*	1,058	*3.7%*	479	*4.0%*
Ridgefield	11,810	*7.7%*	7,513	*10.1%*	3,434	*11.9%*	1,520	*12.7%*
Vancouver (City)	61,602	*40.1%*	21,691	*29.3%*	6,753	*23.4%*	2,367	*19.8%*
Vancouver UGA (Clark County)	58,009	*37.8%*	15,823	*21.4%*	8,932	*30.9%*	3,718	*31.1%*
Washougal	7,349	*4.8%*	1,887	*2.5%*	1,846	*6.4%*	770	*6.4%*
Woodland	101	*0.1%*			95	*0.3%*	23	*0.2%*
Yacolt	268	*0.2%*	307	*0.4%*	206	*0.7%*	103	*0.9%*
Total	153,595	*100.0%*	74,004	*100.0%*	28,909	*100.0%*	11,961	*100.0%*

Capacity by Housing Type

Jurisdiction Label	High Density Residential Housing Units	(%)	Low Density Residential Housing Units	(%)
Battle Ground	2,840	*43.0%*	3,763	*57.0%*
Camas	3,444	*62.0%*	2,109	*38.0%*
La Center	1,178	*51.2%*	1,124	*48.8%*
Ridgefield	8,516	*72.1%*	3,293	*27.9%*
Vancouver (City)	55,676	*90.4%*	5,926	*9.6%*
Vancouver UGA (Clark County)	26,845	*46.3%*	31,164	*53.7%*
Washougal	2,412	*32.8%*	4,937	*67.2%*
Woodland			101	*100.0%*
Yacolt	0	*0.0%*	268	*100.0%*
Total	100,911	*65.7%*	52,684	*34.3%*

Notes:
• Yield estimate for the Town of Yacolt is dependent on development of sewer infrastructure.
• Yield estimate for the City of Woodland is exclusively residential housing units (there is neither commercial nor industrial zoning in the Clark County portion of the city).

CLARK COUNTY WASHINGTON
COMMUNITY PLANNING

CLARK COUNTY WASHINGTON
GEOGRAPHIC INFORMATION SERVICES

VBLM Tools Version: 2023-3.0.1-beta

Disclaimer: Clark County does not warrant the accuracy, reliability or timeliness of any information in this system, and shall not be held liable for losses caused by using this information. Portions of this information may not be current or accurate. Any person or entity who relies on any information obtained from this system, does so at their own risk. RCW 42.56.070(8) prohibits releasing and/or using lists of individuals gathered from this site for commercial

VBLM 2023
(LandUseAlternative2)

Capacity and Yield by Zoning: City, UGA

	Housing Units	(%)	Jobs	(%)	Gross Acres	(%)	Buildable Acres	(%)
Battle Ground	6,603	4.3%	7,571	10.2%	3,307	11.4%	1,422	11.9%
Incorporated City	5,391	3.5%	5,375	7.3%	2,256	7.8%	986	8.3%
Unincorporated UGA	1,212	0.8%	2,196	3.0%	1,050	3.6%	436	3.6%
Camas	5,553	3.6%	16,201	21.9%	3,278	11.3%	1,559	13.0%
Incorporated City	4,676	3.0%	13,821	18.7%	2,795	9.7%	1,309	10.9%
Unincorporated UGA	877	0.6%	2,379	3.2%	482	1.7%	251	2.1%
La Center	2,301	1.5%	3,011	4.1%	1,058	3.7%	479	4.0%
Incorporated City	2,144	1.4%	2,088	2.8%	828	2.9%	383	3.2%
Unincorporated UGA	157	0.1%	923	1.3%	230	0.8%	96	0.8%
Ridgefield	11,810	7.7%	7,513	10.2%	3,434	11.9%	1,520	12.7%
Incorporated City	5,748	3.7%	5,935	8.0%	2,353	8.1%	1,067	8.9%
Unincorporated UGA	6,062	4.0%	1,578	2.1%	1,081	3.7%	453	3.8%
Vancouver (City)	61,602	40.1%	21,691	29.3%	6,753	23.4%	2,367	19.8%
Incorporated City	61,602	40.1%	21,691	29.3%	6,753	23.4%	2,367	19.8%
Vancouver UGA (Clark County)	58,009	37.8%	15,823	21.4%	8,932	30.9%	3,718	31.1%
Unincorporated UGA	58,009	37.8%	15,823	21.4%	8,932	30.9%	3,718	31.1%
Washougal	7,349	4.8%	1,887	2.6%	1,846	6.4%	770	6.4%
Incorporated City	4,912	3.2%	1,378	1.9%	1,032	3.6%	416	3.5%
Unincorporated UGA	2,437	1.6%	509	0.7%	814	2.8%	354	3.0%
Woodland	101	0.1%	0	0.0%	95	0.3%	23	0.2%
Incorporated City	9	0.0%			5	0.0%	1	0.0%
Unincorporated UGA	91	0.1%			90	0.3%	22	0.2%
Yacolt	268	0.2%	307	0.4%	206	0.7%	103	0.9%
Incorporated City	130	0.1%	163	0.2%	98	0.3%	47	0.4%
Unincorporated UGA	138	0.1%	145	0.2%	108	0.4%	56	0.5%

VBLM 2023
(LandUseAlternative2)

Capacity and Yield by Zoning

Battle Ground (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential							
Residential 3 units/acre (R3)	174	58	30	27	59	194	0
Redevelopment	10	3	7	0	0	1	
Underutilized	85	25	18	13	29	87	
Vacant	79	30	5	14	30	106	
Residential 5 units/acre (R5)	358	98	54	65	141	959	0
Redevelopment	12	4	8	0	0	2	
Underutilized	135	30	32	23	51	253	
Vacant	211	64	15	41	90	704	
Residential 7 units/acre (R7)	593	191	72	104	226	1,617	0
Redevelopment	21	8	12	0	1	4	
Underutilized	170	61	33	24	52	364	
Vacant	402	121	28	80	173	1,248	
Residential 10 units/acre (R10)	321	73	44	64	139	1,393	0
Redevelopment	9	1	7	0	1	8	
Underutilized	98	32	20	15	32	318	
Vacant	214	41	17	49	107	1,067	
Residential 12 units/acre (R12)	108	33	20	17	38	457	0
Redevelopment	7	1	5	0	1	7	
Underutilized	53	14	12	9	19	223	
Vacant	48	18	3	9	19	228	
Residential 16 units/acre (R16)	92	17	10	20	45	712	0
Redevelopment	1	0	1	0	0	2	
Underutilized	12	2	3	2	4	70	
Vacant	79	14	6	18	40	640	
Residential 20 units/acre (R20)	10	4	2	1	3	59	0
Redevelopment	2	1	1	0	0	2	
Underutilized	5	2	1	1	1	25	
Vacant	4	1	0	1	2	32	
Residential Subtotal	1,655	474	232	298	651	5,391	0
Commercial							
Community Center (CC)	0	0	0	0	0	0	3
Underutilized	0	0	0	0	0	0	3
Downtown (D)	16	3	0	3	10	0	194
Underutilized	12	2	0	2	7	0	141
Vacant	4	1	0	1	3	0	53
Regional Center (RC)	318	45	0	68	204	0	4,087
Underutilized	318	45	0	68	204	0	4,087
Commercial Subtotal	334	48	0	71	214	0	4,284
Industrial							

VBLM 2023
(LandUseAlternative2)

Capacity and Yield by Zoning

Battle Ground (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Industrial							
Light Industrial (ML)	197	85	0	28	85	0	761
Underutilized	189	81	0	27	81	0	732
Vacant	8	4	0	1	3	0	29
Westside Employment (WE)	70	21	0	12	37	0	330
Underutilized	70	21	0	12	37	0	330
Industrial Subtotal	267	106	0	40	121	0	1,091
Total	2,256	628	232	410	**986**	**5,391**	**5,375**

VBLM 2023
(LandUseAlternative2)

Capacity and Yield by Zoning

Camas (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential							
North Shore Higher Density Residential (HD-NS)	106	35	14	18	39	707	0
Underutilized	57	23	10	7	16	289	
Vacant	49	12	4	11	23	418	
North Shore Lower Density Residential (LD-NS)	138	37	25	24	52	316	0
Redevelopment	13	0	12	0	1	4	
Underutilized	34	13	6	5	10	60	
Vacant	91	24	7	19	42	252	
Residential-6,000 (R-6)	22	8	3	3	7	54	0
Redevelopment	2	1	1	0	0	1	
Underutilized	5	2	1	1	1	10	
Vacant	15	5	1	3	6	43	
Residential-7,500 (R-7.5)	157	44	40	22	50	316	0
Redevelopment	38	11	25	0	1	8	
Underutilized	45	11	10	7	16	96	
Vacant	74	22	5	15	32	211	
Residential-10,000 (R-10)	232	69	27	43	93	486	0
Redevelopment	8	3	5	0	0	1	
Underutilized	51	19	10	7	15	62	
Vacant	173	47	13	36	78	423	
Residential-12 (R-12)	75	21	20	11	24	97	0
Redevelopment	17	4	13	0	1	3	
Underutilized	22	5	5	4	8	34	
Vacant	36	12	2	7	15	61	
Residential-15,000 (R-15)	391	132	104	48	108	331	0
Redevelopment	89	27	59	0	3	9	
Underutilized	192	66	38	28	61	182	
Vacant	110	39	7	20	44	140	
Multifamily Residential-10 (MF-10)	37	10	4	7	16	162	0
Redevelopment	2	1	1	0	0	1	
Underutilized	1	1	0	0	0	4	
Vacant	34	8	3	7	16	156	
Multifamily Residential-18 (MF-18)	43	13	7	7	16	286	0
Redevelopment	5	2	3	0	0	6	
Underutilized	9	2	2	1	3	56	
Vacant	29	9	2	6	12	224	
Multifamily Residential-24 (MF-24)	33	5	4	8	17	399	0
Underutilized	9	4	1	1	2	54	
Vacant	24	1	2	7	14	345	
Multifamily Residential-38 (MF-38)	6	0	2	1	3	113	0
Underutilized	6	0	2	1	3	113	
Single Family Residential (R1-6)	16	1	3	4	8	0	0
Underutilized	8	0	2	2	4	0	
Vacant	8	1	1	2	4	0	

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Capacity and Yield by Zoning

Camas (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential Subtotal	1,256	375	253	196	433	3,265	0
Commercial							
Community Commercial (CC)	63	10	0	13	40	0	804
Underutilized	63	10	0	13	40	0	801
Vacant	0	0	0	0	0	0	3
Downtown Commercial (DC)	8	1	0	2	5	0	109
Underutilized	8	1	0	2	5	0	109
Mixed Use (MX)	67	5	0	15	46	555	462
Underutilized	62	5	0	14	43	520	433
Vacant	5	1	0	1	3	35	29
Neighborhood Commercial (NC)	2	0	0	0	1	0	20
Underutilized	2	0	0	0	1	0	20
North Shore Commercial (C-NS)	46	6	0	10	30	0	595
Underutilized	46	6	0	10	30	0	595
North Shore Mixed Use (MX-NS)	103	8	0	24	71	856	713
Underutilized	103	8	0	24	71	856	713
Regional Commercial (RC)	319	43	0	69	206	0	4,127
Underutilized	279	38	0	60	181	0	3,621
Vacant	39	5	0	8	25	0	506
Mixed Employment (ME)	368	39	0	82	246	0	4,927
Underutilized	368	39	0	82	246	0	4,927
Commercial Subtotal	975	113	0	216	647	1,411	11,757
Industrial							
Business Park (BP)	19	2	0	4	13	0	116
Underutilized	19	2	0	4	13	0	116
Heavy Industrial (HI)	545	257	0	72	216	0	1,948
Underutilized	545	257	0	72	216	0	1,944
Vacant	1	0	0	0	0	0	4
Industrial Subtotal	564	259	0	76	229	0	2,064
Total	2,795	746	253	488	**1,309**	**4,676**	**13,821**

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Capacity and Yield by Zoning

La Center (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential							
Low Density Residential (LDR-7.5)	503	152	81	85	186	999	0
Redevelopment	9	3	6	0	0	2	
Underutilized	285	84	60	44	96	482	
Vacant	210	65	14	41	89	515	
Medium Density Residential (MDR-16)	91	20	13	18	39	527	0
Redevelopment	1	0	1	0	0	1	
Underutilized	35	6	9	7	14	170	
Vacant	55	14	4	12	25	356	
Residential Subtotal	595	172	94	103	225	1,525	0
Commercial							
Downtown Commercial (C-1)	2	0	0	0	1	0	22
Underutilized	1	0	0	0	1	0	19
Vacant	0	0	0	0	0	0	3
Mixed Use (MX)	27	2	0	6	19	179	74
Underutilized	27	2	0	6	19	179	74
Residential/Professional (RP)	12	2	0	2	7	48	30
Underutilized	10	1	0	2	6	41	26
Vacant	2	0	0	0	1	7	4
Junction Plan (JP)	193	19	0	44	131	392	1,961
Underutilized	170	18	0	38	114	342	1,712
Vacant	23	1	0	6	17	50	249
Commercial Subtotal	233	23	0	53	158	619	2,088
Total	828	195	94	156	**383**	**2,144**	**2,088**

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Capacity and Yield by Zoning

Ridgefield (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential							
Residential Medium Density - Mixed Use (RMD-MU)	36	11	5	6	13	0	0
Underutilized	22	7	4	3	7	0	
Vacant	14	4	1	3	6	0	
Residential Low Density - 4 (RLD-4)	711	233	109	116	254	1,531	0
Redevelopment	47	9	36	0	2	10	
Underutilized	214	72	43	31	68	368	
Vacant	450	152	30	85	184	1,152	
Residential Low Density - 6 (RLD-6)	201	68	32	31	69	659	0
Redevelopment	24	7	16	0	1	6	
Underutilized	37	13	7	5	12	83	
Vacant	141	49	9	26	57	570	
Residential Low Density - 8 (RLD-8)	80	17	11	16	36	340	0
Redevelopment	5	0	4	0	0	2	
Underutilized	6	2	1	1	2	17	
Vacant	68	14	5	15	33	321	
Residential Medium Density (RMD-16)	46	9	5	10	22	475	0
Redevelopment	2	0	1	0	0	2	
Underutilized	3	1	0	0	1	13	
Vacant	42	7	3	10	21	460	
Single Family Residential (R1-6)	144	30	24	28	62	0	0
Redevelopment	1	0	1	0	0	0	
Underutilized	74	14	18	13	29	0	
Vacant	69	16	5	15	33	0	
Single Family Residential (R1-7.5)	128	41	25	20	43	0	0
Redevelopment	2	0	2	0	0	0	
Underutilized	102	30	22	16	35	0	
Vacant	24	11	1	4	8	0	
Single Family Residential (R1-10)	39	18	5	5	11	0	0
Underutilized	22	10	4	3	6	0	
Vacant	17	8	1	2	5	0	
Residential Subtotal	1,385	427	216	233	510	3,005	0
Commercial							
Commercial Community Business (CCB)	20	1	0	5	14	0	285
Underutilized	20	1	0	5	14	0	285
Commercial Neighborhood Business (CNB)	14	2	0	3	9	0	185
Underutilized	14	2	0	3	9	0	185
Commercial Regional Business (CRB)	123	11	0	28	84	0	1,678
Underutilized	123	11	0	28	84	0	1,678
Central Mixed Use – High Density (CMU-H)	3	0	0	1	2	39	18
Underutilized	3	0	0	1	2	38	18

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Capacity and Yield by Zoning

Ridgefield (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Commercial							
Central Mixed Use – High Density (CMU-H)	3	0	0	1	2	39	18
Vacant	0	0	0	0	0	1	1
Commercial Community Business - Mixed Use (CCB-	34	3	0	8	23	390	186
Underutilized	30	3	0	7	20	339	161
Vacant	4	0	0	1	3	51	25
Commercial Regional Business - Mixed Use (CRB-	138	16	0	30	91	1,536	731
Underutilized	133	15	0	29	88	1,481	705
Vacant	5	1	0	1	3	55	26
Waterfront Mixed Use (WMU)	4	1	0	1	3	36	20
Underutilized	4	1	0	1	3	36	20
Waterfront Mixed Use – High Density (WMU-H)	35	6	0	7	22	368	175
Underutilized	35	6	0	7	22	368	175
Commercial Subtotal	372	40	0	83	249	2,369	3,279
Industrial							
Employment (E)	493	153	0	85	255	0	2,296
Underutilized	461	145	0	79	237	0	2,135
Vacant	32	8	0	6	18	0	161
Employment – Mixed Use (E-MU)	103	31	0	18	53	374	361
Underutilized	101	31	0	17	52	365	352
Vacant	2	0	0	0	1	9	9
Industrial Subtotal	596	184	0	103	308	374	2,656
Total	2,353	651	216	419	**1,067**	**5,748**	**5,935**

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Capacity and Yield by Zoning

Vancouver (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential							
Medium Scale Neighborhood (MSN)	505	84	155	40	225	10,650	43
Redevelopment	118	8	99	0	11	514	
Underutilized	144	17	38	14	75	3,560	43
Vacant	244	60	18	26	139	6,577	
Low Scale Neighborhood (LSN)	1,328	262	591	142	333	5,926	0
Redevelopment	593	97	471	0	25	434	
Underutilized	400	89	94	69	149	2,616	
Vacant	334	76	26	73	159	2,876	
Residential Subtotal	1,833	346	746	182	558	16,575	43
Commercial							
Regional Activity Center - City Center (RAC-CX)	978	49	568	44	316	23,397	4,605
Redevelopment	594	20	568	0	6	437	86
Underutilized	374	28	0	43	302	22,432	4,415
Vacant	10	1	0	1	8	528	104
Institutional/Campus (IC)	123	0	103	2	19	134	374
Redevelopment	108	0	103	0	5	39	108
Underutilized	15	0	0	2	13	95	265
Mixed-Use (MU)	2,031	55	1,296	76	603	20,429	8,833
Redevelopment	1,382	18	1,296	0	68	2,315	1,023
Underutilized	628	37	0	74	517	17,487	7,533
Vacant	22	0	0	3	18	627	277
Commercial Subtotal	3,132	104	1,967	123	938	43,960	13,812
Industrial							
Heavy Industrial (IH)	1,037	391	0	162	485	0	4,366
Underutilized	1,013	381	0	158	474	0	4,265
Vacant	24	9	0	4	11	0	101
Industrial/Employment (IE)	751	237	0	129	386	1,066	3,470
Underutilized	722	236	0	121	364	1,008	3,280
Vacant	29	1	0	7	21	59	190
Industrial Subtotal	1,788	627	0	290	871	1,066	7,836
Total	6,753	1,078	2,713	595	**2,367**	**61,602**	**21,691**

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Capacity and Yield by Zoning

Washougal (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential							
Multiple-family Residential (AR-16)	9	5	0	1	3	84	0
Redevelopment	0	0	0	0	0	0	
Vacant	9	5	0	1	3	84	
Multiple-family Residential (AR-22)	6	2	2	1	2	36	0
Redevelopment	2	1	2	0	0	4	
Underutilized	1	0	0	0	0	9	
Vacant	2	1	0	0	1	23	
Single-family Residential (R1-5)	51	11	13	9	19	406	0
Redevelopment	10	1	9	0	0	9	
Underutilized	8	2	2	1	3	49	
Vacant	34	8	3	7	16	349	
Single-family Residential (R1-7.5)	312	89	70	48	106	1,328	0
Redevelopment	60	14	43	0	2	27	
Underutilized	65	22	13	10	21	249	
Vacant	187	53	13	38	83	1,052	
Single-family Residential (R1-10)	105	28	26	16	35	311	0
Redevelopment	23	8	14	0	1	6	
Underutilized	41	12	9	6	14	113	
Vacant	41	9	3	9	20	193	
Single-family Residential (R1-15)	288	92	47	47	103	578	0
Redevelopment	34	12	21	0	1	6	
Underutilized	62	21	12	9	20	98	
Vacant	191	58	13	38	82	474	
Single Family Residential (R1-7.5)	8	4	0	1	3	0	0
Vacant	8	4	0	1	3	0	
Single Family Residential (R1-10)	1	0	1	0	0	0	0
Redevelopment	1	0	1	0	0	0	
Residential Subtotal	780	229	159	122	270	2,745	0
Commercial							
Community Commercial (CC)	16	1	0	4	12	173	116
Underutilized	15	1	0	4	11	160	107
Vacant	1	0	0	0	1	14	9
Convenience Commercial (CV)	0	0	0	0	0	4	3
Underutilized	0	0	0	0	0	4	3
Highway Commercial (CH)	45	5	0	10	30	1,185	356
Underutilized	43	5	0	10	29	1,170	346
Vacant	1	0	0	0	1	15	10
Town Center Core (TC-C)	14	2	0	3	9	170	76
Underutilized	2	0	0	1	2	28	12
Vacant	12	2	0	2	7	142	63

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Capacity and Yield by Zoning

Washougal (City)	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Commercial							
Town Center East Village (TC-EV)	53	8	0	11	34	620	276
Underutilized	53	8	0	11	34	620	276
Town Center West Village (TC-WV)	2	0	0	0	1	15	10
Underutilized	2	0	0	0	1	15	10
Commercial Subtotal	131	16	0	29	86	2,167	835
Industrial							
Heavy Industrial (HI)	121	44	0	14	60	0	543
Underutilized	119	43	0	13	59	0	535
Vacant	2	1	0	0	1	0	7
Industrial Subtotal	121	44	0	14	60	0	543
Total	1,032	289	159	164	**416**	**4,912**	**1,378**

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Capacity and Yield by Zoning

Woodland (City)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential							
Low Density Residential (LDR-6)	5	3	1	1	1	9	0
Underutilized	5	3	1	1	1	9	
Vacant	0	0	0	0	0	1	
Residential Subtotal	5	3	1	1	1	9	0
Total	5	3	1	1	1	**9**	**0**

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Capacity and Yield by Zoning

Yacolt (Town)

	Gross	Constrained	Market	Infrastructure	Buildable	Housing Units	Jobs
	Acres of Land						
Residential							
Single-family Residential (R1-10)	9	1	2	2	4	18	0
Redevelopment	2	0	2	0	0	0	
Vacant	7	0	1	2	4	18	
Single-family Residential (R1-12.5)	73	14	13	14	31	112	0
Redevelopment	10	3	7	0	0	1	
Underutilized	6	2	1	1	2	7	
Vacant	56	9	5	13	29	104	
Residential Subtotal	81	14	15	16	36	130	0
Commercial							
Community Commercial (C2)	5	0	0	1	3	0	69
Underutilized	4	0	0	1	3	0	58
Vacant	1	0	0	0	1	0	11
Neighborhood Commercial (C1)	2	0	0	1	2	0	35
Underutilized	2	0	0	1	2	0	35
Commercial Subtotal	7	0	0	2	5	0	104
Industrial							
Light Industrial (ML)	10	1	0	2	7	0	59
Underutilized	10	1	0	2	7	0	59
Industrial Subtotal	10	1	0	2	7	0	59
Total	98	15	15	20	**47**	**130**	**163**

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Capacity and Yield by Zoning

Unincorporated UGA

	Gross	Constrained	Market	nfrastructure	uildable	Housing Units	Jobs
	Acres of Land						
Residential							
Battle Ground (Unincorporated UGA)	**729**	**167**	**198**	**113**	**251**	**1,212**	**0**
Residential 3 units/acre (R3)	430	93	135	63	140	419	0
Redevelopment	81	22	57	0	3	9	
Underutilized	317	65	75	55	121	362	
Vacant	32	6	3	7	16	48	
Residential 5 units/acre (R5)	90	25	20	14	31	155	0
Redevelopment	1	0	0	0	0	0	
Underutilized	87	24	19	14	30	152	
Vacant	1	0	0	0	1	3	
Residential 7 units/acre (R7)	148	39	21	28	60	421	0
Redevelopment	1	0	0	0	0	0	
Underutilized	67	17	15	11	24	170	
Vacant	80	22	6	16	36	250	
Residential 10 units/acre (R10)	56	10	22	7	17	172	0
Redevelopment	16	2	13	0	1	14	
Underutilized	36	7	8	6	14	136	
Vacant	4	1	0	1	2	22	
Residential 16 units/acre (R16)	5	0	0	1	3	46	0
Vacant	5	0	0	1	3	46	
Camas (Unincorporated UGA)	**312**	**54**	**68**	**60**	**130**	**844**	**0**
North Shore Higher Density Residential (HD-NS)	30	0	6	8	17	299	0
Redevelopment	1	0	1	0	0	1	
Underutilized	12	0	4	3	6	101	
Vacant	18	0	2	5	11	197	
North Shore Lower Density Residential (LD-NS)	23	2	5	5	11	67	0
Redevelopment	1	0	1	0	0	0	
Underutilized	11	2	3	2	4	26	
Vacant	11	0	1	3	7	41	
Residential-10,000 (R-10)	44	5	12	9	19	75	0
Redevelopment	1	0	1	0	0	0	
Underutilized	41	5	11	8	17	68	
Vacant	3	0	0	1	2	6	
Residential-12 (R-12)	88	20	14	17	38	150	0
Redevelopment	3	0	2	0	0	1	
Underutilized	33	9	7	5	12	46	
Vacant	52	10	4	12	26	104	
Multifamily Residential-10 (MF-10)	10	0	4	1	3	35	0
Redevelopment	3	0	2	0	0	2	
Underutilized	7	0	2	1	3	32	
Single Family Residential (R1-6)	116	26	28	20	43	218	0
Redevelopment	6	0	5	0	0	1	
Underutilized	94	22	21	16	34	175	
Vacant	17	4	1	4	8	41	

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Capacity and Yield by Zoning

Unincorporated UGA	Gross	Constrained	Market	nfrastructure	uildable	Housing Units	Jobs
	Acres of Land						
Residential							
La Center (Unincorporated UGA)	**125**	**46**	**24**	**17**	**38**	**157**	**0**
Residential (R-12)	12	3	3	2	4	32	0
Underutilized	12	3	3	2	4	32	
Single Family Residential (R1-6)	29	10	6	4	9	33	0
Underutilized	29	10	6	4	9	33	
Single Family Residential (R1-7.5)	52	20	10	7	15	57	0
Underutilized	52	20	10	7	15	57	
Vacant	0	0	0	0	0	0	
Single Family Residential (R1-10)	3	1	1	1	1	5	0
Underutilized	3	1	1	1	1	5	
Single Family Residential (R1-20)	30	13	5	4	8	30	0
Underutilized	30	13	5	4	8	30	
Ridgefield (Unincorporated UGA)	**748**	**218**	**149**	**120**	**261**	**3,654**	**208**
Residential Medium Density - Mixed Use (RMD-MU)	281	80	49	48	104	2,622	208
Underutilized	213	67	44	32	70	1,768	140
Vacant	68	13	6	16	34	854	68
Residential Medium Density - MU, PF (RMD-MU-PF)	14	3	3	2	5	110	0
Underutilized	13	3	3	2	5	99	0
Vacant	1	0	0	0	1	12	0
Residential Low Density - 6 (RLD-6)	65	28	11	8	18	129	0
Redevelopment	1	0	0	0	0	0	
Underutilized	57	24	10	7	16	114	
Vacant	6	3	0	1	2	15	
Residential (R-12)	37	14	6	6	12	158	0
Underutilized	27	9	5	4	9	114	
Vacant	10	4	1	2	3	44	
Single Family Residential (R1-6)	120	30	22	21	46	242	0
Underutilized	85	20	20	14	31	162	
Vacant	35	11	2	7	15	79	
Single Family Residential (R1-7.5)	123	34	27	19	42	220	0
Redevelopment	1	0	1	0	0	0	
Underutilized	120	33	26	19	42	216	
Vacant	2	1	0	0	1	4	
Single Family Residential (R1-10)	108	29	32	15	33	173	0
Redevelopment	17	2	14	0	1	4	
Underutilized	78	23	16	12	26	136	
Vacant	13	3	1	3	6	33	
Vancouver (Unincorporated UGA)	**6,278**	**1,227**	**1,880**	**857**	**2,314**	**51,313**	**0**
Multifamily Residential (R-24)	609	136	133	53	288	6,518	0
Redevelopment	37	3	30	0	3	74	
Underutilized	368	75	88	32	173	3,799	

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Capacity and Yield by Zoning

Unincorporated UGA

	Gross	Constrained	Market	nfrastructure	uildable	Housing Units	Jobs
	Acres of Land						
Residential							
Vancouver (Unincorporated UGA)	**6,278**	**1,227**	**1,880**	**857**	**2,314**	**51,313**	**0**
Vacant	205	58	15	21	112	2,645	
Multifamily Residential (R-32)	409	76	102	35	195	5,317	0
Redevelopment	69	13	51	0	6	152	
Underutilized	137	20	35	13	69	1,875	
Vacant	202	44	16	22	120	3,290	
Multifamily Residential (R-40)	34	7	9	3	15	576	0
Redevelopment	8	0	7	0	1	28	
Underutilized	7	3	1	0	2	81	
Vacant	20	4	2	2	12	468	
Multifamily Residential (R-45)	166	17	38	17	94	4,030	0
Redevelopment	9	1	7	0	1	33	
Underutilized	100	14	26	10	51	2,185	
Vacant	57	2	6	8	42	1,812	
Multifamily Residential (R-50)	16	1	11	0	3	158	0
Redevelopment	12	1	10	0	1	56	
Underutilized	4	1	1	0	2	85	
Vacant	1	0	0	0	0	17	
Multifamily Residential (HWY99/MF)	27	7	7	2	11	1,114	0
Redevelopment	6	1	4	0	1	50	
Underutilized	6	2	1	0	2	224	
Vacant	15	4	1	2	8	840	
Office Residential (OR-24)	1	0	1	0	0	2	0
Redevelopment	1	0	1	0	0	2	
Office Residential (OR-32)	3	1	0	0	2	46	0
Vacant	3	1	0	0	2	46	
Office Residential (OR-40)	91	15	17	9	49	1,864	0
Redevelopment	1	0	1	0	0	3	
Underutilized	50	7	13	5	26	970	
Vacant	39	8	3	4	23	891	
Office Residential (OR-45)	24	8	2	2	12	525	0
Underutilized	3	1	1	0	1	59	
Vacant	21	7	1	2	11	466	
Single Family Residential (R1-5)	523	106	131	89	197	4,398	0
Redevelopment	71	8	60	0	3	69	
Underutilized	225	46	54	39	86	1,864	
Vacant	228	52	18	50	108	2,465	
Single Family Residential (R1-6)	1,706	225	636	260	585	13,083	0
Redevelopment	459	46	393	0	21	451	
Underutilized	795	114	204	150	326	7,113	
Vacant	452	65	39	110	239	5,519	
Single Family Residential (R1-7.5)	1,253	261	352	198	441	9,848	0
Redevelopment	230	30	190	0	10	218	
Underutilized	552	137	124	91	199	4,336	

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Capacity and Yield by Zoning

Unincorporated UGA

Residential

	Gross	Constrained	Market	nfrastructure	uildable	Housing Units	Jobs
	Acres of Land						
Vancouver (Unincorporated UGA)	**6,278**	**1,227**	**1,880**	**857**	**2,314**	**51,313**	**0**
Vacant	472	95	38	107	232	5,294	
Single Family Residential (R1-10)	1,016	242	337	135	303	3,171	0
Redevelopment	259	51	198	0	10	106	
Underutilized	552	140	124	91	198	2,015	
Vacant	205	51	15	44	95	1,049	
Single Family Residential (R1-20)	400	123	104	53	119	665	0
Redevelopment	72	6	63	0	3	18	
Underutilized	143	40	31	23	49	266	
Vacant	184	77	11	30	66	381	
Washougal (Unincorporated UGA)	**761**	**163**	**153**	**140**	**305**	**2,313**	**0**
Single-family Residential (R1-5)	88	16	21	16	35	601	0
Redevelopment	1	0	0	0	0	0	
Underutilized	77	11	20	15	32	601	
Vacant	10	4	1	2	3	0	
Single-family Residential (R1-7.5)	98	20	24	17	36	437	0
Redevelopment	3	0	2	0	0	1	
Underutilized	91	19	22	16	35	418	
Vacant	4	1	0	1	1	18	
Single-family Residential (R1-10)	142	21	33	28	61	433	0
Redevelopment	4	1	3	0	0	1	
Underutilized	103	11	28	20	44	355	
Vacant	36	9	3	8	16	77	
Single-family Residential (R1-15)	294	59	47	59	129	648	0
Redevelopment	1	0	1	0	0	0	
Underutilized	134	21	34	25	54	271	
Vacant	159	37	12	34	75	377	
Single Family Residential (R1-7.5)	35	10	7	6	12	53	0
Redevelopment	0	0	0	0	0	0	
Underutilized	30	9	6	5	10	44	
Vacant	4	1	0	1	2	9	
Single Family Residential (R1-10)	104	37	21	14	31	140	0
Redevelopment	7	2	4	0	0	1	
Underutilized	84	29	16	12	26	116	
Vacant	14	6	1	2	5	23	
Woodland (Unincorporated UGA)	**90**	**45**	**14**	**10**	**22**	**91**	**0**
Single Family Residential (R1-10)	90	45	14	10	22	91	0
Underutilized	90	45	14	10	22	91	
Yacolt (Unincorporated UGA)	**85**	**16**	**11**	**18**	**40**	**138**	**0**
Single-family Residential (R1-12.5)	76	15	8	17	36	126	0
Underutilized	15	3	4	3	6	20	
Vacant	61	12	5	14	30	106	

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Capacity and Yield by Zoning

Unincorporated UGA	Gross	Constrained	Market	nfrastructure	uildable	Housing Units	Jobs
	Acres of Land						
Residential							
Yacolt (Unincorporated UGA)	**85**	**16**	**11**	**18**	**40**	**138**	**0**
Single Family Residential (R1-20)	10	2	2	2	4	13	0
Underutilized	8	1	2	2	3	11	
Vacant	2	1	0	0	1	2	
Residential Subtotal	9,128	1,936	2,496	1,336	3,361	59,723	208
Commercial							
Battle Ground (Unincorporated UGA)	**72**	**8**	**0**	**16**	**48**	**0**	**965**
Regional Center (RC)	63	7	0	14	42	0	838
Underutilized	56	7	0	12	37	0	745
Vacant	7	1	0	2	5	0	93
Neighborhood Commercial (NC)	9	1	0	2	6	0	128
Underutilized	9	1	0	2	6	0	128
Camas (Unincorporated UGA)	**171**	**10**	**0**	**40**	**120**	**33**	**2,379**
Community Commercial (CC)	21	1	0	5	15	0	304
Underutilized	21	1	0	5	15	0	304
North Shore Commercial (C-NS)	12	0	0	3	9	0	178
Underutilized	12	0	0	3	9	0	178
North Shore Mixed Use (MX-NS)	4	0	0	1	3	33	27
Underutilized	4	0	0	1	3	33	27
Mixed Employment (ME)	134	9	0	31	94	0	1,870
Underutilized	134	9	0	31	94	0	1,870
La Center (Unincorporated UGA)	**57**	**8**	**0**	**12**	**37**	**0**	**734**
Downtown Commercial (C-1)	57	8	0	12	37	0	734
Underutilized	57	8	0	12	37	0	734
Ridgefield (Unincorporated UGA)	**63**	**7**	**0**	**14**	**42**	**595**	**375**
Commercial Neighborhood Business (CNB)	4	0	0	1	2	0	0
Underutilized	4	0	0	1	2	0	
Commercial Neighborhood Business - MU (CNB-MU)	53	6	0	12	35	595	284
Underutilized	53	6	0	12	35	595	284
Neighborhood Commercial (NC)	7	1	0	2	5	0	91
Underutilized	7	1	0	2	5	0	91
Vancouver (Unincorporated UGA)	**1,008**	**70**	**290**	**133**	**515**	**6,696**	**7,829**
Community Commercial (CC)	162	8	0	38	115	0	2,305
Underutilized	138	7	0	33	98	0	1,958
Vacant	24	1	0	6	17	0	347

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Capacity and Yield by Zoning

Unincorporated UGA	Gross	Constrained	Market	nfrastructure	uildable	Housing Units	Jobs
	Acres of Land						
Commercial							
Vancouver (Unincorporated UGA)	**1,008**	**70**	**290**	**133**	**515**	**6,696**	**7,829**
General Commercial (GC)	243	22	0	55	166	0	3,324
Underutilized	226	20	0	52	155	0	3,099
Vacant	17	2	0	4	11	0	225
Neighborhood Commercial (NC)	17	1	0	4	12	0	238
Underutilized	17	1	0	4	12	0	238
Klineline, 99 Commons, and Totem TC (HWY99/K9T)	150	12	92	0	46	2,322	697
Redevelopment	104	7	92	0	5	241	72
Underutilized	44	5	0	0	40	1,991	597
Vacant	2	0	0	0	2	90	27
Parks Common, and Minnehaha GV (HWY99/PM)	35	2	22	0	11	285	171
Redevelopment	25	2	22	0	1	28	17
Underutilized	11	1	0	0	10	256	154
Tenny Creek, and Totem TC (HWY99/TNT)	11	0	6	0	5	179	72
Redevelopment	6	0	6	0	0	11	5
Underutilized	2	0	0	0	2	71	28
Vacant	3	0	0	0	3	97	39
Transitional Area (HWY99/T)	240	14	171	0	54	1,353	812
Redevelopment	191	11	171	0	9	225	135
Underutilized	47	3	0	0	43	1,084	650
Vacant	2	0	0	0	2	44	26
Mixed Use (MX)	150	10	0	35	105	2,557	210
Underutilized	114	6	0	27	81	1,960	161
Vacant	37	4	0	8	25	596	49
Washougal (Unincorporated UGA)	**43**	**2**	**0**	**10**	**31**	**125**	**349**
Community Commercial (CC)	12	0	0	3	8	125	83
Underutilized	12	0	0	3	8	125	83
Community Commercial - Schools (CC-S)	31	1	0	8	23	0	266
Underutilized	31	1	0	8	23	0	266
Yacolt (Unincorporated UGA)	**0**	**0**	**0**	**0**	**0**	**0**	**0**
General Commercial (GC)	0	0	0	0	0	0	0
Underutilized	0	0	0	0	0	0	0
Commercial Subtotal	1,414	104	290	226	794	7,448	12,631
Industrial							
Battle Ground (Unincorporated UGA)	**249**	**67**	**0**	**46**	**137**	**0**	**1,231**
Westside Employment (WE)	249	67	0	46	137	0	1,231
Underutilized	249	67	0	46	137	0	1,231

VBLM 2023
(LandUseAlternative2)

Capacity and Yield by Zoning

Unincorporated UGA	Gross	Constrained	Market	nfrastructure	uildable	Housing Units	Jobs
	Acres of Land						
Industrial							
La Center (Unincorporated UGA)	**48**	**20**	**0**	**7**	**21**	**0**	**189**
Light Industrial (IL)	48	20	0	7	21	0	189
Underutilized	48	20	0	7	21	0	189
Ridgefield (Unincorporated UGA)	**270**	**71**	**0**	**50**	**149**	**1,812**	**995**
Employment – Mixed Use, 3-way Split (E-MU-3)	196	52	0	36	108	1,812	626
Underutilized	196	52	0	36	108	1,812	626
Business Park (BP)	74	19	0	14	41	0	369
Underutilized	70	18	0	13	39	0	353
Vacant	4	2	0	1	2	0	16
Light Industrial (IL)	0	0	0	0	0	0	0
Underutilized	0	0	0	0	0	0	0
Vancouver (Unincorporated UGA)	**1,645**	**461**	**0**	**296**	**888**	**0**	**7,994**
Business Park (BP)	794	240	0	139	416	0	3,740
Underutilized	731	229	0	125	376	0	3,385
Vacant	63	11	0	13	39	0	355
Heavy Industrial (IH)	0	0	0	0	0	0	2
Underutilized	0	0	0	0	0	0	2
Light Industrial (IL)	851	221	0	157	472	0	4,252
Underutilized	810	215	0	149	446	0	4,014
Vacant	41	6	0	9	27	0	238
Washougal (Unincorporated UGA)	**10**	**0**	**0**	**0**	**18**	**0**	**160**
Heavy Industrial (IH)	10	0	0	0	18	0	160
Underutilized	10	0	0	0	18	0	160
Yacolt (Unincorporated UGA)	**23**	**2**	**0**	**5**	**16**	**0**	**145**
Light Industrial (IL)	23	2	0	5	16	0	145
Underutilized	23	2	0	5	16	0	145
Industrial Subtotal	2,246	621	0	404	1,229	1,812	10,715
Total	12,789	2,661	2,786	1,965	**5,384**	**68,984**	**23,554**

APPENDIX N

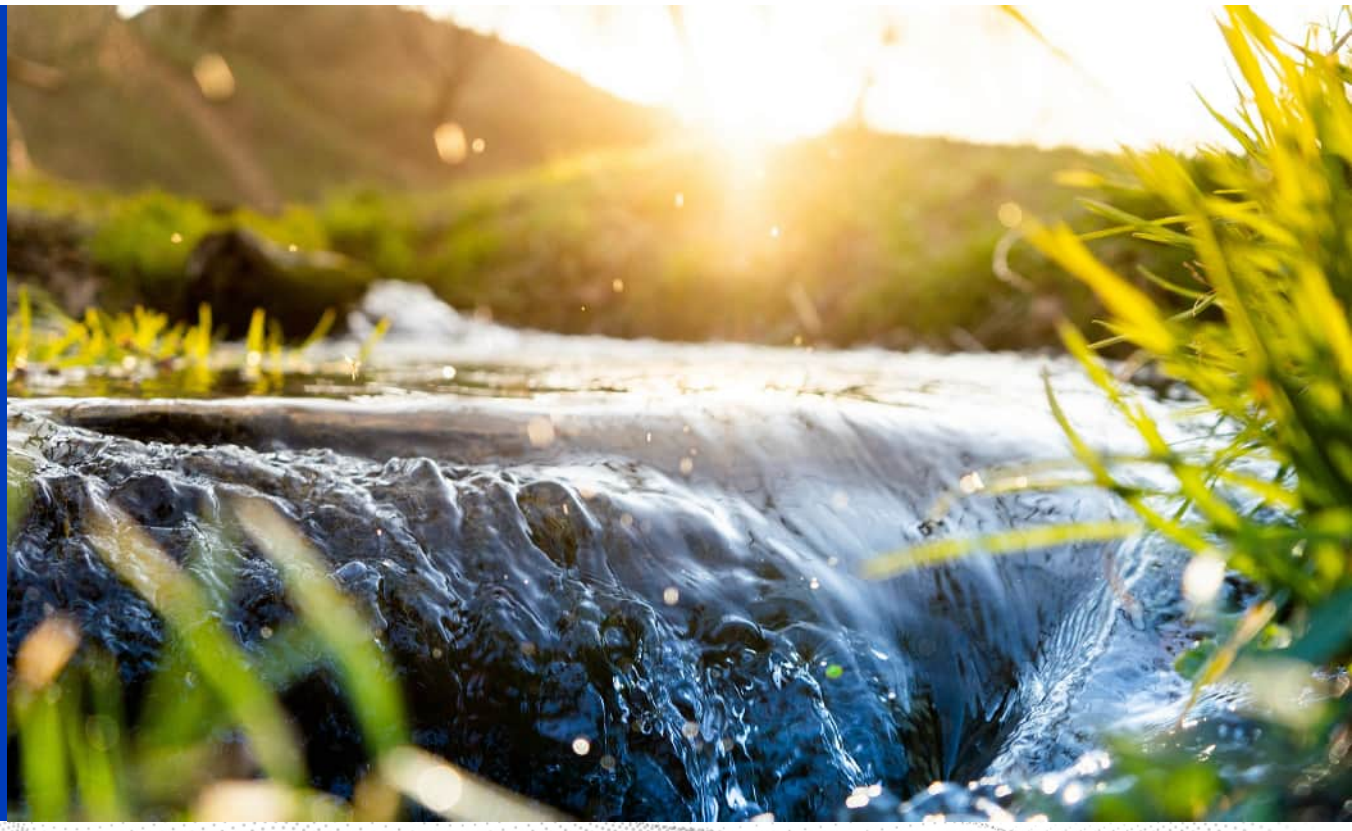
WATER USE EFFICIENCY MEETING MINUTES AND AGENDA

~ To be included in a future submittal. ~

APPENDIX O

WATER LOSS CONTROL ACTION PLAN

Water System Plan Update



Water Loss Control Action Plan

September 2026 / DRAFT

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SECTION 1 INTRODUCTION

From 2022 to 2024, the average distribution system leakage (DSL) was approximately 11.2 percent for the City of Camas (City), triggering the requirement of a completion of a Water Loss Control Action Plan (WLCAP). In successive years, the DSL has decreased, and the standard of 10 percent or less is believed to be achievable within the next 10 years. This plan addresses how the City will mitigate DSL, sets a goal of when it will meet the regulation, and how it intends to fund necessary projects to support controlling water loss.

SECTION 2 WATER LOSS CONTROL METHODS

As mentioned above, the City is slightly over the 10 percent standard based on their Annual Water Use Efficiency Report data. Note that the 2025 DSL brings the three-year rolling average DSL under the 10 percent threshold; however, the data collected for 2025 seems unreliable. In 2025 the City underwent a billing system software change. Consumption data for 2025 is from two different sources which is believed to be the reason why consumption may be over-reported. Therefore, the City elected to complete a WLCAP to show their commitment to ensuring that DSL is consistently 10 percent or less.

To control water loss, the City intends to continue implementing leak detection and mitigation by alerting and visiting customers where leaks are detected as well as leveraging the advanced metering infrastructure (AMI) meters that have been installed for 100 percent of the City's customers. AMI meters collect and transmit data in real time to the finance department at the City, which will aid in detecting leaks quickly. Furthermore, these meters will be repaired and/or replaced per manufacturer recommendations as needed. Leakage has been decreasing in the distribution system already based on the Annual Water Use Efficiency Reports as outlined in Table 1.

Table 1 The City's Yearly DSL

Year	DSL (%)	3-Year Rolling Average DSL (%)
2021	14.7	14.2
2022	14.2	14.5
2023	10.3	13.1
2024	9.2	11.2
2025	0.7	6.7

Additionally, a pipeline replacement program will be included in the City's Capital Improvement Program (CIP) to replace aging cast iron and steel pipe installed before 1960, the majority of which were installed prior to 1940. This piping accounts for 19 percent of the system. By replacing the aging infrastructure, leakage should decrease further, improving the City's DSL.

With these measures and projects implemented, the City is committed to meeting the DSL standard on a consistent basis by 2036.

SECTION 3 DATA ACCURACY AND COLLECTION EVALUATION

As mentioned above, the AMI meters should improve the data accuracy and collection for the distribution system since data is collected in real time and transmitted to the finance department at the City. This reduces data errors caused by human error, such as manually inputting or collecting data. Furthermore, the City switched to monthly billing instead of bi-monthly billing, making it more manageable to verify data accuracy.

Data accuracy could be further improved simply by installing new meters when they start to fail since meters are designed to read low when this occurs. This could potentially lead to under reporting of consumption. The City will repair and/or replace meters in a timely manner to mitigate this implication.

It is believed that the low DSL value in 2025 was primarily due to a switch in billing systems. This could have led to errors in accounting of consumption and possibly double counting. The 92 percent reduction in DSL from 2024 to 2025 does not seem plausible. Therefore, the City considered the 2024 three-year rolling average instead of the 2025 three-year rolling average to err on the side of caution. Moving forward, it is expected that the data accuracy should be stable since continuity will be established using the new billing system.

SECTION 4 FUNDING FOR WATER LOSS CONTROL PROGRAM

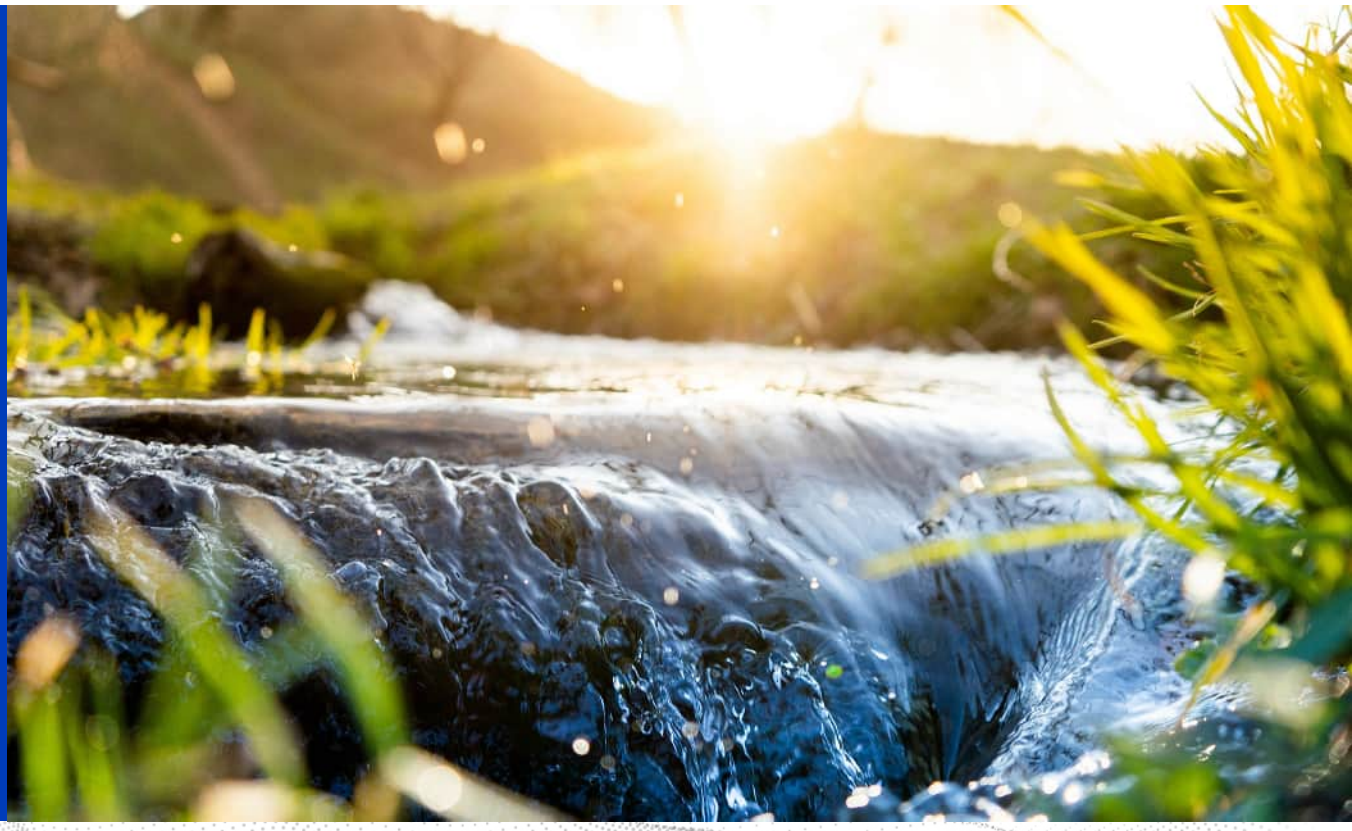
The City realizes that funding is critical to apply successful measures and programs. Currently, it is not anticipated that alerting customers about leakage will need additional funding as this is a current practice done by the City. Also, the meters have been replaced with AMI meters recently as well, so this measure is also not expected to be a significant additional cost to the City in the near future.

The costliest method for controlling water loss is the pipe replacement program. By including this in the CIP, as mentioned above, the City is preparing a funding strategy for this program. Possible options that can be considered are modifying customer rates and applying for funding to replace the aging infrastructure. The City will assess which is the best option once the cost of the program is determined.

APPENDIX P

WATER USE EFFICIENCY PROGRAM

Water System Plan Update



Water Use Efficiency Program

September 2026 / DRAFT

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Abbreviations

2026 WSP	2026 Water System Plan Update
ADD	average day demand
AFY	acre-feet per year
cfs	cubic feet per second
City	City of Camas
DOH	Department of Health
DSL	distribution system leakage
Ecology	Department of Ecology
ERU	equivalent residential unit
gpm	gallons per minute
LWWF	Lower Washougal Wellfield
mgd	million gallons per day
MMD	maximum day demand
O&M	operations and maintenance
Qa	annual water right
Qi	instantaneous water right
SFR	single-family residential
WAC	Washington Administrative Code
WLCAP	Water Loss Control Action Plan
WUE	Water Use Efficiency
WWTP	wastewater treatment plant

SECTION 1 INTRODUCTION

The City of Camas (City) promotes efficient water use to conserve and protect their existing water supplies for present and future residents. The City promotes water conservation and efficient use of water through a variety of activities that encompass their Water Use Efficiency (WUE) Program. The WUE Program encourages water conservation and utilizes continued improvements to reduce leakages and water loss in the City's system. This report details both the City's existing WUE programs.

SECTION 2 WUE PROGRAM BACKGROUND

In 2003, the Washington State Legislature passed the Engrossed Second Substitute House Bill 1338, known as the Municipal Water Law or the WUE rule, to address the increasing demand on Washington's water resources. This law established that all municipal water suppliers must use water more efficiently in exchange for water right certainty and flexibility to help them meet future demand.

The WUE rule, which became effective on January 22, 2007, emphasizes the importance of measuring water use and evaluating the effectiveness of the water supplier's WUE program. The intent is to minimize water withdrawals and water use by implementing water saving activities and adopting policies, resolutions, ordinances, or bylaws. This report follows the guidelines set forth in the *Water Use Efficiency Guide Book*, Fourth Edition, (January 2025) as well as the *Water System Planning Handbook* (April 1997).

SECTION 3 WATER SUPPLY CHARACTERISTICS

3.1 Source

The City obtains its water from two surface water sources and 10 wells. Eight of the groundwater sources (Wells 5, 6, 7, 8, 10, 11, 12, 14) are located in the City's Lower Washougal Wellfield (LWWF), in the lower Washougal floodplain near downtown Camas. Wells 7, 8, 10, 11 and 12 are often referred to as the City's "Oak Park" wellfield. Well 13 is north and west of the Oak Park wells and is effectively part of the same wellfield pumping center but is not typically referenced as being part of the LWWF. The remaining well (Well 9) is located in the uplands about two miles north of the Columbia River and 1.5 miles west of Lacamas Lake. Groundwater sources receive disinfection and other water quality treatment before entering the distribution system.

The City's Boulder and Jones Creek surface water diversions are located in the headwaters of the Washougal River drainage. These sources are treated at the City's slow sand filtration plant.

3.2 Water Rights Summary

The City's water system (Department of Health [DOH] ID 108002) currently has 2 water right claims which have been modified by Certificates of Change, 11 certificated water rights, and 5 water right permits. A summary of the City's water rights is provided in Table 1. Note, the City requested in March 2026 that the

Department of Ecology (Ecology) extend the development schedule on each of the City's five water right permits to 2031. The City's current plan for developing the wells is presented in Section 8.4 of the 2026 Water System Plan Update (2026 WSP).

The City has limitations on its water rights that complicate the calculation of total instantaneous water right (Qi) and annual water right (Qa) as described below:

- Jones and Boulder Creek surface water sources may only be operated seasonally from October 31 through May 15, as directed by Permit G2-30144. The Qa for periods outside of the operating time window are used to maintain instream flow in the Creeks (not for City use).
- Historically, water right permits and certificates with priority dates before 1979 were limited by Ecology to a "total combined maximum Qa of 5,750 acre-feet per year (AFY)". However, modifications to the City's water right claims resulted in the recognition of an additional 550 AFY which increased the total Qa to 6,300 AFY with priority dates before 1979.
- Withdrawals from Well 9 are considered non-additive. The certificate does not increase the cumulative annual total of all rights but does increase the Qi.
- Certificate CG2-20938 (an irrigation water right allocating 330 gallons per minute (gpm) and 106 AFY for use between May 1 to October 1) was acquired by the City in 2015 and transferred into permanent trust as instream baseflow support for Lacamas Creek. The City retains the option to request to apply the consumptive use portion of the right (90.3 AFY) as potential mitigation for future water use within the Lacamas Creek drainage downstream of the water right location.

The City's resulting water rights equate to a Qi of 14,045 gpm (20.2 million gallons per day [mgd]), an additive Qa of 11,090 AFY (9.9 mgd), and a non-additive Qa of 210 AFY (0.3 mgd) as described by Permit G2-30756 (see Page 2) and Certificate G2-27384 (Well 9).

Table 1 Water Right Summary

Source	ID Number	Priority Date	Instantaneous Qi (gpm)	Annual Qa (AFY)
Claims				
Well 1	Claim 121022 transferred to Well 10(6)			
Well 2	Certificate C-85-A transferred to Well 12(6)			
Well 3	Claim 121023 transferred to Well 11(6)			
Well 4	Certificate G2-GWC4079 transferred to Well 13(6)			
Certificates				
Boulder Creek(7)	C-712	08/22/1923	1,120 (2.5 cfs)	977(2) (A)(9)
	CS2-SWC 712			843 A (Instream Flow)
Jones Creek(7)	C-711	09/05/1930	450 (1.0 cfs)	393(3) (A)(9)
	CS2-SWC 711			337 A (Instream Flow)
Well 5	G 6636-A G2-*09325C	03/22/1968	600	920(4) (A)(9)
Well 6	G 6635-A G2-*09325C	03/22/1968	1,500	2,400(4) (A)(9)
Well 7	G2-00501	03/22/1971	1,000	530(5) (A)(9)

Source	ID Number	Priority Date	Instantaneous Qi (gpm)	Annual Qa (AFY)
Well 8	G2-24400	02/04/1977	900	530(5) (A)(9)
Well 9	G2-27384	08/13/1986	650	210 (N)(10)
Well 10	G2-CV1-2P159	06/11/1974	900	320 (A)(9)
Well 11	G2-CV1-2P160	06/11/1974	1,200	230(5) (A)(9)
Well 12	C-85-A G2-*0004C	07/21/1945	900	118 (A)(9)
Well 13	G2-GWC4079 G2-*05130C	02/12/1959	1,325	1,208(5) (A)(9)
Permits				
Lower Washougal Wellfield	G2-30144	08/21/1986(11)	500 (At Well 8)	2,150 (A)(9) (All 8 wells)
Well 14 (Anderson Site)	G2-30145	08/21/1986(11)	1,000	880 (A)(9)
Parkers Landing	G2-30146	08/21/1986(11)	1,000	880 (A)(9)
Treatment Plant Well	G2-30147	08/21/1986(11)	1,000	880 (A)(9)
Umbrella Wellfield	G2-30756	01/08/2020	6,700	11,090(12) (All 8 wells)
Total(13)			**14,045**	**11,090 (A)(9)** **210 (N)**
Pending Applications				
Steigerwald Regional Supply(8)	G2-30528		17,213	13,555

Notes:
(1) Claims are considered valid until proven otherwise through an adjudication process.
(2) This source was formerly known as the Little Washougal River. The certificate refers to an Qi and does not specify an annual withdrawal. An Ecology Report of Examination for Well 7 (G2-00501) summarizes existing water rights, including 1,820 AFY for Boulder Creek (C-712), based on continuous withdrawal at the instantaneous right specified.
(3) The certificate refers to an Qi and does not specify an annual withdrawal. An Ecology Report of Examination for Well 7 (G2-00501) summarizes existing water rights, including 730 AFY for Jones Creek (C-711), based on continuous withdrawal at the Qi specified.
(4) The Permit and Report of Examination preceding this certificate limited water rights to “the total quantity withdrawn or diverted from all sources is not to exceed 3,300 AFY.
(5) The Permit and Report of Examination preceding this certificate limited water rights to “the total quantity withdrawn or diverted from all sources is not to exceed 5,750 AFY.
(6) Well 10, 11, and 12 were installed to replace Well 1, 2 and 3, which have failed due to collapsed well casings; see Pacific Groundwater Group report dated June 9, 2003. Well 13 replaced Well 4 after Well 4 was determined to be groundwater under the influence of surface water; see Pacific Groundwater Group report dated August 14, 2006. G2-CV1-2P160, which is now associated with Well 10, allowed for seasonal between May 1st and August 31st. Year-round operation of Well 10 is authorized under Permit G2-30144 for the LWWF.
(7) See Ecology agreement that limits withdrawal from the surface water sources from May 15 through October 31.
(8) Joint application with City of Camas and City of Washougal.
(9) (A) = Additive water right, additive to other rights.
(10) (N) = Non-additive water right, not included when summing a cumulative total of all rights.
(11) The original Ecology Report of Examination for these permits indicated a priority date of 08/21/2003. However, Ecology assigned a priority date of 08/13/1986 via amended permits to match with the date of the Clark County Reservation identified by watershed planning for WRIAs 27/28.
(12) Installation of one future well in the LWWF is included under this permit.
(13) Due to permit and certificate restrictions, the total Qi and Qa do not equal the sum of quantities for each column.
cfs - cubic feet per second.

3.3 Water Rights Analysis

The City's water rights were compared to existing, 5-year (2031), 10-year (2036), and 20-year (2046) demand projections to establish water right surplus or deficiency. Both Qi and Qa were considered and are summarized in Tables 2 and 3, respectively.

The City currently has surplus water rights based on the actual well pumping in 2024, which was considered to be the existing condition. Note, the reported values reflect the pumping over the entire year, where not all wells were pumped at the same time.

Table 2 Instantaneous Water Rights (Qi) Summary

Year	MDD – High Scenario(1) (gpm)	Instantaneous Water Right (Qi) (gpm)	Surplus/Deficiency (gpm)
Existing	6,765(2)	12,475(3)	5,710
2031	8,620	12,475 (3)	3,855
2036	10,490	12,475 (3)	1,985
2046	14,080	12,475 (3)	-1,605

Notes:
(1) Future values based on high MDD demand projection scenario.
(2) Based on actual 2024 maximum day production data.
(3) Instantaneous water rights of 14,045 gpm shown in Table 8.1 minus 1,570 gpm of surface water rights not available during the summer months.
MDD - maximum day demand.

Table 3 Annual Water Rights (Qa) Summary

Year	ADD - High Scenario(1) (AFY)	Annual Water Right (Qa) (AFY)	Surplus/Deficiency (AFY)
Existing	5,230(2)	11,090	5,860
2031	6,610	11,090	4,480
2036	8,070	11,090	3,020
2046	10,910	11,090	180

Notes:
(1) Future values based on high ADD demand projection scenario.
(2) Based on actual 2024 annual production data.
ADD - average day demand.

For the future water rights evaluation, the forecasted source production was based on the high demand projection scenario. The high demand scenario generally reflects the water use rates from the period of highest demands in the last eight years. Use of the highest projected demands is intended to support the City in planning for sufficient physical supplies to meet demands and provide sufficient time for phasing in new supplies, which is typically a multi-year process.

The City is expected to have sufficient Qa through the next 20 years; however, the City is expected to have a Qi deficiency of 1,605 gpm by 2046. The City plans to meet this deficiency by a combination of improving pumping yields from existing well facilities, developing all of its existing water rights, and securing water rights for additional supply sources. Additionally, the City will continue to encourage water use efficiency including the reduction of irrigation use, which is a major driver for the relatively high projected MDD.

3.4 Production and Delivery System

The City's water system has an available water production capacity of approximately 15.5 mgd and delivers potable water throughout 26 pressure zones. Water is conveyed through more than 159 miles of transmission and distribution pipelines and supported by seven storage reservoirs with a combined capacity of approximately 9.95 million gallons. Ten booster pumping stations and numerous pressure control facilities help move water between service areas, maintain system pressures, and meet varying customer demands across the system. System operations are monitored and controlled through the City's SCADA system, which provides real-time oversight of storage levels, pumping operations, flows, and other critical system functions.

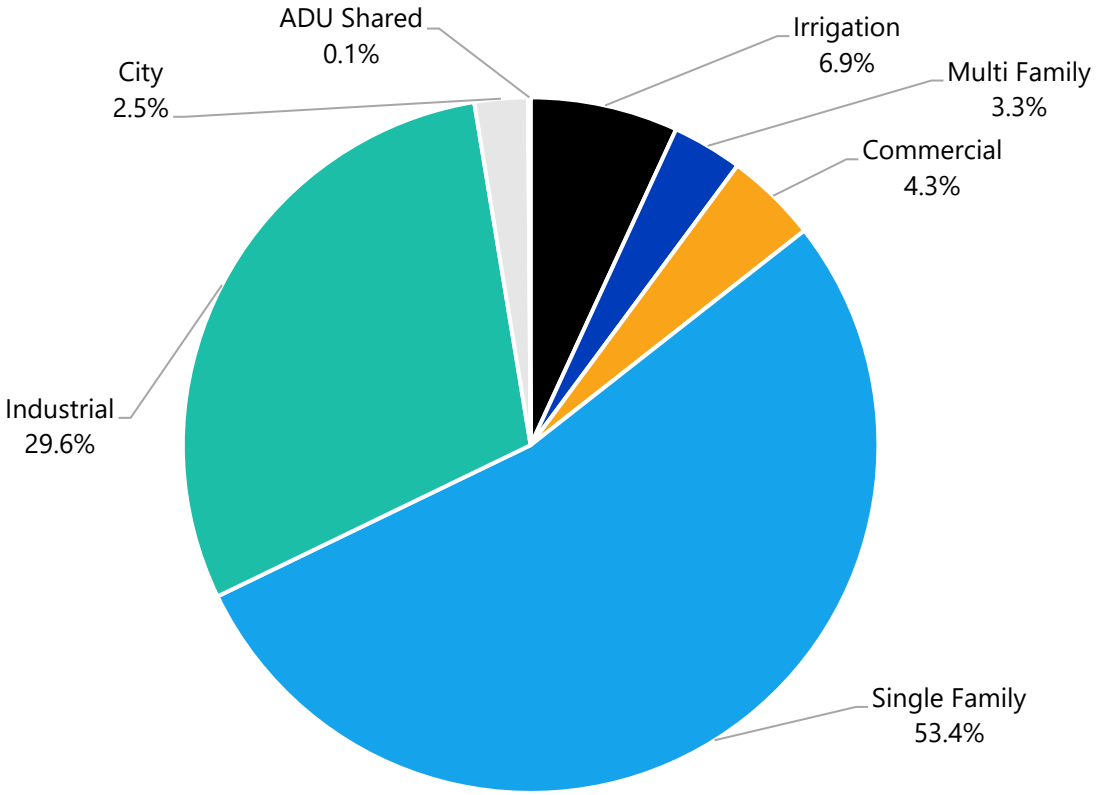


Figure 1 2017 to 2024 Average Water Demand by Customer Class

SECTION 4 2013 TO 2024 WUE PROGRAM SUMMARY

The previous program's demand-side goals were to reduce customer consumption per equivalent residential unit (ERU) by 1 percent or approximately 2 gpd per year over the next six years. Figure 2 compares the City's actual single-family residential (SFR) demand to the demand-side WUE goal to demonstrate the effectiveness of the City's WUE Program. The goal demand begins at 260 gpd/ERU, which represents the 2013 to 2015 average demand used as the planning ERU in the 2019 Water System Plan. The goal demand was then reduced by 2 gpd each year, consistent with the City's goal. As shown in Figure 2, actual SFR demand has generally remained below or near the goal demand, indicating that the

City has been successful in meeting its demand-side WUE objective. Note that the 2016 data is represented with a dashed bar. This is because 2016 data was not available; therefore, the 2016 demand is estimated as the average of 2015 and 2017 demands.

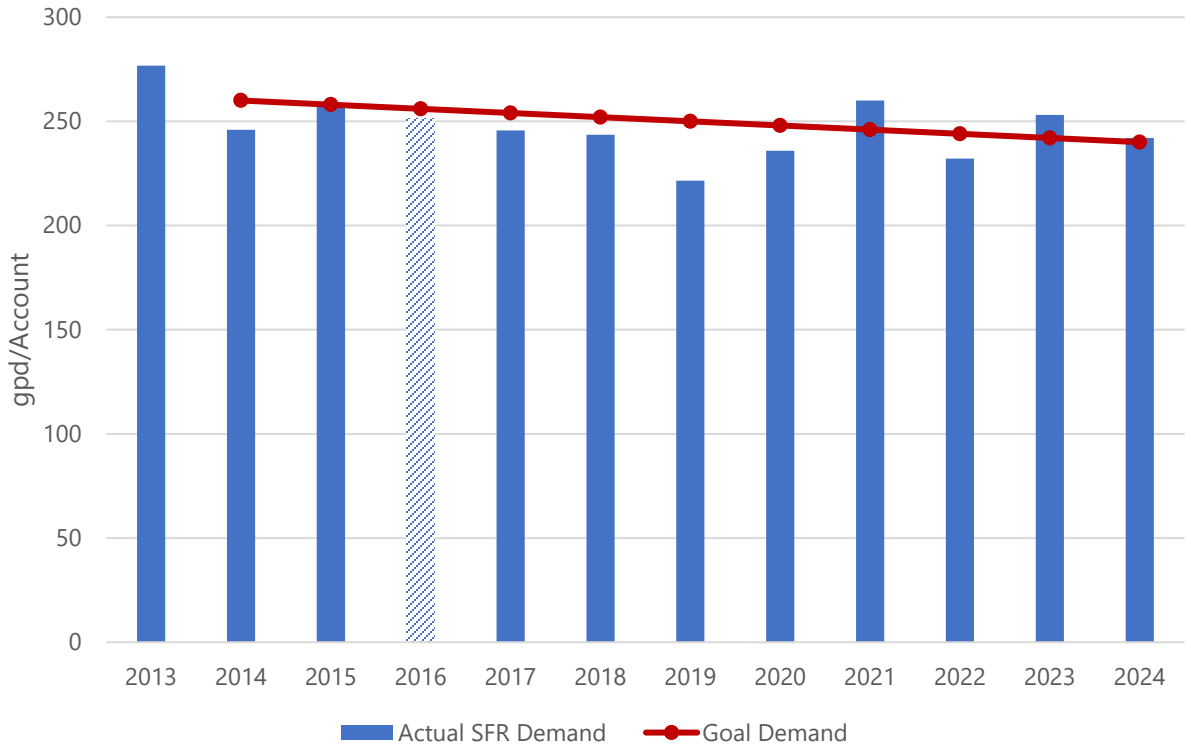


Figure 2 Actual Compared to Goal Single-Family Residential Demand

SECTION 5 DISTRIBUTION SYSTEM LEAKAGE

Distribution system leakage (DSL) is a significant element of supply-side WUE requirements. DSL above 10 percent on a three year rolling average is considered excessive and necessitates the creation of a Water Loss Control Action Plan (WLCAP). DSL is the difference between total water production and metered water use. The estimate of DSL is dependent on the accuracy of meter readings for supply and customer meters. Table 4 presents the City's reported three year rolling average DSL from 2021 through 2025. The City has averaged above their WUE program goal and DOH standard of 10 percent, but the City is making progress in mitigating DSL with it decreasing in successive years. Note that the 2025 three year rolling average is under the 10 percent threshold; however, it is possible that there may be inaccuracies in the data collected for 2025 as the billing system shifted to a new one. Therefore, the City will complete a WLCAP to address their DSL.

Table 4 Distribution System Leakage (3-year Rolling Average)

Year	3-Year Rolling Average DSL (%)
2021	14.2
2022	14.5
2023	13.1
2024	11.2
2025	6.7

The DSL in Table 4 differs from that calculated in Chapter 5 - Water Requirements of the 2026 WSP, where Chapter 5 evaluated historical billing data for consumption. The City is not able to account for the differences; however, it is believed to be related to year end meter reading. In 2025 the City transitioned its billing software. Consumption data for 2025 was compiled from two sources which may account for the low reported water consumption.

SECTION 6 2027 TO 2032 WUE PROGRAM

The City's current WUE Program was established as part of the 2026 WSP. Per the Washington Administrative Code (WAC) 246-290-830(4)(a), all water purveyors with 1,000 or more connections are required to set efficiency goals through a public process. The established goals promote WUE for internal operations and for water customers. The past WUE Program goals were established in the 2010 WSP and subsequently re-established in 2013, 2019, and 2026:

- **Demand-Side Goal:** Reduce customer consumption per ERU by 1 percent over the next six years.
- **Supply-Side Goal:** Continue to reduce distribution loss to 10 percent or less over the next five years.

6.1 Supply-Side Measures

The City implements the following supply-side measures as part of their WUE Program. A number of these measures are mandated by Washington State DOH per the WUE Guidebook. The following summarizes the City's supply-side measures:

1. Record and monitor supply source production (Mandatory).
2. Record and monitor customer demands through customer water meters (Mandatory).
3. Test and calibrate industrial and commercial meters annually (Mandatory).
4. The City will repair and/or replace residential meters per manufacturer recommendations.
5. Perform annual leak detection surveys through a private contractor. Hydrants and valves are checked as part of leak detection surveys (Mandatory).
6. Repair or replace old distribution system piping with defects as budget allows.
7. Reclaimed Water: Treated wastewater is used for washdown and process use and for landscape irrigation at the wastewater treatment plant (WWTP) (Mandatory to evaluate reclaimed water).

6.2 Demand-Side Measures

The City implements a number of demand-side measures. These measures are similar to many of the example WUE measures presented in Appendix B of the *Water Use Efficiency Guidebook*. The City provides an overview of their WUE activities on their Water Services website (http://www.ci.camas.wa.us/index.php/pwwater). The City's various public outreach activities meet the DOH requirement for educating customers about WUE. The following provides a summary of the City's demand-side measures:

1. City staff alert and visit customers where customer leaks are identified.
2. Promote installation of smart controllers for City-wide users.
3. Educate the public on conservation and water-saving devices at community events, such as Camas Days, and on the City website (http://www.ci.camas.wa.us/images/DOCS/WATER_SEWER/REPORTS/waterconservation.pdf).
4. Promote xeriscaping and Low Impact Development to reduce irrigation requirements for new developments.
5. Promote irrigation systems to incorporate drip systems or micro sprayers.
6. Promote odd/even day and late night or early morning irrigation for all customers.
7. Provide monthly billing to all customers.
8. Send water savings tips to customers in the annual water quality report.
9. Onsite irrigation at the WWTP with treated effluent.

The above supply- and demand-side WUE measures are effective in encouraging WUE for the water system.

6.3 Mandatory Measures

The WUE Program includes supply side measures that the City implements to understand and control leakage including new meters and leak detection surveys. The City's WUE Program will continue to meet the following mandatory measures in the future:

- Install production (source) meters.
- Install consumption (service) meters.
- Perform meter calibration.
- Implement a water loss control action plan to control leakage if the three year rolling average exceeds 10 percent.
- Educate customers about WUE practices.
- Evaluate rates that encourage water demand efficiency, as discussed in a subsequent section.
- Evaluate reclamation opportunities, as discussed in a subsequent section.

6.3.1 Rate Structure

The City's current rate structure bills customers on a uniform volumetric charge. In 2010, the City added a consumption-based element to sewer rates based on average winter water consumption, which was thought to encourage water efficiency. In 2023, a rate study was performed that evaluated a tiered rate structure. Ultimately, it was determined that the current rate structure would remain in place. Future rate studies will continue to reevaluate rate structures to encourage conservation.

6.3.2 Reclaimed Water

Per WAC 246-290-100 and WUE requirements, water systems with over 1,000 connections must evaluate reclaimed water opportunities. As mentioned previously, the City currently uses treated wastewater at the WWTP. In addition, the City previously evaluated reclaimed water opportunities in 2006 with costs escalated to 2025 dollars in the concurrent effort of updating the General Sewer Plan, considering a multitude of locations to use the water for irrigation; Figure 1 displays locations with irrigation connections. Overall, it was concluded that using reclaimed water as irrigation water was not economically feasible, and therefore, the reclaimed water system will not be expanded at this time.

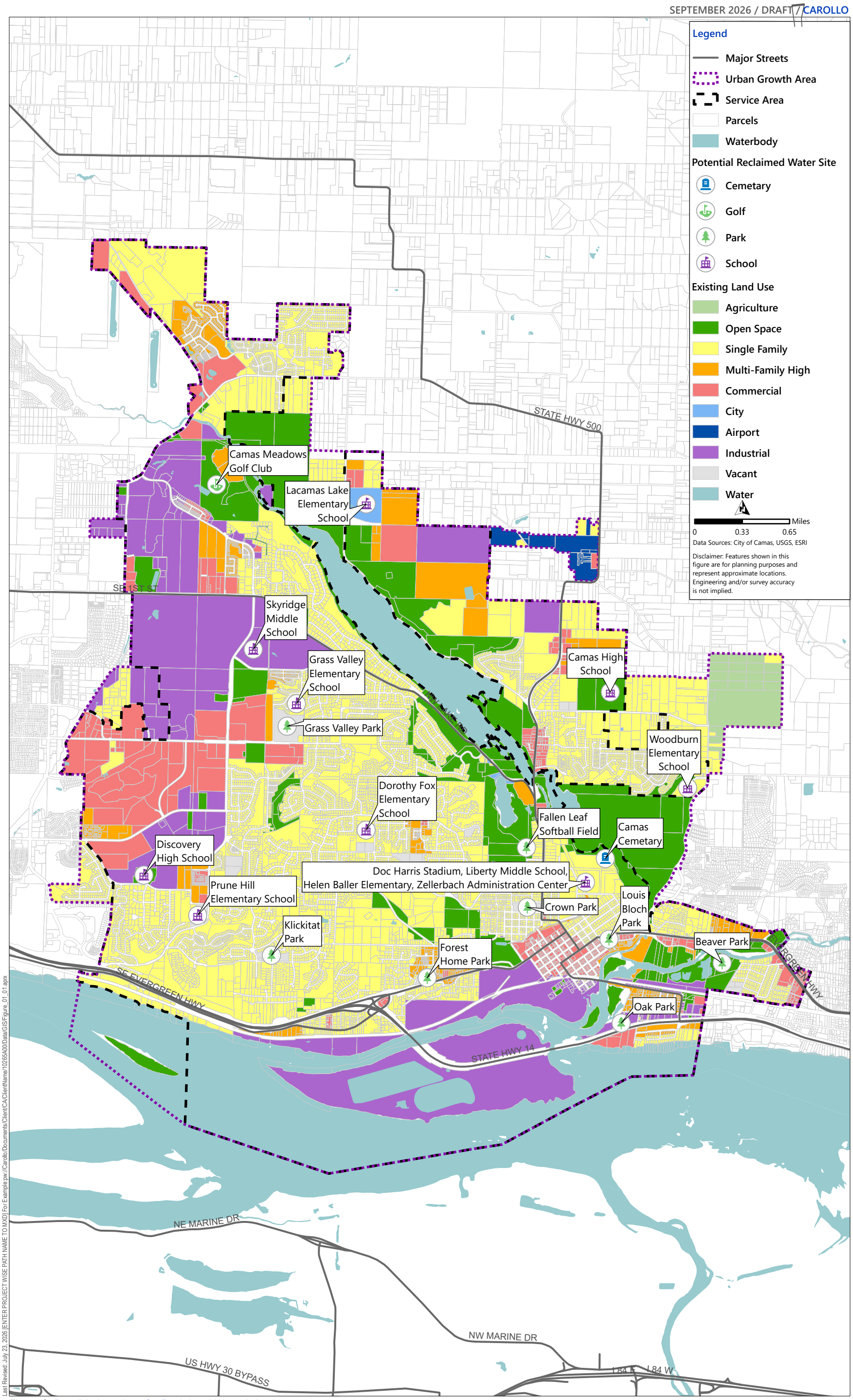


Figure 3 Possible Locations for Reclaimed Water Irrigation

6.3.3 Projected Demands with WUE Goals

The projected water demands considering the water savings from the City's WUE Program were represented with the low demand scenario presented in Chapter 5 of the 2026 WSP. Projected demands with WUE savings were compared to the medium demand projection. The low demand projection assumes a 2025 demand of 242 gpd/ERU while the medium demand projections assume a 2025 demand of 248 gpd/ERU. The low demand projection also assumes the WUE Program will help to reduce the MDD to ADD peaking factor by approximately 0.45 percent. The low and medium demand projections assume the City's DSL is 9.1 and 10 percent, respectively. Table 5 presents the projected ADD and MDD with and without the WUE Program for the 20-year planning period. The projected demands with the WUE Program are also shown in Figure 4. For ADD, WUE measures are projected to provide a reduction of 1.0 mgd), or 11.9 percent, by 2046. For MDD, WUE measures are projected to provide a reduction of 2.4 mgd, or 14.6 percent, by 2046.

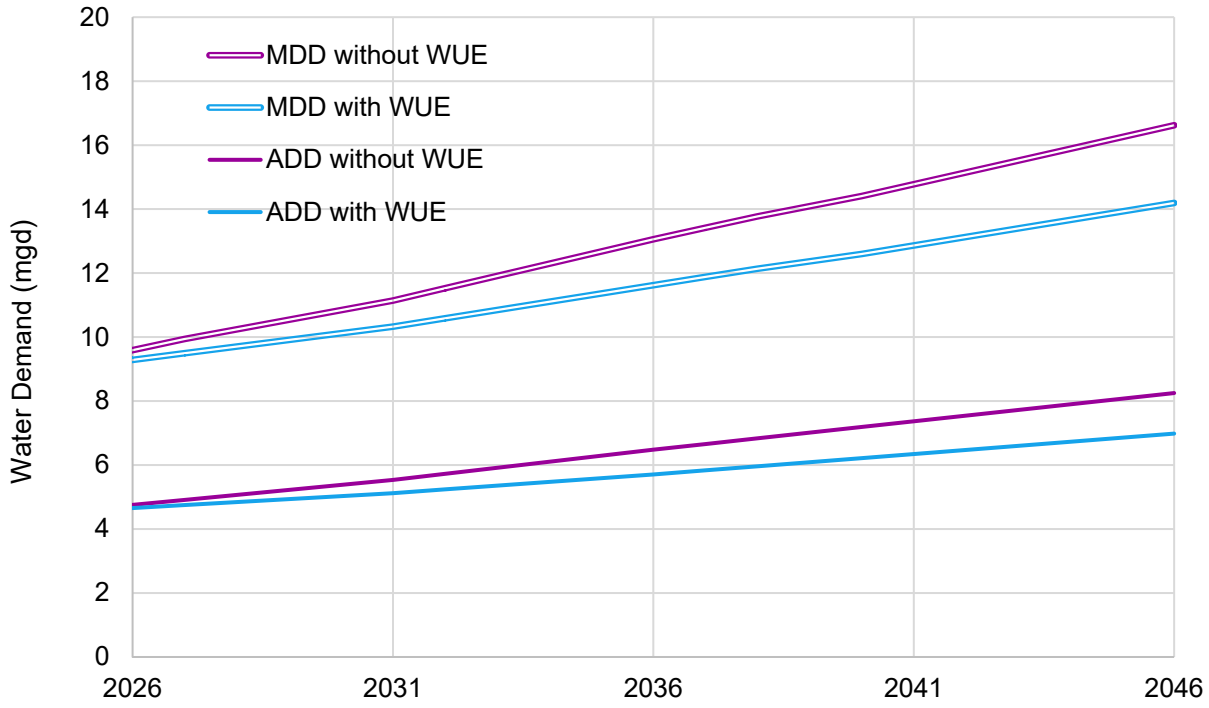


Figure 4 Projected Demands With and Without Water Use Efficiency

Table 5 WUE Demand Projections

Demand Scenario	2046 Projection with WUE (mgd)	2046 Projection without WUE (mgd)	Water Savings (mgd)	Percent Savings
ADD	7.4	8.4	1.0	11.9
MDD	14.2	16.6	2.4	14.6

6.4 WUE Program Effectiveness

The effectiveness of the existing WUE program was evaluated using system-wide water use data. Measuring the effectiveness of the City's future WUE Program against the established goals could be similarly evaluated using system-wide water use data. Estimating the water savings directly resulting from the City's WUE Program in a single year is difficult. Therefore, long-term trends should be use to more clearly show the impact of the City's WUE Program.

The first step would be to establish a baseline from historical information. The second step is to evaluate the resulting water use after promoting WUE through targeted activities and events to customers. It is recommended that water use be tracked for at least a year to identify trends. Some consideration needs to be given to variations in weather and economic conditions. Another method would be to perform the same before/after water use analysis for WUE Program participants who volunteer and provide their address. The resulting information would be valuable for the City to correlate its WUE Program efforts with direct water savings for its customers.

Advanced Metering Infrastructure (AMI) was implemented in 2025. The City plans to leverage this data in its targeted public education programs to customers in a particular area or user profile, such as heavy irrigators. Using AMI, the City can estimate overall usage, irrigation usage, and peak water use rates.

6.5 Budget

The City recognizes the importance of continuing their WUE measures and considers it a core function of the Utility. The WUE program provides cost savings through demand reduction and reduction in DSL. Continuing the WUE Program can assist the City in meeting peak demands and avoiding curtailment periods.

The City does not officially track staff time or project costs associated with WUE. The supply-side WUE measures, such as metering and leak detection, are core activities of the Utility and are funded through Utility Capital Improvement and operations and maintenance (O&M) funds. The City estimates that it dedicates approximately 0.5 full-time-equivalents of staff time to conduct demand-side measures across its Water Utility, finances department, and development services staff. It is not possible to estimate the cost of each demand-side measure; therefore, a cost-benefit comparison cannot be calculated.

Due to AMI capabilities, it is anticipated that the City will further personalize water use communications with customers without increasing staff effort. Future supply-side WUE measures will be funded, as appropriate, through the Capital Improvement and O&M funds. If AMI detects a large number of existing and new leaks, the City will evaluate the need for additional personnel in its meter maintenance group to address leaks.

APPENDIX Q

CONSUMER CONFIDENCE REPORTS 2017-2024

ANNUAL WATER QUALITY REPORT

2017 Consumer Confidence Report

CONTACT US:

Public Works
Water Department:
360-817-1563

Backflow Prevention:
360-817-1569
Email: backflow@cityofcamas.us

Water Billing
616 NE Fourth Avenue
Camas, WA 98607
360-834-2462

After Hours/Holiday
Water Emergency
360-737-0592

Camas Connect 24/7:
Stay Connected! Make service requests and follow the work flow.

Download our new mobile app, or visit online:
www.cityofcamas.us/index.php/service-request

City of Camas Website:
www.cityofcamas.us

Water is a precious and limited resource. Use it wisely.

Attention Non-English Speaking Customers

This report contains important information about your drinking water. Translate it or speak with someone who can translate it for you.

Russian
Это сообщение содержит важную информацию о вашей питьевой воде. Переведите это или говорите с кем - то, кто может перевести это для Вас.

Spanish
Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

Water Quality Results

At the City of Camas we understand how important it is to ensure we provide high quality water. The health of our consumers and their families is paramount and our goal is to provide you with a safe and dependable supply of drinking water. We work diligently to provide top quality water to a residential population of 23,080.

Our drinking water is safe and surpasses all State and Federal health standards.

We ask that all of our customers help us protect our water sources, which are the heart of our community, our way of life, and our children's future. This report provides a summary of the tests and processes performed to ensure the safety of your drinking water. For more information or questions about this report, please contact Public Works call 360-817-1563, or email publicworks@cityofcamas.us



Public Water System ID 108002

Water Conservation

The average daily water consumption in Camas for 2017 was 4.01 million gallons (mg/d) per day. During our peak usage day on July 22nd, 2017 we consumed 8.3 million gallons. Most of this increase in the summer months is due to irrigation demand. We are once again asking for your help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days if your house number ends in an odd number, and even days if it ends in an even number.

To view more water saving tips for residential use visit the following websites: www.irrigationtutorials.com/faq/save-water.htm and www.home-water-works.org/water-conservation-tips/home



Voluntary Odd/Even Watering Program

Water Use Facts

A leaky faucet can waste 100 gallons a day.

An average bath requires 37 gallons of water.

What's Ahead

The City of Camas Cross Connection Control Program is being updated. Be on the look out for increased information regarding backflow regulations and testing requirements.

Approximately 65% of the City's water meters have been replaced with advanced radio read meters. The City is continuing the replacement project and will be upgrading appro[illegible] 600 additional meters in 2017

Important Health Information

Drinking water, including bottled water, may reasonably be expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline 800-426-4791.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water before we treat it include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture and residential uses.
- Radioactive contaminants, which are naturally occurring.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. We treat our water according to the EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health. Some people may be more vulnerable to contaminants in drinking water than the general population.

Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

EPA Statement for Lead and Copper

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead

To Reduce Lead and Copper Exposure

1. When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.

2. Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.

3. Frequently clean the filter screens and aerators in faucets to remove captured particles.

4. If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.

Contaminants Inorganic	Maximum Contaminant Level Goal mg/L	Action Level (AL) mg/L	Camas Water Results g/L	Sample Year	# of Samples Exceeding AL	Violation	Typical Sources
Lead (ppb) at Consumers Tap	0	0.015	0.0026	2015	0 of 30	NO	Corrosion of household plumbing systems; erosion of natural deposits
Copper	0	1.30	0.6100	2015	0 of 30	NO	

Unregulated Contaminants Monitoring

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information, go to:

http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/ or contact the Safe Drinking Water Hotline at 1-800-426-4791, or at: http://water.epa.gov/drink/contact.cfm

2017 Water Quality Test Results

The City of Camas has its water analyzed for more than 200 different regulated and unregulated contaminants. Only the samples that have detec of contaminants are required by law to be reported to the public. The contaminants listed below are REGULATED and were in our water during 2017. All samples taken are from treated water that is delivered to the distribution system. All contaminants tested were below levels allowed by Federal and State agencies. We have provided definitions below to help you understand the terms and abbreviations that are used in the Test Results.

In some cases, certain contaminants are granted waivers from monitoring. This is due to past consecutive years of non-detectable results, or results lower that the State Reporting Level (SRL).

Important Terms and Abbreviations

Maximum Contaminant Level (MCL): The "Maximum Allowed" is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG) : The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Milligrams Per Liter (MG/L): A unit of measurement used in reporting the concentration of matter in water as determined by water analyses.

Nephelometric Turbidity Unit (NTU): Nephelometric Turbidity Unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Parts Per Million (ppm): A unit of measurement used in reporting the concentration of matter in water as determined by water analyses.

pCi/L: Picocuries per liter is a unit for measuring radioactive concentrations. The curie (Ci) unit is the activity of 1 gram of pure radium.

N/A (Not applicable): Means EPA has not established MCLGs for these substances.

Ug/L: Units of measurement in micrograms/liter. A unit of concentration for dissolved substances based on their weights.

Regulated Contaminants Unit Measurement	Violation	Range of Level Detected	Ideal Goal (MCLG)	MAX Allowed (MCL)	Description & Origin of Substance
Health Related (Primary) Standards: Inorganic					
Fluoride (MG/L)	No	0.31-1.13	1	4	Sodium fluoride added to Camas water to maintain good dental hygiene.
Nitrates (MG/L) (As Nitrogen)	No	1.30-1.60	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products.
Health Related Standards: Radiological					
Radium 228	No	.0366 -.313	0.00	5 pCi/L	Erosion of natural deposits leaching into the groundwater.
Other Substances					
Total Hardness (ppm)	No	22	N/A	N/A	Hardness units are in ppm as $CaCO^3$ (calcium carbonate equivalent units).
Turbidity (NTU)	No	0.33	N/A	N/A	Turbidity is a measure of the cloudiness of water.
Disinfection By-Products and Residuals within the Distribution System					
Haloacetic Acids (UG/L)	No	6.9	48	60	By-product of drinking water disinfection.
Total Trihalomethanes (UG/L) *	No	4.50-10.00	60	80	Chlorination by-product caused by the reaction of chlorine with organic matter.

New Water System Supply

As the City of Camas continues to grow, our water system serves a greater population each year. The City is currently seeking new water system supply to meet the needs of our growing population. You may hear about a new groundwater well called "Well 17", which the City is in the active planning stages. This includes finding a suitable location, testing for water availability and quality and seeking new water rights from the Department of Ecology. This process will take at least two years to complete but the City is committed to delivering clean and reliable drinking water to our citizens and meeting growing dema

Our Water System

The City of Camas has multiple water sources that include surface and ground water. The surface water sources, Boulder and Jones Creeks, are located on the south side of Larch Mountain, northeast of Camas. Surface water was not used in 2017. The ground water sources include nine wells near the Washougal river and one well in Grass Valley. All water sources are treated with chlorine for disinfection, fluoride for good dental health and sodium hydroxide to reduce the corrosion of copper piping to meet State and EPA standards. Water pressure and fire flows are maintained throughout the service area with seven distribution reservoirs, nine pump stations, and over 160 miles of pipeline.

Water Leaks

Locate your master water supply valve and label it. The master supply valve can be turned off in case of a major leak or broken pipe.

The majority of leaks in residential plumbing systems are found at the toilet tank (fill and flapper valves).

Other common areas for leaks include:

- Lawn irrigation valves and lines
- Hose in yard turned on or leaking
- Ornamental fountains, fish ponds
- Relief valve or fittings on water heater
- Leaking pipes or fittings in the house
- Line between the meter and the house
- Dripping faucets in bathrooms or sinks
- Outside faucet open or dripping

The City is actively working to reduce system leaks. If you suspect a leak in your neighborhood please call 360-817-1563.



Check out this helpful website at www.epa.gov/watersense/fixaleak

City of Camas Numbers
Residential population served: 23,080
The Camas water system contains:
Seven reservoirs
Nine pump stations
8,649 water meters
Ten wells
More than 500 fire hydrants

Five Simple Water Conservation Tips

1. Fix leaks inside and outside, including old leaky faucets, toilets, hoses, and sprinkler systems.
2. Choose water saving fixtures and appliances and you will use 30% less water.
3. Sweep porches, driveways and sidewalks rather than hosing, to not only conserve water, but to avoid runoff.
4. Water late at night or early in the morning (10:00 pm to 6:00 am).
5. Take a short shower instead of a bath.

An inch of water per week is enough to keep lawns green.

For more water saving ideas see our newsletters, news releases, and/or printed material available at City Hall and the Operations Center, or visit our website at : www.cityofcamas.us/pwwater





It's Yearly Backflow Testing Time!

Make sure to schedule your yearly backflow inspection. If you are a property owner and have an in-ground sprinkler system you are required by State and local laws to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a certified backflow tester. If you have more questions call our Backflow Cross Connection Hotline at 360-817-1569, or email us at backflow@cityofcamas.us. For more information and a current list of certified backflow testers visit www.cityofcamas.us/index.php/pwwater#backflowirrigation

Water Quality Monitoring

The City of Camas routinely monitors for constituents in your drinking water according to Federal and State laws. Field and laboratory analyses include tests for bacteria, as well as chemical and physical indicators. Reports are submitted monthly to the Department of Health to report that your water meets all drinking water standards. Should there ever be a public health concern, you would be notified immediately.

Please report possible water pollution (illicit discharge) to the City of Camas 360-817-1563, or the Department of Ecology SW Regional Office 360-407-6300

2018

CONSUMER CONFIDENCE REPORT

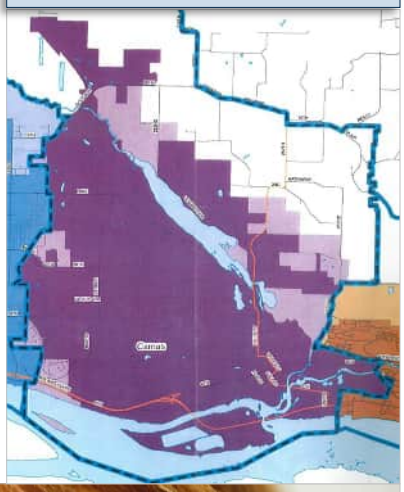
City of Camas Annual Water Quality Report

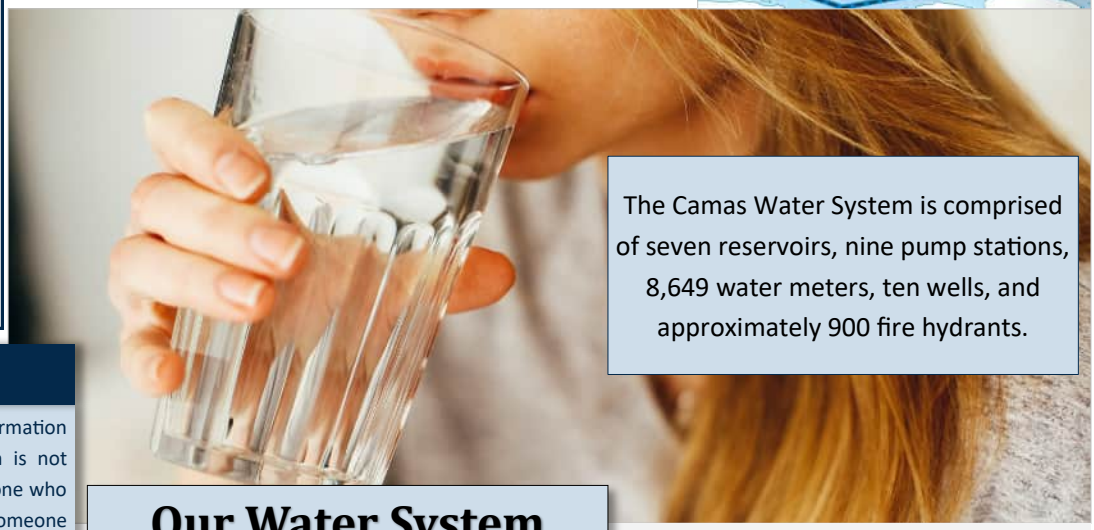
Public Water System ID: 108002

The City of Camas is pleased to present the annual Water Quality Report, which provides the public with water testing results. The health of our consumers and their families is paramount and our goal is to provide the community with a safe and dependable supply of drinking water.

At the City of Camas we understand how important it is to ensure we provide high quality water. We work diligently to provide top quality water to a growing residential population of 23,770.

More information about Camas drinking water and what we're doing to keep your water safe can be found online at www.cityofcamas.us/pwwater





The Camas Water System is comprised of seven reservoirs, nine pump stations, 8,649 water meters, ten wells, and approximately 900 fire hydrants.

CONTACT US

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360-834-2462
www.cityofcamas.us

Public Works
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Cross-Connection Control
backflow@cityofcamas.us
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Camas Connect 24/7
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IMPORTANT!

This report contains important information about your drinking water. If English is not your first language, please have someone who can translate it for you, or speak with someone who understands it.

Este informe contiene información importante sobre su agua potable. Si el inglés no es su primer idioma, tenga a alguien que pueda traducirlo por usted o hable con alguien que lo entienda.

Ce rapport contient des informations importantes sur votre eau potable. Si l'anglais n'est pas votre langue maternelle, demandez à quelqu'un de le traduire à votre place ou de parler à quelqu'un qui le comprend.

Этот отчет содержит важную информацию о вашей питьевой воде. Если английский не является вашим родным языком, попросите кого-нибудь, кто может перевести его для вас, или поговорить с кем-то, кто понимает его.

Our Water System

The City of Camas has multiple water sources that include surface and ground water. The surface water sources (Boulder and Jones Creeks) are located on the south-side of Larch Mountain, northeast of Camas. Surface water was not used in 2018. The ground water sources include nine wells near the Washougal river and one well in Grass Valley. All water sources are treated with chlorine for disinfection, fluoride for good dental health and sodium hydroxide to reduce the corrosion of copper piping to meet State and EPA standards. Water pressure and fire flows are maintained throughout the service area with seven distribution reservoirs, nine pump stations, and over 160 miles of pipeline.

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Facebook: www.facebook.com/cityofcamas

2018 Water Quality Summary

Our drinking w
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The City of Camas routinely monitors for contaminants in your drinking water according to Federal and State laws. Field and laboratory analyses include tests for bacteria, as well as chemical and physical indicators. Reports are submitted monthly to the Department of Health to report that City water meets all drinking water standards. Contaminants that were detected are listed in the following tables.

Should there ever be a public health concern, you would be notified immediately. Please report possible water pollution (illicit discharge) to the City of Camas 360-817-1563, or the Department of Ecology-SW Regional Offices 360-407-6300.

Definitions

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as possible using the best available treatment technologies.

MCLG (Maximum Contaminant Level Goal): The maximum level of a contaminant in drinking water below which there is no known or expected health risk. MCLGs allow for a margin of safety.

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatments or other requirements that a waster system must follow.

Milligram Per Liter (mg/L): A unit of measurement used in reporting the concentration of matter in water as determined by water analyses.

NTU (Nephelometric Turbidity Unit): Turbidity is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Definitions

ug/L: Units of measurement in micrograms/liter. A unit of concentration for dissolved substances based on their weights.

ppm: (1 parts per million = 1 mh/L = 1 milligram per liter)

ppb: (1 parts per billion = 0.001 mg/L = 1 microgram per liter)

pCi/L: Picocuries per liter is a unit for measuring radioactive concentrations. The curie (Ci) unit is the activity of 1 gram of pure radium.

NA (Not Applicable): Means that the U.S. EPA has not established MCLGs for these substances.

ND (Not Detected): A compound that was analyzed and not detected at a level greater than or equal to the state reporting level.

2018 Detected Contaminants

		EPA Regulations		City of Camas Water Quality Results	
Regulated Contaminants	**Units**	**Ideal Level/Goal (MCLG)**	**Maximum Level (MCL)**	**Range of Level Detected**	**Violation**
Fluoride	mg/L	.5—2.9	4	.42—.9	No
Fluoride is added to your water in carefully controlled levels for dental health. In May 2016, the Washington State Department of Health changed the fluoridation requirement to a target of 0.7 mg/L from the previous target of 0.7-1.2 mg/L.					
Nitrates ***(as nitrogen)***	mg/L	10	10	Not Detected—1.7	No
Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products.					
Haloacetic Acid (5)	ug/L	48	60	2.9	No
Trihalomethanes	ug/L	60	80	4.5	No
Haloacetic acids (HAA5) and trihalomethanes form as by-products of the chlorination process that is used to kill or inactivate disease-causing microbes.					

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information, go to: https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule or contact the Safe Drinking Water Hotline at 1-800-426-4791 or via website https://www.epa.gov/home/epa-hotlines.

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The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity. To ensure that tap water is safe to drink, the Washington Department of Health and the United State Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in the water provided by public water systems. Contaminants that may be present in source water before we treat it include:

Mandatory EPA Statement for All Community Water Systems

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The US EPA-Center for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are from the EPA's Safe Drinking Water website.

- **Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic Contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.
- **Pesticides and Herbicides**, which may come from a variety of sources such as agriculture and residential uses.
- **Organic Chemicals**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Lead & Copper

In 2018, the City tested thirty residences for lead and copper. The highest result was 0.0026 mg/L for Lead, and 0.6100 mg/L in Copper. No households exceeded the action level. The next sampling event is scheduled for 2021.

Parameter	Major Source	Units	(MCLG) mg/L	(AL) mg/L	City Results mg/L	Violation
Lead *(at consumers tap)*	Plumbing, erosion of natural deposits.	ppb	0	0.015	.0010—.0034	No
Copper		ppm	0	1.30	.027—.55	No

To Reduce Lead and Copper Exposure

1. When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.
2. Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.
3. Frequently clean the filter screens and aerators in faucets to remove captured particles.
4. If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.

EPA STATEMENT

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from the **Safe Drinking Water Hotline 1-800-426-4791, or at www.epa.gov/safewater/lead.**

Water Conservation

In 2018, the **average daily water consumption in Camas was 4.2 million gallons**. Our **peak usage day was on August 19, 2018, when 8,335,000 gallons were consumed**. Most of this increase in the summer months, is due to irrigation demands. We are once again asking for the publics help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days for home addresses that end in an odd number, and even days if it ends in an even number.

In 2018, the City replaced approximately 470 advanced radio read water meters. We will be continuing the water meter replacement project and upgrading approximately 529 additional meters in 2019.

City Water Saving Commitments

- To reduce the customer consumption per ERU by one percent or approximately two gallons-per-day per year over the next six years. The City will continue to reduce distribution system loss at-or-below ten percent for the next five years.
- Replacing industrial, commercial, and residential service meters with the new radio read meters, which will allow the City to log usage more effectively to notify customers about continuous leaks or high consumption.
- Encourage the installation of smart controllers on irrigation systems for the school district and industrial users.
- Educate the public on water-saving devices, and distribute water conservation kits and water-saving devices to homeowners. Continue metering all sources.
- Replace water mains and service lines in problematic areas and complete Capital Projects in accordance with the new Water System Plan Update.

Community Involvement to Reduce Water Leaks

Locate your master water supply valve and label it. The master supply valve can be turned off in case of a major leak or broken pipe. The majority of leaks in residential plumbing systems are found at the toilet tank (fill and flapper valves).

CONSERVATION TIPS

Fix leaks on old leaky faucets, toilets, hoses, and sprinkler systems.

Choose water saving fixtures and appliances and you will use 30% less water.

Sweep porches, driveways & sidewalks rather than hosing, to not only conserve water, but to avoid runoff.

Water late at night or early in the morning (10:00 pm or 6:00 am).

Take a short shower instead of a bath.

Other common leaks include:

- Lawn irrigation valves and lines
- Yard hose turned on or leaking
- Ornamental fountains & fish ponds
- Water heater relief valve or fittings
- Leaking house pipes or fittings
- Leaking between the house and meter
- Inside and outside dripping faucets

The City is actively working to reduce system leaks. If you suspect a leak in your neighborhood please call City of Camas at 360-817-1563.

Cross Connection Program

What is backflow?

Backflow is the undesirable reversal of the flow of water from the intended direction of flow. When this occurs, other liquids, mixtures, gases or substances can enter the potable water piping through cross connection. Under the right hydraulic conditions, backflow can result in contamination of the water supply, which is called backsiphonage and backpressure.



How to keep our drinking water clean and safe

Locate or install a backflow device

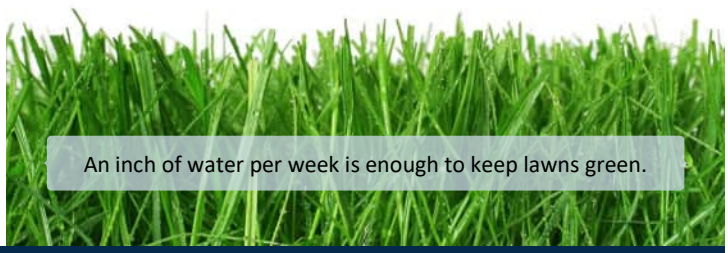
If you have an underground irrigation system, check to see if you have a backflow assembly. The backflow assembly is a brass valve usually found between your water meter and the point where your water service line enters your home, usually in a small green box similar to a meter box. If your irrigation system does not include backflow assembly or if you are installing a new underground irrigation system, City of Camas plumbing code requires you to install a *Double Check Valve Assembly (DCVA)* at a minimum.

Test your backflow assembly device annually

Once you have your backflow assembly installed or located, make sure to have it tested annually by a state-certified backflow assembly tester. If you are a property owner and have an in-ground sprinkler system you are required by state and local laws (WAC 246-290) to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a Washington State Certified Backflow Assembly Tester (BAT). If you have more questions call our Backflow Hotline at 360-817-1569, or email us at backflow@cityofcamas.us

Properly winterizing your irrigation system

During the fall, most irrigation systems will need to be winterized to prevent pipes from freezing and breaking. Many times this involves using compressed air to blow out the excess water left in the irrigation piping. Although this is the best method, backflow of compressed air and contaminants may enter the drinking water distribution system and cause damage and or health risks if not performed properly. Make sure the compressed air is connected to a properly installed blowout connection to avoid inadvertently introducing air into our water system.



An inch of water per week is enough to keep lawns green.

Stop these biggest water consumers first! Look for the Water Sense label on new plumbing fixtures; Repair leaky toilets or install high efficiency low flow toilets; Consider purchasing a water-energy-efficient washer and use water-savings habits such as washing full loads only. Repair leaky faucets, and turn off water when you shave or brush your teeth, Install low flow showerheads and take shorter showers. **For more information Visit City Hall to pick up printed material or visit our website at www.cityofcamas.us/pwwater, or check out this the EPA's website at www.epa.gov/watersense/fixaleak.**

2019

CONSUMER CONFIDENCE REPORT

City of Camas Annual Water Quality Report

Public Water System ID: 108002

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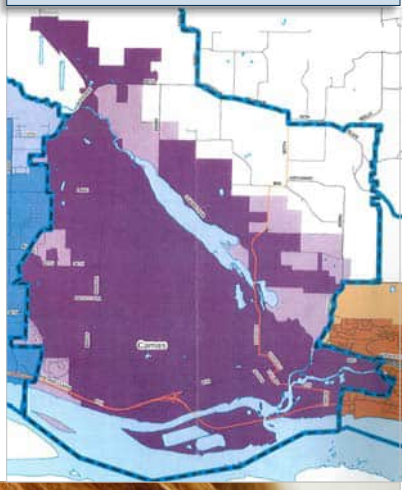



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2019 Detected Contaminants

		EPA Regulations		City of Camas Water Quality Results	
Regulated Contaminants	**Units**	**Ideal Level/Goal (MCLG)**	**Maximum Level (MCL)**	**Range of Level Detected**	**Violation**
Fluoride	mg/L	.5—.9	4	.45—.84	No
Fluoride is added to your water in carefully controlled levels for dental health. In May 2016, the Washington State Department of Health changed the fluoridation requirement to a target of 0.7 mg/L from the previous target of 0.7-1.2 mg/L.					
Nitrates ***(as nitrogen)***	mg/L	10	10	Not Detected—1.4	No
Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products.					
Haloacetic Acid (5)	ug/L	48	60	1.0-1.1	No
Trihalomethanes	ug/L	60	80	2.3-4.1	No
Haloacetic acids (HAA5) and trihalomethanes form as by-products of the chlorination process that is used to kill or inactivate disease-causing microbes.					

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information, go to: https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule or contact the Safe Drinking Water Hotline at 1-800-426-4791 or via website https://www.epa.gov/home/epa-hotlines.

2460

In general, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity. To ensure that tap water is safe to drink, the Washington Department of Health and the United State Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in the water provided by public water systems. Contaminants that may be present in source water before we treat it include:

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Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The US EPA-Center for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are from the EPA's Safe Drinking Water website.

- **Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic Contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.
- **Pesticides and Herbicides**, which may come from a variety of sources such as agriculture and residential uses.
- **Organic Chemicals**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Lead & Copper

In 2018, the City tested thirty residences for lead and copper. The highest result was 0.0026 mg/L for Lead, and 0.6100 mg/L in Copper. No households exceeded the action level. The City was not required to test for lead or copper in 2019. The next sampling event is scheduled for 2021.

Parameter	Major Source	Units	(MCLG) mg/L	(AL) mg/L	City Results mg/L	Violation
Lead *(at consumers tap)*	Plumbing, erosion of natural deposits.	ppb	0	0.015	.0010—.0034	No
Copper		ppm	0	1.30	.027—.55	No

To Reduce Lead and Copper Exposure

1. When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.
2. Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.
3. Frequently clean the filter screens and aerators in faucets to remove captured particles.
4. If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.

EPA STATEMENT

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from:

Safe Drinking Water Hotline 1-800-426-4791, or at www.epa.gov/safewater/lead.

Water Conservation

In 2019, the average daily water consumption in Camas was 3.96 million gallons. Our peak usage day was on June 15, 2019, when 7,693,000 gallons were consumed. Most of this increase in the summer months is due to irrigation demands. We are once again asking for the public's help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days for home addresses that end in an odd number, and even days if it ends in an even number.

In 2019, the City replaced approximately 596 advanced radio read water meters. We will be continuing the water meter replacement project and upgrading additional meters in 2020.

City Water Saving Commitments

- To reduce the customer consumption per home by one percent or approximately two gallons-per-day per year over the next six years. The City will maintain distribution system loss at-or-below ten percent for the next five years.
- Replacing industrial, commercial, and residential service meters with the new radio read meters, which will allow the City to log usage more effectively to notify customers about continuous leaks or high consumption.
- Encourage the installation of smart controllers on irrigation systems for the school district and industrial users.
- Educate the public on water-saving devices, and distribute water conservation kits and water-saving devices to homeowners. Continue metering all sources.
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Community Involvement to Reduce Water Leaks

Locate your master water supply valve and label it. The master supply valve can be turned off in case of a major leak or broken pipe. The majority of leaks in residential plumbing systems are found at the toilet tank (fill and flapper valves).

CONSERVATION TIPS

Fix leaks on old leaky faucets, toilets, hoses, and sprinkler systems.

Choose water saving fixtures and appliances and you will use 30% less water.

Sweep porches, driveways & sidewalks rather than hosing, to not only conserve water, but to avoid runoff.

Water late at night or early in the morning (10:00 pm or 6:00 am).

Take a short shower Instead of a bath.

An inch of water per week is enough to keep lawns green.

Other common leaks include:

- Lawn irrigation valves and lines
- Yard hose turned on or leaking
- Ornamental fountains & fish ponds
- Water heater relief valve or fittings
- Leaking house pipes or fittings
- Leaking between the house and meter
- Inside and outside dripping faucets

The City is actively working to reduce system leaks. If you suspect a leak in your neighborhood please call City of Camas at 360-817-1563.

Cross Connection Program

What is Backflow?

Backflow is the undesirable reversal of the flow of water from the intended direction of flow. When this occurs, other liquids, mixtures, gases or substances can enter the potable water piping through cross connection. Under the right hydraulic conditions, backflow can result in contamination of the water supply, which is called back siphonage and backpressure.



How to keep our drinking water clean and safe:

Locate or install a backflow device

If you have an underground irrigation system, check to see if you have a backflow assembly. The backflow assembly is a brass valve usually found between your water meter and the point where your water service line enters your home, usually in a small green box similar to a meter box. If your irrigation system does not include backflow assembly or if you are installing a new underground irrigation system, City of Camas plumbing code requires you to install a *Double Check Valve Assembly (DCVA)* at a minimum.

Test your backflow assembly device annually

Once you have your backflow assembly installed or located, make sure to have it tested annually by a state-certified backflow assembly tester. If you are a property owner and have an in-ground sprinkler system you are required by state and local laws (WAC 246-290) to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a Washington State Certified Backflow Assembly Tester (BAT).

If you have more questions call our Backflow Hotline at 360-817-1569, or email us at backflow@cityofcamas.us

Properly winterizing your irrigation system

During the fall, most irrigation systems will need to be winterized to prevent pipes from freezing and breaking. Many times this involves using compressed air to blow out the excess water left in the irrigation piping. Although this is the best method, backflow of compressed air and contaminants may enter the drinking water distribution system and cause damage and or health risks if not performed properly. Make sure the compressed air is connected to a properly installed blowout connection to avoid inadvertently introducing air into our water system.



Stop these biggest water consumers first! Look for the Water Sense label on new plumbing fixtures; Repair leaky toilets or install high efficiency low flow toilets; Consider purchasing a water-energy-efficient washer and use water-savings habits such as washing full loads only. Repair leaky faucets, and turn off water when you shave or brush your teeth, Install low flow showerheads and take shorter showers. **For more information Visit City Hall to pick up printed material or visit our website at www.cityofcamas.us/pwwater, or check out this the EPA's website at www.epa.gov/watersense/fixaleak.**

2020 Consumer Confidence Report

CONTACT US

City Hall
616 NE Fourth Ave
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360-834-2462
www.cityofcamas.us

Public Works
360-817-1563
publicworks@cityofcamas.us

After-Hours/Holiday Water Emergency: 360-737-0592

Cross-Connection Control
backflow@cityofcamas.us
360-817-1569

Camas Connect 24/7
Download our city app to make service requests, or go to www.cityofcamas.us/service-request

IMPORTANT!

This report contains important information about your drinking water. If English is not your first language, please have someone who can translate it for you, or speak with someone who understands it.

Este informe contiene información importante sobre su agua potable. Si el inglés no es su primer idioma, tenga a alguien que pueda traducirlo por usted o hable con alguien que lo entienda.

Ce rapport contient des informations importantes sur votre eau potable. Si l'anglais n'est pas votre langue maternelle, demandez à quelqu'un de le traduire à votre place ou de parler à quelqu'un qui le comprend.

Этот отчет содержит важную информацию о вашей питьевой воде. Если английский не является вашим родным языком, попросите кого-нибудь, кто может перевести его для вас, или поговорить с кем-то, кто понимает его.

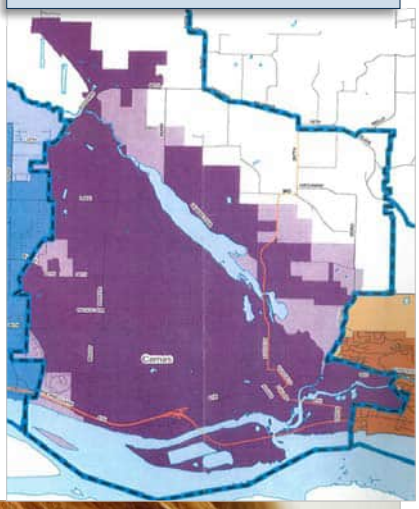
City of Camas Annual Water Quality Report

Public Water System ID: 108002

The City of Camas is pleased to present the annual Water Quality Report, which provides the public with water testing results. The health of our consumers and their families is paramount and our goal is to provide the community with a safe and dependable supply of drinking water.

At the City of Camas we understand how important it is to ensure we provide high quality water. We work diligently to provide top quality water to our growing residential population.

More information about Camas drinking water and what we're doing to keep your water safe can be found online at www.cityofcamas.us/publicworks/page/water-services





Our Water System

The City of Camas has multiple water sources that include surface and ground water. The surface water sources (Boulder and Jones Creeks) are located on the south-side of Larch Mountain, northeast of Camas. Surface water was not used in 2020. The ground water sources include nine wells near the Washougal river and one well in Grass Valley. All water sources are treated with chlorine for disinfection, fluoride for good dental health and sodium hydroxide to reduce the corrosion of copper piping to meet State and EPA standards. Water pressure and fire flows are maintained throughout the service area with eight distribution reservoirs, nine pump stations, and over 160 miles of pipeline.

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2020 Water Quality Summary

Our drinking w... and surpasses all State and Federal health standards!



The City of Camas routinely monitors for contaminants in your drinking water according to Federal and State laws. Field and laboratory analyses include tests for bacteria, as well as chemical and physical indicators. Reports are submitted monthly to the Department of Health to report that City water meets all drinking water standards. Contaminants that were detected are listed in the following tables.

Should there ever be a public health concern, you would be notified immediately. Please report possible water pollution (illicit discharge) to the City of Camas 360-817-1563, or the Department of Ecology-SW Regional Offices 360-407-6300.

Definitions

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as possible using the best available treatment technologies.

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Milligram Per Liter (mg/L): A unit of measurement used in reporting the concentration of matter in water as determined by water analyses.

NTU (Nephelometric Turbidity Unit): Turbidity is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

ug/L: Units of measurement in micrograms/liter. A unit of concentration for dissolved substances based on their weights.

ppm: (1 parts per million = 1 mh/L = 1 milligram per liter)

ppb: (1 parts per billion = 0.001 mg/L = 1 microgram per liter)

pCi/L: Picocuries per liter is a unit for measuring radioactive concentrations. The curie (Ci) unit is the activity of 1 gram of pure radium.

NA (Not Applicable): Means that the U.S. EPA has not established MCLGs for these substances.

ND (Not Detected): A compound that was analyzed and not detected at a level greater than or equal to the state reporting level.

2020 Detected Contaminants

		EPA Regulations		City of Camas Water Quality Results	
Regulated Contaminants	**Units**	**Ideal Level/Goal (MCLG)**	**Maximum Level (MCL)**	**Range of Level Detected**	**Violation**
Fluoride	mg/L	.50 -.90	4	.48 - 1.09	No
Fluoride is added to your water in carefully controlled levels for dental health. In May 2016, the Washington State Department of Health changed the fluoridation requirement to a target of 0.7 mg/L from the previous target of 0.7-1.2 mg/L.					
Nitrates ***(as nitrogen)***	mg/L	10	10	Not Detected - 1.30	No
Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products.					
Haloacetic Acid (5)	ug/L	48	60	.64 - 1.90	No
Trihalomethanes	ug/L	60	80	.29 - .54	No
Haloacetic acids (HAA5) and trihalomethanes form as by-products of the chlorination process that is used to kill or inactivate disease-causing microbes.					
Radionuclides - Naturally Occurring Substances In Drinking Water					
Gross Alpha	pCil	0	15	2.34 -2.95	No
Radium 228	pCil	0	5	.974 -.713	No
Total Coliform Bacteria	%	0	<5% Positive/Mo.	0	No

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information, go to: https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule or contact the Safe Drinking Water Hotline at 1-800-426-47... via website https://www.epa.gov/home/epa-hotlines.

Sources of Drinking Water

In general, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity. To ensure that tap water is safe to drink, the Washington Department of Health and the United State Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in the water provided by public water systems. Contaminants that may be present in source water before we treat it include:

Mandatory EPA Statement for All Community Water Systems

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The US EPA-Center for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are from the EPA's Safe Drinking Water website.

- **Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic Contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.
- **Pesticides and Herbicides**, which may come from a variety of sources such as agriculture and residential uses.
- **Organic Chemicals**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive Contaminants**, which are naturally occurring as a result of mining and/or gas production.

Lead & Copper

In 2018, the City tested thirty residences for lead and copper. The highest result was 0.0026 mg/L for Lead, and 0.6100 mg/L in Copper. No households exceeded the action level. The City was not required to test for lead or copper in 2020. The next sampling event is scheduled for 2021.

Parameter	Major Source	Units	(MCLG) mg/L	(AL) mg/L	City Results mg/L	Violation
Lead *(at consumers tap)*	Plumbing, erosion of natural deposits.	ppb	0	0.015	.0010—.0034	No
Copper		ppm	0	1.30	.027—.55	No

To Reduce Lead and Copper Exposure

- When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.
- Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.
- Frequently clean the filter screens and aerators in faucets to remove captured particles.
- If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.

EPA STATEMENT

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from:

Safe Drinking Water Hotline 1-800-426-4791, or at www.epa.gov/safewater/lead.

Water Conservation

In 2020 the average daily water consumption in Camas was 4.22 million gallons. Our peak usage day was on August 16, 2020, when 8,686,000 gallons were consumed. Most of this increase in the summer months is due to irrigation demands. We are once again asking for the public's help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days for home addresses that end in an odd number, and even days if it ends in an even number.

City Water Saving Commitments

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- Replacing industrial, commercial, and residential service meters with the new radio read meters, which will allow the City to log usage more effectively to notify customers about continuous leaks or high consumption.
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Other common leaks include:

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Annual Backflow Test Required - Cross-Connection Prevention



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Properly winterizing your irrigation system

During the fall, most irrigation systems will need to be winterized to prevent pipes from freezing and breaking. Many times this involves using compressed air to blow out the excess water left in the irrigation piping. Although this is the best method, backflow of compressed air and contaminants may enter the drinking water distribution system and cause damage and or health risks if not performed properly. Make sure the compressed air is connected to a properly installed blowout connection to avoid inadvertently introducing air into our water system.

For more water-leak information, check the EPA's website at www.epa.gov/watersense/fixaleak.



2021 Consumer Confidence Report

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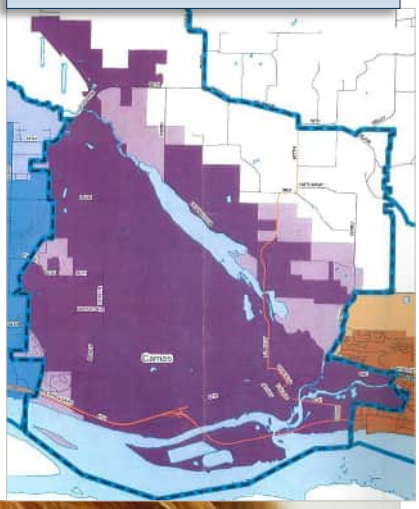



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2021 Water Quality Summary

Our drinking w... and surpasses all State and Federal health standards!



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2021 Detected Contaminants

		EPA Regulations		City of Camas Water Quality Results	
Regulated Contaminants	**Units**	**Ideal Level/Goal (MCLG)**	**Maximum Level (MCL)**	**Range of Level Detected**	**Violation**
Fluoride	mg/L	.50 -.90	4	.34—1.03	No
Fluoride is added to your water in carefully controlled levels for dental health. In May 2016, the Washington State Department of Health changed the fluoridation requirement to a target of 0.7 mg/L from the previous target of 0.7-1.2 mg/L.					
Nitrates ***(as nitrogen)***	mg/L	10	10	Not Detected—2.9	No
Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products.					
Haloacetic Acid (5)	ug/L	48	60	Not Detected—1.4	No
Trihalomethanes	ug/L	60	80	2.5-6.5	No
Haloacetic acids (HAA5) and trihalomethanes form as by-products of the chlorination process that is used to kill or inactivate disease-causing microbes.					
Radionuclides - Naturally Occurring Substances In Drinking Water					
Gross Alpha	pCil	0	15	2.67	No
Radium 228	pCil	0	5	.670	No
Total Coliform Bacteria	%	0	<5% Positive/Mo.	0	No

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Sources of Drinking Water

In general, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity. To ensure that tap water is safe to drink, the Washington Department of Health and the United State Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in the water provided by public water systems. Contaminants that may be present in source water before we treat it include:

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- **Inorganic Contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.
- **Pesticides and Herbicides**, which may come from a variety of sources such as agriculture and residential uses.
- **Organic Chemicals**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive Contaminants**, which are naturally occurring as a result of mining and/or gas production.

Lead & Copper

In 2021, the City tested thirty two residences for lead and copper. The highest level for copper was 0.93 mg/L. The highest level for lead was .019mg/L. To be in compliance with the Lead and Copper Rules, our system must fall within the 90th percentile of samples collected, where sample results are less than or equal to the action level for lead and copper. The action level for Lead is .015 mg/L and the action level for Copper is 1.3mg/L.

Parameter	Major Source	Units	(MCLG) mg/L	(AL)	City Results mg/L	Violation
Lead *(at consumers tap)*	Plumbing, erosion of natural deposits.	ppb	0	0.015	Not Detected —.019	No
Copper		ppm	0	1.30	.021—.93	No

To Reduce Lead and Copper Exposure

- When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.
- Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.
- Frequently clean the filter screens and aerators in faucets to remove captured particles.
- If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.

EPA STATEMENT

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from:

Safe Drinking Water Hotline 1-800-426-4791, or at www.epa.gov/safewater/lead.

Water Conservation

In 2021 the average daily water consumption in Camas was 4.75 million gallons. Our peak usage day was on July 22, 2021, when 11,670,000 gallons were consumed. Most of this increase in the summer months is due to irrigation demands. We are once again asking for the public's help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days for home addresses that end in an odd number, and even days if it ends in an even number.

City Water Saving Commitments

- To reduce the customer consumption per home by one percent or approximately two gallons-per-day per year over the next six years. The City will maintain distribution system loss at-or-below ten percent for the next five years.
- Replacing industrial, commercial, and residential service meters with the new radio read meters, which will allow the City to log usage more effectively to notify customers about continuous leaks or high consumption.
- Encourage the installation of smart controllers on irrigation systems for the school district and industrial users.
- Educate the public on water-saving devices, and distribute water conservation kits and water-saving devices to homeowners. Continue metering all sources.
- Replace water mains and service lines in problematic areas and complete Capital Projects in accordance with the new Water System Plan Update.

Community Involvement to Reduce Water Leaks

Locate your master water supply valve and label it. The master supply valve can be turned off in case of a major leak or broken pipe. The majority of leaks in residential plumbing systems are found at the toilet tank (fill and flapper valves).

Other common leaks include:

- Lawn irrigation valves and lines
- Yard hose turned on or leaking
- Ornamental fountains & fish ponds
- Water heater relief valve or fittings
- Leaking house pipes or fittings
- Leaking between the house and meter
- Inside and outside dripping faucets

The City is actively working to reduce system leaks. If you suspect a leak in your neighborhood please call City of Camas at 360-817-1563.

CONSERVATION TIPS

Fix leaks on old leaky faucets, toilets, hoses, and sprinkler systems.

Choose water saving fixtures and appliances and you will use 30% less water.

Sweep porches, driveways & sidewalks rather than hosing, to not only conserve water, but to avoid runoff.

Water late at night or early in the morning (10:00 pm or 6:00 am).

Take a short shower Instead of a bath.

An inch of water per week is enough to keep lawns green.

Cross Connection Program

Annual Backflow Test Required - Cross-Connection Prevention



Backflow is the undesirable reversal of the flow of water from the intended direction of flow. When this occurs, other liquids, mixtures, gases or substances can enter the potable water piping through cross connection. Under the right hydraulic conditions, backflow can result in contamination of the water supply, which is called back siphonage and back pressure.

How to keep our drinking water clean and safe:

Locate or install a backflow device

If you have an underground irrigation system, check to see if you have a backflow assembly. The backflow assembly is a brass valve usually found between your water meter and the point where your water service line enters your home, usually in a small green box similar to a meter box. If your irrigation system does not include backflow assembly or if you are installing a new underground irrigation system, City of Camas plumbing code requires you to install a *Double Check Valve Assembly (DCVA)* at a minimum.

Test your backflow assembly device annually

Once you have your backflow assembly installed or located, make sure to have it tested annually by a state-certified backflow assembly tester. If you are a property owner and have an in-ground sprinkler system you are required by state and local laws (WAC 246-290) to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a Washington State Certified Backflow Assembly Tester BAT). View our Certified Backflow Tester List on the City website: https://www.cityofcamas.us/publicworks/page/backflow-and-cross-connection-prevention.

If you have more questions call our Backflow Hotline at 360-817-1569, or email us at backflow@cityofcamas.us

Properly winterizing your irrigation system

During the fall, most irrigation systems will need to be winterized to prevent pipes from freezing and breaking. Many times this involves using compressed air to blow out the excess water left in the irrigation piping. Although this is the best method, backflow of compressed air and contaminants may enter the drinking water distribution system and cause damage and or health risks if not performed properly. Make sure the compressed air is connected to a properly installed blowout connection to avoid inadvertently introducing air into our water system.

For more water-leak information, check the EPA's website at www.epa.gov/watersense/fixaleak.



2022 Consumer Confidence Report

CONTACT US

City Hall
616 NE Fourth Ave
Camas, WA 98607
360-834-2462
www.cityofcamas.us

Public Works
360-817-1563
publicworks@cityofcamas.us

After-Hours Water Emergency: 360-737-0592

Cross-Connection Control
backflow@cityofcamas.us
360-817-1569

Engage Camas
www.Engagecamas.com

IMPORTANT!

This report contains important information about your drinking water. If English is not your first language, please have someone translate it for you, or speak with someone who understands it.

Este informe contiene información importante sobre su agua potable. Si el inglés no es su primer idioma, tenga a alguien que pueda traducirlo por usted o hable con alguien que lo entienda.

Ce rapport contient des informations importantes sur votre eau potable. Si l'anglais n'est pas votre langue maternelle, demandez à quelqu'un de le traduire à votre place ou de parler à quelqu'un qui le comprend.

Этот отчет содержит важную информацию о вашей питьевой воде. Если английский не является вашим родным языком, попросите кого-нибудь, кто может перевести его для вас, или поговорить с кем-то, кто понимает его.

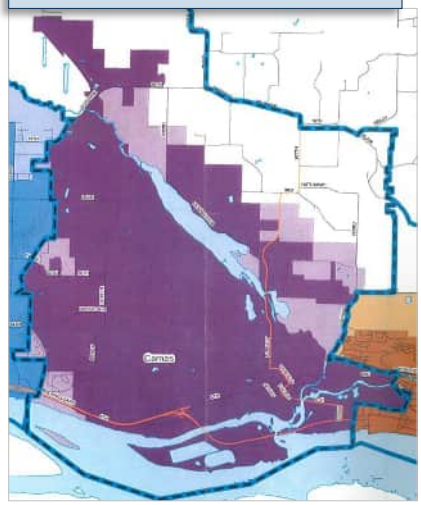
City of Camas Annual Water Quality Report

Public Water System ID: 108002

The City of Camas is pleased to present the annual Water Quality Report, which provides the public with water testing results. The health of our consumers and their families is paramount and our goal is to provide the community with a safe and dependable supply of drinking water.

At the City of Camas we understand how important it is to ensure we provide high quality water. We work diligently to provide top quality water to our growing residential population.

More information about Camas drinking water and what we're doing to keep your water safe can be found online at www.cityofcamas.us/publicworks/page/water-services





Our Water System

The City of Camas has multiple water sources that include surface and ground water. The surface water sources (Boulder and Jones Creeks) are located on the south-side of Larch Mountain, northeast of Camas. Surface water was not used in 2022. The ground water sources include nine wells near the Washougal river and one well in Grass Valley. All water sources are treated with chlorine for disinfection, fluoride for good dental health and sodium hydroxide to reduce the corrosion of piping to meet State and Environmental Protection Agency (EPA) standards. Water pressure and fire flows are maintained throughout the service area with eight distribution reservoirs, nine pump stations, and over 160 miles of pipeline.

2022 Water Quality Summary

Our drinking w... and surpasses all State and Federal health standards!



The City of Camas routinely monitors for contaminants in your drinking water according to Federal and State laws. Field and laboratory analyses include tests for bacteria, as well as chemical and physical indicators. Reports are submitted monthly to the Department of Health to report that City water meets all drinking water standards. Contaminants that were detected are listed in the following tables.

Should there ever be a public health concern, you would be notified immediately. Please report possible water pollution (through illicit discharge or contamination) to the City of Camas 360-817-1563, or the Department of Ecology-SW Regional Offices 360-407-6300.

Definitions

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as possible using the best available treatment technologies.

MCLG (Maximum Contaminant Level Goal): The maximum level of a contaminant in drinking water below which there is no known or expected health risk. MCLGs allow for a margin of safety.

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatments or other requirements that a waster system must follow.

Milligram Per Liter (mg/L): A unit of measurement used in reporting the concentration of matter in water as determined by water analyses.

NTU (Nephelometric Turbidity Unit): Turbidity is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

µg/L: Units of measurement in micrograms/liter.

ppm: (1 parts per million = 1 mg/L = 1 milligram per liter)

ppb: (1 parts per billion = 0.001 µg/L = 1 microgram per liter)

ppt: (1 parts per trillion = 1 ng/L = 1 nanogram per liter)

pCi/L: Picocuries per liter is a unit for measuring radioactive concentrations. The curie (Ci) unit is the activity of 1 gram of pure radium.

NA (Not Applicable): Means that the U.S. EPA has not established MCLGs for these substances.

ND (Not Detected): A compound that was analyzed and not detected at a level greater than or equal to the state reporting level.

Ng/L: Nanograms per liter

2022 Detected Contaminants

		EPA Regulations		City of Camas Water Quality Results	
Regulated Contaminants	**Units**	**Ideal Level/Goal (MCLG)**	**Maximum Level (MCL)**	**Range of Level Detected**	**Violation**
Fluoride	mg/L	.50 -.90	4	.16-1.10	No
Fluoride is added to your water in carefully controlled levels for dental health. In May 2016, the Washington State Department of Health changed the fluoridation requirement to a target of 0.7 mg/L from the previous target of 0.7-1.2 mg/L.					
Nitrates ***(as nitrogen)***	mg/L	10	10	Not Detected—2.1	No
Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products.					
Haloacetic Acid (5)	ug/L	48	60	Not Detected	No
Trihalomethanes	ug/L	60	80	5.7-7.6	No
Haloacetic acids (HAA5) and trihalomethanes form as by-products of the chlorination process that is used to kill or inactivate disease-causing microbes.					
Radionuclides - Naturally Occurring Substances In Drinking Water					
Gross Alpha	pCil	0	15	2.68	No
Radium 228	pCil	0	5	.739	No
Total Coliform Bacteria	%	0	<1% Positive/Mo.	0	No

2022 Detected Contaminants continued...

A Volatile Organic Chemical (VOC) sample was inadvertently missed at the Washougal Wellfield (source 5-18) in 2022. Through coordination with The Department of Health, the sample was taken in March 2023 resulting in a non-detect.

Sources of Drinking Water

In general, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity. To ensure that tap water is safe to drink, the Washington Department of Health and EPA prescribe regulations that limit the amount of certain contaminants in the water provided by public water systems. Contaminants that may be present in source water before we treat it include:

- **Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic Contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.
- **Pesticides and Herbicides**, which may come from a variety of sources such as agriculture and residential uses.
- **Organic Chemicals**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive Contaminants**, which are naturally occurring as a result of mining and/or gas production.

Mandatory EPA Statement for All Community Water Systems

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The US EPA-Center for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are from the EPA's Safe Drinking Water website.

Lead & Copper

In 2022, the City tested thirty two residences for lead and copper. The highest level for copper was 0.93 mg/L. The highest level for lead was .019mg/L. To be in compliance with the Lead and Copper Rules, sample results must be less than or equal to the action level for lead and copper. The action level for Lead is .015 mg/L and the action level for Copper is 1.3mg/L.

Parameter	Major Source	Units	(MCLG) mg/L	(AL) mg/L	City Results mg/L	Violation
Lead *(at consumers tap)*	Plumbing, erosion of natural deposits.	ppb	0	0.015	Not Detected —	No
Copper		ppm	0	1.30	.021—.93	No

To Reduce Lead and Copper Exposure

- When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.
- Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.
- Frequently clean the filter screens and aerators in faucets to remove captured particles.
- If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.

EPA Statement

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

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PFAS

In 2021, the Washington State Board of Health (SBOH) adopted a rule that requires water system utilities, including the City of Camas, to test for Per and Polyfluoroalkyl substances (PFAS). PFAS are a new class of contaminants not currently regulated by the EPA which include Perfluorooctanoic acid (PFOA) and Perfluorooctanioc Sulfonic Acid (PFOS). The rule requires the City to notify you if any test results exceed a State Action Level. EPA has not yet set an action level but one is expected sometime in 2024 that is anticipated to be lower than the state action level (SAL).

The City recently completed another sampling for PFAS at all of its wells in March of 2023. The testing resulted in no detection for PFOA or PFOS at any of the City wells. PFAS detection below 4 parts per trillion is considered a non-detect. The City will continue to sample for PFAS as required by the Washington Department of Health on a quarterly basis at all of its wells. Complete information for 2023 will be provided in next years Annual Water Quality Report.

Source	PFOA Result (ppt)	PFOA SAL 10ppt	PFOS Result (ppt)	PFOS SAL 15ppt
Well 5 (S-06)	3.6	Below	6.9	Below
WFW (S-19)	ND	NA	3.1	Below
WFE (S-18)	ND	NA	3.3	Below
Well 13 (S-16)	3.6	Below	21	Above

ND: None Detected **NA:** Not Applicable

The City continues to monitor the water system, coordinate with the Department of Health, and investigate options for treatment of PFAS in the City's water system. For more information, please visit the City's website.

Water Conservation

In 2022 the average daily water consumption in Camas was 4.49 million gallons. Our peak usage day was on July 29, 2022, when 8,781,000 gallons were consumed. Most of this increase in the summer months is due to irrigation demands. We are once again asking for the public's help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days for home addresses that end in an odd number, and even days if it ends in an even number.

City Water Saving Commitments

- To reduce the customer consumption per home by one percent, or approximately two gallons-per-day per year over the next six years. The City will maintain distribution system loss at-or-below ten percent for the next five years.
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Community Involvement to Reduce Water Leaks

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Other common leaks include:

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Cross Connection Program

Annual Backflow Test Required

Cross-Connection Prevention

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Test your backflow assembly device annually

Once you have your backflow assembly installed or located, make sure to have it tested annually by a state-certified backflow assembly tester. If you are a property owner and have an in-ground sprinkler system you are required by state and local laws (WAC 246-290) to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a Washington State Certified Backflow Assembly Tester (BAT). View our Certified Backflow Tester List on the City website: Backflow and Cross-Connection Prevention | Camas WA (cityofcamas.us).

If you have more questions call our Backflow Hotline at 360-817-1569, or email us at backflow@cityofcamas.us

Properly winterizing your irrigation system

During the fall, most irrigation systems will need to be winterized to prevent pipes from freezing and breaking. Many times this involves using compressed air to blow out the excess water left in the irrigation piping. Although this is the best method, backflow of compressed air and contaminants may enter the drinking water distribution system and cause damage and or health risks if not performed properly. Make sure the compressed air is connected to a properly installed blowout connection to avoid inadvertently introducing air into the City's water system.

For more water-leak information, check the EPA's website at www.epa.gov/watersense/fixaleak.

We've got news!

Follow City of Camas on social media and on the city's website for the latest in updates and alerts:

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2023 Consumer Confidence Report

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City of Camas Annual Water Quality Report

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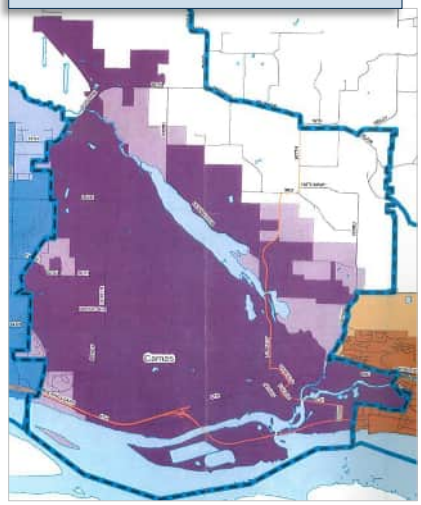
Public Water System ID: 108002





Our Water System

The City of Camas has multiple water sources that include surface and ground water. The surface water sources (Boulder and Jones Creeks) are located on the south-side of Larch Mountain, northeast of Camas. Surface water was not used in 2022. The ground water sources include nine wells near the Washougal river and one well in Grass Valley. All water sources are treated with chlorine for disinfection, fluoride for good dental health and sodium hydroxide to reduce the corrosion of copper piping to meet State and EPA standards. Water pressure and fire flows are maintained throughout the service area with eight distribution reservoirs, nine pump stations, and over 160 miles of pipeline.

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Our drinking w... and surpasses all State and Federal health standards!



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Should there ever be a public health concern, you would be notified immediately. Please report possible water pollution (illicit discharge) to the City of Camas 360-817-1563, or the Department of Ecology-SW Regional Offices 360-407-6300.

Definitions

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ppm: (1 parts per million = 1 mg/L = 1 milligram per liter)

ppb: (1 parts per billion = 0.001 µg/L = 1 microgram per liter)

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pCi/L: Picocuries per liter is a unit for measuring radioactive concentrations. The curie (Ci) unit is the activity of 1 gram of pure radium.

NA (Not Applicable): Means that the U.S. EPA has not established MCLGs for these substances.

ND (Not Detected): A compound that was analyzed and not detected at a level greater than or equal to the state reporting level.

Ng/L: Nanograms per liter

2023 Detected Contaminants

		EPA Regulations		City of Camas Water Quality Results	
Regulated Contaminants	**Units**	**Ideal Level/Goal (MCLG)**	**Maximum Level (MCL)**	**Range of Level Detected**	**Violation**
Fluoride	mg/L	.50 -.90	4	.13 - 1.11	No
Fluoride is added to your water in carefully controlled levels for dental health. In May 2016, the Washington State Department of Health changed the fluoridation requirement to a target of 0.7 mg/L from the previous target of 0.7-1.2 mg/L.					
Nitrates ***(as nitrogen)***	mg/L	10	10	Not Detected—1.7	No
Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products.					
Haloacetic Acid (5)	ug/L	48	60	.87—1.0	No
Trihalomethanes	ug/L	60	80	.50—4.1	No
Haloacetic acids (HAA5) and trihalomethanes form as by-products of the chlorination process that is used to kill or inactivate disease-causing microbes.					
Radionuclides - Naturally Occurring Substances In Drinking Water					
Gross Alpha	pCil	0	15	2.16	No
Radium 228	pCil	0	5	.760	No
Total Coliform Bacteria	%	0	<1% Positive/Mo.	0	No

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information, go to: https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule or contact the Safe Drinking Water Hotline at 1-800-426-47... via website https://www.epa.gov/home/epa-hotlines.

2023 Detected Contaminants continued...

A VOC was missed at WFE (5-18) which caused a non-compliance letter for 2022. The sample was taken in March 2023 resulting in a non-detect. This brought the source back into compliance.

Sources of Drinking Water

In general, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity. To ensure that tap water is safe to drink, the Washington Department of Health and the United State Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in the water provided by public water systems. Contaminants that may be present in source water before we treat it include:

- **Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic Contaminants**, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.
- **Pesticides and Herbicides**, which may come from a variety of sources such as agriculture and residential uses.
- **Organic Chemicals**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive Contaminants**, which are naturally occurring as a result of mining and/or gas production.

Mandatory EPA Statement for All Community Water Systems

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The US EPA-Center for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are from the EPA's Safe Drinking Water website.

Lead & Copper

In 2022, the City tested thirty two residences for lead and copper. The highest level for copper was 0.93 mg/L. The highest level for lead was .019mg/L. To be in compliance with the Lead and Copper Rules, our system must fall within the 90th percentile of samples collected, where sample results are less than or equal to the action level for lead and copper. The action level for Lead is .015 mg/L and the action level for Copper is 1.3mg/L. Lead & Copper sampling for 2024 will begin in the fall.

Parameter	Major Source	Units	(MCLG) mg/L	(AL) mg/L	City Results mg/L	Violation
Lead *(at consumers tap)*	Plumbing, erosion of natural deposits.	ppb	0	0.015	Not Detected —	No
Copper		ppm	0	1.30	.021—.93	No

To Reduce Lead and Copper Exposure

- When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.
- Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.
- Frequently clean the filter screens and aerators in faucets to remove captured particles.
- If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.

EPA Statement

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from:

Safe Drinking Water Hotline 1-800-426-4791, or at www.epa.gov/safewater/lead.

PFOS

In 2021, the Washington State Board of Health (SBOH) adopted a rule that requires water system utilities, including the City of Camas, to test for PFAS. PFAS are a new class of contaminants not currently regulated by the Environmental Protection Agency (EPA). The rule also requires the City to notify you if any test results exceed a State Action Level. EPA has not yet set an action level but one is expected sometime in 2024.

The City recently completed another sampling for PFOS at all its wells in March of 2023. The testing resulted in no detection for PFOA or PFOS at any of the sites sampled in 2022. Detection below 4 parts per trillion is considered a non-detect. The City will continue to sample for PFAS as requested by the Washington Department of Health on a quarterly basis at all of its wells.

Source	PFOA Result	PFOA SAL 10ppt	PFOS Result	PFOS SAL 15ppt
Well 5 (S-06)	3.6	Below	6.9	Below
WFW (S-19)	ND	NA	3.1	Below
WFE (S-18)	ND	NA	3.3	Below
Well 13 (S-16)	3.6	Below	21	Above

ND: None Detected **NA:** Not Applicable



Water Conservation

In 2023 the average daily water consumption in Camas was 4.66 million gallons. Our peak usage day was on August 23, 2023, when 8,796,000 gallons were consumed. Most of this increase in the summer months is due to irrigation demands. We are once again asking for the public's help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days for home addresses that end in an odd number, and even days if it ends in an even number.

City Water Saving Commitments

- To reduce the customer consumption per home by one percent or approximately two gallons-per-day per year over the next six years. The City will maintain distribution system loss at-or-below ten percent for the next five years.
- Replacing industrial, commercial, and residential service meters with the new radio read meters, which will allow the City to log usage more effectively to notify customers about continuous leaks or high consumption.
- Encourage the installation of smart controllers on irrigation systems for the school district and industrial users.
- Educate the public on water-saving devices, and distribute water conservation kits and water-saving devices to homeowners. Continue metering all sources.
- Replace water mains and service lines in problematic areas and complete Capital Projects in accordance with the new Water System Plan Update.

Community Involvement to Reduce Water Leaks

Locate your master water supply valve and label it. The master supply valve can be turned off in case of a major leak or broken pipe. The majority of leaks in residential plumbing systems are found at the toilet tank (fill and flapper valves).

Other common leaks include:

- Lawn irrigation valves and lines
- Yard hose turned on or leaking
- Ornamental fountains & fish ponds
- Water heater relief valve or fittings
- Leaking house pipes or

CONSERVATION TIPS

Fix leaks on old leaky faucets, toilets, hoses, and sprinkler systems.

Choose water saving fixtures and appliances and you will use 30% less water.

Sweep porches, driveways & sidewalks rather than hosing, to not only conserve water, but to avoid runoff.

Water late at night or early in the morning (10:00 pm or 6:00 am).

An inch of water per week is enough to keep lawns green.

Take a short shower instead of a bath

Cross Connection Program

Annual Backflow Test Required

Cross-Connection Prevention

Backflow is the undesirable reversal of the flow of water from the intended direction of flow. When this occurs, other liquids, mixtures, gases or substances can enter the potable water piping through cross connection. Under the right hydraulic conditions, backflow can result in contamination of the water supply, which is called back siphonage and back pressure.



How to keep our drinking water clean and safe:

Locate or install a backflow device

If you have an underground irrigation system, check to see if you have a backflow assembly. The backflow assembly is a brass valve usually found between your water meter and the point where your water service line enters your home, usually in a small green box similar to a meter box. If your irrigation system does not include backflow assembly or if you are installing a new underground irrigation system, City of Camas plumbing code requires you to install a *Double Check Valve Assembly (DCVA)* at a minimum.

Test your backflow assembly device annually

Once you have your backflow assembly installed or located, make sure to have it tested annually by a state-certified backflow assembly tester. If you are a property owner and have an in-ground sprinkler system you are required by state and local laws (WAC 246-290) to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a Washington State Certified Backflow Assembly Tester (BAT). View our Certified Backflow Tester List on the City website: Backflow and Cross-Connection Prevention | Camas WA (cityofcamas.us).

If you have more questions call our Backflow Hotline at 360-817-1569, or email us at backflow@cityofcamas.us

Properly winterizing your irrigation system

During the fall, most irrigation systems will need to be winterized to prevent pipes from freezing and breaking. Many times this involves using compressed air to blow out the excess water left in the irrigation piping. Although this is the best method, backflow of compressed air and contaminants may enter the drinking water distribution system and cause damage and or health risks if not performed properly. Make sure the compressed air is connected to a properly installed blowout connection to avoid inadvertently introducing air into our water system.

For more water-leak information, check the EPA's website at www.epa.gov/watersense/fixaleak.

We've got news!

Follow City of Camas on social media and on the city's website for the latest in updates and alerts:

Website: www.cityofcamas.us
Twitter: www.twitter.com/CityofCamas— @CityofCamas
Facebook: www.facebook.com/cityofcamas



2024 Consumer Confidence Report

CONTACT US

City Hall
616 NE Fourth Ave
Camas, WA 98607
360-834-2462
www.cityofcamas.us

Public Works
360-817-1563
publicworks@cityofcamas.us

After-Hours/Holiday Water Emergency: 360-737-0592

Cross-Connection Control
backflow@cityofcamas.us
360-817-1569

Camas Connect 24/7
Download our city app to make service requests, or go to www.cityofcamas.us/service-request

IMPORTANT!

This report contains important information about your drinking water. If English is not your first language, please have someone who can translate it for you, or speak with someone who understands it.

Este informe contiene información importante sobre su agua potable. Si el inglés no es su primer idioma, tenga a alguien que pueda traducirlo por usted o hable con alguien que lo entienda.

Ce rapport contient des informations importantes sur votre eau potable. Si l'anglais n'est pas votre langue maternelle, demandez à quelqu'un de le traduire à votre place ou de parler à quelqu'un qui le comprend.

Этот отчет содержит важную информацию о вашей питьевой воде. Если английский не является вашим родным языком, попросите кого-нибудь, кто может перевести его для вас, или поговорить с кем-то, кто понимает его.

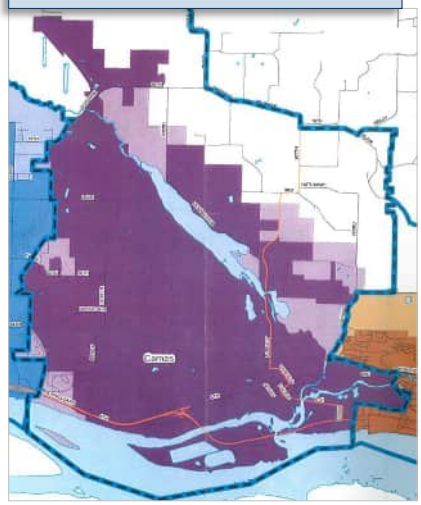
City of Camas Annual Water Quality Report

Public Water System ID: 108002

The City of Camas is pleased to present the annual Water Quality Report, which provides the public with water testing results. The health of our consumers and their families is paramount and our goal is to provide the community with a safe and dependable supply of drinking water.

At the City of Camas we understand how important it is to ensure we provide high quality water. We work diligently to provide top quality water to our growing residential population.

More information about Camas drinking water and what we're doing to keep your water safe can be found online at www.cityofcamas.us/publicworks/page/water-services





Our Water System

The City of Camas has multiple water sources that include surface and ground water. The surface water sources (Boulder and Jones Creeks) are located on the south-side of Larch Mountain, northeast of Camas. Surface water was not used in 2024. The ground water sources include nine wells near the Washougal river and one well in Grass Valley. All water sources are treated with chlorine for disinfection, fluoride for good dental health and sodium hydroxide to reduce the corrosion of copper piping to meet State and EPA standards. Water pressure and fire flows are maintained throughout the service area with eight distribution reservoirs, nine pump stations, and over 160 miles of pipeline.

2024 Water Quality Summary

Our drinking w... and surpasses all State and Federal health standards!



The City of Camas routinely monitors for contaminants in your drinking water according to Federal and State laws. Field and laboratory analyses include tests for bacteria, as well as chemical and physical indicators. Reports are submitted monthly to the Department of Health to report that City water meets all drinking water standards. Contaminants that were detected are listed in the following tables.

Should there ever be a public health concern, you would be notified immediately. Please report possible water pollution (illicit discharge) to the City of Camas 360-817-1563, or the Department of Ecology-SW Regional Offices 360-407-6300.

Definitions

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as possible using the best available treatment technologies.

MCLG (Maximum Contaminant Level Goal): The maximum level of a contaminant in drinking water below which there is no known or expected health risk. MCLGs allow for a margin of safety.

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatments or other requirements that a waster system must follow.

Milligram Per Liter (mg/L): A unit of measurement used in reporting the concentration of matter in water as determined by water analyses.

NTU (Nephelometric Turbidity Unit): Turbidity is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

µg/L: Units of measurement in micrograms/liter.

ppm: (1 parts per million = 1 mg/L = 1 milligram per liter)

ppb: (1 parts per billion = 0.001 µg/L = 1 microgram per liter)

ppt: (1 parts per trillion = 1 ng/L = 1 nanogram per liter)

pCi/L: Picocuries per liter is a unit for measuring radioactive concentrations. The curie (Ci) unit is the activity of 1 gram of pure radium.

NA (Not Applicable): Means that the U.S. EPA has not established MCLGs for these substances.

ND (Not Detected): A compound that was analyzed and not detected at a level greater than or equal to the state reporting level.

Ng/L: Nanograms per liter

2024 Detected Contaminants

		EPA Regulations		City of Camas Water Quality Results	
Regulated Contaminants	**Units**	**Ideal Level/Goal (MCLG)**	**Maximum Level (MCL)**	**Range of Level Detected**	**Violation**
Fluoride	mg/L	.50 -.90	4	.12-1.24	No
Fluoride is added to your water in carefully controlled levels for dental health. In May 2016, the Washington State Department of Health changed the fluoridation requirement to a target of 0.7 mg/L from the previous target of 0.7-1.2 mg/L.					
Nitrates ***(as nitrogen)***	mg/L	10	10	Not Detected—2.0	No
Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products.					
Haloacetic Acid (5)	ug/L	48	60	No Detected	No
Trihalomethanes	ug/L	60	80	2.9-3.5	No
Haloacetic acids (HAA5) and trihalomethanes form as by-products of the chlorination process that is used to kill or inactivate disease-causing microbes.					
Radionuclides - Naturally Occurring Substances In Drinking Water					
Gross Alpha	pCil	0	15	.102	No
Radium 228	pCil	0	5	.954	No
Total Coliform Bacteria	%	0	<1% Positive/Mo.	0	No

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information, go to: https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule or contact the Safe Drinking Water Hotline at 1-800-426-47... via website https://www.epa.gov/home/epa-hotlines.

2024 Detected Contaminants continued...

Sources of Drinking Water

In general, the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity. To ensure that tap water is safe to drink, the Washington Department of Health and the United State Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in the water provided by public water systems. Contaminants that may be present in source water before we treat it include:

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- **Radioactive Contaminants**, which are naturally occurring as a result of mining and/or gas production.

Mandatory EPA Statement for All Community Water Systems

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The US EPA-Center for Disease Control guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are from the EPA's Safe Drinking Water website.

Lead & Copper

In 2024, the City tested thirty two residences for lead and copper. The highest level for copper was 0.73 mg/L. The highest level for lead was .014mg/L. To be in compliance with the Lead and Copper Rules, our system must fall within the 90th percentile of samples collected, where sample results are less than or equal to the action level for lead and copper. The action level for Lead is .015 mg/L and the action level for Copper is 1.3mg/L. The next round of lead sampling will occur in fall of 2027.

Parameter	Major Source	Units	(MCLG) mg/L	(AL) mg/L	City Results mg/L	Violation
Lead *(at consumers tap)*	Plumbing, erosion of natural deposits.	ppb	0	0.015	ND –.014	No
Copper		ppm	0	1.30	ND-.73	No

To Reduce Lead and Copper Exposure

- When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.
- Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.
- Frequently clean the filter screens and aerators in faucets to remove captured particles.
- If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.

EPA Statement

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from:

Safe Drinking Water Hotline 1-800-426-4791, or at www.epa.gov/safewater/lead.

PFOS

In 2021, the Washington State Board of Health (SBOH) adopted a rule that requires water system utilities, including the City of Camas, to test for PFAS. PFAS are a new class of contaminants not currently regulated by the Environmental Protection Agency (EPA). The rule also requires the City to notify you if any test results exceed a State Action Level (SAL). EPA adopted limits of 4 ppt for PFOA and PFOS in April of 2024.

The City recently completed another sampling for PFOS at all its wells in June and July 2024 of 4 ppt. The testing resulted in no detection for PFOA or PFOS at any of the sites sampled in 2022. Detection below 4 parts per trillion is considered a non-detect. The City will continue to sample for PFAS as requested by the Washington Department of Health on a quarterly basis at all of its

Source	PFOA Result	PFOA SAL 10 ppt	PFOS Result	PFOS SAL 15 ppt
Well 5 (S-06)	5.	Below	7.2	Below
WFW (S-19)	ND	Below	3.2	Below
WFE (S-17)	ND	NA	ND	Below
Well 13 (S-16)	ND	NA	8.3	Below

ND: None Detected **NA:** Not Applicable



Water Conservation

In 2024 the average daily water consumption in Camas was 4.66 million gallons. Our peak usage day was on July 8, 2024, when 10,243,000 gallons were consumed. Most of this increase in the summer months is due to irrigation demands. We are once again asking for the public's help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days for home addresses that end in an odd number, and even days if it ends in an even number.

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Cross Connection Program

Annual Backflow Test Required

Cross-Connection Prevention

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How to keep our drinking water clean and safe:

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Test your backflow assembly device annually

Once you have your backflow assembly installed or located, make sure to have it tested annually by a state-certified backflow assembly tester. If you are a property owner and have an in-ground sprinkler system you are required by state and local laws (WAC 246-290) to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a Washington State Certified Backflow Assembly Tester (BAT). View our Certified Backflow Tester List on the City website: Backflow and Cross-Connection Prevention | Camas WA (cityofcamas.us).

If you have more questions call our Backflow Hotline at 360-817-1569, or email us at backflow@cityofcamas.us

Properly winterizing your irrigation system

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For more water-leak information, check the EPA's website at www.epa.gov/watersense/fixaleak.

We've got news!

Follow City of Camas on social media and on the city's website for the latest in updates and alerts:

Website: www.cityofcamas.us
Twitter: www.twitter.com/CityofCamas— @CityofCamas
Facebook: www.facebook.com/cityofcamas



APPENDIX R

WATER FACILITY INVENTORY

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 12/2(
Item 11.
Printed: 3/6/2026
WFI Printed For: On-Demand
Submission Reason: Pop/Connect Update

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822 or email wfi@doh.wa.gov

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
10800 2	CAMAS MUNICIPAL WATER SEWER SYSTEM	CLARK	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS
ALLEN J. NELSON [WATER SUPPLY] CITY HALL 1620 SE 8TH AVE CAMAS, WA 98607	CAMAS, CITY OF ROB CHARLES 616 NE 4TH AVE CAMAS, WA 98607 ACTING PUBLIC WORKS DI
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM ABOVE**
ATTN	ATTN
ADDRESS	ADDRESS
CITY STATE ZIP	CITY STATE ZIP

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone: (360) 817-7287		Owner Daytime Phone: (360) 817-7899	
Primary Contact Mobile/Cell Phone: (360) 690-5095		Owner Mobile/Cell Phone:	
Primary Contact Evening Phone: (xxx)-xxx-xxxx		Owner Evening Phone:	
Fax:	E-mail: AxxxxxN@CITYOFCAMAS.US	Fax: (360) 834-1535	E-mail: rxxxxxxs@cityofcamas.us

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: _____ SMA Number:

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- [ ] Agricultural
- [x] Commercial / Business
- [x] Day Care
- [x] Food Service/Food Permit
- [ ] 1,000 or more person event for 2 or more days per year
- [x] Hospital/Clinic
- [x] Industrial
- [x] Licensed Residential Facility
- [x] Lodging
- [x] Recreational / RV Park
- [x] Residential
- [x] School
- [ ] Temporary Farm Worker
- [x] Other (church, fire station, etc.):
- [ ] RTCR Seasonal System

13. WATER SYSTEM OWNERSHIP (mark only one)				14. STORAGE CAPACITY (gallons)
[ ] Association	[ ] County	[ ] Investor	[ ] Special District	
[x] City / Town	[ ] Federal	[ ] Private	[ ] State	8,500,000

- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES -

2487

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
10800 2	CAMAS MUNICIPAL WATER SEWER SYSTEM	CLARK	A	Comm

15	16	17	18									19			20	21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY									USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	BOULDER CREEK									X					X	Y		X	X	X		X		500	SW NE	04	02N	04E
S02	JONES CREEK									X					X	Y		X	X	X		X		500	SE SW	03	02N	04E
S06	DEEP WELL #5 AFP623		X										X			Y		X		X		X	71	600	SW SE	12	01N	03E
S07	DEEP WELL #6 AFP624				X								X			Y	X						85	1400	NE SW	12	01N	03E
S08	DEEP WELL #7 AFP628				X								X			Y	X						49	950	NW SW	12	01N	03E
S09	DEEP WELL #8 AFP629				X								X			Y	X						44	1350	NW SW	12	01N	03E
S11	WELL #9 AFP631 16"		X											X		Y		X		X			145	650	NE NW	04	01N	03E
S13	WELL #11 AHM259				X								X			Y	X						80	1200	NW SW	12	01N	03E
S14	WELL #12 AHM266				X								X			Y	X						81	1300	NW SW	12	01N	03E
S15	WELL #10 AGP495				X								X			Y	X						82	1300	NW SW	12	01N	03E
S16	WELL #13 ALL997		X										X			Y		X		X		X	80	1325	NE SE	47	01N	03E
S17	WELL #14 BAM409				X								X			Y	X						58	1000	NE SW	12	01N	03E
S18	Eastern WF(S07, S17)			X									X			N		X		X		X	58	2400	NW SW	12	01N	03E
S19	Western WF (S08, 9, 13,14,15)			X									X			N		X		X		X	44	6100			00N	00E

2488

WATER FACILITIES INVENTORY (WFI) FORM - Continued

Item 11.

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
10800 2	CAMAS MUNICIPAL WATER SEWER SYSTEM	CLARK	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		11254	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	9075		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	372		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	2179		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	588	588	
28. TOTAL SERVICE CONNECTIONS		11842	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 27703

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?	1794	1482	1638	1716	1716	1560	1560	1716	1560	1794	1482	1560
B. How many days per month is water accessible to the public?	23	19	21	22	22	20	20	22	20	23	19	20

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students, daycare children and/or employees are present each month that are NOT already included in the residential population?	4013	4013	4013	4013	4013	4013	2148	2148	4013	4013	4013	4013
B. How many days per month are they present?	20	20	22	21	22	21	21	23	20	23	19	20

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	30	30	30	30	30	30	30	30	30	30	30	30

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ **DATE:** _____

PRINT NAME: _____ **TITLE:** _____

2489

Intentionally left blank

WS ID	WS Name
10800	CAMAS MUNICIPAL WATER SEWER SYSTEM

Total WFI Printed: 1

2492

Division of Environmental Public Health
Washington State Department of
HEALTH

Water Facilities Inventory (WFI)

Report Create Date:	3/6/2026		
Water System Id(s):	108002		
Print Data on Distribution Page:	ALL		
Print Copies For:	DOH Copy		
Water System Name:	ALL		
County:	-- Any --		
Region:	ALL		
Group:	ALL		
Type:	ALL		
Permit Renewal Quarter:	ALL		
Water System Is New:	ALL		
Water System Status:	ALL		
Water Status Date From:	ALL	**To**	ALL
Water System Update Date	ALL	**To**	ALL
Owner Number:	ALL		
SMA Number:	ALL		
SMA Name:	ALL		
Active Connection Count From:	ALL	**To:**	ALL
Approved Connection Count	ALL	**To:**	ALL
Full-Time Population From:	ALL	**To:**	ALL
Water System Expanding	ALL		
Source Type:	ALL		
Source Use:	ALL		
WFI Printed For:	On-Demand		

2493

APPENDIX S

WATER RIGHT DOCUMENTATION

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

WATER RIGHT CLAIM

RECEIVED
DEPT. OF ECOLOGY
JUN 13 1974
NUMBER NONE

1. NAME CITY OF CAMAS, WASHINGTON

ADDRESS 616 N.E. 4th Avenue

Camas, Washington ZIP CODE 98607

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Ground (SURFACE OR GROUND WATER)

W.R.I.A. 28 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS Deep Well No. 1

B. IF SURFACE WATER, THE SOURCE IS

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 900 gpm PRESENTLY USED 900 gpm
(CUBIC FEET PER SECOND OR GALLONS PER MINUTE)

B. ANNUAL QUANTITY CLAIMED 320 PRESENTLY USED Average 300
(ACRE FEET PER YEAR)

C. IF FOR IRRIGATION, ACRES CLAIMED PRESENTLY IRRIGATED

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: All Year

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Unknown YEAR Before 1942

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 2159 FEET North AND 667 FEET East FROM THE Southwest CORNER OF SECTION 12

BEING WITHIN Southwest quarter OF SECTION 12 T. 1 N., R. 3 E (E.OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT BLOCK OF

Within the City limits of the City of Camas
(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Municipal supply

Clark COUNTY Washington

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal - Domestic Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED:

DO NOT USE THIS SPACE

THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHERS. THIS ACKNOWLEDGEMENT CONSTITUTES RECEIPT FOR THE FILING FEE.

DATE RETURNED THIS HAS BEEN ASSIGNED WATER RIGHT CLAIM REGISTRY NO.

FEB 7 1511 21022

DIRECTOR - DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

X CITY OF CAMAS, WASHINGTON

DATE June 11, 1974

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE, PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW.

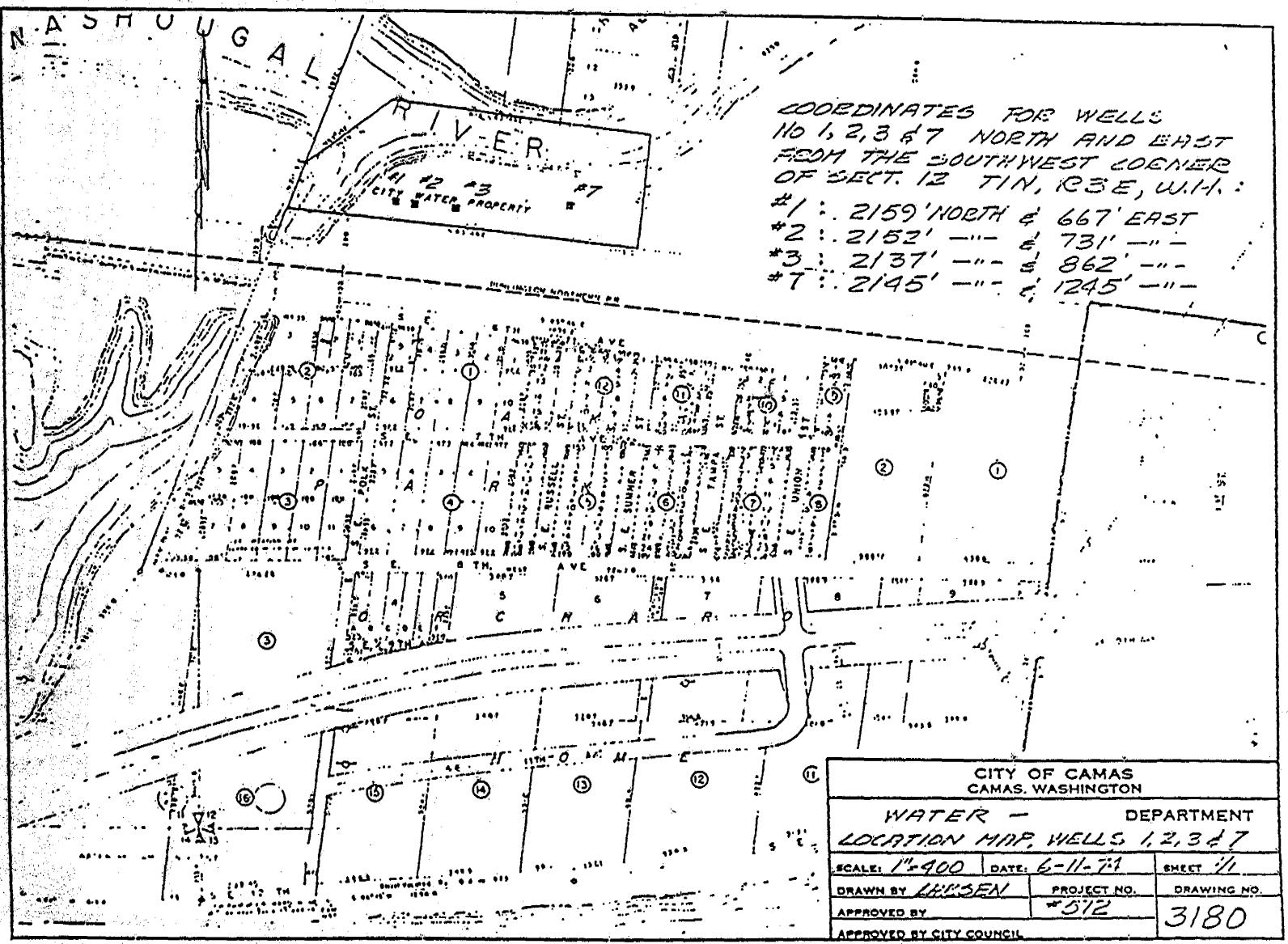
BY: Lewis Angelo
Lewis Angelo, Director of Public Works

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE.

A FEE OF $2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT, ALONG WITH YOUR FEE TO:
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P.O. BOX 829 OLYMPIA, WASHINGTON 98504


N. A S H O U G A L
R I V E R
#1 #2 #3 #7
CITY WATER PROPERTY
COORDINATES FOR WELLS
#1, 2, 3 & 7 NORTH AND EAST
FROM THE SOUTHWEST CORNER
OF SECT. 12 T1N, R3E, W.M.:
#1 : 2159' NORTH & 667' EAST
#2 : 2152' —"— & 731' —"—
#3 : 2137' —"— & 862' —"—
#7 : 2145' —"— & 1245' —"—
OAK
ADAMS
CHERRY
11TH-OAK-ELM
CITY OF CAMAS
CAMAS, WASHINGTON
WATER — DEPARTMENT
LOCATION MAP, WELLS 1, 2, 3 & 7
SCALE: 1"=400
DATE: 6-11-71
SHEET #1
DRAWN BY LARSEN
PROJECT NO. #512
DRAWING NO. 3180
APPROVED BY
APPROVED BY CITY COUNCIL

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

WATER RIGHT CLAIM

RECEIVED
STATE DEPARTMENT OF ECOLOGY
JUN 21 1974 132273
CASH ___ CHECK ___ MONEY ORDER ___

1. NAME CITY OF CAMAS, WASHINGTON

ADDRESS 616 N.E. 4th Avenue

Camas, Washington ZIP CODE 98607

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Ground (SURFACE OR GROUND WATER)

W.R.I.A. 28 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS Deep Well No. 2

B. IF SURFACE WATER, THE SOURCE IS ___

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 900 gpm PRESENTLY USED 900 gpm
(CUBIC FEET PER SECOND OR GALLONS PER MINUTE)

B. ANNUAL QUANTITY CLAIMED 230 PRESENTLY USED 200
(ACRE FEET PER YEAR)

C. IF FOR IRRIGATION, ACRES CLAIMED ___ PRESENTLY IRRIGATED ___

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: The months of May through August

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Unknown YEAR Before 1945

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 2152 FEET North AND 731 FEET East FROM THE Southwest CORNER OF SECTION 12

BEING WITHIN Southwest quarter OF SECTION 12 T. 1 N., R. 3 E (E.OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT ___ BLOCK ___ OF Within the City limits of the City of Camas
(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Municipal supply

Clark COUNTY Washington

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal - Domestic Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED: ___

DO NOT USE THIS SPACE
THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHER PERSONS. NON-ISSUANCE OF A RECEIPT FOR A WATER RIGHT CLAIM DOES NOT CONSTITUTE RECEIPT FOR THE PURPOSES OF
DATE RETURNED THIS HAS BEEN AMENDED
WATER RIGHT CLAIM REGISTRY
JUL 24 10 28
DIRECTOR, DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

X CITY OF CAMAS, WASHINGTON

DATE June 11, 1974

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE, PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW.

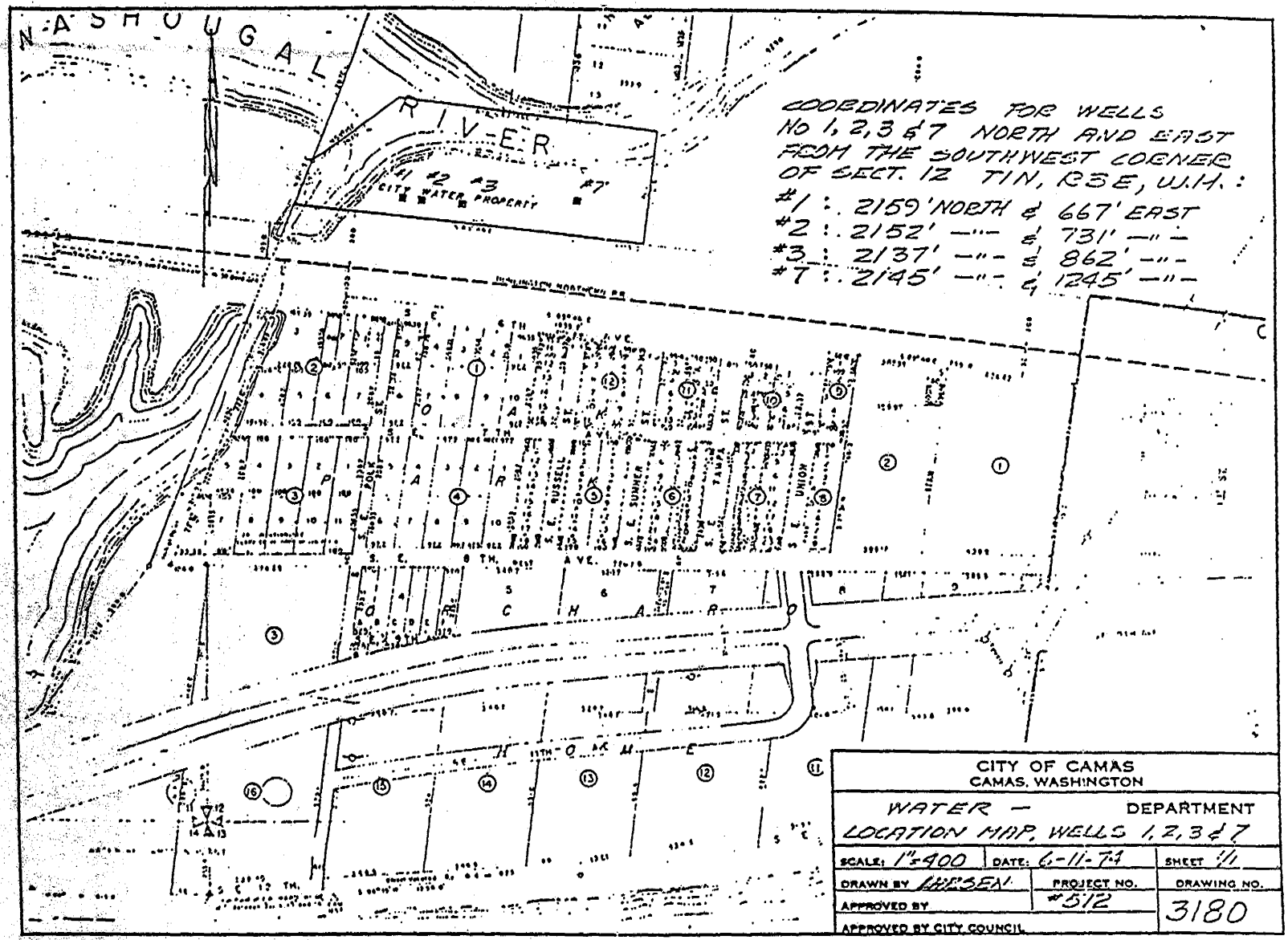
BY: Lewis Angelo
Lewis Angelo, Director of Public Works

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE.

A FEE OF $7.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT, ALONG WITH YOUR FEE TO:
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P.O. BOX 829 OLYMPIA, WASHINGTON 98504


N A S H O U G A L
R I V E R
#1 #2 #3 #7
CITY WATER PROPERTY
COORDINATES FOR WELLS
No 1, 2, 3 & 7 NORTH AND EAST
FROM THE SOUTHWEST CORNER
OF SECT. 12 T1N, R3E, W.M.:
#1 : 2159' NORTH & 667' EAST
#2 : 2152' —"— & 731' —"—
#3 : 2137' —"— & 862' —"—
#7 : 2145' —"— & 1245' —"—
CITY OF CAMAS
CAMAS, WASHINGTON
WATER — DEPARTMENT
LOCATION MAP, WELLS 1, 2, 3 & 7
SCALE: 1"=400
DATE: 6-11-74
SHEET 1/1
DRAWN BY
PROJECT NO. #512
DRAWING NO. 3180
APPROVED BY
APPROVED BY CITY COUNCIL

F No. 369—1923. Approved as to Form by Dept. of Efficiency. 8509.

CERTIFICATE RECORD NO. 2, PAGE NO. 711

STATE OF WASHINGTON, COUNTY OF Clark

CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits.)

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the regulations of the State Hydraulic Engineer thereunder.)

This is to certify, that City of Camas, *of* Camas, *State of* Washington, *has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of* Jones Creek, *a tributary of* Little Washougal River *for the purposes of* domestic supplies, *under* Appropriation *Permit No.* 1575, *of the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume* 2, *at Page* 711, *on the* 28th *day of* July, *19*33; *that the right hereby confirmed dates from* September 5th, *19*30; *that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 1.0 *cubic feet per second.*

A description of the lands under such right, and to which the water hereby confirmed is appurtenant, or if for other purposes, the place where such water is put to beneficial use, is as follows:

PLACE OF USE			LEGAL SUBDIVISION	[illegible]	[illegible]
Section	Township	Range			
			City of Camas		

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of herein described, except as provided in Section 39, Chapter 117, Session Laws 1917.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 28th *day of* July, *19*33.

State Supervisor of Hydraulics.

ENGINEERING DATA

O.K. [illegible]

NOTICE OF PETITION FOR CHANGE OF
POINT OF DIVERSION OF WATER.

TO WHOM IT MAY CONCERN:

Notice is hereby given that the City of Camas, Clark County, Washington, has filed a petition with the State Supervisor of Hydraulics, Olympia, Washington, for a permit to change the point of diversion of one cubic foot per second of the waters of Jones Creek from a point set out in water right permit 1575 as NW¼ of NW¼ of Sec. 10, Twp. 2 N., Rge. 4 E.W.M., to a point within the SW¼ of SW¼ of Sec. 3, Twp. 2 N., Rge. 4 E.W.M., such point being approximately one-half mile above the point of diversion described in permit, all in Clark County, Wash.

Any person, firm or corporation whose right will be injuriously affected by the granting of said petition may file with the Supervisor of Hydraulics, at Olympia, Washington, such objections or representations, in writing, as he may desire to make within thirty (30) days after the date of last publication, which date is _____.

Witness my hand and official seal this 24th day of April, 1933.

CHAS. J. BARTHOLET
State Supervisor of Hydraulics

PERMIT

This is to certify that I have examined the foregoing application and do hereby grant the same, subject to the following limitations and conditions. ~~If for irrigation, this appropriation shall be subject to such reasonable rotation system as may be ordered by the State Supervisor of Hydraulics.~~ And is further subject to rights of C. W. Cottrell under certificate #121, for the appropriation and use of waters of Little Washougel River of which Jones Creek is a tributary.

The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and not to exceed 1.0 *cubic feet per second, or its equivalent in case of rotation. The priority date of this permit is* September 5th, 1930.

Actual construction work shall begin on or before December 1st, 1931 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before* December 1st, 1952.

Complete application of the water to the proposed use shall be made on or before December 1st, 1953.

Given under my hand and the seal of this office at Olympia, Washington, this 2nd *day of* December, 1930.

Chas. J. Bartholomew
State Supervisor of Hydraulics.

Application No. 3[illegible]6
Permit No. 1575

PERMIT
To Appropriate Public Waters of the State of Washington

Filed by City of Camas
County of Clark

This instrument was first received in the office of the State Supervisor of Hydraulics, Olympia, Washington, on the 5th *day of* September, 19 30, *at* 8:30 *o'clock* A. M.

Approved December 2nd, 1930
Recorded in Book No. 7 *of Permits, on Page* 1575

CHAS. J. BARTHOLOMEW
State Supervisor of Hydraulics.

JAY ENGLISH, PUBLIC PRINTER

Before your certificate of water right is issued it will be necessary for you to file with the State Supervisor of Hydraulics a copy of each of the following reports:

1st. Progress reports (in case temporary permit is issued).
2nd. Affidavit of publication of notice of water right application.
3rd. Notice of beginning of construction.
4th. Notice of prosecution of work with diligence.
5th. Notice of completion of construction.
6th. Notice of application of water to a beneficial use.
7th. Proof of appropriation of water.

Upon a satisfactory showing that the appropriation has been perfected as provided by statute the State Supervisor of Hydraulics will issue a water right certificate.

[illegible]ks will be furnished by the office of State Supervisor of Hydraulics.

APPLICATION NO. 5126

CITY OF CAMAS

Examination made November 3rd & 4th, 1930

This application is for 1.0 c.f.s. for domestic use from Jones Creek a tributary of Washougal River.

November 3rd I talked to Mr. R. C. Sugg, Attorney for Mr. C. W. Cottrell who is making protest against the issuance of permit on this application. He stated he questioned the City of Camas right to Jones Creek but suggested I go over the ground with Mr. Cottrell.

November 4th I went over the ground with Mr. W. H. Barber, City Clerk and Superintendent of Water for City of Camas, also, in reference to application No. 924. Mr. Barber stated that a survey was made in 1925 and this system installed same year from the Little Washougal consisting of two reservoirs on hill above Camas and approximately 11 miles of pipe line. The main from reservoirs to "Y" is of 10 inch steel pipe the portion from "Y" to diversion of Little Washougal is of 8 inch steel pipe. The "Y" was installed for the purpose of diverting a portion of Jones Creek when the city needed the additional water.

There is approximately 6.0 c.f.s. in Jones Creek today.

I then went with Mr. Cottrell over the ground on Washougal River. There is approximately 15.0 c.f.s. in the Little Washougal at the mouth. Mr. Cottrell has a 75 K.W. plant on Washougal River about one-half mile below mouth of Little Washougal which is a part of supply. There is approximately 12.0 c.f.s. going over dam not utilized today.

Mr. Cottrell has another 2 unit hydro plant on Washougal River above mouth of Little Washougal which this application does not affect, it develops 362 K.W. He also has a 340 K.W. Diesel plant at Washougal.

Mr. Barber stated that the water supply from Little Washougal was so inadequate this summer that rigid restrictions were necessary and if they would of had fires the storage supply would have been exhausted.

Mr. Cottrell stated that shortage was experienced only at extreme low water.

The City of Camas has no other means of water supply. A permit should be issued the applicant for 1.0 c.f.s. subject to existing rights.

A. E. Hanson

Signed this 15 day of Nov. 1930.

O.K. for Permit and send to Denver 4/65

Form No. 349—1933. Approved as to Form by Dept. of Efficiency. 8189.

CERTIFICATE RECORD NO. 2, PAGE NO. 712

STATE OF WASHINGTON, COUNTY OF Clark

CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits.)

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the regulations of the State Hydraulic Engineer thereunder.)

This is to certify, that City of Camas, *of* Camas, *State of* Washington, *has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of* Little Washougal River, *a tributary of* Washougal River, *for the purposes of* municipal supply, *under* Appropriation Permit No. 1576, *of the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume* 2, *at Page* 712, *on the* 28th *day of* July, 1933; *that the right hereby confirmed dates from* August 22nd, 19 23; *that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 2.5 *cubic feet per second.*

A description of the lands under such right, and to which the water hereby confirmed is appurtenant, or if for other purposes, the place where such water is put to beneficial use, is as follows:

PLACE OF USE			LEGAL SUBDIVISION		
Section	Township	Range			
			City of Camas		

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Section 39, Chapter 117, Session Laws 1917.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 28th *day of* July, 19 33.

Chas. Danckaert
State Supervisor of Hydraulics.

Examined by

PERMIT

STATE OF WASHINGTON,
COUNTY OF THURSTON. } ss.

This is to certify that I have examined the foregoing application and do hereby grant the same, subject to the following limitations and conditions. ~~If for irrigation, this appropriation shall be subject to such reasonable rotation system as may be ordered by the State Hydraulic Engineer.~~ And is further subject to rights of C. W. Cottrell under certificate #121, for the appropriation and use of waters of Little Washougal River of which Jones Creek is a tributary.

The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and not to exceed 2½ *cubic feet per second, or its equivalent in case of rotation.*

The priority date of this permit is August 22nd, 1923

Actual construction work shall begin on or before December 1st, 1931 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before* December 1st, 1932

Complete application of the water to the proposed use shall be made on or before December 1st, 1933

WITNESS my hand this 2nd *day of* December, *19*30.

Chas. J. Barkhouse
State Hydraulic Engineer.

This form approved by the State Hydraulic Engineer, 1917.

Application No. 924
Permit No. 1576

PERMIT
To Appropriate the Public Waters of the State of Washington

Issued to City of Camas

County of Clark

This instrument was first received in the office of the State Hydraulic Engineer, Olympia, Washington, on the 22nd *day of* August, *19*23, *at* 1:45 *o'clock* P. M.

Returned to applicant for correction

Corrected Application received .....

Approved December 2nd, 1930

Recorded in Book No. 7 *of Permits, on Page* 1576

CHAS. J. BARKHOUSE
State Hydraulic Engineer,

Before your certificate of water right is issued it will be necessary for you to fill out and file with the State Hydraulic Engineer a copy of each of the following reports:

1st. Progress report.
2nd. Notice of water right application.
3rd. Notice to begin construction.
4th. Notice of prosecution of work with diligence.
5th. Notice of completion of construction.
6th. Notice of application of water to a beneficial use.
7th. Proof of appropriation of water.

Upon a satisfactory showing that the appropriation has been perfected as provided by statute the State Hydraulic Engineer will issue a water right certificate.

(Blanks will be furnished by the office of State Hydraulic Engineer.)

APPLICATION NO. 924

CITY OF CAMAS

Examination made November 4, 1950

This application is for 2.5 c.f.s. from Little Washougal a tributary to Washougal River for domestic and municipal supply.

Mr. Sugg stated he did not question in his mind the legal right of this application.

I went over the ground with Mr. W. H. Barber, City Clerk and Superintendent of City Water and found the following:

This system was installed in 1925 after a survey had been made, a part of which included a survey for pipe line extended to Jones Creek. The main is of 10" steel pipe from the two reservoirs on a hill about a mile above town of Camas a distance of about 9 miles to a "Y" then approximately 2 miles of 8" pipe to point of diversion. There is approximately 2.5 c.f.s. now running in pipe line and approximately 1.5 c.f.s. going past intake.

Mr. Barber stated that they were taking all of the water up to the recent rains about a week ago and was not filling the pipe and the City of Camas was under a dangerous water shortage.

This application is in reference to application No. 5126.

A. G. Stevens

Signed this 15 day of Nov. 1950.

V.K.
Subject to prior Permit #465

WELL No3

CERTIFICATE RECORD No. 1 PAGE No. 85-A

STATE OF WASHINGTON, COUNTY OF Clark

Certificate of Ground Water Right

Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and the rules and regulations of the State Supervisor of Hydraulics thereunder.

THIS IS TO CERTIFY That THE CITY OF CAMAS

of Camas, Washington, has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the ground waters of a Well

located within the NW¼ of SW¼ of Sec. 12 Twp. 1 N. Rge. 3 E.W.M.

for the purpose of Municipal Supply

under Ground Water Permit No. 2 issued by the State Supervisor of Hydraulics, and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume 1 at page 85-A ; that the quantity of ground water to which such right is entitled and hereby confirmed for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1200 gallons per minute; 118 acre-feet per year; That the right hereby confirmed dates from July 21, 1945.

~~for irrigation of xxxxxxxxxxxxxx acres.~~

A description of the lands under such right to which the ground water hereby confirmed is appurtenant, and the place where such water is put to beneficial use, is as follows:

City of Camas, Clark County, Washington.

The right to the use of the ground water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 13th day of November, 19 47

State Supervisor of Hydraulics.

S. F. No. 7334—6-45—3C. 9235.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
DIVISION OF HYDRAULICS

Permit to Appropriate Public Ground Waters of the State of Washington

Book No. 1 of Ground Water Permits, on page 2 under Application No. 4

The City of Camas

of City Hall, Camas, Washington

is hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights, and to the limitations and provisions set out herein.

Priority date of this permit is July 21, 1945

Source of the proposed ground water appropriation is a well

within area, sub-area

zone. Name or number of works is

Quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 1200 gallons per minute; 118 acre-feet per year, to be used for the following purposes: Municipal supply

as more definitely set out below.

Location of the well, tunnel, or infiltration trench is North 7°31' East 480 feet and South 83°46' East 112 feet from the Northwest corner of Block 1 of Oak Park Addition to the City of Camas, being within NW¼ of SW¼ of Sec. 12, Twp. 1 N., Rge. 3 E.W.M., county of Clark

Use, or uses to which water is to be applied:

For municipal supply: 1200 gallons per minute; acre-feet per year, to supply The City of Camas

For irrigation: gallons per minute; acre-feet per year, for the irrigation of acres.

For miscellaneous uses: gallons per minute; acre-feet per year, for

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Camas, Clark County, Washington

DESCRIPTION OF WORKS FROM WHICH WATER IS TO BE WITHDRAWN

The well will be Drilled (Dug or drilled) and have a diameter of 14 inches, and depth of 95 feet.

Description of tunnel or infiltration trench:

(Please read carefully provisions below)

Particular specifications required by the Supervisor of Hydraulics for the purpose of preventing waste of public waters:

Construction work shall begin on or before July 1, 1946 and shall thereafter be prosecuted with reasonable diligence and completed on or before October 1, 1946 and complete application of water to proposed use shall be made on or before October 1, 1947

Given under my hand and the seal of this office at Olympia, Washington, this 20th day of September, 19 45

CLARENCE B. SHAIN
State Supervisor of Hydraulics

By: Chas J. Northwest
Deputy.

GROUND WATER

APPLICATION NO. 4

... City of Camas.

The application of the City of Camas for the appropriation of 1200 gallons per minute from ground water through a well, which will be designated Well No. 3, was approved for a permit on September 6.

On September 21 the undersigned visited the locality, accompanied by Mr. Arthur K. Piper, Ground Water Geologist.

The City has a gravity water supply and an additional water supply from two wells. The supply from both of which sources does not furnish sufficient water for the town during the dry months. It was therefore found by the City officials that additional water had to be obtained in order to meet its requirements. For that reason they planned a third well to augment the water supply during critical periods.

Judging from the wells now in use, the amount of water applied for will be available and will be put to an important beneficial use.

Permit has been approved.

Signed this 25th day of September, 1945.

CHAS. J. BARTHOLET
Consulting Engineer

S. F. No. 1361—5-60—3M. 42306.

CERTIFICATE RECORD NO. 9 PAGE NO. 4072-A

STATE OF WASHINGTON, COUNTY OF Clark

Certificate of Ground Water Right

Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the State Supervisor of Water Resources thereunder.

THIS IS TO CERTIFY That CITY OF CAMAS, WASHINGTON

a municipal corporation, has made proof to the satisfaction of the State Supervisor of Water Resources of Washington, of a right to the use of the ground waters of a well located within NW¼ NW¼ Sec. 12, Twp. 1 N., R. 3 E. W.M., for the purpose of municipal supply under and subject to provisions contained in Ground Water Permit No. 4804 issued by the State Supervisor of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Water Resources of Washington and entered of record in Volume 9 at page 4072-A, that the right hereby confirmed dates from February 12, 1959; that the quantity of ground water under the right hereby confirmed for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1325 gallons per minute; 1208 acre-feet per year for municipal supply.

Special provisions required by the Supervisor of Water Resources:

A description of the lands to which such ground water right is appurtenant:

City of Camas, Clark County, Washington.

The right to the use of the ground water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Water Resources affixed this 24th day of November, 19 61.

M Grantham

S. F. No. 7336—12-58—20M. 58139.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

Permit to Appropriate Public Ground Waters of the State of Washington

Book No. 10 of Ground Water Permits, on page 404 under Application No. 5130

CITY OF CAMAS, WASHINGTON

or

is hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights, and to the limitations and provisions set out herein.

Priority date of this permit is February 12, 1959

Source of the proposed ground water appropriation is a well

within _____ area, _____ sub-area

_____ zone. Name or number of works is _____

Quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 1500 gallons per minute; 1206 acre-feet per year, to be used for the following purposes: municipal supply

as more definitely set out below.

Location of the well, tunnel, or infiltration trench is N.10°E. 150 feet from west quarter corner of sec.12

being within NW¼NW¼, sec.12, T.1 N., R.3 E.W.M.

county of Clark

Use, or uses to which water is to be applied:

For municipal supply: 1500 gallons per minute; 1206 acre-feet per year, to supply the City of Camas.

For irrigation: _____ gallons per minute; _____ acre-feet per year, for the irrigation of _____ acres.

For miscellaneous uses: _____ gallons per minute; _____ acre-feet per year for _____

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Camas, Clark County, Washington.

DESCRIPTION OF WORKS FROM WHICH WATER IS TO BE WITHDRAWN

The well will be drilled and have a diameter of 16 inches and depth of 135 feet.
(dug or drilled)

Description of tunnel or infiltration trench:

(Please read carefully provisions below)

Particular specifications required by the Supervisor of Water Resources for the purpose of preventing waste of public waters:

Construction work shall begin on or before May 1, 1960

and shall thereafter be prosecuted with reasonable diligence and completed on or before November 1, 1960

and complete application of water to proposed use shall be made on or before November 1, 1961

Given under my hand and the seal of this office at Olympia, Washington, this 6th day of May, 1959.

M. O. Watkins
State Supervisor of Water Resources

S. F. No. 1108-4-57-50M-3-2

RETURN TO:
DIVISION OF WATER RESOURCES
335 GENERAL ADMINISTRATION BLDG
OLYMPIA

RECEIVED
DIVISION OF WATER RESOURCES
JUL 15 1959

RECORD BY WELL DRILLER OR OTHER CONSTRUCTOR OF WORKS FOR WITHDRAWAL OF GROUND WATER

Under Permit No. G. W. 4804

("The well driller or other constructor of works for the withdrawal of public ground waters shall be obligated to furnish the permittee a certified record of the factual information necessary to show compliance with the provisions of this section." Sec. 8, Chap. 263, Laws of 1945.)

1. City of Camas, Washington
(Name and address of owner of well or other works for withdrawal of water)

2. Type; name or number of works where water is taken Well
(Well, tunnel or infiltration trench)

3. Date on which work on well or other structure was started June 2, 1959

4. Date on which work was completed July 7, 1959

5. If work on well or other structure was abandoned, give date _____

and reason for abandonment _____

6. DESCRIPTION OF WORKS:

(a) WELL: Depth 112 ft. Diameter 16 in. or ft. Dug or drilled Drilled

Flowing or pump well _____ Water Temp. 46 degrees

IF PUMP WELL: Type and size of pump is Test pump: 1500 g.p.m. pump 11½" bowl
9" pump column

Type and size of motor or engine is Gulberson Diesel 210 h.p.

Depth from ground surface to water level before pumping 35 ft.

After continuous operation for 8 hours (At least four), the measured discharge of the pump is 1500 g.p.m., and the drawdown of water level is 24 ft. (Pumping level minus static water level)

Recovery data (taken after pump has been shut off) (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level
Immediate recovery.			

Date of test June 29, 1959

IF FLOWING WELL: Measured discharge _____ g.p.m. on _____ (Date)

Shut-in pressure at ground surface _____ lbs. per sq. in. on _____ (Date)

Water is controlled by _____ (Cap, valve, etc.)

CASING: (Give diameter, commercial specifications and depth below ground surface of each casing size.)

16 in. diameter _____ from 0 to 112 ft.

_____ in. diameter _____ from _____ to _____ ft.

_____ in. diameter _____ from _____ to _____ ft.

_____ in. diameter _____ from _____ to _____ ft.

Describe and show depth of shoe, plug, adapter, liner or other details:

Grout seal from 32-35.
Grout seal from 15-18

OK

Perforated casing or screens:

60 perf. per ft. each perf. 1&3/8 by 3/8" from 82 to 102 ft.
(Describe perforations or slots)

from ____ to ____ ft.

from ____ to ____ ft.

from ____ to ____ ft.

from ____ to ____ ft.

LOG OF WELL OR TUNNEL: (Describe each stratum or formation clearly, indicate if water bearing, and give thickness and depth as indicated.)

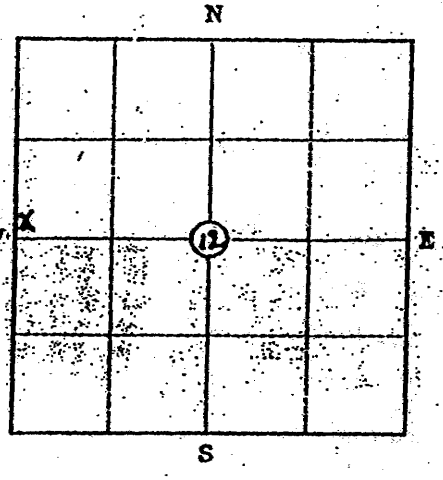
MATERIAL	Thickness (Feet)	Depth to bottom (Feet)
Top soil	3	3
Gravel and boulders	9	12
Gravel, some binder	9	21
Gravel and boulders	11	32
Cemented gravel	21	53
Loose sand and gravel, some silt	22	75
Loose sand and gravel, water-bearing	24	99
Large gravel and sand	11	110
Clay and gravel	2	112

(b) INFILTRATION TRENCH OR TUNNEL: Type ____

Dimensions: ____
(Tunnel—length, course, and cross-sectional size) (Trench—minimum and maximum depths)

Bottom width ____ ft. Discharge ____ g.p.m. Date of test ____

Position of water bearing stratum with reference to portal of tunnel ____



Scale: 1" = 2000'

Sec. 12 Twp. 1N Rge. 3E

Show approximate location of well or other works with (X) on section plat at left.

W. A. Shaw
Signature of well driller or other constructor

8110 S.E. Sunset Lane, Portland, Ore.
Address

STATE PRINTING PLANT OLYMPIA, WASH., 1947

well #4

Item 11.

Report of Examination on Ground Water

Received date 2-5-59 Date of exam 2-12-59 Appl. No 5130

Name City of Camas Address Camas, Washington

Type of works well Dimensions 16"x125'

Progress of works not begun

Quantity applied for 1500 g.p.m. acre-feet per year

Legal sub. NW¼NW¼ Sec. 12 Twp. 1 N. Rge. 3 E. County Clark

Use municipal water supply

Irrigation-acreage: Present Planned Feasible

Municipal: Population 5391 as of 1959

Industrial

Time pump will be operated

Other water rights appurtenant to this land Cert's. 711, 712 & 85 A

Proximity to existing works, springs, wells, or streams approximately 300' to Washougal River; approx. 35' above river level

Area Sub-area Zone

RECOMMENDATIONS

Approved for 1500 g.p.m. 1208 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

The water requirement for municipl supply is calculated on a per capita consumption of 200 gallons a day or 0.224 acre-feet per year, a total of 1208 acre-feet per year for 5391 persons, less any quantity diverted to this use under existing water rights.

The installation of an access port to well as described in attached Ground Water Bulletin No. 1 is recommended.

Signed this 13th day of April, 1959.

DEE MOLENAAR, Geologist
Division of Water Resources

2515

S. F. No. 2361—(Rev. 10-69)—10-69—534 15000.

CERTIFICATE RECORD NO. 14, PAGE NO. 6636-A

STATE OF WASHINGTON, COUNTY OF Clark

CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington of 1945, and amendments thereto, and the rules and regulations of the Department of Water Resources thereunder.)

THIS IS TO CERTIFY That CITY OF CAMAS

of Camas, Washington, has made proof to the satisfaction of the Department of Water Resources of a right to the use of the public ground waters of the State of Washington from a well

located within Lot 9, Plat of Orchard Home within the City of Camas and road right of way abutting thereto to the east, of Sec. 12, Twp. 1 N., R. 3 E., W.M.,

for the purpose(s) of Municipal supply

under and specifically subject to provisions contained in Ground Water Permit No. 8627 issued by the Department of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Water Resources and entered of record in Volume 14 at page 6636-A; that the priority of the right hereby confirmed dates from March 22, 1968; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 600 gallons per minute, 920 acre-feet per year for municipal supply continuously during entire year to supply an estimated population of 8550 by 1970.

16636-A

A description of the lands to which such ground water right is appurtenant is as follows:

City of Camas

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.160.

WITNESS the seal and signature of the Assistant Director, Division of Water Management, Department of Water Resources, affixed this 17th day of November, 19 69

Glen L. Liddell

Assistant Director
Division of Water Management
Department of Water Resources

Engineering Data

S. F. No. 7234—OS—4-67.

STATE OF WASHINGTON
DEPARTMENT OF WATER RESOURCES
DIVISION OF WATER MANAGEMENT

Permit to Appropriate Public Ground Waters of the State of Washington

Book No. 18 of Ground Water Permits, on page 8627 under Application No. 9326

CITY OF CAMAS

of Camas, Washington

is hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights, and to the limitations and provisions set out herein.

Priority date of this permit is March 22, 1968

Source of the proposed ground water appropriation is a well

within _____ area, _____ sub-area

_____ zone. Name or number of works is _____

Quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 700 gallons per minute; 1120 acre-feet per year, to be used for the following purposes: municipal supply

as more definitely set out below.

Location of the well, tunnel, or infiltration trench is 2760 feet east and 840 feet north of southwest corner of Sec. 12

being within Lot 9, Plat of Orchard Home within City of Camas and road right-of-way abutting thereto to the east, of Sec. 12, T. 1 N., R. 3 E.W.M.

county of Clark

Use, or uses to which water is to be applied:

For municipal supply: 700 gallons per minute; 1120 acre-feet per year,

to supply municipal supply for estimated population of 8500 by 1970

For irrigation: _____ gallons per minute; _____ acre-feet per year,

for the irrigation of _____ acres.

For miscellaneous uses: _____ gallons per minute; _____ acre-feet per year,

for _____

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Camas

DESCRIPTION OF WORKS FROM WHICH WATER IS TO BE WITHDRAWN

The well will be drilled (Dug or drilled) and have a diameter of 8 inches, and depth of 70 feet.

Description of tunnel or infiltration trench:

Please read carefully provisions below)

Particular specifications required by the Department of Water Resources for the purpose of preventing waste of public waters:

Issued as a supplementary supply to Surface Water Certificates 711 and 712, Ground Water Certificates 85-A and 4072-A and concurrent Ground Water Application 9325, for 700 gallons per minute and ~~1120~~ 2240 acre-feet per year; the total quantity withdrawn or diverted from all sources is not to exceed 3300 acre-feet per year.

Construction work shall begin on or before Started

and shall thereafter be prosecuted with reasonable diligence and completed on or before September 1, 1969

and complete application of water to proposed use shall be made on or before September 1, 1970

Given under my hand and the seal of this office at Olympia, Washington, this 21st day of August, 19 68.

Glen H. Faddis

Assistant Director
Division of Water Management
Department of Water Resources

File Original and First Copy with the Division of Water Resources
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. 9326

Permit No. 8627

(1) OWNER: Name City of Camas Address 616 N.E. 4th Avenue

(2) LOCATION OF WELL: County Clark - Lot 9, Plat of Orchard 54 ¼ SE ¼ Sec. 12 T. 1 N. R. 3E W.M.

Bearing and distance from section or subdivision corner: Home within City of Camas& road right of way abutting thereto the East of Sec. 12 TIN R3 East of WM

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 5
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches. Drilled 71 ft. Depth of completed well 71 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8 " Diam. from ft. to ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☒ No ☐
Type of perforator used
SIZE of perforations 3/8" in. by 1-1/4" in.
408 perforations from 44'6" ft. to 65 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☐ No ☐ To what depth? 22 ft.
Material used in seal Concrete grout
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off gravity

(7) PUMP: Manufacturer's Name Johnson
Type: V.H.S. Turbine H.P. 75

(8) WATER LEVELS: Land-surface elevation above mean sea level 36 ft.
Static level 36 ft. below top of well Date 7-25-68
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? O.J. Norris
Yield: 450 gal./min. with 1 ft. drawdown after 8 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test 3-16-68
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 53° Was a chemical analysis made? Yes ☒ No ☐

See attached copy

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7154—(Rev. 2-66)—3-66—5M—File. WR

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Surface dirt with small boulder	0	3
Gravel & Bouxlers, very little binder	3	7
Gravel & boulders w/ clay binder	7	21
Large gravel & small boulders, loose	21	24
Med. size gravel, fairly loose	24	33
Med size gravel	33	35
Large to fine gravel, some red gravel	35	45
Started making water at 35 feet		
Med. to fine gravel, clean some red - very little sand	45	48
Some larger gravel	48	56
Med. to fine gravel, clean & loose	56	60
Med to fine gravel clean, loose	60	65
Med to fine gravel, clean, loose	65	67' 6"
Loose gravel formation	67'6"	68' 6"
Loose gravel formation	68'6"	69' 6"
Fine yellow sand	69'6"	71
Sealed bottom with concrete	71	

Work started Feb. 14 19 68 Completed Mar. 19 19 68

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME O.J. NORRIS - WATER WELL DRILLING
(Person, firm, or corporation) (Type or print)
Address 4411 N.E. 59th Avenue Vancouver, Washington

[Signed] O. J. Norris
(Well Driller)

License No. 223 62 4069 Date Sept. 9, 19 68

Report of Examination on Ground Water

Received date March 22, 1968 Date of exam May 28, 1968 Appl. No. 9326

Name City of Camas Address 616 N.E. 4th Ave., Camas, Wash. 98607

Type of works a well Dimensions 8" x 70'

Progress of works Started

Quantity applied for 700 g.p.m. acre-feet per year

Legal sub / Sec 12 Twp 1 N. Rge 3 E. County Clark

Lot 9, Plat of Orchard Home within City of Camas & road right of way abutting thereto to the east

Use Municipal supply

Irrigation-acreage: Present Planned Feasible

Municipal: Population 8500 as of 1970

Industrial

Time pump will be operated May 1st through September 30th

Other water rights appurtenant to this land SW Cert. 711 for 1.0 cfs from Jones Cr. for dom. supply; SW Cert. 712 for 2.5 cfs from Little Washougal R. for Munic. supply; GW Cert. 85-A for 1200 gpm, 118 ac-ft/yr for munic. supply; GW Cert. 4072-A for 1325 gpm; 1208 ac-ft/yr for mun. sup.; and concurrent GW App. 9325 for 1500 gpm for mun. supply.

Proximity to existing works, springs, wells, or streams / City of Washougal, northeasterly 1200 feet

Area Sub-area Zone

RECOMMENDATIONS

Approved for 700 g.p.m. 1120 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

It is noted that the well site and water transmission facilities therefrom are not located upon the land owned by the applicant. Applicant is, accordingly, advised that the issuance of permit by this department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the State Director of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Department of Health, 304 Public Health Building, Olympia, with regard to the need for compliance.

The following water rights are appurtenant to this land:

Certificate Number	c.f.s./g.p.m.
Surface Water Cert. 711	1.0 c.f.s.
Surface Water Cert. 712	2.5 c.f.s.
Ground Water Cert. 85-A	1200 g.p.m.
Ground Water Cert. 4072-A	1325 g.p.m.
Concurrent Ground Water Appli. 9325	1500 g.p.m.

(over)

2520

The total requirement based on an engineering study is 345 gallons per capita per day for all purposes for an estimated population of 8500 by 1970, or approximately 3300 acre-feet per year.

The quantity recommended under this application is 700 gallons per minute pumping continuously, or 1120 acre-feet per year.

The permit when issued will carry the following provision: "Issued as a supplementary supply to Surface Water Certificates 711 and 712, Ground Water Certificates 85-A and 4072-A and concurrent Ground Water Application 9225, for 700 gallons per minute and 1120 acre-feet per year, the total quantity withdrawn or diverted from all sources is not to exceed 3300 acre-feet per year."

Signed at Olympia, Washington
this 5 day of June, 1968

B. A. CAMERON, Engineer
Division of Water Management

S. F. No. 7361—(Rev. 10-801—10-68—33M 12000.

CERTIFICATE RECORD NO. 14, PAGE NO. 6435-A

STATE OF WASHINGTON, COUNTY OF Clark

CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Water Resources thereunder.)

THIS IS TO CERTIFY That CITY OF CAMAS

of Camas, Washington, has made proof to the satisfaction of the Department of Water Resources of a right to the use of the public ground waters of the State of Washington from a well

located within David C. Parker D.L.C. No. 48

Sec. 12, Twp. 1 N., R. 3 E. W.M.,

for the purpose(s) of Municipal supply

under and specifically subject to provisions contained in Ground Water Permit No. 8344

issued by the Department of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Water Resources and entered of record in Volume 14 at page ~~6435-A~~ 6635-A; that the priority of the right hereby confirmed dates from March 22, 1968; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1500 gallons per minute, 2400 acre-feet per year for municipal supply to supply a population of 8500 by 1970 continuously during entire year.

A description of the lands to which such ground water right is appurtenant is as follows:

City of Camas

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

WITNESS the seal and signature of the Assistant Director, Division of Water Management, Department of Water Resources, affixed this 17th day of November, 19 69

C-37

Glen H. Lidke

STATE OF WASHINGTON
DEPARTMENT OF WATER RESOURCES
DIVISION OF WATER MANAGEMENT

Permit to Appropriate Public Ground Waters of the State of Washington

Book No. 18 of Ground Water Permits, on page 8544 under Application No. [illegible]

CITY OF CAMAS

of Camas, Washington

is hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights, and to the limitations and provisions set out herein.

Priority date of this permit is March 22, 1968

Source of the proposed ground water appropriation is a well

within _____ area, _____ sub-area

_____ zone. Name or number of works is _____

Quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 1500 gallons per minute; 2400 acre-feet per year, to be used for the following purposes: municipal supply

as more definitely set out below.

Location of the well, tunnel, or infiltration trench is 2300 feet east and 1800 feet north of southwest corner of Sec. 12

being within David C. Parker D.L.C. No. 48 of Sec. 12, T. 1 N., R. 3 E.W.M.

county of Clark

Use, or uses to which water is to be applied:

For municipal supply: 1500 gallons per minute; 2400 acre-feet per year, to supply a population of 8500 by 1970 continuously during entire year.

For irrigation: _____ gallons per minute; _____ acre-feet per year, for the irrigation of _____ acres.

For miscellaneous uses: _____ gallons per minute: _____ acre-feet per year, for _____

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Camas

2523

DESCRIPTION OF WORKS FROM WHICH WATER IS TO BE WITHDRAWN

The well will be drilled (Dug or drilled) and have a diameter of 16 inches, and depth of 85 feet.

Description of tunnel or infiltration trench:

Please read carefully provisions below)

Particular specifications required by the Department of Water Resources for the purpose of preventing waste of public waters: 1) The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final Certificate of Water Right. 2) Issued as a supplementary supply to Surface Water Certificates 711 and 712, Ground Water Certificates 85-A and 4072-A and concurrent Ground Water Application 9126, for 1500 gallons per minute and 2400 acre-feet per year; the total quantity withdrawn or diverted from all sources is not to exceed 3300 acre-feet per year.

(Gallons per min.) 2400

Construction work shall begin on or before July 1, 1969

and shall thereafter be prosecuted with reasonable diligence and completed on or before July 1, 1970

and complete application of water to proposed use shall be made on or before July 1, 1971

Given under my hand and the seal of this office at Olympia, Washington, this 20th day of June, 1968

Glen H. Fuller

Assistant Director
Division of Water Management
Department of Water Resources

WELL #6

Report of Examination on Ground Water

Received date March 22, 1968 Date of exam. May 28, 1968 Appl. No. 9325

Name City of Camas Address 616 N.E. 4th Ave., Camas, Wash. 98607

Type of works a well Dimensions 16" x 85'

Progress of works Not started

Quantity applied for 1500 g.p.m. 2300 acre-feet per year

David C. Parker D.L.C. No. 48

Legal sub. / Sec. 12 Twp. 1 N. Rge. 3 E. County Clark

Use Municipal supply

Irrigation-acreage: Present Planned Feasible

Municipal: Population 8500 as of 1970

Industrial

Time pump will be operated Continuously

Other water rights appurtenant to this land SW Cert. 711 for 1.0 cfs from Jones Cr. for dom. supply; SW Cert. 712 for 2.5 cfs from Little Washougal R. for munic. supply; GW Cert. 85-A for 1200 gpm, 118 ac-ft/yr for munic. supply; GW Cert. 4072-A for 1325 g.p.m; 1208 ac-ft/yr for mun. sup.; and concurrent GW App. 9326 for mun. supply, 700 gpm.

Proximity to existing works, springs, wells, or streams /

City of Camas, west 1300 feet:

City of Washougal, east 1300 feet

Area Sub-area Zone

RECOMMENDATIONS

Approved for 1500 g.p.m. 2400 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

It is noted that the well site and water transmission facilities therefrom are not located upon the land owned by the applicant. Applicant is, accordingly, advised that the issuance of permit by this department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the State Director of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Department of Health, 304 Public Health Building, Olympia, with regard to the need for compliance.

The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final Certificate of Water Right. The applicant may, for his own convenience, wish to install an air-line and gage in addition to the access port.

(over)

The following water rights are appurtenant to this land:

Certificate Number	c.f.s./g.p.m.
Surface Water Cert. 711	1.0 c.f.s.
Surface Water Cert. 712	2.5 c.f.s.
Ground Water Cert. 85-A	1200 g.p.m.
Ground Water Cert. 4072-A	1325 g.p.m.
Concurrent Ground Water Appli. 9326	700 g.p.m.

The total requirement based on an engineering study is 345 gallons per capita per day for all purposes for an estimated population of 8500 by 1970, or approximately 3300 acre-feet per year.

The quantity recommended under this application is 1500 gallons per minute pumping continuously, or 2400 acre-feet per year.

The permit when issued will carry the following provision: "Issued as a supplementary supply to Surface Water Certificates 711 and 712, Ground Water Certificates 85-A and 4072-A and concurrent Ground Water Application 9326, for 1500 gallons per minute and 2400 acre-feet per year; the total quantity withdrawn or diverted from all sources is not to exceed 3300 acre-feet per year."

Signed at Olympia, Washington
this 2 day of June, 1968

B. A. CAMERON, Engineer
Division of Water Management

File Original and First Copy with the Division of Water Resources
Second Copy -- Owner's Copy
Third Copy -- Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. 9325
Permit No. 8544

(1) OWNER: Name City of Camas Address 616 N.E. 4th Avenue

(2) LOCATION OF WELL: County Clark David C Parker D.L.C. #48 NE¼ SW¼ Sec. 12 T. 1 N. R. 3E W.M.
Bearing and distance from section or subdivision corner.

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 6
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 16 inches.
Drilled 85 ft. Depth of completed well 85 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 16"OD Diam. from 0 ft. to 85 ft.
Threaded ☐ ____" Diam. from ____ ft. to ____ ft.
Welded ☒ ____" Diam. from ____ ft. to ____ ft.

Perforations: Yes ☒ No ☐
Type of perforator used Mill knife
SIZE of perforations 5/16 in. by 3-1/2 in.
____ perforations from ____ ft. to ____ ft.
552 perforations from 56 ft. to 80 ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name ____
Type ____ Model No. ____
Diam. ____ Slot size ____ from ____ ft. to ____ ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ____
Gravel placed from ____ ft. to ____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 22 ft.
Material used in seal Concrete grout
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ____ Depth of strata 27
Method of sealing strata off ____

(7) PUMP: Manufacturer's Name ____
Type: ____ H.P. ____

(8) WATER LEVELS: Land-surface elevation above mean sea level 48 ft.
Static level 45 ft. below top of well Date 6-29-68
Artesian pressure ____ lbs. per square inch Date ____
Artesian water is controlled by ____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? City
Yield: 1600 gal./min. with 5 ft. drawdown after 12 hrs
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test June 29, 1968
Bailer test ____ gal./min. with ____ ft drawdown after ____ hrs.
Artesian flow ____ g.p.m. Date ____
Temperature of water 53° Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Surface Soil	0	2
Gravel & Small Boulders	2	6
Gravel & Boulders	6	10
Gravel & Small Boulders	10	14
Boulders	14	15
Pea Gravel	15	17
Boulders	17	19
Boulders	19	21
Large to Medium gravel	21	26
Medium to fine gravel, some sand	26	30
Medium to fine gravel with a few boulders	30	40
Med. to fine gravel with fine sand	40	48'6"
Med to fine gravel with some sand	48'6"	53
Water bearing gravel and sand	53	55
Med to fine gravel, water bearing	55	59
Med to fine gravel, water bearing	59	69
Med to fine gravel, some black sand water bearing	69	76
Med to large gravel	76	80
Gravel & small boulders, very tight formation	80	83'9"
Med hard gray rock	83'9"	85

Work started June 5, 1968 Completed 6-27-68, 19

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME O.J. NORRIS-WATER WELL DRILLING
(Person, firm, or corporation) (Type or print)
Address 4411 N.E. 59th Avenue Vancouver, Washington

[Signed] O. J. Norris
(Well Driller)

License No. 223 02 4069 Date Sept. 9, 1968

See Enclosed

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 1386—(Rev. 3-66)—3-66—5M. 4516

CK/WCL

S. F. No. 2361—(Rev. 6-70).

WELL No 7

Item 11.

CERTIFICATE RECORD NO. ——, PAGE NO. G 2-00501 C

STATE OF WASHINGTON, COUNTY OF Clark

CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology thereunder.)

THIS IS TO CERTIFY That CITY OF CAMAS

of Camas, Washington, has made proof to the satisfaction of the Department of Ecology of a right to the use of the public ground waters of the State of Washington from a well

located within a portion of David C. Parker D.L.C. #48 lying within the SW¼ within the city limits of Camas

Sec. 12, Twp. 1 N., R. 3 E., W.M.,

for the purpose(s) of municipal supply

under and specifically subject to provisions contained in Ground Water Permit No. 10515 issued by the Department of Ecology and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Ecology and entered of record in Volume — at page 1 G 2-00501 C ; that the priority of the right hereby confirmed dates from March 22, 1971 ; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1000 gallons per minute; 530 acre-feet per year, during entire year for municipal supply.

A description of the lands to which such ground water right is appurtenant is as follows:

Area served by the City of Camas.

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and seal of this office at Olympia, Washington, this 16th day of February, 1973

JOHN A. BIGGS, Director
Department of Ecology

by R. L. Bolton

Engineering Data
TM

C-43

Well No 7

S. F. No. 2354—(Rev. 6-70)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Permit to Appropriate Public Waters of the State of Washington

Book No. 22 of Ground Water Permits, on page 10515 under Application No. 11718

CITY OF CAMAS

of CAMAS, WASHINGTON

is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.

Priority date of this permit is March 22, 1971

Source(s) of the proposed ground water appropriation is/~~are~~ a well

The quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 1000 gallons per minute; 530 acre-feet per year, to be used for the following purposes: municipal supply

as more definitely set out below.

Approximate location(s) of the point(s) of withdrawal is/~~are~~ 1245 feet east and 2145 feet north of southeast corner of Sec. 12

being within A portion of David C. Parker D.L.C. # 48 lying within the SW¼ within the city limits of Camas

of Sec. 12, Twp. 1 N., Rge. 3 E. W.M., Clark County.

The use, or uses, to which water is to be applied:

~~Domestic~~/municipal supply: 1000 gallons per minute; 530 acre-feet per year, during entire year.

Irrigation: gallons per minute; acre-feet per year from to each year, for the irrigation of acres.

Other use(s): gallons per minute: acre-feet per year, from to each year, for

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the City of Camas

ADDITIONAL LIMITATIONS AND PROVISIONS: The installation and maintenance of an access port as described in Ground Water Bulletin No. ' shall be required prior to issuance of final Certificate of Water Right.

The total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificates No. 711 and 712 and Ground Water Certificates Nos. 85, 4072, 6635 and 6636 shall not exceed 5750 acre-feet per year.

Nothing in this permit shall **be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.**

DESCRIPTION OF PROPOSED WORKS:

The well will be drilled (Dug or drilled) and have a diameter of 14 inches, and depth of 85 feet.

Description of tunnel or infiltration trench: _____

DEVELOPMENT SCHEDULE:

Construction work shall begin on or before Started

and shall thereafter be prosecuted with reasonable diligence and completed on or before November 1, 1972

and complete application of water to proposed use shall be made on or before November 1, 1973

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Olympia, Washington, this 10th day of November 19 71.

JOHN A. BIGGS, *Director*
Department of Ecology

by R. Jerry Bollen

ENGINEERING DATA

File Original and First Copy with the Division of Water Resources
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. 11716
Permit No. .....

(1) OWNER: Name CITY OF CAMAS, WASH Address 616 NE 4TH AVE CAMAS, WASH

(2) LOCATION OF WELL: County CLARK — NE ¼ SW ¼ Sec 12 T 1 N. R 3E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 7
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 14 inches.
Drilled 84 ft. Depth of completed well 84 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 14 " Diam. from +5 ft. to 84 ft.
Threaded ☐ ..... " Diam. from ..... ft. to ..... ft.
Welded ☒ ..... " Diam. from ..... ft. to ..... ft.

Perforations: Yes ☒ No ☐
Type of perforator used STAR
SIZE of perforations 3/8 in. by 1¼ in.
520 perforations from 49 ft. to 77 ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☐ No ☒
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... from ..... ft. to ..... ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal CEMENT GROUT
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: Submersible turbine HP 100
1-25-75 JM

(8) WATER LEVELS: Land-surface elevation above mean sea level ..... ft.
Static level 8.5 ft. below top of well Date 6/22/71
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? STRASSER
Yield: 1000 gal./min. with 4 ft. drawdown after 1½ hrs.
" 1425 " 5 " 6 "
" 1200 " 4 " 24 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
IMMEDIATE	RECOVERY				

Date of test JUNE 22, 1971
Bailer test ..... gal./min. with ..... ft. drawdown after ..... hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water 57 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
GRAVEL AND BOULDERS	0	8
GRAVEL, SOME CLAY	8	18
CEMENTED GRAVEL	18	20
LOOSE GRAVEL	20	30
PACKED GRAVEL	30	36
GRAVEL AND GREY CLAY	36	39
LOOSE GRAVEL (WATER)	39	65
MEDIUM GRAVEL (WATER)	65	70
LARGE GRAVEL (WATER)	70	81
RED CLAY	81	84

RECEIVED
DEPARTMENT OF ECOLOGY
JUL 1 1971
AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

Work started JUNE 7, 19 71 Completed JUNE 25, 19 71

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME R.J. STRASSER DRILLING CO (Person, firm, or corporation) (Type or print)
Address 8110 SE SUNSET LANE PORTLAND ORE
[Signed] Robert L Strasser (Well Driller)
License No 223022806 Date JULY 12, 1971

(USE ADDITIONAL SHEETS IF NECESSARY)

O.F. No. 7256—(Rev. 2-68)—3M. 4816.

well #7

Report of Examination on Ground Water

Received date March 22, 1971 Date of exam. August 31, 1971 Appli. No. 11718

Name City of Camas Address 616 N.E. 4th Ave., Camas WA 98607

Type of works A well Dimensions 14" x 85'

Progress of works Well drilled and capped

Quantity applied for 1000 g.p.m. 530 acre-feet per year of David C. Parker P.L.C. #48 within the City of Camas (lying within the SW¼)

Legal sub A portion/Sec. 12 Twp. 1 Rge. 3 E. County Clark

Use Municipal supply

Irrigation-acreage: Present Planned Feasible

Municipal: ~~Population~~ Area served 15,000 as of 1990

Industrial

Time pump will be operated Continuously

Other water rights appurtenant to this land See Surface Water Certificates Nos. 712 & 711; Ground Water Certificates Nos. 85, 4072, 6635 and 6636

Proximity to existing works, springs, wells, or streams City of Camas, west 400'; City of Camas, southeasterly 1000'; City of Camas, north; Washougal River, north 200'

Area Sub-area Zone

RECOMMENDATIONS

Approved for 1000 g.p.m. 530 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right. The applicant may, for his own convenience, wish to install an airline and gage in addition to the access port.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the Assistant Secretary, Division of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Division of Health, Public Health Bldg. No. 7, Thurston Airdustrial Center, Olympia, with regard to the need for compliance.

The following water rights are appurtenant to this land:

Certificate No.	c.f.s./g.p.m.	ac-ft per yr.
SWC 711	1.0 c.f.s.	730
SWC 712	2.5 c.f.s.	1820
GWC 85-A	1200 g.p.m.	118
GWC 4072-A	1325 g.p.m.	1208
GWC 6635	1500 g.p.m.	2400
GWC 6636	600 g.p.m.	920

The total requirement based on an engineering study is 345 gallons per capita per day for all purposes for an estimated population of 15,000 by 1990 or approximately 5,750 acre-feet per year.

The quantity recommended under this application is 1000 gallons per minute not to exceed 530 acrefeet per year as requested in the application.

The permit when issued will carry the following provision: 'The total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificates Nos. 711 and 712 and Ground Water Certificates Nos. 85, 4072, 6635 and 6636 shall not exceed 5,750 acre-feet per year."

Additionally, the permit when issued shall carry the following provision: "Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971."

Signed at Olympia, Washington
this 28th day of September, 1971.

JERRY LOUTHAIN, Engineer
Department of Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
February 4, 1977	G 2-24400	G 2-24400 P	G 2-24400 C

NAME
CITY OF CAMAS

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
P.O. Box 1055	Camas	Washington	98607

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	900	530

QUANTITY, TYPE OF USE, PERIOD OF USE		
530 acre-feet per year	municipal supply	continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
1375 feet East and 2145 feet North of Southwest corner of Section 12.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼	12	1	3 E	28	Clark

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Camas Municipal water system.

"The total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificate No. 711 and 712 and Ground Water Certificate Nos. 85A, 4072 A, 6635 A and G 2-00501 and this certificate shall not exceed 5750 acre-feet per year."

↑ 6635A ?

The access port as required on your permit shall be maintained at all times.

"All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under Chapter 18.104 RCW (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and maintenance of Water Wells)."

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Olympia *Washington, this* 23rd *day of* May, *19* 79

WILBUR G. HALLAUER, DIRECTOR

Department of Ecology

by E.W. ASSELSTINE, Regional Manager

ENGINEERING DATA

OK RPS

OTES

FOR COUNTY USE ONLY

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. 52-24400P
Permit No.

(1) OWNER: Name City of Camas Address Camas, Washington

(2) LOCATION OF WELL: County Clark NW¼ SW¼ Sec. 12 T. 1 N. R. 3E W.M.
Bearing and distance from section or subdivision corner 1375 E. & 2145' N of SW Cor of Sec 12

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 8
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 14 inches.
Drilled 87 ft. Depth of completed well 87 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 14" Diam. from 0 ft. to 87 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.
(3' riser added for future fill)
Perforations: Yes ☒ No ☐
Type of perforator used Mills Knife
Size of perforations 3/8 in. by 3½ in.
8 rows perforations from 44 ft. to 79 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft
Material used in seal Cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 33.2 ft. below top of well Date 5/10/77
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? driller
Yield: 1,040 gal./min. with 1.15 ft. drawdown after ½ hrs.
" 1,791 " 3.60 " 6 "
" 1,921 " 3.65 " 7 "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
0:00	36.85				
7:00	34.00				
minutes					

Date of test 5/10/77
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 50° Was a chemical analysis made? Yes ☒ No ☐

OK PTS

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Topsoil	0	6"
Gravel, small boulders	6"	4'
Gravel, boulders	4'	21'
Gravel, small boulders, brown clay seams	21'	37'
Gravel, loose, some brown clay	37'	39'
Gravel, sand, gray	39'	42'
Gravel, sand, gray, water bearing	42'	49'
Gravel, medium size, sand, gray, loose, water bearing	49'	55'
Gravel, small to large, loose, water bearing	55'	75'
Gravel, medium to large, loose	75'	79'
Gravel, large, red clay	79'	82'
Clay, red	82'	87'

RECEIVED
JUN 6 '77
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 4/14 19 77 Completed 5/19 19 77

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME NORRIS DRILLING & PUMP CO., INC.
(Person, firm, or corporation) (Type or print)
Address 11026 N.E. St. Johns Blvd. Vancouver, Washington 98665

[Signed] O. J. Norris
(Well Driller)

License No. 0366 Date June 6 19 77

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
February 4, 1977	G 2-24400	G 2-24400 P	

NAME
CITY OF CAMAS

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
616 NE 4th Ave. PO Box 1065	Camas	Washington	98607

The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	900	530

QUANTITY, TYPE OF USE, PERIOD OF USE
530 acre-feet per year — municipal supply — continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
1375 feet East and 2145 feet North of Southwest corner of Section 12.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼	12	1	3 E	28	Clark

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Camas Municipal water system.

DESCRIPTION OF PROPOSED WORKS

Well 14" x 85', 100 HP pump to municipa water system.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	July 1, 1979	July 1, 1980

PROVISIONS

"The total amount of water to be withdrawn or diverted, which includes the amounts as approved in surface water certificate No. 711 and 712 and Ground Water Certificate Nos. 85A, 4072 A, 5635 A and G2-00501 and this permit shall not exceed 5750 acre-feet per year.

The installation of an access port as described in Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right. The permittee, may for his own convenience, wish to install an airline and gage in addition to the access port.

"All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under Chapter 18.104 RCW (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and maintenance of Water Wells)."

Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Olympia *Washington, this* 15th *day of* March, *19* 78

WILBUR HALLAUER, DIRECTOR
Department of Ecology

by E.W. Asselstine

E.W. Asselstine, Regional Manager

ENGINEERING DATA
OK RPB

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
February 4, 1977	G 2-24400		

NAME
CITY OF CAMAS

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
616 NE 4 th Ave	Camas	Washington	98607

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	900	530

QUANTITY, TYPE OF USE, PERIOD OF USE		
530 acre-feet per year	municipal supply	continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
1375 feet East and 2145 feet North of Southwest corner of Section 12.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW¼	12	1	3 E	28	Clark

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Camas Municipal water system.

2539

DESCRIPTION OF PROPOSED WORKS

1 14" x 85', 100 HP pump to municipal water system.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	July 1, 1979	July 1, 1980

PROVISIONS

Recommend this application be approved for 900 gallon per minute and 530 acre-feet per year for a municipal supply for the City of Camas.

The following water rights are appurtenant to this land.

Certificate No.	CFS/GPM	Acre-feet per year
SWC 711	1.0 CFS	730
SWC 712	2.5 CFS	1820
GWC 85-A	1200 GPM	118
GWC 4072 A	1325 GPM	1208
GWC 6635	1500 GPM	2400
GWC 6636	600 GPM	920
G2 - 00501 C	1000 GPM	530

total requirement based on an engineering study is 345 gallons per capita per day for all poses for an estimated population of 15,000 by 1990 or approximately 5,750 acre-feet per year. The permit when issued will carry the following provision: "The total amount of water to be withdrawn or diverted, which includes the amounts as approved in surface water certificate Nos. 711 and 712 and Ground Water Certificate Nos. 85A, 4072A, 6635 A 6636 A and G2-00501 and this application shall not exceed 5750 acre-feet per year.

The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right. The applicant may for his own convenience, wish to install an airline and gage in addition to the access port.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the Water Supply and Waste Section, Department of Social and Health Services, Mail Stop 4-1, Building 4, Olympia, Washington, 98504, prior to any new construction or alterations of a public water supply.

"All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under Chapter 18.104 RCW (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells)."

Nothing in this application shall be construed as excusing the applicant from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.

ned at Olympia, Washington,
...is 4 day of August, 1977.

Robert P. Burrell
Robert P. Burrell
Department of Ecology

2540

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 13, 1986	G2-27384	G2-27384 P	

NAME
City of Camas

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
616 NE 4th Avenue	Camas	Washington	98607

The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the limitations and provisions specified herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 9

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	650	210 Supplemental

QUANTITY, TYPE OF USE, PERIOD OF USE		
210 acre-feet per year Supplemental to existing rights	Municipal Supply	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL
600 feet south and 700 feet west of the north quarter corner of Section 4.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼NW¼	4	1	3E	28	Clark

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the City of Camas.

2541

This permit is subject to the implementation of the minimum requirements established in the Interim Guidel for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conserva Programs, July 1990.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphas in the management of the states water resources, and must be considered as a potential new source of wa Accordingly, as part of the terms of this permit, the applicant shall prepare and implement a water conserva plan approved by Department of Health. The standards for such a plan may be obtained from either Department of Health or the Department of Ecology.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the wa of the state in the best public interest. Use of water may be subject to regulation at certain times, based on necessity to maintain water quantities sufficient for preservation of the natural environment.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regu... the Department of Ecology.)

☒ Ground Water (issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regu... the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 13, 1986	G2-27384		

NAME
City of Camas

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
616 NE 4th Avenue	Camas	Washington	98607

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 9

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	650	210 Supplemental

QUANTITY, TYPE OF USE, PERIOD OF USE		
210 acre-feet per year Supplemental to existing rights	Municipal Supply	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL
600 feet south and 700 feet west of the north quarter corner of Section 4.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼NW¼	4	1	3E	28	Clark

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the City of Camas.

2543

Existing City of Camas rights. The City of Camas has several surface and ground water rights and clair shown below:

Little Washougal River (reach now known as Boulder Creek), Certificate No. S 711 C, is for 1.0 cfs an acre-feet per year (AF/Y). This source is subject to low flow conditions in the summer.

Jones Creek, Certificate No. S 712 C, is for 2.5 cfs and 1820 AF/Y. This source goes low in the summer

Well No. 1, Claim No. 121022 for vested rights, is for 900 gpm and 320 AF/Y. The well is no longer use a regular basis.

Well No. 2, Claim No. 121023 for vested rights, is for 900 gpm and 230 AF/Y. The well is no longer use a regular basis.

Well No. 3, Certificate No. G 85-A C, is for 1200 gpm and 118 AF/Y.

Well No. 4, Certificate No. G 4072 C, is for 1325 gpm and 1208 AF/Y.

Well No. 5, Certificate No. G 6636 C, is for 600 gpm and 920 AF/Y.

Well No. 6, Certificate No. G 6635 C, is for 1500 gpm and 2400 AF/Y.

Well No. 7, Certificate No. G2-00501, is for 1000 gpm and 530 AF/Y.

Well No. 8, Certificate No. G2-24400, is for 900 gpm and 530 AF/Y.

Under the provisions of Certificates No. G2-00501C and G2-24400, the total annual quantity allowed u existing rights is 5,750 AF/Y.

Clark County Reservation. Under the provisions of Chapter 173-592 WAC, Reservation of Future Public W Supply for Clark County, ground water was reserved for future beneficial use for public water supply in C County. Since the enactment of this reservation, water rights issued pursuant to WAC 173-592 have rece a priority date of August 13, 1986, the effective date of said regulation. The total reservation quantity is 97 gpm and 65,300 AF/Y prorated by aquifer as follows:

1) Columbia River Alluvium (1A) and Sandy River Mudstone (1C) 77,000 gpm, 51,800 AF/Y;

2) Upper Troutdale (1B-2B) 20,000 gpm, 13,500 AF/Y.

The subject well is completed within the Upper Troutdale sediments. This appropriation, therefore, falls ur WAC 173-592 and will, when permitted, be debited against the reserved quantity for the Upper Trout aquifers. In addition, the permit will carry the August 13, 1986, priority date of the reservation.

Annual quantity supplemental to existing rights. The total annual allocation under the City's existing rig 5,750 AF/Y, was based on a projected population of 15,000. The City of Camas' actual water use for the 1989 amounted to 1,930 acre-feet for a population of 6,600 (Clark County Coordinated Water system P Update, April 1991; Intergovernmental Resource Center population summary, March 1990).

The City's annual water use should remain within existing rights (5,750 AF/Y) for the foreseeable fut Therefore the annual quantity recommended for this permit will be supplemental to existing rights, augmen system supply within the 5,750 AF/Y already authorized.

Quantities from this well. Due to the apparent limitations of the aquifer, this well is probably not suitable use as a major production well, but it could serve to boost system capacity during peak periods. Mr. Levi requested that the permit authorize a maximum withdrawal of 650 gpm up to 20% of the time on average allow the City to determine the optimum rate and pumping schedule. Accordingly, the permit will autho 650 gpm and 210 AF/Y from Well 9, subject to the provisions below.

Water right certificate. Pursuant to RCW 90.03.330 and 90.44.080, a final certificate will be issued upo showing satisfactory to the Department that the appropriation has been perfected in compliance with the ter of the subject permit. The certificated withdrawal rate and annual quantity will reflect a sustainable yield a protection of senior rights, within the amounts specified on the permit. Monitoring and data submittal will required under the certificate as well as the permit.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the
of the state in the best public interest. Favorable consideration of this application has been based on suf
waters available, at least during portions of the year. However, it is pointed out to the applicant that th
of water may be subject to regulation at certain times, based on the necessity to maintain water qua
sufficient for preservation of the natural environment.

REPORTED BY: Vennie Wright DATE: October 12, 1992

The statutory permit fee for this application is $20.00.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
REPORT OF EXAMINATION

Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

[X] Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 21, 2003	G2-30144		

NAME
City of Camas

ADDRESS (STREET)	CITY	STATE	ZIP CODE
616 NE Fourth Avenue	Camas	WA	98607

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
8 Wells (Lower Washougal Wellfield)
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	500	2,150

QUANTITY, TYPE OF USE, PERIOD OF USE

2,150 acre-feet per year	Municipal	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

Well 5: 2600ft E & 790ft N of SW corner of Section 12, T1NR3E; Parcel=87268000; Lat=45.58059763; Long=122.38336343
Well 6: 2410ft E & 1795ft N of SW corner of Section 12, T1NR3E; Parcel=89927000; Lat=45.58340428; Long=122.38412204
Well 7: 1280ft E & 2110ft N of SW corner of Section 12, T1NR3E; Parcel=89891000; Lat=45.58431461; Long=122.38852327
Well 8: 1410ft E & 2080ft N of SW corner of Section 12, T1NR3E; Parcel=89888000; Lat=45.58426809; Long=122.38802699
Well 10: 790ft E & 2170ft N of SW corner of Section 12, T1NR3E; Parcel=89866000; Lat=45.58447735; Long=122.39044258
Well 11: 1060ft E & 2145ft N of SW corner of Section 12, T1NR3E; Parcel=89892000; Lat=45.58439709; Long=122.38937969
Well 12: 1030ft E & 2145ft N of SW corner of Section 12, T1NR3E; Parcel=89892000; Lat=45.58439492; Long=122.38950256
Well 13: 15ft E & 3410ft N of SW corner of Section 12, T1NR3E; Parcel=90928000; Lat=45.58783343; Long=122.39350782

SMALLEST SUBDIVISION	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
	12	1 N	3 E.W.M.	28	Clark

POINT OF WITHDRAWAL NAME	PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
Washougal River Wellfield	See above	See above	See above	NAD 83 (orthophoto)

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Camas. The place of use of this water right is the service area described in the currently approved Water System Plan as approved by the Washington State Department of Health. RCW 90.03.386 may have the effect of revising the place of use of this water right if the criteria in section RCW 90.03.386(2) are met.

DESCRIPTION OF PROPOSED WORKS

8 Existing Wells in the Lower Washougal Wellfield

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
August 1, 2008	August 1, 2015	August 1, 2025

PROVISIONS

Monitoring

The City of Camas shall develop a monitoring plan that includes the following:

a.) Monitor water levels in existing wells (TW-C and Well 4) and three new monitoring wells. The new monitoring wells must be installed as a cluster in the lower Washougal River in general proximity to the Georgia Pacific wellfield (where the largest drawdown occurs in the area). Two wells must be completed in the lower permeability streambed unit that lies beneath the river, and the third well must be completed in the more permeable PAA aquifer. All water levels must be measured to the nearest tenth of a foot, on an hourly basis during baseflow periods. New monitoring wells must be accurately located within 10 feet horizontally and 0.1 foot vertically. All monitoring wells must be constructed according to WAC 173-160-400.

b.) The City shall install a continuous river stage monitoring station in vicinity of the new monitoring wells. The monitoring station must include a staff gage which is accurately located within 10 feet horizontally and 0.1 foot vertically. Stage readings shall also be recorded on an hourly basis.

c.) Aquifer tests on the new Camas production wells must coincide with summer/fall low-flow periods and include seepage surveys during testing events. New supply wells must be accurately located within 10 feet horizontally and 0.1 foot vertically.

d.) The City shall submit water level data from their monitoring network for the previous year by January 31 to the Department of Ecology. Data shall be provided in a digital format along with a two page summary attached. A more thorough monitoring report must be provided after 5 years from the date of issuance of this water right or when this permit is perfected (whichever comes first), to further evaluate the effects of pumping on the Washougal River.

Operations of Surface Water System

1. Prior to groundwater being withdrawn under this water right, the City of Camas must cease their surface water diversions from Jones and Boulder Creeks between May 15 and October 31 of each year. At the State's discretion, the water rights associated with these diversions will be placed into the State's Trust Water Program as permanent, seasonal donations.

Metering and Reporting Diversions

1. An approved measuring device shall be installed and maintained for each of the wells authorized by this water right, in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.

2. Reported water use data shall be submitted via the Internet. To set up an Internet reporting account, access https://fortress.wa.gov/ecy/wrx/wrx/Meteringx/. If you do not have Internet access, contact the Southwest Regional Office for forms to submit your data.

3. Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation, and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements."

4. Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions and may inspect, at reasonable times, any measuring device used to meet the above conditions.

Development Schedule

1. The development schedule shall be as follows:

   - Construction shall begin by August 1, 2008

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
REPORT OF EXAMINATION

Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

[X] Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 21, 2003	G2-30145		

NAME
City of Camas

ADDRESS (STREET)	CITY	STATE	ZIP CODE
616 NE Fourth Avenue	Camas	WA	98607

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Proposed Well (Anderson Site)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	1000	880

QUANTITY, TYPE OF USE, PERIOD OF USE

880 acre-feet per year | Municipal | Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

1900 feet north and 2050 feet west of SE corner of Section 12

SMALLEST SUBDIVISION	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW 1/4 SE 1/4	12	1 N	3 E.W.M.	28	Clark

POINT OF WITHDRAWAL NAME	PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
Anderson proposed well	91045003	45.58349161	122.38087177	NAD 83 (orthophoto)

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Camas. The place of use of this water right is the service area described in the currently approved Water System Plan as approved by the Washington State Department of Health. RCW 90.03.386 may have the effect of revising the place of use of this water right if the criteria in section RCW 90.03.386(2) are met.

DESCRIPTION OF PROPOSED WORKS

A proposed well

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
August 1, 2008	August 1, 2015	August 1, 2025

PROVISIONS

Monitoring

The City of Camas shall develop a monitoring plan that includes the following:

a.) Monitor water levels in existing wells (TW-C and Well 4) and three new monitoring wells. The new monitoring wells must be installed as a cluster in the lower Washougal River in general proximity to the Georgia Pacific wellfield (where the largest drawdown occurs in the area). Two wells must be completed in the lower permeability streambed unit that lies beneath the river, and the third well must be completed in the more permeable PAA aquifer. All water levels must be measured to the nearest tenth of a foot, on an hourly basis during baseflow periods. New monitoring wells must be accurately located within 10 feet horizontally and 0.1 foot vertically. All monitoring wells must be constructed according to WAC 173-160-400.

b.) The City shall install a continuous river stage monitoring station in vicinity of the new monitoring wells. The monitoring station must include a staff gage which is accurately located within 10 feet horizontally and 0.1 foot vertically. Stage readings shall also be recorded on an hourly basis.

c.) Aquifer tests on the new Camas production wells must coincide with summer/fall low-flow periods and include seepage surveys during testing events. New supply wells must be accurately located within 10 feet horizontally and 0.1 foot vertically.

d.) The City shall submit water level data from their monitoring network for the previous year by January 31 to the Department of Ecology. Data shall be provided in a digital format along with a two page summary attached. A more thorough monitoring report must be provided after 5 years from the date of issuance of this water right or when this permit is perfected (whichever comes first), to further evaluate the effects of pumping on the Washougal River.

Operations of Surface Water System

1. Prior to groundwater being withdrawn under this water right, the City of Camas must cease their surface water diversions from Jones and Boulder Creeks between May 15 and October 31 of each year. At the State's discretion, the water rights associated with these diversions will be placed into the State's Trust Water Program as permanent, seasonal donations.

Metering and Reporting Diversions

1. An approved measuring device shall be installed and maintained for each of the wells authorized by this water right, in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.

2. Reported water use data shall be submitted via the Internet. To set up an Internet reporting account, access https://fortress.wa.gov/ecy/wrx/wrx/Meteringx/. If you do not have Internet access, contact the Southwest Regional Office for forms to submit your data.

3. Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation, and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements."

4. Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions and may inspect, at reasonable times, any measuring device used to meet the above conditions.

Development Schedule

1. The development schedule shall be as follows:

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
REPORT OF EXAMINATION

Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

[X] Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 21, 2003	G2-30146		

NAME
City of Camas

ADDRESS (STREET)	CITY	STATE	ZIP CODE
616 NE Fourth Avenue	Camas	WA	98607

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Proposed Well (Parkers Landing)
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	1000	880

QUANTITY, TYPE OF USE, PERIOD OF USE

880 acre-feet per year	Municipal	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
200 feet north and 2500 feet west of the SE corner of Section 12

SMALLEST SUBDIVISION	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW 1/4 SE 1/4	12	1 N	3 E.W.M.	28	Clark

POINT OF WITHDRAWAL NAME	PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
Parkers Landing proposed well	73134162	45.57960601	122.38210695	NAD 83 (orthophoto)

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Camas. The place of use of this water right is the service area described in the currently approved Water System Plan as approved by the Washington State Department of Health. RCW 90.03.386 may have the effect of revising the place of use of this water right if the criteria in section RCW 90.03.386(2) are met.

DESCRIPTION OF PROPOSED WORKS

A proposed well

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
August 1, 2008	August 1, 2015	August 1, 2025

PROVISIONS

Monitoring

The City of Camas shall develop a monitoring plan that includes the following:

a.) Monitor water levels in existing wells (TW-C and Well 4) and three new monitoring wells. The new monitoring wells must be installed as a cluster in the lower Washougal River in general proximity to the Georgia Pacific wellfield (where the largest drawdown occurs in the area). Two wells must be completed in the lower permeability streambed unit that lies beneath the river, and the third well must be completed in the more permeable PAA aquifer. All water levels must be measured to the nearest tenth of a foot, on an hourly basis during baseflow periods. New monitoring wells must be accurately located within 10 feet horizontally and 0.1 foot vertically. All monitoring wells must be constructed according to WAC 173-160-400.

b.) The City shall install a continuous river stage monitoring station in vicinity of the new monitoring wells. The monitoring station must include a staff gage which is accurately located within 10 feet horizontally and 0.1 foot vertically. Stage readings shall also be recorded on an hourly basis.

c.) Aquifer tests on the new Camas production wells must coincide with summer/fall low-flow periods and include seepage surveys during testing events. New supply wells must be accurately located within 10 feet horizontally and 0.1 foot vertically.

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Operations of Surface Water System

1. Prior to groundwater being withdrawn under this water right, the City of Camas must cease their surface water diversions from Jones and Boulder Creeks between May 15 and October 31 of each year. At the State's discretion, the water rights associated with these diversions will be placed into the State's Trust Water Program as permanent, seasonal donations.

Metering and Reporting Diversions

1. An approved measuring device shall be installed and maintained for each of the wells authorized by this water right, in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.

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PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 21, 2003	G2-30147		

NAME

City of Camas

ADDRESS (STREET)	CITY	STATE	ZIP CODE
616 NE Fourth Avenue	Camas	WA	98607

PUBLIC WATERS TO BE APPROPRIATED

SOURCE

Proposed Well (Treatment Plant Well)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	1000	880

QUANTITY, TYPE OF USE, PERIOD OF USE

880 acre-feet per year | Municipal | Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

200 feet north and 200 feet west of the SW corner of Section 12

SMALLEST SUBDIVISION	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW 1/4 SW ¼	12	1 N	3 E.W.M.	28	Clark

POINT OF WITHDRAWAL NAME	PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
Treatment Plant proposed well	87360000	45.57902697	122.39273145	NAD 83 (orthophoto)

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

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A proposed well

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Development Schedule

1. The development schedule shall be as follows:

Item 11.

RECEIVED
SEP 04 2001
Washington State

For Ecology Use
Fee Paid _____
Date _____

State of Washington
Application for a Water Right

Please follow the attached instructions to avoid unnecessary delays.

Section 1. APPLICANT - PERSON, ORGANIZATION, OR WATER SYSTEM

Name City of Camas Home Tel:( ) -

Mailing Address 616 NE 4th Ave. Work Tel:(360) 834 - 3451

City Camas State WA Zip+4 98607 + FAX:(360) 834 - 1535

Section 2. CONTACT - PERSON TO CALL ABOUT THE APPLICATION

☐ Same as above

Name Eric Levison Home Tel:( ) -

Mailing Address 616 NE 4th Ave. Work Tel:(360) 834 - 3451

City Camas State WA Zip+4 98607 + FAX:(360) 834 - 1535

Relationship to applicant Engineering Manager - City of Camas

Section 3. STATEMENT OF INTENT

Municipal

The applicant requests a permit to use not more than 1,000 (☒ gallons per minute or ☐ cubic feet per second) from a ☐ surface water source or ☒ ground water source (check only one) for the purpose(s) of Domestic/Public Supply. **ATTACH A "LEGAL" DESCRIPTION OF THE PLACE OF USE.** (See instructions.) *NOTE: A tax parcel number or a plat number is not sufficient.* Area served by City of Camas.

Estimate a maximum annual quantity to be used in acre-feet per year: 1200 AF/YR

☐ Check if the water use is proposed for a short-term project. Indicate the period of time that the water will be needed:

From ___/___/___ to ___/___/___

Section 4. WATER SOURCE

If SURFACE WATER	If GROUNDWATER
Name the water source and indicate if stream, spring, lake, etc. If unnamed, write "unnamed spring," "unnamed stream," etc.: Number of diversions:	A permit is desired for 2 well(s).
Source flows into (name of body of water):	Size & depth of well(s): 12-inch deep 150 feet deep

LOCATION

Enter the north-south and east-west distances in feet from the point of diversion or withdrawal to the nearest section corner: 1600 feet east and 1000 feet south of the NW 1/4 of Section 28, Township 2 North, Range 3 East

¼ of	¼ of	Section	Township	Range(E/W)	County	If location of source is platted, complete below: Lot	Block	Subdivision
NE	NW	28	2N	3E	Clark			

For Ecology Use Date Received: 9-4-01 Priority Date: 9.4.01

SEPA: Exempt/Not Exempt FERC License # Dept. Of Health #

Date Accepted As Complete 9-21-01 By SC Date Returned By WRIA: 28

ECY 040-1-14 Rev. 9/95 F

APPLICATION

Appl. No.: G2-30019

2554

Section 5. GENERAL WATER SYSTEM INFORMATION

A. Name of system, if named: Camas Municipal Water-Sewer System

B. Briefly describe your proposed water system. (See instructions.)

Two 12-inch supply wells will be constructed to depths of 150 feet. The wells will be used to provide water supply to municipal and industrial water users that are served by the City of Camas in the Lacamas Basin area. See 1996 Water System Plan documents for other related water system information.

C. Do you already have any water rights or claims associated with this property or system? ☒ YES ☐ NO
PROVIDE DOCUMENTATION. See list of City Water Rights and claims that are attached.

Section 6. DOMESTIC / PUBLIC WATER SUPPLY SYSTEM INFORMATION
(Completed for all domestic/public supply uses.)

A. Number of "connections" requested: 4896 (current number of connections) Type of connection Municipal Industrial Hookup (Homes, Apartment, Recreational, etc.)

B. Are you within the area of an approved water system? ☒ YES ☐ NO
If yes, explain why you are unable to connect to the system. *Note: Regional water systems are identified by your County Health Department.* The applicant (City of Camas) is the regional water provider.

Complete C. and D. only if the proposed water system will have fifteen or more connections.

C. Do you have a current water system plan approved by the Washington State Department of Health? ☒ YES ☐ NO
If yes, when was it approved? 1996 Please attach the current approved version of your plan.
Note: City is currently updating water system plan. New plan should be approved in early 2002.

D. Do you have an approved conservation plan? ☒ YES ☐ NO
If yes, when was it approved? 1996 Please attach the current approved version of your plan.
Note: Water Conservation Plan incorporated into 1996 Water System Plan, which is currently being updated.

Section 7. IRRIGATION/AGRICULTURAL/FARM INFORMATION
(Complete for all irrigation and agriculture uses.) N/A

A. Total number of acres to be irrigated: _____

B. List total number of acres for other specified agricultural uses:

Use _____ Acres _____
Use _____ Acres _____
Use _____ Acres _____

C. Total number of acres to be covered by this application: _____

D. Family Farm Act (Initiative Measure Number 59, November 3, 1977)
Add up the acreage in which you have a controlling interest, including only:
‡ Acreage irrigated under water rights acquired after December 8, 1977;
‡ Acreage proposed to be irrigated under this application;
‡ Acreage proposed to be irrigated under other pending application(s).

1. Is the combined acreage greater than 2000 acres? ☐ YES ☐ NO
2. Do you have a controlling interest in a Family Farm Development Permit? ☐ YES ☐ NO
If yes, enter permit no: _____

E. Farm uses:
Stockwater - Total # of animals _____ Animal type _____ (If dairy cattle, see below)
Dairy - # Milking _____ # Non-milking _____

Section 8. WATER STORAGE

Will you be using a dam, dike, or other structure to retain or store water? ☐ YES ☒ NO

NOTE: If you will be storing 10 acre-feet or more of water and/or if the water depth will be 10 feet or more at the deepest point, and some portion of the storage will be above grade, you must also apply for a reservoir permit. You can get a reservoir permit application from the Department of Ecology.

Section 9. DRIVING DIRECTIONS

Provide detailed driving instructions to the project site. From Lacey, WA, go southbound on I-5. Take I-205 exit at Hazel Dell. Proceed southbound on I-205 to SR-14. Take SR-14 eastbound to Brady Road. Proceed north on Brady Road which turns into NW Parker Avenue. Continue northbound on NW Parker to SE 1st Street. Go westbound on NW 1st to 216th Ave. Take 216th Ave. northbound to Camas Meadows Golf Course. Take service road through golf course to well site.

Section 10. REQUIRED MAP

A. Attach a map of the project. (See instructions.)

Section 11. PROPERTY OWNERSHIP

A. Does the applicant own the land on which the water will be used? ☐ YES ☒ NO
If no, explain the applicant's interest in the place of use and provide the name(s) and address(es) of the owner(s):

The City will use the water for supply within their service area.

B. Does the applicant own the land on which the water source is located? ☐ YES ☒ NO
If no, submit a copy of agreement:
The City will purchase property as part of the supply well development.

I certify that the information above is true and accurate to the best of my knowledge. I understand that in order to process my application, I grant staff from the Department of Ecology access to the site for inspection and monitoring purposes. Even though I may have been assisted in the preparation of the above application by the employees of the Department of Ecology, all responsibility for the accuracy of the information rests with me.

CITY OF CAMAS E. Levison ERIC LEVISON — 8/29/01
Applicant (or authorized representative) — Date

Landowner for place of use (if same as applicant, write "same") — Date

Use this page to continue your answers to any questions on the application. Please indicate section number before answer.

We are returning your application for the following reason(s):	
_____ Examination fee was not enclosed	APPLICANT PLEASE RETURN TO CASHIER, PO BOX 5128, LACEY, WA 98509-5128
_____ Section number(s) _____ is/are incomplete	APPLICANT PLEASE RETURN TO THE APPROPRIATE REGIONAL OFFICE
Explanation:	
Please provide the additional information requested above and return your application by _____ _____ *(date).*	

Ecology staff_____ Date_____

To receive this document in alternative format, contact Lisa Newman at (360) 407-6604 (Voice) or (360) 407-6006 (TDD).

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 1, 2001

City of Camas
Attn Eric Levison
616 NE 4th Avenue
Camas WA 98607

Re: Water Right Application No. G2-30018

This letter is to acknowledge that the Washington State Department of Ecology received your water right application. We have assigned your application the number indicated above. Please include this number in future correspondence regarding your application with the Department of Ecology.

When we begin actively evaluating applications in your area, we will prepare a public notice and send it to you with publication instructions. It will be sometime before we are able to begin working in your area. In the meantime, please notify Ecology of changes such as address, property ownership, or variations in your proposed water use plans.

The availability of water in Washington state is a serious problem. Much of the water in our state has already been appropriated. The competition for water has escalated with our state's increasing population, conflicting water policy issues, and grave declines in salmon and other fish populations. A new watershed management law brings us a step closer to addressing some of these issues. It sets into motion a locally based process to address water quantity, quality, and habitat issues. Watershed management will help meet challenges for getting water to people, industries, farms, and fish.

In some areas of the state, we are continuing to evaluate applications within watersheds where we have previously gathered information and completed watershed assessments. We are also continuing to process water right permit or change applications that are intended to address public health and safety emergencies, the natural environment, or are for nonconsumptive withdrawals. All other applications are grouped by watershed and processed according to the date of submittal, and when we have enough information and staff resources to make decisions.

If you would like further information on your application, please contact the Southwest Regional Office at (360) 407-0240.

Sincerely,

J. Mike Harris

J. Mike Harris
Water Resources Supervisor
Southwest Regional Office

JMH:th (applet.doc)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 1, 2001

City of Camas
Attn Eric Levison
616 NE 4th Avenue
Camas WA 98607

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Sincerely,

J. Mike Harris

J. Mike Harris
Water Resources Supervisor
Southwest Regional Office

JMH:th (applet.doc)

CITY OF CAMAS
616 Northeast Fourth Avenue
P.O. Box 1055
Camas, Washington 98607
http://www.ci.camas.wa.us

RECEIVED
DEPT. OF ECOLOGY/SWRO

'01 SEP -4 A10 :37

August 29, 2001

DEPARTMENT OF PUBLIC WORKS

Mr. Mike Harris
Department of Ecology
300 Desmond Drive
P.O. Box 47600
Olympia, WA 98504-7600

Subject: ***Water Right Application Submittals***
City of Camas

Dear Mr. Harris:

Enclosed you will find two water right applications along with the statutory examination fee of $10.00 for each water right application (total of $20.00). The enclosed applications are for new water supply sources in the Lacamas Basin.

The City of Camas would like to develop three new supply wells under these applications to meet the rapid growth, which is occurring in the western portion of our service area. We recently completed an extensive test well drilling program in this area. The results of the exploratory drilling and aquifer testing are summarized in the attached report titled *City of Camas, Westside Test Well Drilling Program (PGG, 2001).*

At your convenience, we would like to schedule a meeting with you and your staff to discuss the results of our test well program and strategies for obtaining water right permits for new production wells.

We appreciate your assistance on this matter.

Sincerely,

Eric Levison
Engineering Manager

Enclosures: Water Right Applications

rls:g:\pworks\eric\harris 082901.doc

Printed By: Dawn Merryman
On: 09/07/2001 At: 10:10 am

RECEIPT

Receipt Number 02-00512

Department of Ecology (4610)
PO Box 5128
Lacey, WA 98509-5128
(360) 407-7095

Current Document Number **461G0355CJ** Date **09/10/2001** FM **03**

Remitter Name **CAMAS CITY** Receipt Name

Check/Draw Number **4149**
Document Amount **$20.00**
Method of Payment **Check**
Comment Description **WATER RIGHTS**

Ref Doc Nr	Ref Doc Sfx	Inv Nr	Id Nr	Prgm Cd	T C	R	Fund	Maj Grp	Maj Src	Sub Src	Cnty	Work Cls	PIC	AI	Org	Prj	Sub Prj	Prj Phs	Sub Obj	Sub Sub Obj	Var GL	Sub Sid Dr	Sub Sid Cr	Alloc Amt
				H00	001		001	02	85	000010														$20.00

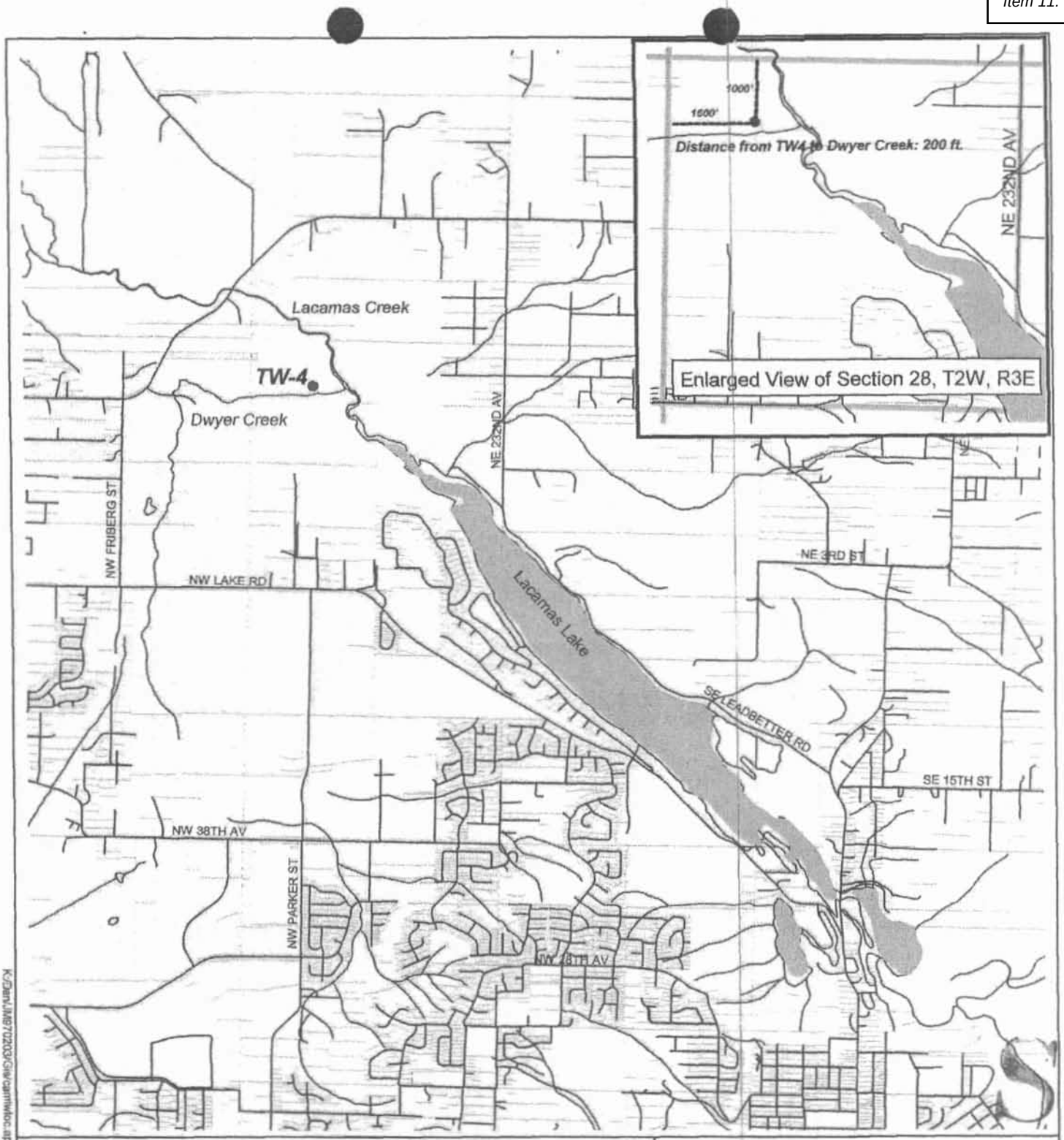
2561

TABLE 1-3

City of Camas Water Right Summary

Source	Location of Diversion	Identification Number	Priority Date	Instantaneous Quantity Q_i (gpm)	Annual Quantity Q_a (ac-ft/yr.)
Claims					
Well No. 1	2159 ft. N, 667 ft. E, from the SW corner, S12, T1N, R3E	121022	6/11/74	900	320(1)
Well No. 2	2152 ft. N, 731 ft. E, from the SW corner, S12, T1N, R3E	121023	6/11/74	900	230(1)
Certificates					
Boulder Creek	(need this info)	S 712 C	8/22/23	1120 [2.5 cfs]	1820(2) (P)
Jones Creek	SE1/4, SW1/4, S3, T2N,R4E	S 711 C	9/5/30	450 [1.0 cfs]	730(3) (P)
Well No. 3	NW1/4, SW1/4, S12,T1N, R3E	G 85-A C	7/21/45	1200	118 (P)
Well No. 4	W1/2, NW1/4, S12, T1N, R3E	G 4072-A C	2/12/59	1325	1208 (S)
Well No. 5	Lot 9 of Orchard Homes, 2760 ft. E, 840 ft. N from SW corner, S12, T1N, R3E	G 6636-A C	3/22/68	600	920(4) (P)
Well No. 6	2300 ft. E, 1800 ft. N from SW corner, S12, T1N, R3E	G 6635-A C	3/22/68	1500	2400(4) (P)
Well No. 7	1245 ft. E, 2145 ft. N from SW corner, S12, T1N, R3E	G2-00501 C	3/22/71	1000	530(5) (P)
Well No. 8	1375 ft. E, 2145 ft. N from SW corner, S12, T1N, R 3E	G2-24400 C	2/4/77	900	530(5) (P)
Permits					
Well No. 9	600 ft. S, 700 ft. W from N1/4 corner, S4, T1N, R3E	G4-27384 P	8/13/86	650	210(5) (S)
Total	Sum of all existing water right certificates and permits. **These values do not include claims.**			**SW = 1570 gpm GW = 7175 gpm Total = 8745 gpm**	**SW = 2550 ac-ft. GW = 3200 ac-ft. Total = 5750 ac-ft.**

(1) Claims must go through an adjudication procedure in state court to determine validity.
(2) This source was formerly known as the Little Washougal River. The certificate refers to an instantaneous quantity (Q_i) and does not specify an annual withdrawal. A DOE Report of Examination for Well No. 7 (G2-00501 C) summarizes existing water rights including 1820 ac-ft/yr. for Boulder Creek (S 712 C) based on continuous withdrawal at the instantaneous right specified.
(3) The certificate refers to an instantaneous quantity (Q_i) and does not specify an annual withdrawal. A DOE Report of Examination for Well No. 7 (G2-00501 C) summarizes existing water rights including 730 ac-ft/yr. for Jones Creek (S 711 C) based on continuous withdrawal at the instantaneous right specified.
(4) The Permit and Report of Examination preceding this certificate limited water rights to "the total quantity withdrawn or diverted from all sources is not to exceed 3300 ac-ft/yr."
(5) The Permit and Report of Examination preceding this certificate provided for "the total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificates No. 711 and 712 and Ground Water Certificates No. 85,4072, 6635, 6636, shall not exceed 5750 ac-ft/yr."
(P) Primary water right, additive to other rights.
(S) Supplemental water right, not additive or considered when summing a cumulative total of all rights.



Legend

- Proposed Supply Well Site
- Roads
- Parcels
- Rivers, Streams
- Water bodies

N

0 4000 Feet

Figure 1
Proposed Well Location Map

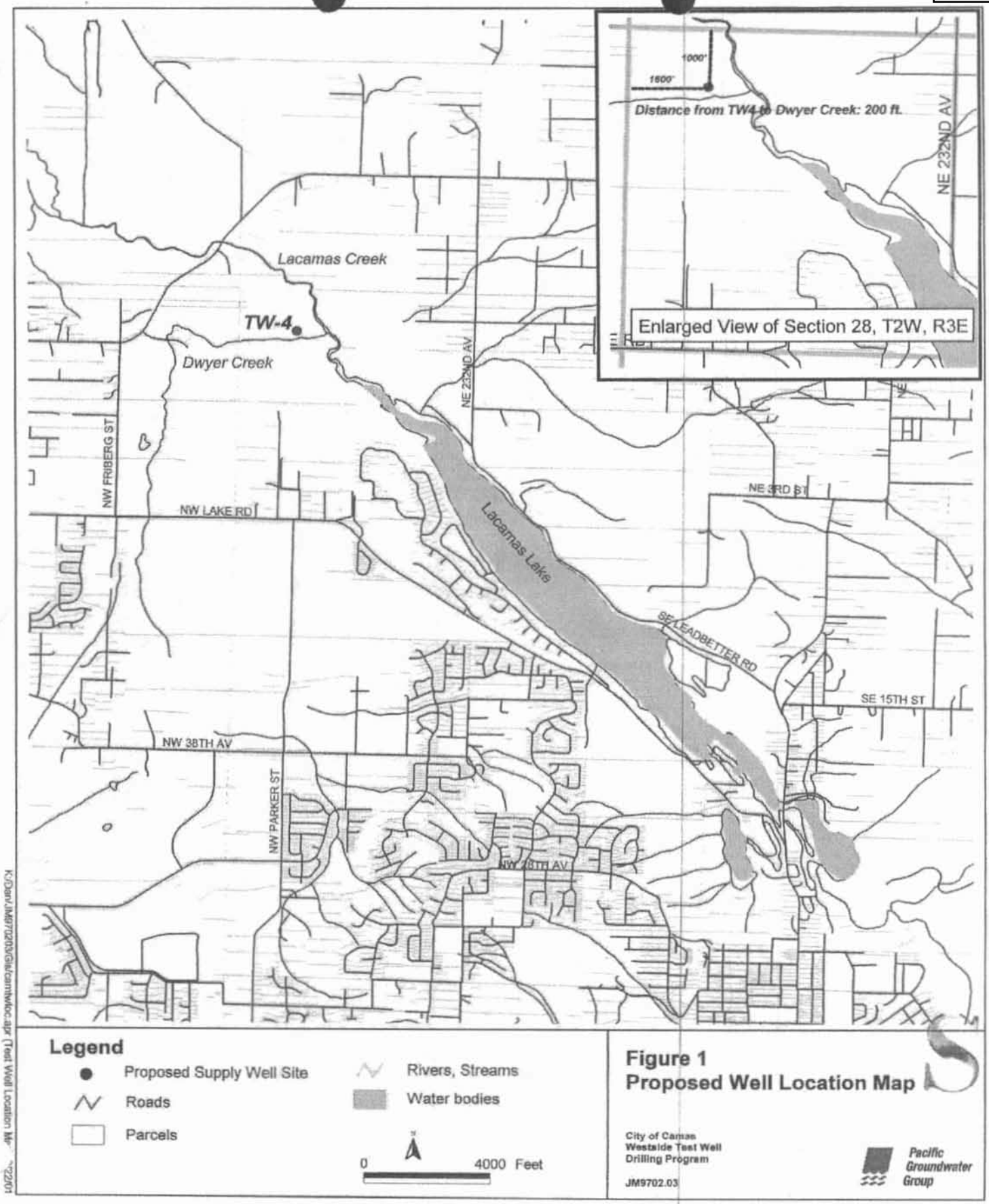
City of Camas
Westside Test Well
Drilling Program

JM9702.03

Pacific Groundwater Group

K:\Dan\JM9702\03\Gis\camwloc.apr (Test Well Location Map), 2/22/01

2563


Distance from TW4 to Dwyer Creek: 200 ft.
1000'
1500'
Enlarged View of Section 28, T2W, R3E
NE 232ND AV
Lacamas Creek
TW-4
Dwyer Creek
NW FRIBERG ST
NW LAKE RD
NE 3RD ST
Lacamas Lake
SE LEADBETTER RD
SE 15TH ST
NW 38TH AV
NW PARKER ST
NW 38TH AV
Legend
Proposed Supply Well Site
Roads
Parcels
Rivers, Streams
Water bodies
0
4000 Feet
Figure 1
Proposed Well Location Map
City of Camas
Westside Test Well
Drilling Program
JM9702.03
Pacific Groundwater Group

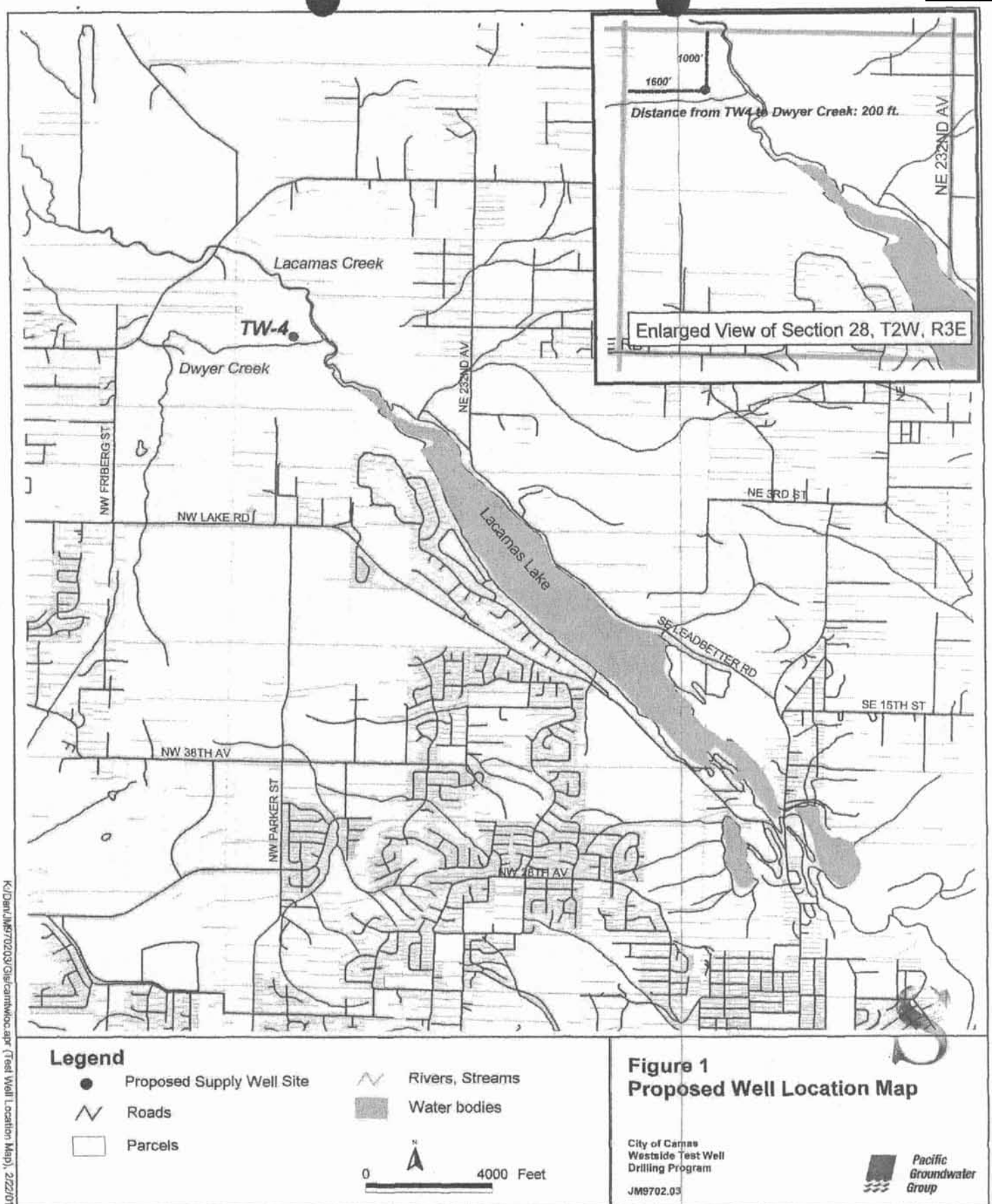


Figure 1
Proposed Well Location Map

City of Camas
Westside Test Well
Drilling Program

JM9702.03

Pacific Groundwater Group

K:\Dart\JM9702.03\Gis\camtwloc.apr (Test Well Location Map), 2/22/01

Item 11.

Account Transfers | Recurring Transfers | Third-Party Transfers | External Transfers
IRA/ESA Certificate Add-On

Third Party Transfer Confirmation

Transfer of funds successfully completed. See the new account balances below.

From Account:	Share Savings 1274297009 KENNETH C ALEXANDER
From Account Balance:	$14.25
To Account:	EveryDay Checking 1274297710 ERNESTINE P ALEXANDER
Payment Amount:	$3,325.00
Effective Date:	03/09/2009
Confirmation Number:	304756

Print Receipt

2566

ROTORK CONTROLS, INC.
SCOPE OF WORK
START UP/COMMISSIONING OF ROTORK ACTUATORS

JOB SITE LOCATION: WARDEN, WASHINGTON

Rotork Field Engineer will:

1. Inspect all installed Rotork actuators for proper orientation.
2. Inspect all installed Rotork actuators for proper wiring terminations.
3. Electrically power up Rotork actuators and perform initial programming.
4. Set both the Open and Closed limits on the Rotork actuators.
5. Electrically stroke all valves with Rotork actuators to ensure proper operation.
6. Provide customer with the Field Service Report for their records.
7. Correct any discrepancies found during this course of work.

rotork
factory service

2180 South Mc Dowell Blvd. Suite B
Petaluma, CA 94954
Phone: (707) 769-4880
Fax: (707) 769-4888

Service Report

Job No.:
Engineer:
Date:
Site:

Site Contact:
Phone Number:
Date Service Performed:
PO Number:
Type of Service:

Serial Number:	**Type:**	**WD:**	**RPM:**	**Volts:**
Gearbox Type:	**Valve Type:**		**Service Type:**	**Valve Tag No:**

Reported Problem:

Work Completed:

If there is additional work needed, please explain:

2568

Rotork Site Training Syllabus (for IQT)

I. Introduction to Rotork

A. Tech introduction
B. Rotork Controls, Inc.
C. Types and models of actuators. Sizing, classifications. Nameplates.
D. Documentation, Rotork.com
1) IQT- E110, E120, E175, E185, Wiring diagrams

II. IQT

A. Nomenclature and parts ID.
1) Gearcase, center column, drive bushings, battery, seals and o-rings.
2) Motor & wormwheel, resolver.
3) Handwheel, hand/auto lever, H/A cover.
4) Electronics- Cover (UV Window/ local controls), main pcb, power module, motor control pcb
5) Options, if applicable

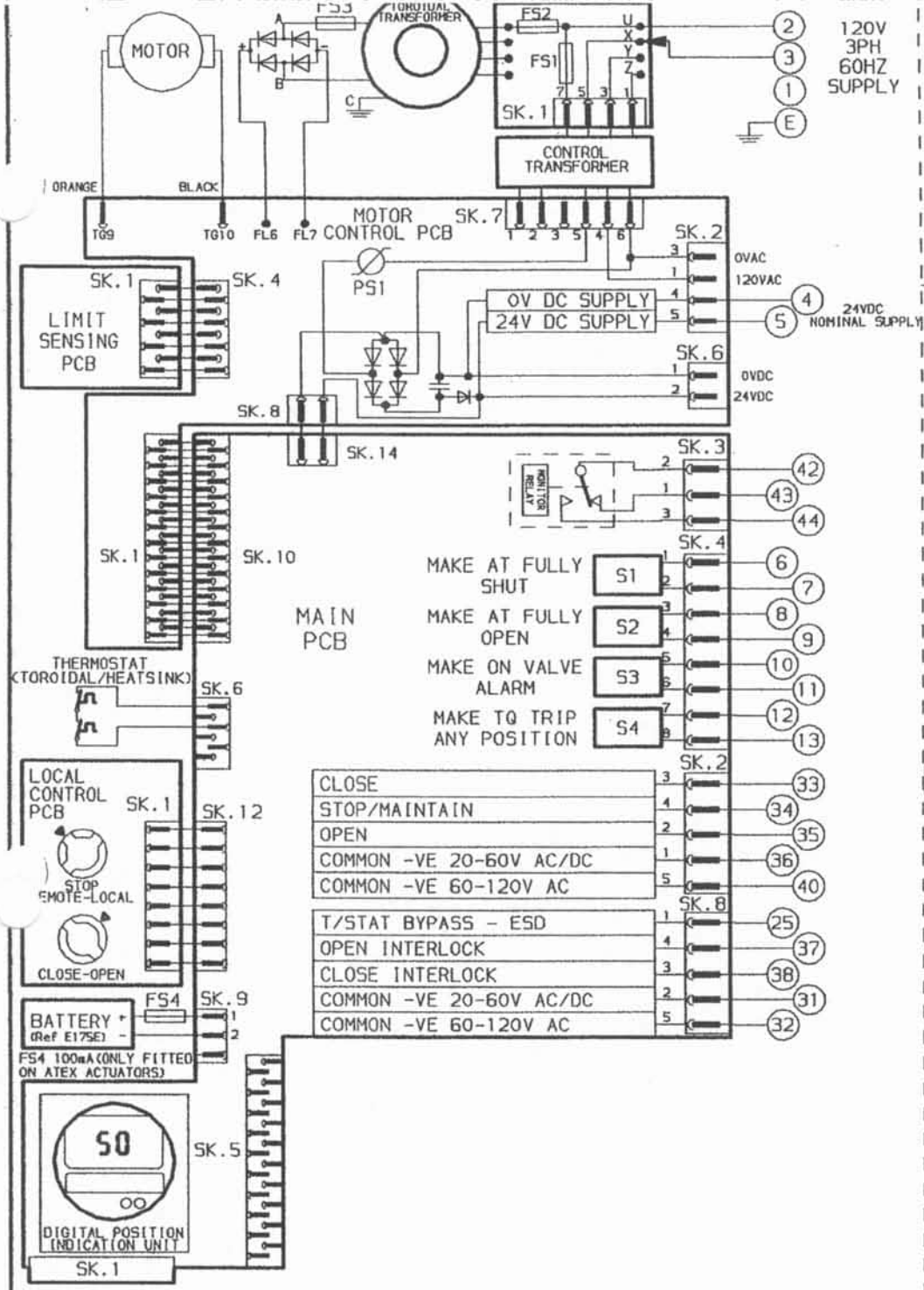
III. Operation, set-up and calibration (using live demo actuator)

A. Manual operation B. Setting tool and display
C. Menu structure and functions
1) Torque display, password screen
2) Primary functions- open/close action, torque setting, limit setting.
3) Secondary functions-Indication, ESD(emerg shut down), options, IQT type and speed.
D. Local operation
E. Remote operation
1) Remote voltage supplies 2) Remote control configurations 3) Network options
F. Installation and adaption
G.Troubleshooting
1) Alarms 2) Help screens 3) Common faults and checks
H. Maintenance - 1) Lubrication 2) inspection 3) spares

IV. Advanced Functions and Utilities (using laptop and PDA)

A. Insight
B. Configuration Files
C. Datalogger files
1) Torque profiles (for baseline files/trending, torque issues)
2) Event logging and review

V. Conclusion- Review and Follow-up



RWS300

TRANSFORMER TAPPIN

TYPE 1

TAP	NOM	RANGE
Z	120	96-144

FS1-250mA A/S
FS2-5A A/S

FUSE FS3 - 20A ATO FAST ACTING

PS1 SELF RESETTING FUSE

NOTE

REFER TO PUBLICATION E175E FOR APPROVED FUSES FS1, FS2 AND FS3.

MAX EXTERNAL LOAD ON TERMINALS 4 & 5 TO BE 5W.

CONTROL SIGNAL THRESHOLD VOLTAGES TO BE MINIMUM 'ON' 20V AC/DC
MAXIMUM 'OFF'= 3V
MINIMUM CONTROL SIGNAL DURATION TO BE 300mS.

CURRENT DRAWN FROM EACH REMOTE CONTROL SIGNAL IS 5mA ON 24V DC OR 12mA ON 120V AC

WIRES ARE IDENTIFIED AT EACH END BY TERMINAL No. OR TAG No.

INDICATION CONTACTS S1-S4 ARE SHOWN IN THEIR DEFAULT CONFIGURATION. CONTACTS MAY BE CONFIGURED FOR ANY OF THE FUNCTIONS DESCRIBED IN E175E

IQT

No	DATE	REVISION DETAILS
01	061008	FIRST ISSUE

www.rotork.com

CONFIG BY TPW
DATE 061008

6000-000 B1, C1, 41, M1
CUSTOMER SPECIFIC

2570

Rotork Site Training Syllabus (for IQMKII)

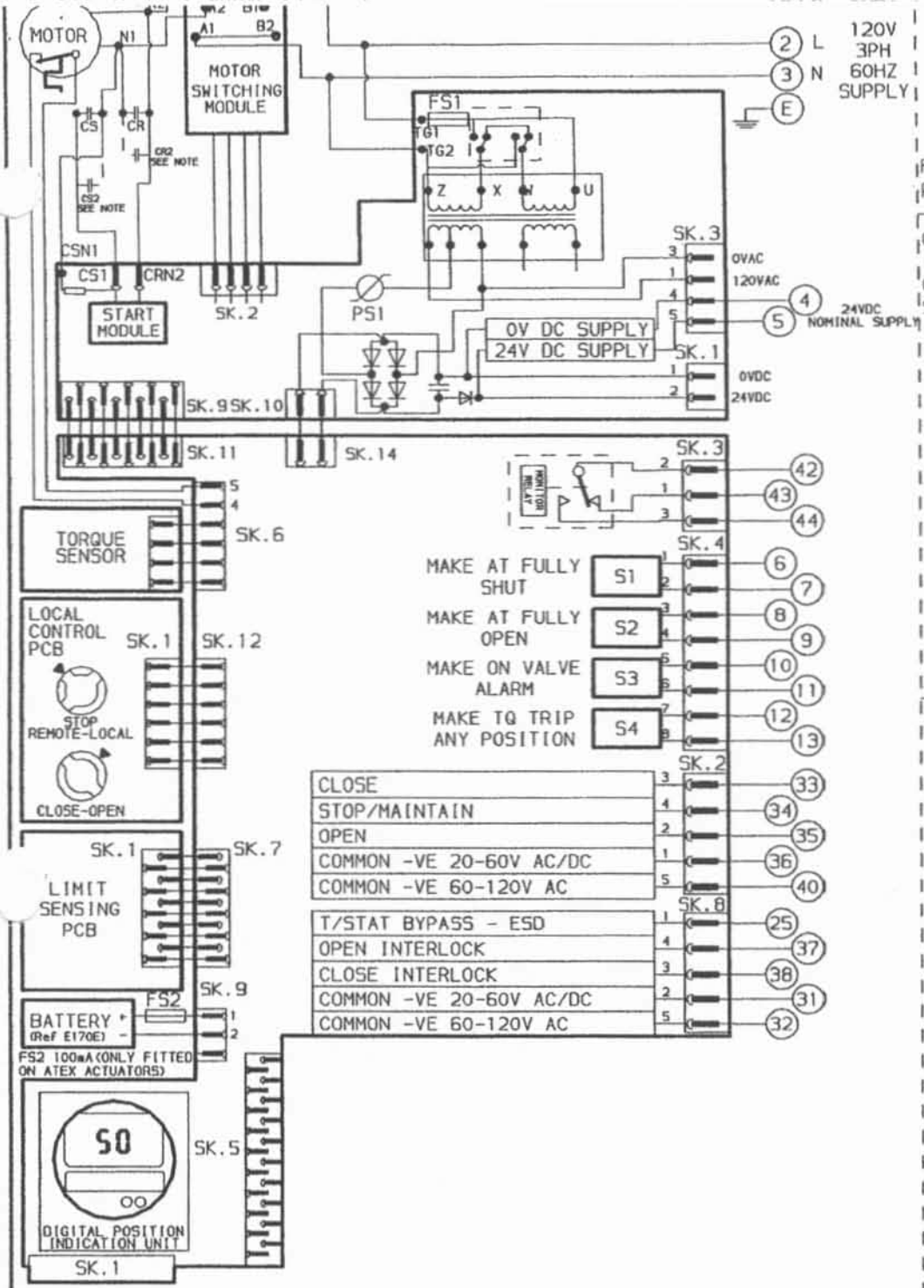
I. Introduction to Rotork
- A. Tech introduction
- B. Rotork Controls, Inc.
- C. Types and models of actuators. Sizing, classifications. Nameplates.
- D. Documentation, Rotork.com
  - 1) IQMKII- E110, E120, E170E2, E170E3, E180, Wiring diagrams

II. IQMKII
- A. Nomenclature and parts ID.
  - 1) Gearcase, center column, resolver drive, battery, terminal block/cover, seals and o-rings.
  - 2) Motor & wormwheel, torque transducer (piezo assembly).
  - 3) Handwheel (THW, SHW), Hand/Auto (H/A) lever
  - 4) Electronics- Cover (UV window, local controls), main pcb, power module, resolver
  - 5) Bases, drive bushings.
  - 6) Options, gearboxes, if applicable

III. Operation, set-up and calibration
- A. Manual operation
- B. Setting tool and display
- C. Menu structure and functions
  - 1) Torque display, password screen
  - 2) Primary functions- open/close action, torque setting, limit setting.
  - 3) Secondary functions-Indication, ESD(emerg shut down), options
- D. Local operation
- E. Remote operation
  - 1) Remote voltage supplies 2) Remote control configurations 3) Network options
- F. Installation and adaption
- G.Troubleshooting
  - 1) Alarms 2) Help screens 3) Common faults and checks
- H. Maintenance
  - 1) Lubrication 2) Inspection 3) Spares

IV. Advanced Functions and Utilities (using laptop)
- A. Insight
- B. Configuration Files
- C. Datalogger files
  - 1) Torque profiles (for baseline files/trending, torque issues)
  - 2) Event logging and review

V. Conclusion- Review and Follow-up



RWS300

TRANSFORMER TAPPIN

VOLTAGE	60HZ
LOW	92-135

FUSE FS1 - 500mA ANTI-SURGE
PS1 SELF RESETTING FUSE.

CAPACITOR START/RUN
(CS/CS2 and CR/CR2)
COMBINATIONS & VALUES VARY WITH
SUPPLY VOLTAGE & ACTUATOR SIZE.

NOTE

REFER TO PUBLICATION E170E FOR APPROVED FUSES FS1 AND FS2.

MAX EXTERNAL LOAD ON TERMINALS 4 & 5 TO BE 5W.

CONTROL SIGNAL THRESHOLD VOLTAGES
TO BE MINIMUM 'ON' 20V AC/DC
MAXIMUM 'OFF'= 3V
MINIMUM CONTROL SIGNAL DURATION
TO BE 300mS.

CURRENT DRAWN FROM EACH REMOTE CONTROL SIGNAL IS 5mA ON 24V DC OR 12mA ON 120V AC

WIRES ARE IDENTIFIED AT EACH END BY TERMINAL No. OR TAG No.

INDICATION CONTACTS S1-S4 ARE SHOWN IN THEIR DEFAULT CONFIGURATION. CONTACTS MAY BE CONFIGURED FOR ANY OF THE FUNCTIONS DESCRIBED IN E170E

1Q

No	DATE	REVISION DETAILS
01	061008	FIRST ISSUE

www.rotork.com

CONFIG BY TPW
DATE 061008

3001-000 B1, C1, 41, M1
CUSTOMER SPEC

2572

CITY OF CAMAS
616 Northeast Fourth Avenue
P.O. Box 1055
Camas, Washington 98607
http://www.ci.camas.wa.us

RECEIVED
DEPT. OF ECOLOGY/SWRO
'01 SEP -4 A10 :37

August 29, 2001

DEPARTMENT OF PUBLIC WORKS

Mr. Mike Harris
Department of Ecology
300 Desmond Drive
P.O. Box 47600
Olympia, WA 98504-7600

Subject: ***Water Right Application Submittals***
City of Camas

Dear Mr. Harris:

Enclosed you will find two water right applications along with the statutory examination fee of $10.00 for each water right application (total of $20.00). The enclosed applications are for new water supply sources in the Lacamas Basin.

The City of Camas would like to develop three new supply wells under these applications to meet the rapid growth, which is occurring in the western portion of our service area. We recently completed an extensive test well drilling program in this area. The results of the exploratory drilling and aquifer testing are summarized in the attached report titled *City of Camas, Westside Test Well Drilling Program (PGG, 2001).*

At your convenience, we would like to schedule a meeting with you and your staff to discuss the results of our test well program and strategies for obtaining water right permits for new production wells.

We appreciate your assistance on this matter.

Sincerely,

Eric Levison
Engineering Manager

Enclosures: Water Right Applications

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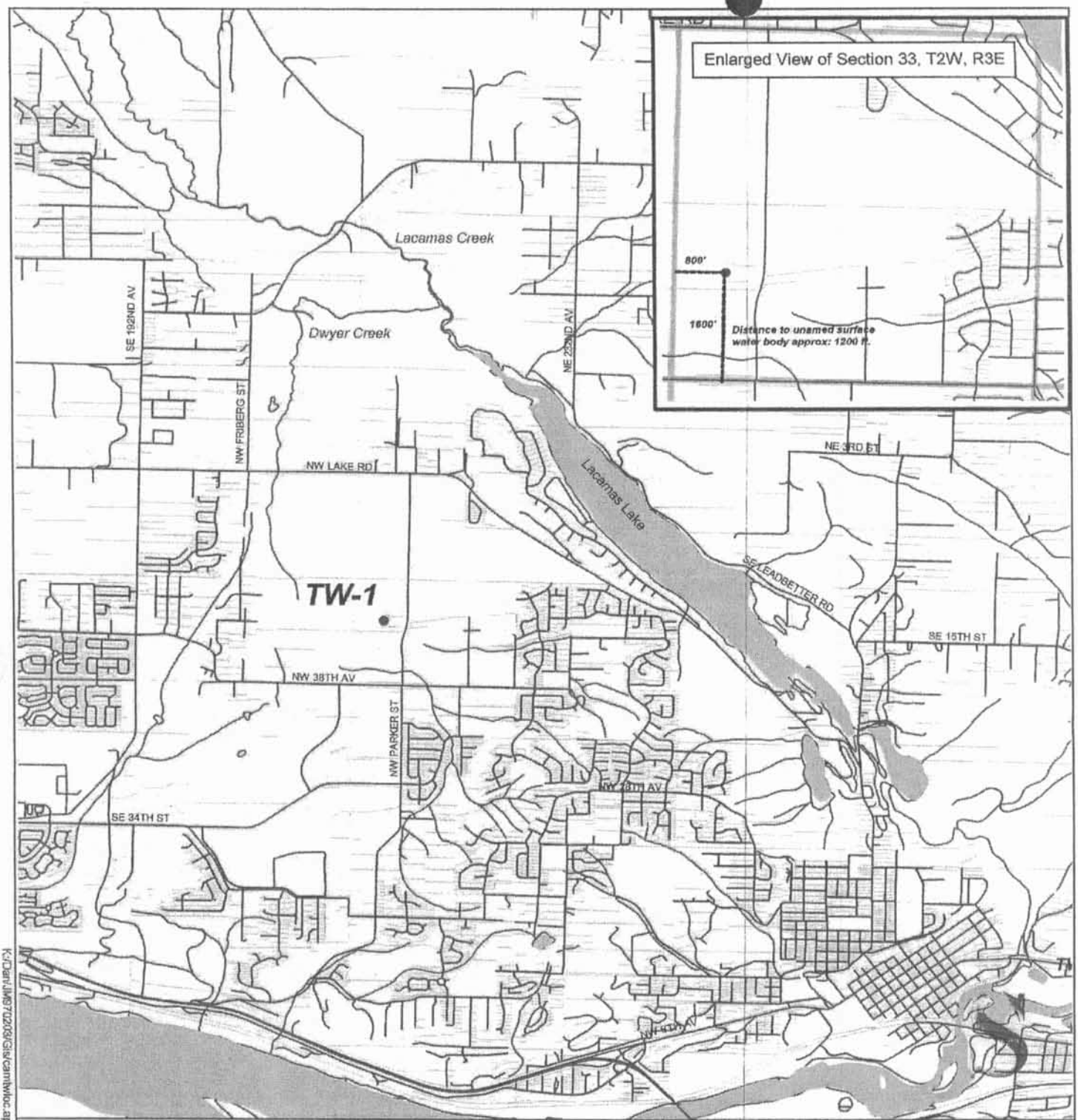

Figure 1
Proposed Well Location Map

City of Camas
Westside Test Well
Drilling Program

JM9702.03

Pacific Groundwater Group

K:\Dan\JM9702\03\Gis\camtwloc.apr (Test Well Location Map) 11/22/01

2574

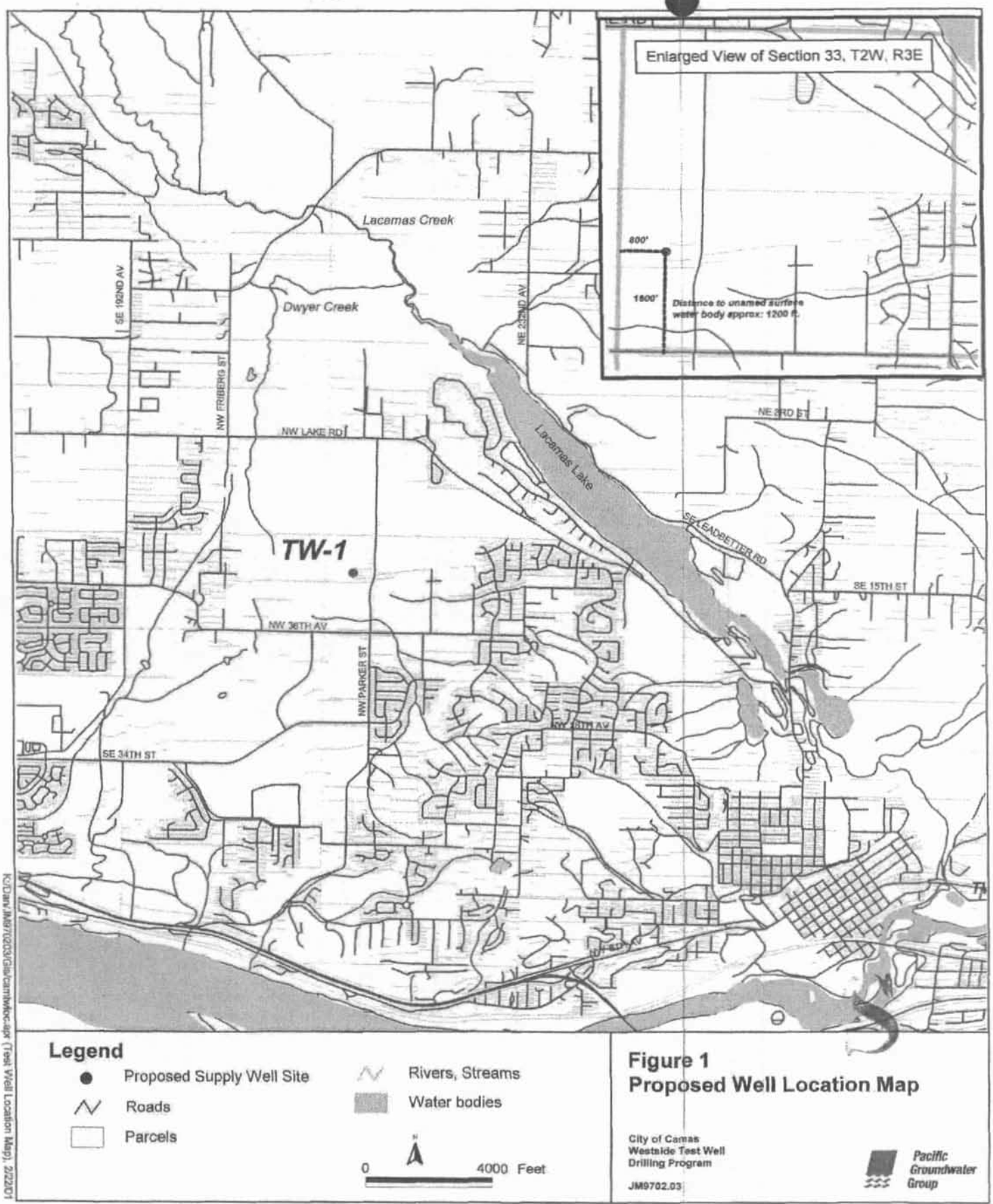

Figure 1
Proposed Well Location Map

City of Camas
Westside Test Well
Drilling Program

JM9702.03

Pacific Groundwater Group

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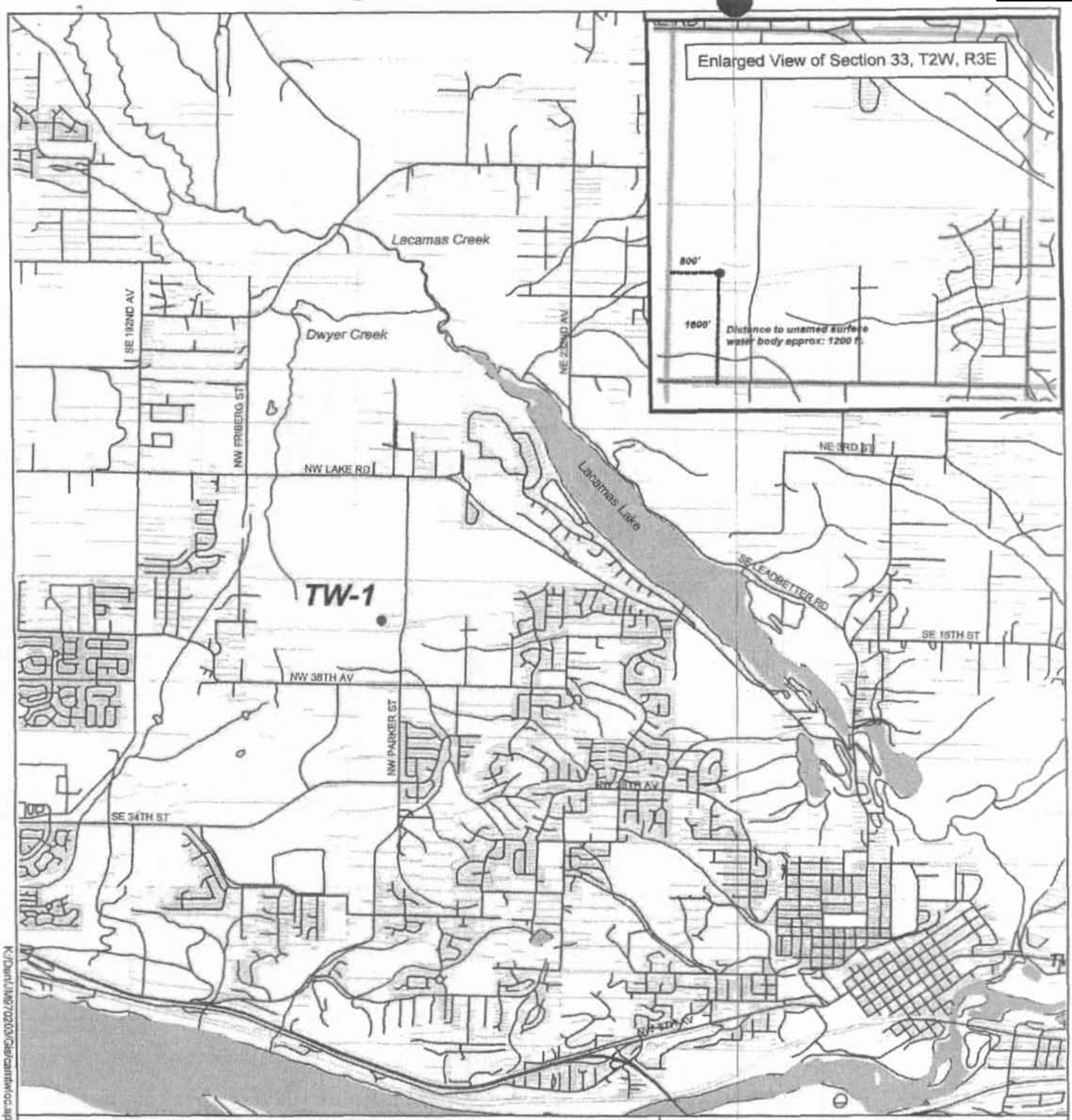


Figure 1
Proposed Well Location Map

City of Camas
Westside Test Well
Drilling Program
JM9702.03

Pacific Groundwater Group

K:\Dwrt\JM9702\03\Gis\camtwloc.apr (Test Well Location Map), 2/22/01

TABLE 1-3

City of Camas Water Right Summary

Source	Location of Diversion	Identification Number	Priority Date	Instantaneous Quantity Q_i (gpm)	Annual Quantity Q_a (ac-ft/yr.)
Claims					
Well No. 1	2159 ft. N, 667 ft. E, from the SW corner, S12, T1N, R3E	121022	6/11/74	900	320(1)
Well No. 2	2152 ft. N, 731 ft. E, from the SW corner, S12, T1N, R3E	121023	6/11/74	900	230(1)
Certificates					
Boulder Creek	(need this info)	S 712 C	8/22/23	1120 [2.5 cfs]	1820(2) (P)
Jones Creek	SE1/4, SW1/4, S3, T2N,R4E	S 711 C	9/5/30	450 [1.0 cfs]	730(3) (P)
Well No. 3	NW1/4, SW1/4, S12,T1N, R3E	G 85-A C	7/21/45	1200	118 (P)
Well No. 4	W1/2, NW1/4, S12, T1N, R3E	G 4072-A C	2/12/59	1325	1208 (S)
Well No. 5	Lot 9 of Orchard Homes, 2760 ft. E, 840 ft. N from SW corner, S12, T1N, R3E	G 6636-A C	3/22/68	600	920(4) (P)
Well No. 6	2300 ft. E, 1800 ft. N from SW corner, S12, T1N, R3E	G 6635-A C	3/22/68	1500	2400(4) (P)
Well No. 7	1245 ft. E, 2145 ft. N from SW corner, S12, T1N, R3E	G2-00501 C	3/22/71	1000	530(5) (P)
Well No. 8	1375 ft. E, 2145 ft. N from SW corner, S12, T1N, R 3E	G2-24400 C	2/4/77	900	530(5) (P)
Permits					
Well No. 9	600 ft. S, 700 ft. W from N1/4 corner, S4, T1N, R3E	G4-27384 P	8/13/86	650	210(5) (S)
Total	Sum of all existing water right certificates and permits. These values do not include claims.			**SW = 1570 gpm GW = 7175 gpm Total = 8745 gpm**	**SW = 2550 ac-ft. GW = 3200 ac-ft. Total = 5750 ac-ft.**

(1) Claims must go through an adjudication procedure in state court to determine validity.
(2) This source was formerly know as the Little Washougal River. The certificate refers to an instantaneous quantity (Q_i) and does not specify an annual withdrawal. A DOE Report of Examination for Well No. 7 (G2-00501 C) summarizes existing water rights including 1820 ac-ft/yr. for Boulder Creek (S 712 C) based on continuous withdrawal at the instantaneous right specified.
(3) The certificate refers to an instantaneous quantity (Q_i) and does not specify an annual withdrawal. A DOE Report of Examination for Well No. 7 (G2-00501 C) summarizes existing water rights including 730 ac-ft/yr. for Jones Creek (S 711 C) based on continuous withdrawal at the instantaneous right specified.
(4) The Permit and Report of Examination preceding this certificate limited water rights to "the total quantity withdrawn or diverted from all sources is not to exceed 3300 ac-ft/yr."
(5) The Permit and Report of Examination preceding this certificate provided for "the total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificates No. 711 and 712 and Ground Water Certificates No. 85,4072, 6635, 6636, shall not exceed 5750 ac-ft/yr."
(P) Primary water right, additive to other rights.
(S) Supplemental water right, not additive or considered when summing a cumulative total of all rights.

Printed By: Dawn Merryman
On: 09/07/2001 At: 10:10 am

RECEIPT

Receipt Number 02-005

Department of Ecology (4610)
PO Box 5128
Lacey, WA 98509-5128
(360) 407-7095

Current Document Number **461G0355CJ** Date **09/10/2001** FM **03**

Remitter Name **CAMAS CITY** Receipt Name

Check/Draw Number **4149**
Document Amount **$20.00**
Method of Payment **Check**
Comment Description **WATER RIGHTS**

Ref Doc Nr	Ref Doc Sfx	Inv Nr	Id Nr	Prgm Cd	T C	R	Fund	Maj Grp	Maj Src	Sub Src	Cnty	Work Cls	PIC	AI	Org	Prj	Sub Prj	Prj Phs	Sub Obj	Sub Sub Obj	Var GL	Sub Sid Dr	Sub Sid Cr	Alloc Amt
				H00	001		001	02	85	000010														$20.00

2578

RECEIVED
DEPT. OF ECOLOGY/SWRO
'01 NOV -5 A11 :26

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

October 31, 2001

Department of Ecology
Southwest Regional Office
7272 Cleanwater Lane
Olympia, Washington 98504-6811

WATER RIGHT APPLICATION REVIEW

Application Number: G230018

Applicant: City of Camas
616 NE 4th Avenue
Camas, Washington 98607

WRIA: 28
Water: Well near Lacamas Lake and the Columbia River.
This water and/or affected reaches downstream are inhabited by:

Based on: ☐ Site-specific observations ☐ WDFW database or GIS
☐ Literature ☐ Knowledge of this type of stream

Amount: cfs 359.00 gpm 300.00 acre-ft
Point of diversion: NW1/4 SW1/4 of S33 T2N R3E.
Point of use:

WDFW recommended conditions:

☐ Instream flows in WAC 173-5

☐ This water right should be subject to any established lake levels, if any.

Instream flows based on: ☐ IFIM study ☐ USGS toe-width ☐ Tennant
☐ Other:

WDFW requests that water right be subject to the following instream flows or natural flow, whichever is less:

Jan
Feb
Mar
Apr
May
Jun

Jul
Aug
Sep
Oct
Nov
Dec

Instream flows to be measured at:

Other conditions requested by WDFW indicated by ☐:

☐ HPA

☐ Screen intake if accessible to fish (to be determined during application for HPA) according to WDFW standards.

☐ Based upon review of fish resources present, type and amount of water use, condition of habitat, and amount of water available, WDFW REQUESTS DENIAL of this application, in accordance with RCW 75.20.050, IF THIS SPACE IS CHECKED.

☐ WDFW recommends modification of this proposal to minimize impacts to fish.

☐ WDFW is a landowner and water user that will be affected by this proposed use.

☐ Please HOLD this application pending field review. WDFW staff will provide detailed response by

☐ Granting this water right application would adversely affect WDFW's existing water rights for a facility. We request the following conditions for this water right if it is granted.

Rationale for WDFW recommendations if not based on existing rules or statutes: WDFW has no objections to this application.

Additional Comments:

Karen Kloempken

Karen Kloempken
Water Rights Biologist
360-902-2615
Fax: 360-902-2946
E-mail: kloemkak@dfw.wa.gov

State of Washington
Application for a Water Right

Please follow the attached instructions to avoid unnecessary delays.

For Ecology Use
Fee Paid _____
Date _____

Section 1. APPLICANT - PERSON, ORGANIZATION, OR WATER SYSTEM

Name City of Camas Home Tel:( ) -
Mailing Address 616 NE 4th Ave. Work Tel:(360) 834 - 3451
City Camas State WA Zip+4 98607 + FAX:(360) 834 - 1535

Section 2. CONTACT - PERSON TO CALL ABOUT THE APPLICATION

☐ Same as above

Name Eric Levison Home Tel:( ) -
Mailing Address 616 NE 4th Ave. Work Tel:(360) 834 - 3451
City Camas State WA Zip+4 98607 + FAX:(360) 834 - 1535
Relationship to applicant Engineering Manager - City of Camas

Section 3. STATEMENT OF INTENT

Municipal

The applicant requests a permit to use not more than 350 (☒ gallons per minute or ☐ cubic feet per second) from a ☐ surface water source or ☒ ground water source (check only one) for the purpose(s) of Domestic/Public Supply. **ATTACH A "LEGAL" DESCRIPTION OF THE PLACE OF USE.** (See instructions.) *NOTE: A tax parcel number or a plat number is not sufficient.* Area served by City of Camas
Estimate a maximum annual quantity to be used in acre-feet per year: 300 AF/YR

☐ Check if the water use is proposed for a short-term project. Indicate the period of time that the water will be needed:
From ___/___/___ to ___/___/___

Section 4. WATER SOURCE

If SURFACE WATER	If GROUNDWATER
Name the water source and indicate if stream, spring, lake, etc. If unnamed, write "unnamed spring," "unnamed stream," etc.: Number of diversions:	A permit is desired for 1 well(s).
Source flows into (name of body of water):	Size & depth of well(s): 12-inch well 400 feet deep

LOCATION

Enter the north-south and east-west distances in feet from the point of diversion or withdrawal to the nearest section corner: 1600 feet north and 800 feet east of the SW 1/4 of Section 33, Township 2 North, Range 3 East

¼ of	¼ of	Section	Township	Range(E/W)	County	If location of source is platted, complete below: Lot	Block	Subdivision
NW	SW	33	2N	3E	Clark			

For Ecology Use Date Received: 9-4-01 Priority Date: 9-4-01
SEPA: Exempt/Not Exempt FERC License # Dept. Of Health #
Date Accepted As Complete 9-21-01 By SC Date Returned By WRIA 28

ECY 040-1-14
Rev. 9/95 F

APPLICATION

Appl. No.: G2-30018

G9-30018

Section 5. GENERAL WATER SYSTEM INFORMATION

A. Name of system, if named: Camas Municipal Water-Sewer System

B. Briefly describe your proposed water system. (See instructions.)

One 12-inch supply well will be constructed to a depth of 400 feet. The well will be used to provide water supply to municipal and industrial water users that are served by the City of Camas in the Lacamas Basin Area. See City's 1996 Water System Plan documents for other related water system information.

C. Do you already have any water rights or claims associated with this property or system? ☒ YES ☐ NO
PROVIDE DOCUMENTATION. See list of city water right permits and claims that are attached.

Section 6. DOMESTIC / PUBLIC WATER SUPPLY SYSTEM INFORMATION
(Completed for all domestic/public supply uses.)

A. Number of "connections" requested: 4896 Type of connection Municipal Industrial Hookup
(Homes, Apartment, Recreational, etc.)

B. Are you within the area of an approved water system? ☒ YES ☐ NO
If yes, explain why you are unable to connect to the system. *Note: Regional water systems are identified by your County Health Department.* The applicant (City of Camas) is the regional water provider.

Complete C. and D. only if the proposed water system will have fifteen or more connections.

C. Do you have a current water system plan approved by the Washington State Department of Health? ☒ YES ☐ NO
If yes, when was it approved? 1996 Please attach the current approved version of your plan.
Note: City is currently updating their Waster System Plan. The new plan should be approved in early 2002.

D. Do you have an approved conservation plan? ☒ YES ☐ NO
If yes, when was it approved? 1996 Please attach the current approved version of your plan.
Note: Water Conservation Plan incorporated into 1996 Water System Plan which is currently being updated.

Section 7. IRRIGATION/AGRICULTURAL/FARM INFORMATION
(Complete for all irrigation and agriculture uses.) N/A

A. Total number of acres to be irrigated: _____

B. List total number of acres for other specified agricultural uses:

Use _____ Acres _____
Use _____ Acres _____
Use _____ Acres _____

C. Total number of acres to be covered by this application: _____

D. Family Farm Act (Initiative Measure Number 59, November 3, 1977)
Add up the acreage in which you have a controlling interest, including only:
‡ Acreage irrigated under water rights acquired after December 8, 1977;
‡ Acreage proposed to be irrigated under this application;
‡ Acreage proposed to be irrigated under other pending application(s).

1. Is the combined acreage greater than 2000 acres? ☐ YES ☐ NO
2. Do you have a controlling interest in a Family Farm Development Permit? ☐ YES ☐ NO
If yes, enter permit no: _____

E. Farm uses:
Stockwater - Total # of animals _____ Animal type _____ (If dairy cattle, see below)
Dairy - # Milking _____ # Non-milking _____

Section 8. WATER STORAGE

Will you be using a dam, dike, or other structure to retain or store water? ☐ YES ☒ NO

NOTE: If you will be storing 10 acre-feet or more of water and/or if the water depth will be 10 feet or more at the deepest point, and some portion of the storage will be above grade, you must also apply for a reservoir permit. You can get a reservoir permit application from the Department of Ecology.

Section 9. DRIVING DIRECTIONS

Provide detailed driving instructions to the project site. From Lacey, WA, go southbound on I-5. Take I-205 exit at Hazel Dell. Proceed southbound on I-205 to SR-14. Take SR-14 eastbound to Brady Road. Proceed northbound on Brady Road, which turns into NW Parker Avenue, continue northbound on NW Parker Avenue past 20th Street NW. Turn into Fire Station Property, which is located on west side of NW Parker Avenue.

Section 10. REQUIRED MAP

A. Attach a map of the project. (See instructions.)

Section 11. PROPERTY OWNERSHIP

A. Does the applicant own the land on which the water will be used? ☐ YES ☒ NO
If no, explain the applicant's interest in the place of use and provide the name(s) and address(es) of the owner(s):

The City will use the water for supply within their service area.

B. Does the applicant own the land on which the water source is located? ☐ YES ☐ NO
If no, submit a copy of agreement:

The City will purchase the property as part of the supply well development.

I certify that the information above is true and accurate to the best of my knowledge. I understand that in order to process my application, I grant staff from the Department of Ecology access to the site for inspection and monitoring purposes. Even though I may have been assisted in the preparation of the above application by the employees of the Department of Ecology, all responsibility for the accuracy of the information rests with me.

City of Camas E. Levison Eric Levison — 8/20/01

Applicant (or authorized representative) — Date

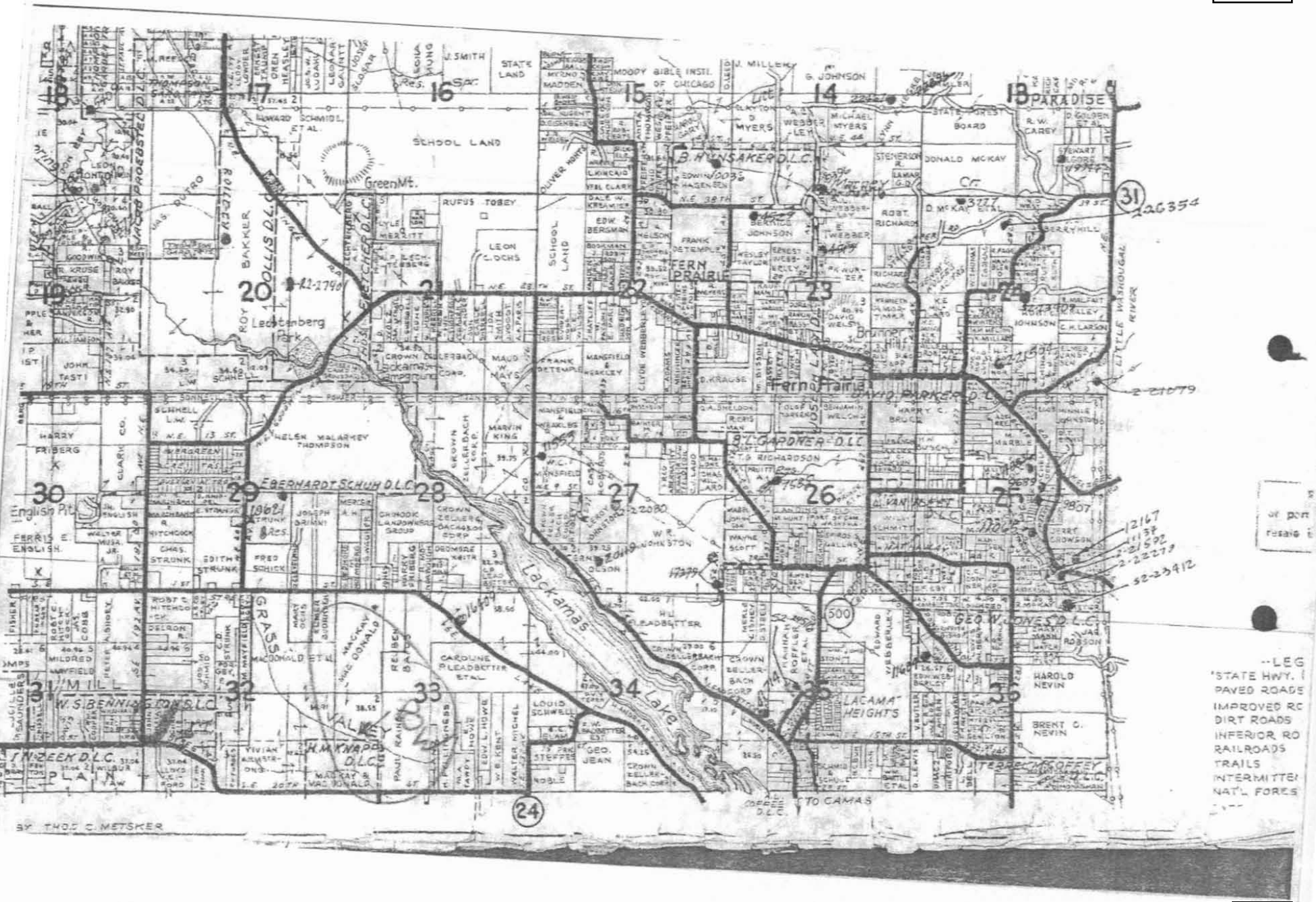
Landowner for place of use (if same as applicant, write "same") — Date

Use this page to continue your answers to any questions on the application. Please indicate section number before answer.

We are returning your application for the following reason(s):	
_____ Examination fee was not enclosed	APPLICANT PLEASE RETURN TO CASHIER, PO BOX 5128, LACEY, WA 98509-5128
_____ Section number(s) _____ is/are incomplete	APPLICANT PLEASE RETURN TO THE APPROPRIATE REGIONAL OFFICE
Explanation:	
Please provide the additional information requested above and return your application by _____ _____ *(date).*	

Ecology staff_____ Date_____

To receive this document in alternative format, contact Lisa Newman at (360) 407-6604 (Voice) or (360) 407-6006 (TDD).


SCHOOL LAND
GreenMt.
Leabtenberg Park
FERN PRAIRIE
Fern Prairie
Brunner Hill
Lackamas Lake
LACAMA HEIGHTS
PARADISE
MILL
PLAIN
VALLEY
TO CAMAS
BY THOS. C. METSKER

616 NE 4th Avenue
PO Box 1055
Camas WA 98607

WASHINGTON STATE DEPARTMENT OF ECOLOGY

STATE OF WASHINGTON
CERTIFICATE OF CHANGE ON A CLAIM

Document Title: Certificate of Water Right

Agency: Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Applicant: **City of Camas**
616 NE 4th Ave
PO Box 1055
Camas, WA 98607

Reference Number:

PRIORITY DATE	CLAIM NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
3/09/2001	G2-121022		G2-CV1-2P159

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Well 12	

MAX. CUBIC FEET PER SECOND	MAX GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
	900 GPM	320 AF/Y

QUANTITY/TYPE OF USE/PERIOD OF USE

320 Acre-feet per year Municipal Supply Year-round, as needed

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF WITHDRAWAL

2240 feet North and 1000 feet East of the Southwest corner of Section 12.

¼ ¼	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW ¼ SW ¼	12	1	3E	28	Clark

PARCEL # 89892000

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R I.A.	COUNTY
N/A	N/A	N/A	N/A	28	Clark

PARCEL #

Area served by City of Camas for municipal supply.

N/A

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

N/A

PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

The water appropriated under this application will be used for public water supply. The State Board of Health rules require public water supply owners to obtain written approval from the Office of Water Supply, Department of Health, 1112 SE Quince Street, PO Box 47890, Olympia, Washington 98504-7890, prior to any new construction or alterations of a public water supply system.

An approved measuring device shall be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

Water use data shall be recorded monthly. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to Ecology by January 31st of each calendar year.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit/Certificate/Claim No., source name, annual quantity used including units, maximum rate of diversion including units, monthly meter readings including units, peak monthly flow including units, Department of Health WFI water system number and source number(s), well tag number, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information. Submit data to: Department of Ecology, SWRO/WR PO Box 47775, Olympia, WA 98504-7775.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable

(continued on page 3)

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.100.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in Chapter 90.14 RCW.

Given under my hand and the seal of this office at Olympia, Washington, this 5th *day of* February, *2008.*

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

Jay Manning, Director
Department of Ecology

By Thomas Loranger
Thomas Loranger Section Manager

OK

Provisions Continued

times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

All wells constructed in the State shall meet the construction requirements of Chapter 173-160 WAC entitled "Minimum Standards for the Construction and Maintenance of Wells" and Chapter 18-104 RCW entitled "Water Well Construction, Act (1971)."

In accordance with Chapter 173-160 WAC, wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations, as appropriate. In general, wells shall be located at least 100 feet from sources of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.

Nothing in this approval shall be construed as lessening or enlarging any water rights represented by Water Right Claim No's 121022 & 121023. The water use authorized under this filing (fill in with water right no.) shall be considered supplemental to any water rights confirmed for said claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

PO Box 1055
Camas WA 98607

STATE OF WASHINGTON
CERTIFICATE OF CHANGE ON A CLAIM

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Document Title: Certificate of Water Right

Agency: Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Applicant: **City of Camas**
616 NE 4th Ave
PO Box 1055
Camas, WA 98607

Reference Number:

PRIORITY DATE	CLAIM NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
4/06/2001	G2-121023		G2-CV1-2P160

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Well 10	

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
	900	230

QUANTITY/TYPE OF USE/PERIOD OF USE

230 Acre-feet per year Municipal Supply Seasonal Use, May 1 – August 31

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF WITHDRAWAL

2220 feet North and 710 feet East of the Southwest corner of Section 12.

¼ ¼	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R I.A.	COUNTY
NW ¼ SW ¼	12	1	3E	28	Clark

PARCEL # 89866000

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R I.A.	COUNTY
N/A	N/A	N/A	N/A	28	Clark

PARCEL #

Area served by City of Camas for municipal supply.

N/A

CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

N/A

PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

The water appropriated under this application will be used for public water supply. The State Board of Health rules require public water supply owners to obtain written approval from the Office of Water Supply, Department of Health, 1112 SE Quince Street, PO Box 47890, Olympia, Washington 98504-7890, *prior to any new construction* or alterations of a public water supply system.

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(continued on page 3)

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This certificate of water right is specifically subject to relinquishment for non-use of water as provided in Chapter 90.14 RCW.

Given under my hand and the seal of this office at Olympia, Washington, this 5th *day of* February, *2008.*

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

Jay Manning, Director
Department of Ecology

OK

By Thomas Loranger
Thomas Loranger, Section Manager

2590

Provisions Continued

times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

All wells constructed in the State shall meet the construction requirements of Chapter 173-160 WAC entitled "Minimum Standards for the Construction and Maintenance of Wells" and Chapter 18-104 RCW entitled "Water Well Construction, Act (1971)."

In accordance with Chapter 173-160 WAC, wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations, as appropriate. In general, wells shall be located at least 100 feet from sources of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.

Nothing in this approval shall be construed as lessening or enlarging any water rights represented by Water Right Claim No's 121022 & 121023. The water use authorized under this filing (fill in with water right no.) shall be considered supplemental to any water rights confirmed for said claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

Hall, Tammy (ECY)

From: Hall, Tammy (ECY)
Sent: Monday, October 08, 2018 11:09 AM
To: Bennett, Rose (ECY)
Cc: 'Jill Van Hulle'; 'sadams@cityofcamas.us'
Subject: New Streamlined CRA-City of Camas G2-30019

Good morning Rose

This application requests 1,000 gpm for municipal supply.

Would you please put me down for 25 hours of review time.

	Project Manager/ Primary Point of Contact	Billing Contact
Name	Sam Adams, Utilities Manager	Same
Address	1620 SE 8th Ave Camas, WA 98607	
Telephone	360-817-7003	
Fax		
Email	sadams@cityofcamas.us	

TAMMY HALL, L.HG.--HYDROGEOLOGIST
WA DEPT OF ECOLOGY--WATER RESOURCES PROGRAM--SOUTHWEST REGIONAL OFFICE
PO BOX 47775 | OLYMPIA, WA 98504-7775
v 360-407-6099 | f 407-6305 | tammy.hall@ecy.wa.gov

City of Camas
WASHINGTON

Public Works Department

RECEIVED
SEP 24 2018
WA State Department
of Ecology (SWRO)

September 19, 2018

Tammy Hall
Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775

RE: Streamlined CRA Request for City of Camas Well 17 (G2-30019)

Dear Ms. Hall:

The City of Camas would like to move forward with the processing of our *Application for Water Right G2-30019*. This request is associated with our Well 17 which is currently being drilled under the Preliminary Permit you issued. As you are already aware the issuance of new water rights in the Lacamas Creek watershed is regulated protect flows. Our current water right permitting approach is to provide Ecology with an appropriate mitigation offset for the water we will be withdrawing from Well 17.

We wish to use the Streamlined Cost Reimbursement Process, and enter into a contract with Ecology to oversee the processing of our new application.

Our consultant Pacific Groundwater Group's (PGG) preliminary evaluation of Well 17 indicates that a relatively small portion (less than 10%) of our projected surface water capture from the well will affect stream flows in the Lacamas Creek drainage above the confluence with the Lacamas Lake impoundment and the balance of the capture is to the impoundment itself. We understand that mitigation for this site, as for all new applications in WRIA 28, needs to be provided in a manner consistent with the recommendation of the WRIA 27/28 Planning Group, and embodied in the provisions of WAC 173-528.

Under the Streamlined CRA approach PGG will prepare a Report of Examination (ROE) for your review. The ROE will address impairment, mitigations and consistency with WAC 173-528.

For contracting purposes please use the following information:

	Project Manager/ Primary Point of Contact	Billing Contact
Name	Sam Adams, Utilities Manager	Sam Adams
Address	1620 SE 8th Avenue, Camas, WA 98607	Same
Telephone	(360) 817-7003	
Email	sadams@cityofcamas.us	

Feel free to contact me at (360) 817-7003, or you may speak directly with Jill Van Hulle at (360) 413-1510.

Sincerely,

Sam Adams
Utilities Manager
City of Camas

Date: April 6, 2018

Teresa Hanson:

The following is in response to your April 6, 2018 request for delivery information on your Certified Mail™ item number 9171999991703776661108. The delivery record shows that this item was delivered on April 2, 2018 at 11:22 am in CAMAS, WA 98607. The scanned image of the recipient information is provided below.

Signature of Recipient :



Address of Recipient : 616 NE 4th

Thank you for selecting the Postal Service for your mailing needs.

If you require additional assistance, please contact your local Post Office or postal representative.

Sincerely,
United States Postal Service

Re. 62-30019

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 29, 2018

City of Camas
Attn: Eric Levison
616 NE 4th Ave
Camas WA 98607

Re: Preliminary Permit to Drill and Test a Well for Water Right Application G2-30019

Dear Mr. Levison:

Water Right Application G2-30019 requests 1,000 gallons per minute (gpm) and 1,200 acre-feet (ac-ft) per year for municipal supply. The proposed point of withdrawal is a well to be drilled in the SW ¼ NW ¼ of Section 34, T. 2 N., R. 3 E.W.M. of Clark County.

Under the authority of RCW 90.03.290, Ecology can issue a Preliminary Permit for a water right applicant to conduct studies, surveys, and investigations to gather information to assess a water right application. This Preliminary Permit allows temporary groundwater withdrawals for testing purposes only.

Ecology needs information that evaluates your proposed withdrawal before your application can be processed. Impacts to area users and surface water impacts need to be evaluated. Ecology reserves the right to ask for more information before making a final decision on the application, if necessary.

The requirements of this Preliminary Permit must be met within the deadline or Water Right Application G2-30019 will automatically be cancelled. This Preliminary Permit does not commit Ecology to approve the water right for your project. Other uses needing a water right permit are not allowed unless approved.

Ecology has determined the activities authorized under this Preliminary Permit are categorically exempt from SEPA review under WAC 197-11-800(17).

Please make sure that your consultant receives a copy of this Preliminary Permit to ensure compliance with all requirements. If adverse impacts to senior water right holders occur during any portion of the test, the test must be stopped immediately. Once testing is complete, the well must be capped so it does not pose a safety hazard.

This Preliminary Permit will remain in effect until April 1, 2020, unless revoked sooner by Ecology. The City of Camas will assume all expenses, risks, and liabilities incurred in response to this Preliminary Permit.

This Preliminary Permit is subject to existing rights and the following requirements:

Requirements for drilling new wells:

- ✓ All water wells constructed must meet the minimum standards for construction and maintenance. Chapter 18.104 RCW (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells) discuss well construction requirements.

> *Check with the County Health Department to see if well site approval is required before well construction.*

- ✓ Wells must be at least 100 feet away from potential sources of contamination, such as a sewer, septic tank, privy as specified in WAC 173-160-171. Wells must also be at least 1,000 feet away from solid waste landfills. These minimum distances must also comply with state and local health laws.

- ✓ The well must have a well-maintained access port. A backflow check-valve must also be installed. This valve will prevent water from flowing back into the well when pumping stops so data collected during recovery is accurate.

- ✓ The well driller must submit a well report for the new wells to Ecology within 30 days after drilling.

Requirements for test observation wells:

- ✓ At least one observation well must be monitored for drawdown, recovery and water quality during the aquifer test.

- ✓ Observation wells must be completed in the same aquifer as the pumping well and not be actively pumping during the test.

- ✓ Wells should be selected where they will best determine potential for impacts to surface water in the area, effects on nearby wells, and potential to cause seawater intrusion.

Requirements for pumping test:

The Washington State Department of Health (DOH) Water System Design Manual (DOH #331-123, June 99), Appendix E provides guidelines for designing and conducting aquifer tests (available at www.doh.wa.gov/ehp/dw). DOH guidelines are minimum requirements. Failure to follow correct methods may require the tests to be repeated.

- ✓ A Washington Licensed Hydrogeologist or Registered Engineer, specializing in groundwater evaluation, must supervise the test and perform data analysis.
- ✓ The well must be tested at a constant rate not less than the maximum design rate of the well.
- ✓ The test **must be designed to provide the following information:**
  - Distance and time drawdown response in the producing aquifer.
  - Aquifer transmissivity.
  - Aquifer storage coefficient and specific yield.
  - Effects on regulated surface water.
  - Effects to area users

Select accurate water level devices, such as transducers, or electric tape, to measure water levels. All watches and clocks used for timing should be synchronized so that each measurement can be referenced to the exact time since pumping began.

- ✓ The pumping portion of the test must be at least 24 hours long OR until the water level in the pumping well has been stable for at least four (4) hours, whichever occurs last.

Water levels are stable if they drop less than 0.1 foot in an hour while the well is pumping. Measuring points for water levels must be accurately located within 10 feet horizontally and 1 foot vertically.

- ✓ Water pumped during the test should be discharged so it will not recharge the drawdown cone or influence monitoring during the test.

- ✓ Recovery data must be collected from all wells until the water level in the pumped well nears pre-pumping conditions and the water-level recovery rate is less than 0.1 foot per hour.

- ✓ Data collected must be corrected for influences of barometric pressure, if applicable.

> *Ecology recommends measuring water levels in the test and observation well every hour at least 48 hours before the start of the aquifer test. This will help evaluate aquifer response to external stresses such as precipitation and well interference. Barometric pressure should also be monitored on similar schedule, particularly for confined aquifers, so corrections for barometric influences can be made.*

For water quality sampling, water samples must be collected from the pumping well and observation wells and tested for chlorides and conductivity at a laboratory accredited by the Department of Ecology. Water samples must be collected as follows:

- ✓ From the pumping well:
  - During the first 30 minutes of pumping.
  - About mid-way through pumping.
  - During the last 15 minutes of pumping.

- ✓ From the observation wells:
  - Before the pump test starts.
  - Immediately after all recovery data is collected and the well has recovered to its static water level.

Please be aware that the state or county health department may require additional testing prior to the approval of your project. If your project involves a public water system, please check with the appropriate health agency to determine what additional testing is required before you conduct the test.

Requirements for reporting:

City of Camas must file a report with Ecology when aquifer testing is complete. This information must provide Ecology with the information needed to evaluate results of the study. Ecology may request any of this information in an electronic format.

The report should contain the following information:

- ✓ Maps showing locations of wells used in pump test (pumping and observation wells) and surface water bodies.

- ✓ Pumping well information.
  - o Construction diagrams.
  - o Well report
  - o Lithology description of units.
  - o Pump intake depth.
  - o Wellhead elevation and way measured.
  - o Identification of measuring point.

- ✓ Monitoring well information.
  - o Well reports (if available).
  - o Well information and way it was determined (if no well report).
  - o Wellhead elevations and way measured.
  - o Total well depth and way determined.
  - o Screened interval and way determined.
  - o Identification of measuring point.

All water level and water quality data must be presented in both tabular form and on data plots.

- ✓ Distances between pumping well and observation well(s).

- ✓ Testing information.
  - o Pumping rates.
  - o Duration of pumping and recovery.
  - o Water level information.
  - o Raw data and corrected measurements.
  - o Corrections made for tidal influences (if any).
  - o Discussion of the methods and calculations used to determine aquifer characteristics.
  - o Copies of the all field data sheets related to the testing.

- ✓ Hydrogeology information.
  - o Hydrogeologic cross-sections.
  - o Description of the hydrogeologic system.
  - o Copies of all laboratory data sheets.

YOUR RIGHT TO APPEAL

You have a right to appeal this Preliminary Permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Preliminary Permit. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Preliminary Permit:

- File your appeal and a copy of this with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Preliminary Permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Michael Gallagher, Section Manger
Department of Ecology, SWRO
PO Box 47775
Lacey, WA 98504-7775

If you have any questions regarding this Preliminary Permit please contact Tammy Hall at (360) 407-6099.

Sincerely,

Joseph J. Witczak

Michael J. Gallagher, Section Manager
SWRO Water Resources Program

cc: Jill Van Hulle, Pacific Groundwater Group

By Certified Mail: 91 7199 9991 7037 7666 1108

Hall, Tammy (ECY)

From: Jill Van Hulle <jill@PGWG.COM>
Sent: Wednesday, March 21, 2018 2:57 PM
To: Hall, Tammy (ECY)
Cc: Dan Matlock; Sam Adams (SAdams@cityofcamas.us); Carroll, Sheri (ECY)
Subject: City of Camas - Request for Preliminary Permit and to Amend Application G2-30019
Attachments: Amend Camas Application.pdf; G2-30019_Camas application.pdf; Fig1_Site_Plan_V2.pdf

Hi Tammy, it's been a couple of months since we met with your regarding the City of Camas' plans to construct a new well (Well 17) near Lacamas Lake. As we discussed the City has a new well site in mind - just over a mile south and east from the originally designated site. We would like to modify the application that was filed in 2001 (G2-30019) with the new site AND request a **Preliminary Permit to Drill and Test** as soon as possible.

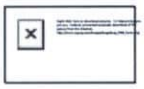
It does not appear that the original application was ever published so I will let the City know to be expecting that – and if you guys could loop me on that notice, I'd appreciate it.

A hard copy of this will be in the mail as well.

Thanks, and let me know if you need anything!

Jill

Jill Van Hulle | Water Resource Specialist
Pacific Groundwater Group | Water Resource & Environmental Consulting
(360) 413-1510 | jill@pgwg.com | www.pgwg.com



PACIFIC groundwater GROUP

RECEIVED
MAR 28 2018
WA State Department
of Ecology (SWRO)

March 21, 2018

Tammy Hall
Dept. of Ecology SWRO
PO Box 47775
Olympia, WA 98504

Re: Amendment of Application G2-30019

Dear Tammy

The intent of this letter is to request a modification in the *Point of Withdrawal* for pending application G2-30019 AND to request the issuance of a **Preliminary Permit** to drill and test at the new site.

Application G2-30019 was filed on September 4, 2001 in the amount of 1,000 gpm and projected annual quantity of 1,200 acre-feet per year. The intent was to construct up to two 12-inch production wells at a site immediately north of Lacamas Lake in the NE ¼ NW ¼ of Section 28, T. 2N. R. 3 E.W.M.

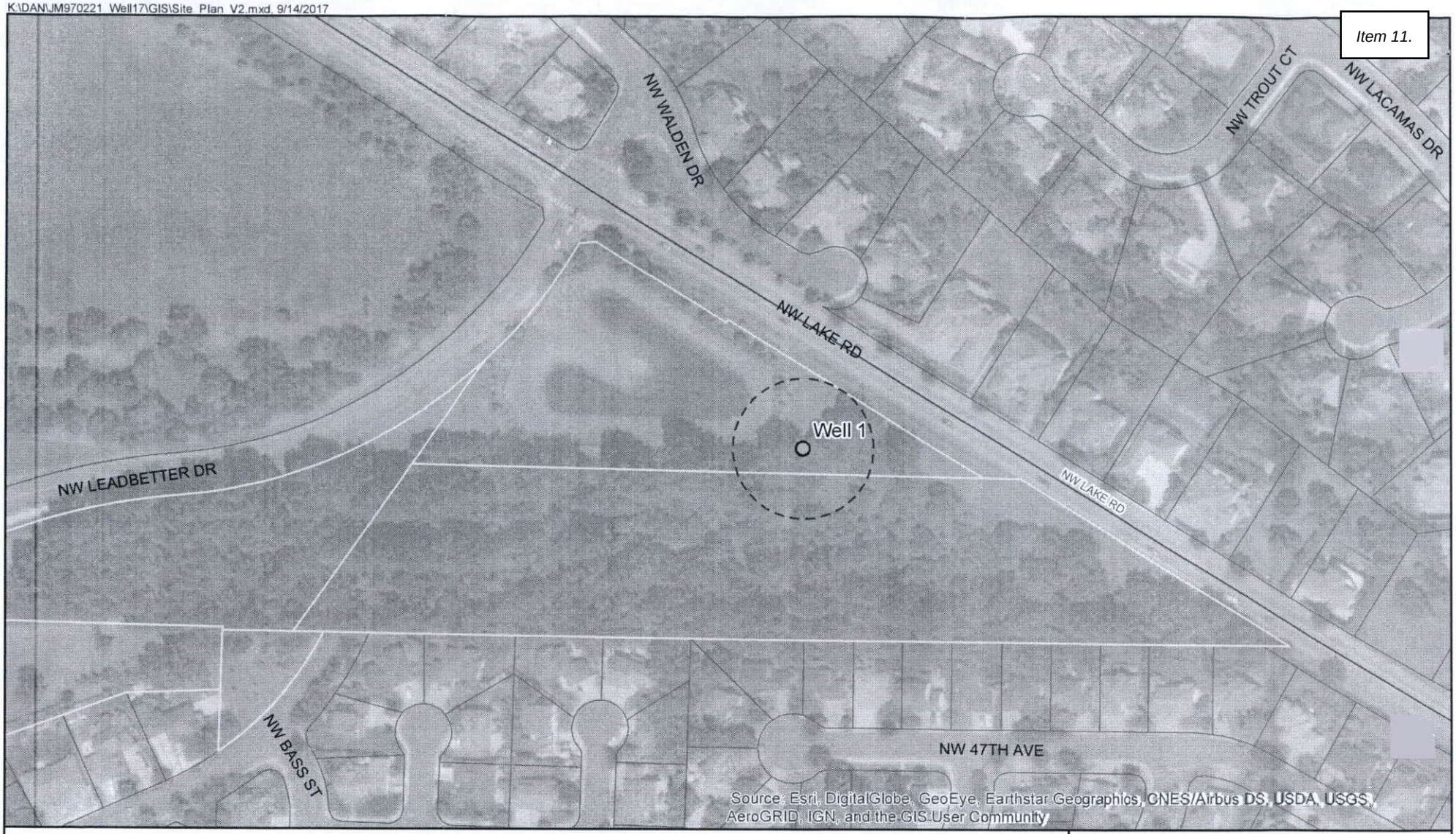
Since the time the application was filed we have reassessed our infrastructure needs and selected a new site for this well (Well 17) approximately a mile to the southeast of the original site within the SW ¼ NW ¼ of Section 34, T. 2 N., R. 3 E.W.M.

We would like to publish and secure the Preliminary Permit as soon as possible.

Sincerely,
Pacific Groundwater Group

Jill Van Hulle
Water Resources Specialist

K:\DAN\JM970221_Well17\GIS\Site_Plan_V2.mxd, 9/14/2017



Proposed Well 17 Location
100-ft Sanitary Control Area
City Properties

N
0 Feet 200

Figure 1
Camas
Well 17 Site

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 1, 2001

City of Camas
Attn Eric Levison
616 NE 4th Avenue
Camas WA 98607

Re: Water Right Application No. G2-30019

This letter is to acknowledge that the Washington State Department of Ecology received your water right application. We have assigned your application the number indicated above. Please include this number in future correspondence regarding your application with the Department of Ecology.

When we begin actively evaluating applications in your area, we will prepare a public notice and send it to you with publication instructions. It will be sometime before we are able to begin working in your area. In the meantime, please notify Ecology of changes such as address, property ownership, or variations in your proposed water use plans.

The availability of water in Washington state is a serious problem. Much of the water in our state has already been appropriated. The competition for water has escalated with our state's increasing population, conflicting water policy issues, and grave declines in salmon and other fish populations. A new watershed management law brings us a step closer to addressing some of these issues. It sets into motion a locally based process to address water quantity, quality, and habitat issues. Watershed management will help meet challenges for getting water to people, industries, farms, and fish.

In some areas of the state, we are continuing to evaluate applications within watersheds where we have previously gathered information and completed watershed assessments. We are also continuing to process water right permit or change applications that are intended to address public health and safety emergencies, the natural environment, or are for nonconsumptive withdrawals. All other applications are grouped by watershed and processed according to the date of submittal, and when we have enough information and staff resources to make decisions.

If you would like further information on your application, please contact the Southwest Regional Office at (360) 407-0240.

Sincerely,

J. Mike Harris

J. Mike Harris
Water Resources Supervisor
Southwest Regional Office

JMH:th (applet.doc)

DEPARTMENT OF ECOLOGY
State of Washington

STATE OF WASHINGTON
FINAL
REPORT OF EXAMINATION
FOR WATER RIGHT APPLICATION

File NR G2-30756
WR DOC ID #6802639

PRIORITY DATE	WATER RIGHT APPLICATION NUMBER
January 8, 2020	G2-30756

NAME AND MAILING ADDRESS	SITE ADDRESS (IF DIFFERENT)
CITY OF CAMAS 1620 SE 8TH AVE CAMAS, WA 98607	

Total Rate and Quantity Authorized for Withdrawal

WITHDRAWAL RATE (gpm)	ANNUAL QUANTITY (ac-ft/yr)
6,700	11,090

gpm = Gallons per Minute; ac-ft/yr = Acre-feet per Year

Attention: The annual quantity and instantaneous rate of withdrawal from the Lower Washougal Wellfield authorized under G2-30756 are non-additive to the associated rights listed below.

Purpose

PURPOSE	WITHDRAWAL RATE ADDITIVE	WITHDRAWAL RATE NON-ADDITIVE	WITHDRAWAL RATE UNITS	ANNUAL QUANTITY (AF/YR) ADDITIVE	ANNUAL QUANTITY (AF/YR) NON-ADDITIVE	PERIOD OF USE (mm/dd)
Municipal		6,700	GPM		11,090	01/01-12/31

PUBLIC WATER SYSTEM INFORMATION	
WATER SYSTEM NAME and ID	CONNECTIONS
Camas Municipal Water Sewer System 108002	Unspecified

SPECIAL REMARKS:
Exercise of the non-additive quantities authorized by G2-30756 attributable to the primary authorizations under G2-30144, G2-30145, G2-30146, and G2-30147.

Associated Water Rights

DOCUMENT NUMBER	INSTANTANEOUS RATE (gpm)	ANNUAL QUANTITY (ac-ft/yr)	REMARKS
G2-CV1-2P159	900	320	Annual appropriations for these water rights and the City of Camas' surface water certificates 711 and 712 were capped at 6,300 ac-ft/yr under water right decisions G2-00501 and G2-24400.
G2-CV1-2P160	900	230	
C-85-A	1,200	118	
C-6635-A	1,500	2,400	
C-6636-A	600	920	
G2-00501C	1,000	530	
G2-24400C	900	530	
G2-30144	500	2,150	Withdrawals authorized under these four water rights are mitigated by reduced diversions from the City's Boulder Creek and Jones Creek surface water sources.
G2-30145	1,000	880	
G2-30146	1,000	880	
G2-30147	1,000	880	
Total Associated Rights	10,500	11,090	Total annual quantity accounts for 6,300 af/yr cap noted above.

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Clark	Groundwater		WRIA 28

SOURCE NAME	PARCEL	WELL TAG	TOWNSHIP	RANGE	SECTION	QQ Q	LATITUDE (N)	LONGITUDE (W)
Well 5	87266000	AFP623	1N	3E	12	SW SE	45.5806	122.3834
Well 6	89927000	AFP624	1N	3E	12	NE SW	45.5834	122.3841
Well 7	89891000	AFP628	1N	3E	12	NW SW	45.5843	122.3885
Well 8	89888000	AFP629	1N	3E	12	NE SW	45.5843	122.3880
Well 10	89866000	AGP495	1N	3E	12	NW SW	45.5845	122.3904
Well 11	89892000	AHM259	1N	3E	12	NW SW	45.5840	122.3894
Well 12	89892000	AHM266	1N	3E	12	NW SW	45.5844	122.3895
Well 14	91045003	BAM409	1N	3E	12	NW SE	45.5837	122.3817

QQ Q = ¼ Quarter Quarter

Datum: NAD83/WGS84

Place of Use

Area served by Camas Municipal Sewer and Water System. The place of use of this water right is the service area described in the most recent Water System Plan approved by the Washington State Department of Health. RCW 90.03.386 may have the effect of revising the place of use of this water right if the criteria in section RCW 90.03.386(2) are met.

Proposed Works
Eight existing wells and one proposed well in the Lower Washougal Wellfield: Well 5: 8-inch diameter well to 71 feet below ground surface (bgs) Well 6: 16-inch diameter well to 85 feet bgs Well 7: 14-inch diameter well to 84 feet bgs Well 8: 14-inch diameter well to 87 feet bgs Well 10: 16-inch diameter well to 88 feet bgs Well 11: 16-inch diameter well to 105 feet bgs Well 12: 16-inch diameter well to 101 feet bgs Well 14: 20-inch diameter well to 85 feet bgs Proposed Well 18: Assumed 20-inch casing to about 100 feet bgs

Development Schedule

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	PUT WATER TO FULL USE BY THIS DATE
Started	December 31, 2026	December 31, 2031

Attention: These dates represent deadlines that must be met or risk cancellation of this authorization. Submittal of formal documentation for each stage is required. Extensions may be requested.

Measurement of Water Use

HOW OFTEN MUST WATER USE BE MEASURED AND RECORDED?	Weekly
HOW OFTEN MUST WATER USE DATA BE REPORTED TO ECOLOGY?	Annually by January 31
WHAT QUANTITY SHOULD BE REPORTED?	Total annual quantity in acre-feet
WHAT RATE SHOULD BE REPORTED?	Annual peak rate of withdrawal in gpm

Provisions

Measurements, Monitoring, Metering, and Reporting

An approved measuring device must be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", chapter 173-173 WAC, which describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology (Ecology) for modifications to some of the requirements.

Recorded water use data shall be submitted electronically by January 31 each year. To set up an Internet reporting account, contact the Regional Office. If you do not have Internet access, you can still submit hard copies by contacting the Regional Office for forms to submit your water use data.

Department of Health Requirements

Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Southwest Drinking Water Operations: 243 Israel Road S.E., PO Box 47823, Tumwater, WA 98504-7823, (360) 236-3030.

Water Use Efficiency
Use of water under this authorization will be contingent upon the water right holder's maintenance of efficient water delivery systems and use of up-to-date water conservation practices consistent with established regulation requirements and facility capabilities.

Relationship with Other Water Rights and Mitigation
Exercise of the non-additive quantities authorized by G2-30756 is attributable to the primary authorizations under G2-30144, G2-30145, G2-30146, and G2-30147.

Proof of Appropriation
Consistent with the development schedule given in this report (unless extended by Ecology), the water right holder must file a Notice of Proof of Appropriation (PA) of Water with Ecology. The PA documents the project is complete and all the water needed has been put to full beneficial use (perfected). In order to verify the extent of water use under this permit, an inspection of water use is typically required, known as a "proof exam". After filing the PA, the water right holder's next step is to hire a Certified Water Rights Examiner (CWRE) to conduct this proof exam. A list of CWREs is provided to the water right holder upon filing the PA with Ecology. The final water right document, a water right certificate, then may issue based upon the findings of the CWRE. Statutory county and state filing fees may apply prior to certificate issuance.

Schedule and Inspections
Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

Findings of Fact and Order

Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated.

Therefore, I ORDER **APPROVAL** of Application No. G2-30756, subject to existing rights and the provisions specified above.

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of the Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order to Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW, Ste 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

For additional information, visit the Environmental Hearings Office Website: http://www.eho.wa.gov. To find laws and agency rules, visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser.

Authorizing Signature

Signed at Lacey, Washington, this 2nd day of June, 2022.

Michael J. Gallagher

Michael J Gallagher, Section Manager
Water Resources Program/Southwest Regional Office
Department of Ecology

INVESTIGATOR'S REPORT

Water Right Application No.: G2-30756 (City of Camas)
Investigators: Joseph Morrice, LHG; Burt G. Clothier, LHG, RG
Reviewed by: Tammy Hall, L.HG.

BACKGROUND

This report serves as the written findings of fact concerning Water Right Application Number G2-30756.

On January 8, 2020 the City of Camas (City) filed an application for a new water right permit with the Washington State Department of Ecology (Ecology). The application requested authority to withdraw 6,700 gallons per minute (gpm) and an unspecified annual quantity from the City's Lower Washougal Wellfield (LWWF), non-additive to existing rights. The City also requested authorization for an additional point of withdrawal (well) in the LWWF; however, the requested new well (Well 18) will be authorized adding a point of withdrawal to one or more existing water rights (e.g., G2-0004C and G2-CV1-2P160) through a showing of compliance with RCW 90.44.100(3).

The LWWF consists of 8 existing wells near the confluence of the Washougal River and the Columbia River in the S½ of Section 12, Township 1N, Range 2E W.M. The City holds eleven water rights for the wellfield. Ten of the water rights each authorize withdrawals from a single well in the LWWF. The eleventh water right authorizes additional instantaneous withdrawals from one well (Well 8) and additional annual withdrawals from all existing wells in the wellfield except for Well 14. Combined, these rights authorize withdrawal of 10,500 gpm and 11,090 acre-feet per year (ac-ft/yr).

The purpose of the requested water right is to provide the City more flexibility in managing pumping from the wellfield, which is constrained by the instantaneous and annual limits associated with each water right and well. Additionally, the City's 2019 Water System Plan identified the need for additional supply to meet projected growth through 2035.

On February 17, 2022 the City requested via email that the application be amended to request a water right of 6,700 gpm, non-additive to existing rights for the LWWF. Over the near future this would help alleviate the City's constraints on managing the wellfield by allowing production to be shifted between wells, maximizing available withdrawals under the City's water rights. Projected long-term deficits in the annual quantity will likely require additional permitting of a new appropriation.

Table 1. Summary of Requested Water Right, as Amended

Applicant Name	City of Camas
Priority Date	1/8/2020
County	Clark
WRIA	27 – Salmon/Washougal
Water Source	Groundwater
Place of Use	The City of Camas service area as defined in the most recent Water System Plan.

Purpose	Instantaneous Rate (gpm)	Annual Quantity (ac-ft/yr)	Begin Season	End Season
Municipal	6,700	11,090	1/1	12/31

Source Name	Parcel	Well Tag	Township	Range	Section	QQ Q	Latitude (N)	Longitude (W)
Well 5	87266000	AFP623	1N	3E	12	SW SE	45.5806	122.3834
Well 6	89927000	AFP624	1N	3E	12	NE SW	45.5834	122.3841
Well 7	89891000	AFP628	1N	3E	12	NW SW	45.5843	122.3885
Well 8	89888000	AFP629	1N	3E	12	NE SW	45.5843	122.3880
Well 10	89866000	AGP495	1N	3E	12	NW SW	45.5845	122.3904
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Well 12	89892000	AHM266	1N	3E	12	NW SW	45.5844	122.3895
Well 14	91045003	BAM409	1N	3E	12	NW SE	45.5837	122.3817

WRIA = Water Resource Inventory Area; gpm = Gallons per Minute; ac-ft/yr = Acre-feet per Year; QQ Q = ¼ Quarter Quarter Datum: NAD83/WGS84

Cost Reimbursement

Under RCW 90.03.265 (1)(a) "any applicant for a new withdrawal or a change, transfer, or amendment of a water right pending before the department may initiate a cost-reimbursement agreement with the department to provide expedited review of the application. A cost-reimbursement agreement may be initiated under this section if the applicant agrees to pay for, or as part of a cooperative effort agrees to pay for, the cost of processing his or her application and all other applications from the same source of supply which must be acted upon before the applicant's request because they were filed prior to the date of when the applicant filed."

This application is being processed under a cost reimbursement agreement between the applicant and the Department of Ecology. This report has been prepared by Pacific Groundwater Group (PGG), a subsidiary of Mott MacDonald, and reviewed by Tammy Hall with the Department of Ecology's Water Resources Program.

Senior and Competing Applications

Under RCW 90.03.265 (1)(b) "the requirement to pay for the cost of other applications under (a) of this subsection does not apply to an application for a new appropriation that would not diminish the water available to earlier pending applicants for new appropriations from the same source of supply."

This new appropriation request is only for instantaneous and annual quantities non-additive to existing certificates and permits within the LWWF, no additional instantaneous or annual quantities will be approved. As such, this application can be processed without the risk of impacting the outcome of other applications.

INVESTIGATION

Investigation of this application included, but was not limited to, research and review of the following:

Carollo, 2019. City of Camas, Water System Plan Update, October 2019.
Ecology files of the water rights and well logs referenced in this report

Ecology, 2008. Hydrogeologic Investigation for the City of Camas Water Right Applications: G2-30144, G2-30145, G2-30146, and G2-30147. Memo from John Pearch, LHG to Tom Loranger.
Hartford and McFarland, 1989. Lithology, Thickness, and Extent of Hydrogeologic Units Underlying the East Portland Area, Oregon. USGS Water Resources Investigations Report 88-4110.
Hogenson and Foxworthy, 1965. Ground Water in the East Portland Area. USGS Water Supply Paper 1793.
McFarland and Morgan, 1997. Description of the Ground-Water Flow System in the Portland Basin, Oregon and Washington. USGS Water Supply Paper 2470-A.
Mundorff, 1964. Geology and Ground-Water Conditions of Clark County, Washington, with a Description of a Major Alluvial Aquifer along the Columbia River. USGS Water Supply Paper 1600.
PGG, 2003. Hydrogeologic Evaluation for City of Camas Replacement Wells 10, 11, and 12, Prepared for the City of Camas.
PGG, 2004. City of Camas Water Supply Alternatives Investigation, Prepared for City of Camas, Prepared by Pacific Groundwater Group.
PGG, 2006. Hydrogeologic Evaluation for City of Camas Replacement Well 13, Prepared for the City of Camas.
Swanson, McFarland, Gonthier, and Wilkinson, 1993. A Description of the Hydrogeologic Units in the Portland Basin, Oregon and Washington. USGS Water Resources Investigations Report 90-4196.

Proposed Use and Basis of Water Demand

Site Description

The LWWF is on a strip of land between the confluence of the Columbia and the Washougal Rivers. The distance between the two rivers is roughly one-half mile near LWWF with ground surface elevations about 20 to 40 feet above the elevation of the rivers. The City relies on the LWWF, two other water wells (Well 9 and Well 13), and two surface water diversions on Jones Creek and Boulder Creek to provide municipal supply to a residential population of about 26,000 people within the City's service area.

The City's water sources are within the Washougal River basin. The basin is in parts of Skamania and Clark counties. The headwaters are in the foothills of the Cascade Range at elevations up to 4,000 feet. Major tributaries include Lacamas Creek and the Little Washougal River. Lacamas Creek enters the river immediately downstream of the LWWF and the Little Washougal River enters the river about 5 miles upstream. Jones Creek and Boulder Creek, the City's surface water sources, both discharge to the Little Washougal River. The Washougal River discharges into the Columbia River, near the City of Camas at an average elevation of about 10 feet above mean sea level (msl).

Population is generally concentrated in the lower Washougal floodplain (e.g., the Cities of Camas and Washougal) and the lower reaches of the Little Washougal River and Lacamas Creek. The climate is characterized by mild, cool, wet winters and moderately dry warm summers. The Columbia River and the Pacific Ocean affect the weather patterns and help moderate temperatures year-round.

Topographic relief influences the distribution of precipitation, with average values of 35 inches per year west of Camas at the Portland Airport increasing to 110 inches per year in the upper elevations of the Washougal watershed.

Water System Description

The City of Camas water system serves about 26,000 people within their service area. The City's surface water and groundwater sources and service area are shown on Figure 1. The City currently operates 10 wells and two surface water diversions. Eight wells are in the LWWF (Well 5, Well 6, Well 7, Well 8, Well 10, Well 11, Well 12, and Well 14). Well 13 is located across the Washougal River from the LWWF, near the confluence of the river and Lacamas Creek and Well 9 is located about 3 miles northwest of the LWWF.

The eight LWWF wells range in depth from 70 to 110 feet below ground surface (bgs) and range in capacity from 500 to 1,350 gpm. The combined LWWF capacity is about 7,800 gpm or 11.23 million gallons per day (mgd), slightly less than the combined authorized withdrawal of 8,500 gpm. The City plans on system upgrades to increase the capacities of Well 11 and Well 12 and installing a new adjacent well (Well 18) under a Showing of Compliance with RCW 90.03(100) to allow full exercise of the water rights.

The City maintains emergency interties with the neighboring Cities of Washougal and Vancouver. However, due to system pressure relationships, the interties can only deliver water from Camas to the neighboring City except in very extreme circumstances and these connections do not represent practical sources of water for Camas.

History of Water Use

The City's has diverted water from Jones Creek since 1913 and from Boulder Creek since 1931 for municipal supply. The City drilled Wells 1 and 2 in 1936 and added Well 3 in 1945. These wells are all located in the LWWF. The system continued to expand with the addition of Wells 5 through 8 and 14 in the LWWF plus Wells 4 and 9 outside the wellfield. Wells 1, 2, 3 and 4 were subsequently replaced with Wells 10, 11, 12 and 13.

The City hasn't diverted any water from the two surface water sources since 2011 and intends to only use these sources during winter months. City staff provided monthly pumping and surface water diversion data obtained from their SCADA system. Table 2 presents average monthly and annual groundwater pumping rates and surface water diversion rates.

Table 2 – Annual Surface Water and Groundwater Production

YEAR	SURFACE WATER (ac-ft/yr)	GROUNDWATER (ac-ft/yr)	TOTAL (ac-ft/yr)
1997	1,597	1,418	3,015
1998	1,544	2,149	3,693
1999	1,541	2,136	3,677
2000	Data Unavailable		
2001	Data Unavailable		
2002	1,363	2,610	3,973
2003	1,183	3,474	4,657
2004	1,251	3,272	4,523
2005	864	3,390	4,254

2006	837	3,758	4,595
2007	855	3,260	4,115
2008	679	3,485	4,164
2009	306	3,800	4,106
2010	311	3,511	3,822
2011	51	3,935	3,986
2012	0	4,084	4,084
2013	0	4,156	4,156
2014	0	4,432	4,432
2015	0	4,765	4,765
2016	0	4,605	4,605
2017	0	4,578	4,578
2018	0	4,623	4,623
2019	0	4,437	4,437
2020	0	4,721	4,721

Proposed Use

The City's WSP identified the need for additional supply to meet future demands (Carollo, 2019). The WSP estimated population and water demand growth under low, medium and high growth projections to assess future instantaneous and annual supply needs. The WSP evaluated the instantaneous capacity requirements for the LWWF by subtracting Qi's allocated to non-LWWF sources from projected maximum daily demand (MDD) over a planning horizon (through 2035). Table 3 summarizes the annual demand data (under medium growth projections) and shows that the allocated LWWF Qi will be exceeded in 2030. The shortfall in instantaneous capacity could reach about 1,700 gpm in 2035.

Table 3 – Projected Maximum Day Demands and Water Right Authority, Medium Growth Scenario

YEAR	INSTANTANEOUS DEMAND (gpm)	AUTHORIZED Qi[1] (gpm)	SURPLUS / (DEFICIT) (gpm)
2021	8,188	10,475	2,287
2022	8,458	10,475	2,017
2023	8,729	10,475	1,746
2024	9,000	10,475	1,475
2025	9,271	10,475	1,204
2026	9,563	10,475	912
2027	9,854	10,475	621
2028	10,146	10,475	329
2029	10,438	10,475	37

[1] Includes rights associated with the LWWF and wells PW9 and PW13 but does not include undeveloped rights G2-30146 and G2-30147, which authorize an additional 1,000 gpm each. Water rights for the surface water diversions are not included, because diversions are not permitted during periods of maximum system demand (i.e., summer).

2030	10,729	10,475	(254)
2031	11,021	10,475	(546)
2032	11,313	10,475	(838)
2033	11,604	10,475	(1,129)
2034	11,896	10,475	(1,421)
2035	12,188	10,475	(1,713)

Other Rights Associated with Project or Place of Use

The City currently maintains a water rights portfolio of 11 certificates and four permits. Accounted together based on their stated amounts, these would allow for instantaneous withdrawal of 14,045 gpm and total annual withdrawal of 13,596 ac-ft/yr. Several factors alter the total annual allocation. In 1980 Ecology established an annual withdrawal limit of 5,750 ac-ft/yr for all (surface-water and groundwater) rights issued prior to 1979. This was increased to a maximum allocation of 6,300 ac-ft/yr with the recognition of groundwater claims for Wells 1 and 2. At that time, combined instantaneous and annual withdrawals authorized for the LWWF were 7,000 gpm and 5,048 ac-ft/yr.

This maximum allocation from the LWWF was increased again in 2008, when Ecology issued Permits G2-30144 and G2-30145 that added an allocation of 1,500 gpm and 3,030 ac-ft/yr to LWWF sources along with authorizing expansion of the wellfield with new Well 14. Addition of these two permits allowed the City to pump the LWWF at combined instantaneous and annual rates of up to 8,500 gpm and 8,078 ac-ft/yr.

Also, in 2008 Ecology issued additional permits to further expand the LWWF to new wells at Parker's Landing (G2-30146) and the Wastewater Treatment Plant (G2-30147). Neither of these permits have yet been developed due to current engineering and property constraints. Combining these permits with the others issued for the LWWF increases the total LWWF Qi to 10,500 gpm and the Qa to 9,838 ac-ft/yr.

The extended wellfield, as defined by the City's water right approvals, includes Wells 5 through 8, 10, 11, 12, 14, and the WWTP and Parkers Landing well sites.

Table 4 - City of Camas Water Rights

DOCUMENT NUMBER	PRIORITY DATE	INSTANTANEOUS RATE (gpm)	ANNUAL QUANTITY (ac-ft/yr)	COMMENTS
CS2-SWC712	8/22/1923	1,120	1,820	Boulder Creek
CS2-SWC711	9/5/1930	450	730	Jones Creek
G2-CV1-2P159	6/11/1974	900	320	Well 10 (replaced PW1)
G2-CV1-2P160	6/11/1974	900	230	Well 11 (replaced PW3)
C-85-A	7/21/1945	1,200	118	Well 12 (replaced PW2)
C-4072-A	2/12/1959	1,325	1,208	Well 13 (replaced PW4)
C-6635-A	3/22/1968	1,500	2,400	Well 6
C-6636-A	3/22/1968	600	920	Well 5
G2-00501C	3/22/1971	1,000	530	Well 7
G2-24400C	8/13/1986	900	530	Well 8
G2-30144	8/21/2003	500 (Well 8 only)	2,150	Wells 5 – 8, 10, 11, and 13

G2-27384	8/13/1986	650	210 N	Well 9
G2-30145	8/13/1986	1,000	880	Well 14
G2-30146	8/13/1986	1,000	880	Parkers Landing
G2-30147	8/13/1986	1,000	880	WWTP

gpm = Gallons per Minute; ac-ft/yr = Acre-feet per Year; N = non-additive

Hydrogeologic Evaluation

The geology of the project area has been studied and investigated by the United States Geological Survey (USGS; Mundorff, 1964; Hogenson and Foxworthy, 1965; Hartford and McFarland, 1989; Swanson and others, 1993; McFarland and Morgan, 1997) and various consultant reports for local governments (PGG, 2003, 2004, and 2006).

The City is located near the eastern edge of the Portland Basin near the Cascade foothills. The bottom of the basin is formed of volcanic rocks that rise to the east to form the Cascade Range. Sediments that fill the basin range are over 1,700 feet thick in the middle of the basin around the City of Vancouver, but dip up and thin toward the Camas area and are absent in the northern portion of the study area where bedrock is exposed. These sediments include river alluvium (deposited during both recent and Pleistocene times) underlain by deposits of the Troutdale formation. In the LWWF vicinity, the Troutdale formation is absent and alluvial deposits are underlain directly by relatively shallow bedrock.

Pleistocene Alluvial Deposits occur at or near the land surface throughout much of the City in the area that lies between the Washougal and Columbia Rivers and are largely overlain by river alluvium in the LWWF vicinity. During the late Pleistocene, the ancestral Columbia River deposited a great deltaic fan emanating to the west from the mouth of the Gorge during a series catastrophic events known as the "Missoula floods." The resulting deposits are approximately 100 feet thick in the vicinity of the LWWF increasing to about 200 feet under the Columbia River channel. Sediment textures are typically described by drillers as boulders, cobbles, sand and gravel with some limited cemented zones. In places, the Pleistocene Alluvial Deposits are overlain by finer-grained recent alluvial deposits.

Saturated portions of the Pleistocene Alluvial Deposits form the Pleistocene Alluvial Aquifer (PAA). The PAA is highly productive, with local supply wells typically producing between 500 and 1,500 gpm. Testing at the City's LWWF indicates an aquifer transmissivity of approximately 1,000,000 gallons per day per foot (gpd/ft) and a storage coefficient of about 0.05 (PGG, 2004). All of the City's wells located within the floodplain are completed in the PAA. Relatively shallow bedrock limits the saturated thickness of the PAA, thus limiting available drawdowns and maximum yields of PAA wells.

Groundwater levels in the PAA show significant seasonal variation due to river stage variation and pumping withdrawals (by Camas, Washougal and Georgia Pacific). Seasonal water level variations are locally observed to range from 15 to over 35 feet. Water levels in the LWWF tend to rise to the Washougal River elevation during high-flow events in late spring when the Columbia River and lower Washougal River are at their highest. This suggests that the aquifer is replenished up to the river elevation during these events and that groundwater and surface water are hydraulically connected. In contrast, seasonal declines in groundwater levels near the river during the summer and fall months indicate that unsaturated conditions develop in the lower reaches of the system. These unsaturated conditions locally sever the direct hydraulic connection between the river and the PAA water table during portions of the summer and the fall (PGG, 2004 and 2013).

Despite the proximity of LWWF wells to the Washougal River, testing showed that only Well 4 exhibited groundwater under the influence of surface water from the Washougal River (PGG, 2004). The City has subsequently taken Well 4 out of service.

ANALYSIS

Under Washington State law (RCW 90.03.290), each of the following four criteria must be met for an application for a new water right permit to be approved:

- Water must be available for appropriation.
- Water withdrawal and use must not cause impairment of existing water rights.
- The proposed water use must be beneficial.
- Water use must not be detrimental to the public interest (public welfare).

Water Availability

For any new appropriation, water must be both physically and legally available.

Physical Availability

For water to be physically available for appropriation, water must be present in quantities and quality and on a sufficiently frequent basis to provide a reasonably reliable source for the requested beneficial use or uses. An analysis of physical availability is required for both surface water and groundwater applications.

The PAA tapped by the LWWF wells is highly transmissive and supports numerous high-production supply wells operated by the City, the City of Washougal, and Georgia-Pacific. The City has been withdrawing groundwater from the LWWF since the late 1930s without any reported loss of aquifer yield or need to curtail use due to physical unavailability of water. Given the requested water right is non-additive to existing water rights for the LWWF there will be no increase in instantaneous or annual production and water is physically available for the requested use.

Legal Availability

To meet the legal availability test, the proposed appropriation may not withdraw and use water that is already “spoken for”, such as water from sources that are protected by administrative rule or court order.

Under Chapter 173-528 WAC, the Washougal River is closed to new consumptive appropriations year-round, including appropriation of groundwater in hydraulic continuity with surface water. The LWWF wells are in hydraulic continuity with the Washougal River. The existing water rights for the LWWF either pre-date adoption of Chapter 173-528 WAC (G2-CV1-2P159, G2-CV1-2P160, C-85-A, C-6635-A, C-6636-A , G2-00501C, and G2-24400C) or were issued as mitigated water rights, mitigated by the City’s reduced seasonal diversions from Jones Creek and Boulder Creek. Given the requested water right is non-additive to these primary water rights there will be no increase in pumping from the LWWF and pumping effects on the Washougal River remain within those estimated to support the authorization of previous water rights. As such, water is legally available.

Impairment

In analyzing impairment, Ecology must make a determination as to whether existing water rights, including adopted instream flows, may be impaired by the withdrawal and proposed use.

The requested water right is non-additive to the City's existing rights for the LWWF and would not increase the instantaneous or annual withdrawals. The existing primary water rights all either pre-date the adoption of Chapter 173-528 WAC or are mitigated by the City's reduction in diversions from Jones Creek and Boulder Creek. Approval of the requested non-additive water right would allow the City to shift production between wells within the expanded LWWF, but not increase the total authorized instantaneous or annual quantities from the LWWF. Based on this, impairment of other water rights or instream flows is unlikely.

Beneficial Use

The proposed appropriation must be for a beneficial use of water.

Municipal supply is considered a beneficial use of water under RCW 90.54.020(1).

Public Interest

The withdrawal and associated use must not be detrimental to the public interest. At a minimum, the following are considered when making this assessment.

Notification to the Washington Department of Fish and Wildlife
Per RCW 90.03.280 and 77.57.020, Ecology must give notice to the Washington Department of Fish and Wildlife (WDFW) of applications to divert, withdraw, use, or store water.

WDFW was provided notice of this water right application on November 4, 2021. Steve Boessow responded in a letter dated March 15, 2022 stating that WDFW did not oppose the approval of this application.

State Environmental Policy Act (SEPA)
Under chapter 197-11 WAC, a water right application is subject to a SEPA threshold determination (i.e., an evaluation of whether there will be significant adverse environmental impacts) if any of the following conditions are met:

- It is a surface water right application for more than 1 cfs, unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cfs, so long as that irrigation project will not receive public subsidies;
- It is a groundwater right application for more than 2,250 gpm;
- It is an application that, in combination with other water right applications for the same project, collectively exceed the amounts above;
- It is a part of a larger proposal that is subject to SEPA for other reasons (e.g., the need to obtain other permits that are not exempt from SEPA);
- It is part of a series of exempt actions that, together, trigger the need to do a threshold determination, as defined under WAC 197-11-305.

The subject application's requested groundwater withdrawal exceeds 2,250 gpm. Therefore, a SEPA threshold determination was completed. Acting as the lead agency, the City of Camas prepared a SEPA checklist for the water right change. The City of Camas issued a Determination of Non-Significance (DNS) on January 20, 2022.

Public Notice

RCW 90.03.280 requires that notice of a water right application be published once a week, for two consecutive weeks, in a newspaper of general circulation in the county or counties where the water is to be stored, diverted, and used. Notice of this application was published in the Camas-Washougal Post-Record, a weekly newspaper, on 2/13/20 and 2/20/20.

No protests to this water right application were received.

Other Public Interest Concerns

The Watershed Management Plan adopted for WRIA 27/28 in 2006 addresses a range of issues related to water resources in the Salmon/Washougal drainage, including water supply, stream flow management, water quality, and aquatic habitat. The Watershed Management Plan recommended development of rules to protect instream flows and guide water resources permitting decisions. Chapter 173-528 WAC – Water Resources Program for the Salmon-Washougal Basin, WRIA 28 – was adopted into rule in January 2009 and implements the instream flow closures recommended in the Watershed Management Plan. The proposed new groundwater right, non-additive to existing rights, is consistent with the requirements and intent of Chapter 173-528 WAC and is not detrimental to the public interest.

Conclusions

I find that:

- Water is physically and legally available.
- The appropriation will not impair existing rights.
- The proposed municipal use is a beneficial use.
- Approval of this application will not be detrimental to the public interest.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend this request for a water right be **APPROVED** in the amounts and within the limitations listed below and subject to the provisions listed above.

Recommended Quantities, Purpose of Use, and Project Location

The rate and quantity of water recommended are maximum limits. The permit holder may only withdraw water at a rate and quantity within the specified limits that are reasonable and beneficial:

Table 5. Recommended Limits and Location

Maximum Instantaneous Rate (gpm)	6,700 (non-additive)
Maximum Annual Quantity (ac-ft/yr)	10,050 (non-additive)
Purpose of Use	Municipal
Points of Withdrawal	Well 5: SW¼, SE¼, S12, T1N, R3E W.M. Well 6: NE¼, SW¼, S12, T1N, R3E W.M. Well 7: NW¼, SW¼, S12, T1N, R3E W.M. Well 8: NE¼, SW¼, S12, T1N, R3E W.M. Well 10: NW¼, SW¼, S12, T1N, R3E W.M. Well 11: NW¼, SW¼, S12, T1N, R3E W.M. Well 12: NW¼, SE¼, S12, T1N, R3E W.M. Well 14: NW¼, SE¼, S12, T1N, R3E W.M.
Place of Use	As described in the City's most recent Water System Plan, dated May 1, 2019.



Burt G. Clothier, LHG, RG — *Date*: June 2, 2022

Tammy Hall, LHG — *Date*: June 2, 2022

To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

May 12, 2026

City of Camas
Attn: Rob Charles, PE
1620 SE 8th Ave
Camas, WA 98607

Email: rcharles@cityofcamas.us

Re: Proof of Appropriation Extension for Water Right No. G2-30144 & G2-30145

Dear City of Camas:

The Washington State Department of Ecology (Ecology) received your request to extend the date your project will be fully developed from August 1, 2025 to December 31, 2031. This is your first extension request to fully develop your project and therefore put (up to) the quantities of water on your permit to full beneficial use.

Per RCW 90.03.320, we approve permit extensions for "good cause shown" and "as may be reasonably necessary, having due regard to the good faith of the applicant and the public interests affected." For the reason(s) below, your permit extension request is approved:

- Changes in the project, while the project scope remains consistent with the original intent of the water right application – While the test wells have drilled, they are not productive or sufficient. Production has been shifted to the Lower Washougal Well Field under the non-additive quantities of water right permit G2-30756.

- Unforeseen financial and engineering problems – With the detection of PFAS is Well 13, funding and planning delays have resulted in significate redirection of Camas's resources. This has caused delays in development.

- Demonstrated effort to attain additional environmental studies – Camas has completed extensive testing and analysis within the Lower Washougal Wellfield to have a better understanding of the relationship between wells (i.e. existing and future), wellfield yield, hydrogeologic conditions, and hydraulic continuity between surface water and groundwater. This includes updating the regional groundwater model to better understand these conditions.

- Development of an updated water system plan – Camas is completing a Water System Plan Update (WSP) to be submitted to the Department of Health. The WSP will include changes to existing project and future plans.

The new deadline to fully develop your project is December 31, 2031. This is also the deadline to submit the enclosed Proof of Appropriation of Water form.

Please note that we expect you to follow all provisions on your permit and any underlying documentation until your use is certificated. Non-compliance may result in enforcement orders and/or penalties and may delay the certification of your water right permit.

Contact information

Please direct all questions about this letter and the enclosed Proof of Appropriation of Water form to:

Matthew Kogle
Staff Hydrogeologist – Permit Writer
Water Resources Program
Southwest Region Office

Phone: (360) 280-2983
Email: matthew.kogle@ecy.wa.gov

When you have fully developed your project, send the completed Proof of Appropriation of Water form to:

Department of Ecology – Southwest Region Office
Attn: Water Resources Program
P.O. Box 47775
Olympia, WA 98504-7775

Your right to appeal

You have a right to appeal this decision to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. “Date of receipt” is defined in RCW 43.21B.001(2).

To appeal, you must do all of the following within 30 days of the date of receipt of this decision:

- File your notice of appeal and a copy of this decision with the PCHB (see filing information below). “Filing” means actual receipt by the PCHB during regular business hours as defined in WAC 371-08-305 and -335. “Notice of appeal” is defined in WAC 371-08-340.

- Serve a copy of your notice of appeal and this decision on the Department of Ecology by mail, in person, or by email (see addresses below).

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Filing an appeal

Filing with the PCHB
For the most current information regarding filing with the PCHB, visit: https://eluho.wa.gov/ or call: 360-664-9160.

Service on Ecology

Street Address:

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:

ecologyappeals@ecy.wa.gov

More information

- **Pollution Control Hearings Board Website**
  https://eluho.wa.gov/
- **Chapter 43.21B RCW – Environmental Hearings Office – Pollution Control Hearings Board**
  http://apps.leg.wa.gov/RCW/default.aspx?cite=43.21B
- **Chapter 371-08 WAC – Practice And Procedure**
  http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Ecology's Laws, Rules & Rulemaking**
  https://www.ecology.wa.gov/About-us/How-we-operate/Laws-rules-rulemaking#ws

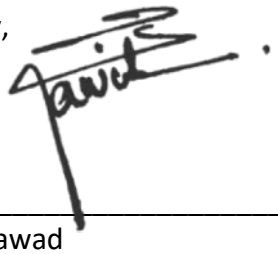
Americans with Disabilities Act information

Accommodation Requests

To request ADA accommodation including materials in a format for the visually impaired, call Ecology at 360-407-7668 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TTY at 877-833-6341.

Signature

Sincerely,



Saboor Jawad
Section Manager
Water Resources Program
Southwest Region Office

Enclosures: **Proof of Appropriation of Water**
https://apps.ecology.wa.gov/publications/documents/ecy040126.pdf

cc: Burt Clothier, Strate Geoscience - burt@stratageosciences.com (email only)
City of Camas, Operations Center – publicworks@cityofcamas.us (email only)

Sent by Certified Mail: 9489 0090 0027 6340 7369 64

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

May 12, 2026

City of Camas
Attn: Rob Charles, PE
1620 SE 8th Ave
Camas, WA 98607

Email: rcharles@cityofcamas.us

Re: Complete Construction Extension for Water Right No. G2-30146 & G2-30147

Dear City of Camas:

The Washington State Department of Ecology (Ecology) received your extension request to complete construction on your project. While Ecology's records indicate that construction has not started for these water right permits, further conversation with Camas indicated that test wells have been drilled under these water right permits. Furthermore, these water right permits are being exercised under non-additive quantities of water right permit G2-30756 within the Lower Washougal Well Field. Therefore, Ecology has determined that construction has begun for water right permits G2-30146 and G2-30147. This is your first request to extend the complete construction deadline.

Per RCW 90.03.320, we approve permit extensions for "good cause shown" and "as may be reasonably necessary, having due regard to the good faith of the applicant and the public interests affected." For the reason(s) below, your permit extension request is approved:

- Changes in the project, while the project scope remains consistent with the original intent of the water right application – While the test wells have drilled, they are not productive or sufficient. Production has been shifted to the Lower Washougal Well Field under the non-additive quantities of water right permit G2-30756.

- Unforeseen financial and engineering problems – With the detection of PFAS is Well 13, funding and planning delays have resulted in significate redirection of Camas's resources. This has caused delays in development.

- Demonstrated effort to attain additional environmental studies – Camas has completed extensive testing and analysis within the Lower Washougal Wellfield to have a better understanding of the relationship between wells (i.e. existing and future), wellfield yield,

hydrogeologic conditions and hydraulic continuity between surface water and groundwater. This includes updating the regional groundwater model to better understand these conditions.

- Development of an updated water system plan – Camas is completing a Water System Plan Update (WSP) to be submitted to the Department of Health. The WSP will include changes to existing project and future plans.

The new deadline to complete construction on your project is December 31, 2031. This is also the deadline to submit the enclosed Complete Construction Notice and Form 1 – Measuring Device Information.

As you develop your project, we expect you to follow all provisions on your permit and any underlying documentation. Non-compliance may result in enforcement orders and/or penalties and may delay the certification of your water right permit.

Contact information

Please direct all questions about this letter and the enclosed Complete Construction Notice and Form 1 – Measuring Device Information to:

Matthew Kogle
Staff Hydrogeologist – Permit Writer
Water Resources Program
Southwest Region Office

Phone: (360) 280-2983
Email: matthew.kogle@ecy.wa.gov

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Filing an appeal

Filing with the PCHB

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Service on EcologyStreet Address:

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:

ecologyappeals@ecy.wa.gov

More information

- **Pollution Control Hearings Board Website**
  https://eluho.wa.gov/
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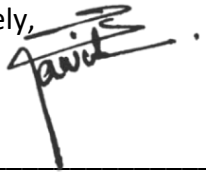
hearing may call Washington Relay Service at 711. People with speech disability may call TTY at 877-833-6341.

Signature

Sincerely,



Saboor Jawad
Section Manager
Water Resources Program
Southwest Region Office

Enclosures: **Complete Construction Notice**
https://apps.ecology.wa.gov/publications/documents/ecy04030b.pdf

Measuring Device Information form
https://apps.ecology.wa.gov/publications/documents/ecy070170.pdf

cc: Burt Clothier, Strate Geoscience - burt@stratageosciences.com (email only)
City of Camas, Operations Center – publicworks@cityofcamas.us (email only)

Sent by Certified Mail: 9489 0090 0027 6340 7369 40

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

May 12, 2026

City of Camas
Attn: Rob Charles, PE
1620 SE 8th Ave
Camas, WA 98607

Email: rcharles@cityofcamas.us

Re: Complete Construction Extension for Water Right No. G2-30756

Dear City of Camas:

The Washington State Department of Ecology (Ecology) received your extension request to complete construction on your project from December 31, 2026 to December 31, 2031. This is your first request to extend the complete construction deadline.

Per RCW 90.03.320, we approve permit extensions for "good cause shown" and "as may be reasonably necessary, having due regard to the good faith of the applicant and the public interests affected." For the reason(s) below, your permit extension request is approved:

- Unforeseen financial and engineering problems – With the detection of PFAS is Well 13, funding and planning delays have resulted in significate redirection of Camas's resources. This has caused delays in development.

- Demonstrated effort to attain additional environmental studies – Camas has completed extensive testing and analysis within the Lower Washougal Wellfield to have a better understanding of the relationship between wells (i.e. existing and future), wellfield yield, hydrogeologic conditions, and hydraulic continuity between surface water and groundwater. This includes updating the regional groundwater model to better understand these conditions.

- Development of an updated water system plan – Camas is completing a Water System Plan Update (WSP) to be submitted to the Department of Health. The WSP will include changes to existing project and future plans.

The new deadline to complete construction on your project is December 31, 2031. This is also the deadline to submit the enclosed Complete Construction Notice and Form 1 – Measuring Device Information.

As you develop your project, we expect you to follow all provisions on your permit and any underlying documentation. Non-compliance may result in enforcement orders and/or penalties and may delay the certification of your water right permit.

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Matthew Kogle
Staff Hydrogeologist – Permit Writer
Water Resources Program
Southwest Region Office

Phone: (360) 280-2983
Email: matthew.kogle@ecy.wa.gov

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Service on EcologyStreet Address:

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:

ecologyappeals@ecy.wa.gov

More information

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  https://eluho.wa.gov/
- **Chapter 43.21B RCW – Environmental Hearings Office – Pollution Control Hearings Board**
  http://apps.leg.wa.gov/RCW/default.aspx?cite=43.21B
- **Chapter 371-08 WAC – Practice And Procedure**
  http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Ecology's Laws, Rules & Rulemaking**
  https://www.ecology.wa.gov/About-us/How-we-operate/Laws-rules-rulemaking#ws

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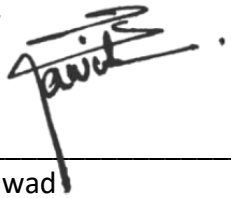
Signature

Sincerely,



Saboor Jawad
Section Manager
Water Resources Program
Southwest Region Office

Enclosures: **Complete Construction Notice**
https://apps.ecology.wa.gov/publications/documents/ecy04030b.pdf

Measuring Device Information form
https://apps.ecology.wa.gov/publications/documents/ecy070170.pdf

cc: Burt Clothier, Strate Geoscience - burt@stratageosciences.com (email only)
City of Camas, Operations Center – publicworks@cityofcamas.us (email only)

Sent by Certified Mail: 9489 0090 0027 6340 7369 57

APPENDIX T

WATER RIGHTS SELF-ASSESSMENT

Water Right Self-Assessment Form for Water System Plans

331-372 • 3/19/2026

All water right permits, claims, and certificates must be evaluated in a water right self-assessment for all sources used to supply the water system. The self-assessment is used to compare the parameters and other limitations of existing water rights against current and forecasted water production, as described in your water system plan, to determine whether the rights are adequate to serve your system's current and future water needs. This evaluation is for planning purposes and **does not constitute an official tentative determination of extent and validity** of water right permits, certificates, and claims. Tentative determinations of extent and validity occur when Ecology makes certain water right decisions, such as on water right change applications.

You must account for **all** sources of supply and total quantities of water withdrawn from the source. If you purchase water from another purveyor through a non-emergency intertie, you must complete the INTERTIES section of the self-assessment. All parts of the form must be filled out for each source. If information is missing it could result in delays of the water system plan approval process.

A Note on Permit-Exempt Wells

If you're seeking DOH approval of a new Group A or Group B water system using a permit-exempt well, you must complete the self-assessment, although certain fields will not apply. Talk to your DOH regional planner about using the Water Right Self-Assessment form for a Small Water System Management Program instead of this version.

Local governments must ensure that an adequate potable water supply is available from the permit-exempt well before issuing a building permit. Before developing a permit-exempt well, check with your local authorities on their criteria for establishing an adequate potable water supply for your planned public water system.

Water Right Parameters

Below is a brief description of the parameters associated with a typical water right. For the self-assessment, you only need to describe the last two bulleted items if they apply to your water rights.

- **Source Type**—refers to whether the source is surface water or groundwater.
- **Source Location**—this refers to the location of points of groundwater withdrawal or surface water diversion for each right.
- **Purpose of Use**—refers to the type of use, such as municipal water supply, community domestic, industrial or agricultural purposes.
- **Place of Use**—describes where water can be put to beneficial use under the right. Under the 2003 Municipal Water Law, RCW 90.03.386, the place of use for a water right held for municipal water supply purposes may be the system's service area as identified in an **approved** water system plan or small water system management program. Attach written

description and/or a map for water rights original place of use if service area is located in Mason, Thurston, Pierce, and Kitsap counties. To see the original place of use of a water right, use Ecology's Water Right Tracking System to look up the water right document using Ecology's Water Right Tracking System website.
    - See Ecology Policy 2030 for information on how Ecology administers the Municipal Water Law.
- **Period of Use**—refers to time-of-year limitations in which the water right may be put to use. If any water right has a time-of-year limitation, please include this information in the INTERRUPTIBLE WATER RIGHTS section.
- **Provisions or Limiting Conditions**—refers to any provisions or conditions placed on the water right. If a water right has a limiting condition or other provision, such as a collection and reporting requirement, other than a time-of year limitation, include this information in the ADDITIONAL COMMENTS section at the bottom of the self-assessment and in the water system plan narrative.

See Ecology Policy 20-11-065 for more information on water right terminology. If you have questions about your water rights, please contact the Ecology regional office in your area.

Completing the Water Right Self-Assessment Form

The self-assessment is a Word document to allow users to make changes or to expand the document. You may use another format, if preferred, as long as all required information is included. Below is a description of all fields and how to complete them. This form is divided into four different sections. Each section is described in the headings below.

See the column identifiers (A, B, C, etc) at the bottom of each column for guidance in completing the necessary calculations.

Water Right Permit, Certificate, or Claim Number: This number is assigned by Ecology when a permit application is filed. It's listed at the top of the permit or certificate. For water right claims, this is the registration number stamped in the lower left hand corner of the claim form.

WFI Source #: Identify the individual sources (e.g. well #1, well #2) as defined on the DOH Water Facilities Inventory form. If a **water right** is associated with multiple sources, list all sources in the same row in this column. If a **source** is associated with multiple water rights, identify each water right on a separate row.

Point of Withdrawal or Diversion Location: For wells, identify the well tag #. For wells and diversions please list the quarter-quarter section; township, range, or other more specific location identification information. If there are multiple points of withdrawal or diversion for single water right, list them all on the same line for that water right (do not list the water right on multiple lines with each unique point of withdrawal or diversion).

If you have any source(s) that is not currently being used (categorized as standby, back-up, or emergency), and the source has an associated water right that is not listed in column #1, please include the source and water right information in the ADDITIONAL COMMENTS section. This will identify that the source is still intended for a beneficial use under RCW 90.03.015(4). See Ecology Policy 20-11-065.

EXISTING WATER RIGHTS SECTION *(olive green color, top section)*

This section refers to existing water rights. It does not include any water right applications that have been submitted to Ecology.

Primary Qi (Instantaneous Quantity): This is also known as instantaneous flow rate. It's the amount of water allowed to be taken under the right from the source during a period of peak operation. For surface water, this is generally expressed in terms of cubic feet per second (cfs). For groundwater, this is generally expressed in terms of gallons per minute (gpm). One cfs equals 448.8 gpm. Please indicate the units of measurement you are using for each source. If there are situations where the flow rate will be limited (e.g. limitations established on the source when other sources are utilized), please note them in the ADDITIONAL COMMENTS section in the form and in the WSP narrative.

Non-Additive Qi: This term was formally known as "supplemental." Your water rights may use the old terminology. See Ecology Policy 20-11-065 for more information. Not all water rights have non-additive quantities. If a water right has non-additive Qi quantities, include the non-additive quantity in this field. This is generally listed in the "quantity, type of use, period of use" section on both permits and certificates. *Non-additive quantities should not be included in the primary Qi totals.*

Primary Qa (Annual Quantity): This is the amount of water that can be taken from the source under the right on an annual basis. This is different than the consumptive use limitation listed on the water right, if applicable (see WAC 173-500-050 and Ecology POL-1020 for further definition of consumptive use). It's usually expressed in terms of acre-feet. An acre-foot is the amount of water necessary to submerge an acre of land to a depth of one foot. One acre-foot equals 43,560 cubic feet or 325,851 gallons of water. If a Qa is not listed on the water right please write "N/A".

Non-Additive Qa: This term was formerly known as "supplemental." Your water rights may use the old terminology. See Ecology Policy 20-11-065 for more information. Not all water rights have non-additive quantities. If a water right has non-additive Qa quantities, include the non-additive quantity in this field. This is generally listed in the "quantity, type of use, period of use" section on both permits and certificates. *Non-additive quantities should not be included in the primary Qa totals.*

CURRENT SOURCE PRODUCTION SECTION *(light green color, top section)*

This section refers to how much water is withdrawn from the source under each water right for the most recent full calendar year. You will need to determine any excess or deficiency for each water right after calculating how much water was withdrawn compared to how much water is allowed under each water right. If demand has decreased over past years, you may wish to include historic maximum production information in the ADDITIONAL COMMENTS section. This will provide a more complete picture of the use of your water rights.

Use the water use data and demand projections from your water system plan to define current and projected water needs. You can determine if you'll need additional water rights based on the comparison of existing water rights, current water production, and projected 10- and 20-year needs.

Total Qi (Instantaneous Quantity): This refers to the total maximum instantaneous flow rate withdrawn from the source under each water right during the most recent calendar year. For surface water, this is expressed in terms of cubic feet per second (cfs). For groundwater, this is expressed in terms of gallons per minute (gpm). One cfs equals 448.8 gpm.

Current Excess or Deficiency (Qi): Please calculate the excess or deficiency for each water right after comparing the total amount withdrawn against each water right. Please use parentheses for deficient amounts.

Total Qa (Annual Quantity): This refers to the total volume of water withdrawn from each source under each water right during the most recent calendar year. It's usually expressed in acre-feet.

Current Excess or Deficiency (Qa): Please calculate the excess or deficiency for each water right after comparing the total amount withdrawn against each water right. Please use parentheses for deficient amounts.

10-YEAR FORECASTED SOURCE PRODUCTION SECTION *(light blue color, top section)*

This section refers to how much water you project to withdraw from each source in ten years as determined in your water system plan. Please complete this section in the same manner (using the same units of measurement) as the current source production section using your 10-year forecasted amounts.

20-YEAR FORECASTED SOURCE PRODUCTION SECTION *(darker blue color, top section)*

This section refers to how much water you project to withdraw from each source in twenty years as determined in your water system plan. Please complete this section in the same manner (using the same units of measurement) as the current source production section using your 20-year forecasted amounts. If you are unable to provide 20-year forecasts for each source, you may choose to include the combined 20-year total at the bottom.

PENDING WATER RIGHTS SECTION *(second section of form)*

Please complete this section for any water right applications that have been submitted to Ecology. Please include the application number, whether it's a new or a change application, the date submitted, and the total quantities requested.

INTERTIES SECTION *(third section of form)*

This section must be completed by purveyors who purchase any amount of wholesale water. If your system sells water to another public water system, include the quantity sold in the CURRENT SOURCE PRODUCTION section.

Purchasers of wholesale water must account for all water obtained through the intertie for non-emergency supply purposes. This is to ensure that all sources of supply are considered when evaluating whether new water rights are needed within 20 years.

Please identify the maximum quantity of water, expressed in the same manner as the above sections, allowed under each intertie contract. If there are limiting conditions or temporary agreements that effect the long-term use of the intertie, you must account for such limiting conditions when evaluating the current and forecasted water supply needs in your water system plan.

Finally, purchasers of wholesale water are responsible for ensuring that the underlying water right (held by the purveyor selling water) are adequate for such use. You should confirm that the selling system has accounted for the wholesale area in their water system plan to ensure that the water right authorizes the distribution of water through the intertie.

INTERRUPTIBLE WATER RIGHTS SECTION *(bottom section of form)*

This section refers to water rights that have an annual time-of-year interruption. Please complete this section for any water right listed in the above fields that has a time-of-year interruption. Please include the water right number, describe the limitation, and the time period of interruption. Purveyors with interruptible rights should develop a water shortage response plan as part of their water system plan to describe how demand will be met during periods of interruption through aggressive demand-side conservation, fixing leaks or other means.

ADDITIONAL COMMENTS SECTION *(bottom section of form)*

If the system has any source that is not currently being used on a regular basis (such a source may be categorized as stand-by, back-up, emergency), you should identify the source in this section if the source has an associated water right that is not listed in the above sections. The purpose is to identify that such water rights are still intended for a future beneficial use as required under RCW 90.03.015(4). See Page 2, Item 9 (b) in Ecology Policy 2030. For these water rights, please briefly describe the future intended use of the source and when you expect to utilize the water right. This does not refer to sources categorized as seasonal sources.

You should also include any other comments in this section that will explain aspects of your water right portfolio that are not identified above.

To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email doh.information@doh.wa.gov. If in need of translation services, call 1-800-525-0127.

Water Right Self-Assessment Form for Water System Plan

Mouse-over any link for more information. Click on any link for more detailed instructions.

Water Right Permit, Certificate, or Claim # *If water right is interruptible, identify limitation in yellow section below	WFI Source # If a source has multiple water rights, list each water right on separate line	Point of Withdrawal or Diversion Location Well tag #; quarter-quarter section; and township, range, section	Existing Water Rights Qi= Instantaneous Flow Rate Allowed (GPM or CFS) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold				Current Source Production – Most Recent Calendar Year Qi = Max Instantaneous Flow Rate Withdrawn (GPM or CFS) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold				10-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold				20-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold			
			Primary Qi Maximum Rate Allowed	Non-Additive Qi Maximum Rate Allowed	Primary Qa Maximum Volume Allowed	Non-Additive Qa Maximum Volume Allowed	Total Qi Maximum Instantaneous Flow Rate Withdrawn	Current Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume Withdrawn	Current Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 10 Years	10-Year Forecasted Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume in 10 Years	10-Year Forecasted Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 20 Years	20-Year Forecasted Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume in 20 Years	20-Year Forecasted Excess or (Deficiency) Qa
C-712 CS2-SWC 712	S01: Boulder Creek		1,120 (2.5 cfs)[1]		977													
C-711 CS2-SWC 711	S02: Jones Creek		450 (1 cfs)[1]		393													
G 6636-A G2-*09325C	SO6: Well 5		600		920[5]		675	-75	305	615								
G 6635-A G2-*09325C	S07: Well 6		1,500		2,400[5]		1,200	300	421	1,979								
G2-00501	S08: Well 7		1,000		530[6]		950	50	606	-76								
G2-24400	S09: Well 8		900		530[6]		1,250	-350	511	19								
G2-27384	SO6: Well 9		650			210	575	75	196									
G2-CV1-2P159	S15: Well 10		900		320		900	0	450	-120								
G2-CV1-2P160	S14: Well 12		1,200		230[6]		1,000	200	811	-581								
C-85-A G2-*0004C	S13: Well 11		900		118		1,000	-100	498	-380								
G2-GWC4079 G2-*05130C	S16: Well 13		1,325		1,208[6]		1,350	-25	855	353								
G2-30144	Lower Washougal Wellfield		500 (At Well 8)		2,150 (All 8 wells)													
G2-30145	S17: Well 14		1,000		880		850	150	556	334								
G2-30146	Parkers Landing		1,000		880													
G2-30147	Treatment Plant Well		1,000		880													
G2-30756	Umbrella Wellfield		6,700		11,090 (All 8 wells)													
	TOTALS =		14,045[2] 12,475[3]		11,090[2]		9,750	2,725	5,210	5,880	10,490	1,985	8,070	3,020	14,080	-1,605	10,910	180
Column Identifiers for Calculations:			A		B		C	=A-C	D	=B-D	E	=A-E	F	=B-F	G	=A-G	H	=B-H

PENDING WATER RIGHT APPLICATIONS: Identify any water right applications that have been submitted to Ecology.

Application Number	New or Change Application?	Date Submitted	Quantities Requested			
			Primary Qi	Non-Additive Qi	Primary Qa	Non-Additive Qa
G2-30528	New		17,213 gpm		13,555 AFY	

INTERTIES: Systems receiving wholesale water complete this section. Wholesaling systems must include water sold through intertie in the current and forecasted source production columns above.

Name of Wholesaling System Providing Water	Quantities Allowed In Contract		Expiration Date of Contract	Currently Purchased Current quantity purchased through intertie				10-Year Forecasted Purchase Forecasted quantity purchased through intertie				20-Year Forecasted Purchase Forecasted quantity purchased through intertie			
	Maximum Qi Instantaneous Flow Rate	Maximum Qa Annual Volume		Maximum Qi Instantaneous Flow Rate	Current Excess or (Deficiency) Qi	Maximum Qa Annual Volume	Current Excess or (Deficiency) Qa	Maximum Qi 10-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 10-Year Forecast	Future Excess or (Deficiency) Qa	Maximum Qi 20-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 20-Year Forecast	Future Excess or (Deficiency) Qa
1															
2															
3															
TOTALS =															
Column Identifiers for Calculations:	A	B		C	=A-C	D	=B-D	E	=A-E	F	=B-F	G	=A-G	H	=B-H

INTERRUPTIBLE WATER RIGHTS: Identify limitations on any water rights listed above that are interruptible.

Water Right #	Conditions of Interruption	Time Period of Interruption
C-712 CS2-SWC 712	Surface water diversion unavailable during this period to maintain instream flow.	May 15th – October 31st
C-711 CS2-SWC 711	Surface water diversion unavailable during this period to maintain instream flow.	May 15th – October 31st
3		

ADDITIONAL COMMENTS:

[1] S01 Boulder Creek and S02 Jones Creek surface water diversions cease between May 15th and October 31st of each year as required by G2-30144.

[2] Due to permit and certificate restrictions, the total Qi and Qa do not equal the sum of quantities for each column.

[3] Total Qi available between May 15th and October 31st comes from ground water supplies only and is equal to total Qi of 14,045 gpm minus 1,570 gpm of surface water rights from Boulder Creek and Jones Creek.

[4] Installation of one future well in the LWWF is included under this permit.

[5] The Permit and Report of Examination preceding this certificate limited water rights to "the total quantity withdrawn or diverted from all sources is not to exceed 3,300 AFY.

[6] The Permit and Report of Examination preceding this certificate limited water rights to "the total quantity withdrawn or diverted from all sources is not to exceed 5,750 AFY.

APPENDIX U

WELLHEAD PROTECTION PLAN

CITY OF CAMAS
WELLHEAD PROTECTION PLAN UPDATE

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July 2026

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CITY OF CAMAS
WELLHEAD PROTECTION PLAN UPDATE

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Camas WHP plan (July2026) draft.docx

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SIGNATURE

This report, and Strata Geosciences' work contributing to this report, were reviewed by the undersigned and approved for release.

DRAFT

Burt G. Clothier
Principal Hydrogeologist
Washington State Hydrogeologist No. 140

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Staff Engineer

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1.0 INTRODUCTION

Strata Geosciences, LLC (Strata) has prepared this Wellhead Protection Plan (WHPP) update for the City of Camas (City) to summarize the hydrogeology, wellhead protection area (WHPA) delineations, and contaminant risks to groundwater supplies. Information presented in this report supports an update of the City's Water System Plan (WSP) currently being prepared for the City by Carollo Engineers. The purpose of this report is to help the City better manage its groundwater supply and to better understand the contaminant risks posed to these sources. Elements of the report were developed following the Washington State Department of Health (DOH) guidelines for Wellhead Protection Programs (DOH, 2017).

The study area for this investigation focuses on the WHPAs for the City's nine shallow supply wells that lie in close proximity to the lower Washougal River (Figure 1-1). This includes the Lower Washougal Wellfield (LWWF), comprised of eight wells to the south of the railroad track, and Well 13 on the north bank of the Washougal River. The City also operates one deeper supply well (Well 9) in the Lacamas Lake area to the northwest of downtown Camas that is not included in the study area. This well is used primarily for supply during peak demand. Well construction and land use conditions limit the susceptibility and vulnerability of this source; therefore, it was not reviewed as part of this investigation.

1.1 REPORT ORGANIZATION

This report is organized into seven sections:

Section 1: Introduction. This section contains background information on the report.

Section 2: Hydrogeologic Framework. This section presents the regional and local hydrogeologic features that are pertinent to the City's groundwater supplies. It describes the deposits that form aquifers and aquitards and describes the movement of groundwater through these deposits.

Section 3: Wellhead Protection Area Delineations. This section discusses the methods used to delineate the WHPAs and presents the results of the analysis. Time-related capture zones are presented for the Lower Washougal Wellfield area.

Section 4: Contaminant Source Inventory. This section presents an inventory of confirmed and potential sources of contamination, particularly those that lie within the wellhead capture zones. An evaluation of risks associated with these sources is also presented.

Section 5: Wellhead Management Strategies and Implementation. This section presents options for management strategies to provide safeguards against contamination of groundwater sources.

Section 6: Spill and Incident Response Planning. This section presents the local and regional agencies responsible for emergency incident/spill responses.

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2.0 HYDROGEOLOGIC FRAMEWORK

The hydrogeologic setting of the Camas area has been extensively studied by Strata staff under our predecessor companies Pacific Groundwater Group (PGG) and Mott MacDonald. Previous findings are summarized below.

2.1 GEOLOGY AND HYDROGEOLOGY

The Cities of Camas and Washougal are located near the eastern edge of the Portland Basin near the Cascade foothills. The bottom of the basin is formed of volcanic rocks that rise to the east to form the Cascade Range. Sediments that fill the Portland Basin are over 1,700 feet thick in the middle of the basin, around the City of Vancouver, but dip upwards and thin toward the Camas/Washougal area and are absent in the northern portion of the study area where bedrock is exposed. These sediments include Recent Alluvium and Pleistocene Alluvial Deposits at the surface, which are underlain by deposits of the Troutdale formation.

2.1.1 Recent and Pleistocene Alluvial Deposits

Alluvial deposits are sediments laid down by flowing streams (including channel deposits, overbank deposits, terraces, and deltas). Alluvial deposits exposed on the land surface within the study area include recent alluvium and Pleistocene (ice-age) cataclysmic flood deposits. Recent Alluvium was laid down by the Columbia and Washougal Rivers, with sedimentary textures ranging from silt to sand to gravel (including mixtures of multiple textures). Where exposed on the land surface, recent alluvium overlies the (older) Pleistocene Alluvial Deposits, and the two are mapped as a combined unit on Figure 1-1.

During the late Pleistocene, the ancestral Columbia River deposited a great deltaic fan emanating to the west from the mouth of the Gorge (near the eastern Clark County boundary) during a series of catastrophic events known as the Missoula floods. The resulting Pleistocene Alluvial Deposits crop out throughout much of the area that lies between the Washougal and Columbia Rivers (Figure 1-1). These deposits are approximately 100 feet thick in the vicinity of the City's LWWF. The sediments can reach thicknesses of up to 200 feet under the Columbia River channel. Sediment textures are typically described by drillers as boulders, cobbles, sand and gravel with some limited cemented zones and silty zones (potentially associated with paleosols).

2.1.2 Troutdale Formation

The Troutdale formation underlies the Pleistocene Alluvial Deposits in much of Clark County. The formation is exposed on the land surface in most of the northeastern and northwestern portions of the City (Figure 1-1) and underlies alluvial deposits in the southern portions. This formation is absent where older rocks are exposed at the surface and is inferred to be absent in the western portions of the study area where bedrock occurs at shallow depths. It is comprised of unconsolidated and semi-consolidated clay, silt, sand, and gravel. Throughout most of Clark County, the Troutdale formation contains three coarse-grained units that are separated by finer-grained confining units. The coarse units are:

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- The Upper Troutdale unit – variably cemented gravel in a matrix of sand and silt;
- The Lower Troutdale unit – relatively discontinuous occurrence of fine sand; and,
- The Sand and Gravel Aquifer (SGA) – a deeper sand and gravel unit.

Troutdale deposits underlying the combined floodplains of the Washougal and Columbia Rivers are difficult to differentiate. In this location, the Troutdale deposits are comprised of variably cemented, variably silty sands and gravels. Because this area is so close to the course of the ancestral Columbia River and the mouth of the Gorge, all of the Troutdale sediments deposited by the river are expected to be relatively coarse textured. This makes the upper and lower units difficult to distinguish in this area. Therefore, no attempt is made to distinguish between the various units of the Troutdale formation.

2.1.3 Older Rocks (Bedrock)

Older bedrock crops out in the north-central portion of the study area and in localized areas along the western portion of the study area (Figure 1-1). The older rocks range from Miocene to Eocene age. They are primarily igneous in origin and include andesite, basalt, granodiorite, pyroclastics (breccias, tuff, and agglomerate), conglomerate, and shale. The rocks are generally hard and compact because of Miocene deformation. The older rocks have relatively low permeability and are not considered an import source of supply for municipal purposes.

2.2 REGIONAL AQUIFERS

Two principal aquifers occur in the vicinity of the City: the Pleistocene Alluvial Aquifer (PAA) and the SGA. The Upper Troutdale Aquifer (UTA) and Lower Troutdale Aquifer (LTA) are also present in the Camas area but are not currently utilized by City wells. The four aquifers are discussed in order of occurrence below.

2.2.1 Pleistocene Alluvial Aquifer

The PAA is a shallow water-table aquifer that occurs within the Pleistocene Alluvial Deposits. The aquifer is very permeable and serves as a source of supply to most of the production wells in the lowland (i.e. LWWF vicinity) including industrial wells owned by Georgia Pacific and municipal wells owned by the Cities of Camas and Washougal. Groundwater in the PAA in the vicinity of the LWWF area occurs under unconfined conditions. The aquifer is recharged by local infiltration of precipitation, and induced recharge from the incised Columbia and Washougal rivers. Due to its limited geographic extent, limited saturated thickness, and susceptibility to contamination introduced at ground surface, the PAA is not considered an important water source for the purposes of municipal water supply in the upland portion of the Camas area (i.e. north of Prune Hill and west of Lacamas Lake).

The capacity of lowland wells completed in the PAA has been historically limited by its saturated thickness and the amount of available drawdown; however, recently this limitation is reducing due to water level rise associated with reduced Georgia Pacific pumping. Well capacities typically exceed 1,000 gallons per minute (gpm) and specific capacities (the ratio of pumping rate to pumping

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drawdown) typically range between 250 and 500 gallons per minute per foot of drawdown (gpm/ft). Testing at the City's wellfield indicates a transmissivity of approximately 1,000,000 gallons per day per foot of drawdown (gpd/ft) and a storage coefficient of about 0.05 (dimensionless). Previous PGG studies indicate that aquifer productivity may decline in an easterly direction. Specific capacity at the City of Washougal's Hathaway Wellfield (located approximately 2.5 miles to the east) ranges between about 50 to 65 gpm/ft, or about 10 to 20 percent of the values observed near the City's LWWF.

2.2.2 Upper Troutdale Aquifer

The UTA is the uppermost, regionally occurring aquifer in the Camas upland vicinity. The UTA is typically composed of a heterogeneous distribution of variably cemented sand and gravel. Much of the water-bearing material encountered in test wells drilled on the west side of Lacamas Lake is composed of fine to medium sand. Where the PAA is largely absent, the UTA is more vulnerable to contamination at the land surface and is likely in hydraulic continuity with Lacamas Lake. The UTA is unconfined where it occurs close to the land surface; however, due to cementation within the aquifer, it is often considered to be semi-confined.

On the regional scale, productive wells completed in the UTA often indicate moderate transmissivity in the early-time portions of pumping tests (e.g., during the first four hours) suggestive of sustainable pumping rates on the order of 400 to 500 gpm. However, in pumping tests that are conducted for longer periods, later time data indicate steeper rates of drawdown consistent with significantly lower transmissivity. This has been observed in test data for Camas Well 9 and in other wells in the Lacamas basin. This consistent pattern suggests that the UTA consists of moderate transmissivity lenses, hosted within a lower transmissivity matrix. The lower transmissivity of the bulk aquifer matrix, combined with limited saturated thickness in the Well 17 vicinity, limits expected well yields.

The UTA is not identified in the lowland in sediments underlying the PAA. Instead, underlying sediments are interpreted to represent the SGA (described below).

2.2.3 Lower Troutdale Aquifer

Within the Portland Basin, the LTA is typically a relatively homogeneous sandstone. However, in the Camas area, the LTA is a more heterogeneous mix of sand and gravel, similar to the UTA. This coarser facies is associated with the higher-energy depositional environment of the Columbia River that occurs in proximity to the Columbia River Gorge. In the uplands west of Lacamas Lake, the LTA includes both a coarse facies and sandstone. Materials encountered in the lower portions of the City's Well 17, located west of Lacamas Lake, were interpreted to represent the LTA. The LTA is not identified in the lowland in sediments underlying the PAA. Instead, underlying sediments are interpreted as representing the SGA (described below).

Hydraulic properties of the LTA are expected to be similar to the UTA, however with more available drawdown. Some production wells completed in the sandstone unit within the LTA (e.g. the Vanport Manufacturing Well) are able to produce over 400 gpm, presumably due to transmissivity associated with heavy fracturing of the sandstone.

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2.2.4 Sand and Gravel Aquifer

The SGA occurs within the Troutdale formation and is the next significant aquifer underlying the PAA in the Camas lowland area. The SGA functions as a confined aquifer due to the cemented and silty zones within the Troutdale formation. The aquifer has not been extensively developed for supply in the vicinity of the City but is an important source of supply within other portions of the county. Although specific capacities for SGA wells are considerably lower than the specific capacities of the PAA wells, SGA supply wells can have substantially larger amounts of available drawdown such that even wells with moderately low specific capacities (e.g., 5 gpm/ft) can achieve production capacities in excess of 500 gpm.

2.3 AQUIFER SUSCEPTIBILITY AND VULNERABILITY

The sensitivity of the City's groundwater sources to potential contamination was evaluated by assessing the relative susceptibility and vulnerability of the LWWF. Aquifer susceptibility refers to the estimated ease of contaminant transport from the land surface to the aquifer. Vulnerability accounts for the potential of contaminant releases at the land surface.

Some of the primary factors influencing aquifer susceptibility are the thickness and permeability of the sediments overlying the aquifer. Shallow aquifers are typically more susceptible to surficial contaminants than deeper aquifers. Evaluation of recent water level data from the LWWF supply wells shows typical depths to groundwater in the aquifer as shallow as 20 feet below land surface (Mott MacDonald, 2024). Aquifers overlain by highly permeable sediments such as sand and gravel are also at higher risk than aquifers overlain by lower permeability sediments such as silt or clay. In the vicinity of the LWWF, coarse grained soils typically extend from ground surface to the water table. While some fine-grained or low-permeability zones are noted above the shallow water table in drilling logs, in many cases they are absent in the logs of neighboring wells. Therefore, no laterally extensive low permeability layers appear to exist between land surface and the underlying PAA. The combination of a shallow depth to water and the relatively high permeability of the overlying sediments indicate the PAA has relatively high susceptibility to contamination.

Several natural mechanisms exist for attenuation of pollutant loading to the alluvial aquifer. While these mechanisms are probably benefiting groundwater quality under current conditions, they do not reduce the aquifer's susceptibility rating. Percolation of recharge through the unsaturated zone (from the land surface to the water table) supports some reduction of selected contaminants via: (1) adsorption to particulates, oxides, and organic carbon in surficial soils; (2) precipitation in aerated zones; and (3) biodegradation. However, the course texture of the sediments and general lack of organic matter suggests that the unsaturated zone offers minor contaminant attenuation relative to more silty, organic soils. Dilution via mixing with uncontaminated recharge in the unsaturated zone and the alluvial aquifer also serves to reduce contaminant concentrations. Because it is nearly certain that some contaminant loading occurs at the land surface (e.g., from known contaminated sites, urban runoff and septic systems), the fact that historic drinking water quality monitoring has detected minimal contamination at or above National Primary Drinking Water Regulations (NPDWR) criteria (Section 4.6) supports the value of these two processes. However, lack of contaminant detection in the City's wells does not mean that contamination is not reaching the water table in adjacent areas, as evidenced by the detections of per- and polyfluoroalkyl substances (PFAS) in Camas and

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Washougal source wells. It is important to understand that these natural attenuation processes are not likely to offer sufficient protection against a significant contaminant spill or release at the land surface, particularly for contaminants with maximum contaminant levels (MCLs) at the part-per-trillion (ppt; nanograms per liter [ng/L]) level and minimal natural attenuation (e.g., PFAS).

Aquifer vulnerability is typically expressed as a risk factor, calculated by combining the aquifer susceptibility discussed above, with an evaluation of the availability of contaminants at land surface and the likelihood of a contaminant release. In general, aquifer susceptibility is a function of stratigraphy and hydrogeology and cannot be substantially modified. The potential for contaminant release on the other hand is controllable and can be reduced in areas where susceptible aquifers are utilized as a major source of potable water. One of the primary purposes of a water system's WHPP is to evaluate the susceptibility of the systems aquifer(s), and the potential sources of contamination within the systems capture zones. Additional attention to potential contamination sources is recommended within the capture zones of high susceptibility aquifers, to reduce the likelihood of a contaminant release. This is especially true for potential contaminant sources within the shorter duration capture zones, such as the 1-year capture zone shown in Figure 2-1. In the case of Camas, the PAA should be considered highly vulnerable to potential contamination. While active, confirmed sources of groundwater contamination are limited, potential sources of contamination are discussed in Sections 4.4 and 4.5.

3.0 WELLHEAD PROTECTION AREA DELINEATIONS

The following sections describe the model used to delineate the City's WHPAs and capture zone analysis.

3.1 WHPA MODEL

The capture zone for the LWWF was estimated using the groundwater flow model MODFLOW, a finite difference numerical model originally developed by the U.S. Geologic Survey (McDonald and Harbaugh, 1988). A capture zone is the area that supplies groundwater recharge to a pumping well or wellfield. In natural systems, capture zones are not circular but elongated, with most of the capture occurring from areas that lie hydraulically up-gradient of the well. Each capture zone has a stagnation point, the furthermost point of capture down-gradient of the well. A time-related capture zone is the area in the aquifer that supplies groundwater recharge to a pumping well within a specified time period. Time-related capture zones provide a basis for developing monitoring plans, land-use inventories, and data collection plans. They are used in conjunction with the results of the aquifer vulnerability assessment.

The groundwater flow model developed for the Lower Washougal and Columbia River lowlands depicts the two major aquifers in the study area (PAA and SGA), the occurrence of bedrock, the Columbia and Washougal rivers, recharge from precipitation, and groundwater inflow from areas outside the model domain (PGG, 2004; 2007; 2011). The model simulates three-dimensional flow in its two layers (one for each aquifer). The model was calibrated to observe summer drawdowns in the City's Washougal Wellfield vicinity, summer seepage losses from the Washougal River, and groundwater level responses to tidal fluctuations and runoff events in the Columbia River.

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The calibrated model was used to perform predictive simulations which included evaluation of capture zones for the LWWF. The simulations assumed that the City would exercise all of their water rights and operation of the two proposed future wells (Treatment Plant and Parkers Landing)[1]. In addition, a high-end pumping was assumed for the Georgia Pacific wellfield (37.5 million gallons per day [mgd] based on 2016 information). This assumption provides for a fairly conservative assessment of the capture zone extent. Revision of these model assumptions is currently underway as part the Well 13 project with Carollo and may provide for an updated WHPA delineation later in 2026.

3.2 CAPTURE ZONE ANALYSIS

Estimated capture zones for 6-month, 1-year, and 5-year times of travel for the LWWF area, and the estimated capture zone for a 6-month time of travel for Well 13, are shown on Figure 1-1. The Camas Shoreline Master Program (City of Camas, 2015) states that the WHPA bounded by the 10-year time-of-travel will be considered a critical aquifer recharge area (CARA). All groundwater in the recharge area is younger than 10 years, therefore there is no need for a 10-year time-of-travel delineation (PGG, 2016). To account for the uncertainties associated with temporal variations in capture zones, a buffer area surrounding the WHPAs is defined as the CARA and shown on the attached figures. This includes areas that were not included in the simulated steady state capture zone analysis, but likely will contribute recharge during certain times of the year given variations in pumping, river elevation, and natural recharge. The Lower Washougal Wellfield WHPA is defined as the CARA and includes the 6-month, 1-year, 5-year capture zones and the supplemental CARA area. The LWWF groundwater flow model was also used to estimate WHPA capture zones for the City of Washougal (Murray Smith & Associates, Inc, 2012). Model predictions show the Washougal capture zones are set within the Camas capture zones, and that 5-year capture zones for both wellfields extend all the way to the eastern end of the CARA (Figure 1-1). Uncertainties inherent in the existing groundwater model dictate that estimated boundaries between the two capture zones are approximate, and that capture zones estimated for the two cities are closely geographically related.

The WHPA capture zones used in this report were originally presented in the City's 2016 Wellhead Protection Assessment Report (PGG, 2016). The shape and extent of these capture zones are influenced by pumping at the Georgia Pacific wellfield, and aquifer boundaries including the Washougal and Columbia Rivers and older bedrock exposures to the north. Capture for Well 13 is primarily to the northeast, extending to the approximate boundary where the PAA is pinched out by older bedrock. Capture zones for the remaining Lower Washougal wells extends to the east, between the Columbia and Washougal rivers. Evaluation of mass-balance calculations for the groundwater flow model indicate that the majority of water captured by the LWWF originates as flow within the PAA, that otherwise would have discharged to the Columbia and Washougal rivers.

The estimated capture zones were generated using a steady-state groundwater flow model, meaning that only the long-term average rates of withdrawal were simulated. Variations in pumping, recharge and boundary conditions such as river stage are not simulated in a steady state model. As a result, Figure 1-1 shows the average positions of the capture zones, not the temporal variations in the

[1] Based on test well drilling results these future wells will likely be constructed within the wellfield rather than at the originally proposed locations.

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capture areas. Increased pumping during peak use months will result in variations of the predicted capture zones beyond the long-term average estimates shown in Figure 1-1.

4.0 CONTAMINANT SOURCE INVENTORY

4.1 INTRODUCTION

Contaminant source inventories are included as part of WHPPs to identify potential sources of groundwater contamination to WHPAs associated with public sources of water supply. Although rarely achieved in practice, contaminant source inventories should be updated every two years[2]. In addition, DOH recommends updating the modeling or delineation of the WHPAs every 5 years, or as part of the 10-year Water System Plan cycle. The City's most recent contaminant source inventory was prepared in 2023 and was included in the LWWF Additional Yield Assessment (Mott MacDonald, 2024).

This section presents an inventory of confirmed and potential sources of contamination primarily within the City's WHPA, as well as consideration of land uses that may pose potential risk to groundwater quality. The facilities presented in the following sections were field evaluated by Carollo Engineers in April 2026 and the edits have been incorporated in the associated tables (Strata, 2026). This information can be factored into site selection for possible new production wells along with interpretation of water quality observed in existing wells. This section also includes a summary of water quality encountered in production wells operated by the cities of Camas and Washougal and provides suggestions for groundwater quality monitoring opportunities.

4.2 SEARCH AREA

The search area for this contaminant source inventory includes the City's 2016 WHPA, a "Western Search Area," and the consideration of several sites immediately east of the WHPA. These areas are shown in Figure 4-1.

Patterns of groundwater flow to the west of the Washougal River are not well understood, and the City's Well 13 may capture groundwater flowing towards the river from the west. In addition, reduced Georgia Pacific groundwater withdrawals and possible future redistribution of LWWF pumping (under the City's "umbrella water right") could alter the 2016 WHPA delineations. In order not to rule out possible contaminant sources to the west of the CARA, a Western Search Area was added from the west side of the Washougal River as far west as the Crown Zellerback Power Ditch (Figure 1-1). Ultimately, improved hydrogeologic characterization of this area may be warranted to better understand whether contaminated sites may pose a risk to City water supply.

[2] WAC 246-290-135 states that "an inventory, including identification of site locations and owners/operators, of all known and potential groundwater contamination sources located within the defined WHPA(s) having the potential to contaminate the source water of the well(s) or spring(s) shall be updated every two years".

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4.3 DATA SOURCES

Potential contaminant risks in the vicinity of the LWWF were investigated and mapped using data from the following sources:

- Clark County's (2025) *parcel database*, which contains information on land use and zoning.
- Data on file with Clark County, the City of Camas, and the City of Washougal regarding the locations of septic systems and infiltration facilities (dry wells and infiltration galleries) (Clark County, 2024; City of Camas, n.d.; City of Washougal, 2024).
- Washington State Department of Ecology (Ecology) *Facility/Site database*, which includes State Cleanup Sites, federal Superfund sites, hazardous waste generators, solid waste facilities and underground storage tanks (USTs).
- Ecology's *cleanup and tank search*, which includes confirmed and suspected contaminated sites, leaking and regulated USTs, brownfield sites, and Voluntary Cleanup Program (VCP) wait lists.
- Ecology's *Environmental Information Management (EIM) database*, which includes environmental monitoring physical, chemical, and biological data reported from sources such as Ecology-funded monitoring, cleanup sites, and municipal stormwater.
- A custom data report from DOH's *Sentry database*, which provides drinking water source and distribution sampling results reported by the Cities of Camas and Washougal (along with new PFAS sampling results recently provided by the City of Washougal).
- The U.S. Environmental Protection Agency (EPA) PFAS Industry Sectors Analytical tool, which presents Enforcement and Compliance History Online (ECHO) data filtered to industries identified by EPA as users or manufacturers of PFAS (EPA, 2025a).
- A custom records request from Lightbox Environmental Data Resources (EDR) using a 1-mile radius of Public Supply Well 13 in Camas, WA. A review of the EDR databases was originally presented in the Camas Well 13 PFAS Historic Contaminant Sources Inventory Review (Mott MacDonald, 2025).

The information from these data sources was classified and mapped to assess whether existing and potential contaminant sources were located within the Search Area[3].

4.4 SITES POSING POTENTIAL RISK

Information from Ecology's Facility/Site database were reviewed to identify facilities and sites within the Search Area that could be classified as a posing potential threat to groundwater contamination. The EDR databases and EPA PFAS Analytical Tool were used to augment the data retrieved from Ecology's databases for facilities with PFAS-specific risks to groundwater quality. The EIM database were reviewed to confirm sites with known contamination and the DOH's database of

[3] Some locations from Ecology's Facility/Site database were adjusted in Figure 4-1 based on facility address, parcel information, and imagery.

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drinking water results were reviewed to confirm local PFAS sampling occurrence and detections. Potential threats are associated with the use or storage of hazardous materials including the presence of USTs. A higher level of concern is associated with sites with known contaminant releases. While only a subset of sites with known releases are confirmed to have contaminated groundwater, other sites (e.g., associated with soil contamination) have the potential to contaminate groundwater through downward percolation of infiltrated recharge to the underlying PAA.

Table 4-1a summarizes known sites of potential environmental concern within the Search Area. Sites of potential environmental concern include both sites with and without confirmed or suspected releases of contamination to groundwater or soils. All sites with a cleanup status have a known or interpreted release, and Table 4-1b provides additional information about associated contaminant releases and current cleanup status (e.g., "awaiting cleanup", "cleanup underway", and "no further action" required). Figure 4-1 displays the location of each of these sites and indicates through the location symbols which types of activities or risk are associated with each site. Each site marker has three pie slices which indicate the type of activities associated with the site as follows:

- Cleanup Site (State Cleanup or Voluntary Cleanup)
- Underground Storage Tanks (UST) / Leaking Underground Storage Tanks (LUST)
- Hazardous Material Generator or Handler
- Release to Groundwater, Surface Water, or Soils

A red halo around any site indicates a documented contaminant release to soils, groundwater or surface water that has yet to be remediated. A yellow halo indicates that a prior release has been remediated and the site has been issued a No Further Action status by the Ecology. Any combination of the indicators is possible. Site markers without any halos or filled-in pie slices indicate the facility is tracked in the Ecology Facility/Site database, and the facility type is considered to have risk to soils or receiving water bodies, but the facility is not a cleanup site, a hazardous materials handler, nor does it have registered USTs.

Table 4-2 indicates four sites with contaminant exceedances in groundwater in or near the Search Area where contaminant concentrations are reported in Ecology's EIM database. Table 4-2 additionally shows reported contaminant exceedances in soil and sediment reported at the four sites. There are some differences in the groundwater exceedances identified in the data uploaded to EIM for the two sites within the WHPA, Hambleton Bros Log Yard (6-month capture zone) and Chevron Bulk Plant Camas (6-month capture zone), compared to the Ecology Facility/Site database (Table 4-1b). Likewise, there is no EIM data available for the two sites with confirmed groundwater concentrations in the Ecology Facility/Site database (Table 4-1b): Columbia Rock Concrete Products Inc (6-month capture zone) and Hi Way Fuel (5-year capture zone). The available EIM soil and sediment data for four sites and identified exceedances are summarized in Table 4-2. All four sites have a No Further Action cleanup status. Figure 4-1 identifies the locations of monitoring wells that showed contaminant exceedances at the four sites with the following symbol:

- Monitoring Well with Contaminant Detection in EIM Database (No Further Action)

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Sites posing potential and known contaminant risks are discussed by subarea below. A brief discussion of each known release site and groundwater exceedance site, along with their current status, is provided in Appendix A.

Forty-five sites of potential environmental concern to the water supply were identified within the WHPA, and an additional 21 sites of potential concern were identified in the Western Search Area (Table 4-1a). These sites are discussed in the sections below that are relevant to the onsite activities posing potential contamination risks.

4.4.1 Underground Storage Tanks

Contamination in soil and groundwater can be caused by leaking USTs (LUSTs). The most common causes of leaks are corrosion, fitting failures, improper installation or poor maintenance, impact damage, and overfilling (IIG, 2026; Karalekas, 2026). Although USTs usually contain flammable motor fuels or heating oils, they may contain other compounds used by industry, government, or business. Leakage from USTs and associated piping can often occur without detection. Even relatively small amounts of hazardous compounds can adversely impact groundwater quality. Once released from an UST, some contaminants can rapidly migrate to groundwater, a problem that is especially serious in areas with permeable soils, such as the sand and gravel comprising the PAA.

Of the many materials stored in USTs, solvents are considered the most toxic. However, petroleum products may pose a greater total risk because of the prevalence of tanks containing petroleum products. In addition, petroleum products contain many potential contaminants, including three EPA priority pollutants: benzene, toluene, and ethylbenzene. Benzene is a known human carcinogen.

Figure 4-1 shows the locations of USTs in the Search Area. Most of them lie within areas zoned industrial and commercial. These sites were identified from the Ecology's UST site data. This discussion does not imply UST leakage; LUSTs are discussed in the following paragraph. Table 4-1a shows that 9 of the 14 UST sites within the WHPA and 8 of the 13 UST sites within the Western Search Area have reported tank status that is either closed-in-place or removed, indicating the USTs are no longer present or actively used. Of the 10 active UST sites, there are only three large facilities (>15,000 gallons total volume) in operation within the WHPA and three within the Western Search Area (Table 4-1a). These include:

- Camas Washougal Port (6-month capture zone);
- Jimbo's Deli Mart 2 (6-month capture zone);
- Hi Way Fuel (5-year capture zone);
- Camas Foodmart (Western Search Area);
- Safeway Fuel 1000 (Western Search Area); and
- Quick Stop Mart (Western Search Area).

There are four LUSTs identified in Ecology's database located within the WHPA and seven within the Western Search Area (Table 4-1a). Nine of the 11 LUST sites have received No Further Action

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notices from Ecology. Two sites: Philpot and Hi Way Fuel, both located within the WHPA, have initiated their cleanup efforts. Further details about these sites are provided in Appendix A.

4.4.2 Hazardous Materials

The commercial use of chemicals poses a potential threat to groundwater quality since the chemicals can be accidentally spilled or disposed of improperly. The likelihood of such releases from spills can be reduced by proper methods of handling, spill prevention measures, and emergency response strategies. Improper disposal is likely the most common pathway for chemicals to be released into the environment. The following Ecology facility activity classifications were included as hazardous materials sites in this assessment:

Table 4-3: Hazardous Site Activity Code Definitions

Activity Code	Definition
HWG	Facilities that generate dangerous waste. They may be classified as very small, small, medium or large quantity generators (VSQG, SQG, MQG, or LQG) depending on the quantity of hazardous waste generated.
HWOTHER	Facilities that are required to have an EPA/State ID number but who do not generate and/or manage hazardous waste (XQG generator status). This includes transporters, used oil recyclers, and dangerous waste fuel marketers and burners.
HWP	Under Chapter 173-307 Washington Administrative Code (WAC), facilities that report under Section 313 of the Emergency Planning/Community Right-To-Know Act (EPCRA), or that generate more than 2,640 pounds of hazardous waste per year, must prepare Pollution Prevention Plans.
HWTSDF	Facilities that treat, store, or dispose of hazardous waste.
TIER2	Businesses that store 10,000 pounds or more of a hazardous chemical or 500 pounds or less, depending on the chemical, of an extremely hazardous chemical on site at any one time must report annually. Reports are sent to the State Emergency Response Commission [represented by Ecology], Local Emergency Planning Committees, and local fire departments for emergency planning. [product, not waste]
TRI	Facilities in specific industries that manufacture, process or use more than the threshold amount of one or more of 600 listed toxic chemicals. Most threshold amounts are 10,000 or 25,000 pounds per year. Some chemicals have much lower thresholds.

The Ecology Facility/Site database indicates that there are 25 sites within the WHPA and 9 additional sites within the Western Search Area that fall into one of the above hazardous waste classifications. Of these only 13, three of which are in the Western Search Area, have an active status (see below) and, the rest are inactive. Inactive status indicates that the sites do not have current permitting, and therefore, are not actively overseen by Ecology.

Table 4-4: Active Hazardous Materials Sites

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FSID	Facility Name	WHPZ	Activity Code
93671	City Of Camas Well 13	6-Month	TIER2
11338232	Columbia Storage Inc 2nd St	6-Month	TIER2
37125488	Columbia Warehouse	6-Month	TIER2
3264254	TARR Inc Washougal	6-Month	TIER2
88277363	Tidland Corp	6-Month	HWG (Other)
994431	Camas City Well 11 & 12	6-Month	TIER2
42373	City Of Camas Well 14	6-Month	TIER2
43057	City Of Washougal Lower Well Field	6-Month	TIER2
99999862	Walgreens 1085	1-Year	HWG (VSQG)
74959167	Camas STP	CARA	TIER 2
66765272	Georgia Pacific Consumer Products	Western Search Area	TIER2, HWP, TRI, HWG (SQG)
89994319	Verizon Northwest Inc Camas Co	Western Search Area	TIER2
8343024	Safeway Fuel 1000	Western Search Area	HWG (VSQG)

The Facility/Site database does not indicate whether sites listed are large or small hazardous waste generators. The hazardous waste generator (HWG) status presented in Table 4-4 were retrieved from EPA's ECHO facility search (https://echo.epa.gov/).

4.4.3 Cleanup Sites

The following subsections describe state cleanup sites that are located within the WHPA, Western Search Area, and east of the CARA, based on available information from Ecology.

4.4.3.1 Lower Washougal Wellfield WHPA

Ten of the 47 sites of potential environmental concern in the WHPA have known contaminant releases and are listed as State Cleanup Sites (Table 4-1b), as follows:

- Four sites (5, 13, 21, 25) have confirmed results below cleanup levels for all sampled media and have been issued a No Further Action status by Ecology.
- Six sites (4, 6, 11, 29, 35, 36) have confirmed or suspected contamination of groundwater and/or soil. Of these:
  - Two sites (11 and 29) have been issued a No Further Action status by Ecology.
  - Three sites (4, 29, 36) are associated with LUSTs.
  - Two sites are listed by Ecology as Awaiting Cleanup:

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- Site 6 (Facility ID 5016308, Columbia Rock Concrete Products, Inc.) has confirmed EPA Priority metals contamination in groundwater and is within the 6-month capture zone. Impacts to soil and groundwater were first detected in 2001 and the site was placed on the national priorities list in 2007. As of 2016, Ecology reported that it had had no plans for taking action on the site in the immediate future (Appendix A).
- Site 35 (Facility ID 94778244, Asher Engine Service Facility) has suspected soil and groundwater contamination and is located within the 5-year capture zone.

The use and storage of solvents poses a threat to groundwater quality. Solvents are persistent, both soluble and insoluble in water, and highly mobile. A small release of solvents to groundwater can cause a large groundwater plume. There are two cleanup sites (21 and 35) with solvents suspected or confirmed in soil or groundwater in Ecology's database located within the WHPA (Table 4-1b).

4.4.3.2 Western Search Area

Of the 22 sites of potential environmental concern that were identified in the Western Search Area, 12 have known contaminant releases and are listed as State Cleanup Sites (Table 4-1b). Seven of the 12 release sites (47, 48, 49, 52, 53, 58, 59) are associated with LUSTs, all of which have confirmed petroleum product detections in soil, including three with Petroleum product concentrations confirmed above cleanup levels by Ecology. Of the 12 sites, nine are listed as No Further Action, two (Sites 46 and 56) have cleanup underway, and one (Site 54) is awaiting cleanup, as summarized on Table 4-1b. Sites requiring cleanup include:

- Site 46 (Facility ID 66765272, Georgia Pacific Consumer Products) has suspected soil contamination, including for solvents, petroleum products, and reactive wastes.
- Site 54 (Facility ID 9620, Residence Heating Oil Tank) has non-halogenated solvent and petroleum product contamination confirmed in soil and suspected in groundwater.
- Site 56 (Facility ID 5458, Greseth Property) has confirmed petroleum product contamination of soil.

No contaminant exceedances in groundwater are reported in Ecology's EIM database within the Western Search Area.

4.4.3.3 East of the Critical Aquifer Recharge Area

Table 4-2 indicates two sites with contaminant exceedances in groundwater near the eastern boundary of the WHPA that have been reported to Ecology's EIM database. Both locations, ARCO 6008 and George Schmid & Sons, Inc, are listed as State Cleanup Sites that have been issued a No Further Action status by the Ecology and are associated with LUSTs. Reported groundwater exceedances include petroleum products, metals, and PAHs. The two LUST sites are included in this report due to their proximity to the 5-year capture zone (Figure 4-1) and the confirmed impact to groundwater.

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4.5 CURRENT ZONING AND LAND USE

Current zoning and land use information from Clark County's database were reviewed to evaluate zoning areas and specific parcels in the LWWF vicinity that could pose a risk to groundwater now or in the future. The following zoning categories were mapped (Figure 4-2):

- Industrial
- Commercial
- Residential
- Parks

The most common allowed land use within the WHPA is residential followed by commercial and industrial. Areas zoned as commercial and industrial are most likely to comprise threats to groundwater quality. Most of the allowed commercial and industrial use is concentrated along SR-14, the southern terminus of SR-500, the railroad corridors, SE 3rd and 6th Avenues, and E. Street. The Western Search Area is nearly evenly divided between industrial (in the south), commercial, and residential (in the north).

A GIS analysis was used to identify land uses descriptions within each parcel where associated activities could pose a risk to groundwater within the Search Area. Parcels where such land uses were identified were designated "parcels of concern" and are interpreted to represent potential sources of contamination. [Note: whereas "parcels of concern" are based on land use, "sites of concern" (discussed above) are based on registered handling of hazardous waste and suspected or known contaminant releases.] Table 4-5 provides a list of land uses and categories that are considered potential concerns and counts of these parcels within WHPA and Western Search Area. The land uses are divided into 7 generalized use groupings based on similar activities, including: A) uses related to automobiles, boats and fuel; B) potential biohazards; C) manufacturing; D) dry cleaners; E) electrical infrastructure; M) medical; and O) "other" uses[4]. Appendix B provides a detailed list of ownership and land-use description associated with these parcels. Parcels of concern are also mapped on Figure 4-2.

The WHPA contains 81 parcels of concern, and the Western Search Area contains 75 parcels of concern. Evaluation by sub-area shows:

- The WHPA 6-month capture zone contains 38 parcels of concern distributed among all categories besides biohazards and dry cleaners, with larger proportions of automobile-related, manufacturing, and "other" uses.
- The WHPA 1-year capture zone contains 14 parcels of concern, comprised mostly of automobile-related and "other" uses.

[4] "Biohazards" include: cemeteries, crematories, feedlots, biofiltration, and sewage infrastructure. "Electrical infrastructure" includes: boosters, transformers and stations. "Medical" also includes dental and veterinary. "Manufacturing" includes chemical, wood, machinery, paper, plastic. "Other" includes storage, parking, quarries, sand/gravel pits and crushing operations.

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- The WHPA 5-year capture zone contains 20 parcels of concern, comprised mostly of automobile-related uses.
- The WHPA supplemental CARA zone contains 9 parcels of concern, distributed between biohazards and "other" uses.
- The Western Search Area contains 75 parcels of concern, distributed between all categories with a larger proportion of automobile-related uses and just one dry cleaner and one electrical facility.

In addition to the zoning categories and parcels of concern discussed above, the following land uses and activities should be considered as potential sources of contamination:

- On-site septic systems
- Stormwater
- Unused and improperly constructed wells
- Agriculture, golf courses, and parks
- Burlington Northern Santa Fe Railway
- Users and Potential Sources of PFAS

4.5.1 On-Site Septic Systems

On-site septic systems pose a risk to groundwater where they are relatively high in density and/or where hazardous waste is discharged to them. Potential contaminants from septic systems include pathogenic organisms (bacteria and parasites), toxic substances including PFAS, and nitrogen compounds (EPA, 2026a; Palmerton, 2023).

The extent to which pathogens are transported in the subsurface away from a septic drain field depends on the type of pathogen and the chemical and physical conditions in the subsurface. In general, if a septic system is properly sited, constructed, and maintained, the impact to water quality will be limited (EPA, 2026b). Household hazardous chemicals such as cleaners, polishes, waxes, and paints can be transported to groundwater via a septic system. Some products contain toxic and persistent chemicals that can cause low-level contamination when coupled with a high density of septic systems. Homeowners can improperly apply or dispose of chemicals because they do not understand the threat they pose to groundwater quality. A variety of in-home materials (such as food packaging, cookware, cosmetics and dust generated from upholstery) can supply PFAS to domestic septic systems (Kaboggoza, 2026). Other organic compounds (such as pharmaceuticals, personal care products and organophosphate flame retardants) can also be associated with domestic wastewater (EPA, 2026b; EPA, 2026c). In some areas, business and commercial facilities still use on-site septic systems for sewage disposal. Business, commercial, and industrial operations that utilize on-site systems need to take special precautions to avoid contamination of their wastewater.

Ammonia and nitrate are highly soluble in water and can be expected in detectable quantities wherever portions of an aquifer are affected by septic system discharges. Septic systems are a source of nitrates in groundwater throughout Clark County. Nitrate is regulated, since ingestion can result in

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methemoglobinemia, or "blue baby" syndrome (Knobeloch, 2000). Other sources of nitrate include fertilizers, feedlots, and natural mineral deposits. Background concentrations of nitrates in groundwater are typically less than 1 milligram of nitrogen per liter (mg-N/L) (EPA, 2026d). The MCL for nitrate is 10 mg-N/L.

Although significant portions of the urban areas are served by sewer systems, many residents still rely on septic systems. Clark County maintains GIS coverage of on-site septic system locations, locations that are based on information provided by the Clark County Public Health Department. The locations of the septic systems are plotted on Figure 4-1. This figure indicates that the LWWF WHPA has only one identified septic system within the 6-month capture zone, four systems within the 1-year capture zone, 26 systems within the 5-year capture zone, and none in the supplemental CARA. Overall, 29 septic systems fall within the WHPA. There is one additional septic system identified in the Western Search Area, within the Georgia Pacific facility.

4.5.2 Stormwater

Stormwater (i.e., urban runoff) is produced when rainfall or other precipitation accumulates faster than it can evaporate, be used by plants, or infiltrate to the subsurface. Urban areas, particularly industrial, commercial, and high-density residential development areas, produce more runoff than rural areas because they have more impermeable surfaces, such as rooftops, driveways, streets, and highways (Ecology, n.d.). These surfaces not only promote runoff, but they also reduce the infiltration that recharges groundwater supplies. Even grass lawns can produce more runoff than forests and pasture. Most of the stormwater infiltration and bioswale areas are concentrated along SR-14 and E. Street (Figure 4-3).

Concern over potential groundwater contamination from stormwater has been recognized by several governmental agencies in western Washington. Stormwater typically contains pollutants, such as sediment, nutrients, bacteria, oils and grease, metals, and other toxicants. Many of these contaminants come from air pollution, motor vehicles, application of pesticides and fertilizers, soil erosion, and pet feces. Stormwater runoff from highways and roads can introduce contaminants such as heavy metals, organic priority pollutants, pesticides, coliform bacteria, and 6PPD-quinone into the groundwater system (Ecology, n.d.). Roofing materials have also been identified as a diffuse source of metals in runoff, particularly zinc (Good, 1993). Concentrated sources of stormwater contamination may also occur if undiluted pollutants (e.g., fertilizer, gasoline) are accidentally spilled or intentionally released and enter storm drains.

Stormwater contamination has primarily been a concern for surface water pollution because urban runoff is typically directed to streams, lakes, and other water bodies with fish and other aquatic life that are highly sensitive to common stormwater contaminants. However, in areas where coarse-grained Pleistocene Alluvial Deposits occur at the land surface (i.e. portions of Vancouver, Camas and Washougal), dry wells are commonly used to infiltrate stormwater into the subsurface, which creates the potential for groundwater contamination. Specific sites with potential/known stormwater contamination risks and general assessment of stormwater impacts to groundwater via dry wells and infiltration facilities are discussed below.

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Information from Ecology, Clark County's GIS coverage of dry wells, and prior communications with City Staff were reviewed to evaluate stormwater-related site features and land uses in the LWWF vicinity that could pose a risk to groundwater now or in the future.

4.5.2.1 Stormwater Risks at Ecology Sites of Potential Environmental Concern

Ecology considers sites to be a risk to stormwater if they have any of the following site interaction types noted in Ecology's Facility/Site database: Underground Injection Control, Fruit Packer General Permit (GP), Municipal SW GP (any phase), WSDOT Municipal SW GP, Construction SW GP, or Industrial SW GP. As shown on Table 4-1a, there are eight sites located within the WHPA and one within the Western Search Area that have been identified as posing a potential stormwater risk to groundwater. These sites include:

- Triangle Resources (6-month capture zone);
- Columbia Storage Inc 2nd St (6-month capture zone);
- Hambleton Bros Log Yard (6-month capture zone);
- Goodwill – Washougal (6-month capture zone);
- Washougal City Westside Wellfield Well 12 (6-month capture zone);
- Rockwood Terrace (1-year capture zone);
- Washougal School District Bus Garage (5-year capture zone);
- SE 8th & SE Tampa Development (CARA);
- Camas City Municipal SW (Western Search Area).

Sites with only Construction SW GP interactions have not been included in Table 4-1a due to their temporary nature.

4.5.2.2 Consideration of Dry Wells and Infiltration Facilities

Impervious surfaces in the commercial and industrial areas along SR-14, the southern terminus of SR-500, the railroad, and 3rd Avenue contribute substantial amounts of runoff in the Camas study area. In 2012, the Washington State Department of Transportation (WSDOT) installed a large stormwater infiltration facility between SE 11th Avenue and SR-14, near the City's wastewater treatment plant (Figure 4-3) in order to infiltrate road runoff. The City (along with PGG) communicated with WSDOT during the construction phase the need to protect water quality in the underlying PAA. The infiltration facility is located within the CARA boundary. The operation and performance of this facility should be evaluated if the City pursues new groundwater sources in this area in the future.

Sam Adams, former Utilities Manager at Camas Public Works provided the following information about the City's stormwater facilities (reproduced from PGG, 2016). This information should be confirmed by follow-up conversations but indicates that all of the stormwater runoff in Camas flows to catchment basins, drainage ditches, biofiltration swales, exfiltration ponds or sedimentation ponds. Catchment basins and other surface stormwater facilities filter out some pollutants before the

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water enters the subsurface or surface water environment. Near the LWWF area, most stormwater is captured via catchment basins and then routed to the Washougal River via outfall pipes. The City's stormwater discharges are regulated under the Federal National Pollutant Discharge Elimination System (NPDES) Phase II permitting process (Permit Number WAR045004). The permitting process requires that the City provide annual reports and updates to their stormwater management plan (SWMP). A Reporting Violation was issued for Permit WAR045004 on March 31, 2025 for a late/missing submittal. According to the City, there are no current dry wells associated with the City of Camas stormwater system. Dry wells previously used in the area of Oak Park and Goot Park in southeast Camas were abandoned and replaced with new stormwater collections systems in the mid 1990's (PGG, 2016).

Dry wells currently included in the Clark County GIS are shown on Figure 4-3. The GIS coverage shows 19 dry wells within the 6-month capture zone, 12 dry wells within the 1-year capture zone, 69 wells within the 5-year capture zone, and no dry wells within the supplemental CARA. Overall, 100 dry wells fall within the WHPA. There are five additional dry wells identified in the Western Search Area along the Crown Zellerback Power Ditch near NE Dallas Street. Several dry wells within the 6-month capture zone are close to the City's Well 5, but all other City production wells do not have immediately adjacent dry wells. A large portion of dry wells within the 5-year capture zone are located along E Street. These features are likely the City's abandoned and replaced dry wells and are incorrectly attributed in the County's database. The City should review this dataset with the County and make appropriate modifications to reflect current conditions.

4.5.3 Unused and Improperly Constructed Wells

Well casings can provide a conduit between the ground surface and underlying aquifers. Improperly constructed or abandoned wells pose several potential problems. In wells with no surface seal, contaminants introduced near the wellhead can move downward outside the casing to underlying aquifers (Scherer, 2021). Many older wells that were constructed before the implementation of the State's minimum well standards in WAC 173-160 (pre-1971) have no surface seal. Unused wells that have not been properly abandoned are left uncapped in many cases, posing a special risk because contaminants can be introduced directly into the aquifer. Unused wells also pose a risk when they are damaged during site redevelopment. Any of these situations can provide a conduit for contaminant movement.

Among the private wells in the Camas vicinity, a portion were constructed prior to adoption of Ecology's drilling standards in 1971 and therefore have a higher likelihood of improper construction. There is no inventory on the number or location of these wells; however, many of them may have been abandoned properly following the State's standards. Furthermore, public water supplies have served most of the LWWF area since the 1930's and therefore few private wells are likely to occur in this area.

4.5.4 Agriculture, Golf Courses, and Parks

Fertilizers, pesticides, and herbicides are applied to residential lawns, commercial landscaping, agricultural lands, and landscaped areas adjacent to roads. If optimally applied, these chemicals pose little threat to groundwater, however, applications are commonly not made correctly and groundwater contamination can result if fertilizers are applied in exceedance of the agronomic uptake rate (Pitz,

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2014). Excess nitrate from fertilizer will be recharged to the underlying groundwater system. Frimpter and others (1990) estimated that an average of 9 pounds of nitrate-N leached annually to groundwater from each 5,000-squarefoot lawn. Landscaping activities can also be the source of pesticides and herbicides such as ethylene dibromide (EDB), 1,2-dibromo-3-chloropropane (DBCP), and dicamba.

There are no agricultural parcels within the WHPA and park turf is not a significant concern (Figure 4-2). Most of the parks within the 6-month capture zone are natural areas with the exception of Goot Park, which has managed turf. The City should coordinate with the parks department to confirm these designations and discuss the use of chemicals at Goot Park given its proximity to the City's Well 14 (although groundwater beneath Goot Park is more likely to be captured by the City of Washougal's "Lower Wellfield," comprised of five production wells located immediately east of Camas Well 14).

Residential lawns and other landscaping occur throughout the WHPA. These are potential sources of nitrogen, pesticides, and herbicides to the groundwater. The risk of groundwater contamination by these contaminants is high in the PAA because the aquifer is unconfined and groundwater is relatively shallow.

4.5.5 Burlington Northern Santa Fe Railway

In 2001, about 32 to 45 Burlington Northern Santa Fe (BNSF) freight trains were reported to pass through the Washougal area on a daily basis (pers. comm. Read Fay, BNSF), with roughly 25% of the containers potentially containing hazardous materials (including petrochemicals). Movement of crude oil by rail in Washington State began in 2012 and has continued to increase since that time (Ecology, 2025a)

During the 1-year period between July 1, 2024 and June 30, 2025, rail was responsible for 18 percent of reported crude oil movement through Washington, equal to over 38 million barrels (Ecology, 2025a). In the same period, receiving facilities reported that 49,879 rail cars transported crude oil through route segment 2, which follows the Columbia River corridor from the Tri-Cities to Vancouver, Washington. This averages to approximately 959.2 oil tank cars travelling on the rail segment per week with an average tank car volume of 681 barrels. The 2025 Quarter 2 total volume transported by rail through segment 2 was 11,684 tank cars carrying an estimated 7.95 million barrels (Ecology, 2025a), a 42 percent reduction in volume from the 20,037 tank cars carrying 13.7 million barrels reported to have passed through the same segment in 2017 Quarter 2 (Ecology, 2017).

Derailment of rail cars with hazardous materials is a serious potential contaminant source for the WHPA since the BNSF tracks run directly over the source aquifer. Road crossings at rail tracks are of highest concern since there is increased risk of accidents at these locations. There are three railroad crossings within the WHPA and one within the Western Search Area (Figure 4-1). Two of the crossings are public with warning lights and rail guard (6th Street and 3rd Street) and one is private with only a stop sign. The private crossing leads to the main entrance for the Columbia Rock Concrete site at 1615 SE 6th Avenue and is within the WHPA 6-month capture zone. Rail collision with large trucks entering or leaving the concrete facility increases the possibility of derailment at this location and is considered a potential risk for the wellfield.

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As noted in the 2016 WHPP report (PGG, 2016), the maximum speed of BNSF freight trains was reported to not exceed 45 to 50 miles per hour (pers. comm. Read Fay, BNSF). These low speeds and the durability of the tank cars minimize the possibility of a spill in the unlikely event of a derailment. The most recent crude oil spill from a train occurred in Whatcom County in December 2020 and 28,962 gallons were released to the environment (Ecology, 2021) BNSF maintains a spill response plan working with local fire departments, emergency response, and Ecology.

4.5.6 PFAS Regulation and Potential Sources

PFAS is a group of thousands of compounds that have been designated as contaminants of emerging concern. On April 10, 2024, EPA announced the final NPDWRs and MCL goals (MCLGs) for six PFAS compounds (Table 4-6). Public water systems were given three years (by 2027) to complete initial monitoring, followed by ongoing compliance monitoring, and five years (by 2029) to implement solutions that reduce these PFAS if monitoring shows that drinking water levels exceed these MCLs. Beginning in 2029, public water systems that have PFAS in drinking water which violates one or more of these MCLs must take action to reduce levels of these PFAS in their drinking water and must provide notification to the public of the violation (EPA, 2025b). Compliance with MCLs is determined by running annual averages at the sampling point. On May 8, 2024, EPA designated PFOA and PFOS, including their salts and structural isomers, as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (EPA, 2024). Ecology has concluded that PFAS fall under the Model Toxics Control Act (MTCA) and is applying the federal MCLs as well as calculated cleanup levels for other media (Ecology, 2025b).

Table 4-6: Final EPA MCLs and MCLGs

Compound	Final MCLG	Final MCL (enforceable levels)
PFOA	Zero	4.0 ng/L (ppt)
PFOS	Zero	4.0 ng/L (ppt)
PFHxS	10 ng/L (ppt)	10 ng/L (ppt)
PFNA	10 ng/L (ppt)	10 ng/L (ppt)
HFPO-DA (GenX)	10 ng/L (ppt)	10 ng/L (ppt)
Mixtures containing 2 or more of PFHxS, PFNA, HFPO-DA, and PFBS	1 (unitless) Hazard Index	1 (unitless) Hazard Index

On May 14, 2025 EPA announced its intent to extend the compliance deadlines for PFOA and PFOS to 2031 and rescind the regulations and reconsider the regulatory determinations for PFHxS, PFNA, HFPO-DA (GenX), and the Hazard Index for mixtures of these three plus PFBS (EPA, 2025c).

In 2021, the Washington State Board of Health adopted State Action Levels (SALs) for five PFAS (Table 4-7). SALs are set to protect human health and are based on the best available science at the time.

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WAC 246- 290-315(8) states that upon federal adoption of a MCL, the MCL will supersede a less stringent SALs and associated requirements, including monitoring and public notice. The Washington State Board of Health adopted emergency rule CR-103E on June 12, 2024 to amend WAC 246-290-315 such that the criteria would apply on the effective date of the MCL as set in the federal standard, not the adoption date. This ruling extends the SALs and the associated requirements for Group A Public Water Supplies until 2029, or 2031, when the EPA MCL compliance becomes effective. The fourth emergency rule has been extended to October 16, 2025. The Board will consider additional emergency rule filings as needed, until a permanent rule is in place.

Table 4-7: Washington State Action Levels (SALs)

Compound	**2021 WA SALs**	**2025 WA SALs**
PFOA	10 ng/L (ppt)	4.0 ng/L (running annual average)
PFOS	15 ng/L (ppt)	4.0 ng/L (running annual average)
PFHxS	65 ng/L (ppt)	10 ng/L (running annual average)
PFNA	9 ng/L (ppt)	10 ng/L (running annual average)
PFBS	345 ng/L (ppt)	-
HFPO-DA (GenX)	-	10 ng/L (running annual average)
Hazard Index PFAS (HFPO-DA, PFBS, PFHxS, and PFNA)[5]	-	1 (unitless) Hazard Index

Detection of PFAS in the City's LWWF production wells suggests that there are sources of PFAS within the capture zones of the City's wells. The mobility of PFAS in groundwater varies by the specific compound, with branched, shorter-chain, and octanoic acid species being more mobile than their longer-chain and linear counterparts

Ecology indicates that the storage and use of aqueous film-forming foam (AFFF), a common type of firefighting foam, is a key suspected source of PFAS-contaminated drinking water in Washington with specific source areas that include military facilities, airports, and firefighting training facilities (Ecology, 2026). Other sources of PFAS to the environment include wastewater treatment plants, paper mills, refineries, landfills, biosolids facilities, manufacturing and semiconductor industries, auto garages, dry cleaners, concrete production sites, chemical and metal plating facilities, and residential septic systems. There are no confirmed PFAS releases in or around the WHPA; however, this does not preclude unidentified releases to groundwater.

In April 2025, Mott MacDonald completed a review of historical site data to identify potential sources of PFAS contamination (Mott MacDonald, 2025). The historical site list was reviewed in

[5] The PFAS Mixture Hazard Index (HI) is the sum of component hazard quotients (HQs), which are calculated by dividing the measured component PFAS concentration in water by the relevant health-based water concentration (HBWC) when expressed in the same units (shown in ng/L for simplification). The HBWC for PFHxS is 10 ng/L; the HBWC for HFPO-DA is 10 ng/L; the HBWC for PFNA is 10 ng/L; and the HBWC for PFBS is 2000 ng/L. Hazard Index = ([HFPO-DA$_{water}$ ng/L]/[10 ng/L]) + ([PFBS$_{water}$ ng/L]/[2000 ng/L]) + ([PFNA$_{water}$ ng/L]/[10 ng/L]) + ([PFHxS$_{water}$ ng/L]/[10 ng/L])

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tandem with Ecology's facility site database (Table 4-1a and 4-1b) and EPA's PFAS Industry Sectors Analytical tool (EPA, 2025a) to develop a PFAS industry site risk ranking (Table 4-8). The 80 sites included in Table 4-8 are from Camas and Washougal and within 4 miles of Camas supply well 13; 13 sites are within the 6-month capture zone, 12 sites are within the 1-year capture zone, six sites within the 5-year capture zone, and four in the supplemental CARA (Figure 4-4). Overall, 35 PFAS industry sites are within the WHPA, ten of which have a recorded or likely release to the environment. There are 17 additional PFAS industry sites in the Western Search Area. Of the 52 PFAS industry sites within the WHPA and Western Search Area, 41 are included in Tables 4-1a and 4-1b. The 11 PFAS industry sites within the WHPA and Western Search Area and not included in Tables 4-1a and 4-1b are predominantly historical auto service stations and dry cleaners. There are 28 PFAS industry sites included in Table 4-8 that are outside of the WHPA and Western Search Area. Eleven of these 28 sites are within the industrial park northeast of Captain William Clark Park, south of Highway 14 in Washougal, and west of Steigerwald Lake National Wildlife Refuge (labeled "Columbia Industrial Park" in Table 4-8). The industries represented by these facilities includes textiles and leather, metal plating and machining, semiconductors and related devices, chemical manufacturing including surface active agents, waste management, and plastics and resins. Three sites (Camas-Washougal Fire Department [CWFD], Pendleton Woolen Mills, and ARCO #6008) are near the eastern boundary of the WHPA.

4.6 PUBLIC WATER SYSTEM MONITORING

Public water system sources are routinely sampled for water quality analysis and screening for drinking water contaminants. Strata obtained query results from DOH's Sentry database regarding exceedances of regulated drinking water parameters along with PFAS analyses from groundwater sources operated by the Cities of Camas and Washougal. Reported monitoring results were compared to NPDWRs and National Secondary Drinking Water Regulations (NSDWR). NPDWRs are legally enforceable primary standards and treatment techniques that apply to public water systems, and NSDWRs are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water. Washington State groundwater quality criteria for use as drinking water are available in WAC 173-200-040 Table 1. State criteria for detected analytes generally agrees with NPDWR or NSDWR and is only referenced below if it is the stricter of the standards. In general, groundwater quality meets NPDWR and NSDWR, with the most recent exceedance occurring in 2005 for the City of Camas and in 2023 for the City of Washougal. However, recent detections of PFAS in both city's supply wells necessitate an investment in treatment infrastructure, scoping alternative sources, or both. The results of our review are reported below.

4.6.1 City of Camas Water Supply Wells

Water system monitoring results from the City of Camas water supply wells are available from October 1988 through August 2025. From the reported samplings, four exceedances of National Primary or Secondary Drinking Water Regulations have been identified in the Post-Treatment/Finished water:

- Iron (NSDWR: 0.3 mg/L): exceeded once in 2004 at a concentration of 0.4 mg/L.

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- Radium 228 (NPDWR MCL for Radium 226+228: 5 picocuries per liter [pCi/L]): exceeded once in 2005 at a concentration of 2.5 pCi/L.

EPA finalized the MCLs for PFAS (Section 4.5.6) in April 2024. PFAS sampling performed to date has detected 33 exceedances of the final MCLs for individual PFAS compounds in sampled Post-Treatment/Finished water. Specifically:

- PFOA (MCL: 4.0 ng/L): exceeded five times between August 2022 and July 2024 with a maximum concentration of 5.4 ng/L at City Well 5.
- PFOS (MCL: 4.0 ng/L): exceeded 28 times between March 2022 and July 2024 with a maximum concentration of 25 ng/L in August 2022 at City Well 13.
  - Three detections of PFOS at City Well 13 exceed the 2021 Washington SALs.

Seven detections of PFOS exceed the MCL within the past year (October 2024-October 2025) with a maximum concentration of 7.2 ng/L at City Well 9.

Table 4-9a summarizes the results of all known PFAS sampling efforts through September 2024 within the Camas supply and distribution network. Detections of PFBS, PFOA, and PFOS are the most frequent of the tested PFAS compounds.

4.6.2 City of Washougal Water Supply Wells

Water system monitoring results from the City of Washougal water supply wells are available from December 1993 through February 2025. From the reported samplings, one exceedance of National Primary or Secondary Drinking Water Regulations has been identified in the Post-Treatment/Finished water. Lead (0.028 mg/L) exceeded the NPDWR action level (0.01 mg/L) in July 2023 in a sample collected from 3600 Ast #24. The Lower Wellfield comprises the five production wells located immediately east of Camas Well 14 (Figure 1-1). The PFAS results from the City of Washougal's "Lower Wellfield", summarized in Table 4-9b, show detections of PFBS, PFHxA, PFHxS, and PFOA below the MCL, and PFOS detections above the MCL. None of the detections exceed the 2021 Washington SALs.

5.0 WELLHEAD MANAGEMENT STRATEGIES AND IMPLEMENTATION

The completion of wellhead protection planning provides no safeguards unless effective management strategies are implemented to prevent potential contamination of groundwater sources. The City does not have land-use regulatory control within all of its WHPAs. Therefore, the City should endeavor to keep and maintain close, cooperative ties with Clark County and the Cities of Washougal and Vancouver.

The City continues to interact with its neighbors, especially the City of Washougal which has overlapping WHPAs with the City of Camas, and regulating agencies to exchange information on

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groundwater protection activities. The City also monitors land use activities and groundwater conditions within the WHPA for its supply sources.

Implementation of some of the proposed management strategies presented below will be dependent on the availability of City resources. For this review, we have included strategies that are both completed, ongoing, or have yet to be implemented. The strategies shown in Table 5-1 below are organized by recommended priority.

Table 5-1: WHPP Management Strategies

Priority	Strategy
1	Maintain a Central Point of Contact
2	Track State Cleanup (MTCA) Sites
3	Obtain Notifications of Hazardous Materials Spills
4	Monitor Groundwater
5	Map Petroleum Pipelines and Develop Emergency Response Measures
6	Provide Current WHPA Maps to Controlling Jurisdictions
7	Send Notification Letters to Owners/Operators of Identified Contaminant Sources
8	Promote Protective Stormwater Management
9	Track Pesticide Use
10	Inventory of Historical Sites
11	Inventory Underground Storage Tanks
12	Track the State's Inventory of Dry Wells
13	Inventory Abandoned Wells
14	Encourage BMPs in Land Management Activities
15	Review Pending Land Use Permits
16	Develop Notification Process for Pending Land Use Permits in WHPA
17	Target Public Education Programs in the WHPA
18	Participate in Future Updates to CARA Regulations

5.1 MAINTAIN A CENTRAL POINT OF CONTACT

The City should maintain a central point of contact for issues related to their Wellhead Protection Program. For purposes of this WHPP, this central point of contact is referred to as the "Wellhead Protection Coordinator." The Wellhead Protection Coordinator will foster and promote ongoing interaction with jurisdictions inside the WHPA but outside the City limits and will provide a central resource for departments within the City.

5.2 TRACK STATE CLEANUP (MTCA) SITES

The City should continue to track the status of all contaminated sites within their WHPA. This includes checking the Ecology databases at least every six months to determine if any new sites have

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been added to the contaminated sites lists. For sites that have cleanup work in progress (see Section 4.4.3), notify the Ecology Site Manager that the site is in a WHPA, and request that Ecology notify the City when the site status is updated or changed. Review all available information regarding activities being conducted on the site until the cleanup action and confirm that all monitoring is being completed as directed. Maintain periodic communications with the Ecology site manager to efficiently track status and maintain awareness of the site's location within the WHPA.

5.3 OBTAIN NOTIFICATIONS OF HAZARDOUS MATERIALS SPILLS

Concurrent with tracking MTCA sites (Section 5.2), the City should request notification from Ecology for any spills that occur within the WHPA. This should also include similar coordination with the first-response emergency units (e.g., Camas Dire Department, National Response Center, State Emergency Management Division). The City should then follow up with Ecology on any cleanup action implemented following the spill.

5.4 MONITOR GROUNDWATER

The City should actively participate in the collection and analysis of groundwater quality and water level information. A Monitoring Program provides a means of identifying trends and detecting problems before they reach the wellhead. Monitoring data can support protective regulatory actions and allow proactive measures to be enacted before the City's water supply sources are impacted. In addition, the data collection and monitoring can assist with regional groundwater management since data provide the basis for making appropriate decisions for long-term protection of groundwater quality and quantity. The monitoring data should be reviewed and summarized annually to identify any potential problems and evaluate the effectiveness of the network.

5.5 MAP PETROLEUM PIPELINES AND DEVELOP EMERGENCY RESPONSE MEASURES

The Northwest Pipeline passes through Washougal before crossing the Columbia River into Troutdale, Oregon. The City should map the Northwest Pipeline and any other petroleum distribution lines within or near the City's WHPAs. The City should coordinate with state and local spill response organizations to develop emergency plans to be implemented in the advent of pipeline leaks or spills.

5.6 PROVIDE CURRENT WHPA MAPS TO CONTROLLING JURISDICTIONS

The City should provide the current electronic (GIS) and printed maps of their WHPAs to all land use authorities within the City's WHPAs on a periodic basis. These maps should also be provided to DOH, Clark County Public Health Department, and local fire departments or Districts.

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Fire departments are recommended since, as first responders, they should be aware of the proximity to water sources when responding to fires or spills or other incidents where contaminants are involved. The nature of the response may need to be changed depending on the need to contain or prevent disbursement of a contaminant in order to prevent compromising the water source.

5.7 SEND NOTIFICATION LETTERS TO OWNERS/OPERATORS OF IDENTIFIED CONTAMINANT SOURCES

In an effort to protect and coordinate spill response planning within the City's WHPA, the City should send notification letters to the owners and operators of sites with identified sources of contamination as described in Section 4.4. The notification letters should present a map of the WHPAs, a table of the site of concern, the system's susceptibility rating and population served, and briefly describe appropriate procedures in the event of a spill. The City should maintain documentation of the notifications in accordance with the Wellhead Protection Program Guidance Document (DOH, 2017).

5.8 PROMOTE PROTECTIVE STORMWATER MANAGEMENT

The City should continue to promote and enforce stormwater requirements that provide water quality protection in the WHPA, consistent with the 2024 Ecology Stormwater Management Manuals. Specifically, support development of the most protective criteria; such as 5 feet of separation between infiltration facilities and the water table, sufficient rigor in testing of potential infiltration pond locations, and mandatory treatment requirements within 1-year time-of-travel zones.

5.9 TRACK PESTICIDE USE

The City can monitor some of the state and county pesticide use within the WHPA by requesting annual reports from WSDOT and Washington State Department of Agriculture (WSDA) Pesticide Management Division. Roadside pesticide/herbicide use by WSDOT and WSDA are maintained in digital database formats that provide up-to-date information on the recently sprayed locations, and quantities and types of pesticides used. WSDOT's database is available on the web. This inventory may be used to guide future groundwater monitoring and WHP-related education programs. In addition, the City should encourage private land managers to use vegetation management practices which protect groundwater quality (Strategy 5.14).

5.10 INVENTORY OF HISTORICAL SITES

The City should locate and inventory sites that are historical sources of potential contamination. This includes maintaining a record of MTCA cleanup sites after receiving an NFA status from Ecology. Retain all available information regarding activities conducted on the site up to and including the cleanup action. Conduct additional reviews as research progress on contaminants of emerging concern and contaminant sources, including when new industries are linked to groundwater contaminants.

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5.11 INVENTORY UNDERGROUND STORAGE TANKS

The City should locate and inventory USTs. USTs registered with the Ecology have been included in the contaminant source inventory (Section 4.0). This includes checking the Ecology databases at least every six months to determine if new USTs have been registered.

5.12 TRACK THE STATE'S INVENTORY OF DRY WELLS

The City should locate and inventory dry wells. Owners of these dry wells should be notified of the potential liability such wells cause and be educated on the stormwater requirements that provide water quality protection in the WHPA. Dry wells that are currently included in the Clark County GIS should be reviewed for accuracy.

5.13 INVENTORY ABANDONED WELLS

The City should locate and inventory abandoned (unused) wells. Owners of these wells should be notified of the potential liability such wells cause and be educated on the state's requirements for well decommissioning once a well is longer in use. This effort could be time consuming since the available information for many of the wells is limited to a driller's log, which, particularly for older wells, can be of variable quality. Wells located within the 1-year WHPA should be prioritized as time allows, and notification sent to owners regarding the well decommissioning requirements and the availability of technical assistance from Ecology or Clark County Public Health Department.

5.14 ENCOURAGE BMPS IN LAND MANAGEMENT ACTIVITIES

The City should engage with County and City planning departments to encourage that planners require developers use best management practices (BMPs) that reduce the potential for contaminants to enter the groundwater system.

5.15 REVIEW PENDING LAND USE PERMITS

Concurrent with encouraging BMPs in land management activities (Section 5.14), the City should track and review all pending land development projects within its WHPA. Review should include communication with the permit project manager and submission of comments to the permitting agency as necessary on mitigation and BMPs appropriate to protection of water quantity and quality.

5.16 DEVELOP NOTIFICATION PROCESS FOR PENDING LAND USE PERMITS IN WHPA

The City should maintain a point of contact within the City of Washougal and Clark County to ensure an opportunity to comment on pending land use activities within those jurisdictions and develop a process that ensures the City will be notified of all pending land use permitting actions.

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5.17 TARGET PUBLIC EDUCATION PROGRAMS IN THE WHPA

The City should continue to educate residents, particularly on groundwater quality issues. Customers within the WHPA should be targeted for distribution of literature regarding:

- Septic tank maintenance: Comply with the existing state regulations on septic tank use (WAC 246-272A), which requires the owner to inspect and maintain the system, and notify the Clark County Public Health Department of any repairs, alterations, or expansions
- Home heating oil tank maintenance and proper decommissioning
- Residential use of herbicides and pesticides: Encourage "waterwise" native vegetations planting and integrated pest management, rather than chemical applications
- Hazardous material use, disposal, and storage

In addition to City-run programs, the City should strive to participate in and support small-quantity waste disposal programs and support Clark County and other local municipal governments in developing and creating public education programs concerning groundwater.

5.18 PARTICIPATE IN FUTURE UPDATES TO CARA REGULATIONS

With adoption of Clark County Code 40.410, Clark County specified activities that are prohibited or require permits depending on the activity location within CARAs. Other municipalities with jurisdiction over land use within the City of Camas WHPAs should be reminded to consult the CARA ordinance, and the City should track and comment on any future proposed changes to the CARA ordinance.

6.0 SPILL AND INCIDENT RESPONSE AND PLANNING

As part of the wellhead protection program, the City must develop a spill and incident response plan. The City should summarize its spill response procedures, continue to coordinate it spill response planning with local emergency responders, the Department of Ecology's Spill Operations Section, the Emergency Management Division of the Washington Military Department, the local health department, Clark County, and any local emergency planning committee (at minimum) and contact first responders and regulators to provide input into the completed plan.

This section outlines spill response procedures and capability for jurisdictions within the WHPA. Spill events can be large or small and can consist of materials that can range from inert to highly toxic. Spills can occur under conditions and locations which are easily contained, or not, so that surface water or groundwater are under immediate threat. This range of possibilities has prompted a spill response (and emergency response) system which is nationwide in scope (National Response System), yet one which is designed to handle the more common, small scale (yet potentially dangerous) spills. This plan takes into account this range of systems.

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The ability of the City to affect the protocols and procedures of the national and state response systems is limited. Also, the majority of spills are small and require local response. Therefore, for the purposes of this WHPP, focus is given to local response capabilities and needs associated with these local response systems.

6.1 NATIONAL, STATE, AND LOCAL SPILL RESPONSE PLANS

Spill response planning has been ongoing throughout Clark County and within Washington State for many years. As a result, there are many plans in existence, each focusing on a specific geographical area or type of substance. In addition, parties involved in the storage and transportation of hazardous materials have been required to develop contingency plans. Each of these contingency plans should be consistent with each other and fit within the context of the response plans listed and described below. The following spill response plans are in effect in Washington State and cover inland, or non-marine areas, such as wellhead protection areas and aquifer recharge areas:

- National Oil and Hazardous Substances Pollution and Contingency Plan (National Contingency Plan; NCP), prepared by the EPA
- Oil and Hazardous Substance Pollution Contingency Plan for Federal Region 10 (RCP), prepared by Region 10 of the EPA
- Washington Statewide Master Oil and Hazardous Substance Spill Prevention and Contingency Plan, prepared by Ecology
- Local Emergency Response Plans prepared by city and county governments

6.2 SPILL RESPONSE ORGANIZATIONS

Depending on the magnitude of the spill event, numerous organizations at all levels of government, some voluntary organizations, and the private sector may have a role in spill response and cleanup. Each of the plans mentioned above describes the relationship and roles of these organizations in terms of the specific area of concern. Some of the organizations listed below might be, depending on the size and nature of the release, involved in a spill response in the City's WHPA. Spill response plans stress that spill response procedures be effectively executed. For that to be accomplished, each party must be fully aware of their specific roles and responsibilities. Moreover, there must be an understanding of the roles of other parties potentially involved in response activities, as well as effective coordination, cooperation, and communication among responding agencies, organizations, and individuals. The discussion below briefly summarizes the organizations that may be involved in spill response within the WHPA and describes their roles and responsibilities. The discussion below is organized in order from federal to local jurisdictions.

6.2.1 Federal Spill Response

The EPA has primary responsibility for all spills that occur on land. As directed by the NCP, the EPA is pre-designated as on-scene commander (OSC) for spills occurring under its jurisdiction. The OSC determines the status of the local spill response and determines whether, or how much, federal

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involvement is needed. The EPA may call on the following response teams to assist them in responding to a spill.

- National Response Team (NRT): The NRT consists of representatives from the various federal agencies (such as EPA, the US Coast Guard, Fish and Wildlife Service, etc.). It serves as the national body for planning and preparedness actions prior to a spill and as an emergency advisory center when a spill occurs.
- Regional Response Team (RRT): The RRT, consisting of representatives from selected federal and state agencies, performs functions similar to those performed nationally by the NRT. Essentially, the RRT is the regional body responsible for planning and preparedness before an oil spill occurs and provides advice to the OSC following such incidents.
- Technical Assistance Team (TAT): The TAT is a contractor used by the EPA Region 10 Office to provide technical oversight for spill response. Requests for the TAT are made via the EPA. Once on site, the TAT will report the situation to the EPA duty officer who then decides whether an EPA OSC needs to be on scene.
- Environmental Response Team (ERT): The ERT, based in Edison, New Jersey, is established to advise the OSC and RRT on environmental issues surrounding spill containment, cleanup, and damage assessment, with personnel expertise in areas such as treatment technology, biology, chemistry, hydrology, geology, and engineering.

6.2.2 State Spill Response

- Military Department Emergency Management Division (EMD): The state EMD is tasked with receiving and record verbal emergency toxic chemical release reports through its 24-hour duty officer system and making appropriate notifications. The EMD also assists and provides guidance to local emergency planning commissions for preparation of their emergency response plans.
- Department of Ecology: Ecology is the lead state agency for environmental pollution response within the State of Washington. As such, it serves as an advisor to the OSC and the Incident Commander (IC) for many spills occurring in state jurisdiction. Ecology is the state designated OSC for all oil spills in water. In the event of a spill occurring on a state highway, Ecology coordinates with the Washington State Patrol (State Patrol), which assumes responsibility as IC. In addition, Ecology acts as the lead agency responsible for cleanup activities.
- Ecology Spill Response Team: The Ecology Spill Response Team consists of Ecology regional office personnel. This team is responsible for determining the source, cause, and responsible party, as well as initiating enforcement action as appropriate. Additional responsibilities include ensuring containment, cleanup, and disposal are carried out adequately. The team coordinates its actions with other state, federal, and local agencies.
- State Patrol: The State Patrol acts as the designated IC Agency for incidents on interstate and state highways, and other roads and jurisdictions as delegated. When a spill occurs

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on a state highway, Ecology joins the Unified Command and acts as the lead agency for cleanup response.

- Washington Department of Fish and Wildlife (WDFW): The WDFW is a state agency with trustee responsibilities for fish and wildlife, and associated habitats. The WDFW Oil Spill Team (OST) provides round-the-clock oil spill response capability to address the needs of fish and wildlife resources. The OST also provides extensive technical support to the State's oil spill planning and preparedness efforts.
- Department of Transportation (DOT): The Washington State DOT may provide traffic control, equipment, and personnel for non-hazardous cleanup activities on and interstate highways. The DOT may provide and mobilize the necessary equipment in a major spills incident.

6.2.3 Local Response

Local governments have a duty to be prepared for all disaster emergencies. The Clark Regional Emergency Services Agency (CRESA) is charged with establishing Local Emergency Planning Committees (LEPC) to facilitate the local planning efforts.

LEPCs have the responsibility to create local emergency response plans. General requirements for local response plans are contained in Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986. Generally, local agencies, particularly fire services and law enforcement agencies, can be activated to provide emergency response services when there is a threat to life and property. Emergency response services may include: fire and explosion controls investigation and documentation, perimeter control, evacuation, traffic controls, and initial containment or even removal depending on the nature of the incident.

The "first responders" for the majority of spills are these local entities. They provide for immediate protection of health, property, and the environment. It is this group of responders who determine the need for additional assistance and mobilization of the additional resources provided by the state and federal government.

Local spill response within the WHPAs is within the jurisdiction of the Camas Fire Department (CFD) for incident response. Within the City, the CFD has been appointed IC for hazardous material incidents, except upon State and Interstate roadways, where the State Patrol will assume the role of IC upon arrival at the scene.

The Clark County Hazardous Materials Emergency Response Plan (HMERP) is the guide for coordinating all resources, both public and private toward preparedness, response, recovery and mitigation efforts for hazardous material emergencies.

6.2.4 The Responsible Party

The primary responsibility for assessing, responding to, and containing an oil spill or discharge falls upon the individual, agency, and/or company responsible for the spill incident. The responsible party (RP), whether there is an approved contingency plan or not, is responsible for containment and cleanup of the spill, disposal of contaminated debris, restoration of the environment, and

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payment of damages. State law (Chapter 70.105D RCW) and federal law (40 CFR 300, the NCP) specifically require that the removal of a discharge of oil or hazardous substance should be immediate.

6.3 SPILL RESPONSE CONTACT INFORMATION

A spill of any magnitude within the WHPA, must be reported to Ecology's Southwest Regional Office:

- Ecology (24 hour) **1-800-OILS-911 (645-7911)**
  or 206-594-0000 (during business hours)

https://ecology.wa.gov/footer-pages/report-an-environmental-issue/report-a-spill

If necessary, contact local first responders and other government agencies and request their assistance:

- Police 911
- Fire/Ambulance 911
- Clark County Public Health (564) 397-8000

If a spill cannot be contained, Safety Kleen, a cleanup contractor in Clackamas, Oregon should be contacted:

- Safety Kleen (503) 655-5798

If a spill can be contained, it should be pumped into a containment tank. If there are no containment tanks on site, United Rentals can be contacted to provide one:

- United Rentals (360) 574-5455

In the case of a railway spill, BNSF railways General Director of Hazardous Material Safety should be notified (in addition to first responders and agencies above):

- Patrick Brady office: (817) 352-3652
  mobile: (817) 821-1325

6.4 WHPA NOTIFICATION LETTERS

To help protect and coordinate spill response planning within the community surrounding the City's WHPAs, the City should send notification letters (example letters included in Appendix C) to contaminant source site owners, emergency responders, and governmental and regulatory agencies. The notification letters should present a map of the WHPAs (similar to Figure 4-1), a table of the site of concern (similar to Table 4-1a) and briefly describe appropriate procedures in the event of a spill. Notification letters for business/site owners should be sent all 69 sites ranked in Table 4-1a.

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Notification letters for emergency responders should be sent to the following entities:

- Parcels of Concern within WHPA (Appendix B)
- Owners of Environmental Sites of Potential Concern within WHPA (Table 4-1a)
- Local Fire and Police Departments
- Ecology Southwest Regional Office
- Washington State Department of Health Southwest Regional Office
- Clark County Public Health
- BNSF railways

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7.0 LIMITATIONS

Work for this project was performed for the exclusive use of the City of Camas (Client), and this report was prepared consistent with generally accepted environmental and hydrogeologic practices of professionals in the same locality and involving similar conditions, at the time the work was performed. No other warranty, express or implied, is made by Strata Geosciences' (Strata). All deliverables prepared by Strata for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Strata. Strata's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others. Strata accepts no responsibility for any error or omission which is due to an error or omission in data supplied to us by other parties.

8.0 REFERENCES

City of Camas, n.d. *Camas SMAP - System Map, Drywells*. Retrieved from https://www.arcgis.com/apps/mapviewer/index.html?web-map=e9b2d5a3106b4a4aa0b83fe35aecf65f

City of Camas, 2015. *Camas Shoreline Master Program*. Limited Amendment Ord. #15-007. Effective July 27, 2015.

City of Washougal, 2024. *Layer: Drywells (ID:14)*. Retrieved from https://services6.arcgis.com/ZcuYjGGvzsyH5Zu7/ArcGIS/rest/services/Stormwater_Public/FeatureServer/14. Updated March 6.

Clark County, 2024. *Digital GIS Data Bulk Download*. https://hub-clarkcountywa.opendata.arcgis.com/pages/digital-gis-data-download. Updated June 27.

Fay, Read, 2001. Burlington Northern Santa Fe Railroad Superintendent of Washington and Oregon Division, personal communication, telephone conversation. February 21, 2001.

Frimpter, M. H., J. J. Donohue, and M. V. Rapacz, 1990. *A Mass Balance Nitrate Model for Predicting the Effects of Land Use on Ground-Water Quality*, U.S. Geological Survey Open File Report 88-493.

GHP, 2023. *A Complete Guide to Underground Storage Tanks (USTs)*. https://www.ghp1.com/blog/how-to-know-when-to-replace-your-underground-storage-tank. April 5.

Industrial Inspection Group, Inc (IIG), 2026. *Why Do Underground Storage Tanks Leak?* Industrial Inspection & Consulting LLC. Accessed July 7, 2026. https://www.indinspect.com/blogs/why-do-underground-storage-tanks-leak/.

Kaboggoza, Herbert Cirrus, Chimdi Moughau, Jiahui Guo, Zanina Ilieva, Rania Hamza, and Musa Manga, 2026. *Per- and Polyfluoroalkyl Substances (PFAS) in on-Site Domestic Wastewater: Sources, Occurrence, Influential Factors and Biochar-Based Remediation*. Journal of Water Process Engineering 88 (June 2026): 110065. https://doi.org/10.1016/j.jwpe.2026.110065.

Karalekas, Andrew, 2026. "Common Storage Tank Leaks and How They're Fixed." CommTank. Accessed July 7, 2026. https://www.commtank.com/tank-articles/common-storage-tank-leaks-and-how-theyre-fixed/. April 27.

DRAFT

Knobeloch, L., B. Salna, A. Hogan, J. Postle, and H. Anderson, 2000. *Blue Babies and Nitrate-Contaminated Well Water*. Environmental Health Perspectives 108, no. 7 (2000): 675–78. https://doi.org/10.1289/ehp.00108675. July.

McDonald, M.G., and Harbaugh, A.W., 1988. *A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model*. USGS Survey Techniques of Water-Resources Investigations, 6:A1.

Mott MacDonald, 2024. *LWWF Additional Yield Assessment (DRAFT)*. Prepared for City of Camas. March.

Mott MacDonald, 2025. *Camas Well 13 PFAS Historic Contaminant Sources Inventory Review*. April 2025.

Murray Smith & Associates, Inc, Pacific Groundwater Group, FCS Group, 2012. *City of Washougal Water System Plan Update*. Consultant's report prepared for the City of Washougal. June 2012.

Pacific Groundwater Group (PGG), 2004. *City of Camas Water Supply Alternatives Investigation*. JM9702.07, October 22, 2004.

Pacific Groundwater Group (PGG), 2007. *Steigerwald Area Exploration & Testing Program, Draft Report*, JM9702.08, May 2007.

Pacific Groundwater Group (PGG), 2011. *Options for Future Use of Georgia Pacific Water Rights*. Technical memorandum to Eric Levison, City of Camas, from Dan Matlock and Jill Van Hulle, Pacific Groundwater Group. January 25.

Pacific Groundwater Group (PGG), 2016. *City of Camas Hydrogeology Summary and Wellhead Protection Assessment Report*. November 2016.

Palmerton, David, 2023. *Septic Systems Failures and Forever Chemicals*. SCS Engineers. https://www.scsengineers.com/scs-white-papers/septic-systems-failures-and-forever-chemicals/. December 27.

Pitz, C. F., 2014. Spreadsheet Models for Determining the Influence of Land Applications of Fertilizer on Underlying Groundwater Nitrate Concentrations. Washington State Department of Ecology. https://apps.ecology.wa.gov/publications/summarypages/1403018.html. July.

Scherer, T. (2021). *A Guide to Plugging Abandoned Wells | NDSU Agriculture*. https://www.ndsu.edu/agriculture/extension/publications/guide-plugging-abandoned-wells. August.

Strata Geosciences (Strata), 2026. *Subject: Camas Contaminant Source Inventory: Windshield Survey Instructions*. Letter to Rob Charles at City of Camas. April 8.

United States Environmental Protection Agency (EPA), 2024. *Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) as CERCLA Hazardous Substances*. Federal Register, 89(90), 39124–39192. https://www.govinfo.gov/content/pkg/FR-2024-05-08/pdf/2024-08547.pdf

United States Environmental Protection Agency (EPA), 2025a. *PFAS Analytic Tools*. https://awsedap.epa.gov/public/extensions/PFAS_Tools/PFAS_Tools.html. August 29.

United States Environmental Protection Agency (EPA), 2025b. *Per- and Polyfluoroalkyl Substances (PFAS)* [Reports and Assessments]. https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas

DRAFT

United States Environmental Protection Agency (EPA), 2025c. *EPA Announces It Will Keep Maximum Contaminant Levels for PFOA, PFOS* [News Release]. https://www.epa.gov/newsreleases/epa-announces-it-will-keep-maximum-contaminant-levels-pfoa-pfos. May 14.

United States Environmental Protection Agency (EPA), 2026a. *Septic System Impacts on Water Sources*. https://www.epa.gov/septic/septic-system-impacts-water-sources. June 10.

United States Environmental Protection Agency (EPA), 2026b. *Frequent Questions on Septic Systems*. https://www.epa.gov/septic/frequent-questions-septic-systems. March 11.

United States Environmental Protection Agency (EPA), 2026c. *How Pharmaceuticals Enter the Environment*. Overviews and Factsheets. https://www.epa.gov/household-medication-disposal/how-pharmaceuticals-enter-environment. January 22.

United States Environmental Protection Agency (EPA), 2026d. *Estimated Nitrate Concentrations in Groundwater Used for Drinking*. Data and Tools. https://www.epa.gov/nutrientpollution/estimated-nitrate-concentrations-groundwater-used-drinking. May 18.

Washington State Department of Ecology (Ecology), n.d.. *Stormwater & Residential Pollution*. Water & Shorelines. Accessed July 7, 2026. https://ecology.wa.gov/water-shorelines/water-quality/non-point-pollution/stormwater.

Washington State Department of Ecology (Ecology), 2017. *Crude Oil Movement by Rail and Pipeline, Quarterly Report: April 1, 2017, through June 30, 2017* (Quarterly Report Publication 17-08-013). Spill Prevention, Preparedness, and Response Program. https://apps.ecology.wa.gov/publications/documents/1708013.pdf

Washington State Department of Ecology (Ecology), 2021. *Crude Oil Movement by Rail and Pipeline, Quarterly Report: October 1, 2020, through December 31, 2020* (Quarterly Report Publication 20-08-004). Spill Prevention, Preparedness, and Response Program. https://apps.ecology.wa.gov/publications/documents/2108004.pdf

Washington State Department of Ecology (Ecology), 2025a. *Crude Oil Movement by Rail and Pipeline, Quarterly Report: April 1, 2025, through June 30, 2025* (Quarterly Report Publication 25-08-012). Spill Prevention, Preparedness, and Response Program. https://apps.ecology.wa.gov/publications/documents/2508012.pdf

Washington State Department of Ecology (Ecology), 2025b. *Regulating PFAS cleanup*. https://ecology.wa.gov/waste-toxics/reducing-toxic-chemicals/addressing-priority-toxic-chemicals/pfas/regulating-pfas-cleanup

Washington State Department of Ecology (Ecology), 2026. *Aqueous Film-Forming Foam (AFFF)*. State of Washington Department of Ecology. Accessed July 1, 2026. https://ecology.wa.gov/waste-toxics/reducing-toxic-chemicals/reducing-toxic-chemicals-washington/pfas/afff.

Washington State Department of Health (DOH), 2017. *Washington State Wellhead Protection Program Guidance Document*. January 2017. DOH 331-018 (Revised

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TABLES

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Table 4-1a: Sites of Potential Environmental Concern within Wellhead Protection Capture Zones

Map ID	Facility Name	Facility ID	WHPZ	Ecology Active Status	Release	Storm Water Risk	UST	LUST	Total "Current" Operational Tank Volume (gallons)	Solid Waste	Hazardous Materials	Cleanup Site	Cleanup Status[1]
1	Camas Police Department	22289	6-Month Well 13	Active						Y			
2	Camas City Well 4	81347684	6-Month Well 13	Inactive							Y		
3	City of Camas Well 13	93671	6-Month Well 13	Active							Y		
4	Philpot	12088	6-Month	Active	Y		Y	Y	500 - Closing 500 - Exempt			Y	Cleanup Started
5	Camas Washougal Port (The Port Sider Store on the Marina	92847997	6-Month	Active	Y		Y	Y	1,040 - Unregistered 16,000 - Operational			Y	NFA
6	Columbia Rock Concrete Products Inc	5016308	6-Month	Active	Y							Y	Awaiting Cleanup
7	Concrete Products Of Oregon LLC	70983458	6-Month	Active			Y		Removed 1996		Y		
8	Triangle Resources	3153967	6-Month	Active		Y				Y			
9	Columbia Storage Inc 2nd St	11338232	6-Month	Active		Y					Y		
10	Columbia Warehouse	37125488	6-Month	Active			Y		Removed or Closed in Place 1996		Y		
11	Hambleton Bros Log Yard	4399598 87338713	6-Month	Active	Y	Y	Y		Removed 1996			Y	NFA
13	Northwest Pipeline Gp Washougal M/S	14447751	6-Month	Active	Y						Y	Y	NFA
14	Jimbos Deli Mart 2	86429735	6-Month	Active			Y		35000				
15	Tarr Inc Washougal	3264254	6-Month	Active							Y		
12	Tidland Corp	88277363 7282918	6-Month	Active			Y		Removed 1996		Y		
16	Goodwill - Washougal	100001039	6-Month	Active		Y							
17	Camas City Well 11 & 12	994431	6-Month	Active							Y		
18	City of Camas Well 14	42373	6-Month	Active							Y		
19	City of Washougal Lower Well Field	43057	6-Month	Active							Y		
20	Washougal City Westside Wellfield Well 12	6975	6-Month	Active		Y							
21	Chevron Bulk Plant Camas	1043	6-Month	Active	Y							Y	NFA
22	Camas City Well 3	9810684	6-Month	Inactive							Y		
23	Us Doe Bpa Camas Substation	3811629	6-Month	Inactive							Y		
24	Clark Public Utility Dist C St	5352681	6-Month	Inactive			Y		Removed 1996				
25	Clark PUD Transformer Release J Street	100003734	1-Year	Active	Y							Y	NFA
26	Lacamas Dry Cleaners	49143	1-Year	Active									
27	Walgreens 1085	99999862	1-Year	Active							Y		
28	Rockwood Terrace	73627	1-Year	Active		Y							
29	Goodyear Tire Camas	85837922	1-Year	Inactive	Y		Y	Y	Removed 1999 & 2001			Y	NFA
30	Washougal Electric & Sheet Metal Inc	16327542	1-Year	Inactive			Y		Removed 1996				
31	Schucks Auto Supply Camus	52218486	1-Year	Inactive							Y		
32	All Seasons Auto Centers Inc Camas	18768638	1-Year	Inactive							Y		
33	Brass Lamp Motor Inn	64124152	1-Year	Inactive							Y		
34	Helland Brothers SS	69936158	1-Year	Inactive							Y		
35	Asher Engine Service (East County Auto)	94778244	5-Year	Active	Y						Y	Y	Awaiting Cleanup
36	Hi Way Fuel	22538744	5-Year	Active	Y		Y	Y	Removed 1996 56,000 - Operational			Y	Cleanup Started
37	Washougal Shell	57872946	5-Year	Inactive			Y		Removed 1996		Y		
38	Washougal School Dist Bus Garage	48371594	5-Year	Inactive		Y	Y		Removed 1996 Unknown - Exempt				
39	Overton Mfg Inc	49392144	5-Year	Inactive							Y		
40	Napa Washougal	79581825	5-Year	Inactive							Y		
41	Clark County Pub Wks Washougal Site	95756539	5-Year	Inactive			Y		Removed 1996				
42	Camas STP	74959167	CARA	Active						Y	Y		
43	Gk Construction & Equipment Rentals	4168647	CARA	Active							Y		
44	SE 8th & SE Tampa Development	99999682	CARA	Active		Y							
45	Camas City Operations Center	38772238	CARA	Inactive							Y		
46	Georgia Pacific Consumer Products	66765272	Western Search Area	Active	Y						Y	Y	Cleanup Started
47	Camas Foodmart (Browns Chevron)	18732618	Western Search Area	Active	Y		Y	Y	Removed 1996 111-1,100 - Exempt 32,000 - Operational		Y	Y	NFA
48	Camas City Shops	8698751 45416761	Western Search Area	Active	Y		Y	Y	Removed 1996		Y	Y	NFA
49	Verizon Northwest Inc Camas Co (GTE Northwest Inc)	89994319	Western Search Area	Active	Y		Y	Y	Removed 1996 500 - Operational		Y	Y	NFA
50	Safeway Fuel 1000	8343024	Western Search Area	Active			Y		40000		Y		
51	Westlie Ford Mercury Inc	61664371	Western Search Area	Active			Y		500 - Unregister 30 Day Notice 2014		Y		

Table 4-1a: Sites of Potential Environmental Concern within Wellhead Protection Capture Zones

Map ID	Facility Name	Facility ID	WHPZ	Ecology Active Status	Release	Storm Water Risk	UST	LUST	Total "Current" Operational Tank Volume (gallons)	Solid Waste	Hazardous Materials	Cleanup Site	Cleanup Status[1]
52	Camas Gas Services Inc (Browns Arco)	97188815	Western Search Area	Active	Y		Y	Y	Removed 1996			Y	NFA
53	Quick Stop Mart (Camas Mart)	33881994	Western Search Area	Active	Y		Y	Y	Removed 1996 and 1999 15,000 - Operational			Y	NFA
54	Residence Heating Oil Tank	9620	Western Search Area	Active	Y							Y	Awaiting Cleanup
55	Haag & Shaw Excavating	82973453	Western Search Area	Active	Y		Y		Removed 1996			Y	NFA
56	Greseth Property	5458	Western Search Area	Active	Y							Y	Cleanup Started
57	Camas Cemetary Association	39618925	Western Search Area	Active			Y		Removed or Closed in Place 1996				
58	P & L Investments	41313725	Western Search Area	Inactive	Y		Y	Y	Removed 2000			Y	NFA
59	Helen Brothers Service	65648254	Western Search Area	Inactive	Y		Y	Y	Removed 2000			Y	NFA
60	Camas City Minicipal SW	930	Western Search Area	Active		Y							
61	Camas City Old Sewage Treatment Plant	53821114	Western Search Area	Inactive							Y		
62	Camas Public Library	53186612	Western Search Area	Inactive			Y		Removed 1996				
63	Town & Country Stores Inc	44713844	Western Search Area	Inactive			Y		Removed 1996				
64	QWEST Camas N Rptr Bldg	43889368	Western Search Area	Inactive							Y		
65	Imperial Cleaners	78239817	Western Search Area	Inactive							Y		
66	First Christian Church HOT	100003126	Western Search Area	Inactive	Y							Y	NFA

Notes:
CARA = extended CARA
NFA = No Further Action
Y = Yes, site contains Ecology interaction type

Table 4-1b: Cleanup Sites and Associated Contaminants

Map ID	Facility Name	Facility ID	WHPZ	Cleanup Status[1]	Nature of Contaminants at Cleanup Sites[2]																
					Arsenic	Asbestos	Benzene	Dioxins/Furans	Halogenated Solvents	Non-Halogenated Solvents	Halogenated Organic Compounds	Other Non-Halogenated Organics	Lead	Metals - EPA Priority Pollutant	Metals - Other	PAH	PCB	Petroleum- Diesel	Petroleum - Gasoline	Petroleum Products - Unspecified	Phenolic Compounds	Reactive Wastes
4	Philpot	12088	6-Month	Cleanup Started														S(gw) C (s)	S (gw) S(s)			
5	Camas Washougal Port (The Port Sider Store on the Marina)	92847997	6-Month	NFA			B (s)					B (s)							RB (s)			
6	Columbia Rock Concrete Products Inc	5016308	6-Month	Awaiting Cleanup										C (gw) S (s)						S (gw) C (s)		
11	Hambleton Bros Log Yard	4399598 87338713	6-Month	NFA										B (gw) RB (sw) RA (s)		RB (sw) RA (s)	RA (s)	RA (gw) RA (s)		RB (sw) RA (s)	RB (sw)	
13	Northwest Pipeline Gp Washougal M/S	14447751	6-Month	NFA	B (s)									RB (s)								
21	Chevron Bulk Plant Camas	1043	6-Month	NFA						RB (gw) RB (s)	RB (gw)			RB (s)						RB (gw) RB (s)		
25	Clark PUD Transformer Release J Street	100003734	1-Year	NFA													B (s)	B (s)		B (s)		
29	Goodyear Tire Camas	85837922	1-Year	NFA							R (s)									C (s)		
35	Asher Engine Service (East County Auto)	94778244	5-Year	Awaiting Cleanup			S (gw) S (s)		S (gw) S (s)	S (gw) S (s)		S (gw) S (s)	S (gw) S (s)		S (gw) S (s)	S (gw) S (s)	S (gw) S (s)	S (gw) S (s)	S (gw) S (s)	S (gw) S (s)		
36	Hi Way Fuel	22538744	5-Year	Cleanup Started																C (gw) C (s)		
46	Georgia Pacific Consumer Products	66765272	Western Search Area	Cleanup Started		S (s)	S (s)	S (s)		S (s)			S (s)		S (s)	S (s)	S (s)			S (s)		S (s)
47	Camas Foodmart (Browns Chevron)	18732618	Western Search Area	NFA															C (s)	C (s)		
48	Camas City Shops	8698751 45416761	Western Search Area	NFA			B (s)					B (s)	B (s)					B (s)	RB (s)			
49	Verizon Northwest Inc Camas Co (GTE Northwest Inc)	89994319	Western Search Area	NFA														B (s)		B (s)		
52	Camas Gas Services Inc (Browns Arco)	97188815	Western Search Area	NFA			B (s)					B (s)	B (s)						C (s)			
53	Quick Stop Mart (Camas Mart)	33881994	Western Search Area	NFA			B (s)					B (s)	B (s)						B (s)	B (s)		
54	Residence Heating Oil Tank	9620	Western Search Area	Awaiting Cleanup						S (gw) C (s)										S (gw) C (s)		
55	Haag & Shaw Excavating	82973453	Western Search Area	NFA														RB (s)				
56	Greseth Property	5458	Western Search Area	Cleanup Started																C (s)		
58	P & L Investments	41313725	Western Search Area	NFA															C (s)			
59	Helen Brothers Service	65648254	Western Search Area	NFA			B (s)					B (s)						B (s)	B (s)	B (s)		
66	First Christian Church HOT	100003126	Western Search Area	NFA														RB (s)				

Notes:
Nature of Contaminants and Impacted Media at Cleanup Sites (as provided on Ecology's online Site Summary Report).
NFA = No Further Action

B Below Cleanup Level
C Confirmed Above Cleanup Level
S Suspected
R Remediated
RA Remediated-Above Cleanup Level
RB Remediated-Below Cleanup Level
(gw) Groundwater
(sw) Surface Water
(s) Soil

Table 4-2: Sites with EIM Contaminant Detections in Monitoring Wells and Nature of Site Exceedances

Map ID (See Fig. 4-1)	EIM Study ID	EIM Study Name	Facility ID	WHPZ	Cleanup Status[1]	Location ID	Most Recent Exceedance	Most Recent Sample Date	Clean Confirmation Sample	Nature of Contaminants in EIM Reported Detections											
										Benzene	Halogenated Solvents	Non Halogenated Solvents	Non-Halogenated Organics - Phenolic Compounds	Metals - EPA Priority Pollutant	Metals - Other	PAH	PCB	Petroleum- Diesel	Petroleum - Gasoline	Petroleum - Other	Petroleum - Other, Volatile
11	G1400032	Former Hambleton Brothers Log Yard	4399598	6-Month	NFA	G1400032-MW-07	4/17/2015	4/17/2015	N					GW				GW		GW	
						Freshwater Sediment	9/7/2011	9/7/2011	N				Sed	Sed		Sed					
						Soil	10/28/2011	8/26/2014	Y			S		S		S	S			S	
21	AO02TCPSR-3991	Former Chevron Bulk Terminal No. 207407	1043	6-Month	NFA	AO3991_MW5	6/30/2011	12/7/2015	Y									GW		GW	
						AO3991_MW6	6/3/2013	12/7/2015	Y									GW		GW	
						AO3991_MW9	6/30/2011	6/1/2015	Y											GW	
						AO3991_MW10	3/25/2011	6/2/2015	Y											GW	
						AO3991_MW12	3/25/2011	12/7/2015	Y									GW		GW	
						AO3991_MW13	3/15/2007	6/24/2008	Y									GW		GW	
						Soil	9/21/2014	9/21/2014	N							S		S	S	S	S
n/a	VCSW1182	ARCO 6008 (KT KANSO AM/PM), Washougal, WA	46212644	Eastern	NFA	SW1182MW_3	4/17/2013	4/17/2013	N					GW							
						VCSW1182SB_3	1/28/2011	1/28/2011	N					GW						GW	
						Soil	4/8/2013	3/4/2014	Y	S		S									
n/a	VCSW1430	George Schmid & Sons, Inc. 32nd Street Property, Washougal, WA	53281319	Eastern	NFA	VCSW1430-GP09	4/20/2012	4/20/2012	N									GW		GW	
						VCSW1430-GP10	4/20/2012	4/20/2012	N					GW							
						VCSW1430-GP13	4/20/2012	4/20/2012	N					GW	GW						
						VCSW1430-GP18	10/14/2013	10/14/2013	N									GW			
						VCSW1430-GP21	10/14/2013	10/14/2013	N							GW		GW			
						VCSW1430-MW01	1/12/2015	1/12/2015	N						GW			GW			
						VCSW1430-MW03	3/18/2014	9/16/2015	Y											GW	
						VCSW1430-MW04	10/6/2014	1/12/2015	Y					GW							
						Soil	2/19/2015	2/20/2015	N			S		S		S	S	S	S		

Abbreviations:
NFA = No Further Action
GW = Groundwater
Sed = Freshwater Sediment
S = Soil

Table 4-5: Parcel-of-Concerns, Categories, and Occurrence

Parcel Land-Use Description	Zoning Category	Land-Use Concern	Generalized Use Grouping for Land-Uses of Concern	Number of Parcels				
				6-Month Capture Zone	1-Year Capture Zone	5-Year Capture Zone	CARA	Western Search Area
Agricultural Buildings	Residential			1	1	1	0	0
Auto Body Shop	Commercial	High Concern	Auto-Boats-Fuel	0	0	0	0	1
Banks & Credit Unions	Commercial			1	2	2	0	4
Boats And Marine Accessories.	Commercial	Concern	Auto-Boats-Fuel	1	0	0	0	0
Cemeteries	Commercial	High Concern	Biohazards (cemeteries, crematories, feedlots, biofiltration, sewage infrastructure)	0	0	0	0	2
Churches, Synagogues, Temples, Sunday School Bldgs	Commercial			4	1	13	0	22
Communication Bldgs & Related Structures	Commercial			1	0	0	0	1
Community Center	Commercial			0	0	0	1	0
Community Shop Cntr W/ 1 Or More Anchors	Commercial			0	6	0	0	0
Convalescent Or Nursing Home	Commercial			0	0	0	0	1
Convenience Store - W/ Pumps & Tanks	Commercial	High Concern	Auto-Boats-Fuel	2	0	1	0	3
Convenience Store - W/O Pumps & Tanks	Commercial			0	0	1	0	0
Drive Through Car Wash	Commercial	Concern	Auto-Boats-Fuel	0	2	2	0	0
Dry Cleaners, Laundries (1 Tenant - Free Standg Bl	Commercial	High Concern	Dry Cleaners	0	0	0	0	1
Electric Power Boosters, Transformers, Stations, R	Commercial	Concern	Electrical Infrastructure	1	0	0	0	1
Electric Power Operating, Maint., And Repair Build	Commercial	Concern	Electrical Infrastructure	2	0	0	0	0
Espresso Stand	Commercial			0	0	0	0	1
Fast Food Rest & Other Drive Through Food Service	Commercial			4	6	0	0	3
Fleet Operation Centers & Storage	Commercial	Concern	Auto-Boats-Fuel	0	0	4	0	0
Flex Space	Commercial			1	10	0	1	0
Funeral Services And Crematories.	Commercial	High Concern	Biohazards (cemeteries, crematories, feedlots, biofiltration, sewage infrastructure)	0	0	0	0	4
Gas Storage Tanks, Pumping, Distribution, Pipeline	Industrial	Concern	Auto-Boats-Fuel	1	0	0	0	0
General Repair & Service Garages	Commercial	Concern	Auto-Boats-Fuel	0	1	4	1	2
Government Buildings	Commercial			0	0	1	0	0
Government Offices And Courts	Commercial			1	0	0	1	8
Granges, Lodges, & Meeting Halls	Commercial			1	0	0	0	0
Health Clinics: Medical / Dental / Other	Commercial	Concern	Medical	2	0	0	0	16
Highway Construction And Repair Contractors.	Commercial	Concern	Other	1	0	0	0	0
Large Grocery Store	Commercial			0	0	0	0	2
Law Enforcement (Except Jails[085 And 086]).	Commercial			1	0	0	0	0
Libraries.	Commercial			0	0	0	0	1
Lodging - Economy	Commercial			0	2	0	0	1
Lodging - Limited Service	Commercial			2	0	0	0	0
Manufactured Or Mobile Home Assessed With Land	Residential			0	2	7	0	1
Manufactured Or Mobile Home Not Assessed With Land	Residential			0	0	45	0	0
Marinas.	Commercial	Concern	Auto-Boats-Fuel	9	0	0	0	0
Medical & Dental Laboratories	Commercial	Concern	Medical	1	0	0	0	0
Medium Retail Building (Btwn 10,000 S.F. & 40,000	Commercial			2	0	0	0	0
Mfg - Lumber & Wood Products	Industrial	High Concern	Manufacturing	2	0	0	0	1
Mfg - Machinery	Industrial	Concern	Manufacturing	4	0	0	0	0
Mfg - Miscellaneous	Industrial	Concern	Manufacturing	2	0	0	0	0
Mfg - Paper Products	Industrial	High Concern	Manufacturing	0	0	0	0	5
Mhp / Court (Use For The Land Pid'S Of The Mh Cour	Commercial			0	0	2	0	0
Minimal Strg Bldgs, Equip, Sheds, Open Pole Bldgs	Residential	High Concern	Other	0	0	1	0	1
Misc. Bldg. With Office Functionality	Commercial			1	0	0	0	2
Miscellaneous Improvement On Its Own Pid	Residential			0	1	0	0	2
Motor Vehicle Dealers, New Cars And Small Trucks,	Commercial	Concern	Auto-Boats-Fuel	4	0	0	0	0
Motor Vehicle Dealers, Used Cars And Small Trucks.	Commercial	Concern	Auto-Boats-Fuel	0	0	1	0	0
Movie Theaters.	Commercial			0	0	0	0	2
Multi- Family 10 To 14 Units	Residential			1	0	4	0	4
Multi-Family 100 Or More Units	Residential			2	1	0	0	0
Multi-Family 15 To 19 Units	Residential			0	1	0	0	3

Table 4-5: Parcel-of-Concerns, Categories, and Occurrence

Parcel Land-Use Description	Zoning Category	Land-Use Concern	Generalized Use Grouping for Land-Uses of Concern	Number of Parcels				
				6-Month Capture Zone	1-Year Capture Zone	5-Year Capture Zone	CARA	Western Search Area
Multi-Family 20 To 29 Units	Residential			2	1	2	1	0
Multi-Family 30 To 49 Units	Residential			0	0	0	0	4
Multi-Family 5 To 9 Units	Residential			6	0	8	1	2
Multi-Family 50 To 99 Units	Residential			0	1	0	0	0
Neighborhood Strip Center With No Anchor	Commercial			3	3	0	1	0
Nurseries And/Or Commercial Greenhouses	Commercial			1	0	0	0	0
Office Bldg: Leasing Class B & C	Commercial			2	0	0	0	15
Parking Lot: Gravel, For Adjoining Building	Industrial	High Concern	Auto-Boats-Fuel	0	0	0	0	16
Parking Lot: Paved, For Adjoining Building	Industrial	Concern	Auto-Boats-Fuel	0	0	0	0	8
Parking Lots & Parking Structures	Commercial	Concern	Auto-Boats-Fuel	0	0	0	0	2
Parks With Playgrounds, Ball Fields, And Picnic Ar	Residential			18	0	1	1	4
Post Office, Mail Handling Facilities	Commercial			1	0	0	0	1
Prime Commercial Pad Site - Vacant	Commercial			0	0	0	0	1
Prime Developable Ground	Commercial			14	1	8	0	1
Private - Daycare Center & Preschool	Commercial			0	1	0	1	0
Pumping Station / City Well	Commercial			2	0	0	0	0
Railroad Right-Of-Way	Industrial			0	0	0	0	3
Restaurants, Cafes	Commercial			5	1	1	0	7
Retail Services	Residential			0	0	0	0	1
Retirement Residences & Alf'S (Asst Living Facilit	Residential			0	0	1	0	0
Rock Quarry, Crushing, Sand And Gravel Pits.	Commercial	Concern	Other	2	0	0	0	0
Self Service Car Wash (Wand Type)	Commercial	Concern	Auto-Boats-Fuel	0	3	0	0	0
Self Storage / Mini Warehouse	Commercial			14	9	2	1	0
Serv Station W/ Tanks & Pumps Or Card Lock Station	Commercial	Concern	Auto-Boats-Fuel	0	0	1	0	0
Service Repair Shop	Commercial	Concern	Auto-Boats-Fuel	0	1	5	0	6
Sewage Related Bldg Or Structure	Commercial	Concern	Biohazards (cemeteries, crematories, feedlots, biofiltration, sewage infrastructure)	0	0	0	5	0
Sfr Converted To Duplex	Residential			1	1	1	0	0
Sfr Converted To Office Functionality	Commercial			1	1	0	0	8
Sfr Convtd To 3-4 Units, With Kit, Bath & Ext Entr	Residential			0	0	0	0	5
Sfr On Comm Land Chgd To Comm Use Othr Than Office	Commercial			0	7	3	0	5
Sfr Unit Not Sharing Structure With Other Uses	Residential			252	137	871	89	304
Sfr Unit Sharing A Common Wall, W/Lot Ownership	Residential			15	0	20	0	4
Sfr Unit Sharing Premises With Other Major Use	Residential			0	0	0	0	1
Sfr With A Shared Major Use On Commercial Land.	Commercial			0	0	1	0	0
Sfr With Auxiliary Unit	Residential			1	0	0	0	0
Single Family Condominium Unit	Residential			0	0	44	14	9
Single Family Residence On Commercial Land	Residential			4	1	9	0	8
Small Retail Building (<10,000 S.F.)	Commercial			2	3	6	0	32
Social, Charitable Or Community Use Bldgs	Commercial			1	0	2	0	3
Storage Warehouse	Commercial	High Concern	Other	3	5	0	3	6
Taverns And Bars, Drink, And Dance Establishments.	Commercial			0	1	1	0	3
Tidelands	Commercial			0	0	0	23	2
Tire, Batteries, Parts And Accessories Dealers	Commercial	Concern	Auto-Boats-Fuel	1	1	1	0	0
Traditional Duplex	Residential			12	10	40	21	13
Triplex Or Fourplex	Residential			3	2	19	4	3
Unattached Parking For Profit	Commercial			0	0	0	0	1
Unused Buildings Other Than Residential.	Commercial			0	0	1	2	0
Unused Land Because Of Terrain.	Industrial			1	0	0	0	0
Unused Land Timbered.	Residential			1	0	2	0	3
Unused Or Vacant Land - No Improvements	Commercial			44	6	42	8	39
Unused Platted Land.	Commercial			14	4	2	6	6

Table 4-5: Parcel-of-Concerns, Categories, and Occurrence

Parcel Land-Use Description	Zoning Category	Land-Use Concern	Generalized Use Grouping for Land-Uses of Concern	Number of Parcels				
				6-Month Capture Zone	1-Year Capture Zone	5-Year Capture Zone	CARA	Western Search Area
Vacant	Residential			0	0	0	1	1
Veterinarians / Small Animal Hospitals.	Commercial	Concern	Medical	0	1	0	0	0
Warehouse Buildings 201-209	Commercial			0	0	1	0	0
Water Towers & Reservoirs	Industrial			9	0	0	0	0
Wedding Chapels, Dance Halls, Ballrooms	Commercial			1	0	0	0	0
Zero Value Property For Various Reasons	Residential			6	3	20	6	1

Notes:
See Appendix C for detailed descriptions of parcels of concern
“Biohazards” include: cemeteries, crematories, feedlots, biofiltration and sewage infrastructure. “Electrical infrastructure” includes: boosters, transformers and stations. “Medical” also includes dental and veterinary. “Manufacturing” includes chemical, wood, machinery, paper, plastic. “Other” includes storage, parking, quarries, sand/gravel pits and crushing operations
CARA = extended CARA

Table 4-8: PFAS Industry Sites

PFAS Site Ranking	Map ID	Facility Name	Facility ID	WHPZ	Risk Active Status	Distance from Well 13 (Miles)	Historic Site Review Assigned Color	PFAS Industrial Sites - Historical Activities Related to PFAS Contamination																	
								Paper Mills and Products	Lumber Processing	Textiles and Leather	Metal Plating, Finishing, Machining	Electronics Industry	Chemical Manufacturing	Chemical Storage	General Warehouse and Storage	Auto Stations/Garages	Car Wash	Dry Cleaning Facilities	Concrete Production	Waste Management; Water Treatment	Airports	Fire Stations; Fire Protection	Plastics and Resins	Spills and Reported Releases
1	6	Columbia Rock Concrete Products Inc	5016308	6-Month	Active	0.3	5-Amber												Y					Y
2	46	Georgia Pacific Consumer Products	66765272	Western Search Area	Active	0.6	1-Red	Y					Y							Y				Y
3	1	Camas Police Department	22289	6-Month Well 13	Active	0.4	6-Amber													Y				Y
4	45	Camas City Operations Center	38772238	CARA	Active	0.5								M		Y								Y
5	43	Gk Construction & Equipment Rentals	4168647	CARA	Active	0.5								M		Y								Y
6	7	Concrete Products Of Oregon LLC (Jensen Precast Camas)	70983458	6-Month	Active	0.3	5-Amber												Y					
7	8	Triangle Resources	3153967	6-Month	Active	0.5			Y											Y				
8	55	Haag & Shaw Excavating	82973453	Western Search Area	Active	0.4										Y								
9	42	Camas STP	74959167	CARA	Active	0.6														Y				Y
10	12	Tidland Corporation	7282918 88277363	6-Month	Active	0.7	24-Amber				Y			Y										
11	48	Camas City Shops	8698751 45416761	Western Search Area	Active	0.6	14-Amber								Y	M								
12	47	Camas Foodmart (Browns Chevron)	18732618	Western Search Area	Active	0.5	7-Amber									Y								
13	11	Hambleton Bros Lumber Co Inc	87338713 4399598	6-Month	Inactive	0.7	32-Amber		Y					Y										
14	51	Westlie Ford Mercury Inc	61664371	Western Search Area	Inactive	0.6	13-Amber							M										Y
15		Imperial Dry Cleaners & Laundry		Western Search Area	Active	0.6	15-Amber											Y						
16		2500 NE 3rd Ave		CARA	Inactive	0.6	16-Amber															M		Y
17	53	Quick Stop Mart (Camas Mart)	33881994	Western Search Area	Active	0.6	17-Amber									Y								
18	30	Washougal Electric & Sheet Metal Inc	16327542	1-Year	Inactive	1.3	37-Amber				Y	Y		Y										
19	52	Camas Gas Services Inc (Browns Arco)	97188815	Western Search Area	Inactive	0.5	8-Amber									Y								
20	65	Imperial Cleaners	78239817	Western Search Area	Inactive	0.5	10-Amber											Y						
21	23	Us Doe Bpa Camas Substation	3811629	6-Month	Active	0.7						Y												
22		Straubs Swank Memorial Chapel		Western Search Area	Inactive	0.5	11-Amber									Y								
23		Camas Shell		Western Search Area	Inactive	0.5	9-Amber									Y								
24	49	Verizon Northwest Inc Camas Co (GTE Northwest Inc)	89994319	Western Search Area	Active	0.6								M										
25		M&M Car Wash		1-Year	Active	1.1	36-Amber										Y							M
26	61	Camas City Old Sewage Treatment Plant	53821114	Western Search Area	Inactive	0.6														Y				
27		Ulbrich Stan & Sue		Western Search Area	Inactive	0.6	18-Amber											Y						
28	39	Overton Mfg Inc	49392144	5-Year	Inactive	1.8					Y			Y		Y								
29		Camas Chevron Service		Western Search Area	Inactive	0.6	21-Amber									Y								
30	10	Columbia Warehouse (Iron Gate Storage)	37125488	6-Month	Active	1.0	30-Amber								Y									

Table 4-8: PFAS Industry Sites

PFAS Site Ranking	Map ID	Facility Name	Facility ID	WHPZ	Risk Active Status	Distance from Well 13 (Miles)	Historic Site Review Assigned Color	PFAS Industrial Sites - Historical Activities Related to PFAS Contamination																	
								Paper Mills and Products	Lumber Processing	Textiles and Leather	Metal Plating, Finishing, Machining	Electronics Industry	Chemical Manufacturing	Chemical Storage	General Warehouse and Storage	Auto Stations/Garages	Car Wash	Dry Cleaning Facilities	Concrete Production	Waste Management; Water Treatment	Airports	Fire Stations; Fire Protection	Plastics and Resins	Spills and Reported Releases
31	15	Tarr Inc Washougal (Iron Gate Storage)	3264254	6-Month	Active	1.0	30-Amber								Y									
32	59	Helen Brothers Service (CEASARS UNION 76)	65648254	Western Search Area	Inactive	0.7	23-Amber									Y								
33	36	Hi Way Fuel	22538744	5-Year	Active	1.8										Y	Y							
34	13	Northwest Pipeline Gp Washougal M/S	14447751	6-Month	Active	0.7	25-Amber							M										
35	26	Lacamas Dry Cleaners	49143	1-Year	Active	1.1	34-Amber											Y						
36	35	Asher Engine Service (East County Auto)	94778244	5-Year	Active	1.8	47-Amber									Y								Y
37	27	Walgreens 1085	99999862	1-Year	Active	1.1	35-Amber						Y											
38	9	Columbia Storage Inc 2nd St	11338232	6-Month	Inactive	0.8									Y									
39		Camas Transmission (Racers Division)		1-Year	Active	1.2	40-Amber									Y								
40	32	All Seasons Auto Centers Inc Camas	18768638	1-Year	Active	1.2	39-Amber									Y								
41	29	Goodyear Tire Camas	85837922	1-Year	Active	1.2	39-Amber									Y								
42	31	Schucks Auto Supply Camus	52218486	1-Year	Active	1.2	39-Amber									Y								
43		Stanford Cleaners		6-Month	Inactive	1.0	27-Amber											Y						
44		Cavalier Cleaning Corp of Washington		W Camas	Inactive	1.0	29-Amber											Y						
45	21	Chevron Bulk Plant Camas	1043	6-Month	Inactive	0.5	12-Amber							M										
46		Orbit Industries, LLC	1052	Columbia Industrial Park	Unknown	2.7					Y			Y							M			
47		Intech Enterprises	17695 92774682	Columbia Industrial Park	Active	2.7					Y									Y				
48	38	Washougal School Dist Bus Garage	48371594	5-Year	Active	1.7										Y								
49	64	QWEST Camas N Rptr Bldg	43889368	Western Search Area	Inactive	0.6								M										
50		Burlington Environmental LLC (Clean Earth; Stericycle)	1018	Columbia Industrial Park	Active	2.9								Y						Y				
51		Noble William E & J W		W Camas	Inactive	1.2	38-Amber									Y								
52	25	Clark PUD Transformer Release J Street	100003734	1-Year	Inactive	1.2						Y												
53		Hansens One Stop Service		1-Year	Inactive	1.2	41-Amber									Y								
54		Dolinsky Joseph		1-Year	Inactive	1.3	42-Amber									Y								
55		CWFD - A St Station		Beyond CARA	Active	1.9																Y		
56	33	Brass Lamp Motor Inn	64124152	1-Year	Inactive	1.3									Y									
57		Freeman Rick		W Camas	Inactive	1.4	43-Amber									Y								
58	37	Washougal Shell	57872946	5-Year	Inactive	1.4	45-Amber									Y								
59		Miller Manufacturing	23944	Columbia Industrial Park	Inactive	2.8				Y													Y	
60		Lake Store James E Pidgeon	86115375	N Camas	Inactive	1.4	44-Amber									Y								
61		Pendleton Woolen Mills	1020 15438643	Beyond CARA	Active	2.2	49-Amber			Y														
62		East County Fire and Rescue Station 91		N Camas	Active	2.7																Y		
63	40	Napa Washougal	79581825	5-Year	Inactive	1.9										Y								
64		Grove Field Port of Camas		N Camas	Active	2.8															Y			

Table 4-8: PFAS Industry Sites

PFAS Site Ranking	Map ID	Facility Name	Facility ID	WHPZ	Risk Active Status	Distance from Well 13 (Miles)	Historic Site Review Assigned Color	PFAS Industrial Sites - Historical Activities Related to PFAS Contamination																		Spills and Reported Releases
								Paper Mills and Products	Lumber Processing	Textiles and Leather	Metal Plating, Finishing, Machining	Electronics Industry	Chemical Manufacturing	Chemical Storage	General Warehouse and Storage	Auto Stations/Garages	Car Wash	Dry Cleaning Facilities	Concrete Production	Waste Management; Water Treatment	Airports	Fire Stations; Fire Protection	Plastics and Resins		
65		ARCO #6008 (KT KANSO AM/PM)	46212644	Beyond CARA	Active	1.9	48-Amber							M		Gas Only									
66		Linear Technology Corp (Analog Devices, Inc.)	29115524	NW Camas	Active	3.0						Y													
67		Northwest Paper Box Manufacturers	99998131	NW Camas	Active	3.0		Y																	
68		East County Fire and Rescue Station 93		N Washougal	Active	3.2																Y			
69		CWFD Station 42		NW Camas	Active	3.2																Y			
70		nLight Inc Camas	98835	W Camas	Active	3.2						Y													
71		Kemira Chemicals Inc Washougal Plan	68766465	Columbia Industrial Park	Active	3.3							Y												
72		Fiber Web Washougal Inc (Fitesa Washougal)		Columbia Industrial Park	Active	3.5				Y															
73		City of Washougal Wastewater Treatment Plant	100002147 20657 5618	Columbia Industrial Park	Active	3.5														Y					
74		Norwesco	19457 74135527	Columbia Industrial Park	Active	3.6																	Y		
75		Piller Aimmco Grant St	3811	Columbia Industrial Park	Active	3.6																	Y		
76		Wafer Tech LLC (TSMC Washington)	12734887	NW Camas	Active	3.7						Y													
77		Landa Inc	9810176	NW Camas	Inactive	3.0					Y														
78		Betz Dearborn Washougal		Columbia Industrial Park	Inactive	3.0							Y												
79		Saint Gobain Crystals and Detectors	74582235	Columbia Industrial Park	Inactive	3.1						Y													
80		Sigma Design	83917959	NW Camas	Inactive	3.2						Y													

Notes:

Beyond CARA = east of the defined CARA

Columbia Industrial Park = The industrial park northeast of Captain William Clark Park, south of Highway 14 in Washougal, and west of Steigerwald Lake National Wildlife Refuge

M = the site may or may have performed the listed activity

N = North

NW = Northwest

PFAS = Per- and polyfluoroalkyl substances

WHPZ = Wellhead Protection Zone

Y = Yes, site is or was known to perform the listed activity

Table 4-9a: Summary of Available PFAS Results Through CY 2025, City of Camas

Sampling Location	DOH Source No.	Testing Date	Result Summary
SOURCE			
City Well No. 5	06	3/22/2022	PFBS, PFOA, *PFOS*
		8/5/2022	(PFBA), PFBS, *PFOA*, *PFOS*
		11/9/2022	(PFBA), PFBS, (PFHxA), *PFOA*, *PFOS*, (PFPeA)
		4/4/2023	PFBS, *PFOS*
		7/3/2024	PFBS, *PFOA*, *PFOS*, (PFHxA)
City Well No. 6	07	4/4/2023	Not Detected
		9/27/2023	PFBS, (PFHpA), (PFHxA), PFOA, *PFOS*, (PFPeA)
City Well No. 7	08	4/4/2023	Not Detected
		9/27/2023	Not Detected
City Well No. 8	09	9/27/2023	Not Detected
City Well No. 9	11	3/22/2023	Not Detected
		9/27/2023	Not Detected
		8/6/2025	Not Detected
City Well No. 10	15	9/27/2023	Not Detected
City Well No. 11	13	4/4/2023	Not Detected
		9/27/2023	PFOA, PFOS
City Well No. 12	14	9/27/2023	Not Detected
City Well No. 13	16	8/5/2022	PFBS, PFOA, **PFOS**
		12/5/2022	PFOA, **PFOS**
		3/23/2023	PFOS
		5/4/2023	PFOS
		6/8/2023	*PFOS*
		6/13/2023	PFOA, *PFOS*
		6/22/2023	PFOA, *PFOS*
		7/13/2023	PFBS, *PFOA*, **PFOS**
		10/25/2023	PFBS, *PFOA*, *PFOS*
		12/5/2023	PFBS, PFOA, *PFOS*
		3/28/2024	Not Detected
		7/3/2024	*PFOS*
City Well No. 14	17	7/13/2023	PFBS, PFOA, *PFOS*
		9/27/2023	Not Detected
		7/11/2024	Not Detected
DISTRIBUTION SYSTEM			
Jones Creek	01	9/27/2023	Not Detected
Well Field East (City Wells No. 6 or 14)	18	3/22/2022	PFOS
		11/9/2022	PFBS, PFOA, *PFOS*
		7/13/2023	PFBS, PFOA, *PFOS* [detections from Well No. 14]
		9/27/2023	PFBS, (PFHpA), (PFHxA), PFOA, *PFOS*, (PFPeA) [detections only in Well No. 6]
Oak Park Well Field (City Wells No. 7, 8, 10, 11, or 12)	19	3/22/2022	PFOS
		11/9/2022	PFOA, *PFOS*
		4/4/2023	*PFOS*
		7/13/2023	PFBS, PFOA, PFOS
		9/27/2023	PFOA, PFOS [detections only in Well No. 11]
		9/10/2024	PFOS
5711 SE Strong Road		8/23/2023	PFOS
27200 Robinson Road		9/11/2023	PFOS
Deer Haven		9/11/2023	PFOA, *PFOS*
Crown Park		9/11/2023	PFOA, *PFOS*
NE Sitka Dr		9/11/2023	PFOS
NW Woodburn Drive		10/5/2023	PFOA, *PFOS*
1620 SE 8th Ave		10/5/2023	PFOA, *PFOS*
2822 NW 18th Ave		10/5/2023	PFOA, *PFOS*
North Chestnut Street		10/5/2023	*PFOS*
4542 NW Rae Ct		10/5/2023	PFOA, *PFOS*
Stone Leaf		10/5/2023	Not Detected
Columbia River Bank Pearl		11/1/2023	Not Detected
Washougal River (Goot Park)		11/1/2023	Not Detected

Formatting Notes:
PFAS - below EPA MCL
PFAS - above EPA MCL, below Washington SAL
PFAS - above Washington SAL
(PFAS) - detected but no standard established

Table 4-9b: Summary of Available PFAS Results Through CY 2025, City of Washougal

Sampling Location	DOH Source No.	Testing Date	Result Summary
PRE-TREATMENT			
City Well No. 6	Unknown	late 2023	PFOA, *PFOS*
City Well No. 7	Unknown	late 2023	PFOA, *PFOS*
Unknown	04	4/16/2024	PFBS, PFOA, *PFOS*
		7/16/2024	PFOA, PFOS
		2/18/2025	Not Detected
Unknown	05	4/18/2024	PFOA, *PFOS*
		7/16/2024	PFBS, (PFHxA), PFOA, PFOS
Unknown	06	2/1/2024	PFOA, *PFOS*
		7/16/2024	PFHxS, (PFHxA), PFOA, *PFOS*
Unknown	07	2/1/2024	*PFOS*
		7/16/2024	Not Detected
Unknown	11	4/16/2024	PFBS, PFOA, *PFOS*
		7/16/2024	Not Detected
Unknown	13	4/16/2024	PFBS, (PFHxA), *PFOA*, *PFOS*
		7/16/2024	Not Detected
POST-TREATMENT			
Unknown	04	10/8/2024	Not Detected
Unknown	05	4/18/2024	PFOS
		7/16/2024	Not Detected
		10/8/2024	PFOS
		2/18/2025	PFBS, PFOA, *PFOS*
Unknown	06	2/1/2024	PFOA, *PFOS*
		7/16/2024	Not Detected
		10/8/2024	PFOS
		2/18/2025	PFBS, PFOA, *PFOS*
Unknown	07	2/1/2024	*PFOS*
		7/16/2024	Not Detected
		10/8/2024	PFOS
		2/18/2025	PFBS, PFOA, *PFOS*
Unknown	11	4/16/2024	PFBS, (PFHxA), PFOA, *PFOS*
		7/16/2024	PFBS, PFHxS, PFOA, *PFOS*
		10/8/2024	PFBS, PFOA, *PFOS*
		2/18/2025	PFBS, (PFHxA), PFOA, *PFOS*
Unknown	13	4/16/2024	PFBS, (PFHxA), PFOA, *PFOS*
		7/16/2024	PFBS, PFHxS, PFOA, *PFOS*
		10/8/2024	PFBS, (PFHxA), PFOA, *PFOS*
		2/18/2025	PFBS, PFOA, *PFOS*

Formatting Notes:
PFAS - below EPA MCL
PFAS - above EPA MCL, below Washington SAL
PFAS - above Washington SAL
(PFAS) - detected but no standard established

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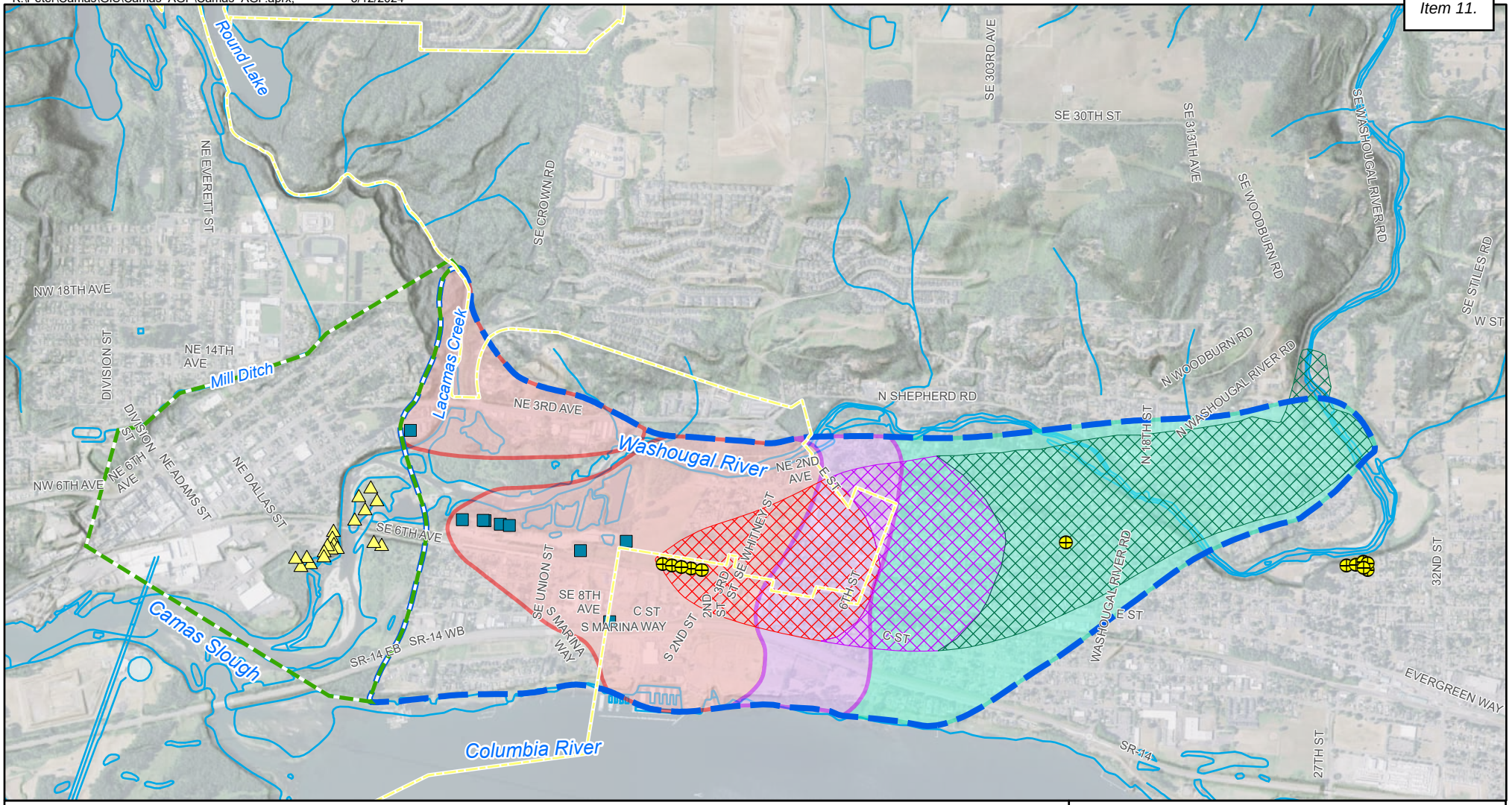

Camas Wellhead Protection Capture Zones

- 6 Month Capture Zone
- 1 Year Capture Zone
- 5 Year Capture Zone
- Critical Aquifer Recharge Area (CARA)

Washougal Wellhead Protection Capture Zones

- 6-Months
- 1-Year
- 5-Year

- Camas Supply Wells
- Washougal Supply Wells
- Georgia Pacific Supply Wells
- Western Search Area
- City Boundary

N

0 Feet 2,000

Figure 1-1
Contaminant Source Inventory - Search Areas

WHPA 2025

Strata Geosciences



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- Camas Supply Wells
- Washougal Supply Wells
- Georgia Pacific Supply Wells
- 6 Month Capture Zone
- 1 Year Capture Zone
- 5 Year Capture Zone
- Critical Aquifer Recharge Area (CARA)
- Western Search Area
- City Limits
- Railroad Crossing (Public)
- Railroad Crossing (Private)
- BNSF Railroad
- Septics (from County 2025)
- Prior Contaminant Detections in Groundwater

DOE Sites of Concern

- Known Release
- NFA
- Table ID → Cleanup Site (11) → UST/LUST
- Hazardous Materials

Refer to Section 7.4, Tables 7-1a and 7-1b, and Appendix C for description.

0 Feet 1,000

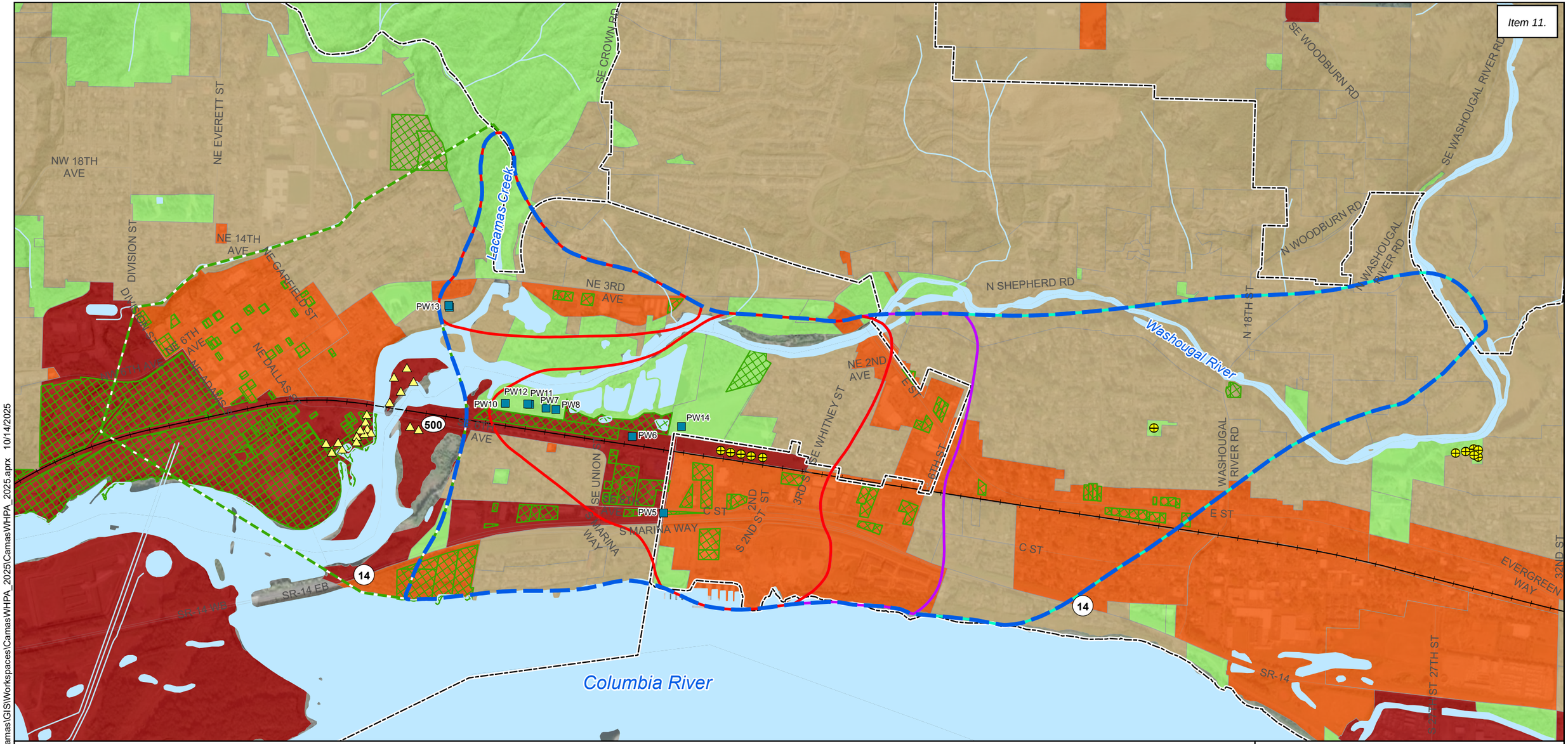
N

Figure 4-1

Potential Contaminant Sources of Concern

WHPA 2025

Strata Geosciences 2710



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- Camas Supply Wells
- Washougal Supply Wells
- Georgia Pacific Supply Wells
- 6 Month Capture Zone
- 1 Year Capture Zone
- 5 Year Capture Zone
- Critical Aquifer Recharge Area (CARA)
- Western Search Area
- BNSF Railroad
- City Limits
- Land Uses of Concern

Zoning Categories

- Industrial
- Commercial
- Residential
- Parks

0 Feet 1,000

N

Figure 4-2

Zoning Categories and Parcels of Concern

WHPA 2025

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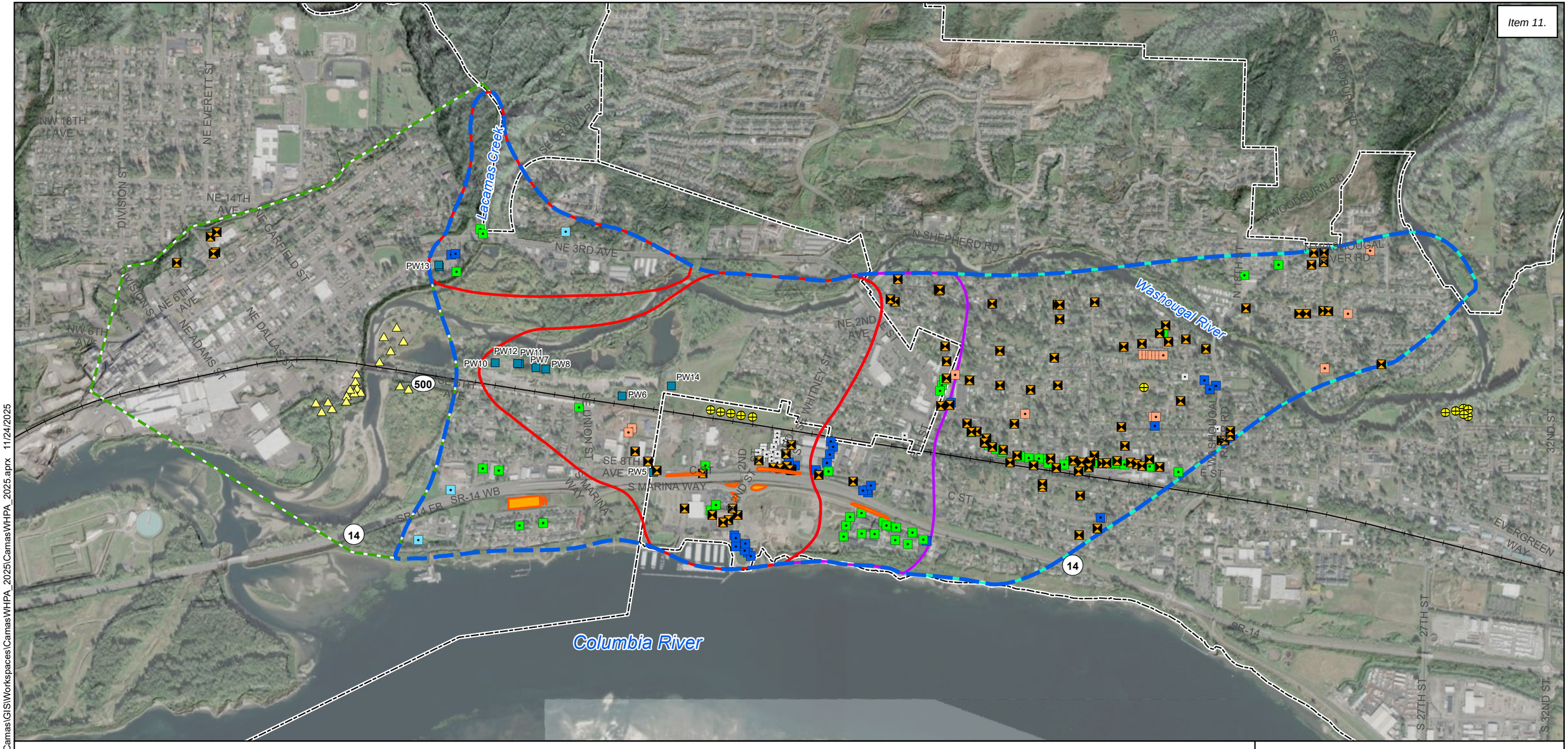
2711



- Camas Supply Wells
- Washougal Supply Wells
- Georgia Pacific Supply Wells
- 6 Month Capture Zone
- 1 Year Capture Zone
- 5 Year Capture Zone
- Critical Aquifer Recharge Area (CARA)
- Western Search Area
- City Limits
- BNSF Railroad
- WSDOT Infiltration Areas
- Drywell
- Bioretention Facility/Swale
- Detention Pond
- Permeable Pavement
- Rain Garden
- Other Infiltration Facility

0 Feet 1,000

N

Figure 4-3
Stormwater Infiltration and Management Areas

WHPA 2025

Strata Geosciences 2712

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Supply Wells
Owner
- Camas Supply Wells
- Washougal Supply Wells
- Georgia Pacific Supply Wells
- Critical Aquifer Recharge Area
- 6 Month Capture Zone
- 1 Year Capture Zone
- 5 Year Capture Zone
- Western Search Area
- City Limits
- BNSF Railroad
- Arterials - base, surfgeo
- Pfas_Facilities

0 Feet 1,000

N

Figure 4-4
PFAS Facilities

WHPA 2025

Strata Geosciences 2713

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APPENDIX A
ENVIRONMENTAL SITES INFORMATION

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1.0 ENVIRONMENTAL SITES INFORMATION

The following 22 sites are indicated as confirmed release sites in Table 4-1a and Table 4-1b. Mapped environmental sites within the Lower Washougal Wellfield Wellhead Protection Area (WHPA) (sites detailed in 1.1) are of primary concern to the City of Camas supply wells. The remaining sites (detailed in 1.2) are within the Western Search Area and should be considered a secondary concern to existing City of Camas supply wells.

Two additional sites with EIM-reported groundwater exceedances near the Eastern border of the CARA are included in 1.3.

Copies of Cleanup Site reports and documents reviewed for this report can be obtained from the Seattle office of Strata Geosciences by contacting Burt Clothier.

1.1 ENVIRONMENTAL SITES WITHIN THE LWWF WELLHEAD PROTECTION AREA

1.1.1 Philpot (FSID 12088, CSID 14631, Map ID=4)

The Philpot residential site is located at 301 NE 2nd Avenue. A 675-gallon UST containing fuel and a 350-gallon Heating Oil Tank (HOT) were decommissioned via removal in 2016. At the time of removal, the soil surrounding the UST and HOT were tested for gasoline and diesel respectively. Results indicated a petroleum release had occurred at the site and the Washington DOE was notified. Excavation of the area was performed following tank removal and follow-up NWTPH-Dx analysis indicated that petroleum impacts remained in the eastern wall and base of the excavation in levels as high as 9,520 mg/Kg. The MTCA Method A cleanup level for diesel in soil is 2,000 mg/Kg. In addition to the confirmed diesel contamination in the soil, it is suspected that there is remaining gasoline products in soil and both petroleum products are also suspected in groundwater. An Early Notice Letter for the site was delivered to the site owner in August 2018, and the site is listed as Cleanup Started. Currently at the site, one 500 gallon unleaded gasoline UST is listed as closure in progress and one 500 gallon tank of hazardous substance is listed as Exempt-Operational.

1.1.2 Camas Washougal Port (FSID 92847997, CSID 11089, Map ID=5)

The Camas Washougal Port (Port Sider Store on the Marina) site is located at 24 South A Street in Washougal and conducted cleanup for a leaking underground storage tank. Initial site characterization and cleanup work for benzene, non-halogenated organics, and gasoline began in 1990 with additional investigative work performed in 2011. Soil concentrations have been confirmed below cleanup levels, and the site was issued a No Further Action by Ecology in 2012. The site remains a Class 4 Facility under WAC 173-180.

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1.1.3 Columbia Rock Concrete Products (FSID 5016308, CSID 1548, Map ID=6)

The Columbia Rock Concrete Products site is located at 1615 SE 6th Avenue, and has documented soil and groundwater contamination based on a 2001 investigation. The site is located immediately adjacent to several of the City's water supply wells. Operations at the site includes production of concrete moldings (primarily Jersey barriers and sound wall barriers). A site hazard assessment was completed by Clark County Public Health in 2007, with the site receiving a ranking of "2" indicating that it poses a serious threat to human health and the environment. Results of a Phase II Environmental Assessment completed in 2001 found impacts to soil and groundwater. Contaminants of concern (above MTCA Cleanup Levels) identified during the Phase II assessment are petroleum products (diesel, gasoline, and heavy range oils) in soils and metals (arsenic, chromium, lead and barium) in groundwater. The concentration of metals in groundwater were reported as:

- Arsenic = 73.1 µg/L (MTCA Level A = 5 µg/L)
- Chromium = 641 µg/L (MTCA Level A = 50 µg/L)
- Lead = 498 µg/L (MTCA Level A = 15 µg/L)
- Barium = 5880 µg/L (MTCA Level B = 3200 µg/L)

The site was placed on the national priorities list in 2007 and is awaiting a remedial assessment (RA). No other information or action has taken place at the site since these activities and Ecology has no plans for taking action in the immediate future (personal communication with Kirsten Alvarez at Ecology 10/31/16).

1.1.4 Hambleton Bros Log Yard (FSID 4399598, CSID 2482, Map ID=11)

The Hambleton Bros. Log Yard is a historic lumber mill along the Columbia River located at 335 South A Street, now managed by the Port of Camas-Washougal. The mill, including chemical storage and aggregate recycling, operated on the property from approximately 1948 to 2010. Wood-treating activities were reported to not be conducted on the Hambleton Site. The site was purchased by the Port of Camas-Washougal in 2012. Site investigations and interim actions have taken place at the site since 2002 and a Focused Site Assessment was conducted in 2011 to evaluate the nature and extent of contamination at the site. Site investigations indicate contaminants above MTCA Method A cleanup levels (CULs) in groundwater, soil, log pond surface water, and log pond sediments. Contaminants found above CULs included:

- Groundwater: Petroleum hydrocarbons and arsenic.
- Soils (near log pond, mill area, and recycling center): Petroleum hydrocarbons, metals (arsenic, lead, and mercury), cPAHs, and PCBs.
- Log Pond Surface Water: metals, petroleum hydrocarbons, VOCs and PAHs
- Log Pond Sediments: VOCs and petroleum hydrocarbons

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- Four sediment samples were also collected from the Columbia River were found to all be below Ecology's Freshwater criteria.

A cleanup action plan (CAP) was developed for the site in 2013 and implemented in 2014. Components of the CAP included dewatering the log pond, consolidating impacted soils into the empty pond, site grading, and capping of the log pond, former mill area and recycling area. Institutional controls to restrict future site use were also included. A No Further Action status was granted to the Port in 2015; however, the Port is required to continue groundwater compliance monitoring at MW-7 for petroleum hydrocarbons on an 18-month schedule until groundwater CULs are achieved. The most recent groundwater sampling results from MW-7 that are accessible on Ecology's Cleanup Page for the site were collected in April 2024, at which time both Diesel Range Organics and Lube Oil range organics were not detected.

The Port completed over-excavation of unsuitable soils and replacement with structural fill for the construction of the Hyas Point Phase 1a and 1b developments that impacted the protective gravel and geotextile cap that was part of the cleanup action. The excavation began on August 7, 2024 and was completed on November 21, 2024. On September 11, 2024, one UST was discovered while excavating the organic-rich soil north of the cap area in an area previously noted as not being environmentally contaminated. The UST was inadvertently damaged by the excavator upon discovery. The UST was not active at the time of discovery and was void of any liquid product, however, approximately five gallons of water was observed draining from the damaged UST upon discovery. PID readings of up to 65 parts per million were observed within the UST. On September 25, 2024, visually stained soils and a degraded hydrocarbon odor were observed to a depth of approximately 10 feet below ground surface (bgs). One confirmation sample taken from within the excavation exceeded 2013 Washington DOE Cleanup Action Levels for diesel range organics, residual range organics, 1,2-dibromomethane, and methylene chloride.

1.1.5 Northwest Pipeline Gp Washougal M/S (FSID 14447751, CSID 420, Map ID=13)

The Northwest Pipeline GP Washougal Meter Station (M/S) site is located at 30 C Street, Washougal. This site was participating in the VCP program for soil and mercury contaminants in soils. Early remedial action performed in 1991 consisted of removal of three drums of soil in a 14-square foot area. Further site assessment work was performed in 2006 and 2007 with collection of 75 surface and subsurface soils samples. Additional soils were excavated in 2007 and confirmation samples were below cleanup levels. The site was issued a No Further Action status by Ecology in 2012.

1.1.6 Chevron Bulk Plant / Former Chevron Bulk Terminal No. 207407 (FSID 1043, CSID 3783, Map ID=21)

The Chevron Bulk Plant site is a decommissioned bulk fuel facility with historic releases of contaminants to soil and groundwater located at SE 6th Avenue and SE Union Avenue. Chevron sold the property in November 1994 to Triangle Resources (FSID 3153967) who uses the property for wood recycling. The site is located in close proximity to City Well 6. A Site Hazardous Assessment (SHA) was originally completed for the site in 1995, and at that time Ecology assigned a ranking of "2" to

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this site, indicating the site posed a serious threat to human health and the environment. Early investigative work conducted during the 1990's included soil borings and sampling, installation of groundwater monitoring wells, and remedial excavation of a sump containing an oil/water mixture and 830 cubic yards of impacted soils. Contaminants of concern at the site include petroleum products in soil and groundwater and priority pollutant metal (lead) in soil. In 2003, Chevron entered an agreed order with Ecology to conduct a formal Remedial Investigation, Risk Assessment, and Feasibility Study (RI/RA/FS) under MTCA and to implement any corrective actions identified in the RI/RA/FS.

Additional soil borings and monitoring wells were installed between 2004 and 2014. Of the soil samples collected in September 2014:

- SB-4-15 exceeded for Gasoline Range Organics and Extractable Petroleum Hydrocarbons (>C10-C12, >C12-C16, >C16-C21)
- SB-5-16 exceeded for 2-methylnaphthalene (PAH), Gasoline Range Organics, Extractable Petroleum Hydrocarbons (>C10-C12, >C12-C16, >C16-C21, >C21-34), and Volatile Petroleum Hydrocarbons (>C8-C10)
- SB-6-19 exceeded for Gasoline Range Organics, Extractable Petroleum Hydrocarbons (>C10-C12, >C12-C16, >C16-C21, >C21-34), and Volatile Petroleum Hydrocarbons (>C8-C10)

Groundwater samples collected at the site between 2006 and June 2013 regularly exceeded for Diesel Range Organics and Heavy Fuel Oil. Follow-up sampling occurred through December 2015. The highest detection of Diesel Range Organics after June 2013 was 120 µg/L in June 2015. There were no detections of Heavy Fuel Oil during the follow-up sampling.

The RI was completed in 2015 following more than eight quarters of groundwater sampling showing Total Petroleum Hydrocarbon (TPH) contamination below MTCA Method A groundwater cleanup levels (CULs). Ecology held a public comment period between December 23, 2018 and January 23, 2019 during which no comments were received. The site status was changed to No Further Action by Ecology in 2019, and Ecology will finalize the Remedial Investigation and Cleanup Action Plan reports and remove the site from the Hazardous Sites List.

1.1.7 Clark PUD Transformer Release J Street (FSID 100003734, CSID 17230, Map ID=25)

The Clark PUD Transformer Release J Street is located at 455 J Street, Washougal. Clark County Public Utilities Department (PUD) reported a release of 5-10 gallons of non-PCB mineral oil from a transformer to soil in June 2021. The impacted soil was removed in two mobilizations between June and August of 2021. Soil confirmation samples were collected from the excavation in August 2021 that were below the MTCA Method A cleanup level (4,000 mg/Kg), and remaining detections of diesel were deemed likely to be present to either pre-existing impact or roadway runoff. The site was classified as No Further Action by Ecology in 2022.

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1.1.8 Goodyear Tire Camas (FSID 85837922, CSID 6772, Map ID=29)

The Goodyear Tire (Schuck's Auto Supply) site is located at 3440 3rd Avenue and participated in a voluntary cleanup for a leaking underground storage tank. The site was cleaned up in 1999 and five USTs totaling 6,275 gallons and storing diesel, unleaded gasoline, and waste oil were removed in 1999 and 2001. The site was subsequently classified as No Further Action by Ecology in 2001. The location is currently an O'Reilly Auto Parts that offers some automotive services, including battery, motor oil, transmission fluid, and gear oil recycling and brake drum and rotor resurfacing.

1.1.9 Asher Engine Service / East County Auto (FSID 94778244, CSID 15034, Map ID=35)

The Asher Engine Service / East County Auto site is an automotive repair and maintenance facility located at 1405 E St, Washougal that is suspected to have soil and groundwater contamination. The site is located near the boundary of the 5-Year capture zone. An initial investigation was conducted in 2019 following a previous remediation and recommendation for No Further Action, following a complaint received from an adjacent property. A pipe appearing to lead from the automotive shop and discharging petroleum hydrocarbon-sheening fluid into a low-lying area between parcels was observed. An accumulation of water with significant petroleum hydrocarbon sheen on its surface was also observed. An Early Notice Letter for the site was delivered to the site owner in September 2019, and the site is listed as Awaiting Cleanup.

1.1.10 Hi-Way Fuel (FSID 22538744, CSID 8323, Map ID=36)

The Hi-Way Fuel site is a gas station with repair shop located at 1250 E Street in Washougal. Initial site characterization work began in 1996 for a leaking underground storage tank. During this time, five older tanks were removed and impacted soils excavated to the extent possible. Four new tanks were installed, increasing the capacity by 21,000 gallons, and pipes were upgraded to newer standards at that time. Some contaminated soils were left in place, but there is no information in current Ecology files indicating confirmed groundwater contamination (personal communication with Aaren Fiedler at Ecology 10/31/16). However, Ecology's online Cleanup Site report indicates confirmed petroleum contamination above cleanup levels in soil and groundwater at this site. Ecology sent a status update request letter to the owner in 2011, but there was no response. No other action has taken place at the site since these activities and Ecology has no plans for taking action in the immediate future (personal communication with Aaren Fiedler at Ecology 10/31/16).

1.2 ENVIRONMENTAL SITES WITHIN THE WESTERN SEARCH AREA

1.2.1 Georgia-Pacific Consumer Products (FSID 66765272, CSID 15156, Map ID=46) and Georgia-Pacific Camas Business Center (FSID 78452582, CSID 2961)

The Georgia-Pacific Consumer Products site includes two locations under Agreed Order 18201.

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The pulp and paper mill is located at 401 NE Adams Street. The mill began operations in the late 1880 and, while pulping operations have ceased, it still makes paper products from purchased pulp. Due to historic land use and industrial practices, soil is contaminated with total petroleum hydrocarbons (TPH) from diesel, gasoline, and oil. Other likely contaminants in soil, groundwater, and/or sediments include:

- Polycyclic aromatic hydrocarbons (PAHs) and carcinogenic PAHs
- Benzene, toluene, ethylbenzene, and xylenes (BTEX)
- Polychlorinated biphenyls (PCBs)
- Metals (lead and chromium)
- Corrosive wastes
- Asbestos
- Dioxins and furans

This facility has an industrial operating permit for industrial fugitive air emissions under WAC 173-401. The listed Program ID on the Ecology Facility is S0110005 and the submitted monitoring data could not be verified.

This facility is additionally tracked under the following EPA Regulatory Programs and Reports: Air Emissions Inventory (EIS) [ID 4986811], Toxics Release Inventory (TRI) [ID 98607JMSRVNE4TH], Clean Air Act (CAA) [ID WASWC000530112514], Clean Water Act (CWA) [ID WA0000256], Resource Conservation and Recovery Act (RCRA) [ID WAD009042896], and Greenhouse Gas Reporting Program (GHGRP) [ID 1005998]. The Facility Register Service (FRS) ID for Georgia Pacific Consumer Products related to these EPA programs is 110000564586. The most recent CAA compliance violation was disclosed by the facility in October 2018. The most recent RCRA violations were issued in May 2024. The facility has had an identified a CWA violation in all 12 of the prior 12 quarters (July 2022-September 2025). TRI tracked releases and transfers dropped off substantially after 2018; after 2020, only releases of 1,3-Dichloro-2-propanol were reported, totaling 19 pounds in 2023 and 20 pounds in 2024. Between January 1 and June 21, 2025, 546 kilograms of hazardous waste were shipped by the facility.

The Camas Business Center (CBC) is located north of the main mill site, at 906 NW Drake Street. This site was used for the manufacturing of chemicals for the paper making process and operated from the 1950s until 1997. Research involved pesticides including dimethyl sulfoxide, energy production, crop yields, and synthetic pulp production. There was also an electrical substation on the western side of the CBC until 2004. During a 2016 Environmental Site Assessment, one surface sample exceeded MTCA cleanup levels for lead (345 mg/kg), two boring samples exceeded MTCA cleanup levels for tetrachloroethylene (PCE) (2.95 mg/Kg and 0.25 mg/Kg), and one boring sample exceeded MTCA cleanup levels for methylene chloride (0.75 mg/Kg). Other soil samples collected in the vicinity were below MTCA cleanup levels for PCE and methylene chloride. Five monitoring wells exist at the CBC, though data is not available through Ecology's EIM database. In the March 2021 sampling event, results were below MTCA cleanup levels except for trichloroethylene (TCE),

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which exceeded the MTCA cleanup level [5 µg/L] at MW-3 (8.2 µg/L). Methylene chloride was not detected in groundwater.

Current Ecology files indicate that cleanup has started at the site. Georgia-Pacific submitted a revised draft Remedial Investigation Work Plan in August 2025 as required under Agreed Order 18201. It defines the investigation of environmental contamination at this site, including:

- A historical site review
- Identification of gaps in data that need to be addressed
- A sampling and analysis plan, that includes a quality assurance project plan

1.2.2 Camas Foodmart (Browns Chevron) (FSID 18732618, CSID 8218, Map ID=47)

The Browns Chevron 60092647 site is a gas station located at 501 NE 3rd Avenue. Notification and reports of a LUST were conducted in 1990 and 1991. Ecology's online Cleanup Site report indicates soil contamination above cleanup levels for gasoline and other petroleum products. Current Ecology files indicate independent action was taken to upgrade three tanks in 1991 and the site status was changed to No Further Action by Ecology in 1995. Five tanks were listed as having been removed from the site in 1996. One exempt, single wall steel tank storing an unknown substance is listed as associated with the property.

1.2.3 Camas City Shops (FSID 8698751, CSID 7811, Map ID=48)

The Camas City Shops is an auto repair property located at 234 E 1st Avenue, within the Georgia Pacific Camas Mill and across the Washougal River from the Lower Camas Washougal wellfield. The discovery of a LUST occurred in 1992 and site characterization began in 2011. Ecology's online Cleanup Site report indicates soil contamination below cleanup levels for diesel, benzene, and lead and remediated-below cleanup levels gasoline contamination. Current Ecology files indicate independent action was taken to remove four USTs and the site status was changed to No Further Action by Ecology in 2012 following a Site Hazard Assessment.

1.2.4 Verizon Northwest Inc Camas Co (GTE Northwest Inc) (FSID 89994319, CSID 11002, Map ID=49)

The GTE Northwest Inc site is a telephone communications and storage property located at 330 NE 5th Avenue. Notification of a LUST was submitted in 1989. Current Ecology files indicate independent action was taken to remove two tanks in 1996 and upgrade one 500-gallon emergency power generation tank in 1998. Initial site characterization work was performed in 2011. Ecology's online Cleanup Site report indicates soil contamination below cleanup levels for diesel and other petroleum products. The site status was changed to No Further Action by Ecology in 2012 following a Site Hazard Assessment. The site has additionally been categorized as a Tier 2 Hazardous Materials Site since 1987 (Program ID WAD988467478) and was listed as a hazardous waste generator in 1989. The Facility Register Service (FRS) ID for Verizon Northwest Inc Camas Co is 110005349710, which reflects that the RCRA identifier is inactive.

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1.2.5 Camas Gas Services Inc (Browns Arco) (FSID 97188815, CSID 11271, Map ID=52)

The Browns Arco site is a gas station located at 435 NE 3rd Avenue. Notification of a LUST was submitted in 1995. Initial site characterization work was performed in 2011. Ecology's online Cleanup Site report indicates soil contamination below cleanup levels for benzene, and other non-halogenated organics and soil contamination above cleanup levels for gasoline. Current Ecology files indicate independent action was taken to remove three USTs and the site status was changed to No Further Action by Ecology in 2012 following a Site Hazard Assessment.

1.2.6 Quick Stop Mart (Camas Mart) (FSID 33881994, CSID 8776, Map ID=53)

The Camas Mart site is gas station located at 207 NE 3rd Avenue, north of the Georgia Pacific Camas Mill. Notification of a LUST was submitted in 1996. Current Ecology files indicate independent action was taken to remove four leaded and unleaded gasoline tanks in 1996, upgrade two unleaded gasoline tanks totaling 15,000 gallons in 1998, and remove an additional waste oil tank in 1999. Initial site characterization work was performed in 2011. Ecology's online Cleanup Site report indicates soil contamination below cleanup levels for benzene, lead, gasoline and other petroleum products, and other non-halogenated organics. The site status was changed to No Further Action by Ecology in 2012 following a Site Hazard Assessment.

1.2.7 726 NE 5th Ave Camas (FSID 9620, CSID 11792, Map ID=54)

The site is a residence located at 726 NE 5th Avenue with a heating oil tank (HOT) of unknown volume. An initial investigation was completed in 2011. Ecology's online Cleanup Site report indicates soil contamination above cleanup levels for non-halogenated solvents and other non-halogenated petroleum products, both of which are also suspected in groundwater. An Early Notice Letter for the site was delivered to the site owner in February 2012, and the site is listed as Awaiting Cleanup.

1.2.8 Haag & Shaw Excavating (FSID 82973453, CSID 12835, Map ID=55)

The Haag & Shaw Excavating site is a general contracting business specializing in demo, underground, site work, excavation, paving utilities, concrete, and asphalt recycling located at 636 SE 3rd Avenue. Above-ground storage tanks and heavy machinery are visible on permeable to semi-permeable surfaces from the street. One 2,000 gallon gasoline UST and one 2,000 gallon diesel UST were decommissioned and removed from the site in 1991. A site discovery report was submitted in 2014 following a geophysical study of the property during which diesel was detected in soil samples collected from borings at 2-feet below ground surface (bgs). The impacted areas were over excavated and confirmation samples were below the MTCA Method A cleanup level for diesel in soil. Groundwater was not encountered during the excavations or boring advancements to 10-feet bgs. The site status was changed to No Further Action by Ecology in 2015.

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1.2.9 Greseth Property (FSID 5458, CSID 12121, Map ID=56)

The Greseth Property site is a residential property located at 1034 NE 6th Avenue. A LUST notification and decommissioning report was submitted to Ecology in 2013. The tank was pumped, cleaned, and backfilled with inert material. Assessment samples taken at the time of decommissioning indicate that soils at the south end of the tank had been impacted with diesel-range organics at up to 28,600 mg/kg and chrysene. Impacted soils were conservatively estimated at 11 cubic yards. Ecology's MTCATPH11.1 spreadsheet model for protection of the ground water resource was completed to conclude that the impacted soil plume was unlikely to present an unacceptable health risk by leaching to ground water with subsequent ingestion pathway.

A Remedial Investigation Report response to comments requesting site closure was submitted to Ecology in 2014. Ecology terminated the VCP Agreement in 2014 following the property owner's decision to conduct the heating oil storage tank cleanup under the direction of the Pollution Liability Insurance Agency. Ecology's online Cleanup Site report indicates soil contamination above the cleanup level for other non-halogenated organics and that cleanup has started at the site.

1.2.10 P & L Investments (FSID 41313725, CSID 6034, Map ID=58)

The P & L Investments site is storefront located at 440 NE 4th Avenue. Notification of a LUST was submitted in 1995. Initial site characterization work was performed in 2011. Ecology's online Cleanup Site report indicates soil contamination above the cleanup level for gasoline. Current Ecology files indicate standard voluntary cleanup action was taken to remove one UST in 2000 that had contained leaded gasoline and the site status was changed to No Further Action by Ecology in 2003.

1.2.11 Helen Brothers Service (FSID 65648254, CSID 10060, Map ID=59)

The Helen Brothers Service site was located at 135 NE 6th Avenue, north of the Georgia Pacific Camas Mill. Notification of a LUST was submitted in 1995. Ecology's online Cleanup Site report indicates soil contamination above cleanup levels for gasoline. Current Ecology files indicate independent action was taken to remove five tanks in 2000 that had contained diesel, leaded and unleaded gasoline, and waste oil. The site status was changed to No Further Action by Ecology in 2012.

1.2.12 First Christian Church HOT (FSID 100003126, CSID 17135, Map ID = 66)

The First Christian Church HOT site is the location of the former Camas First Christian Church located at 4004 NE 6th Avenue. A historical decommissioning permit notes the removal of an underground HOT from the property in 1995 without the collection of confirmation samples. A geophysical survey was completed in September 2023, which located a soil disturbance consistent with a former tank excavation along the eastern side of the church structure. Soil samples were collected and petroleum contamination was encountered at a depth of 8 feet bgs with a maximum diesel-range petroleum concentration of 28,900 mg/Kg. An excavation was performed in March 2024 and diesel-range petroleum was not detected above laboratory reporting limits in any of the confirmation

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samples collected. Groundwater was not encountered during excavation. The site was classified as No Further Action by Ecology in 2024.

1.3 ENVIRONMENTAL SITES WITH GROUNDWATER EXCEEDANCES EAST OF THE CARA

1.3.1 ARCO 6008 / KT KANSO AM/PM (FSID 46212644, CSID 9311)

The ARCO 6008 site is a service station located at 212 15th Street in Washougal. The site is located just beyond the eastern boundary of the 5-Year capture zone. Four 10,000 gallons double-walled fiberglass unleaded gasoline USTs are located on the north side of the site, one of which has been temporarily closed since January 2024. The endorsements for all four USTs expire on June 30, 2026. The site was entered into the Ecology LUST database in January 1990 when petroleum impacted soil was encountered during UST decommissioning and replacement activities. The site was cleaned up under the Voluntary Cleanup Program, and Ecology's online Cleanup Site report indicates soil contamination below cleanup levels for benzene, lead, diesel, gasoline, and other non-halogenated organics. The site was cleaned up under the Voluntary Cleanup Program, and the site status was changed to No Further Action by Ecology in 2014.

In 2011, a groundwater sample from SB-3 exceeded the MCL for lead (15 µg/L) and MTCA Method A for Heavy Fuel Oil (500 µg/L). The most recent groundwater sampling results available on Ecology's EIM database were collected during a site investigation in April 2013, at which time MW-3 exceeded the MCL for lead [15 µg/L] with a result of 22.5 µg/L and lead was detected below the MCL at MW-2 (12.7 µg/L). The most recent soil samples were taken in March 2014. Lead was detected in two samples collected at 3.5 feet bgs (1.49-3.99 mg/Kg), below all available MTCA criteria.

The site was additionally categorized as a Tier 2 Hazardous Materials Site in 1988 (Program ID WAD988517272) and was listed as a hazardous waste generator from 1993 to 2006. The Facility Register Service (FRS) ID for Arco 6008 is 110005383717, which reflects that the RCRA identifier is inactive.

1.3.2 George Schmid & Sons, Inc. (FSID 53281319, CSID 12445)

The George Schmid & Sons, Inc. site is located at 1411 32nd Street in Washougal. The site is located just beyond the northeastern boundary of the 5-Year capture zone. The site consists of a total of 17 acres, which include the former operational area of the property (approximately 5 acres) and the lower pasture area (approximately 12 acres), which is bordered by the Washougal River. Light industrial use of the property started in the 1950s. On-site operations included heavy equipment maintenance and repair, power washing, sandblasting, equipment storage, and administrative business operations. All structures, including aboveground storage tanks (ASTs) and USTs, were removed from the Property by 2010. The site was cleaned up under the Voluntary Cleanup Program, and Ecology's online Cleanup Site report indicates remediated soil contamination below cleanup levels for PAHs, diesel, gasoline, and petroleum products, and remediated groundwater contamination above cleanup

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levels for arsenic, lead, diesel, and other petroleum products. The site status was changed to No Further Action by Ecology in 2016. The site is not Schmid Family Park.

Groundwater samples collected at the site between 2012 and June 2015 exceeded cleanup levels for Arsenic, Barium, Chromium, Iron, Lead, Manganese, PAHs, Diesel Range Organics, and Lube Oil. Follow-up sampling for Diesel Range Organics and Lube Oil occurred in April and September 2015. There were no exceedances during the follow-up sampling.

The site was additionally categorized as a Tier 2 Hazardous Materials Site from 2003 to 2010 (Program ID CRK000054050). The Facility Register Service (FRS) ID for George Schmid & Sons, Inc. is 110015458128 and does not contain information.

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APPENDIX B
PARCELS OF CONCERN

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Parcel Serial Number	Owner Name	Owner Address	Site Address	Legal Description	Land-Use Description	Zoning	WHPZ
71355005	SNOWDEN VETERINARY HOLDINGS LLC	833 K ST, WASHOUGAL, WA, 98671	401 6TH ST, WASHOUGAL, 98671	LOT 2 SP2-554 1.04A	VETERINARIANS / SMALL ANIMAL HOSPITALS.	CH	1-Year
71734000	KIRKLAND PREMIER CAR WASH LLC	2370 E THIRD LOOP #100, VANCOUVER, WA, 98661	510 C ST, WASHOUGAL, 98671	#577 OF RICHARD OUGH DLC .25A	DRIVE THROUGH CAR WASH	CH	1-Year
73134114	SAUER DEVELOPMENT GROUP LLC	26300 NE 16TH ST, CAMAS, WA, 98607	455 C ST, WASHOUGAL, 98671	#114 DAVID C PARKER DLC .48A	STORAGE WAREHOUSE	CH	1-Year
73134116	SAUER DEVELOPMENT GROUP LLC	26300 NE 16TH ST, CAMAS, WA, 98607	453 C ST, WASHOUGAL, 98671	#116 DAVID C PARKER DLC 1.11A	STORAGE WAREHOUSE	CH	1-Year
73134155	DASSA MANAGEMENT LLC	1001 NE 152ND AVE, VANCOUVER, WA, 98684	450 C ST, WASHOUGAL, 98671	#155 DAVID C PARKER DLC .38A	SERVICE REPAIR SHOP	CH	1-Year
75357048	TIMBER RIDGE CAR WASH LLC	24324 NE 14TH ST, CAMAS, WA, 98607	469 E ST, WASHOUGAL, 98671	R B JOHNSTON TTS LOT 12 BLK 2	DRIVE THROUGH CAR WASH	CV	1-Year
75357049	TIMBER RIDGE CAR WASH LLC	24324 NE 14TH ST, CAMAS, WA, 98607		R B JOHNSTON TT LOT 12 BLK 2 (SEE 075357-048-050 LAND AV)	SELF SERVICE CAR WASH (WAND TYPE)	CV	1-Year
75357050	TIMBER RIDGE CAR WASH LLC	24324 NE 14TH ST, CAMAS, WA, 98607	469 E ST, WASHOUGAL, 98671	R B JOHNSTON TRACTS LOT 13 BLK 2	SELF SERVICE CAR WASH (WAND TYPE)	CV	1-Year
75357051	TIMBER RIDGE CAR WASH LLC	24324 NE 14TH ST, CAMAS, WA, 98607		R B JOHNSTON TRACTS LOT 14 BLK 2	SELF SERVICE CAR WASH (WAND TYPE)	CV	1-Year
91045552	FRENCH GORDON B II & FRENCH PATRICIA J TRUSTEES	1639 BROOKHOLLOW DR, HIDEAWAY, TX, 75771		GOOTS ADDN WEIR PARK LOT 4	STORAGE WAREHOUSE	RC	1-Year
91045554	FRENCH GORDON B II & FRENCH PATRICIA J TRUSTEES	1639 BROOKHOLLOW DR, HIDEAWAY, TX, 75771	3439 NE 3RD AVE, CAMAS, 98607	GOOTS ADDN WEIR PARK LOT 5	STORAGE WAREHOUSE	RC	1-Year
91045556	FRENCH GORDON B II & FRENCH PATRICIA J TRUSTEES	1639 BROOKHOLLOW DR, HIDEAWAY, TX, 75771	3501 NE 3RD AVE, CAMAS, 98607	GOOTS ADDN WEIR PARK LOT 6	STORAGE WAREHOUSE	RC	1-Year
91045652	O-R CAMAS LLC	PO BOX 9167, SPRINGFIELD, MO, 65801	3440 NE 3RD AVE, CAMAS, 98607	WEIR PARK LOTS 3 & 4 BLK 5	TIRE, BATTERIES, PARTS AND ACCESSORIES DEALERS	RC	1-Year
91045666	FOUNTAIN ROBERT & FOUNTAIN NANCY	PO BOX 737, WASHOUGAL, WA, 98671	114 NE WEIR ST, CAMAS, 98607	WEIR PARK LOT 16 BLK 5	GENERAL REPAIR & SERVICE GARAGES	RC	1-Year
71360000	HIGGINSON BLAINE & HIGGINSON BRIAN	984 WASHOUGAL RIVER RD, WASHOUGAL, WA, 98671	984 WASHOUGAL RIVER RD, WASHOUGAL, 98671	#19C OF RICHARD OUGH DLC .50A	SERVICE REPAIR SHOP	R1-10	5-Year
71364000	HIGGINSON BLAINE & HIGGINSON BRIAN	984 WASHOUGAL RIVER RD, WASHOUGAL, WA, 98671		#32 OF RICHARD OUGH DLC .18A	MINIMAL STRG BLDGS, EQUIP, SHEDS, OPEN POLE BLDGS	R1-10	5-Year
71528000	SNK PROPERTIES LLC	1700 MAIN ST #136, WASHOUGAL, WA, 98671	1434 E ST, WASHOUGAL, 98671	#275, 276, 803 RICHARD OUGH DLC	GENERAL REPAIR & SERVICE GARAGES	CC	5-Year
71543000	BROTHERS NORTHWEST INVESTMENTS LLC	20615 NE 212TH AVE, BATTLE GROUND, WA, 98604	1423 E ST, WASHOUGAL, 98671	#293 OF RICHARD OUGH DLC	SERVICE REPAIR SHOP	CC	5-Year
71559000	MALFAIT RONALD SCOTT	31914 SE 17TH ST, WASHOUGAL, WA, 98671		#315 OF RICHARD OUGH DLC	DRIVE THROUGH CAR WASH	CC	5-Year

Parcel Serial Number	Owner Name	Owner Address	Site Address	Legal Description	Land-Use Description	Zoning	WHPZ
71592000	MALFAIT RONALD SCOTT	31914 SE 17TH ST, WASHOUGAL, WA, 98671		#367 OF RICHARD OUGH DLC	DRIVE THROUGH CAR WASH	CC	5-Year
71622000	WASHOUGAL SCHOOL DIST #112	4855 EVERGREEN WAY, WASHOUGAL, WA, 98671		#420 OF RICHARD OUGH DLC	FLEET OPERATION CENTERS & STORAGE	CC	5-Year
71666000	MALFAIT RONALD SCOTT	31914 SE 17TH ST, WASHOUGAL, WA, 98671	1138 E ST, WASHOUGAL, 98671	#473 OF RICHARD OUGH DLC	GENERAL REPAIR & SERVICE GARAGES	CC	5-Year
71678002	BROTHERS NORTHWEST INVESTMENTS LLC	20615 NE 212TH AVE, BATTLE GROUND, WA, 98604	1351 E ST, WASHOUGAL, 98671	#487 OF RICHARD OUGH DLC .23A	MOTOR VEHICLE DEALERS, USED CARS AND SMALL TRUCKS.	CC	5-Year
71680000	MALFAIT RONALD SCOTT	31914 SE 17TH ST, WASHOUGAL, WA, 98671	1250 E ST, WASHOUGAL, 98671	#489 OF RICHARD OUGH DLC .22A	CONVENIENCE STORE - W/ PUMPS & TANKS	CC	5-Year
71683000	COLUMBIA ELECTRIC INC	PO BOX 900, WASHOUGAL, WA, 98671	1338 E ST, WASHOUGAL, 98671	#496 OF RICHARD OUGH DLC .21A	SERVICE REPAIR SHOP	CC	5-Year
71706000	MALFAIT RONALD SCOTT	31914 SE 17TH ST, WASHOUGAL, WA, 98671	1204 E ST, WASHOUGAL, 98671	#530 OF RICHARD OUGH DLC .25A	TIRE, BATTERIES, PARTS AND ACCESSORIES DEALERS	CC	5-Year
71717002	KITCHEN PAUL & KITCHEN SARA	1315 E ST, WASHOUGAL, WA, 98671	1315 E ST, WASHOUGAL, 98671	#553 OF RICHARD OUGH DLC .12A	SERVICE REPAIR SHOP	CC	5-Year
71792000	HATTEN RANDALL & HATTEN BRENDA	3567 CEDAR CT, WASHOUGAL, WA, 98671	1320 E ST, WASHOUGAL, 98671	#662 OF RICHARD OUGH DLC .31A	SERVICE REPAIR SHOP	CC	5-Year
71832000	BROTHERS NORTHWEST INVESTMENTS LLC	20615 NE 212TH AVE, BATTLE GROUND, WA, 98604	1405 E ST, WASHOUGAL, 98671	#714 RICHARD OUGH DLC .23A	GENERAL REPAIR & SERVICE GARAGES	CC	5-Year
71909000	MALFAIT RONALD SCOTT	31914 SE 17TH ST, WASHOUGAL, WA, 98671		#802 RICHARD OUGH DLC .12A	SERV STATION W/ TANKS & PUMPS OR CARD LOCK STATION	CC	5-Year
75358010	WASHOUGAL SCHOOL DIST #112	4855 EVERGREEN WAY, WASHOUGAL, WA, 98671	971 E ST, WASHOUGAL, 98671	ELLS SUB-DIV LOT 1	FLEET OPERATION CENTERS & STORAGE	CC	5-Year
75359586	SRBC PARTNERS LLC	13900 NW 53RD AVE, VANCOUVER, WA, 98685	730 E ST, WASHOUGAL, 98671	MIDLAND ACRE REPLT BLKS 1-5 & TTA #2 LTS 24 - 26 BLK 1	GENERAL REPAIR & SERVICE GARAGES	CC	5-Year
75359644	WASHOUGAL SCHOOL DIST #112	4855 EVERGREEN WAY, WASHOUGAL, WA, 98671	995 E ST, WASHOUGAL, 98671	MIDLAND ACRES REPLAT BLKS 1-5 & TT A #1 LOT 2 BLK A	FLEET OPERATION CENTERS & STORAGE	CC	5-Year
75359646	WASHOUGAL SCHOOL DIST #112	4855 EVERGREEN WAY, WASHOUGAL, WA, 98671		MIDLAND ACRE REPLAT BLKS 1-5 & TT A #2 LOT 2 BLK A	FLEET OPERATION CENTERS & STORAGE	CC	5-Year
73134007	NORTHWEST PIPELINE	PO BOX 2400 MD 46-4, TULSA, OK, 74102	30 C ST, WASHOUGAL, 98671	#7 DAVID PARKER DLC 0.45A (TCO 6-164)	GAS STORAGE TANKS, PUMPING, DISTRIBUTION, PIPELINE	CH	6-Month
73134022	S&A OIL INC	1523 NW 33RD WAY, CAMAS, WA, 98607	165 C ST, WASHOUGAL, 98671	#22 DAVID C PARKER DLC .55A M/L	CONVENIENCE STORE - W/ PUMPS & TANKS	CH	6-Month
73134025	BRG LLC	2375 SE 8TH AVE, CAMAS, WA, 98607		#2 LOT 1 SP3-341 1.87A	HIGHWAY CONSTRUCTION AND REPAIR CONTRACTORS.	CH	6-Month
73134047	S&A OIL INC	1523 NW 33RD WAY, CAMAS, WA, 98607	133 C ST, WASHOUGAL, 98671	#47 DAVID C PARKER DLC .23A	CONVENIENCE STORE - W/ PUMPS & TANKS	CH	6-Month
73134157	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		#157 DAVID PARKER DLC .92A	MARINAS.	CH	6-Month

Parcel Serial Number	Owner Name	Owner Address	Site Address	Legal Description	Land-Use Description	Zoning	WHPZ
73134161	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671	40 S MARINA WAY, WASHOUGAL, 98671	#161 DAVID C PARKER DLC 1.79A	MOTOR VEHICLE DEALERS, NEW CARS AND SMALL TRUCKS,	CH	6-Month
73134170	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		#170 DAVID C PARKER DLC	ELECTRIC POWER OPERATING, MAINT., AND REPAIR BUILD	CH	6-Month
73134182	LNI INVESTMENTS LLC	281 C STREET STE 112, WASHOUGAL, WA, 98671	281 C ST, WASHOUGAL, 98671	#184A & #189 DAVID PARKER DLC 1.01A	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	CH	6-Month
73139075	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671	24 S A ST, WASHOUGAL, 98671	PARKERSVILLE LOTS 4 & 5 BLK 9	MARINAS.	CH	6-Month
73139077	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		PARKERSVILLE LOTS 6 & 7 BLK 9	MARINAS.	CH	6-Month
73139079	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		PARKERSVILLE LOTS 8 9 10 BLOCK 9	MARINAS.	CH	6-Month
73139080	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671	115 S 1ST ST, WASHOUGAL, 98671	PARKERSVILLE LOTS 1, 2, 3, 4, 5 BLK 10	BOATS AND MARINE ACCESSORIES.	CH	6-Month
73139085	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		PARKERSVILLE LOTS 6 & 7 BLK 10	MARINAS.	CH	6-Month
73139087	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		PARKERSVILLE LOTS 8 & 9 BLK 10	MARINAS.	CH	6-Month
73139089	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		PARKERSVILLE LOT 10 BLK 10	MARINAS.	CH	6-Month
73139090	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		#223 PARKERSVILLE BLK 13 .84	MARINAS.	CH	6-Month
87021000	BRG LLC	2375 SE 8TH AVE, CAMAS, WA, 98607	2375 SE 8TH AVE, CAMAS, 98607	#1 LOT 1 SP3-341 3.12A	TIRE, BATTERIES, PARTS AND ACCESSORIES DEALERS	HI	6-Month
87053000	SAUER DEVELOPMENT GROUP LLC	26300 NE 16TH ST, CAMAS, WA, 98607		ORCHARD HOME WASHOUGAL #4 LOT 2 1.91A	MFG - MACHINERY	HI	6-Month
87054000	SAUER DEVELOPMENT GROUP LLC	26300 NE 16TH ST, CAMAS, WA, 98607		ORCHARD HOME WASHOUGAL #5 LOT 2 .23A	MFG - MACHINERY	HI	6-Month
87055000	SAUER DEVELOPMENT GROUP LLC	26300 NE 16TH ST, CAMAS, WA, 98607	2305 SE 8TH AVE, CAMAS, 98607	ORCHARD HOME WASHOUGAL #6 LOT 2 1.69A	STORAGE WAREHOUSE	HI	6-Month
87216000	C B I LLC	829 NW VIEW RIDGE CT, CAMAS, WA, 98607		ORCHARD HOME ADDN #3 LOT 8 #8 LOT 9 .26A	MFG - MISCELLANEOUS	LI	6-Month
87260000	C B I LLC	829 NW VIEW RIDGE CT, CAMAS, WA, 98607	2380 SE 8TH AVE, CAMAS, 98607	ORCHARD HOME WASHOUGAL #2 LOT 9 .17A	MFG - MISCELLANEOUS	LI	6-Month
88610000	SAUER DEVELOPMENT GROUP LLC	26300 NE 16TH ST, CAMAS, WA, 98607		OAK PARK ADDN WASHOUGAL LOTS 3 & 4 BLK 8	STORAGE WAREHOUSE	HI	6-Month
88630000	SAUER DEVELOPMENT GROUP LLC	26300 NE 16TH ST, CAMAS, WA, 98607	754 SE UNION ST, CAMAS, 98607	OAK PARK ADDN WASHOUGAL LOT 6 BLK 8	MFG - MACHINERY	HI	6-Month
88640000	SAUER DEVELOPMENT GROUP LLC	26300 NE 16TH ST, CAMAS, WA, 98607	2205 SE 8TH AVE, CAMAS, 98607	OAK PARK ADDN WASHOUGAL LOTS 7 & 8 BLK 8	MFG - MACHINERY	HI	6-Month

Parcel Serial Number	Owner Name	Owner Address	Site Address	Legal Description	Land-Use Description	Zoning	WHPZ
88650000	ZIEGLER JOHN K ETAL	1235 NORTH LOOP WEST, SUITE 205, HOUSTON, TX, 77008		OAK PARK ADDN WASHOUGAL LOT 1 BLK 9	MFG - LUMBER & WOOD PRODUCTS	HI	6-Month
88660000	ZIEGLER JOHN K ETAL	1235 NORTH LOOP WEST, SUITE 205, HOUSTON, TX, 77008		OAK PARK ADDN WASHOUGAL LOTS 2 & 3 BLK 9	MFG - LUMBER & WOOD PRODUCTS	HI	6-Month
89861000	DLJ PROPERTIES CAMAS LLC	9895 DOUBLE R BLVD, RENO, NV, 89521	1635 SE 6TH AVE, CAMAS, 98607	#32 OF DAVID C PARKER DLC 4.98A	ROCK QUARRY, CRUSHING, SAND AND GRAVEL PITS.	HI	6-Month
89934000	INTERFAITH TREASURE HOUSE	89 C ST, WASHOUGAL, WA, 98671	91 C ST, WASHOUGAL, 98671	#194 DAVID C PARKER DLC 1.22A	STORAGE WAREHOUSE	CH	6-Month
91045163	CITY OF CAMAS	613 NE 4TH AVE, CAMAS, WA, 98607	175 SE YALE ST, CAMAS, 98607	#163 DAVID C PARKER DLC 4.39A	ELECTRIC POWER BOOSTERS, TRANSFORMERS, STATIONS, R	SU	6-Month
127950000	CLARK PUBLIC UTILITIES	PO BOX 8900, VANCOUVER, WA, 98668	345 1ST ST, WASHOUGAL, 98671	#115 DAVID C PARKER DLC 1.32A	ELECTRIC POWER OPERATING, MAINT., AND REPAIR BUILD	CH	6-Month
700120000	ENCON NORTHWEST LLC	9895 DOUBLE R BLVD, RENO, NV, 89521	1635 SE 6TH AVE, CAMAS, 98607	BNSF LEASE BF31374	ROCK QUARRY, CRUSHING, SAND AND GRAVEL PITS.	HI	6-Month
986035425	PORT OF CAMAS WASHOUGAL	24 S A ST, WASHOUGAL, WA, 98671		#224 PARKERSVILLE BLK 13 0.53A	MARINAS.	CH	6-Month
87451000	OREGON MOTOR SERVICES LLC	8503 SE 132ND AVE, HAPPY VALLEY, OR, 97086	1846 NE 3RD AVE, CAMAS, 98607	RIVER VIEW ADDN TO CAMAS #3 LOT 8	MOTOR VEHICLE DEALERS, NEW CARS AND SMALL TRUCKS,	RC	6-Month Well 13
87452000	OREGON MOTOR SERVICES LLC	8503 SE 132ND AVE, HAPPY VALLEY, OR, 97086		RIVER VIEW ADDN TO CAMAS #4 LOT 8 & #3 LOT 9	MOTOR VEHICLE DEALERS, NEW CARS AND SMALL TRUCKS,	RC	6-Month Well 13
87460000	OREGON MOTOR SERVICES LLC	8503 SE 132ND AVE, HAPPY VALLEY, OR, 97086	1904 NE 3RD AVE, CAMAS, 98607	RIVER VIEW ADDN TO CAMAS #1 LOT 9	MOTOR VEHICLE DEALERS, NEW CARS AND SMALL TRUCKS,	RC	6-Month Well 13
87500000	2016 NE 3RD LLC	2016 NE 3RD AVE, CAMAS, WA, 98607	2016 NE 3RD AVE, CAMAS, 98607	RIVER VIEW ADD TO CAMAS #1 #4 LOT 10 #2 LOT 11	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	RC	6-Month Well 13
89882000	BRAMBLE ACRES LLC	4206 NE 261ST AVE, CAMAS, WA, 98607	2459 NE 3RD LOOP, CAMAS, 98607	#64 DAVID C PARKER DLC .50A	MEDICAL & DENTAL LABORATORIES	RC	6-Month Well 13
87120000	KINSCO LLC	10500 NE 51ST CIR, VANCOUVER, WA, 98682	1718 SE 8TH AVE, CAMAS, 98607	ORCHARD HOME WASHOUGAL B OF LOT 4 .14A	STORAGE WAREHOUSE	LI	CARA
87124000	CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607		ORCHARD HOME WASHOUGAL G,H,& I LOT 4 .17A	SEWAGE RELATED BLDG OR STRUCTURE	LI	CARA
87180000	HIT DEVELOPMENT LLC	2470 NE 2ND ST, BEND, OR, 97701	1840 SE 8TH AVE, CAMAS, 98607	ORCHARD HOME WASHOUGAL #2 LOT 5 .82A	GENERAL REPAIR & SERVICE GARAGES	LI	CARA
87181000	P&E INVESTMENTS LLC	1900 SE 8TH AVE, CAMAS, WA, 98607	1900 SE 8TH AVE, CAMAS, 98607	ORCHARD HOME WASHOUGAL #3 LOT 5 .44A	STORAGE WAREHOUSE	LI	CARA
87200000	MCELROY PROPERTY MANAGEMENT LLC	PO BOX 908, CAMAS, WA, 98607	1910 SE 8TH AVE, CAMAS, 98607	ORCHARD HOME WASHOUGAL #1 LOT 6 .95A	STORAGE WAREHOUSE	LI	CARA
87360000	CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607	1129 SE POLK ST, CAMAS, 98607	ORCHARD HOME WASHOUGAL #1 LOT 16 3.02A	SEWAGE RELATED BLDG OR STRUCTURE	RC	CARA
87365000	CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607		ORCHARD HOME WASHOUGAL #2 LOT 16	SEWAGE RELATED BLDG OR STRUCTURE	RC	CARA

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89869000	CITY OF CAMAS	1303 SE 12TH, CAMAS, WA, 98607		#40 OF DAVID C PARKER DLC 3.3A	SEWAGE RELATED BLDG OR STRUCTURE	RC	CARA
89924000	CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607		#183A DAVID C PARKER DLC 1 A M/L	SEWAGE RELATED BLDG OR STRUCTURE	RC	CARA
76695000	RODRIGUEZ TYRONE	339 SE EVERETT RD, CAMAS, WA, 98607	410 NE 2ND AVE, CAMAS, 98607	CAMAS LOT 8 BLK 4	GENERAL REPAIR & SERVICE GARAGES	HI	Western Search Area
76880000	MELTON ROBERT S & MELTON JANET L	5120 NW COLUMBIA ST, VANCOUVER, WA, 98663	732 NE 2ND AVE, CAMAS, 98607	CAMAS LOT 5 BLK 7	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	MX	Western Search Area
77355000	SAFEWAY INC	250 PARKCENTER BLVD, BOISE, ID, 83726		SAFEWAY SP LOT 3 4-341	CONVENIENCE STORE - W/ PUMPS & TANKS	DC	Western Search Area
77760000	DIERICKX PROPERTIES LLC	2947 NW IVY LN, CAMAS, WA, 98607		CAMAS LOTS 5 & 6 BLK 18	FUNERAL SERVICES AND CREMATORIES.	DC	Western Search Area
77770000	FMG BODY SHOP LLC	314 NE BIRCH ST, CAMAS, WA, 98607	318 NE 3RD AVE, CAMAS, 98607	CAMAS LOTS 1,2,7 & 8 BLK 18	AUTO BODY SHOP	DC	Western Search Area
77785000	DICKERSON RANDY S	1900 SE 97TH AVE, VANCOUVER, WA, 98664		CAMAS #3 LOT 2 #2 LOTS 3 & 4 BLK 19	SERVICE REPAIR SHOP	HI	Western Search Area
77830000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	339 NE ADAMS ST, CAMAS, 98607	CAMAS #1 BLOCK 20	MFG - PAPER PRODUCTS	HI	Western Search Area
77860000	ESHGHI MAHSA	207 NE 3RD AVENUE, CAMAS, WA, 98607	207 NE 3RD AVE, CAMAS, 98607	CAMAS #1 LOT 1 & 2 BLK 22	CONVENIENCE STORE - W/ PUMPS & TANKS	DC	Western Search Area
78000000	DIERICKX PROPERTIES LLC	2947 NW IVY LN, CAMAS, WA, 98607	325 NE 3RD AVE, CAMAS, 98607	CAMAS #1 LOTS 3 & 4 BLK 23	FUNERAL SERVICES AND CREMATORIES.	DC	Western Search Area
78090000	COLUMBIA RIVER LAND LLC	1104 NE 152ND AVE, VANCOUVER, WA, 98684	501 NE 3RD AVE, CAMAS, 98607	CAMAS LOTS 1 & 2 BLK 25	CONVENIENCE STORE - W/ PUMPS & TANKS	DC	Western Search Area
78105000	CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607	533 NE 3RD AVE, CAMAS, 98607	CAMAS LOT 4 BLK 25	PARKING LOTS & PARKING STRUCTURES	DC	Western Search Area
78150000	CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607	605 NE 3RD AVE, CAMAS, 98607	CAMAS LOT 2 BLK 26	SERVICE REPAIR SHOP	DC	Western Search Area
78560000	BROWN CATH-A-LEENE ANN	410 NE GARFIELD ST, CAMAS, WA, 98607	410 NE GARFIELD ST, CAMAS, 98607	CAMAS LOT 1 & 2 BLK 33	FUNERAL SERVICES AND CREMATORIES.	DC	Western Search Area
78600000	BROWN CATH-A-LEENE ANN	410 NE GARFIELD ST, CAMAS, WA, 98607	436 NE GARFIELD ST, CAMAS, 98607	CAMAS #1 LOT 7 & 8 BLK 33	FUNERAL SERVICES AND CREMATORIES.	DC	Western Search Area
78630000	CHRISTENSEN JEREMY D & CHRISTENSEN INGRID L	1911 NW 22ND AVE, CAMAS, WA, 98607	713 NE 4TH AVE, CAMAS, 98607	CAMAS LOT 2 BLK 34	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
78956000	CORNERSTORE CAMAS LLC	515 NW SALTZMAN RD #70, PORTLAND, OR, 97229	450 NE BIRCH ST, CAMAS, 98607	CAMAS LOT 8 BLK 38	DRY CLEANERS, LAUNDRIES (1 TENANT - FREE STANDG BL	DC	Western Search Area
79040000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		CAMAS BLOCK 42	PARKING LOT: PAVED, FOR ADJOINING BUILDING	DC	Western Search Area
79050000	ALP 3 LLC	16420 SE MCGILLIVRAY, SUITE 103, VANCOUVER, WA, 98683	518 NE BIRCH ST, CAMAS, 98607	CAMAS #1 LOT 1 BLK 43	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area

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79051000	ALP 3 LLC	16420 SE MCGILLIVRAY, SUITE 103, VANCOUVER, WA, 98683		CAMAS #2 LOT 1 BLK 43	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79070000	ALP 3 LLC	16420 SE MCGILLIVRAY, SUITE 103, VANCOUVER, WA, 98683		CAMAS LOT 2 BLK 43	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79080000	ALP 3 LLC	16420 SE MCGILLIVRAY, SUITE 103, VANCOUVER, WA, 98683	327 NE 5TH AVE UNIT A, CAMAS, 98607	CAMAS LOT 3 BLK 43	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79115000	ALP 3 LLC	16420 SE MCGILLIVRAY, SUITE 103, VANCOUVER, WA, 98683	518 NE BIRCH ST, CAMAS, 98607	CAMAS #2 LOT 7 & 8 BLK 43	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79140000	CASCADIA DEVELOPMENT PARTNERS LLC	610 ESTHER ST STE 202, VANCOUVER, WA, 98660	435 NE 5TH AVE, CAMAS, 98607	CAMAS LOTS 3 & 4 BLK 44	GENERAL REPAIR & SERVICE GARAGES	DC	Western Search Area
79194000	NWOH HOLDINGS LLC	531 NE EVERETT ST, CAMAS, WA, 98607	531 NE EVERETT ST, CAMAS, 98607	CAMAS LOT 5 & #1 LOT 6 BLK 45	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79197000	NWOH HOLDINGS LLC	531 NE EVERETT ST, CAMAS, WA, 98607	522 NE 6TH AVE, CAMAS, 98607	CAMAS #2 LOT 6 BLK 45	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79230000	GESSFORD PROPERTY LLC	906 N SHEPHERD RD, WASHOUGAL, WA, 98671	518 NE EVERETT ST, CAMAS, 98607	CAMAS LOTS 1 & 2 BLK 46	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79340000	ALLEN TREVOR W & ALLEN LISA R TRUSTEES	4475 NW EMILY WAY, CAMAS, WA, 98607	736 NE 6TH AVE, CAMAS, 98607	CAMAS LOT 5 BLK 47	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79805002	BRESTER PROPERTIES LLC	403 NE 6TH AVE, CAMAS, WA, 98607	411 NE 6TH AVE, CAMAS, 98607	BENZ NEVIN PAYNE CONDOMINIUMS UNIT 1	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79805004	BRESTER PROPERTIES LLC	411 NE 6TH AVE, CAMAS, WA, 98607	403 NE 6TH AVE, CAMAS, 98607	BENZ NEVIN PAYNE CONDOMINIUMS UNIT 2	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79805006	BRESTER PROPERTIES LLC	411 NE 6TH AVE, CAMAS, WA, 98607	405 NE 6TH AVE, CAMAS, 98607	BENZ NEVIN PAYNE CONDOMINIUMS UNIT 3	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79880000	IMP GROUP LLC	4525 NE 126TH CIR, VANCOUVER, WA, 98686	329 NE 6TH AVE, CAMAS, 98607	CAMAS LOT 3 BLK 58	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79885000	IMP GROUP LLC	4525 NE 126TH CIR, VANCOUVER, WA, 98686		CAMAS LOT 4 BLK 58	HEALTH CLINICS: MEDICAL / DENTAL / OTHER	DC	Western Search Area
79980000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	133 NE 6TH AVE, CAMAS, 98607	CAMAS LOTS 1-8 BLK 60	STORAGE WAREHOUSE	DC	Western Search Area
81760000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		PROSPECT PLACE ADDN CAMAS LOT 8	PARKING LOT: PAVED, FOR ADJOINING BUILDING	DC	Western Search Area
81770000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		PROSPECT PLACE ADDN CAMAS LOTS 9 & 10	PARKING LOTS & PARKING STRUCTURES	DC	Western Search Area
82531000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		#2 OF T M COFFEY BNTY CL 3.41A	PARKING LOT: PAVED, FOR ADJOINING BUILDING	DC	Western Search Area
82532000	CLARK PUBLIC UTILITIES	PO BOX 8900, VANCOUVER, WA, 98668	750 DIVISION ST, CAMAS, 98607	#3 OF TM COFFEY BNTY CL .43A	ELECTRIC POWER BOOSTERS, TRANSFORMERS, STATIONS, R	DC	Western Search Area

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88980000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS #1 LOTS 5 THRU 10 BLK 4	PARKING LOT: PAVED, FOR ADJOINING BUILDING	HI	Western Search Area
88990000	JAMES RIVER II INC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS #2 LOTS 5 THRU 8 BLK 4	MFG - PAPER PRODUCTS	HI	Western Search Area
89020000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	112 E 1ST AVE, CAMAS, 98607	OVERLOOK ADDN CAMAS LOTS 1 & 2 BLK 5	MINIMAL STRG BLDGS, EQUIP, SHEDS, OPEN POLE BLDGS	HI	Western Search Area
89030000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOT 3 BLK 5	SERVICE REPAIR SHOP	HI	Western Search Area
89040000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	234 E 1ST AVE, CAMAS, 98607	OVERLOOK ADDN CAMAS LOT 4 BLK 5	SERVICE REPAIR SHOP	HI	Western Search Area
89060000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOTS 7 & 8 BLK 5 & #224 MAXON DLC	MFG - PAPER PRODUCTS	HI	Western Search Area
89070000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	234 E 1ST AVE, CAMAS, 98607	OVERLOOK ADDN CAMAS LOT 1 BLK 6	SERVICE REPAIR SHOP	HI	Western Search Area
89080000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOT 2 BLK 6	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89090000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOT 3 BLK 6	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89100000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	117 SE CEDAR ST, CAMAS, 98607	OVERLOOK ADDN CAMAS #1 LOT 4 BLK 6	PARKING LOT: PAVED, FOR ADJOINING BUILDING	HI	Western Search Area
89105000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	336 E 1ST AVE, CAMAS, 98607	OVERLOOK ADDN CAMAS #2 LOT 4 BLK 6	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89110000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOT 5 BLK 6	PARKING LOT: PAVED, FOR ADJOINING BUILDING	HI	Western Search Area
89115000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOTS 6 & 7 BLK 6	STORAGE WAREHOUSE	HI	Western Search Area
89120000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	129 SE CEDAR ST, CAMAS, 98607	OVERLOOK ADDN CAMAS LOT 8 BLK 6	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89140000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	416 E 1ST AVE, CAMAS, 98607	OVERLOOK ADDN CAMAS LOTS 1 & 2 BLK 7	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89150000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOTS 3 & 4 BLK 7	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89170000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	124 SE CEDAR ST, CAMAS, 98607	OVERLOOK ADDN CAMAS LOT 6 BLK 7	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89171000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOT 5 BLK 7	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89550000	RIVERVIEW SAVINGS BANK	PO BOX 872290, VANCOUVER, WA, 98687	202 SE DALLAS ST, CAMAS, 98607	OVERLOOK ADDN CAMAS LOT 1 BLK 17	STORAGE WAREHOUSE	HI	Western Search Area
89610000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOT 1 BLK 18	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89615000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	203 SE DALLAS ST, CAMAS, 98607	OVERLOOK ADDN CAMAS #1 LOT 2 BLK 18	PARKING LOT: PAVED, FOR ADJOINING BUILDING	HI	Western Search Area

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89616000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	428 SE 2ND AVE, CAMAS, 98607	OVERLOOK ADDN CAMAS #2 LOT 2 BLK 18	PARKING LOT: PAVED, FOR ADJOINING BUILDING	HI	Western Search Area
89620000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOT 3 BLK 18	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89630000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOTS 4 & 5 BLK 18	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89640000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		OVERLOOK ADDN CAMAS LOTS 6,7 & 8 BLK 18	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89730000	JHTM PROPERTIES LLC	636 SE 3RD AVE, CAMAS, WA, 98607		OVERLOOK ADDN CAMAS #1 LOTS 2 & 3 BLK 20	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89740000	JHTM PROPERTIES LLC	636 SE 3RD AVE, CAMAS, WA, 98607	636 SE 3RD AVE, CAMAS, 98607	OVERLOOK ADDN CAMAS #2 LOTS 2 & 3 BLK 20	SERVICE REPAIR SHOP	HI	Western Search Area
89750000	JHTM PROPERTIES LLC	636 SE 3RD AVE, CAMAS, WA, 98607		OVERLOOK ADDN CAMAS LOT 4 BLK 20	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89760000	JHTM PROPERTIES LLC	636 SE 3RD AVE, CAMAS, WA, 98607		OVERLOOK ADDN CAMAS LOT 5 BLK 20	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
89770000	H & R PROPERTIES LLC	81 ROCKWOOD DR, STEVENSON, WA, 98648	325 SE FRANKLIN ST, CAMAS, 98607	OVERLOOK ADDN CAMAS LOT 6 BLK 20	STORAGE WAREHOUSE	HI	Western Search Area
89790000	JHTM PROPERTIES LLC	636 SE 3RD AVE, CAMAS, WA, 98607		OVERLOOK ADDN CAMAS LOT 8 BLK 20	PARKING LOT: GRAVEL, FOR ADJOINING BUILDING	HI	Western Search Area
90939000	CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607		#65, 73 & 79 OF HJG MAXON DLC 2.30A	CEMETERIES	R-7.5	Western Search Area
90967000	JHTM PROPERTIES LLC	636 SE 3RD AVE, CAMAS, WA, 98607	606 SE 3RD AVE, CAMAS, 98607	#153 HJG MAXON DLC .17A	STORAGE WAREHOUSE	HI	Western Search Area
91044013	GEORGIA-PACIFIC CORPORATION	PO BOX 105681, ATLANTA, GA, 30348		#275 MAXON COFFEY DLCS SEC 10-1-2 OVERLOOK & CAMAS (BLDG)	MFG - LUMBER & WOOD PRODUCTS	HI	Western Search Area
91044015	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348	273 NE ADAMS ST, CAMAS, 98607	#275 MAXON COFFEY DLCS SEC 10-1-2 OVERLOOK & CAMAS 189.27A (SEE 91044027	MFG - PAPER PRODUCTS	HI	Western Search Area
91044019	CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607	630 NE OAK ST, CAMAS, 98607	#281A HJG MAXON DLC 6.53 A	CEMETERIES	R-7.5	Western Search Area
91044034	JHTM PROPERTIES LLC	636 SE 3RD AVE, CAMAS, WA, 98607		#295 HJG MAXON DLC .03A	STORAGE WAREHOUSE	HI	Western Search Area
700525000	FORT JAMES CAMAS LLC	PO BOX 105681, ATLANTA, GA, 30348		BN RR LEASE #500,086	MFG - PAPER PRODUCTS	HI	Western Search Area

APPENDIX C
EXAMPLE NOTIFICATION LETTERS

DRAFT

DATE

Recipient [Fire/Police Departments] name
Recipient company
Recipient address 1
Recipient address 2

Re: City of Camas Wellhead Protection Plan

Dear Emergency Responder:

The City of Camas has developed an updated Wellhead Protection Plan to help maintain drinking water quality for our City residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each city drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPAs).

As part of this Plan, the City must provide wellhead protection information to agencies responsible for incident/spill response procedures. It is important that you are aware of where potential contaminant releases could adversely impact the quality of our community's drinking water supply.

A map of the WHPAs and adjacent transportation routes is enclosed for your review. Also enclosed is a table providing the facility ID, name, and location for each potential contaminant source. An acknowledgement of receipt of this information or a response from your office as part of our wellhead protection plan documentation would be appreciated. Please note that the City has sent notices to each of these properties informing them of their location within the WHPA boundary.

In the event of a spill or contaminant release, we would ask that you immediately notify us and the Department of Ecology, so that we can take appropriate measures to deal with the problem.

Thank you for assisting us in protecting our water supply and groundwater resources. If you have any questions, please contact me at (###) ###-####.

Sincerely,

Name
Title
City of Camas

DRAFT

DATE

Department of Ecology
Recipient company
Recipient address 1
Recipient address 2

Re: City of Camas Wellhead Protection Plan

Dear Department of Ecology:

The City of Camas has developed an updated Wellhead Protection Plan to help maintain drinking water quality for our City residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each city drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPAs).

The enclosed map depicts the WHPA boundary, source wells, and identified potential contaminant sources. Also enclosed is a table providing the facility ID, name, and location for each potential contaminant source. Please review the map and use it as a reference when inspecting and permitting the storage, use, and disposal of hazardous material within our WHPAs.

Please note that the City has sent notices to each of these properties informing them of their location within the WHPA boundary. The City has also sent similar letters to businesses with land uses that could potentially contaminate groundwater quality.

Thank you for assisting us in protecting our water supply and groundwater resources. If you have any questions, please contact me at (###) ###-####.

Sincerely,

Name
Title
City of Camas

DRAFT

DATE

Recipient [local business or cleanup site] name
Recipient company
Recipient address 1
Recipient address 2

Re: City of Camas Wellhead Protection Plan

To Whom It May Concern:

The City of Camas has developed an updated Wellhead Protection Plan to help maintain drinking water quality for our county residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each PUD drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPAs). The Plan also requires an inventory of potential sources of groundwater contamination within these WHPAs.

The primary purpose of this letter is to notify you that your facility is located within one of our WHPAs. Since your business or the activities conducted at your facility may involve the use or storage of chemicals (e.g., gasoline, underground storage tanks, hazardous waste, etc.) that could adversely impact the drinking water supply in the event of a spill. If a chemical spill occurs, immediately notify the Department of Ecology and relevant first responders (for specific guidance see https://ecology.wa.gov/footer-pages/report-an-envi-ronmental-issue/report-a-spill), followed by the City of Camas.

Thank you for assisting us in protecting our water supply and groundwater resources. If you have any questions, please contact me at (###) ###-####.

Sincerely,

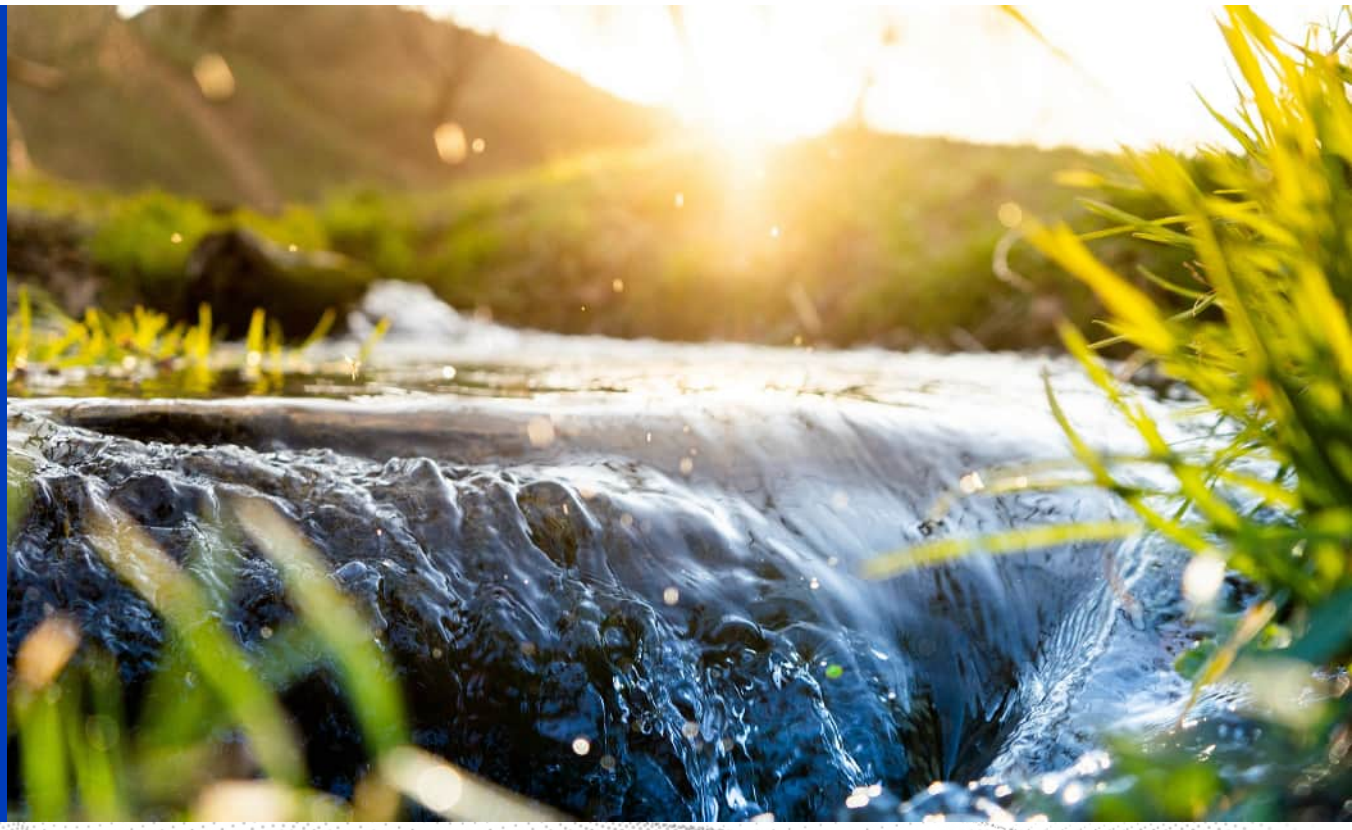
Name
Title
City of Camas

DRAFT

APPENDIX V

TM 1 - HYDRAULIC MODEL DEVELOPMENT AND CALIBRATION

2026 Water System Plan Update



TECHNICAL MEMORANDUM 1

Hydraulic Model Development and Calibration

DRAFT / September 2025

2026 Water System Plan Update

TECHNICAL MEMORANDUM 1

Hydraulic Model Development and Calibration

DRAFT / September 2025

This document is released for the purpose of information exchange review and planning only under the authority of Matthew Huang, September 29, 2025, State of Washington PW No. 54002.

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Abbreviations

ADD	average day demand
AWWA	American Water Works Association
BPS	booster pump station
Carollo	Carollo Engineers
City	City of Camas
DEM	digital elevation model
DS	downstream
DSL	distribution system leakage
EPS	extended period stimulation
FCV	flow control valve
GIS	geographic information system
GME	Green Mountain Estates
gpm	gallons per minute
HGL	hydraulic grade line
HP	horsepower
LPH	Lower Prune Hill
MDD	maximum day demand
MG	million gallons
mgd	million gallons per day
MSL	mean sea level
PM	project memorandum
PRV	pressure reducing valve
psi	pounds per square inch
PSV	pressure sustaining valve
SCADA	supervisory control and data acquisition
TM	technical memorandum
UPH	Upper Prune Hill
USGS	United States Geological Survey
WSPU	Water System Plan Update

TM 1 HYDRAULIC MODEL DEVELOPMENT AND CALIBRATION

1.1 Hydraulic Model Development

This section of the technical memorandum (TM) summarizes the process used to update and calibrate the hydraulic computer model of the City of Camas' (City) water distribution system as part of the City's 2026 Water System Plan Update (WSPU). Included in this TM are summaries of model development, demand allocation, and calibration results.

1.2 Previous Hydraulic Model

Prior to this project, the City maintained a hydraulic model of their distribution system in InfoWater by Innovyze. Recently, Innovyze was acquired by AutoDesk, and its services were updated. The City's hydraulic model has since been converted and utilizes the most current InfoWater Pro software. The most recent recalibration of the City's hydraulic model was completed in 2013 and as part of the last water system plan update, calibration was verified by utilizing data collected from hydrant flow tests.

1.3 Elements of the Hydraulic Model

A hydraulic model is comprised of elements that represent water system assets and include junctions, pipes, tanks and reservoirs, pumps, and control valves. The following provides a brief overview of the various elements of the hydraulic model and the required input parameters associated with each:

- **Elevation.** Each modeled element is assigned an elevation which is used as a reference point when calculating system pressure and hydraulic grade line. Carollo Engineers (Carollo) decided to utilize United States Geological Survey (USGS) Data, available as a standard one-meter resolution digital elevation model (DEM) as the model elevation source. The one-meter DEM (converted to feet for use in the hydraulic model) was developed exclusively from high resolution light detection and ranging datasets collected between March 2016 and May 2017 as part of the USGS 3D elevation program. The DEM elevation values reference the North American Vertical Datum of 1988.
- **Junctions.** Locations where pipe sizes change, where pipelines intersect, change in material, open valves, or where water demands are applied are represented by junctions in the hydraulic model. Required inputs for junctions include service elevation and water demands. Demand nodes were delineated within InfoWater Pro as junctions that were in the respective pressure zone and not linked to a transmission main or facility. Note that hydrants and standpipes are modeled as junctions with a one-to-one relationship.
- **Pipes.** Water mains are represented as pipes in the hydraulic model. Input parameters for pipes include length, roughness (Hazen-Williams C factor), diameter, and whether or not the pipe is a check valve (i.e., does not allow reverse flow). Existing pipes in the hydraulic model were compared to the most recent water main GIS layer provided by the City. Any missing pipes were hand drawn into the hydraulic model. For modeling purposes, any small diameter dead-end pipe (4-inches in diameter and

less) with no hydrant connections were not added to the City's model. Additionally, pipes for facilities (i.e., reservoirs, pump stations), were noted in InfoWater Pro as facility pipes to differentiate between distribution system piping and facility yard piping. This notation will allow for future updates to the model to focus on GIS updates and not facilities.

- **Tanks.** Water tanks are included in the hydraulic model as either cylindrical tanks or variable area tanks, depending on the complexity of the tank geometry. Required input parameters for cylindrical tanks include bottom elevation, maximum level, initial level, and diameter. For modeling purposes, any rectangular tanks were recalculated to be circular tanks. The volume was divided by the depth to obtain the area of the tank and then an equivalent circular diameter tank was calculated.
- **Reservoirs.** For water distribution system modeling, fixed head reservoirs are used to represent a water source with a constant hydraulic grade line (HGL). Typically, fixed head reservoirs are used to represent water sources, such as groundwater wells or water treatment facilities.
- **Pumps**. Pumps are included in the hydraulic model as links. Input parameters for pumps include pump curves, operational controls, and elevation.
- **Control Valves.** Several different valves, such as gate valves, check valves, butterfly valves, pressure sustaining valves (PSV), flow control valves (FCV), and pressure reducing valves (PRV) are represented as links in the hydraulic model. Input parameters for control valves include diameter, operational controls, and other settings.

1.4 Demand Allocation

Allocation of water demands to appropriate nodes in the hydraulic model was completed by Carollo. Demands were allocated based on 2024 water billing dataset provided by the City, which contained billed consumption by month in million gallons (MG) for each parcel connected to the City's distribution system. Annual average demands from the dataset were then allocated into the hydraulic model by assigning each billed parcel to the nearest model "demand" junction in geographic information system (GIS). Excel was utilized to then return consumption volumes for each model junction, and those values were pasted into the model demand set.

The billed consumption for 2024 amounted to approximately 4.03 million gallons per day (mgd). Distribution system leakage (DSL) amounted to 0.64 mgd in 2024 or 14 percent of total water production. DSL is the water lost from the distribution system that includes apparent (theft, meter inaccuracy, data collection errors) and real losses (water main breaks, reservoir overflows, leaky valves, etc.). Annual average production in 2024 from all the City's supply sources was 4.67 mgd. DSL was uniformly distributed across the City's system to match consumption and production values.

After allocating demands, the hydraulic model was calibrated to mimic actual operations. A description of the calibration process and details for the City's distribution system is discussed later in this TM.

1.5 Distribution System Components

The City owns and operates a multi-source municipal water system (Washington State Department of Health System Number 108002), which includes supply, treatment, storage, and distribution of potable water to residential and commercial customers. Carollo updated the City's hydraulic model utilizing GIS geodatabases, pump curves, record drawings, and other facility data provided by the City.

The following sections describe the methodology used to update the hydraulic model.

1.5.1 Water Supply

Water is supplied to the Camas water system from one slow sand filtration plant treating raw water from the City's two surface water diversions and 10 groundwater wells. All supply sources were modeled as a fixed head reservoir and a flow control valve which opens/closes at a set flow rate based on tank levels. Table 1.1 summarizes the City's water supply sources.

Table 1.1 Water Supply Summary(1)

Model ID	Name	Status	Modeled Capacity (gpm)
SLOW_SAND_PLANT	Slow Sand Filtration Plant	Inactive(1)	1,570
BOULDER	Boulder Creek Intake	Inactive(1)	1,120
JONES	Jones Creek Intake	Inactive(1)	450
WELL-5	Well 5	Active	675
WELL-6	Well 6	Active	1,200
WELL-7	Well 7	Active	950
WELL-8	Well 8	Active	1,250
WELL-9	Well 9	Active	575
WELL-10	Well 10	Active	900
WELL-11	Well 11	Active	1,000
WELL-12	Well 12	Active	1,000
WELL-13	Well 13	Active	1,350
WELL-14	Well 14	Active	850

Notes:
(1) During the period of extended period stimulation (EPS) and fire flow calibration, the plant was offline and for purposes of hydraulic analysis it is assumed that under maximum day demand conditions (typically occur during summer months), the plant is unable to divert water from its surface water supplies.
gpm - gallons per minute.

1.5.2 Pressure Zones

The City's water system is divided into 26 distinct pressure zones. Table 1.2 lists the HGL of each pressure zone, which range from 285 feet to 852 feet above mean sea level (MSL). Carollo updated pressure zones using closed valves, pipes and PRV settings provided in the City's PRV Study (Grey & Osborne, 2024). A shapefile containing these updated pressure zone boundaries will be provided for City review and to assist with model review. The ground elevations within the service area range from 21 feet to 757 feet above MSL.

Table 1.2 Pressure Zones

Zone ID[1] (feet)	Supplying Pressure Zone	Open or Closed?	Minimum Elevation[2][3] (feet)	Maximum Elevation[2][3] (feet)
285 – Downtown	343 – Butler (Transmission)	Open	21	159
343 – Butler (Transmission)	N/A	Open	51	234
455 – LPH	N/A	Open	96	409
542 – Gregg	N/A	Open	225	440
544 – Lacamas	N/A	Open	190	456
440 - Lacamas Shores	544 – Lacamas	Open	212	358
852 – UPH	N/A	Open	428	757
542 – Spyglass	852 - UPH	Open	353	485
547	852 – UPH	Open	285	426
550	455 - LPH	Closed	361	409
581	852 – UPH	Open	334	460
612	852 – UPH	Open	404	488
625	852 – UPH	Open	399	549
674	852 – UPH	Open	382	530
675	852 – UPH	Open	460	523
687	852 – UPH	Open	428	524
694	852 – UPH	Open	510	544
695 - Green Mountain Estates	542 – Gregg / 544 - Lacamas	Closed	456	534
697	852 – UPH	Open	421	636
697 – East	852 – UPH	Open	526	557
710	852 – UPH	Open	471	575
711	852 – UPH	Open	502	574
734	852 – UPH	Open	480	634
745	852 – UPH	Open	529	603
782	852 – UPH	Open	610	662
800	852 – UPH	Open	506	633

Notes
(1) Zone ID is based on hydraulic grade line (HGL).
(2) Elevation data based on interpolation of 2-ft contours.
(3) Location of service connections based on model node location.
LPH - Lower Prune Hill; UPH - Upper Prune Hill.

1.5.3 Pipe Network

The modeled water distribution system consists of over 159 miles of pipelines ranging from 6-inch to 24-inches in diameter. Table 1.31.3 provides a breakdown by diameter of the modeled distribution system. As shown in Table 1.3, nearly 64 percent of the City's modeled water distribution system consists of 8-inch through 12-inch diameter water mains. Almost 21 percent of the modeled system is 6-inches in diameter. The remaining 15 percent of the system is 14-inches in diameter and larger.

Table 1.3 Modeled Pipeline Summary(1)

Diameter (inches)	Length		Percent of Modeled System
	(feet)	(miles)	
6	180,065	34.1	21%
8	365,424	69.2	43%
10	20,264	3.8	2%
12	162,810	30.8	19%
14	32,881	6.2	4%
16	13,278	2.5	2%
18	50,251	9.5	6%
20	57	0.01	<1%
24	16,272	3.1	2%
Total	**841,303**	**159.2**	**100%**

Notes:
(1) Source: Hydraulic Model.

1.5.4 Storage Reservoirs

Water distribution systems rely on stored water to help equalize daily fluctuations between supply and demand, to supply sufficient water for firefighting, and to meet demands during an emergency or an unplanned outage of a major source of supply. The hydraulic model includes 7 storage reservoirs with volumes ranging from 0.1 to 2.4 MG. Detailed information for each of the City's storage reservoirs is summarized in Table 1.4.

Table 1.4 Modeled Reservoir Summary

Tank ID	Name	Capacity (MG)	Diameter (feet)	Height (feet)	Base Elevation (feet)	Maximum Level (feet)
BUTLER	Butler Reservoir	1.15	113.0	15.0	328.0	343.0
LOWER_PRUNE_RES2	Lower Prune Hill Reservoir #2	1.5	105.0	23.0	432.0	455.0
GREGG	Gregg Reservoir	0.1	15.5	72	470.0	542.0
LACAMAS	Lacamas Reservoir	2.0	84.2	48.0	496.0	544.0
18TH_AVE	18th Avenue (Anderson) Reservoir	2.0	95.0	44.0	500.0	544.0
UPPER_PRUNE_RES	Upper Prune Hill Reservoir	2.4	77.5	68.0	748.0	816.0
UPPER_PRUNE_STD	Upper Prune Hill Standpipe	0.75	36.0	100.0	752.0	852.0

Notes:
(1) Source: City of Camas 2019 Water System Plan Update.

1.5.5 Booster Pump Stations

The hydraulic model includes 10 booster pump stations with 28 individual pumps. Pump stations were modeled as multiple point curves based on the pump curves or design points based on pump design flow and total dynamic head that the City provided. The hydraulic characteristics for each pump are summarized in Table 1.5.

Table 1.5 Modeled Booster Pump Summary

Name	From Zone	To Zone	Pump Information			
			Pump ID	Status	Power (HP)	Design Capacity (gpm)
Angelo BPS	343 – Butler (Transmission)	455 – LPH	ANGELO-1	Active	75	1,000
			ANGELO-2	Active	75	1,000
			ANGELO-3	Active	75	1,000
			ANGELO-4	Active	75	1,000
Butler BPS	343 – Butler (Transmission)	455 – LPH	BUTLER-1	Active	50	800
			BUTLER-2	Active	60	600
Crown Road BPS	343 – Butler (Transmission)	542 – Gregg	CROWN_RD-1	Active	75	800
			CROWN_RD-2	Active	75	800
Forest Home BPS	285 - Downtown	455 – LPH	FOREST_HOME-PMP	Active	50	1,000
Green Mountain Estates BPS	544 – Lacamas	695 – GME	GME_1	Active	15	180
			GME_2	Active	15	180
			GME_3	Active	15	180
			GME_4	Active	60	650
			GME_5	Active	60	650
Gregg BPS	455 – LPH	542 – Gregg	GREGG-1	Active	100	1,500
			GREGG-2	Active	100	1,500
			GREGG-3	Active	15	500
Lacamas BPS	455 – LPH	544 – Lacamas	LACAMAS-1	Active	25	500
			LACAMAS-2	Active	25	500
			LACAMAS-3	Active	100	1,500
Lower Prune Hill BPS	455 – LPH	852 – UPH	LPH-1	Active	150	1,000
			LPH-2	Active	150	1,000
			LPH-3	Active	100	750
Upper Prune Hill BPS	852 – UPH	852 – UPH	UPH-1	Active	20	750
			UPH-2	Active	20	750
			UPH-3	Active	40	1,400
			UPH-4	Active	40	1,400
Francis Road BPS	455 – LPH	550	FRANCIS_RD-1	Active	7.5	80

Notes:
(1) Source: City of Camas 2019 Water System Plan Update.
BPS - booster pump station; GME - Green Mountain Estates; HP - horsepower.

1.5.6 Control Valves

The City's distribution system includes 39 PRV stations with 71 individual valves, which convey and regulate water between zones and/or storage tanks. PRVs are hydraulically operated valves that modulate open and closed to maintain the downstream pressure setpoint, allowing distribution systems to transfer water from upper pressure zones to lower pressure zones without exceeding design pressures in the lower zones or dropping the pressures of the higher zone. Typically, PRV stations are configured with several valves in parallel, each with a different downstream pressure setpoint for redundancy. All PRVs listed in the table below were modeled, but for modeling purposes if a PRV station had more than one valve, only the largest diameter PRV was simulated (smaller diameter PRV was closed). Pressure reducing valves were adjusted to match field recorded data or reported setpoints and hydraulic grade lines from City provided documents flow control valves are another control valve that limit flow to a specified flowrate. Valves for all supply sources are modeled as FCVs. PSV are also another type of control valve that maintains a set pressure on the suction or discharge of the valve depending on the control configuration. Several of the City's booster pump stations have pump control valves that modulate open and closed for the pump to operate on its curve. In these instances, a pressure sustaining valve was modeled at a specified setpoint to match station flow to values typically seen in historical supervisory control and data acquisition (SCADA) data.

A system valve station typically consists of several valves that are standby, or backup. In addition to independent PRV stations, many pump stations have a bypass PRV that enables water to flow to a lower zone during an emergency. Pump station bypass PRV's were not modeled as part of this project.

The details for each of the City's PRV's are summarized in Table 1.6 and PSV's summarized in Table 1.7

Table 1.6 Pressure Reducing Valves

PRV Station	PRV Model ID	Size (inches)	Downstream Zone	Downstream Setting (psi)	Upstream Pressure (psi)
NW McIntosh	PRV-1	6	697	27	120
	PRV-2	2	697	32	120
NW Payne Rd. and SE 201st Ave.	PRV-3	8	544	Closed	Closed
	PRV-4	4	544	Closed	Closed
NW 16th Ave. and Klickitat	PRV-5	10	697	12	105
	PRV-6	4	697	22	105
NW Ivy and Fargo	PRV-7	4	734	45	90
NW 22nd and Fargo	PRV-8	4	697E	65	130
NW 19th Ave. and Fargo	PRV-9	6	687	70	157
NE 21st and Everett	PRV-10	8	343	45	110
NE 19th and Everett	PRV-11	6	343	40	110
2349 NW 32nd Circle	PRV-12	8	680	25	120
	PRV-13	2	680	30	120
NW Brady Rd. and Deer Creek	PRV-14	8	547	25	105
	PRV-15	3	547	30	105

PRV Station	PRV Model ID	Size (inches)	Downstream Zone	Downstream Setting (psi)	Upstream Pressure (psi)
NW Parker St. and Linear	PRV-16	8	544	Closed	Closed
NW Astor and 36th (Applewood)	PRV-17	8	612	55	90
	PRV-18	2	612	65	90
NW 43rd and Sierra	PRV-19	8	544	30	190
NW 23rd Ave. and Fargo	PRV-20	4	734	45	130
2666 NW Logan St. off NW 28th	PRV-21	6	782	50	90
	PRV-22	2	782	55	90
2929 NW 31st and NW Dahlia Dr.	PRV-23	6	544	Closed	Closed
	PRV-24	2	544	Closed	Closed
NW 29th Ave. and NW Astor St.	PRV-25	2	800	58	90
	PRV-26	6	800	53	90
NW Sierra Dr. and NW 38th Ave.	PRV-27	6	711	35	115
	PRV-28	2	711	40	115
Currawong Ct. and NW 40th Ave.	PRV-29	6	711	75	145
	PRV-30	2	711	80	145
NW 23rd Ave. and Iris	PRV-31	8	656	58	130
	PRV-32	2	656	63	130
NW Julia St.	PRV-33	8	544	Closed	Closed
	PRV-34	2	544	Closed	Closed
NW Fern Ridge Dr.	PRV-35	2	547	40	110
	PRV-36	8	547	35	110
NE 6th and NE Hayes St	PRV-37	4	343	68	94
	PRV-38	12	343	58	94
East End Walden	PRV-41	2	442	37	84
	PRV-42	6	442	32	84
West End Walden	PRV-43	1.5	442	72	118
	PRV-44	6	442	67	118
NE 6th and Joy	PRV-45	6	343	55	92
Goot Park	PRV-46	3	343	115	138
	PRV-47	10	343	110	138
Lake Ridge Lower	PRV-48	2	581	55	98
	PRV-49	6	581	50	98
Lake Ridge Middle	PRV-50	2	675	63	91
	PRV-51	6	675	58	91
Lake Ridge Upper	PRV-52	2	745	68	123
	PRV-53	6	745	63	123

PRV Station	PRV Model ID	Size (inches)	Downstream Zone	Downstream Setting (psi)	Upstream Pressure (psi)
702 NW View Ridge St. (Dovehill) Upper	PRV-54	2	542S	30	100
	PRV-55	6	542S	25	100
NW 7th and Valley (Dovehill) View Ridge Lower	PRV-56	2	542S	40	110
	PRV-57	6	542S	35	110
NW Fargo and 27th (Drewf's Farm Upper)	PRV-58	2	734	Open	63
	PRV-59	6	734	Open	63
905 NW 30th Ave. and NW Ivy Ln. (Drewf's Farm Lower)	PRV-60	2	710	60	130
	PRV-61	6	710	55	130
NW Ivy and Ostenson Canyon	PRV-62	2	694	65	140
	PRV-63	6	694	60	140
NW 24th Ave and NW Brady Rd	PRV-64	6	625	70	124
	PRV-65	2	625	75	124
2011 NW Larkspur St	PRV-66	6	625	45	132
	PRV-67	2	625	50	132
Wellfield East	PRV-69	12	343	100	125
	PRV-70	4	343	Closed	Closed
NE 277th and NE 14th St.	PRV_SSP	6	542	78	140
	V9093	3	542	88	140

Notes:
psi - pounds per square inch.

Table 1.7 Pressure Sustaining Valves

PSV Station	PSV Model ID	Size (inches)	Pressure Setpoint (psi)
Angelo BPS	PSV-ANGELO	8	140
Crown Rd. BPS	PSV-CROWNRD	8	180
Gregg BPS	PSV-GREGG	12	140
Lower Prune Hill BPS	PSV-LPH	6	250

1.5.7 Facility Controls

Facility controls are set for pumps and control valves for supply sources to match actual distribution system conditions. Input from City operations staff and review of SCADA data were used to determine setpoints. Typically, pumps are set with controls to turn on and off at specified tank levels, and PRVs and FCVs may be similarly set to open and close to maintain specified tank levels. For modeling purposes, pumps supplying "closed" zones were modeled having a variable speed control set to maintain a downstream junction pressure setpoint. The specific controls developed are summarized in the tables below. Booster pump station controls are summarized in Table 1.8 noting on/off settings and controlling facility. Supply source controls are summarized in Table 1.9 defining on/off settings, controlling facility and flow setpoint. Controls for miscellaneous facilities like pipes and tank altitude valves are provided in Table 1.10, respectively.

Table 1.8 Pump Station Controls

Pump	On Setting	Off Setting	Control Location
ANGELO-1	Level < 22 feet	Level > 22.5 feet	LPH Reservoir
ANGELO-2	Level < 21 feet	Level > 22 feet	LPH Reservoir
ANGELO-3	Level < 21 feet	Level > 21.5 feet	LPH Reservoir
ANGELO-4	Level < 20.5 feet	Level > 21 feet	LPH Reservoir
BUTLER-1	None	None	None
BUTLER-2	None	None	None
CROWN_RD-1	Level < 57 feet	Level > 66 feet	Gregg Reservoir
CROWN_RD-2	Level < 54 feet	Level > 61 feet	Gregg Reservoir
FOREST_HOME_PMP	00:00	10:00	Time
FRANCIS_RD_PMP	80 psi	None	DS Junction
GREGG-1	None	None	None
GREGG-2	None	None	None
GREGG-3	Level < 59 feet (Pump Setting = 0.82)	Level > 66 feet	Gregg Reservoir
GME_1	140 psi	None	DS Junction
GME_2	None	None	None
GME_3	None	None	None
GME_4	None	None	None
GME_5	None	None	None
LACAMAS-1	Level < 30 feet	Level > 32 feet	Lacamas Reservoir
LACAMAS-2	Level < 32 feet	Level > 34 feet	Lacamas Reservoir
LACAMAS-3	Level < 40 feet	Level > 44 feet	Lacamas Reservoir
LPH-1	Level < 60 feet	Level > 92 feet	On = UPH 2.4 MG Reservoir Off = UPH Standpipe
LPH-2	Level < 52 feet	Level > 86 feet	On = UPH 2.4 MG Reservoir Off = UPH Standpipe
LPH-3	Level < 58 feet	Level > 89 feet	On = UPH 2.4 MG Reservoir Off = UPH Standpipe
UPH-1	Level < 88 feet	Level > 92 feet	UPH Standpipe
UPH-2	Level < 86 feet	Level > 90 feet	UPH Standpipe
UPH-3	Level < 84 feet	Level > 88 feet	UPH Standpipe
UPH-4	Level < 80 feet	Level > 86 feet	UPH Standpipe

Notes:
(1) Source: Hydraulic Model.
DS – downstream.

Table 1.9 Supply Source Controls

Supply Source	On Setting	Off Setting	Control Location	Flow Setting (gpm)
Well_5	00:00	10:00	Time	650
Well_6	None	None	None	0
Well_7	None	None	None	0
Well_8	Level < 13 feet	Level > 13.25 feet	Butler Reservoir	1,250
Well_9	Level < 41 feet	Level > 43 feet	Lacamas Reservoir	575
Well_10	Level < 13 feet	Level > 13.1 feet	Butler Reservoir	900
Well_11	None	None	None	0
Well_12	Level < 13.9 feet	Level > 14 feet	Butler Reservoir	1,000
Well_13	Level < 13.7 feet	Level > 14 feet	Butler Reservoir	1,350
Well_14	Level < 13.2 feet	Level > 13.4 feet	Butler Reservoir	850

Table 1.10 Miscellaneous Controls

Facility Name	On Setting	Off Setting	Control Location	Flow Setting (gpm)
UPH Res Altitude Valve	Level < 58 feet	Level > 62.1 feet	UPH 2.4 MG Reservoir	1,800
P419 (18th Ave Res Inlet/Outlet Pipe)	Lacamas Pump 3 = OFF Lacamas Level > 44 feet	Lacamas Pump 3 = ON Lacamas Level < 40 feet	None	N/A

1.6 Hydraulic Model Calibration Process

This section of the report builds upon the previous project memorandum (PM) developed for this project and is described below:

- **PM - Summary of Hydrant Field Testing** – This document was developed to capture hydrant testing activities and data gathered to support the steady state calibration of the City's distribution system.

This section summarizes the overall methodology employed to calibrate the City's water system hydraulic models and the calibration results, including a detailed description of each of the major components of the model calibration process. The hydraulic model was calibrated in accordance with American Water Works Association (AWWA) Manual on Distribution Network Analysis of Water Utilities (AWWA M-32). Both an extended period simulation calibration and a steady state fire flow calibration were performed for the water system.

1.6.1 Model Scenarios

The scenarios created in the model for calibration and hydraulic analysis purposes are described below and include the following:

- **Extended Period Simulation (EPS) Calibration** - This scenario is for a 24-hour period, simulating system operation and demand conditions for the selected day of calibration. Controls for the facilities were developed and/or updated as part of the EPS model calibration to mimic typical system operations. Demands for the day of EPS calibration are summarized below in Table 1.11.

- **Steady State Fire Flow Scenarios** -– There were 10 hydrant flow tests performed across the City's system that the hydraulic model was calibrated to. Each hydrant test has two separate model scenarios, a static demand and fire flow demand. Each scenario has its own scenario with different demand sets and control sets based on the demand and operations on the day the test was performed. Demands for the days of fire flow calibration are summarized below in Table 1.11.
- **Average Day Demand (ADD)** - A total of five individual ADD scenarios were created. . Each individual scenario utilizes an ADD demand set developed using medium scenario projections for existing (2025), 2031, 2036, 2046, and buildout planning years. Demand sets for the 2031, 2036, and 2046 planning years will be used for hydraulic analysis. Modeled ADD for each planning year is summarized below in Table 1.12.
- **Maximum Day Demand (MDD)** - A total of five individual MDD scenarios were created. Each individual scenario utilizes an MDD demand set developed using medium scenario projections for existing (2025), 2031, 2036, 2046, and buildout planning years. Demand sets for the 2031, 2036, and 2046 planning years will be used for hydraulic analysis. Modeled MDD for each planning year is summarized below in Table 1.12.

The EPS Calibration and the Steady State Fire Flow scenarios are included in the model as a reference to the calibration of the model which is described in Section 6.5.5 of this report and should not be used to perform analysis on the system. Rather, the ADD and MDD scenarios should be used for analysis.

Table 1.11 Calibration Scenario Demand Summary

EPS Calibration Demands (gpm)	Demand Basis	Fire Flow Calibration Demand Set 1 (gpm)	Demand Basis	Fire Flow Calibration Demand Set 2 (gpm)	Demand Basis
3,079	10/11/2024	3,218	05/15/2025	2,978	05/16/2025

Table 1.12 ADD and MDD Demand Summary

Planning Year	ADD (gpm)	MDD (gpm)
Existing (2025)	3,243	6,373
2031	3,972	7,994
2036	4,576	9,208
2046	5,805	11,686
Buildout	10,986	22,727

1.6.2 Operational Considerations

During calibration, it is necessary to adjust the operation of facilities to meet the demand, pressures, and/or reservoir levels of the water system. Pump stations were turned on or off based on downstream pressures or reservoir levels. Supply sources were adjusted to meet scenario demands and cycle the storage reservoirs. The City has the flexibility to alternate supply source operations to evenly distribute wear on the pumps and turn pumps on/off to meet demand conditions for each day as needed. Therefore, the facility controls for supply sources summarized in section 6.3.7 capture the operational statuses for wells on the selected day of EPS calibration. Furthermore, for future planning scenarios where demands increase significantly, additional supply sources and pump station capacities will be required. Control settings and flows for future capacities are not summarized in this report, rather the supply and pump station capacity improvements will be captured in Chapter 9 of the 2026 WSPU.

1.6.3 Diurnal Pattern Development

As part of the EPS calibration process, diurnal patterns were developed for individual pressure zones (where applicable) for the water system. In one case, several of the City's larger pressure zones could not be isolated to create individual diurnal patterns and were combined to develop a grouped zone diurnal pattern. These individual and grouped diurnal patterns were developed based on the selected calibration date. They were applied to each of the respective hydraulic models for use in EPS model simulations. For individual diurnal patterns, see Appendix 1A. Due to limitations in compiling SCADA data for various facilities, the diurnal patterns developed are only representative of a single day. The City maintains a system integrator to generate queries which helps automate compiling SCADA into an excel spreadsheet format. However, for facilities that did not yet have a query created, hourly instantaneous data points were manually recorded using pencil and paper. If more comprehensive SCADA data is available in the future, the diurnal patterns can be refined to be more representative of typical conditions, and the group zone diurnal pattern can be further isolated to create individual diurnal patterns.

1.6.4 Model Calibration Data Collection

Carollo coordinated with City staff regarding SCADA and field data needs that were required to calibrate the hydraulic model. The required calibration data included site maps for specific fire flow test locations, pressure logger locations, and included a list of the SCADA data needs, durations, time intervals, and units. This section summarizes the data collection process that was conducted and how the data will be used to support calibration efforts.

- **SCADA Data Gathering for EPS Model Calibration**: For the EPS data gathering period, Carollo coordinated with City staff to obtain 1 minute data for SCADA points within the distribution system, including flow, and pressure data and reservoir levels. These data, spanning the period from July 2024 to October 2024, were primarily used to generate the diurnal pattern and for EPS model calibration. As discussed in Section 6.5.3, there were difficulties in obtaining SCADA data for certain facilities without a SCADA query. For the locations with no queries, the trends and cleanliness of data were observed during the period of temporary pressure logger deployment. Upon identifying October 11, 2024, as the date with most representative system condition trends, instantaneous data recordings for these facilities were manually recorded using pencil and paper.
- **Temporary Pressure Logger Installation for EPS Calibration:** In addition to the data obtained from the SCADA system from the major system facilities, Carollo also provided temporary pressure loggers that were connected to hydrants to capture pressure fluctuations at key points within the distribution system. The data obtained from the temporary loggers consisted of 1-minute pressure data. The pressure loggers were installed by City staff in the distribution system for a one-week period during October of 2024.
- **Hydrant Flow Testing for Fire Flow (Steady State) Calibration:** Field testing for fire flow calibration took place on May 15 and 16 of 2025. Carollo coordinated with City staff to conduct 10 hydrant flow tests across the distribution system. Specific details related to hydrant flow testing activities are detailed in Table 1.13.
- **SCADA Data Gathering for Fire Flow (Steady State) Calibration:** For the fire flow calibration data gathering period, Carollo coordinated with City staff to obtain 1 minute SCADA data for all pump statuses and reservoir levels within the distribution system during the hydrant flow testing period (May 15 and May 16 of 2025). This data was used to identify boundary conditions in the distribution

system (pump on/off status, reservoir level, etc.) at the time of each hydrant flow test. These boundary conditions were then matched in the model to calibrate each fire flow location. City operations staff provided pump statuses for all booster pump stations without SCADA queries.

1.6.5 Model Calibration Methodology and Results

The purpose of a water system hydraulic model is to estimate, or predict, how the water distribution system will respond under a given set of conditions. One way to assess the accuracy of the hydraulic model is to create a set of known conditions in the water system and then compare the results observed in the field against the results of the hydraulic model simulation using the same conditions. Flow tests conducted in the field on the water system can yield a profound tool in verifying data used in the hydraulic model and a greater understanding of how the water system operates.

Field testing can indicate errors in the data used to develop the hydraulic model or show that a condition might exist in the field not otherwise known. Valves, which are reported as being open, may be closed (or vice versa), an obstruction could exist in a pipeline, or pressure settings for a PRV may be slightly different than noted. Field testing can also correct erroneous model data such as incorrect pipe diameters or incorrect connectivity.

Data obtained from the field tests can be used to determine appropriate roughness coefficients for certain groups of pipe or areas in the City's distribution system, as roughness coefficients can vary with age and pipe material. Other parameters can also be adjusted to generate a calibrated model.

The calibration process for the City's water distribution system hydraulic model consisted of two parts, a macro (EPS) calibration and a fire flow test (Steady State) calibration. The EPS and fire flow calibrations are summarized for each system individually in the following sections.

1.6.5.1 Extended Period Simulation Calibration

The purpose of extended period simulation calibration is to demonstrate the hydraulic model's ability to accurately mimic the real-world operations of the distribution system facilities, including pressure fluctuations, tank fill/drain cycles, PRV station operation, and pump station operations. The primary varied parameters for this calibration were operational controls, with other parameters also being adjusted as calibration results were generated.

The first step in the EPS calibration process is the selection of a calibration day. The selected date of calibration was October 11, 2024. The calibration date was chosen based on SCADA data cleanliness, as well as being a day which field installed pressure loggers were deployed in the distribution system.

The billing data that was allocated in the hydraulic model was scaled to match the demands for the calibration day as noted in the following sections.

The EPS calibration compared model simulated supply source and pump station flows, pump station discharge and suction pressures, and tank levels to the field measured data. In addition, model simulated pressures at the pressure logger locations were compared to the actual field pressures and flows recorded during the calibration day. Model results and SCADA are compared for the City's distribution system for all the monitored facilities and are presented in Appendix 1B.

To assess calibration accuracy, different comparisons can be made. As it is not possible to calibrate while optimizing for all hydraulic variables, considering multiple calibration points together is instructive. One variable may visibly align (match) between SCADA observed and model simulated, while another variable may not match. For example, the value or magnitude may match, but the timing may not. For example, booster pump or well supply setpoints in the model may accurately simulate the normal low water level and normal high-water level of a storage tank, but the model simulated timing (occurrence) of the low and high-water levels may not match SCADA data. Thus, observing a trend over time – as evaluating an average value or a trend – can provide clarity into model calibration accuracy.

In several instances, model simulated results do not match SCADA data due to known circumstances. One reason for known discrepancies is incomplete or unavailable SCADA data for certain facilities, which prevents the ability to fully match system conditions. Having incomplete SCADA data for certain facilities, also prevented the development of diurnals for certain pressure zones as discussed previously. Another reason is that some of the available SCADA data is comprised of instantaneous readings in 1-hour increments, which prevents the ability to determine when pumps turn on and off. These circumstances contribute to model simulated results not matching SCADA data for various facilities and areas of the systems.

Graphs summarizing the EPS model calibration results are presented in the following figures. The calibration graphs include a dashed interior line that represents equivalent average SCADA and average simulated model values with confidence bands. The confidence bands represent a targeted deviation between SCADA and model values. For tanks, this confidence band is +/- 2 feet (ft), for pumps, +/- 10 percent gpm and for pressure +/- 5 pounds per square inch (psi). Select calibration points located outside of the confidence band are labelled for reference.

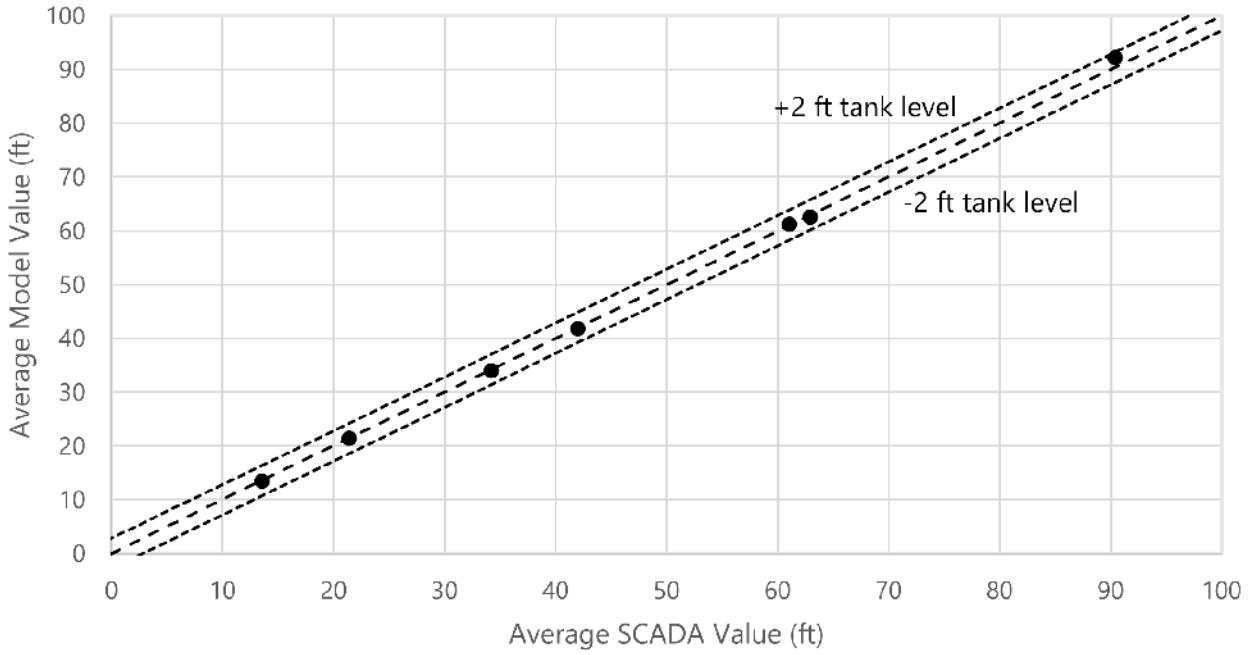


Figure 1.1 EPS Tank Calibration Accuracy Graph

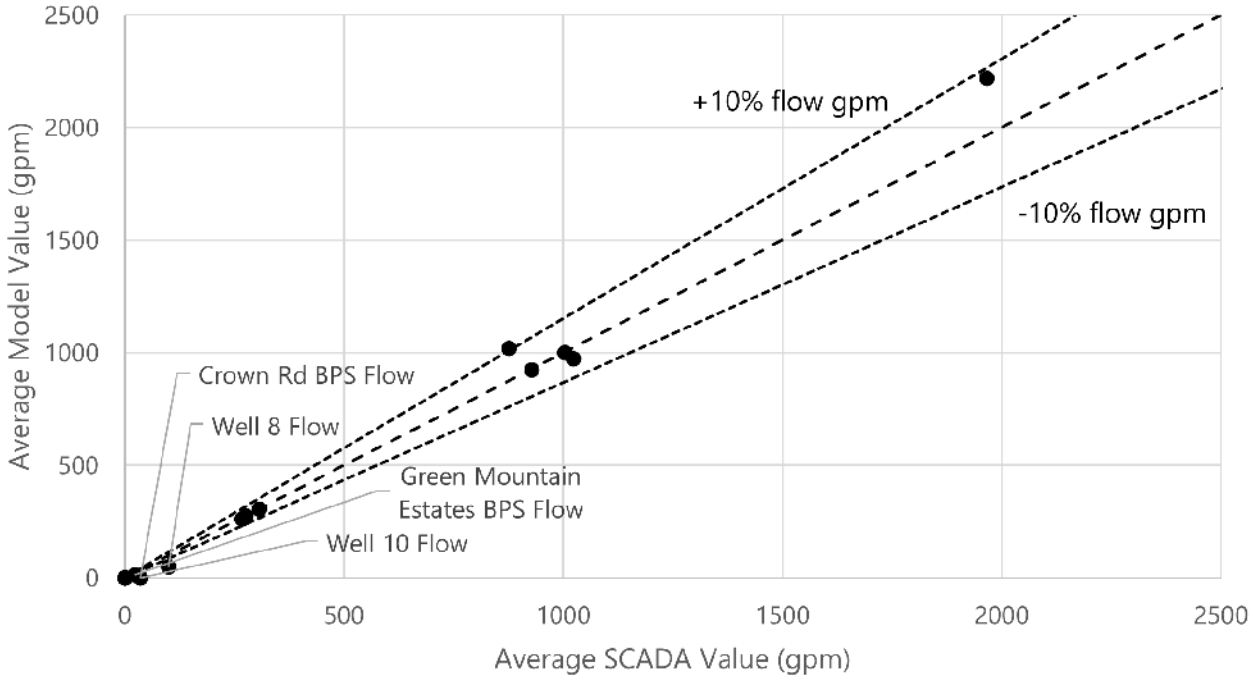


Figure 1.2 EPS Pump Calibration Accuracy Graph

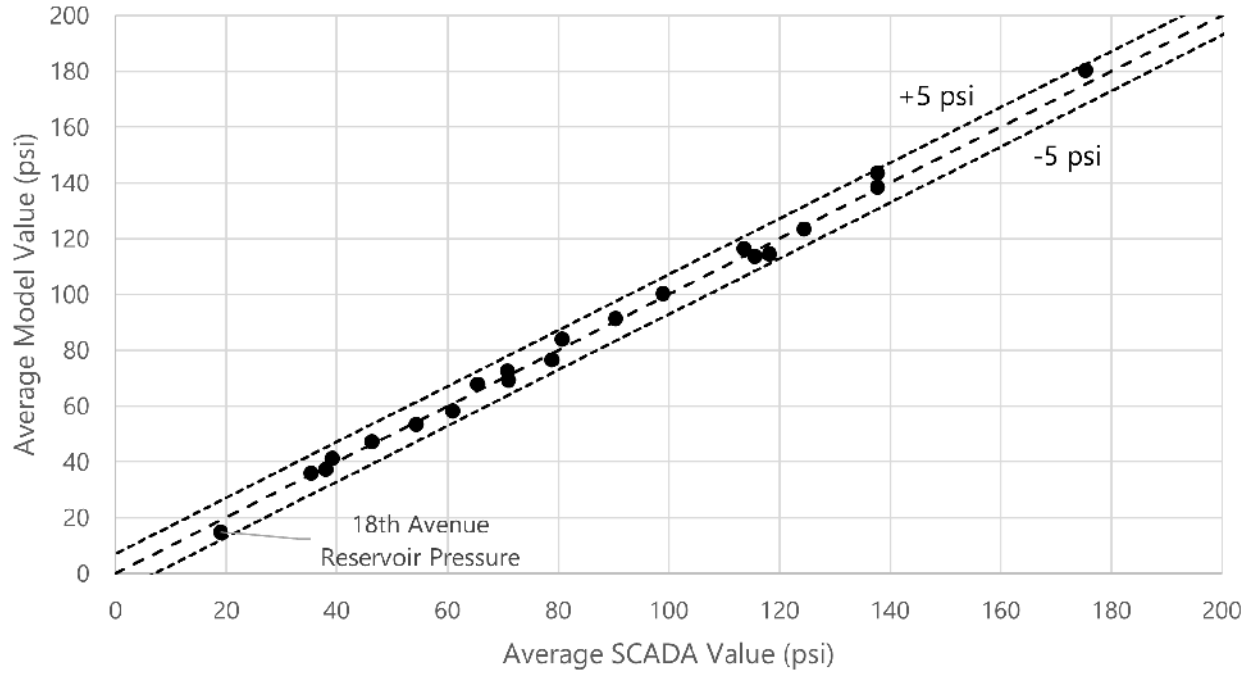


Figure 1.3 EPS Pressure Calibration Accuracy Graph

The graphs above indicate that tank levels and system pressures have an optimal calibration. Percent variance between modeled and SCADA values for tank levels are less than 2 percent and for pressures all but one of the calibration locations are within a 5 percent tolerance between modeled and SCADA values. The one exception is the 18th Avenue Reservoir pressure point; it was determined that this SCADA point is monitoring pressure based on tank level at the reservoir site. Since the tank level calibrated well at the 18th Avenue site, the pressure was determined to be negligible. Pumps generally calibrated well, with most calibration points falling within an acceptable tolerance between modeled and SCADA. The points with greater than 10% variance between modeled and SCADA are noted in Figure 1.3 with a callout. Well 8 and 10 were both supply sources that showed a high variance between modeled and SCADA data. This can likely be attributed to the total runtime of these respective wells during each hour of the calibration day. SCADA data for Well 8 showed the well was operational twice during the day but only ran for approximately 45 minutes each time. Likewise for Well 10, SCADA data showed the well operated for only 30 minutes on the day of calibration. Since model results were only reported in hourly timesteps, it is likely that these wells turned on/off in the model between the hour. The two booster pump stations that showed a higher were Crown Road and GME. In a discussion with City operations staff, it was discovered that Crown Road has a complex control strategy with another booster pump station (New Gregg BPS) that serves the 542 – Gregg Zone. To prevent model convergence issues, New Gregg BPS was modeled as the lead source of supply to this zone, with Crown Road BPS serving as the backup. Since New Gregg BPS was able to keep up with demand, Crown Road did not run in the EPS calibration scenario even though SCADA data showed it was operational. GME BPS showed high variance due to the way in which it was modeled. In reality, GME is equipped with a surge tank that maintains discharge pressure to prevent over cycling of pumps. The GME pumps kick on when pressure in the surge tanks drops (surge tank is emptying). However, the surge tank was not modeled and instead GME pumps were modeled as variable speed pumps with downstream pressure controls. The difference between the modeled field controls were the cause for significant difference in magnitude for maximum flows.

The results of each individual calibration location are presented in Appendix 1B. The minimum/maximum and general trends of modeled values are comparable and within acceptable tolerances to those seen in SCADA data with exceptions to the calibration locations noted above. Although, the timing of facilities turning on/off and peaks observed in system pressures are slightly variable at some calibration points. An example of this can be a well turning off in the model one hour later than what is observed in SCADA. As previously noted, finetuning diurnal patterns could improve timing of modeled simulated results.

1.6.5.2 Fire Flow Calibration

The purpose of fire flow calibration is demonstrating the model's ability to accurately replicate the performance of the distribution system during extreme demand conditions, such as when fire hydrants are being operated. The primary varied parameter for this calibration is pipeline roughness coefficient, although other parameters were also adjusted as calibration results are generated.

Hazen-Williams roughness coefficients, or C-factors, have industry accepted value ranges based on pipeline material, diameter, and age. Characteristics specific to City's water distribution system such as water quality, temperature, construction methodologies, material suppliers, and other factors may result in roughness coefficients that differ from the average of the industry accepted ranges. Fire flow calibration refines the initial estimation of the value of roughness coefficients that best indicate the conditions of the City's distribution system.

During average day flows, roughness coefficients have a relatively small effect on the operation of the distribution system. However, as the flows increase in the system on higher demand days, velocity within pipelines increases and roughness coefficients contribute more to overall system headloss. Fire flow tests artificially create high demand events to generate more headloss, allowing a better estimation of the pipeline roughness coefficients.

Fire flow tests stress the distribution system by creating a differential between the HGL at the point of hydrant flow and the system HGL at neighboring hydrants. This HGL differential increases the effect of the roughness coefficients on system losses and allows adjustments to the model to match model pressures to field pressures within an acceptable tolerance. As the model is adjusted to match system pressures, roughness coefficients should be adjusted only within a tolerance of industry accepted roughness coefficient ranges. If a model is unable to match the calibration results within the acceptable range of roughness coefficient values for a given pipeline material and age, there may be cause for further investigation. Often, a previously unknown field condition may be discovered. Examples of such conditions, which typically arise during hydraulic model calibration, include closed valves, partially closed or malfunctioning valves, extreme corrosion within pipelines, connectivity, and diameter errors in GIS layers or record drawings, and diurnal patterns of large water users.

A separate hydraulic model scenario was created for each flow test for both the static and the dynamic, or flowing, condition for each of the 10 fire flow calibration scenarios. The flow observed at each fire flow hydrant was assigned as a demand to the model node at the location of the hydrant. Residual pressures were then read at each hydrant location while the hydrant was flowing. To assess model result accuracies, the modeled static and residual pressures were compared to the field measured static and residual pressure, and then a percent different between the two values were calculated. Model results were considered acceptable if the pressure drops fell within a 10 percent tolerance or a 10 psi value. Specific details pertaining to each hydrant test are provided in Table 1.13. Furthermore, a summary of the fire flow calibration results is presented in Table 1.14.

Table 1.13 Hydrant Test Locations

Test Site	Pressure Zone	Flow Hydrant ID	Pressure Hydrant 1 ID	Pressure Hydrant 2 ID	Location
1	343 – Downtown	WH200146	WH200144	WH200143	SE 12th Ave
2	343 - Downtown	WH200779	WH200776	WH200777	E 1st Ave / NE Joy St
3	343 – Transmission	WH200802	WH200801	WH200914	NE Garfield St
4	455 – LPH	WH200708	WH200709	WH200992	NW 7th Ave / NW Greeley St
5	852 – UPH	WH200237	WH200236	WH200246	NW 31st Ave / NW Sierra Dr
6	544 – Lacamas	WH200299	WH200298	WH200300	NW 46th Ave / NW Howard St
7	544 – Lacamas	WH200504	WH200503	WH200500	N Alder St / N 96th Ave
8	542 – Gregg	WH200424	WH200423	WH200425	NE Quince Way
9	695 - GME	WH200964	WH200965	WH200963	N 91st Ave
10	697 Zone	WH200860	WH200098	WH200097	NW Deerfern St / NW 14th Ave

Table 1.14 Steady State Fire Flow Calibration Summary

Test Site	Pressure Zone	Field Measured Data(1)			Model Simulated Data		Percent Difference	
		Hydrant Flow (gpm)	Hydrant Pressure (psi)		Hydrant Pressure (psi)			
			Static	Residual	Static	Residual	Static	Residual
1	343 - Downtown	1,100	116	70	116	69	<1%	2%
			115	70	115	69	<-1%	<1%
2	343 -Downtown	1,350	100	80	101	81	<-1%	-1%
			100	83	99	85	1%	2%
3	343 – Transmission	850	54	40	56	39	-3%	3%
			50	35	50	35	<-1%	<1%
4	455 – LPH	1,300	118	99	115	97	3%	2%
			134	120	134	123	<-1%	-2%
5	852 – UPH	1,190	71	64	69	62	4%	3%
			75	72	76	70	-2%	3%
6	544 – Lacamas	1,350	100	82	97	80	3%	3%
			87	66	85	68	2%	-3%
7	544 – Lacamas	1,300	104	84	104	85	<1%	<-1%
			118	101	118	100	<1%	1%
8	542 – Gregg	600	38	28	30	27	22%	4%
			35	24	34	31	3%	-31%
9	695 – GME	950	74	50	75	50	-2%	-1%
			86	62	86	61	<1%	2%
10	697 Zone	1,250	70	67	73	65	-5%	3%
			80	72	80	70	<1%	3%

As shown in Table 1.14, the comparison of model results to observed field data is within a 5 percent tolerance for nine of the fire flow calibration locations, which indicates an excellent calibration at these locations. The remaining fire flow calibration location exceeded the acceptable 10 percent tolerance. This is likely due to elevations being inaccurate in the DEM file. The area this test was conducted in was a recently developed area and it was assumed that significant grading likely lowered the ground elevation, though there was available data that could confirm this assumption. Additionally, there may have been a pipe in that was modeled as a larger diameter reducing headloss at the test location. Pipe diameters will be verified with the City, and any discrepancies will be addressed before recalibrating the model at this location. Detailed comparisons of model results to observed field data are included in Appendix 1C.

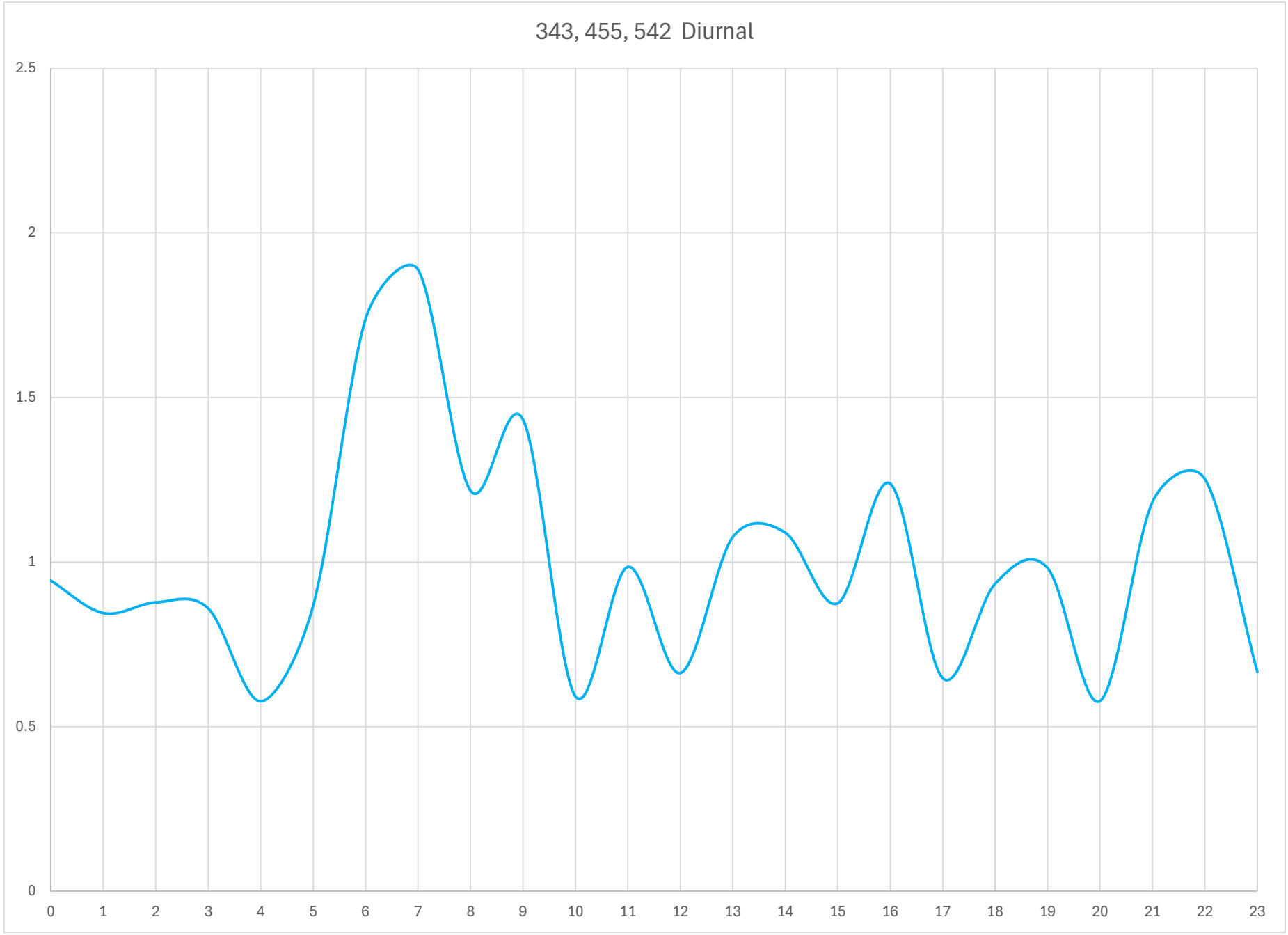
1.7 Calibration Summary

The calibration results indicate that the City's hydraulic model generally predicts conditions similar to those observed in the field.

Based on the results presented in this report, it can be concluded that the model is calibrated to extended period conditions and fire flow conditions. The models provide a reliable representation of the City's distribution system and system operations to a level suitable for hydraulic system analysis.

APPENDIX 1A

DIURNAL PATTERNS


343, 455, 542 Diurnal
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0.5
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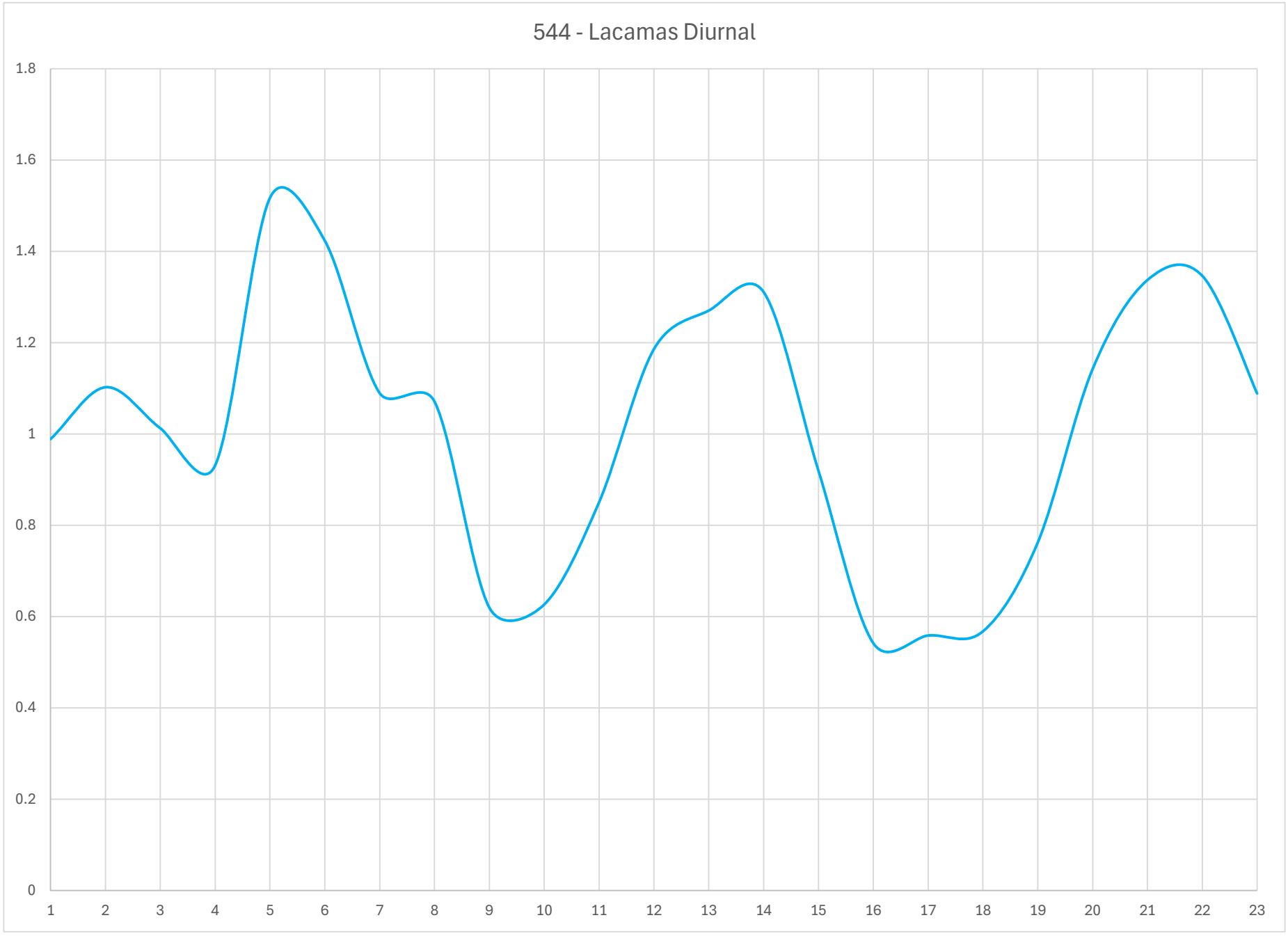
544 - Lacamas Diurnal
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1.4
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0.8
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0.4
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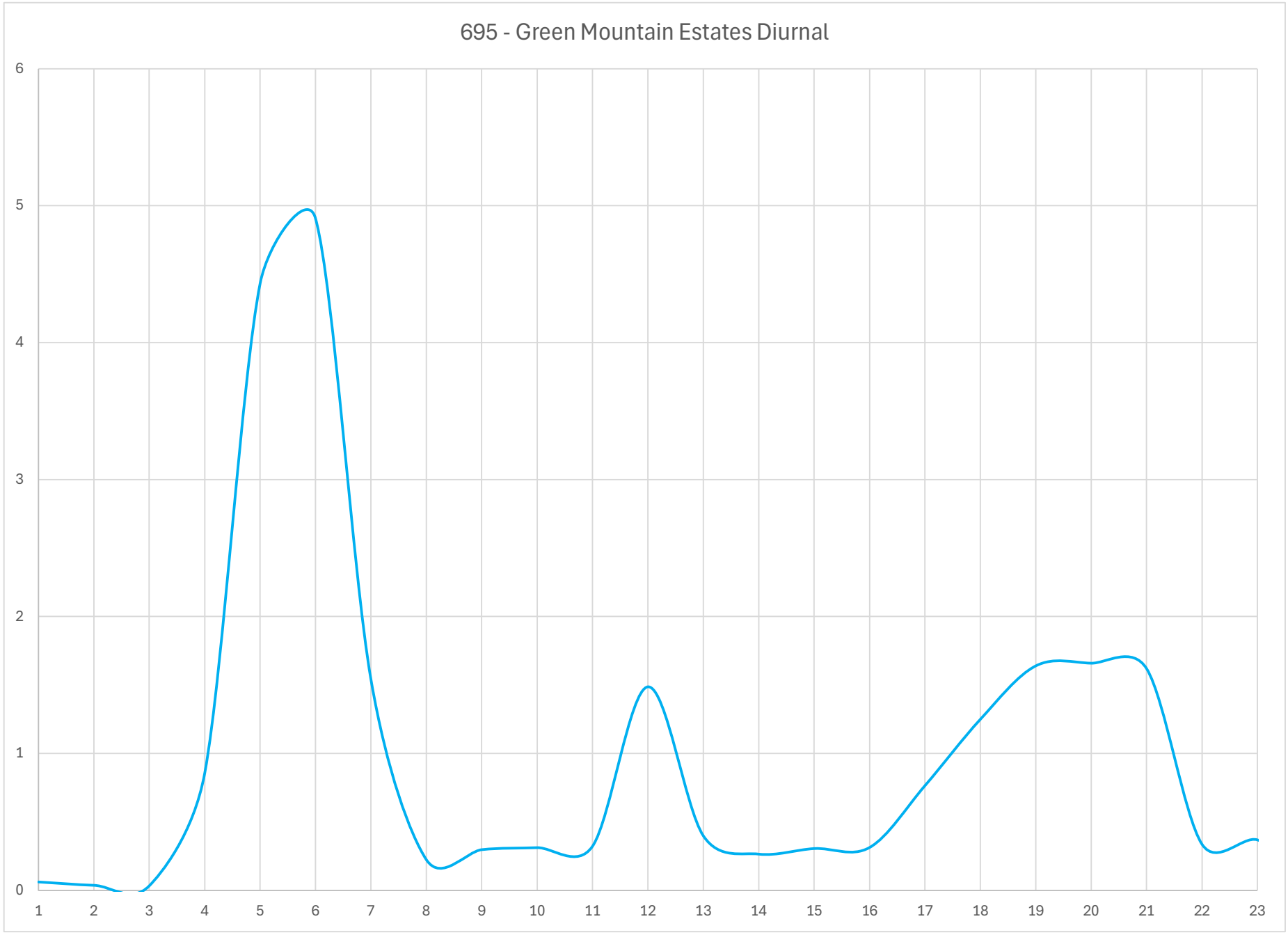
695 - Green Mountain Estates Diurnal
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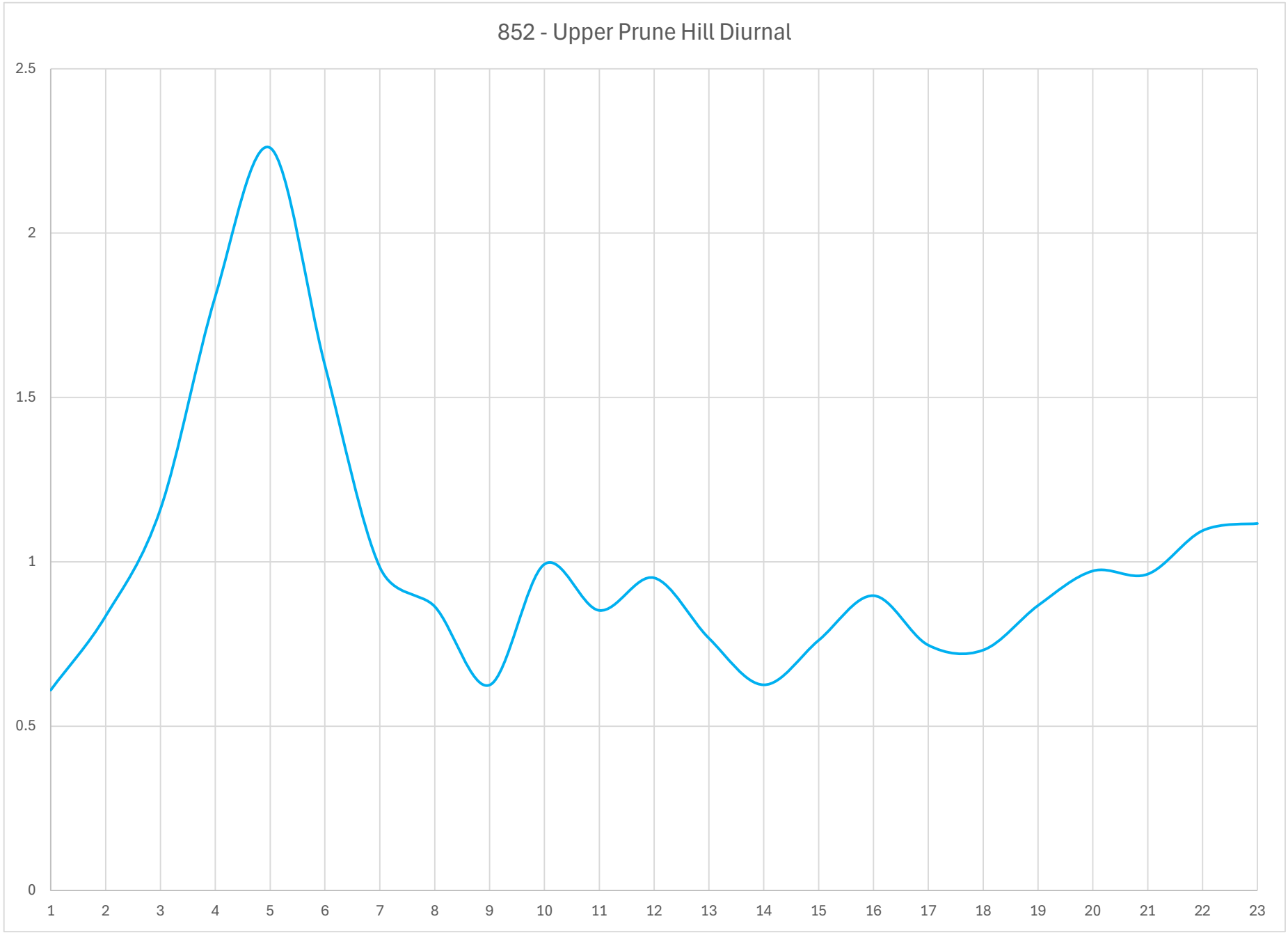
852 - Upper Prune Hill Diurnal
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0.5
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APPENDIX 1B

EPS CALIBRATION

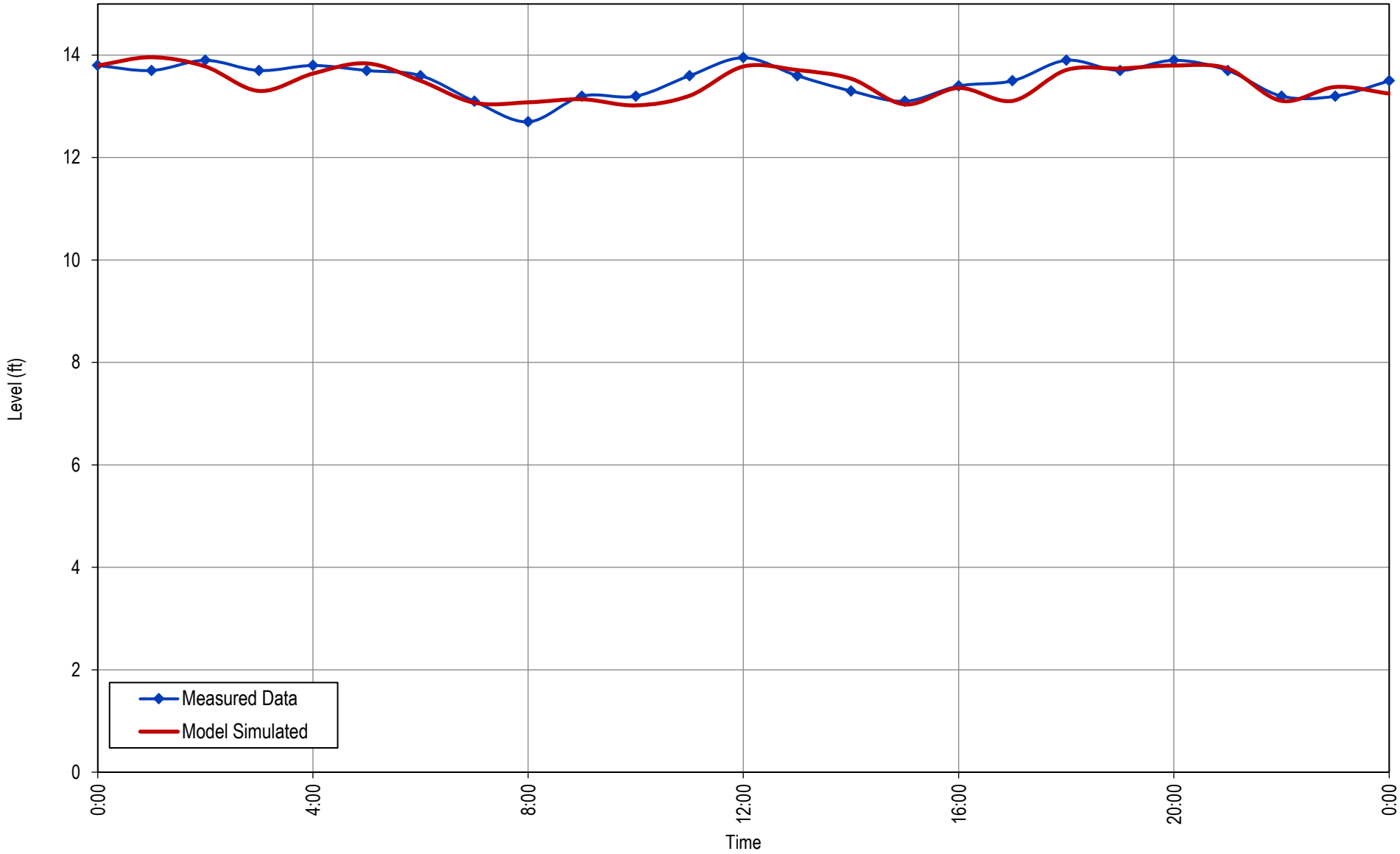
2026 Water System Plan Update
City of Camas
Project Type — Water Distribution System Model Calibration
Project Status — DRAFT
Date — SEPTEMBER 2025
SCADA Data Start Date — **10/11/2024**
Selected Calibration Day = — **10/11/2024**

#	Model Node ID	Cal Point	Units
1	BUTLER	Butler Level	ft
2	LOWER_PRUNE_RES2	Lower Prune Hill Level	ft
3	GREGG	Gregg Level	ft
4	LACAMAS	Lacamas Level	ft
5	18TH_AVE	Anderson Level (18th Ave Reservoir)	ft
6	UPPER_PRUNE_RES	Upper Prune Hill 2.4 MG Level	ft
7	UPPER_PRUNE_STD	Upper Prune Hill Standpipe Level	ft
8	P895	Lower Prune Hill BPS Flow	gpm
9	P2-865	Angelo BPS Flow	gpm
10	P1-910	Butler PRV Flow	gpm
11	P2-656	Lacamas BPS Flow	gpm
12	PS-114	Slow Sand Plant Flow	gpm
13	FCV-52	Well 5 Flow	gpm
14	FCV-62	Well 6 Flow	gpm
15	FCV-72	Well 7 Flow	gpm
16	FCV-82	Well 8 Flow	gpm
17	FCV-92	Well 9 Flow	gpm
18	V-90212	Well 10 Flow	gpm
19	V-90222	Well 11 Flow	gpm
20	V-90232	Well 12 Flow	gpm
21	FCV-42	Well 13 Flow	gpm
22	FCV-142	Well 14 Flow	gpm
23	P665	Green Mountain Estates BPS Flow	gpm
24	P893	Crown Rd BPS Flow	gpm
25	J4-805	Upper Prune Hill Discharge Pressure	psi
26	J1193	Lower Prune Hill Discharge Pressure	psi
27	J1-856	Angelo Discharge Pressure	psi
28	J1-802	Angelo Suction Pressure	psi
29	J2-216	Forest Home Discharge Pressure	psi
30	J1-144	Forest Home Suction Pressure	psi
31	J201	18th Avenue Reservoir Pressure	psi
32	J75	Butler 542 Zone Pressure	psi
33	J4-624	Lacamas Discharge Pressure	psi
34	J2-655	Lacamas Suction Pressure	psi
35	J1191	Crown Road Discharge Pressure	psi
36	J1-402	Crown Road Suction Pressure	psi
37	J355	Green Mountain Estates Suction Pressure	psi
38	J377	Green Mountain Estates Discharge Pressure	psi
39	JS-110	PIT 701 Upstream Pressure	psi
40	JS-111	PIT 702 Downstream Pressure	psi
41	J79	18th Avenue Reservoir (Logger 35)	psi
42	J1-100	Downtown (Logger 37)	psi

43	J1-58	Oak Park, across Ops Center (Logger 49)	psi
44	J1-151	Helen Baller Elementary (Logger 50)	psi
45	J3-388	Dorothy Fox Elementary (Logger 58)	psi
46	J-5062	Union HS (Logger 68)	psi
47	J4-105	Green Mountain Estates (Logger 69)	psi

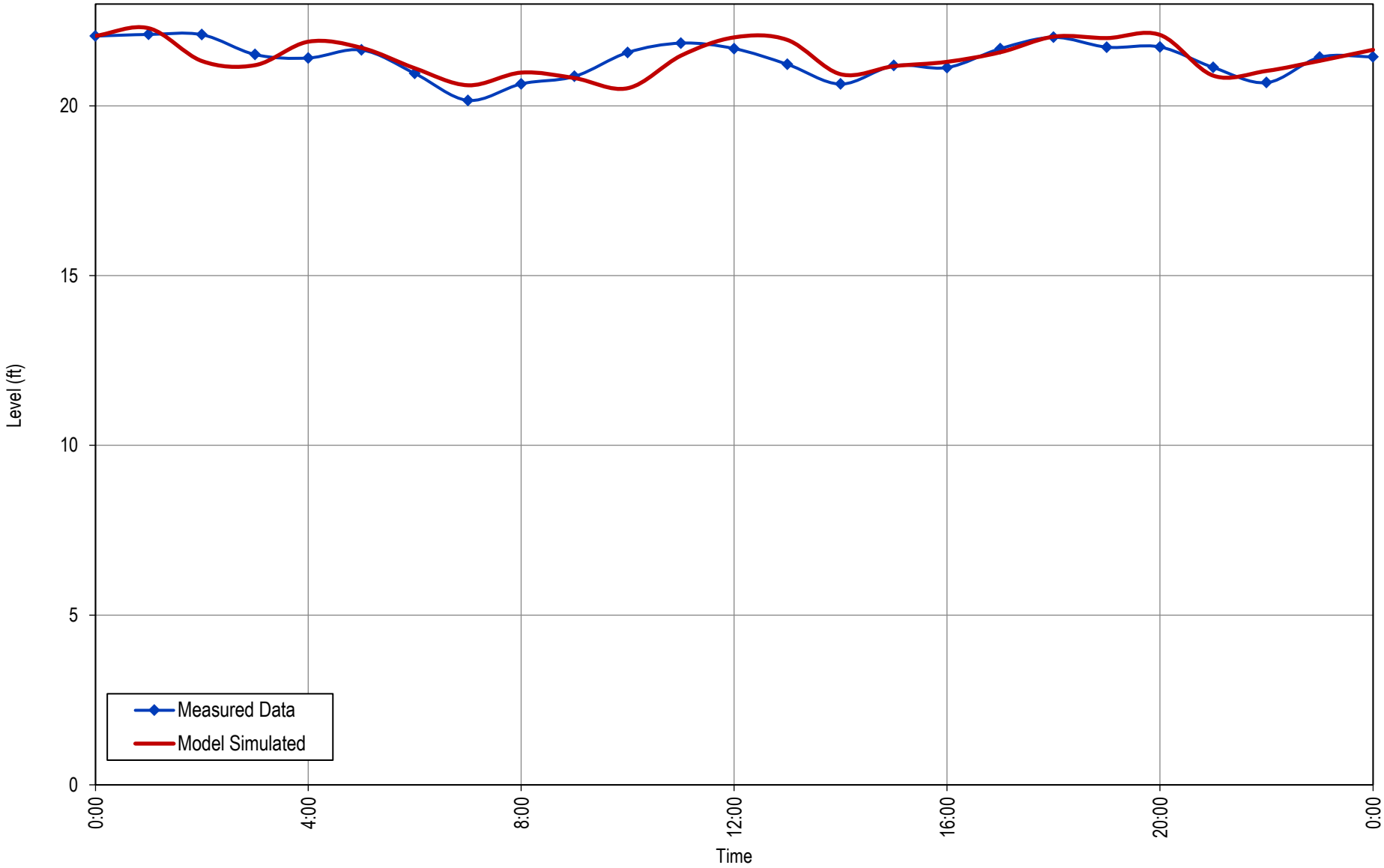
2026 Water System Plan Update

EPS CALIBRATION - BUTLER LEVEL



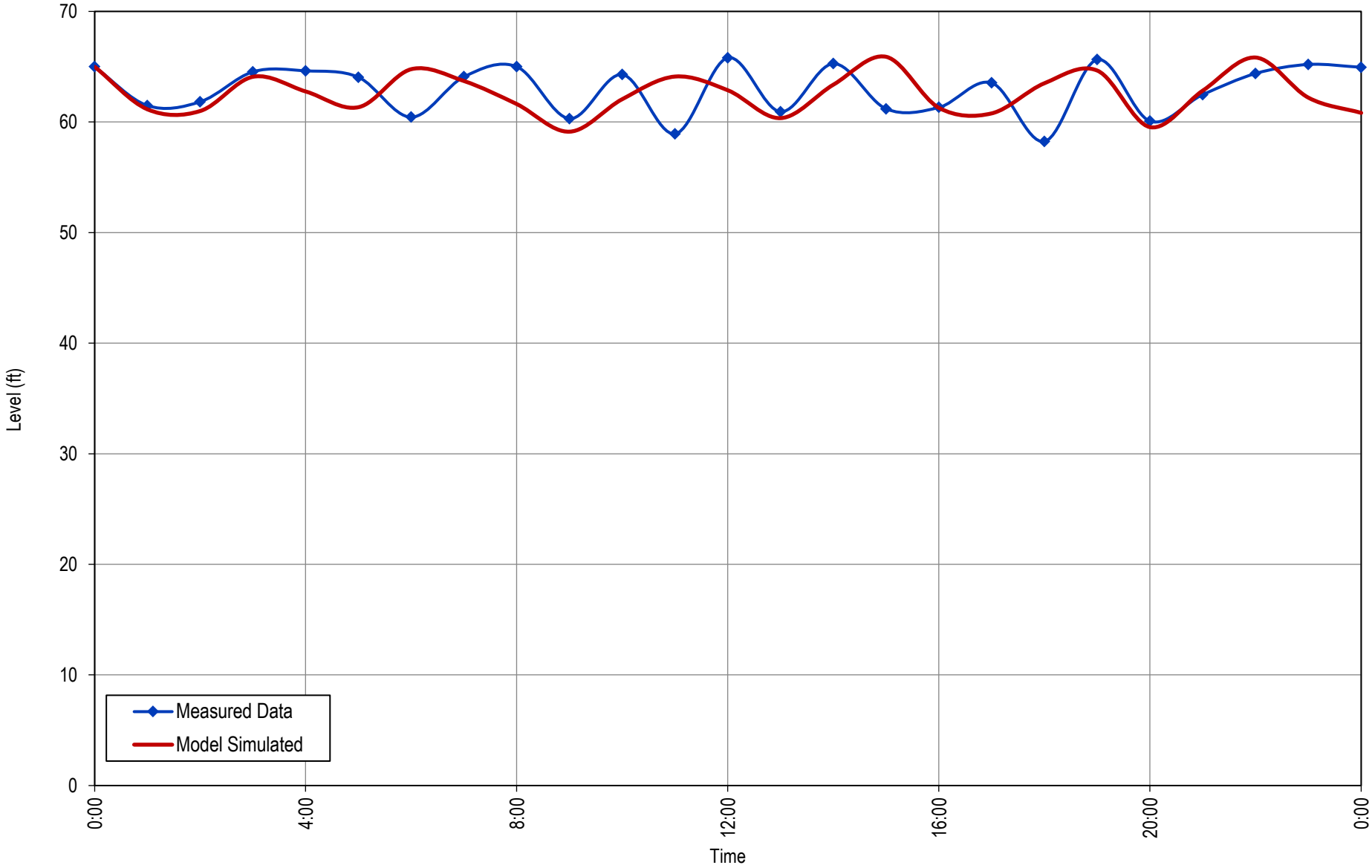
2026 Water System Plan Update

EPS CALIBRATION - LOWER PRUNE HILL LEVEL



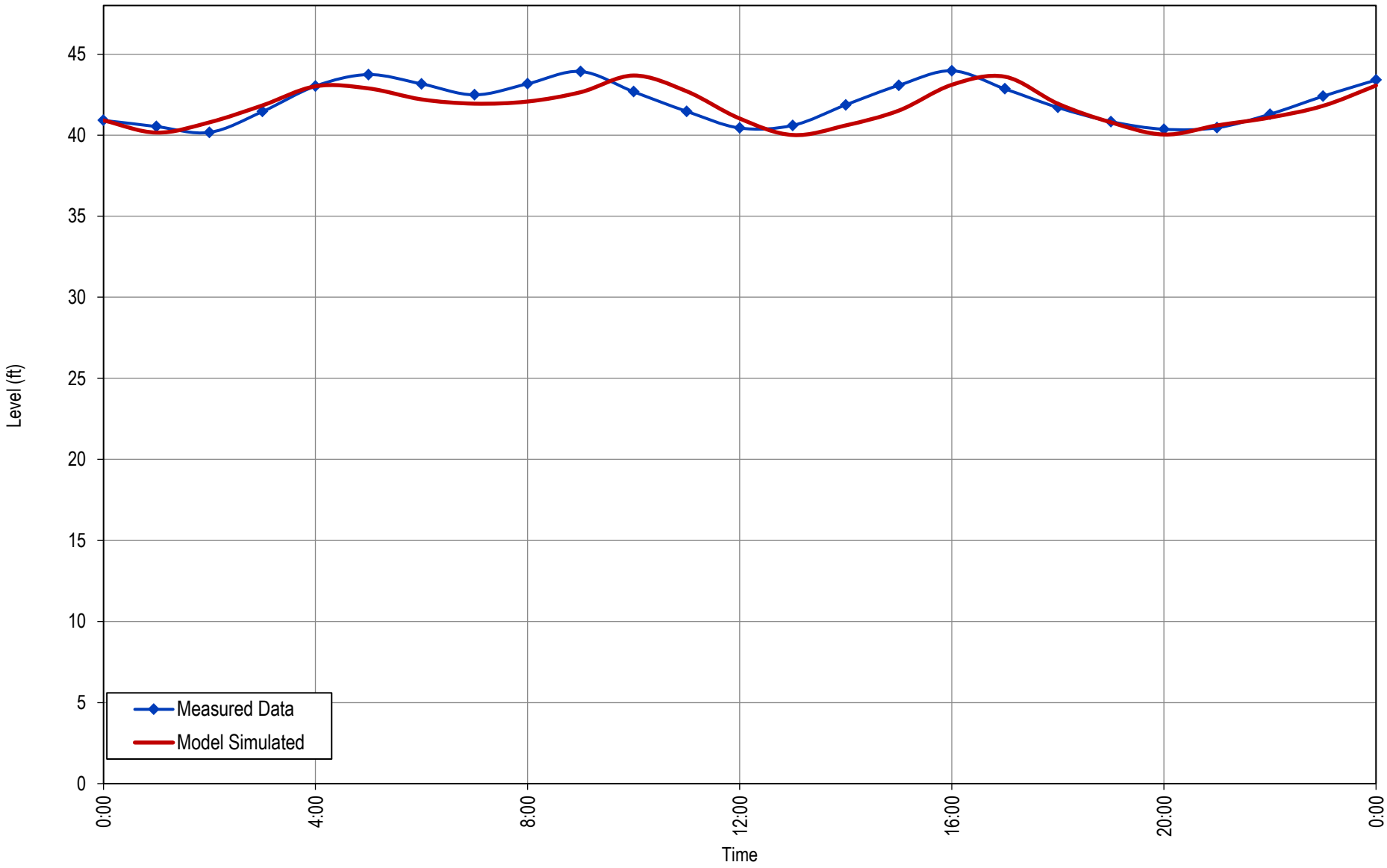
2026 Water System Plan Update

EPS CALIBRATION - GREGG LEVEL



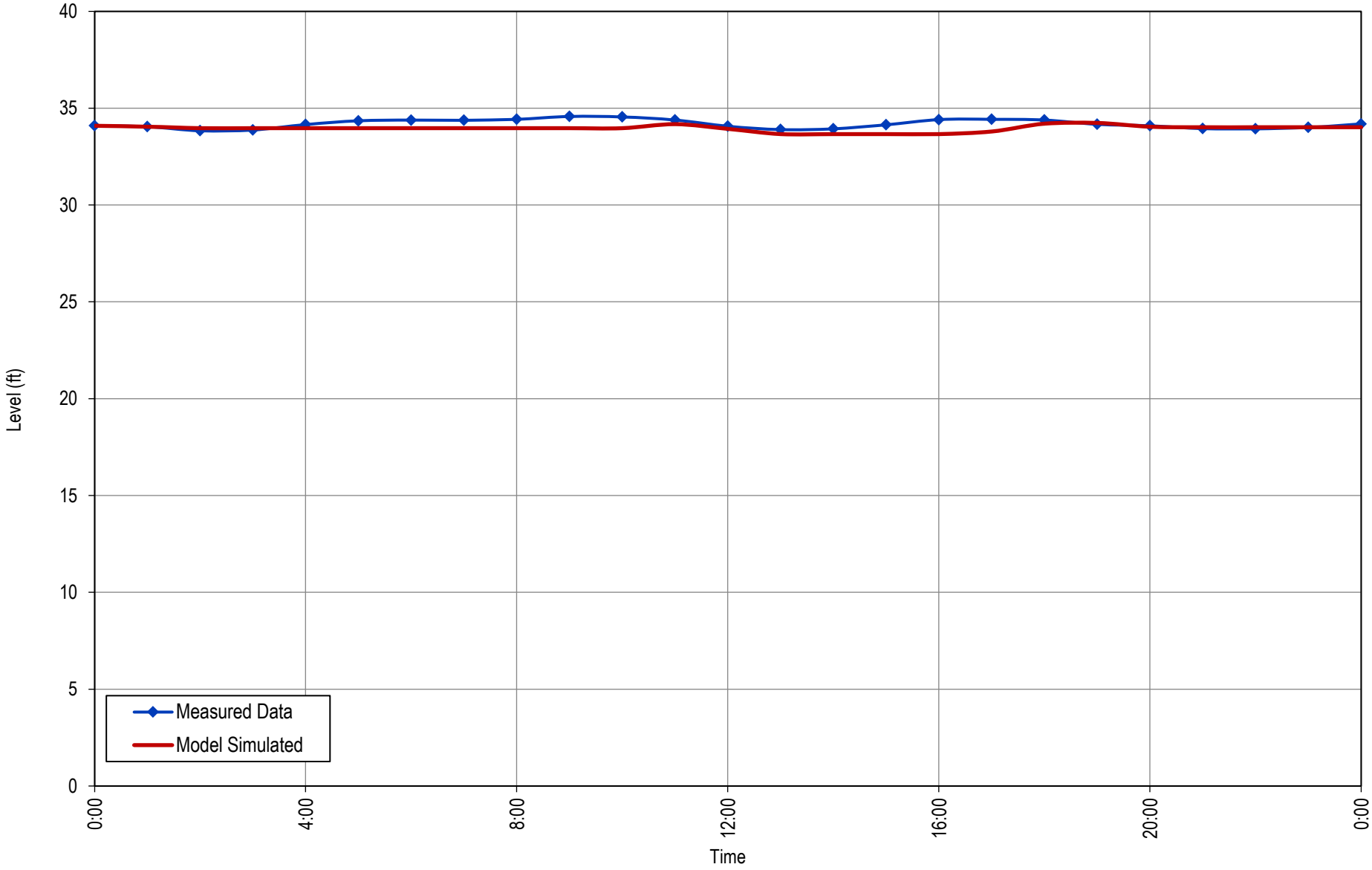
2026 Water System Plan Update

EPS CALIBRATION - LACAMAS LEVEL



2026 Water System Plan Update

EPS CALIBRATION - ANDERSON LEVEL (18TH AVE RESERVOIR)



2026 Water System Plan Update

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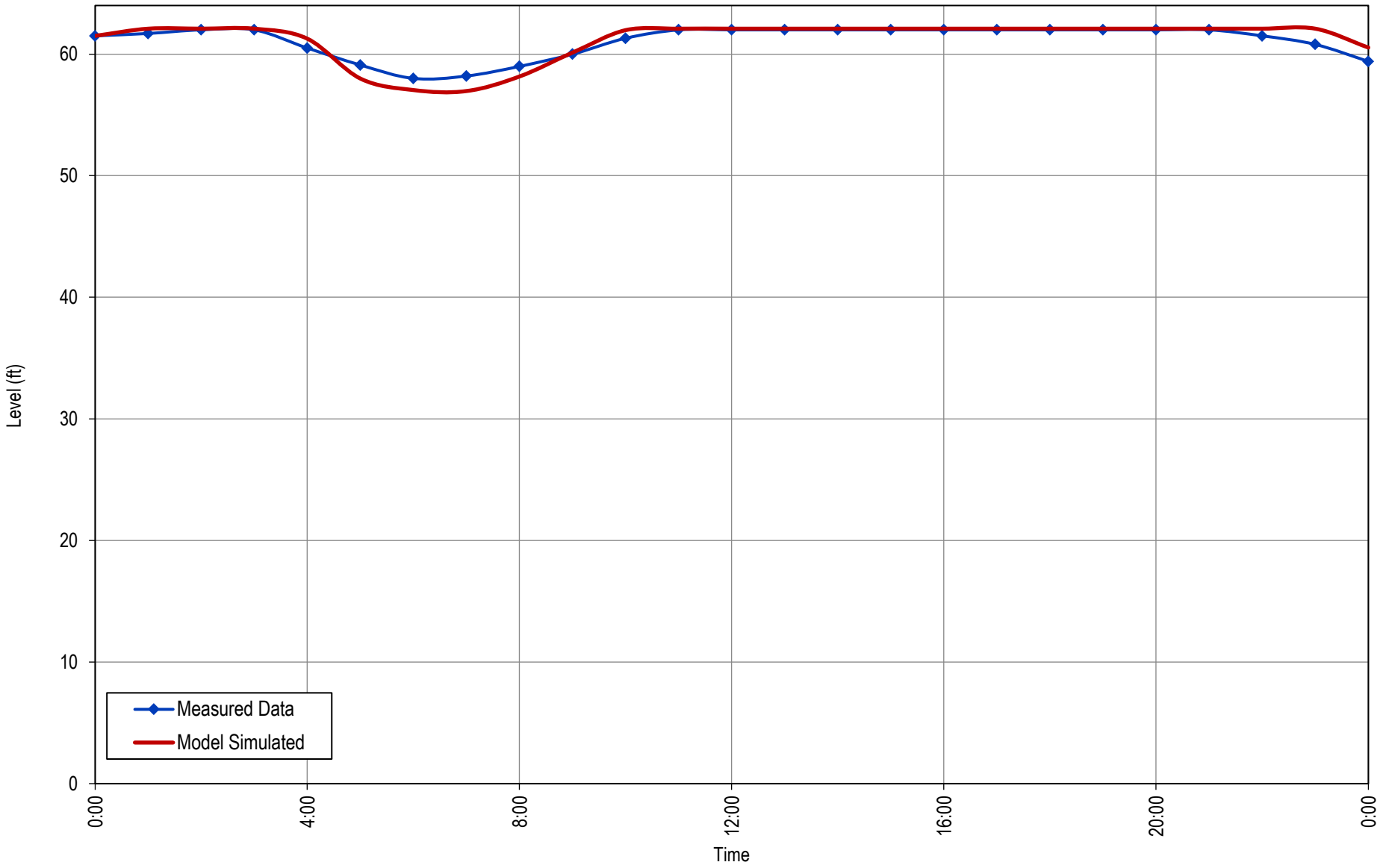
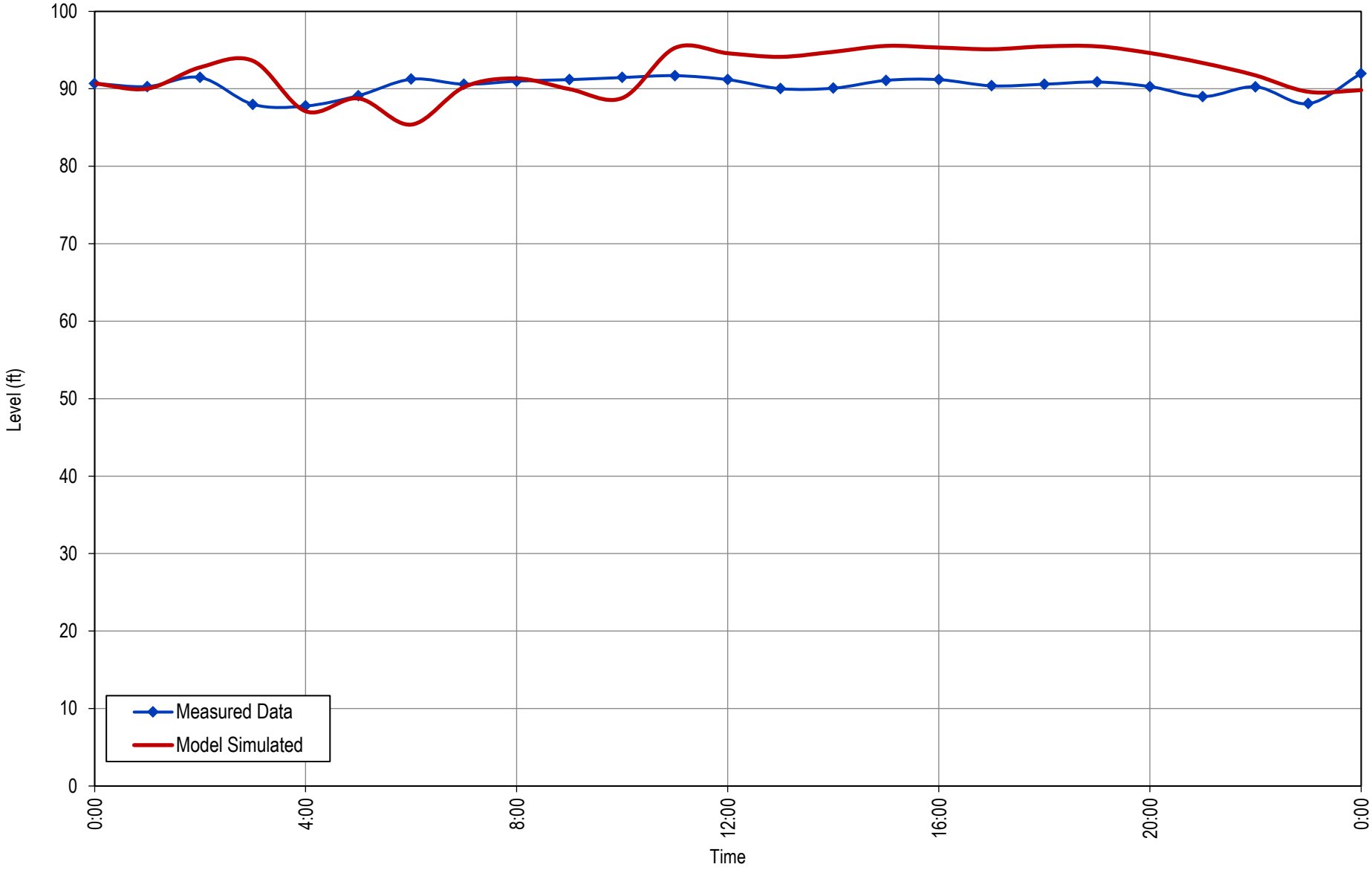


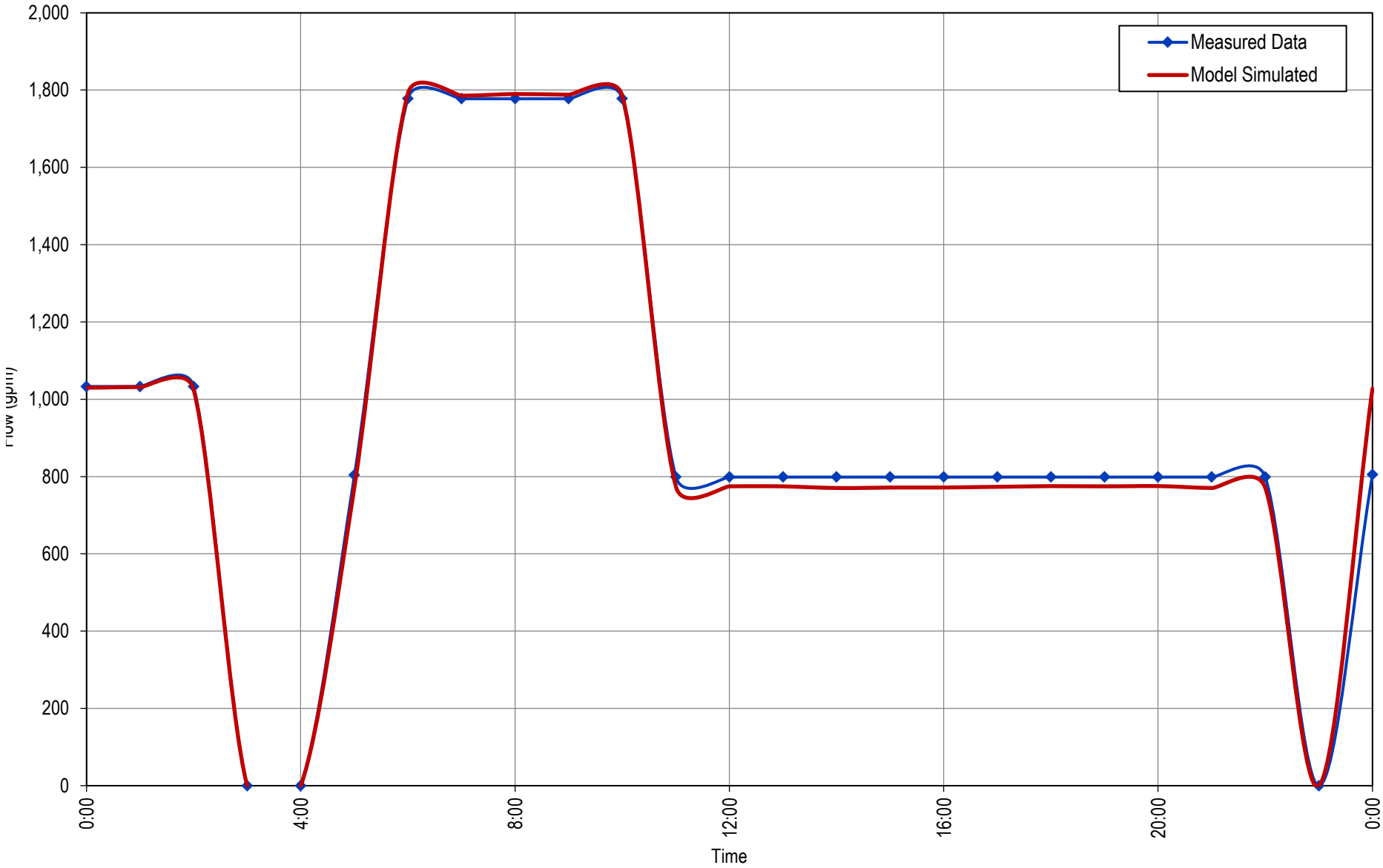
2026 Water System Plan Update

EPS CALIBRATION - UPPER PRUNE HILL STANDPIPE LEVEL



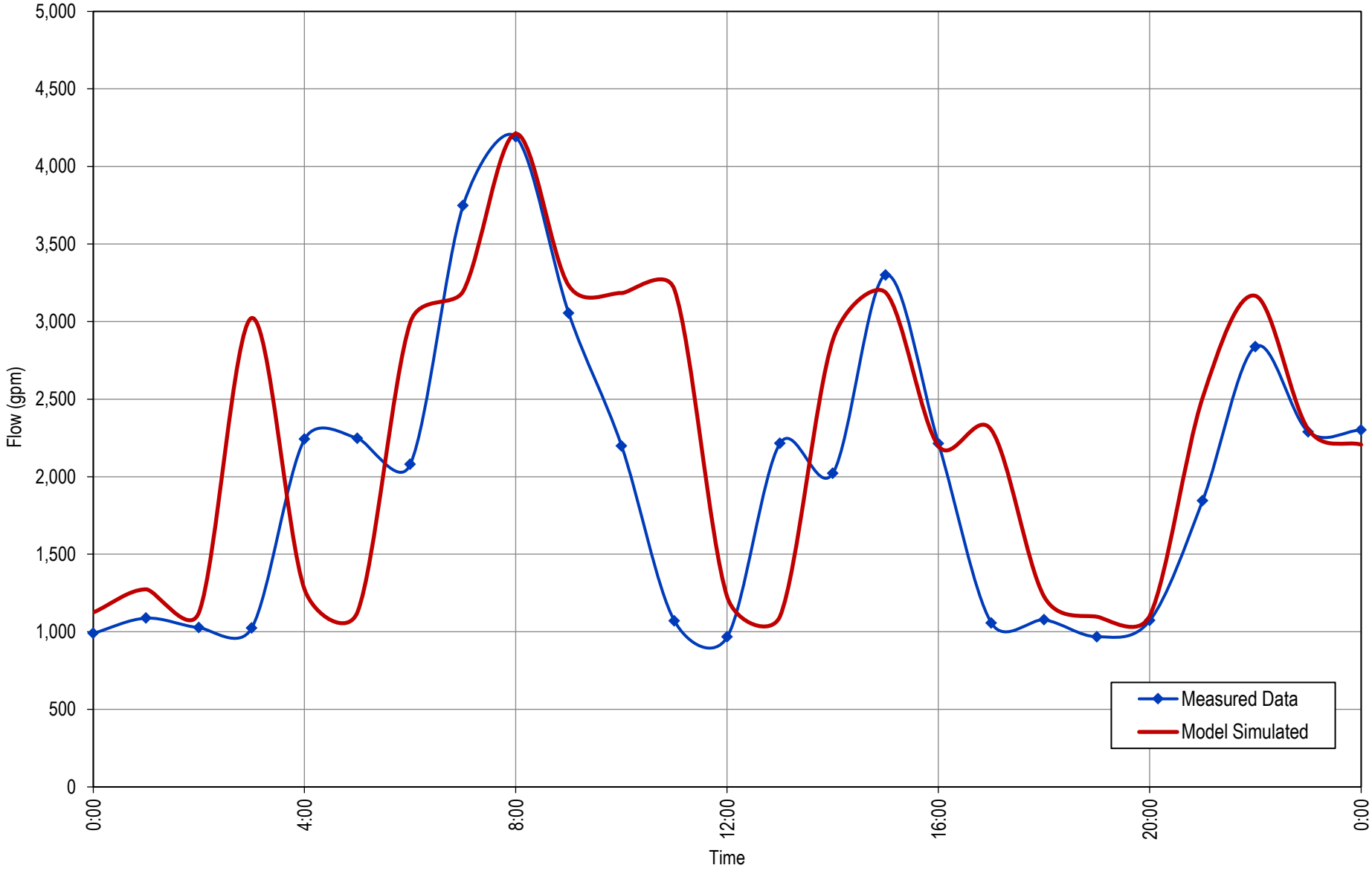
2026 Water System Plan Update

EPS CALIBRATION - LOWER PRUNE HILL BPS FLOW



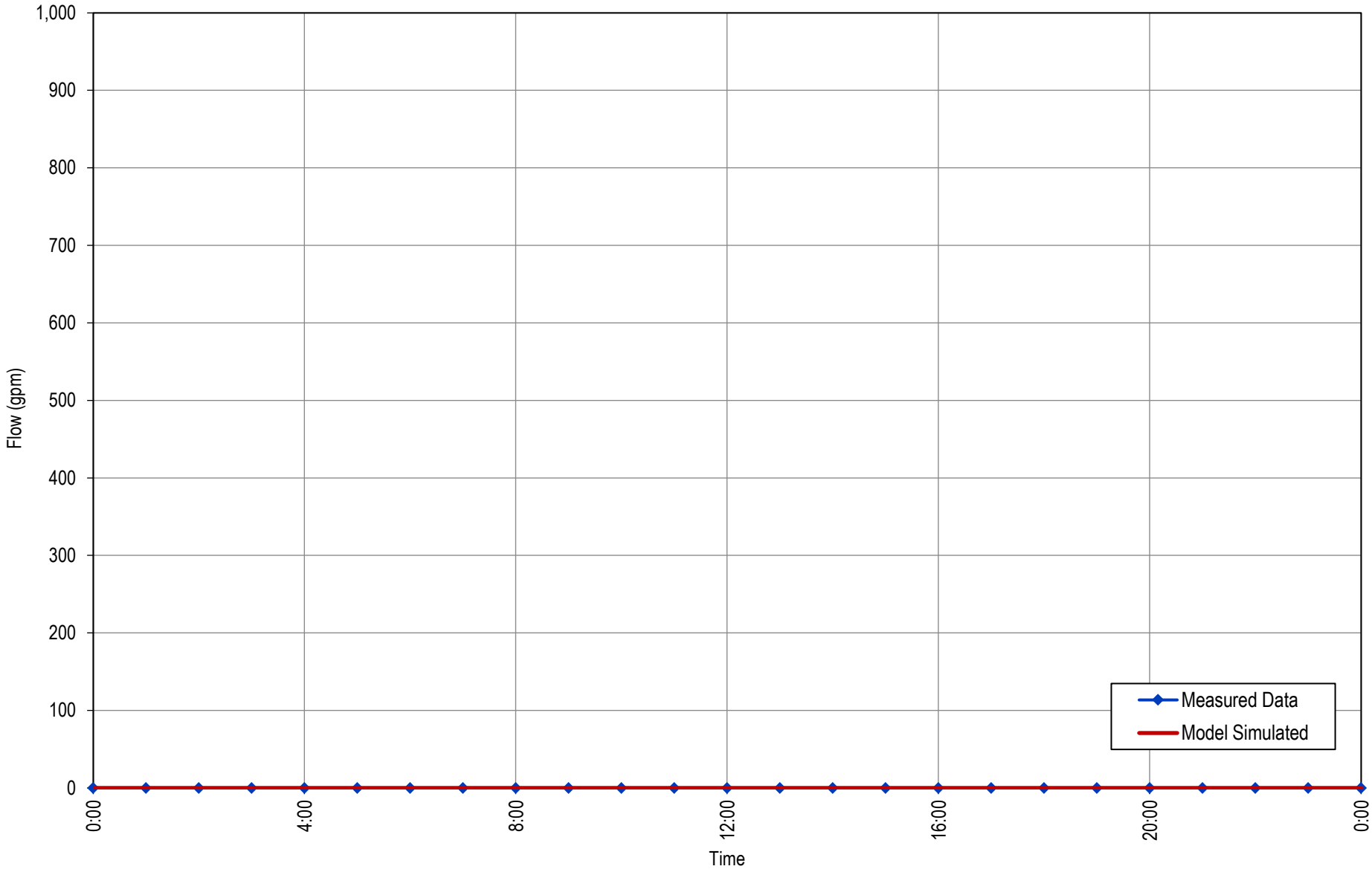
2026 Water System Plan Update

EPS CALIBRATION - ANGELO BPS FLOW



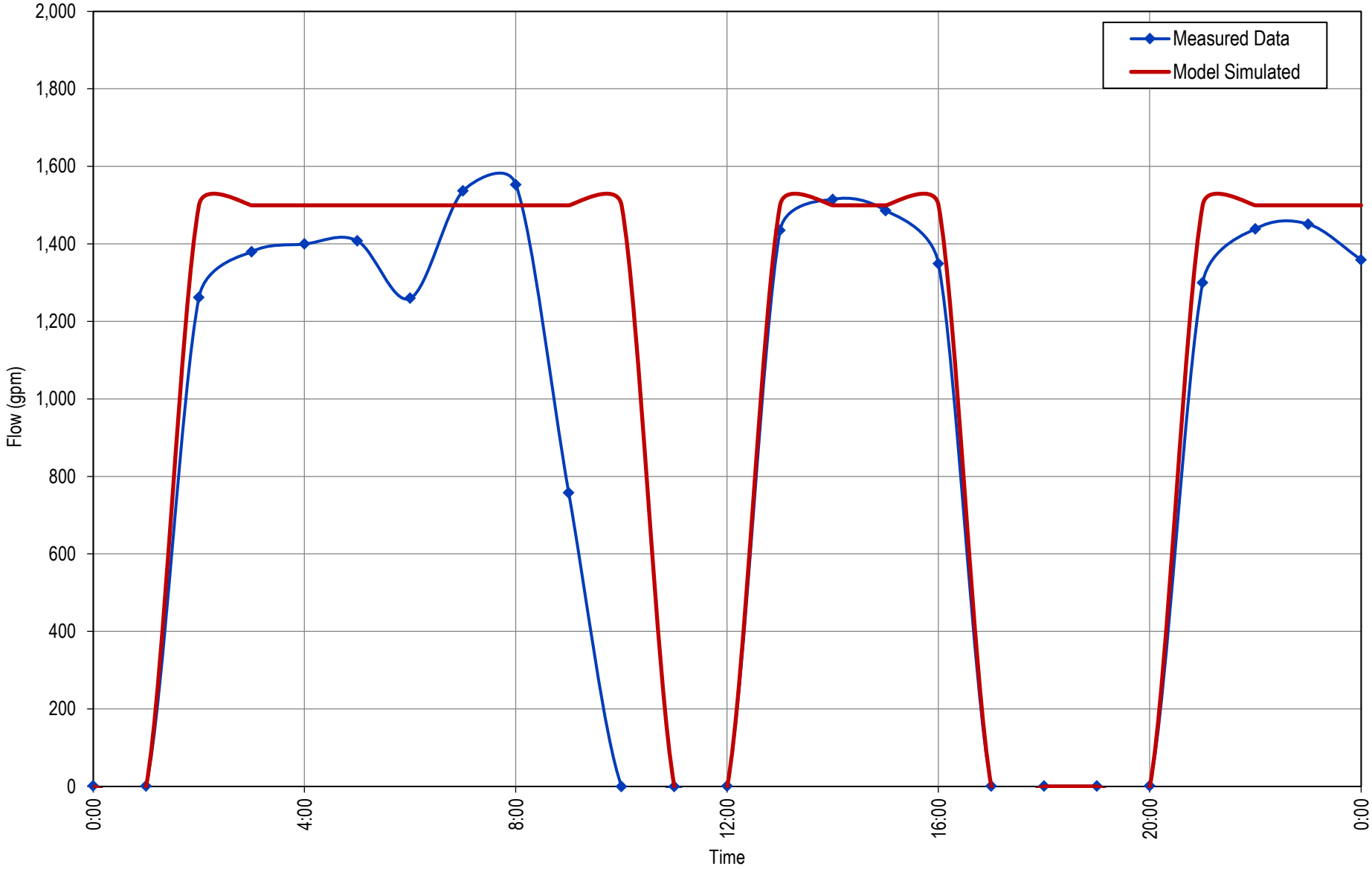
2026 Water System Plan Update

EPS CALIBRATION - BUTLER PRV FLOW



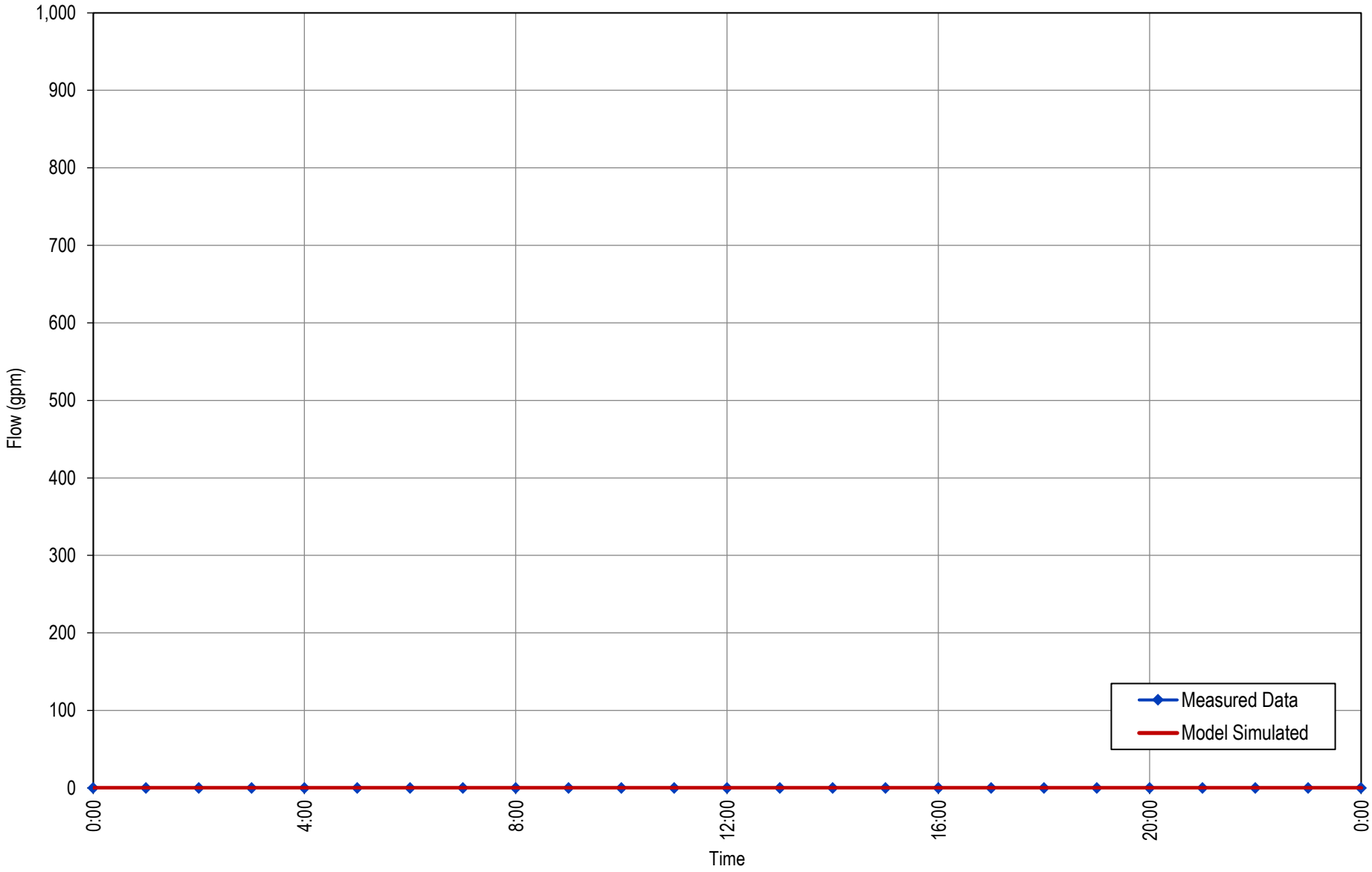
2026 Water System Plan Update

EPS CALIBRATION - LACAMAS BPS FLOW



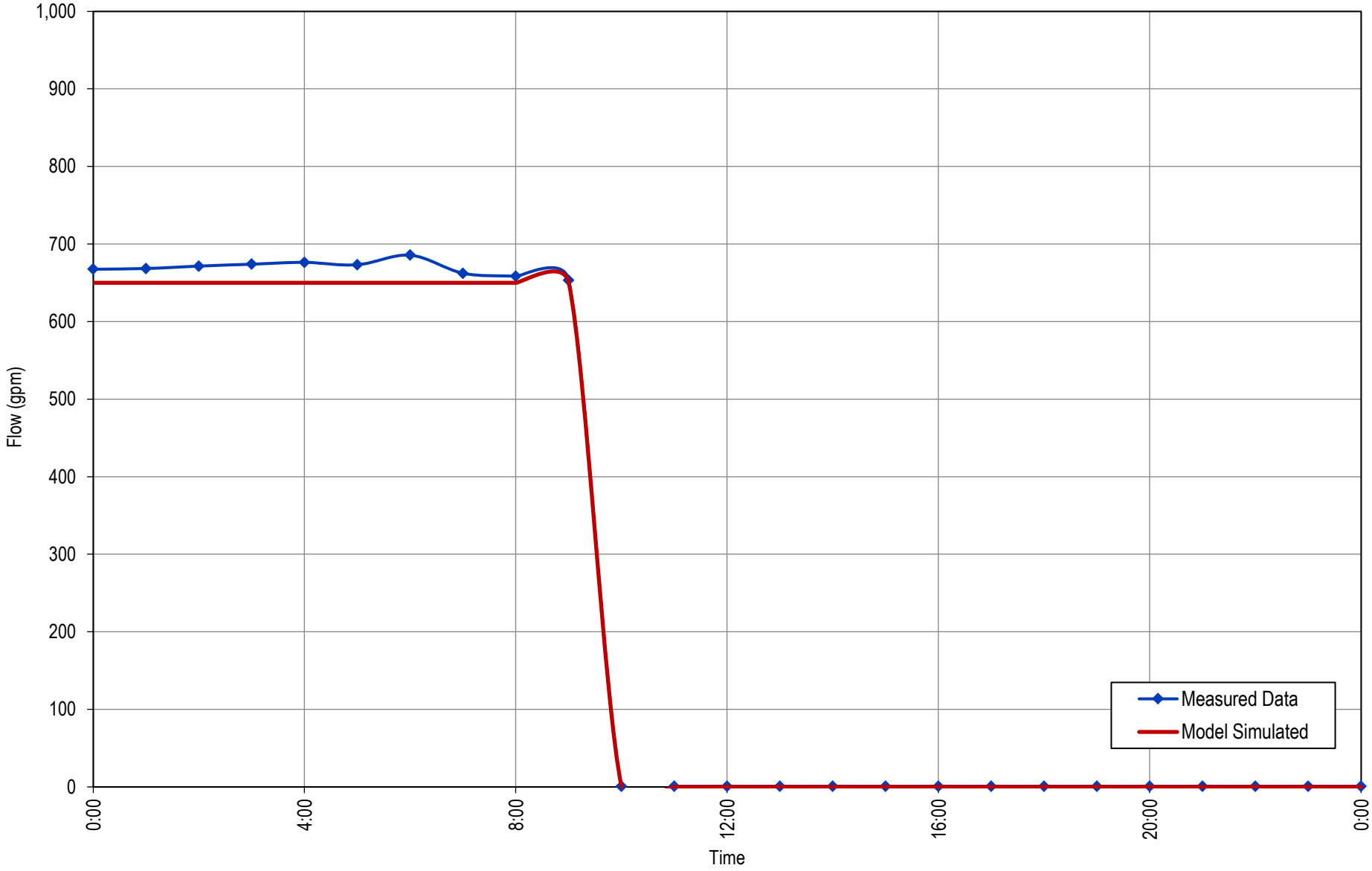
2026 Water System Plan Update

EPS CALIBRATION - SLOW SAND PLANT FLOW



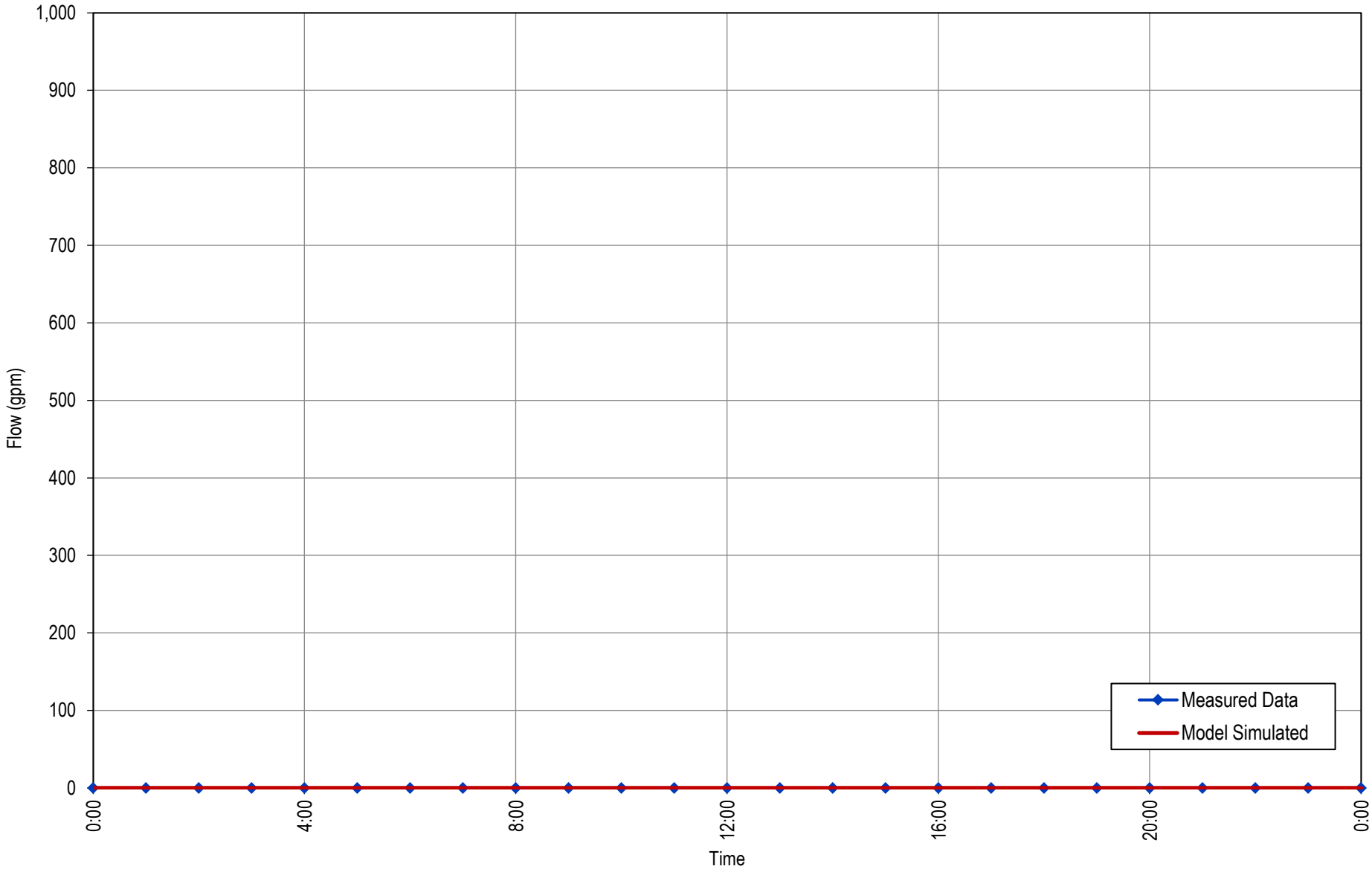
2026 Water System Plan Update

EPS CALIBRATION - WELL 5 FLOW



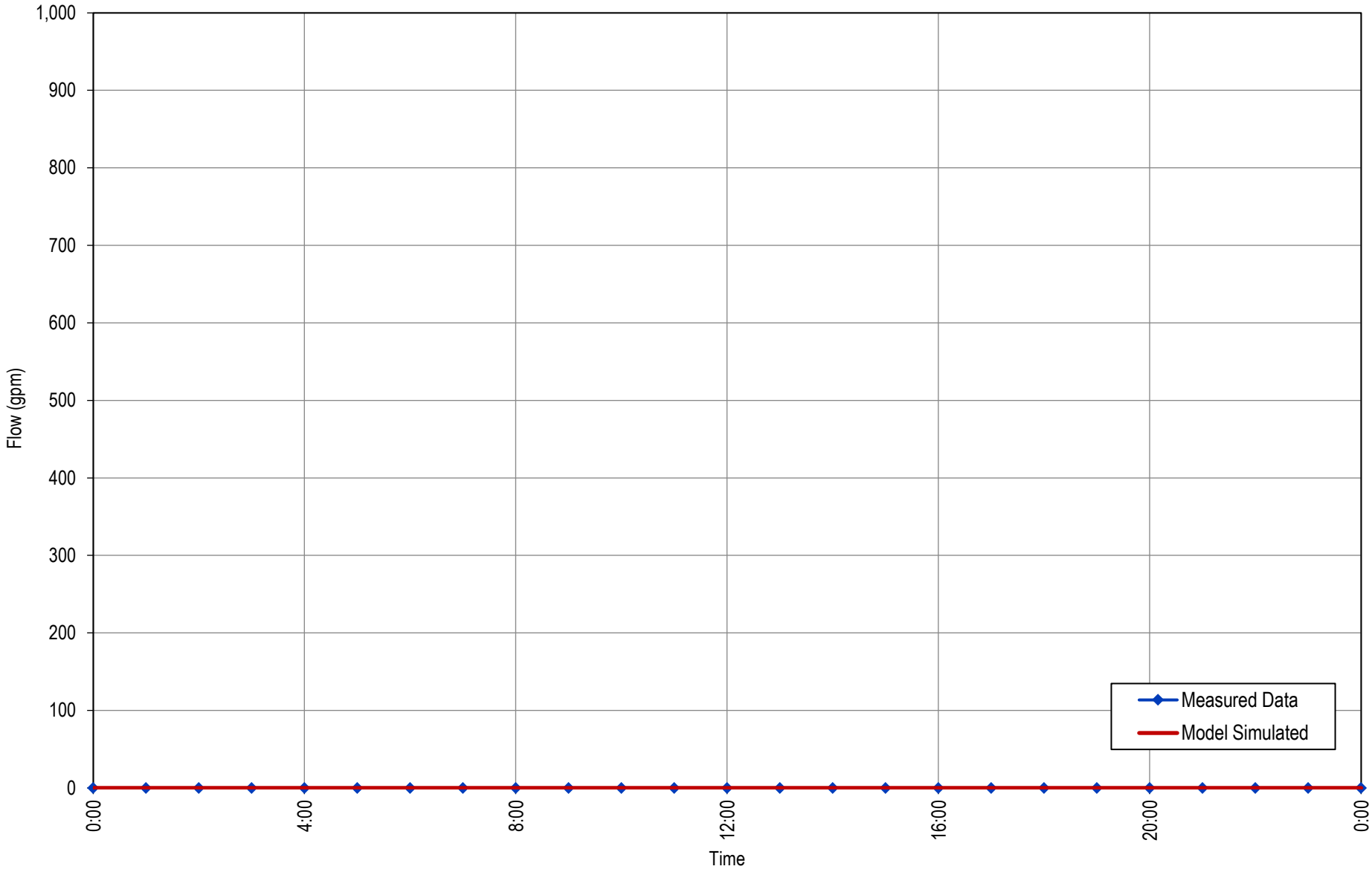
2026 Water System Plan Update

EPS CALIBRATION - WELL 6 FLOW



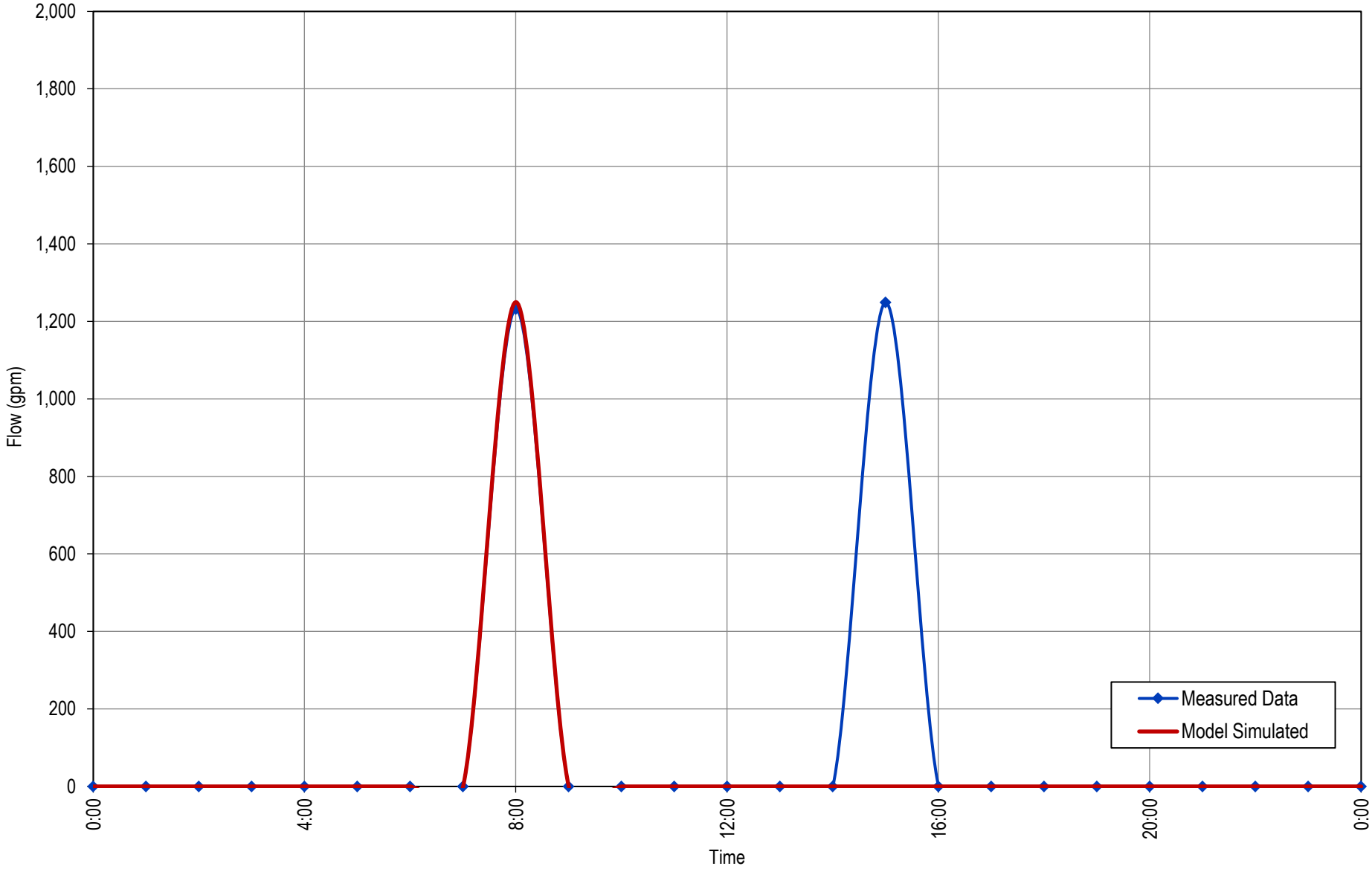
2026 Water System Plan Update

EPS CALIBRATION - WELL 7 FLOW



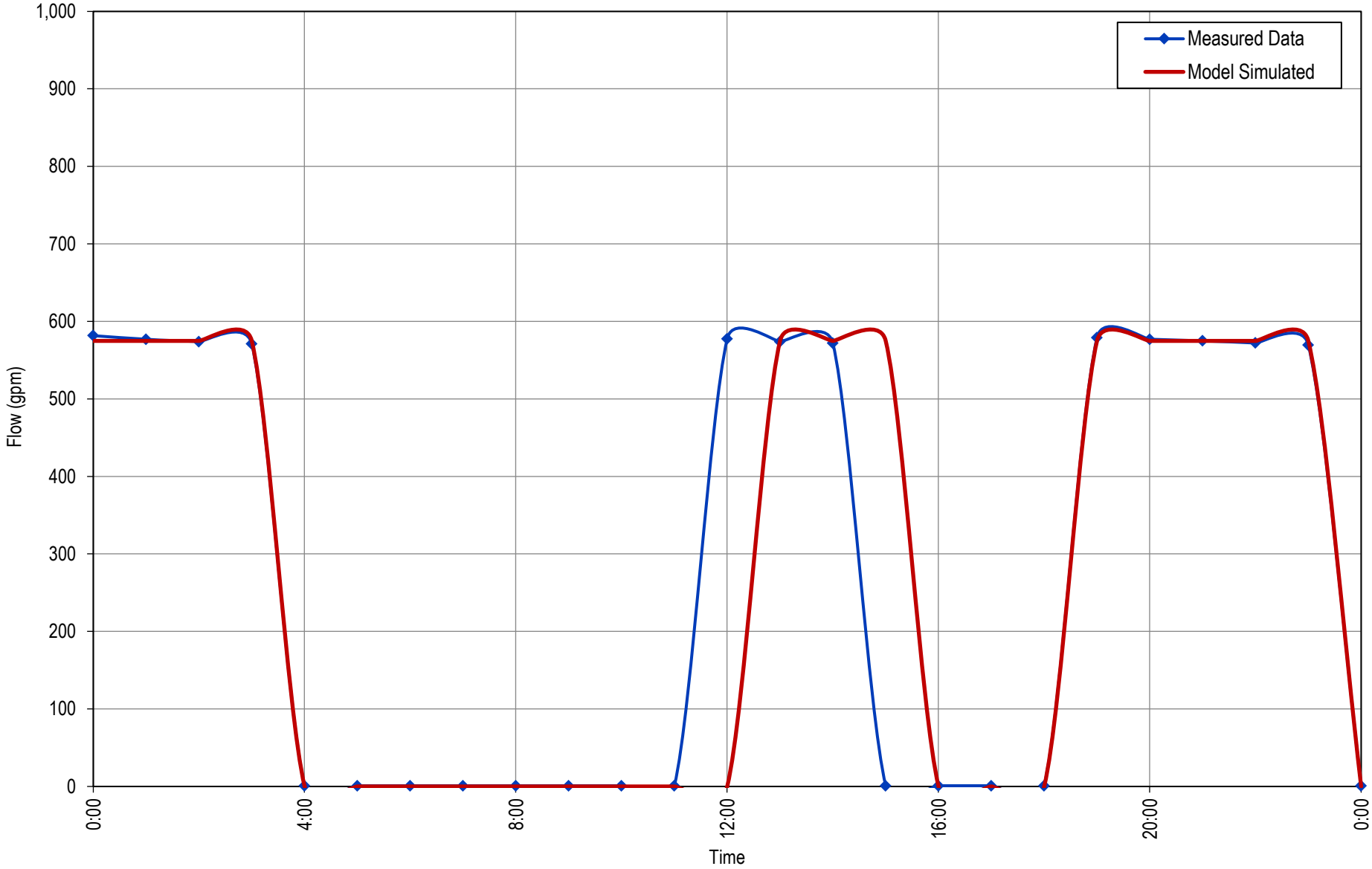
2026 Water System Plan Update

EPS CALIBRATION - WELL 8 FLOW



2026 Water System Plan Update

EPS CALIBRATION - WELL 9 FLOW



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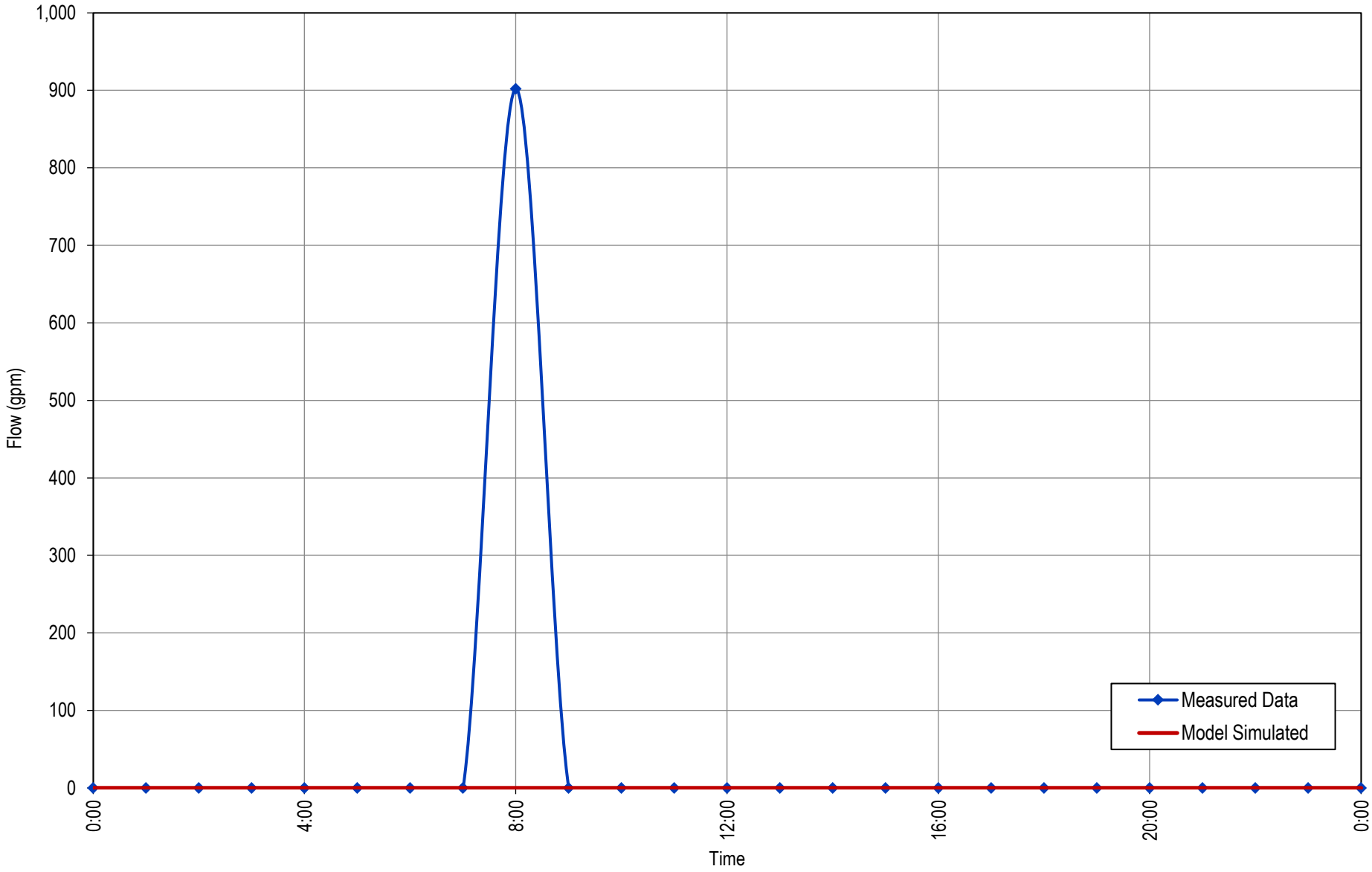
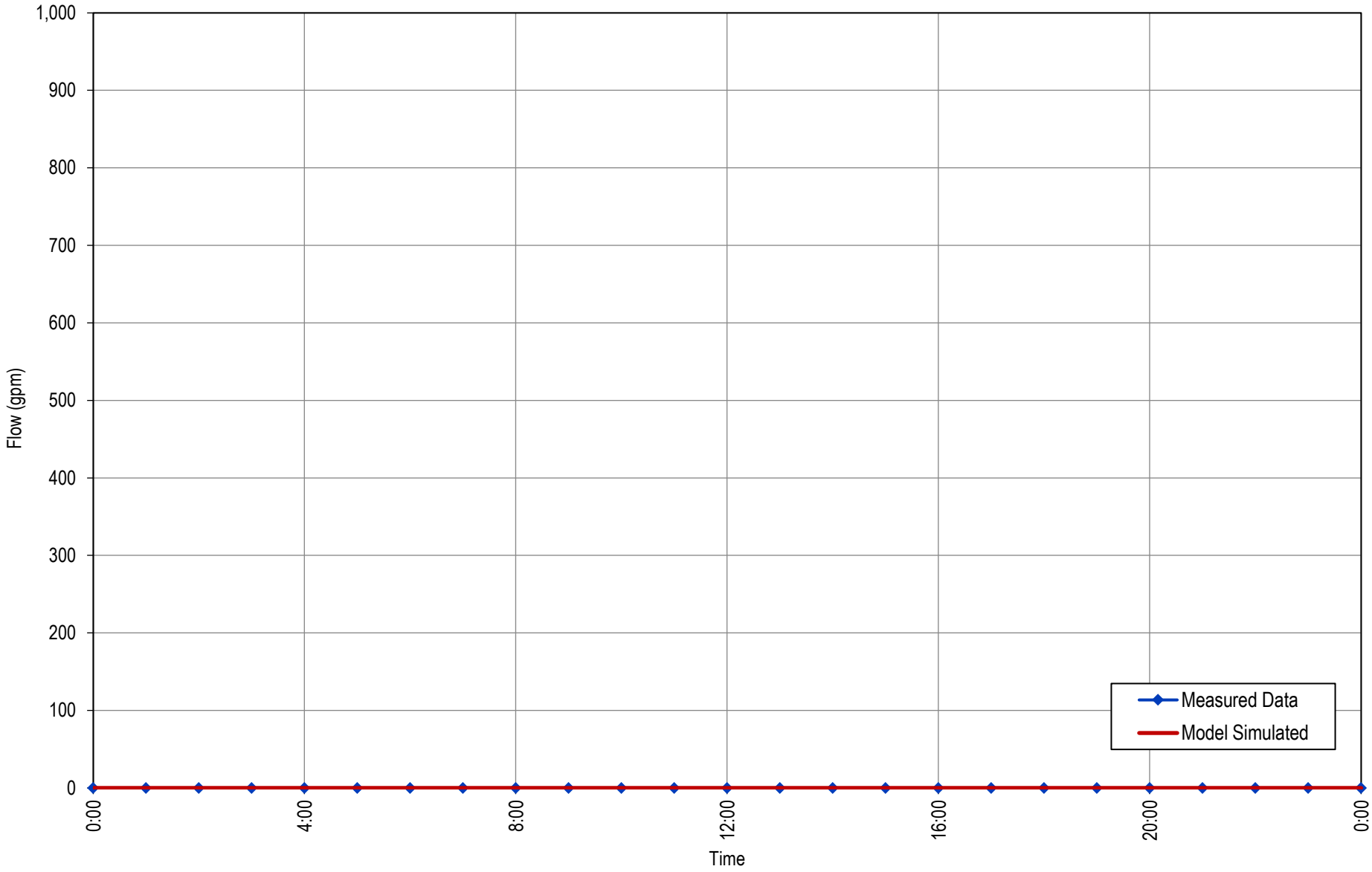
EPS CALIBRATION - WELL 10 FLOW



2026 Water System Plan Update

EPS CALIBRATION - WELL 11 FLOW



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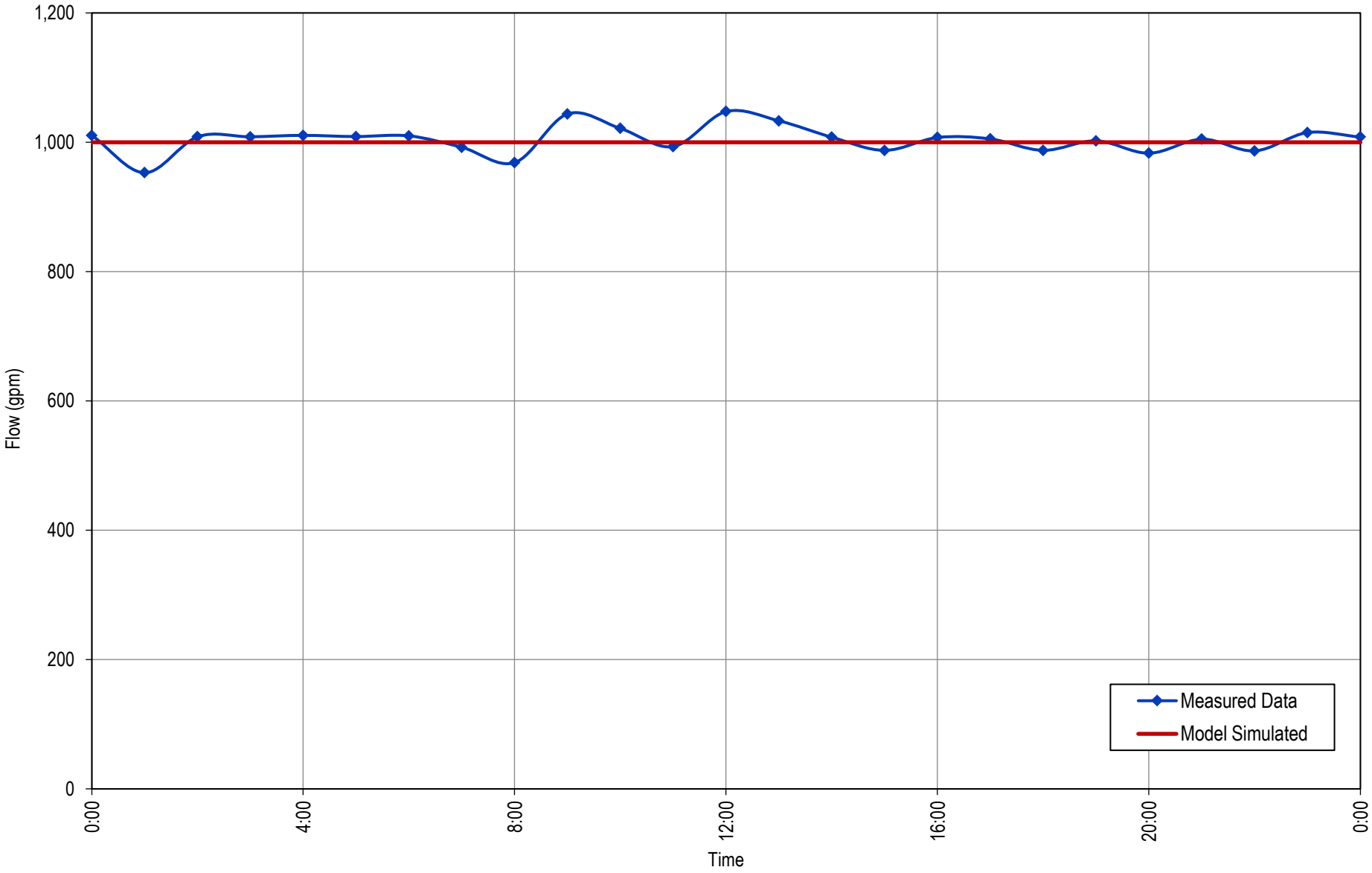
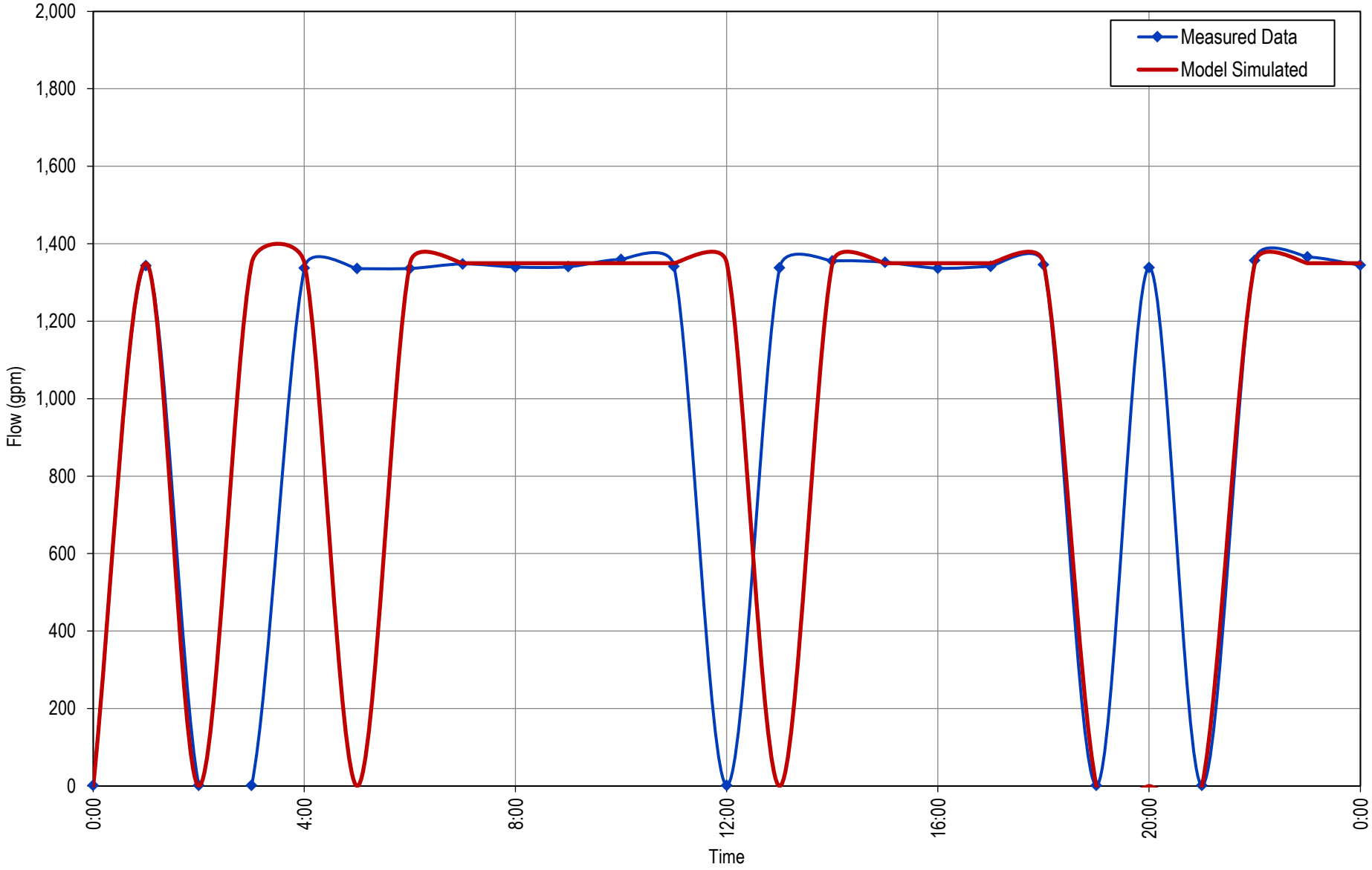
EPS CALIBRATION - WELL 12 FLOW



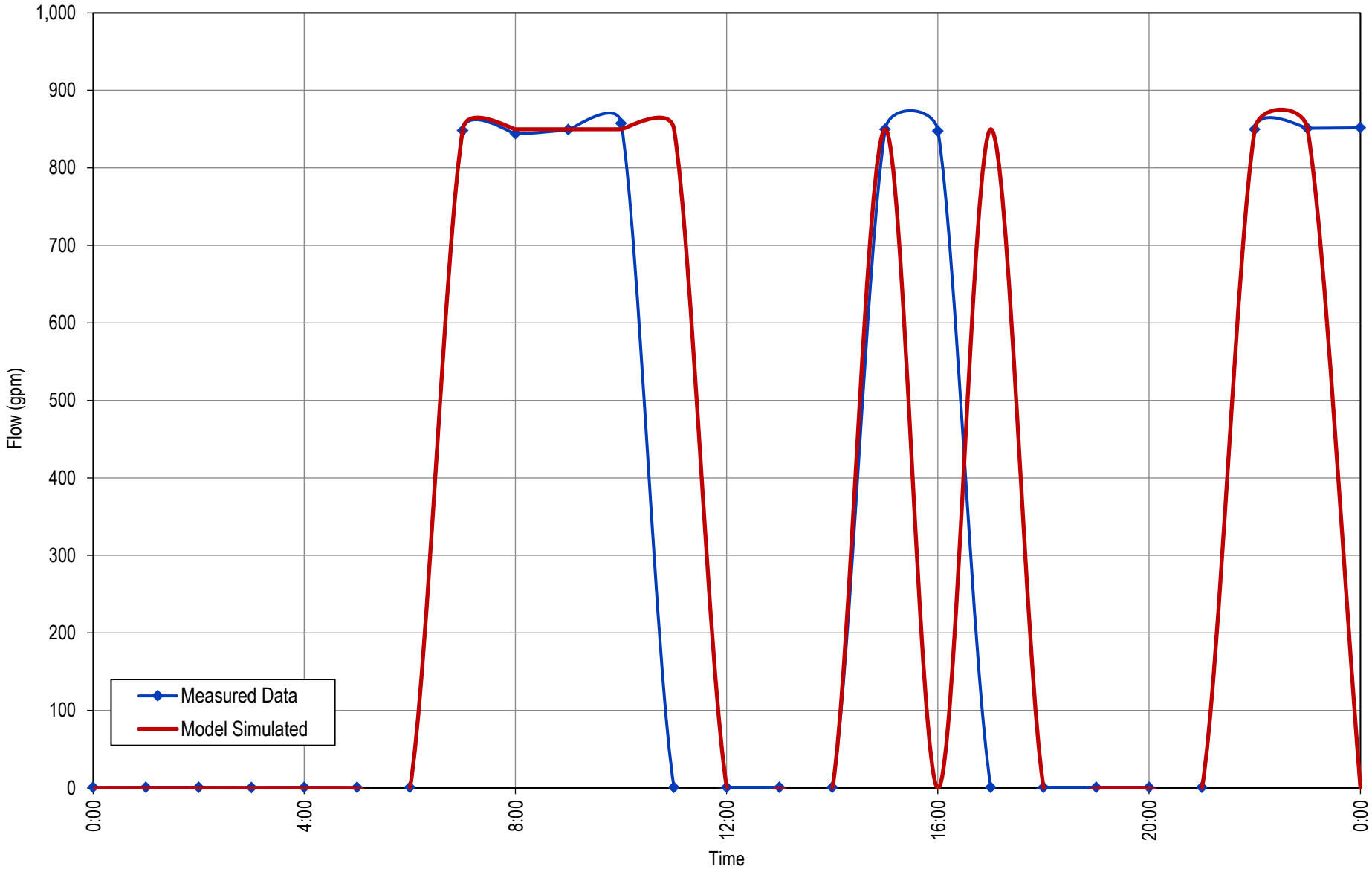
2026 Water System Plan Update

EPS CALIBRATION - WELL 13 FLOW



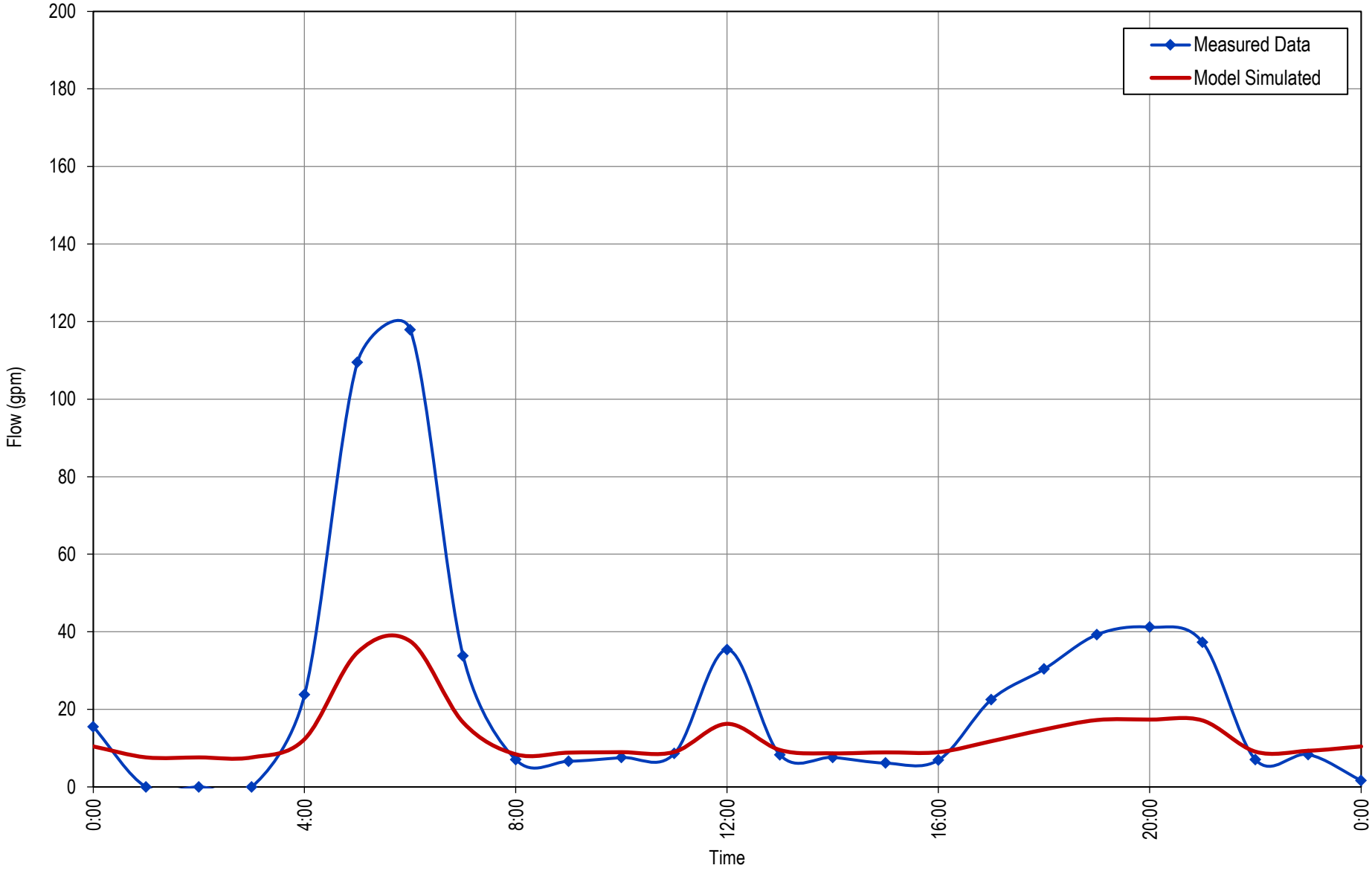
2026 Water System Plan Update

EPS CALIBRATION - WELL 14 FLOW



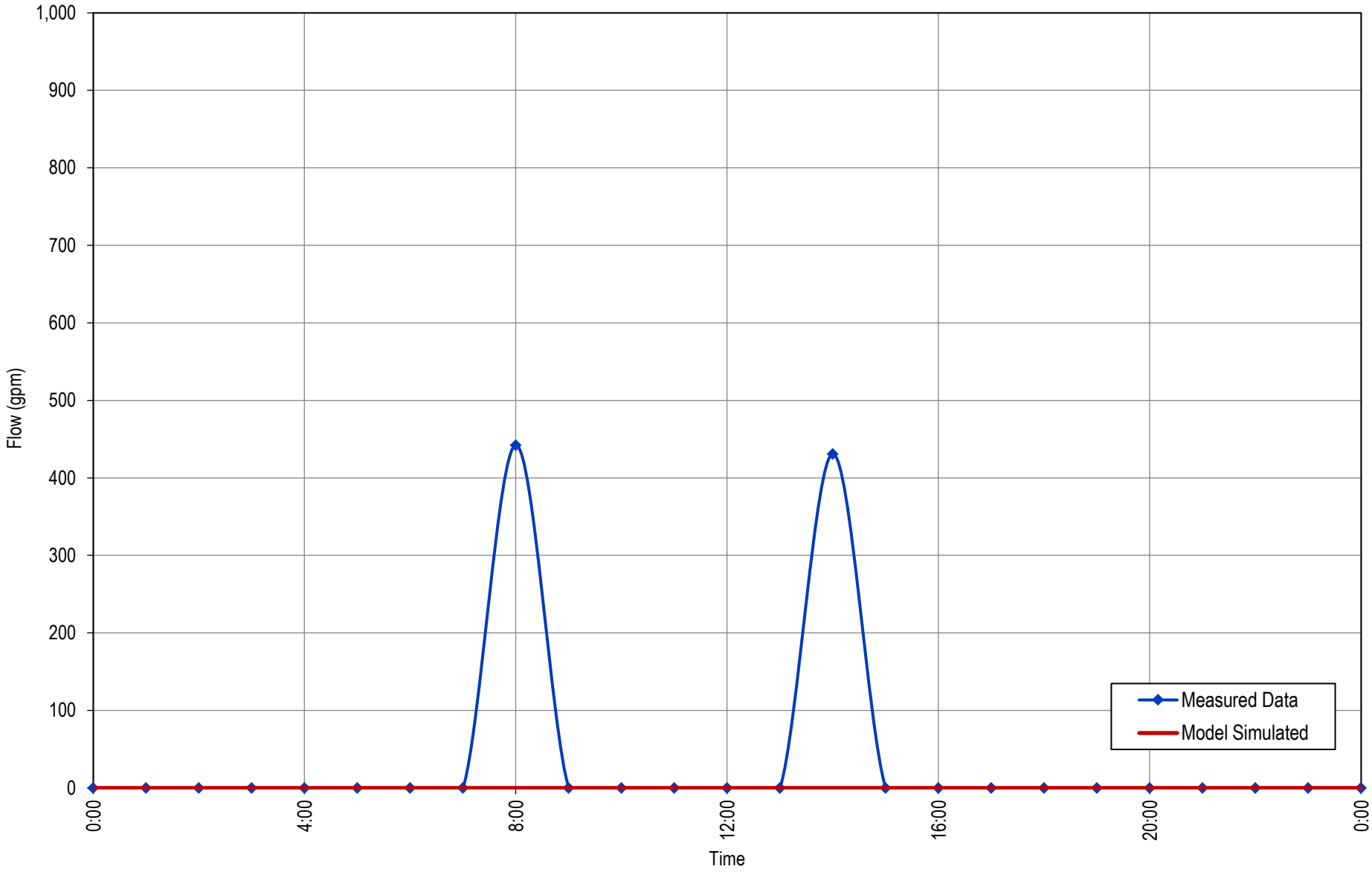
2026 Water System Plan Update

EPS CALIBRATION - GREEN MOUNTAIN ESTATES BPS FLOW



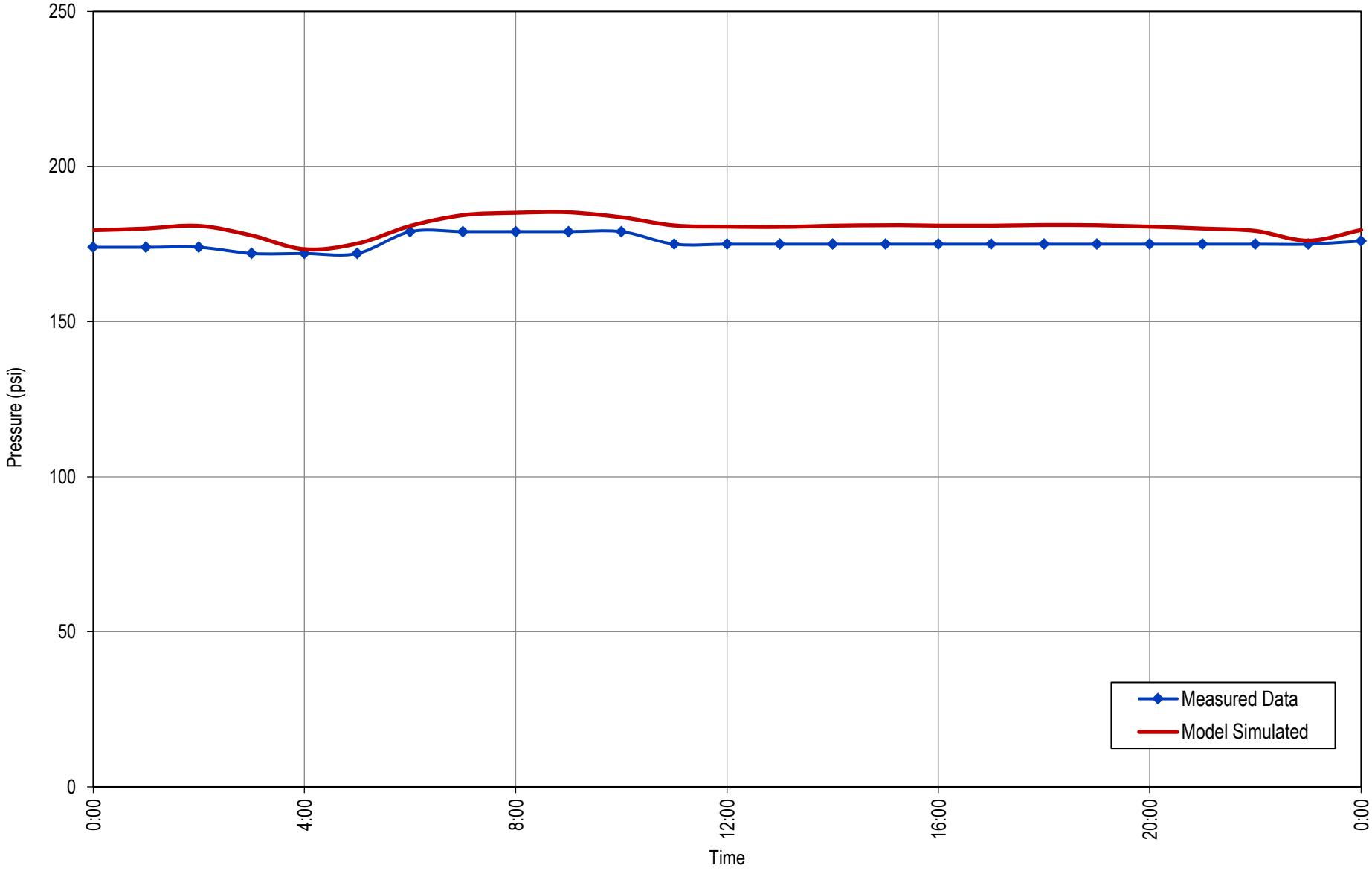
2026 Water System Plan Update

EPS CALIBRATION - CROWN RD BPS FLOW



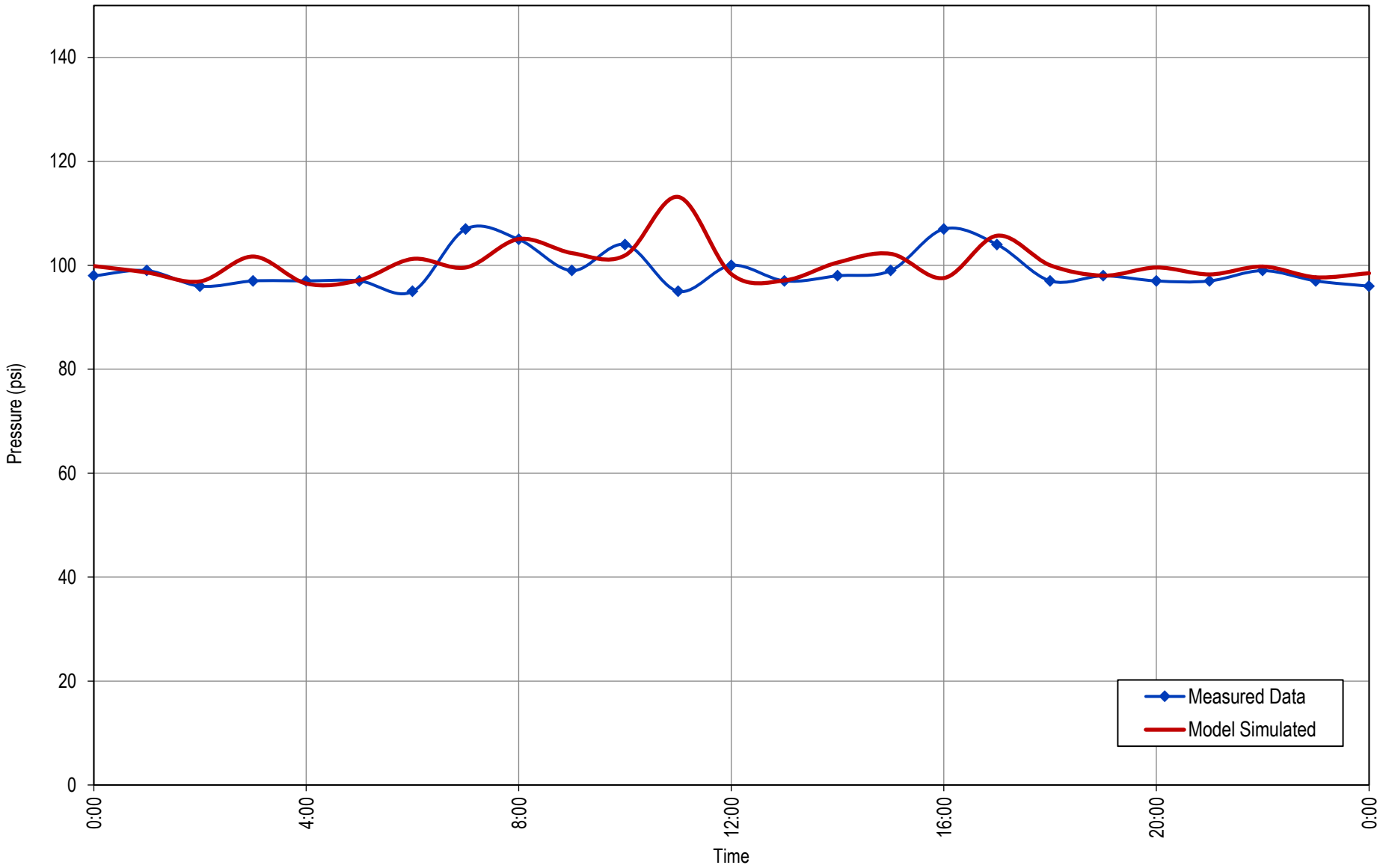
2026 Water System Plan Update

EPS CALIBRATION - LOWER PRUNE HILL DISCHARGE PRESSURE



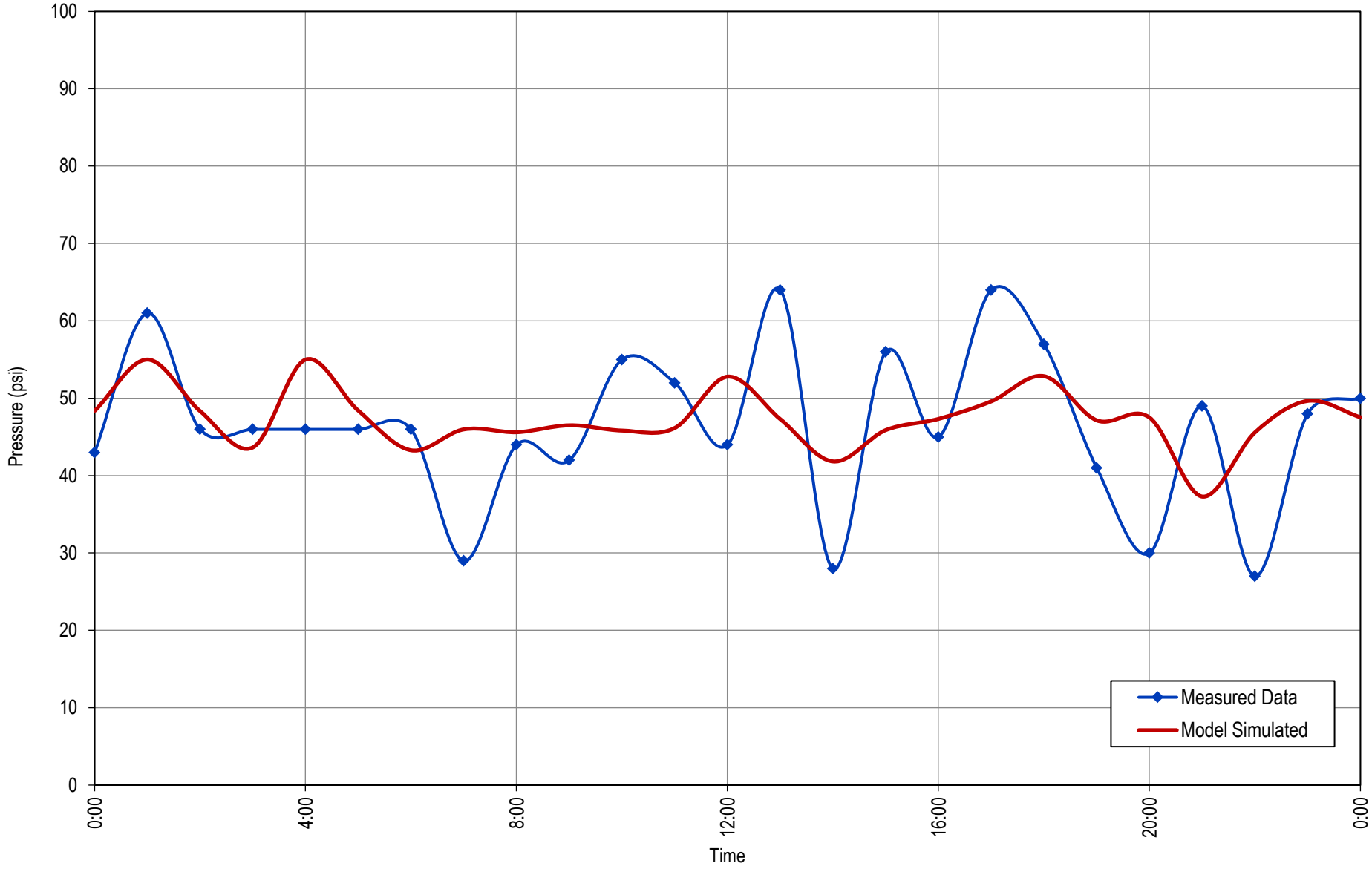
2026 Water System Plan Update

EPS CALIBRATION - ANGELO DISCHARGE PRESSURE



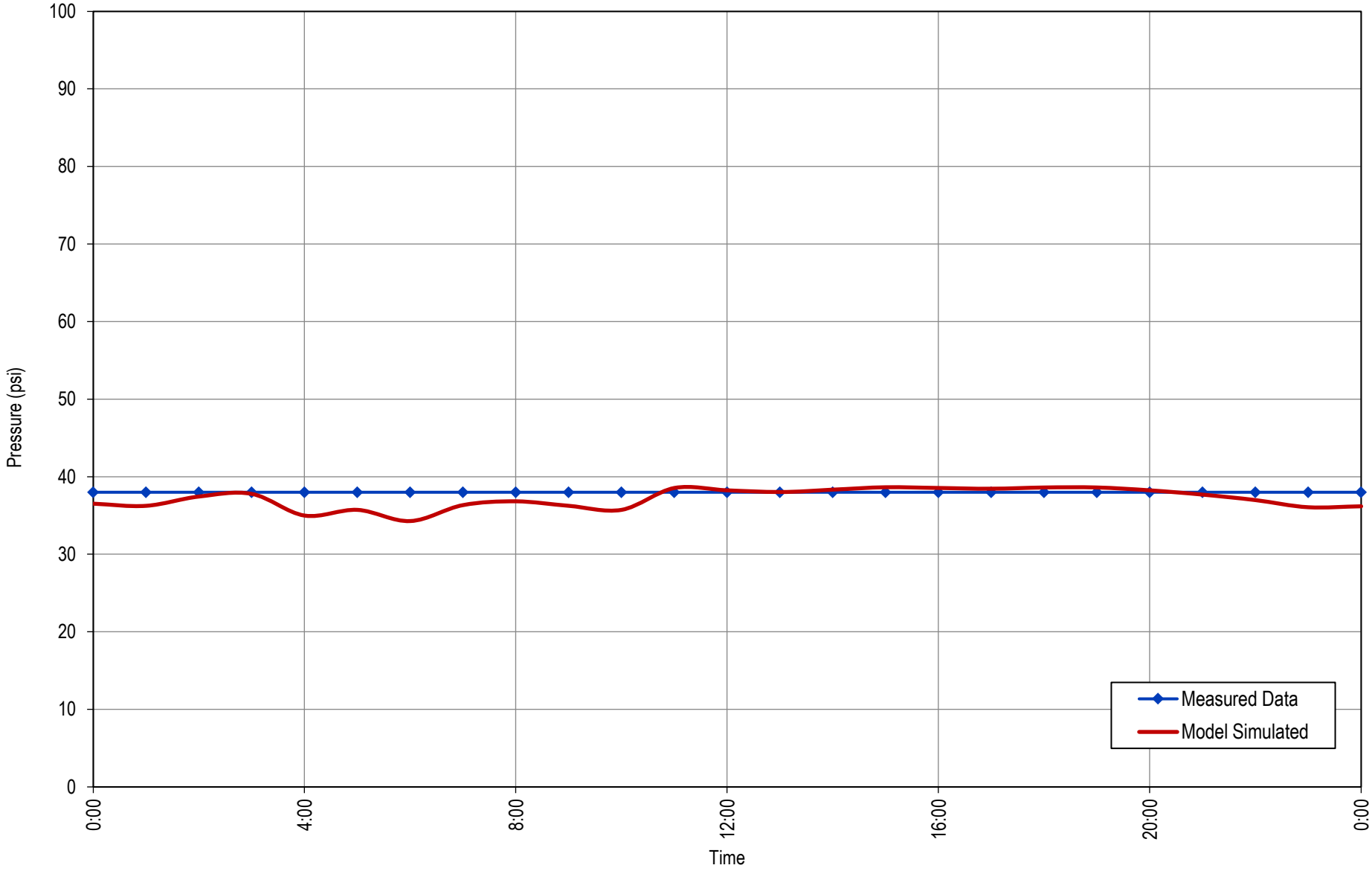
2026 Water System Plan Update

EPS CALIBRATION - ANGELO SUCTION PRESSURE



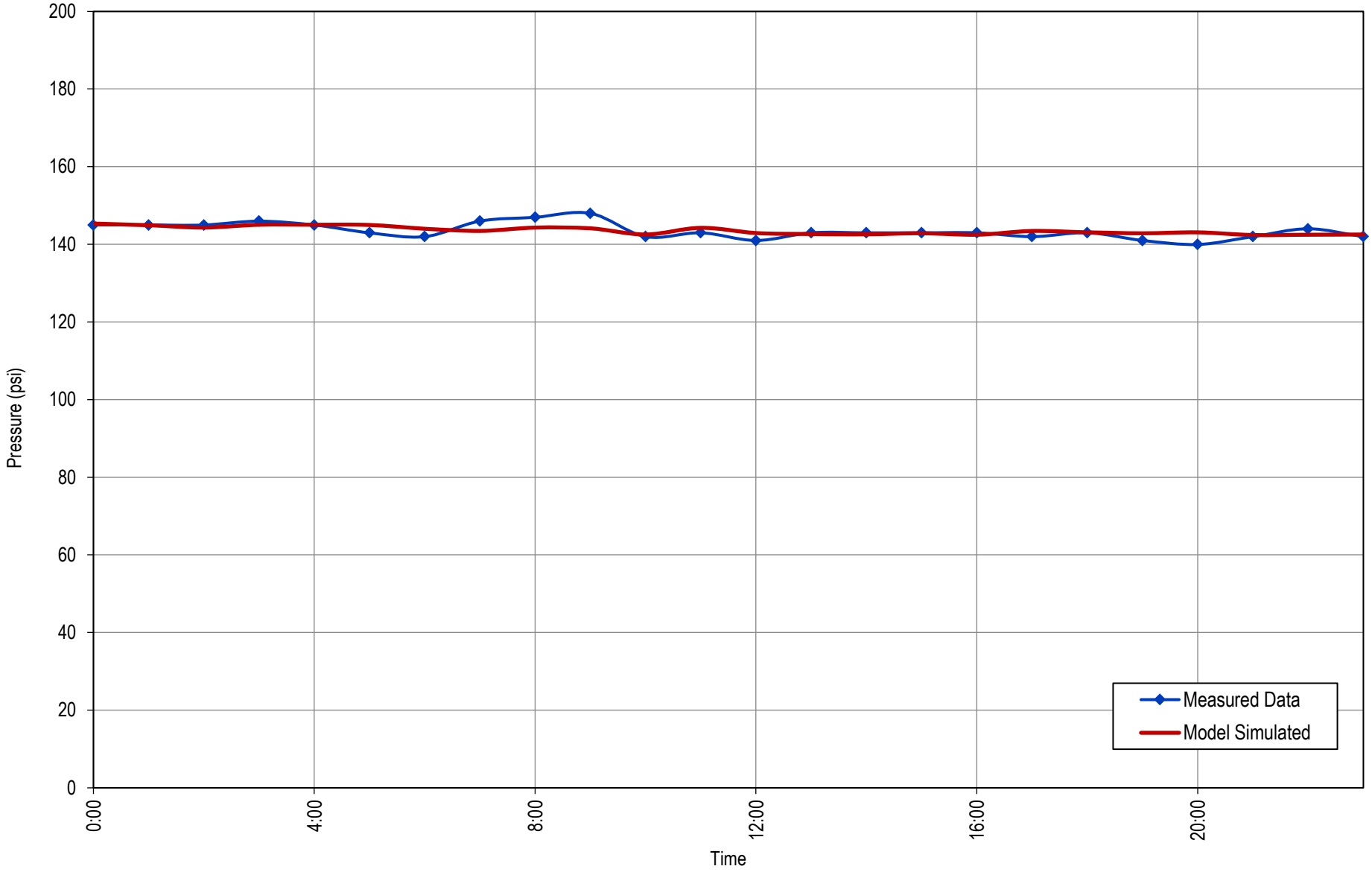
2026 Water System Plan Update

EPS CALIBRATION - UPPER PRUNE HILL DISCHARGE PRESSURE



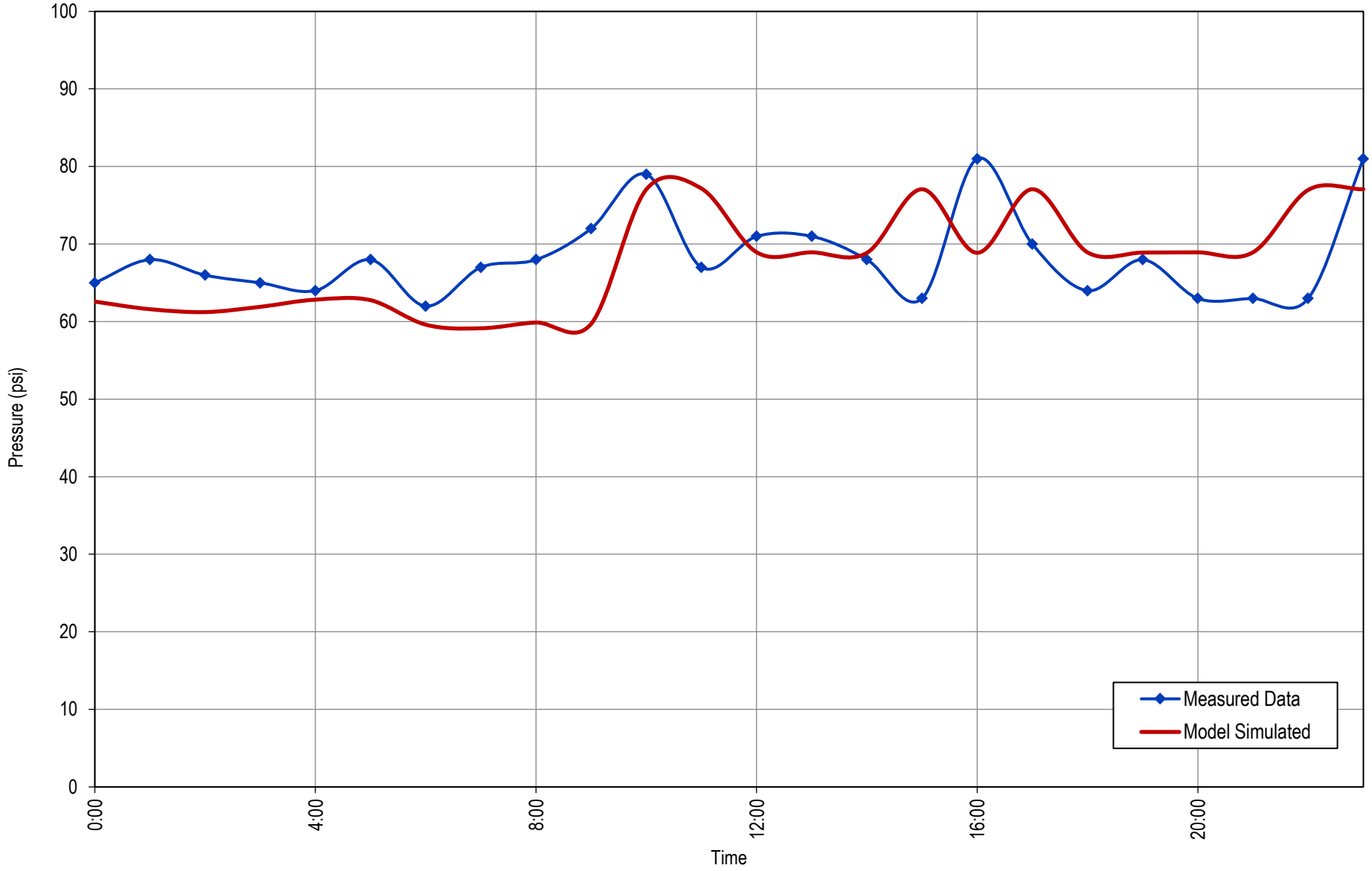
2026 Water System Plan Update

EPS CALIBRATION - FOREST HOME DISCHARGE PRESSURE



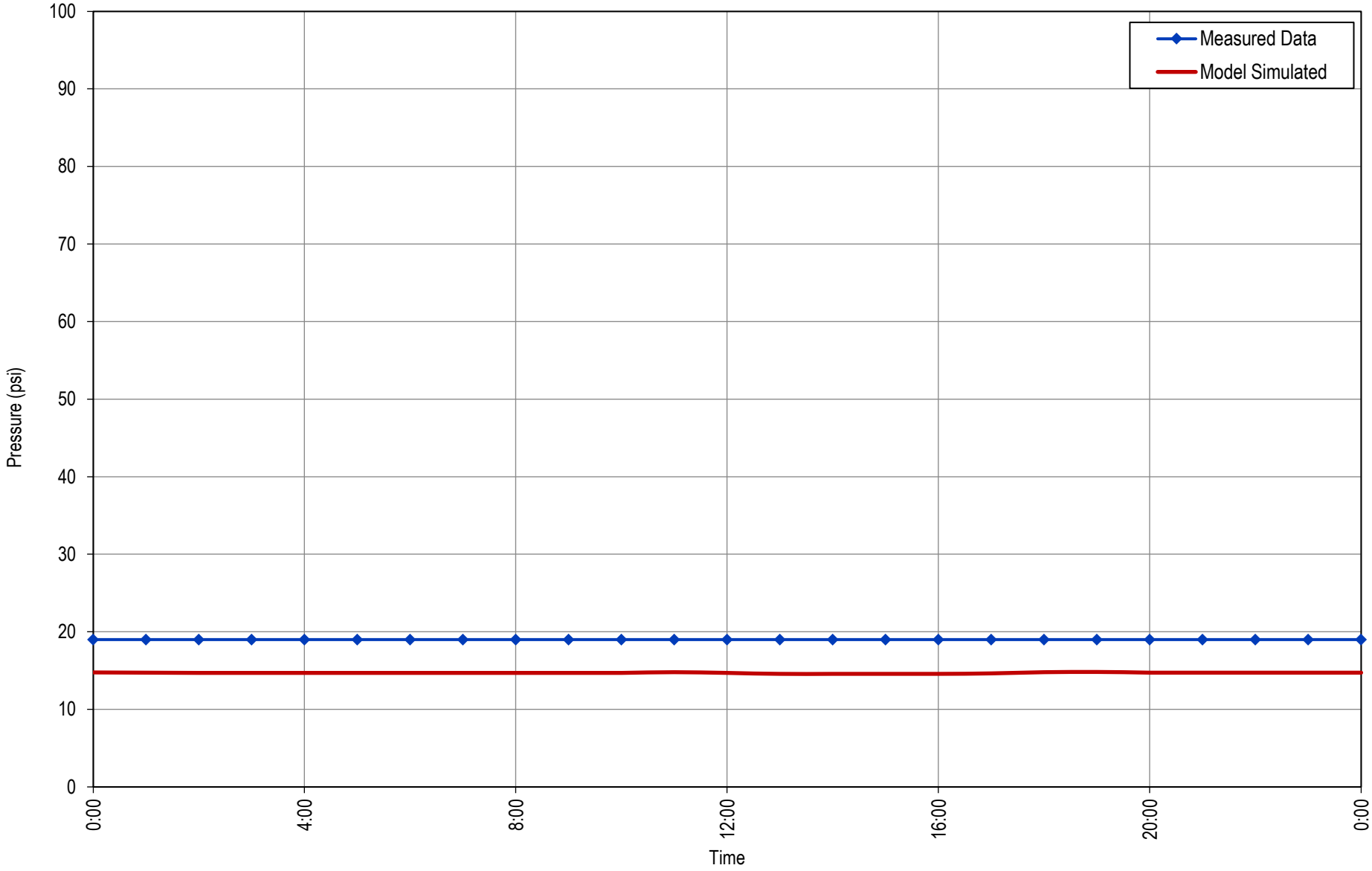
2026 Water System Plan Update

EPS CALIBRATION - FOREST HOME SUCTION PRESSURE



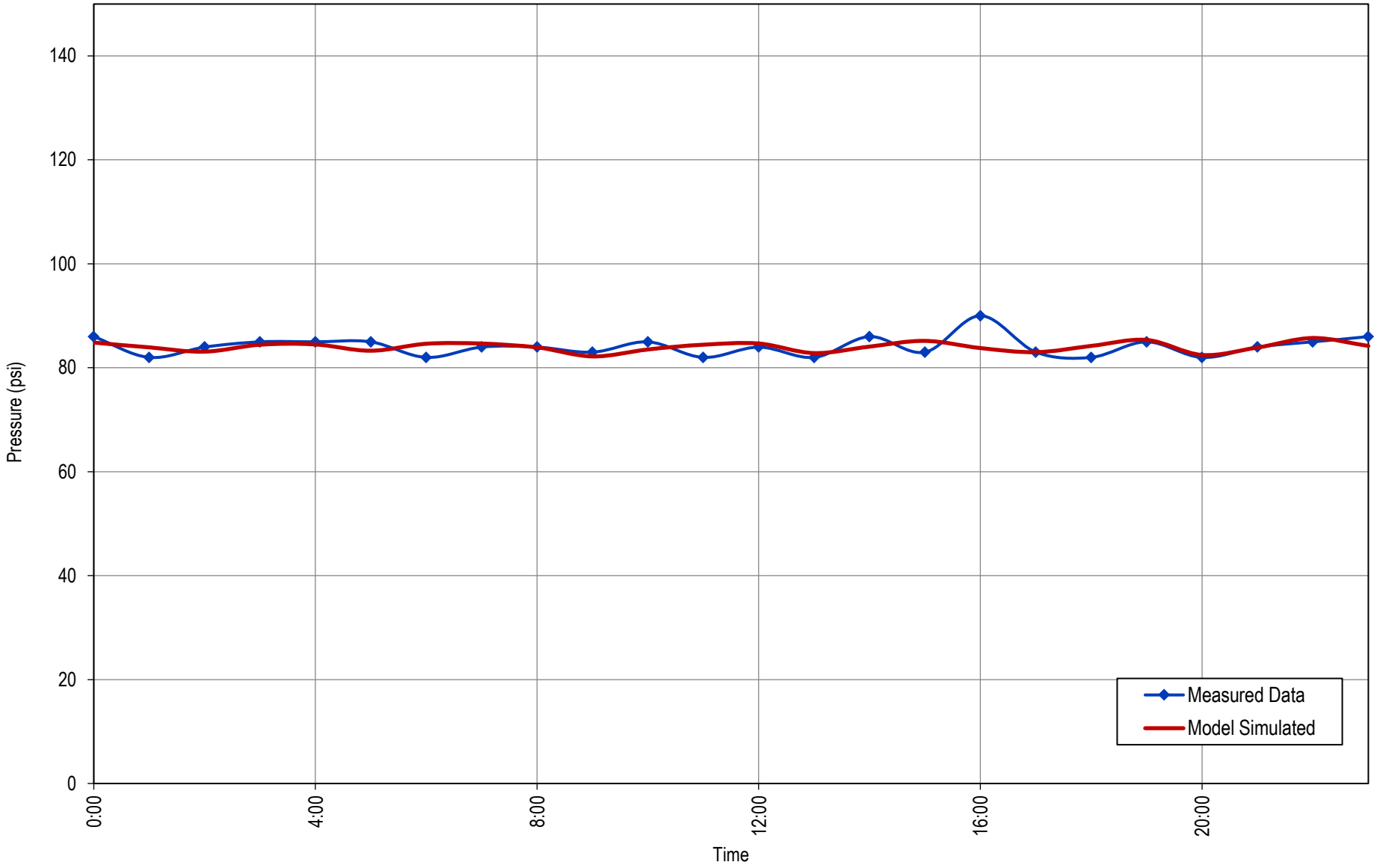
2026 Water System Plan Update

EPS CALIBRATION - 18TH AVENUE RESERVOIR PRESSURE



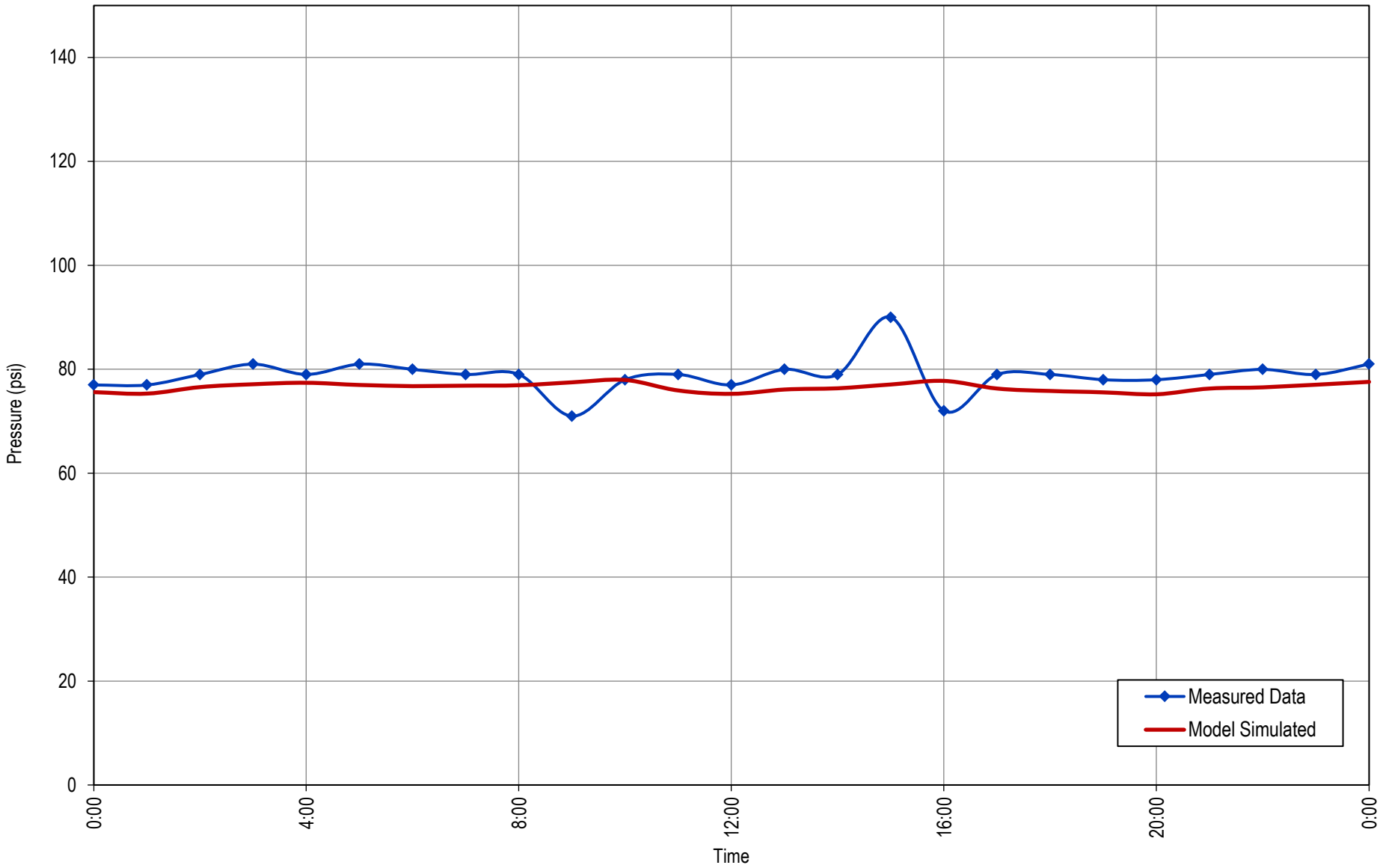
2026 Water System Plan Update

EPS CALIBRATION - BUTLER 542 ZONE PRESSURE



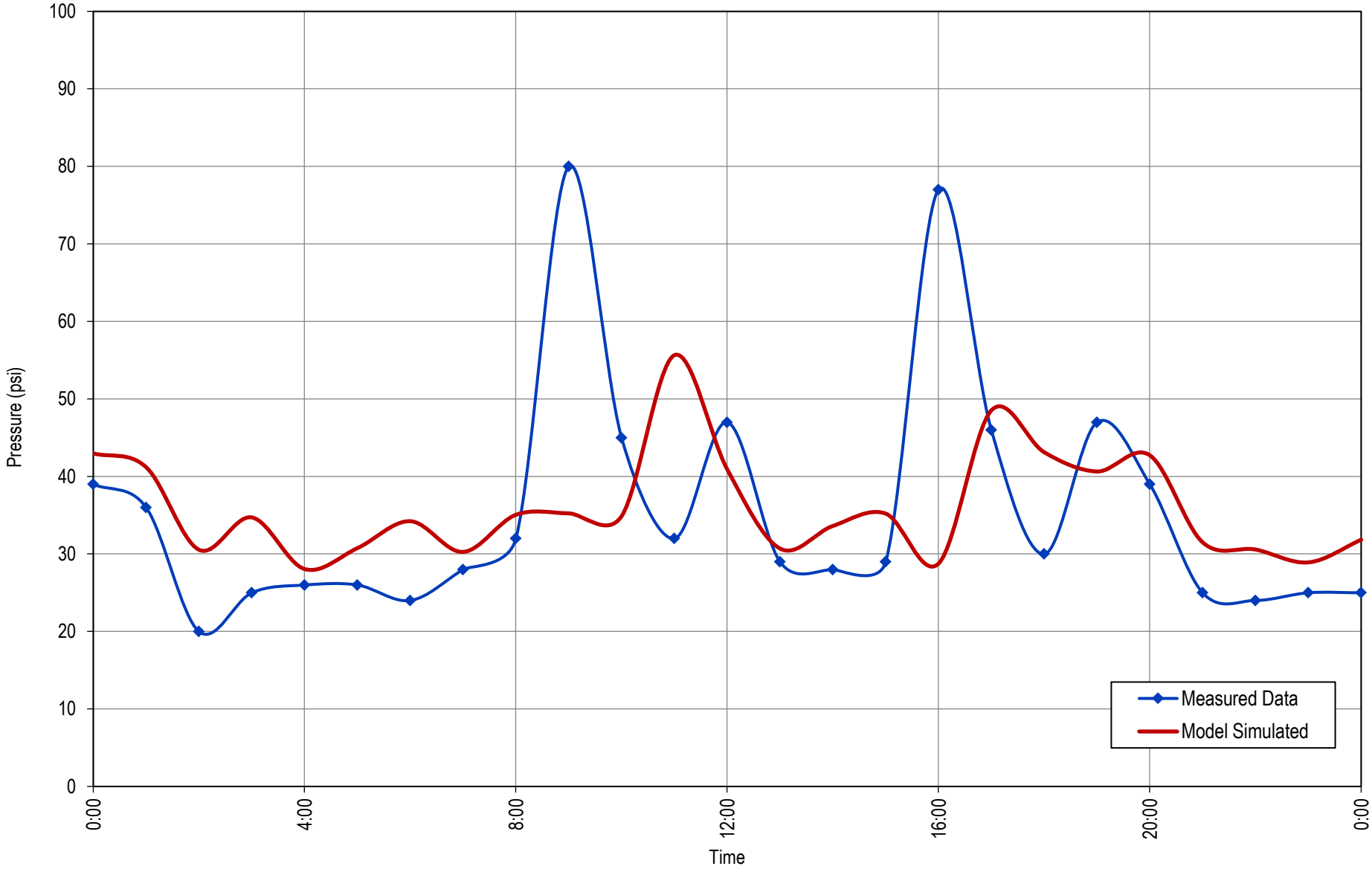
2026 Water System Plan Update

EPS CALIBRATION - LACAMAS DISCHARGE PRESSURE



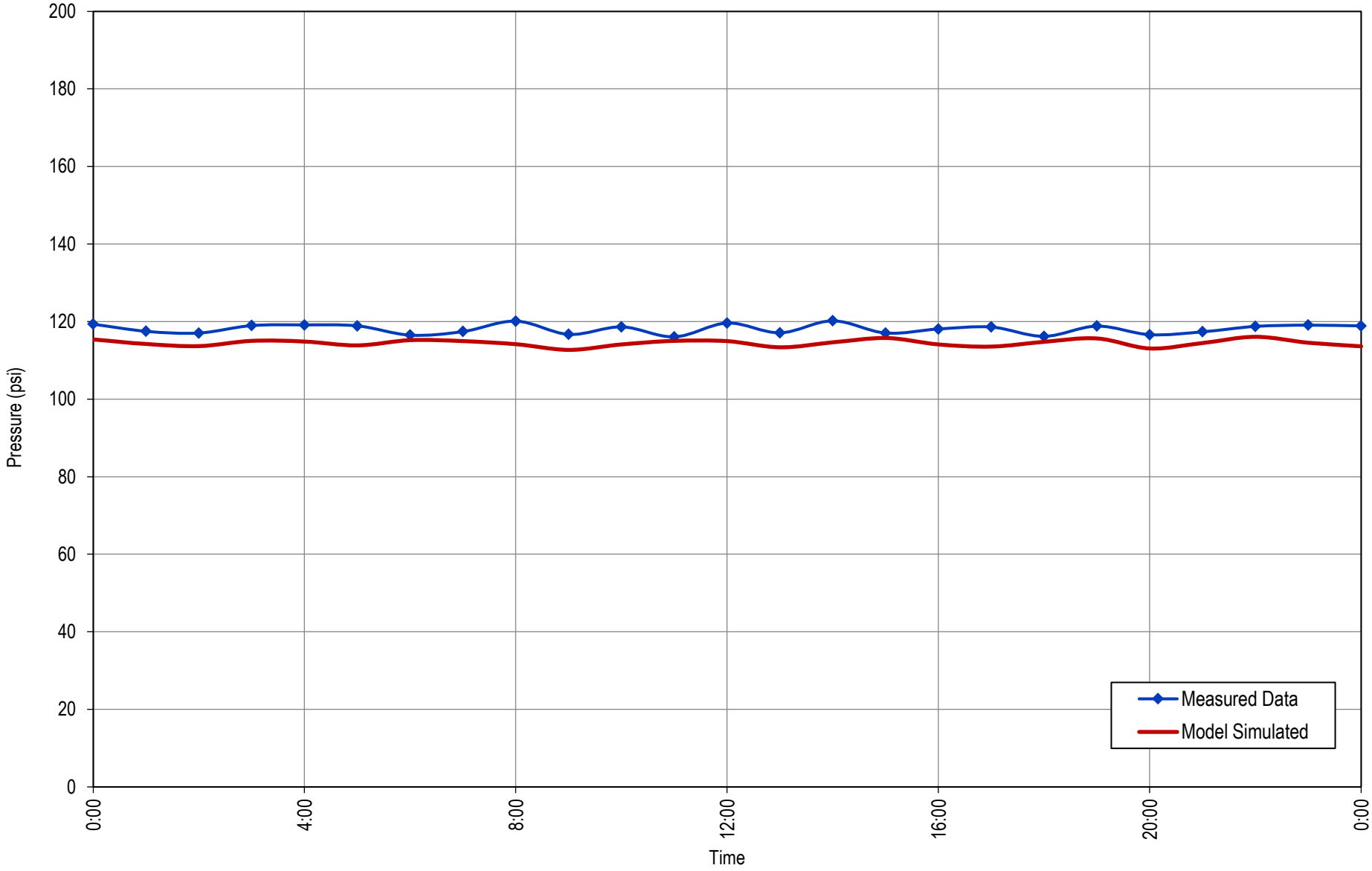
2026 Water System Plan Update

EPS CALIBRATION - LACAMAS SUCTION PRESSURE



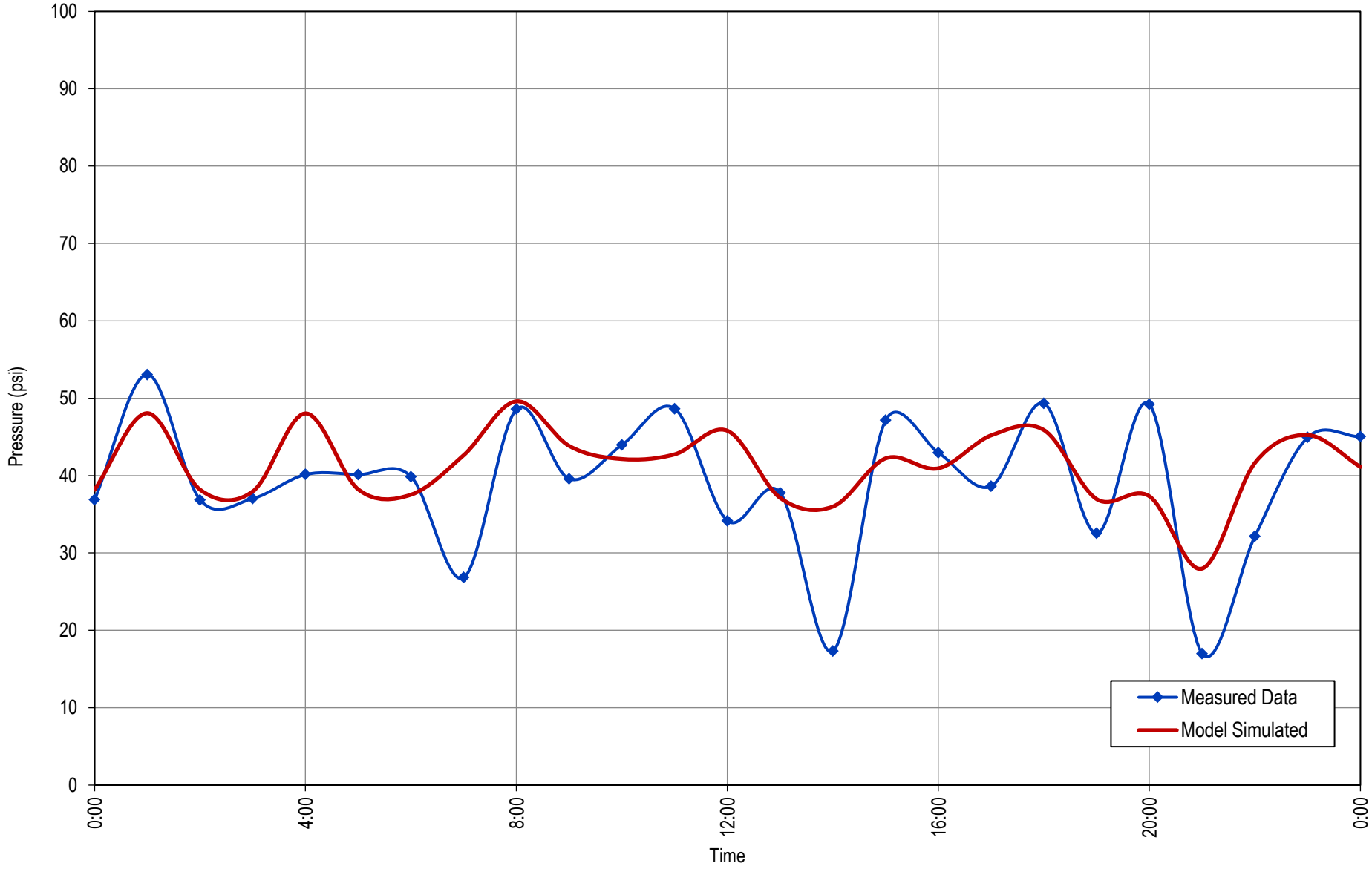
2026 Water System Plan Update

EPS CALIBRATION - CROWN ROAD DISCHARGE PRESSURE



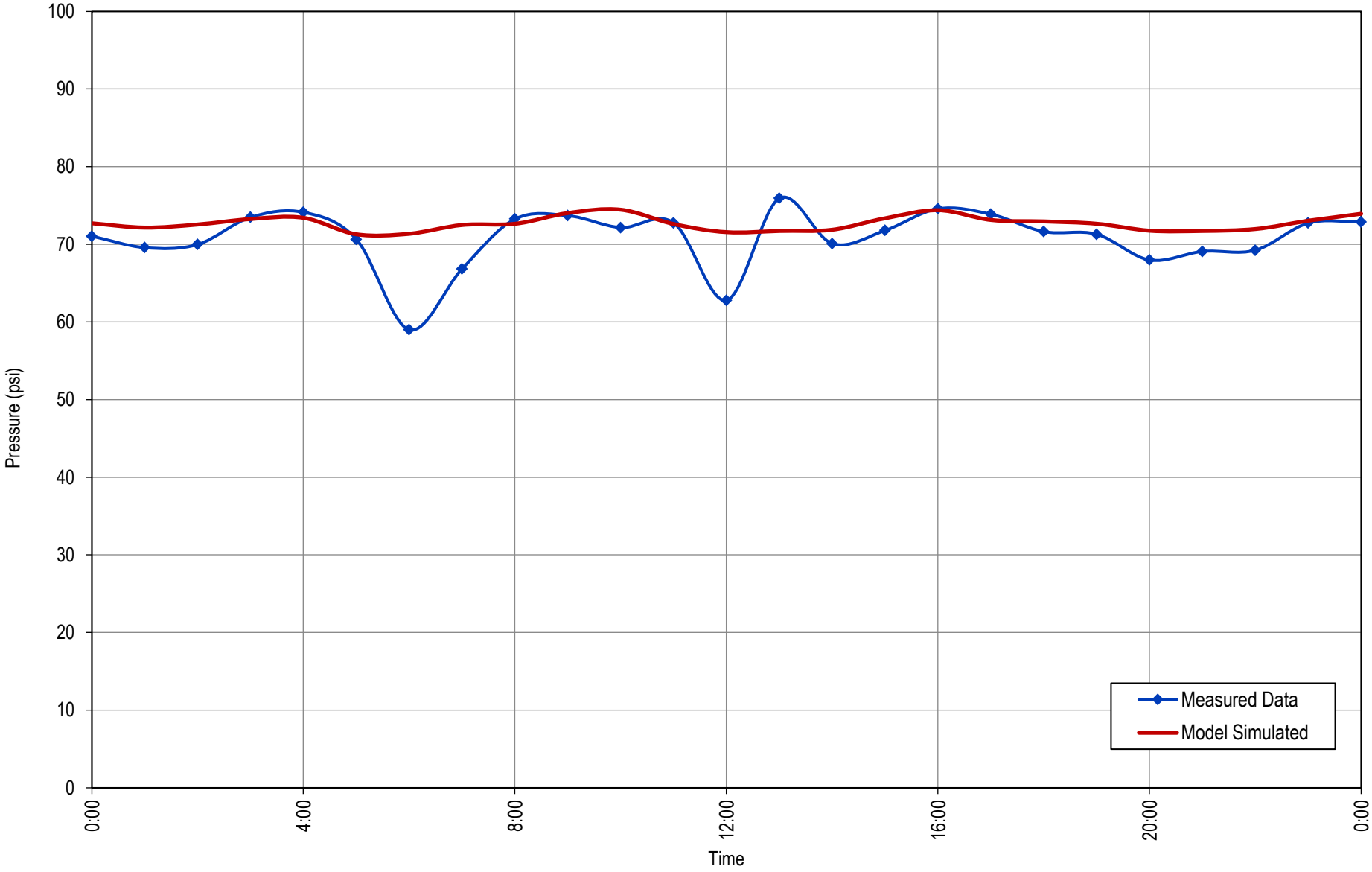
2026 Water System Plan Update

EPS CALIBRATION - CROWN ROAD SUCTION PRESSURE



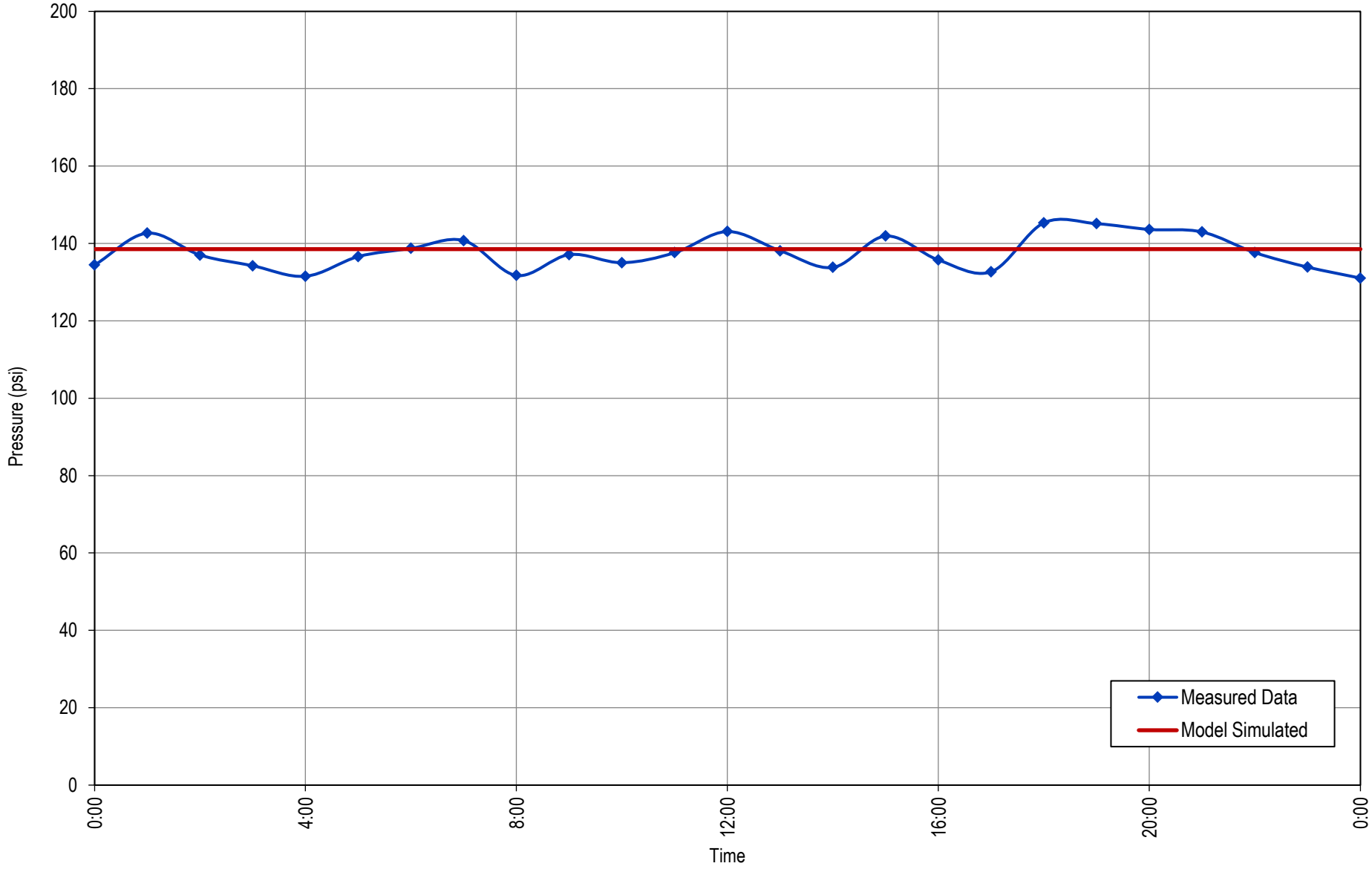
2026 Water System Plan Update

EPS CALIBRATION - GREEN MOUNTAIN ESTATES SUCTION PRESSURE



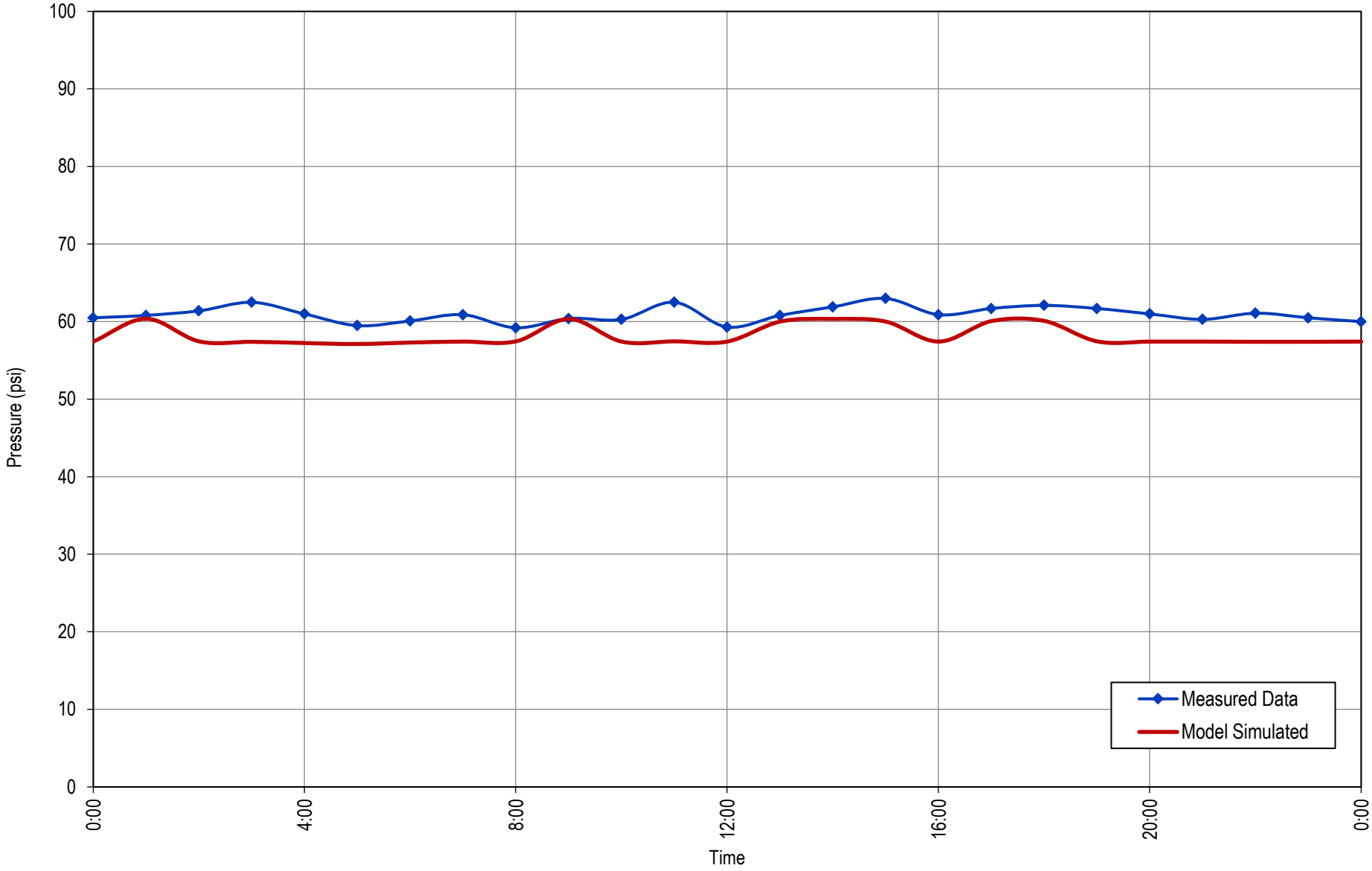
2026 Water System Plan Update

EPS CALIBRATION - GREEN MOUNTAIN ESTATES DISCHARGE PRESSURE



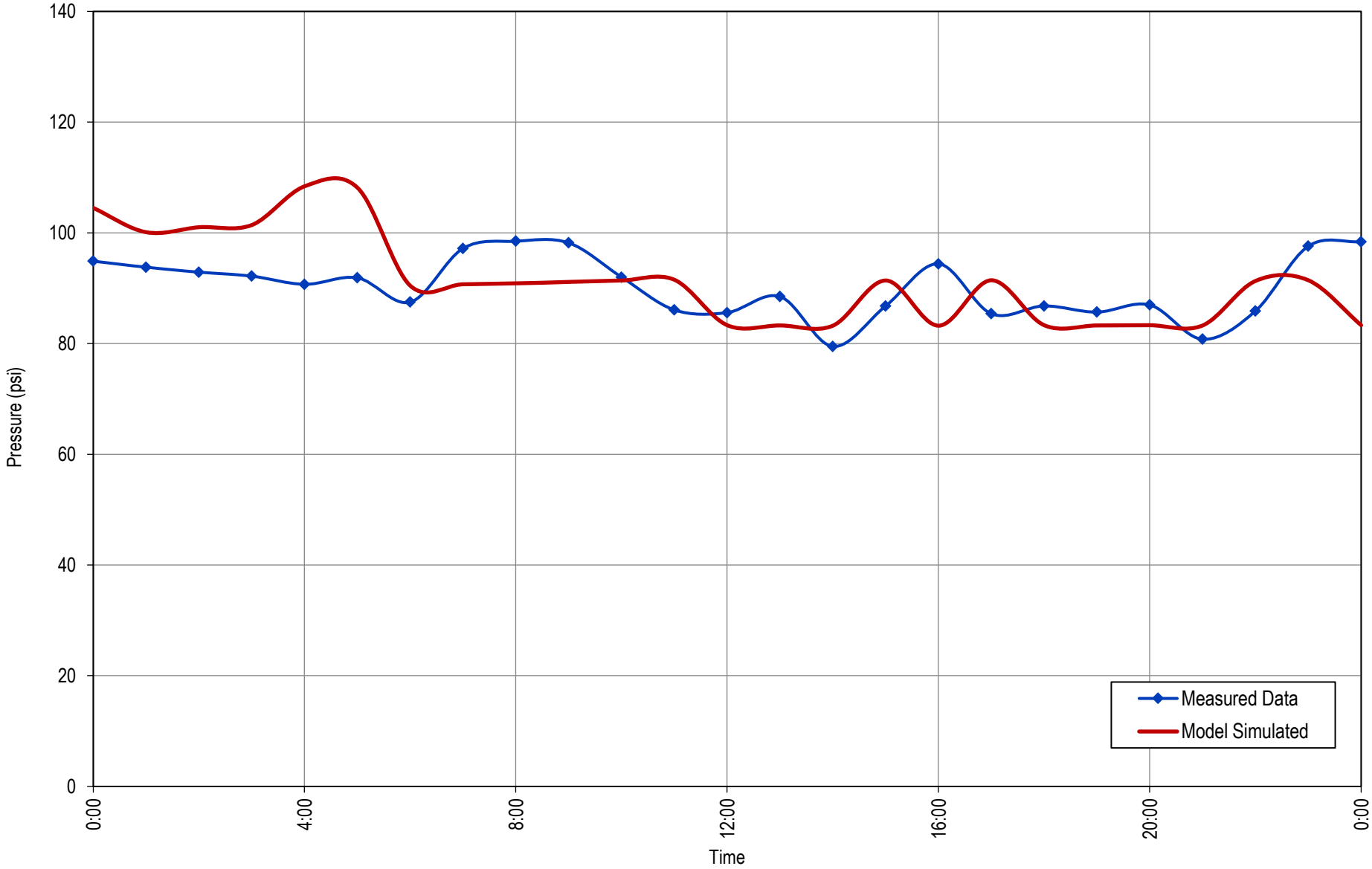
2026 Water System Plan Update

EPS CALIBRATION - 18TH AVENUE RESERVOIR (LOGGER 35)



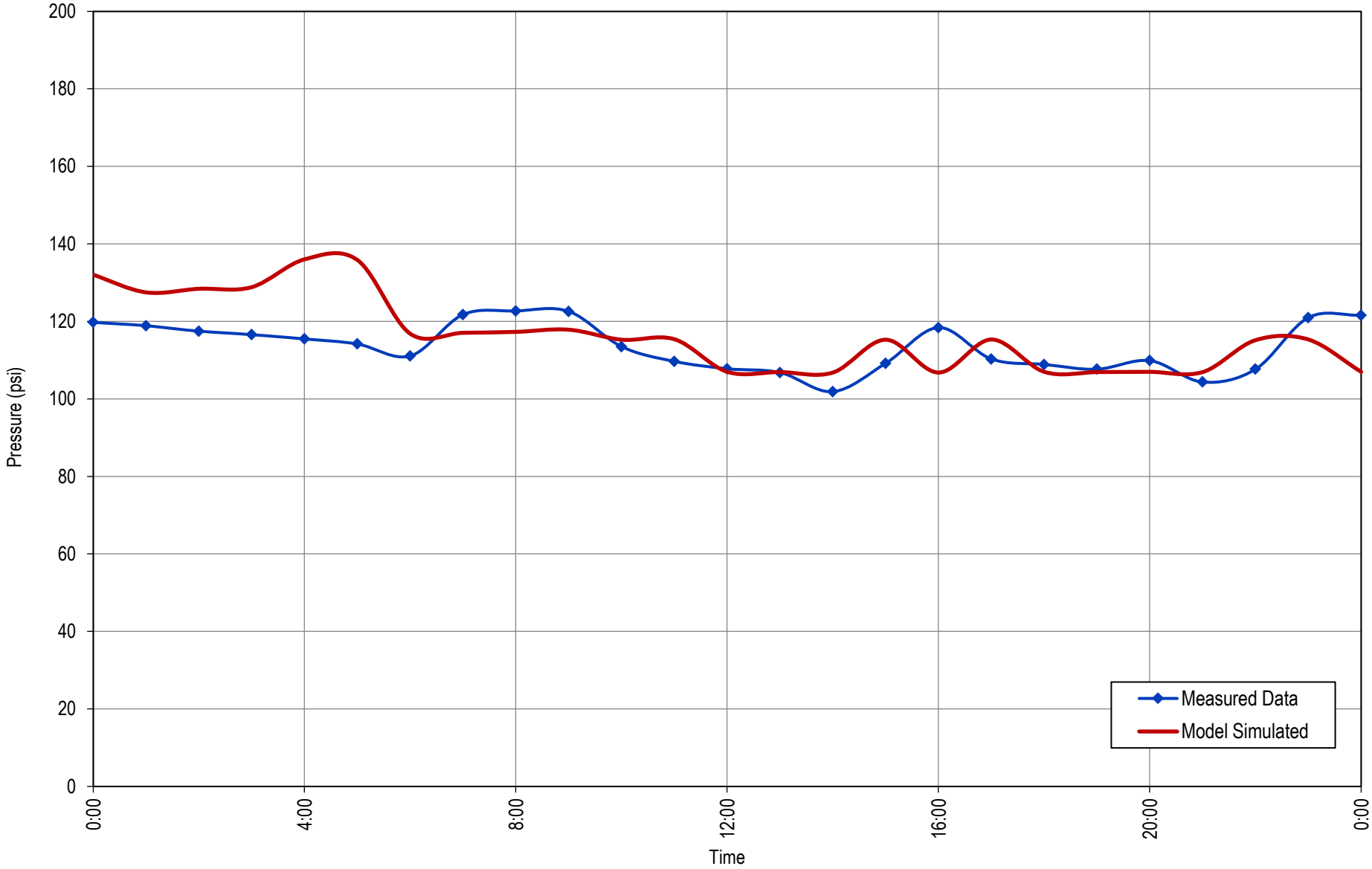
2026 Water System Plan Update

EPS CALIBRATION - DOWNTOWN (LOGGER 37)



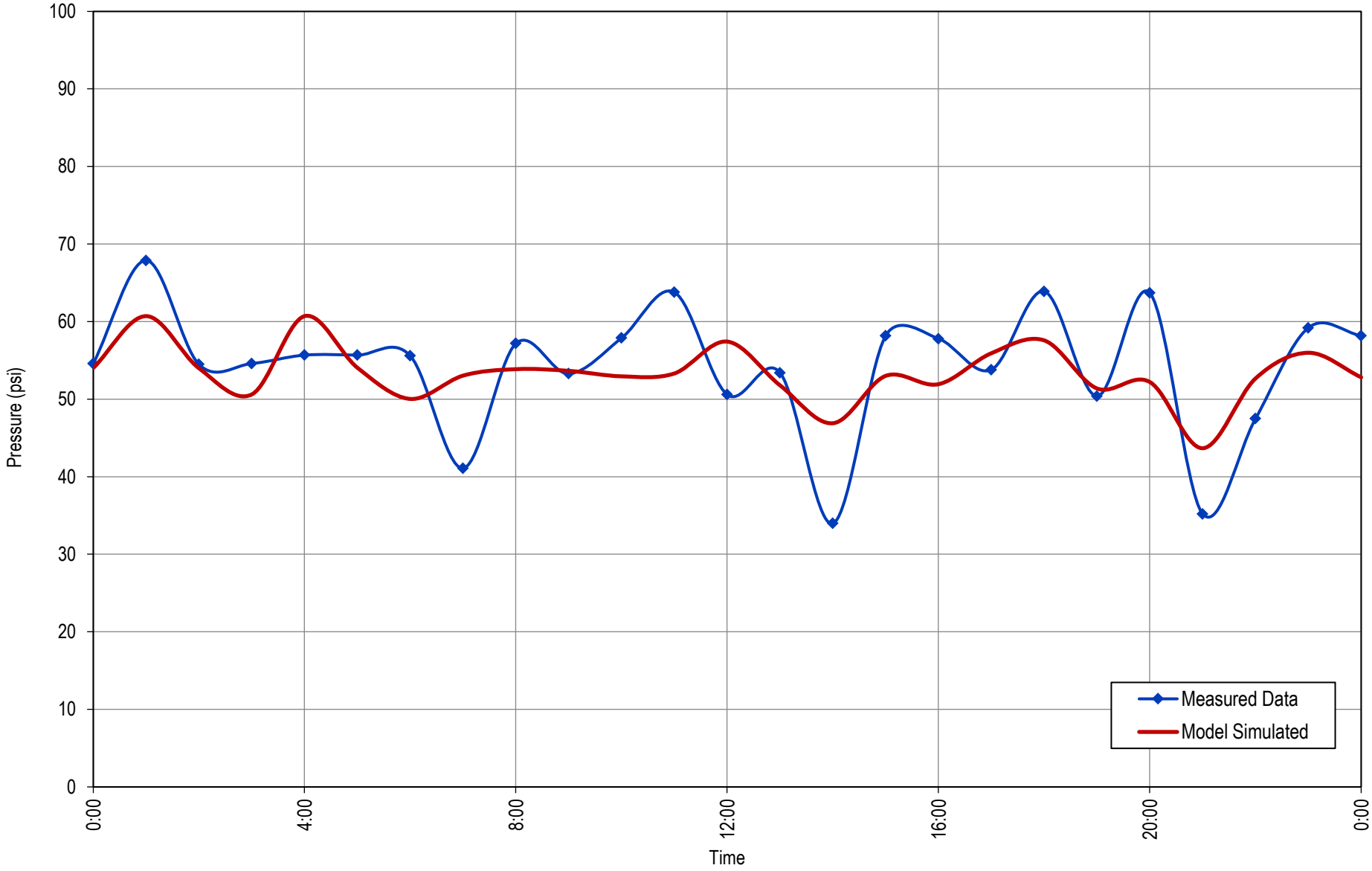
2026 Water System Plan Update

EPS CALIBRATION - OAK PARK, ACROSS OPS CENTER (LOGGER 49)



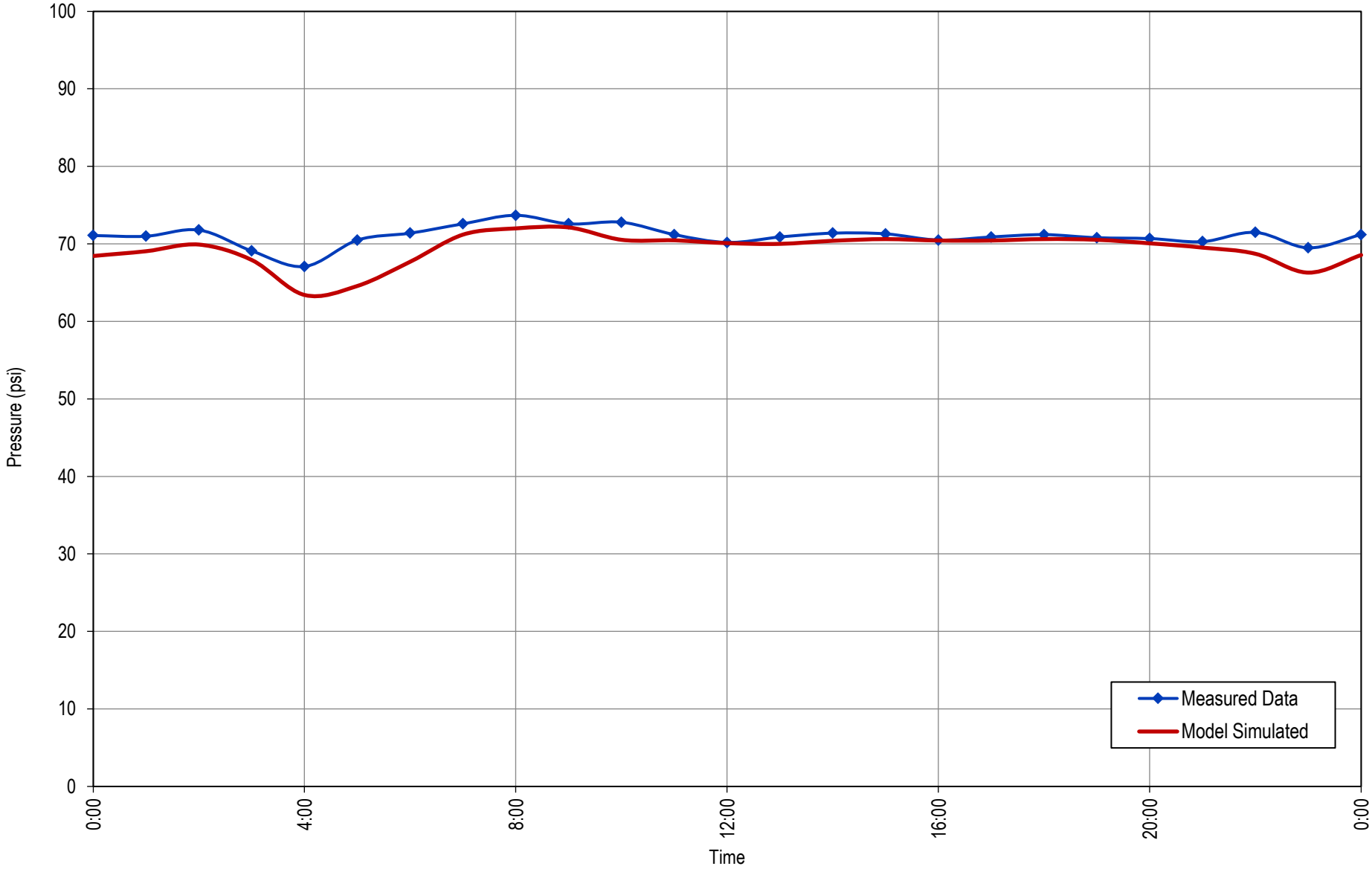
2026 Water System Plan Update

EPS CALIBRATION - HELEN BALLER ELEMENTARY (LOGGER 50)



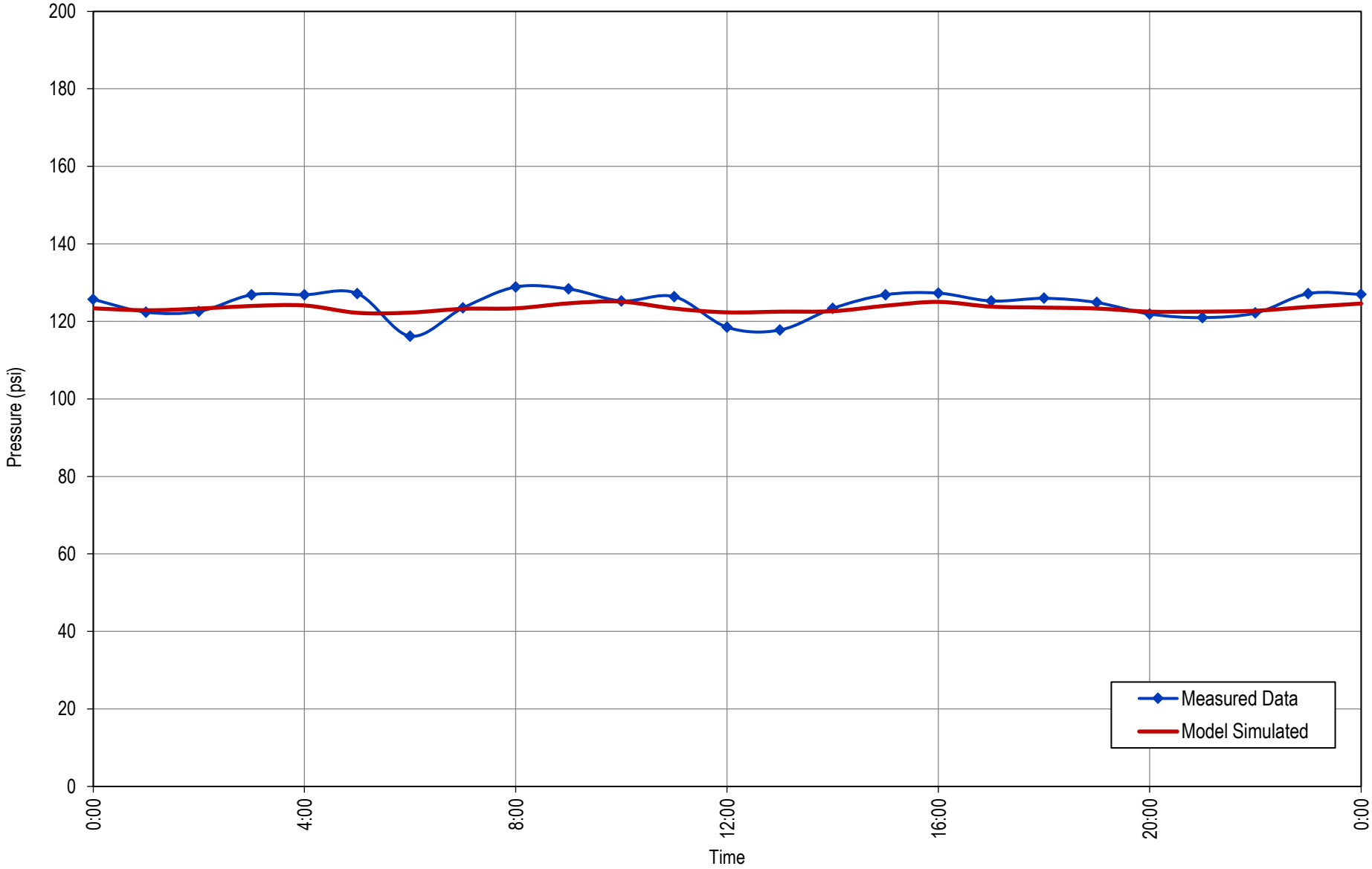
2026 Water System Plan Update

EPS CALIBRATION - DOROTHY FOX ELEMENTARY (LOGGER 58)



2026 Water System Plan Update

EPS CALIBRATION - UNION HS (LOGGER 68)



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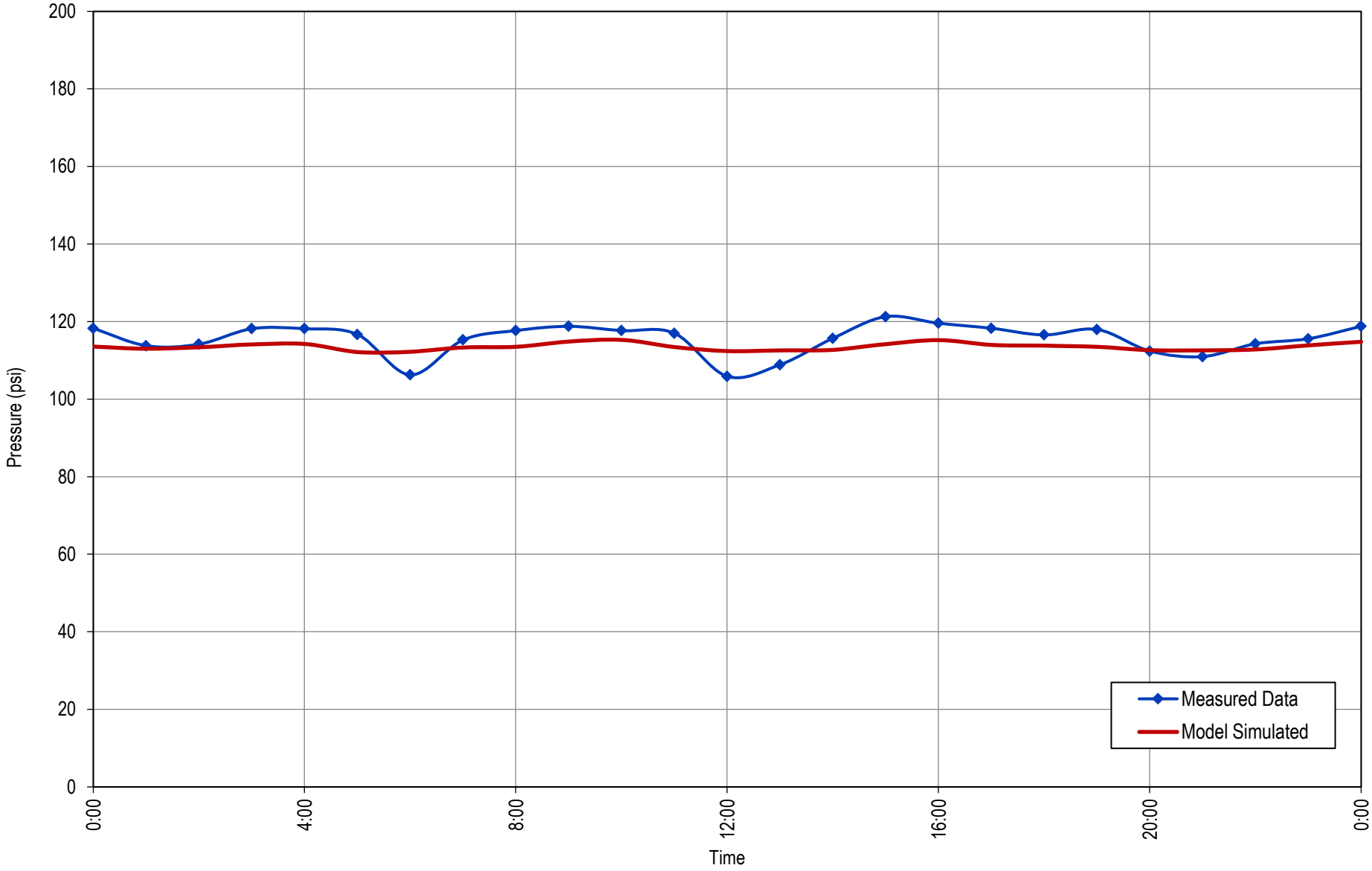
EPS CALIBRATION - GREEN MOUNTAIN ESTATES (LOGGER 69)



APPENDIX 1C

FF CALIBRATION RESULTS

Project Details

Client City of Camas
Project Name 2026 Water System Plan Update
Status Draft
Date September 2025

Hydrant Test Field Data/Model Junctions										Field Results						Model Results				Comparison						
Test No.	Pressure Zone	Date	Time	Duration (mins)	Location	Hydrant	Hydrant Number	Model Junction ID	Junction Elevation (ft)	Flow (gpm)	Post-Static Pressure (psi)	Static Pressure (psi)	Static HGL (FT)	Residual Pressure (psi)	Residual HGL (ft)	Static Pressure (psi)	Static HGL (FT)	Residual Pressure (psi)	Residual HGL (ft)	Static Pressure Diff (psi)	Res. Pressure Diff (psi)	Static Pressure Error (%)	Residual Pressure Error (%)	Pressure Drop (psi)		
																								Measured	Modeled	Diff
1	343 Downtown	May 15, 2025	14:40	1	SE 12th Ave	F1	WH200146	J1-1012	33.81	1100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200144	J1-1013	33.8	--	116	116	302	70	196	116	301	69	192	0.4	1.5	0.3%	2.1%	46	47	-1
						P2	WH200143	J1393	34.77	--	116	115	300	70	196	115	301	69	195	-0.2	0.6	-0.2%	0.9%	45	46	-1
2	343 Downtown	May 15, 2025	9:00	2	E 1st Ave / NE Joy St	F1	WH200779	J1-93	66.68	1350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200776	J1207	68.3	--	100	100	299	80	253	101	301	81	256	-0.9	-1.1	-0.9%	-1.4%	20	20	0
						P2	WH200777	J1-91	73.59	--	100	100	305	83	265	99	301	85	269	1.4	-1.7	1.4%	-2.0%	17	14	3
3	343 Cemetery	May 15, 2025	9:39	1	NE Garfield St	F1	WH200802	J1-794	216.99	850	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200801	J1-152	210.9	--	56	54	336	40	303	56	339	39	300	-1.6	1.2	-3.0%	3.1%	14	17	-3
						P2	WH200914	J1-158	223.3	--	50	50	339	35	304	50	339	35	304	-0.1	0.3	-0.2%	0.7%	15	15	0
4	455 LPH	May 15, 2025	10:37	2	NW 7th Ave / NW Greeley St	F1	WH200708	J2-220	176.97	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200709	J2-225	188.19	--	120	118	461	99	417	115	453	97	412	3.2	2.1	2.7%	2.1%	19	18	1
						P2	WH200992	J2-213	143.04	--	134	134	453	120	420	134	454	123	427	-0.5	-2.8	-0.4%	-2.3%	14	12	2
5	852 UPH	May 15, 2025	11:03	2	NW 31st Ave / NW Sierra Dr	F1	WH200237	J3-322	678.51	1190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200236	J3-338	676.63	--	70	71	841	64	824	69	835	62	820	2.5	1.9	3.5%	2.9%	7	6	1
						P2	WH200246	J3-318	659.15	--	75	75	832	72	825	76	835	70	820	-1.1	2.2	-1.5%	3.1%	3	6	-3
6	544 Lacamas	May 15, 2025	12:45	2	NW 46th Ave / NW Howard St	F1	WH200299	J4-2008	315.05	1350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200298	J1195	306.82	--	100	100	538	82	496	97	531	80	491	3.1	2.1	3.1%	2.6%	18	17	1
						P2	WH200300	J4-2003	334.14	--	87	87	535	66	487	85	531	68	491	1.9	-1.9	2.2%	-2.9%	21	17	4
7	544 Lacamas	May 15, 2025	13:15	1	N Alder St / N 96th Ave	F1	WH200504	J285	286.35	1300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200503	J281	290.66	--	104	104	531	84	485	104	530	85	486	0.2	-0.7	0.2%	-0.9%	20	19	1
						P2	WH200500	J295	258.24	--	114	118	531	101	492	118	530	100	489	0.2	1.3	0.2%	1.3%	17	18	-1
8	542 Gregg	May 15, 2025	14:10	1	NE Quince Way	F1	WH200424	J779	443.31	600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200423	J791	462.25	--	40	38	550	28	527	30	530	27	525	**8.5**	1.0	**22.3%**	3.5%	10	2	**8**
						P2	WH200425	J751	452.22	--	35	35	533	24	508	34	530	31	525	1.1	**-7.4**	3.3%	**-31.0%**	11	2	**9**
9	GME	May 15, 2025	1:45	1	N 91st Ave	F1	WH200964	J1203	505.64	950	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200965	J1199	518.06	--	110	74	689	50	634	75	692	50	634	-1.2	-0.3	-1.7%	-0.6%	24	25	-1
						P2	WH200963	J1201	494.15	--	109	86	693	62	637	86	692	61	634	0.4	1.3	0.5%	2.0%	24	25	-1
10	697	May 16, 2025	8:10	2	NW Deefern St. / NW 14th Ave.	F1	WH200860	J3-602	501.47	1250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						P1	WH200098	J3-573	497.37	--	75	70	659	67	652	73	667	65	648	-3.3	1.8	-4.7%	2.7%	3	8	**-5**
						P2	WH200097	J1205	482.52	--	81	80	667	72	649	80	667	70	643	0.3	2.4	0.3%	3.3%	8	10	-2

APPENDIX W

CIP PROJECTS

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-01
Project Title: NW 7th Avenue Fire Flow Improvements
Priority: 0-10 years

Facility Type: Distribution System
Pressure Zone: 285 - Downtown
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To address fire flow deficiencies along NW 7th Avenue, replace approximately 1,300 linear feet of 6-inch diameter cast iron pipeline to 12-inch pipeline.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 12-inch	1,300	LF	$ -	$ -	$ -	$ -	$ -
Total Anticipated Project Cost							$ -

Notes on Cost Estimation:

Costs for this project have been incorporated into the pipe replacement program.

Go to Assumptions Tab

Cost Allocation:

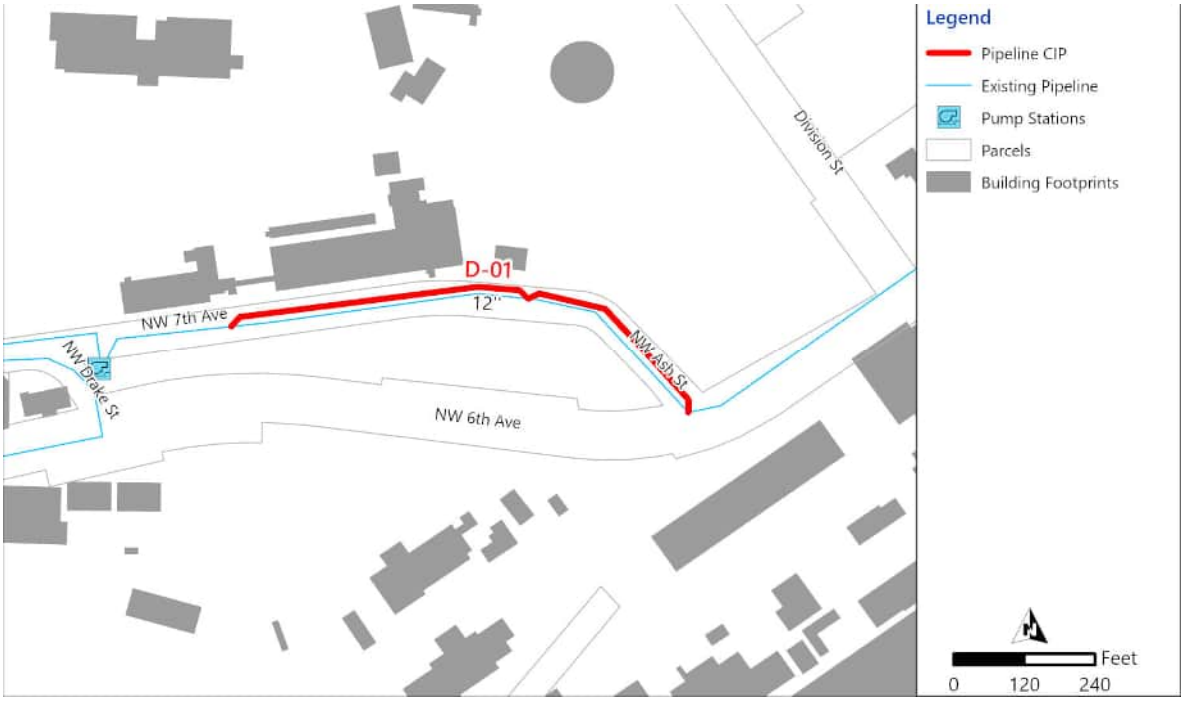
Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ -

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	-	0-10 years	$ -
Total Anticipated Project Cost			$ -

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-02
Project Title: NE Dallas Street Fire Flow Improvements
Priority: 0-10 years
Facility Type: Distribution System
Pressure Zone: 285 - Downtown
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To address fire flow deficiencies along NE Dallas Street the following improvements are recommended:
1) Construct approximately 500 LF of 8-inch diameter pipeline along NE Everett Street between NE 4th and NE 6th Avenue
2) Replace approximately 250 LF of 6-inch diameter cast iron pipeline along NE 6th Ave with 8-inch pipeline.
3) Replace approximately 400 LF of 6-inch diameter cast iron pipeline along NE Dallas Street between NE 6th Ave and View Crest Terrace with 8-inch pipeline.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 8-inch	1,150	LF	$ -	$ -	$ -	$ -	$ -
Total Anticipated Project Cost							$ -

Notes on Cost Estimation:
Costs for this project have been incorporated into the pipe replacement program.

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ -

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	-	0-10 years	$ -
Total Anticipated Project Cost			$ -

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-03
Project Title: 1st Avenue Fire Flow Improvements
Facility Type: Distribution System
Pressure Zone: 285 - Downtown

Go to CIP Summary Table

Priority: 0-10 years
Project Status (Completed?): No

Project Description:

Project Description: To address fire flow deficiencies, upsize approximately 1,150 LF of 6-inch cast iron pipeline along E 1st Ave between SE Garfield Street and SE King Street with 8-inch pipeline.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 8-inch	1,150	LF	$ -	$ -	$ -	$ -	$ -
Total Anticipated Project Cost							$ -

Notes on Cost Estimation:

Costs for this project have been incorporated into the pipe replacement program.

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ -

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	-	0-10 years	$ -
Total Anticipated Project Cost			$ -

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-04
Project Title: Operations Center/WWTF Fire Flow Improvements
Priority: 0-10 years
Facility Type: Distribution System
Pressure Zone: 285 - Downtown
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To address fire flow deficiencies near the City's operations center and WWTF the following improvements are recommended:
1) Replace approximately 450 LF of 6-inch cast iron pipeline along SE 8th Avenue with 8-inch pipeline.
2) Replace approximately 400 LF of 6-inch cast iron pipeline along SE Polk Street with 8-inch pipeline.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 8-inch	850	LF	$ -	$ -	$ -	$ -	$ -
Total Anticipated Project Cost							$ -

Notes on Cost Estimation:

Costs for this project have been incorporated into the pipe replacement program.

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ -

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	-	0-10 years	$ -
Total Anticipated Project Cost			$ -

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-05
Project Title: NW Fargo Street Fire Flow Improvements
Priority: 0-10 years
Facility Type: Distribution System
Pressure Zone: 697/734
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To address fire flow deficiencies in the NW Fargo Street area the following improvements are recommended:
1) Replace approximately 450 LF of 6-inch cast iron pipeline along NW Fargo Street between NW 23rd Street/Fargo PRV and NW 22nd Avenue with 8-inch pipeline.
2) Replace approximately 1,250 LF of 6-inch cast iron pipeline along NW Fargo Loop with 8-inch pipeline.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 8-inch	1,700	LF	$ -	$ -	$ -	$ -	$ -
Total Anticipated Project Cost							$ -

Notes on Cost Estimation:

Costs for this project have been incorporated into the pipe replacement program.

Go to Assumptions Tab

Cost Allocation:

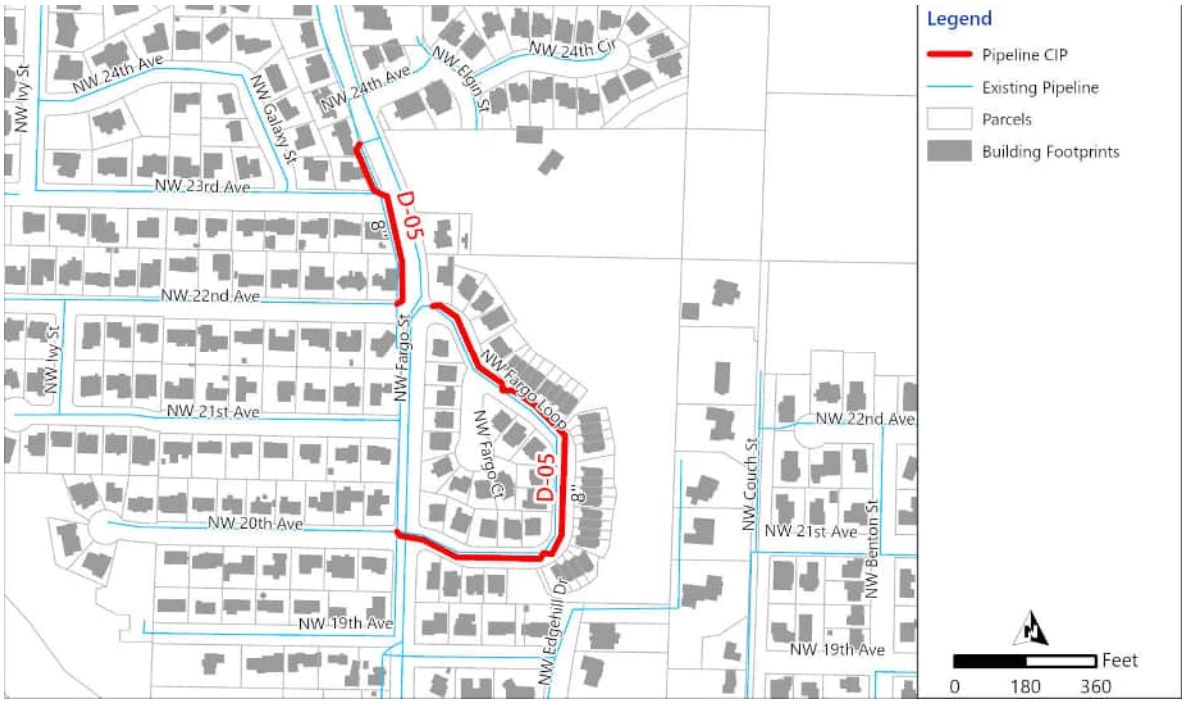
Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ -

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	-	0-10 years	$ -
Total Anticipated Project Cost			$ -

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-06
Project Title: Upper Prune Hill Fire Flow Improvements
Priority: 0-10 years
Facility Type: Distribution System
Pressure Zone: 852
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To improve fire flows near the Upper Prune Hill Reservoirs, the following improvements are recommended.
1) Upsize approximately 1,100 feet of existing 12-inch pipeline from along NW 18th Avenue from NW Cascade Street to Upper Prune Hill Reservoir with 16-inch pipeline.
2) Upsize approximately 450 feet of 8-inch pipeline along NW Cascade Street to 12-inch pipeline.
3) Construct approximately 250 feet of 8-inch pipeline along the walking path between NW 12th Circle and NW Astor Street.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 8-inch	250	LF	$ 236	$ 60,000	$ 20,000	$ 40,000	$ 120,000
Pipeline: 12-inch	450	LF	$ 300	$ 140,000	$ 40,000	$ 100,000	$ 280,000
Pipeline: 16-inch	1,100	LF	$ 404	$ 440,000	$ 130,000	$ 280,000	$ 850,000
Total Anticipated Project Cost							$ 1,250,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	50%	$ 625,000
Upgrade:	50%	$ 625,000
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 1,250,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2034	0-10 years	$ 1,250,000
Total Anticipated Project Cost			$ 1,250,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-07
Project Title: Sierra Lane PRV Station
Facility Type: Distribution System
Pressure Zone: 455

Go to CIP Summary Table

Priority: 0-10 years
Project Status (Completed?): No

Project Description:

Project Description: To address fire flow deficiencies near the top of NW Sierra Lane, a PRV station is recommended to allow fire flow from the 542_S zone to the 455 zone.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
PRV	1	No.	$ 400,000	$ 400,000	$ 120,000	$ 260,000	$ 780,000
Total Anticipated Project Cost							$ 780,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 780,000
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 780,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2034	0-10 years	$ 780,000
Total Anticipated Project Cost			$ 780,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-08
Project Title: SE 5th Street and SE Everett Rd Fire Flow Improvements
Priority: 0-10 years
Facility Type: Distribution System
Pressure Zone: 542
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To improve fire flows along SE Everett Road and SE 5th Street the following improvements are recommended:
1) Upsize approximately 1,200 LF of 10-inch pipeline along SE Everett Street between SE 5th Street and the proposed North Shore roundabout with 12-inch pipeline.
2) Construct approximately 50 LF of 8-inch pipeline along SE 5th Street to connect to the 12-inch pipeline on SE Everett Street.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 8-inch	50	LF	$ 236	$ 10,000	$ -	$ -	$ 10,000
Pipeline: 12-inch	1,200	LF	$ 300	$ 360,000	$ 110,000	$ 230,000	$ 700,000
Total Anticipated Project Cost							$ 710,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

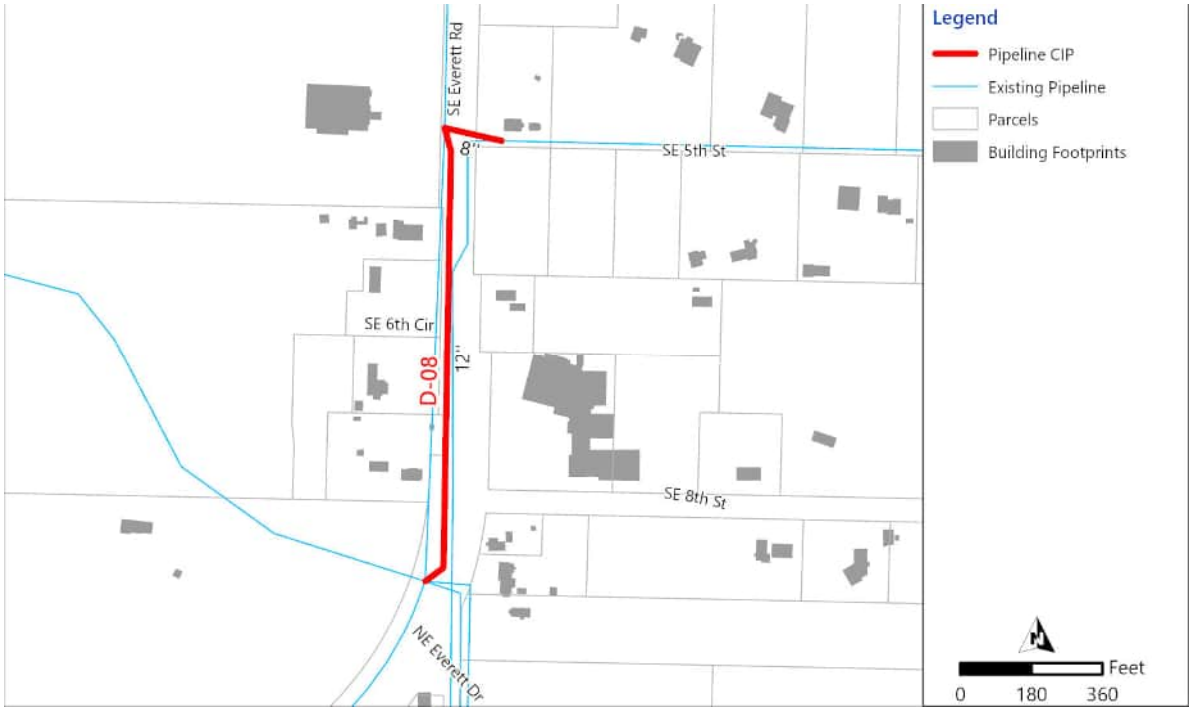
Project Type	Percent	Cost
Growth:	100%	$ 710,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 710,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2034	0-10 years	$ 710,000
Total Anticipated Project Cost			$ 710,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-09
Project Title: SE 283rd Avenue Fire Flow Improvements
Priority: 0-10 years
Facility Type: Distribution System
Pressure Zone: 542
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To address fire flow deficiencies along SE 283rd Avenue, replace approximately 2,700 LF of 8-inch pipeline between SE 7th Street and SE Nourse Road with 12-inch pipeline.

Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 12-inch	2,700	LF	$ 300	$ 810,000	$ 240,000	$ 550,000	$ 1,600,000
Total Anticipated Project Cost							$ 1,600,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 1,600,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 1,600,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2034	0-10 years	$ 1,600,000
Total Anticipated Project Cost			$ 1,600,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: D-10
Project Title: NE 6th Avenue and NE Nevada Street Fire Flow Improvements
Priority: 0-10 years
Facility Type: Distribution System
Pressure Zone: 285-Downtown/343
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To address fire flow deficiencies in the NW Fargo Street area the following improvements are recommended:
1) Replace approximately 1,700 LF of 6-inch cast iron pipeline along NE 6th Avenue with 8-inch pipeline.
2) Replace approximately 1,900 LF of 6-inch cast iron pipeline along NE Nevada Street with 8-inch pipeline.
Reasoning Fire flow deficiency

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 8-inch	3,600	LF	$ -	$ -	$ -	$ -	$ -
Total Anticipated Project Cost							$ -

Notes on Cost Estimation:

Costs for this project have been incorporated into the pipe replacement program.

Go to Assumptions Tab

Cost Allocation:

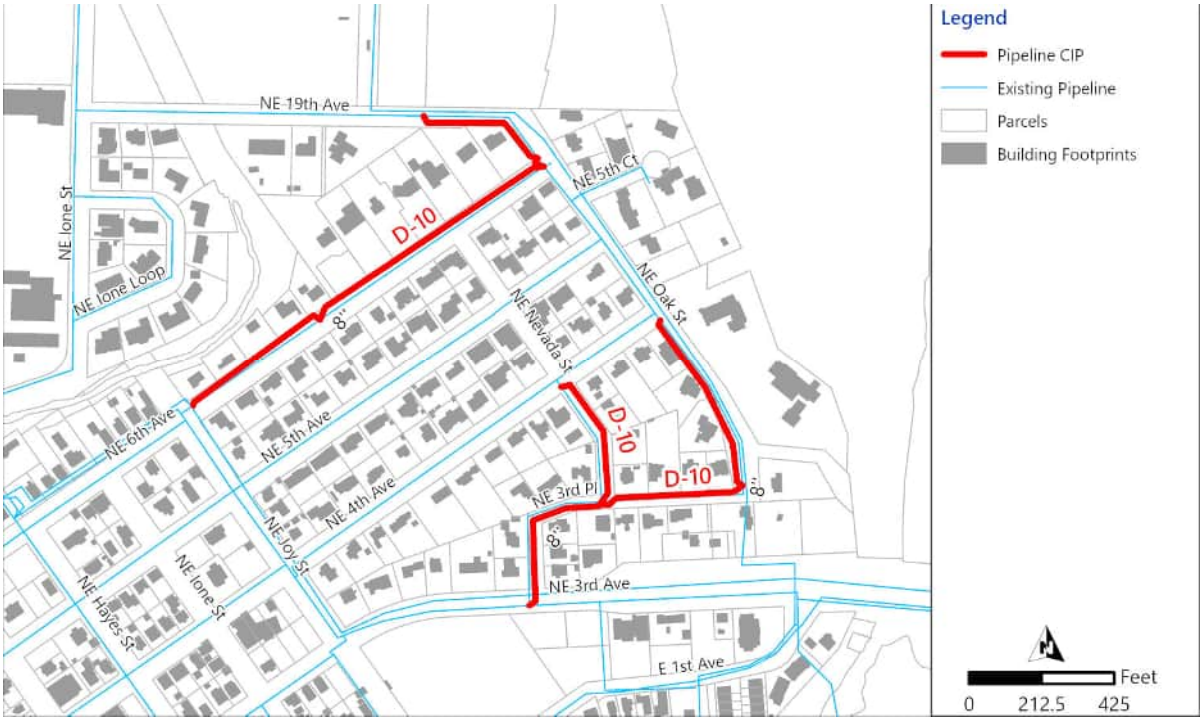
Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ -

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	-	0-10 years	$ -
Total Anticipated Project Cost			$ -

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: T-01
Project Title: North Shore Transmission Pipeline
Facility Type: Transmission Pipeline
Pressure Zone: 542

Go to CIP Summary Table

Priority: 0-10 years
Project Status (Completed?): No

Project Description:

Project Description: To serve future development and demands expected in the North Shore area, it is recommended to construct a transmission pipeline network. The transmission pipeline network shall consist of the following segments:
Segment 1 - 1,600 LF of 12-inch pipeline along NE 3rd Avenue between NE Everett Street and N Benton Drive
Segment 2 - 13,200 LF of 24-inch pipeline along the proposed North Shore Boulevard between the proposed roundabout at NE Everett Street and N Benton Drive.
Segment 3 - 4,200 LF of 24-inch pipeline along SE 15th Street between the recommended Gregg Reservoir and the proposed roundabout at NE Everett Street.

Reasoning Demand growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Segment 1: Pipeline: 12-inch	1,600	LF	$ 300	$ 480,000	$ 140,000	$ 310,000	$ 930,000
Segment 2: Pipeline: 24-inch	13,200	LF	$ 575	$ 7,600,000	$ 2,300,000	$ 5,000,000	$ 14,900,000
Segment 3: Pipeline: 24-inch	4,200	LF	$ 575	$ 2,400,000	$ 720,000	$ 1,580,000	$ 4,700,000
Total Anticipated Project Cost							$ 20,530,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

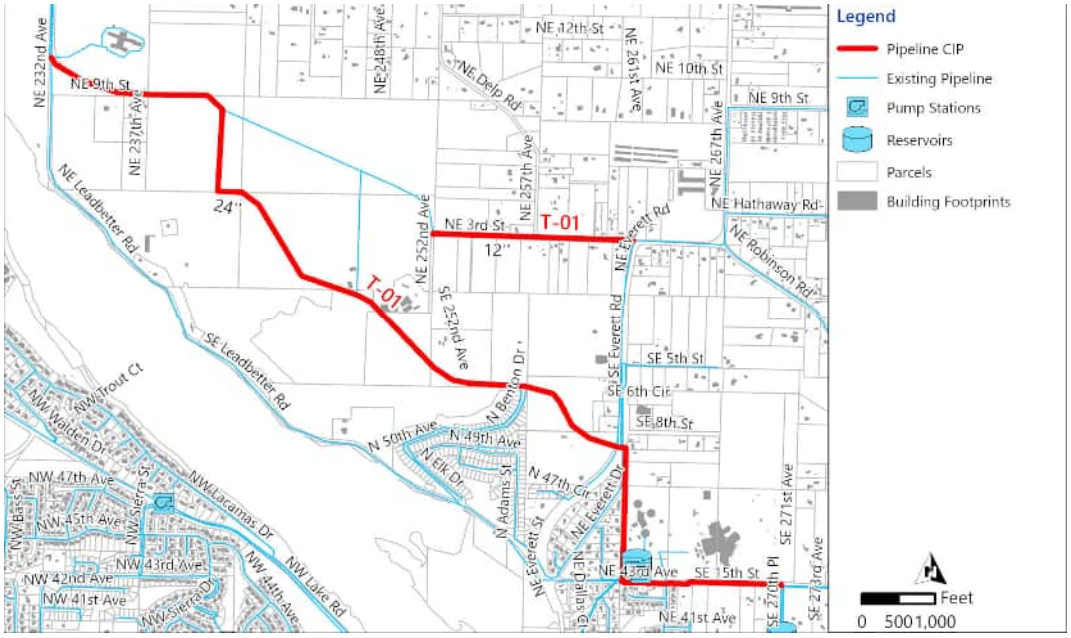
Project Type	Percent	Cost
Growth:	100%	$ 20,530,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 20,530,000

Project Timing:

Project Element	Timing	Priority	Cost
Segment 1	2032	0-10 years	$ 930,000
Segment 2	2032	0-10 years	$ 14,900,000
Segment 3	2032	0-10 years	$ 4,700,000
Total Anticipated Project Cost			$ 20,530,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: T-02
Project Title: Angelo Discharge Pipeline
Facility Type: Transmission Pipeline
Pressure Zone: 455

Go to CIP Summary Table

Priority: 10-20 years
Project Status (Completed?): No

Project Description:

Project Description: The discharge piping for Angelo Pump Station in the distribution network is undersized for future demands, resulting in high head loss and discharge pressures. Approximately 3,350 linear feet of 16-inch pipeline is recommended between Angelo PS and the Lower Prune Hill Reservoirs.

Reasoning Demand growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 16-inch	3,350	LF	$ 404	$ 1,400,000	$ 420,000	$ 880,000	$ 2,700,000
Total Anticipated Project Cost							$ 2,700,000

Notes on Cost Estimation:

To distribute project costs across multiple fiscal years, it is expected design of this pipeline will occur in 2037 with construction to occur in 2038. Design is assumed to be 10% of the total project cost.

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 2,700,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 2,700,000

Project Timing:

Project Element	Timing	Priority	Cost
Design	2037	10-20 years	$ 270,000
Construction	2038	10-20 years	$ 2,430,000
Total Anticipated Project Cost			$ 2,700,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: R-01
Project Title: Pipeline R&R Program
Facility Type: Annual Programs
Pressure Zone: System-wide

Go to CIP Summary Table

Priority: Annual
Project Status (Completed?): No

Project Description:

Project Description: During the duration of this WSP planning period, the City should consider implementing a pipeline replacement program to address localized issues or to participate in joint projects that cost-effectively replace aging pipeline. The City currently has approximately 32 miles of cast iron or steel pipeline in its distribution system, mostly centralized in the downtown area that have or are approaching the end of their useful life. Small diameter mains (less than 6-inch) should also be upsized to 8-inch to meet current City standards. This pipelineline replacement program recommends replacing 1% (~1.5 miles) of pipeline per year.

Reasoning Replace aging infrastructure

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Pipeline: 8-inch	119,700	LF	$ 236	$ 28,200,000	$ 8,500,000	$ 18,300,000	$ 55,000,000
Pipeline: 12-inch	33,500	LF	$ 300	$ 10,100,000	$ 3,000,000	$ 6,600,000	$ 19,700,000
Pipeline: 16-inch	11,900	LF	$ 404	$ 4,800,000	$ 1,400,000	$ 3,100,000	$ 9,300,000
Total Anticipated Project Cost							$ 84,000,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

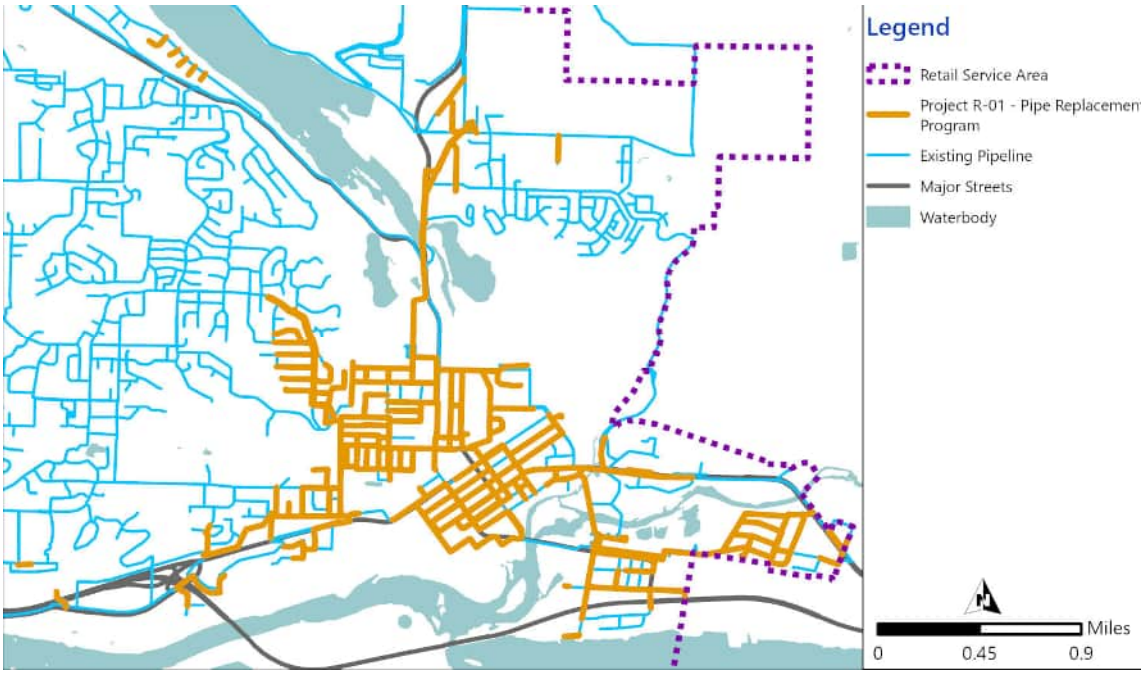
Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
Repair & Replacement:	100%	$ 84,000,000
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 84,000,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	-	Annual	$ 84,000,000
Total Anticipated Project Cost			$ 84,000,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: R-02
Project Title: Miscellaneous Facility Projects
Facility Type: Annual Programs
Pressure Zone: System-wide

Go to CIP Summary Table

Priority: Annual
Project Status (Completed?): No

Project Description:
Project Description: Miscellaneous Facility Projects

Reasoning Repair and Replacement

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Miscellaneous	40	No.	$ 75,000	$ 3,000,000	$ -	$ -	$ 3,000,000
Total Anticipated Project Cost							$ 3,000,000

Notes on Cost Estimation:
Total cost for the entire 20 year period is $3M. The City typically completes two projects per year totaling $150K.

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Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
Repair & Replacement:	100%	$ 3,000,000
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 3,000,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	-	Annual	$ 3,000,000
Total Anticipated Project Cost			$ 3,000,000

Project Location Map:

Go to Maps Tab

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: PS-01
Project Title: 544 Zone Pumping Improvements
Facility Type: Pump Station
Pressure Zone: 544

Go to CIP Summary Table

Priority: 0-10 years
Project Status (Completed?): In Design

Project Description:

Project Description: Lake Road PS and 343 zone transmission pipeline are recommended to increase pumping capacity into the 544 zone. The new PS will pump directly from the 343 zone into the 544 zone alleviating reliance on Angelo PS. To best align the construction of the transmission pipeline with future water system needs and ongoing projects within the City, it is recommended the transmission pipeline be divided into the following segments:
Segment 1 - 6,000 LF of 36-inch diameter pipeline from the intersection of E 1st Avenue/NE 3rd Avenue to the intersection of NE Everett Street/NE 22nd Avenue.
Segment 2 - 3,600 LF of 30-inch pipeline from the intersection of NE Everett Street/NE 22nd Avenue to Lacamas Lodge.
Segment 3 - 6,250 LF of 30-inch pipeline along NW Lake Road between Lacamas Lodge and NW Sierra Street.
Segment 4 - 1,350 LF of 24-inch pipeline along NW Sierra Street between NW Lake Road and NW 43rd Avenue.

Reasoning Demand growth

Anticipated Project Cost:

Project Element	Total Cost
Pump Station	$ 7,300,000
Segment 1: Pipeline: 36-inch	$ 13,200,000
Segment 2: Pipeline: 30-inch	$ 5,800,000
Segment 3: Pipeline: 30-inch	$ 10,200,000
Segment 4: Pipeline: 24-inch	$ 1,400,000
Total Anticipated Project Cost	$ 37,900,000

Notes on Cost Estimation:

Pump station cost provided from Lake Road PS Class 4 estimate prepared by Carollo. Pipe cost developed using unit costs and assumes 10% ELA for construction management services (project is currently in design).

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Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 37,900,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 37,900,000

Project Timing:

Project Element	Timing	Priority	Cost
Segment 1 Construction	2027-2028	0-10 years	$ 13,200,000
Segment 2-4 Design	2031	0-10 years	$ 1,740,000
Segment 2-4 Construction	2032-2033	0-10 years	$ 15,660,000
PS Design	2032	0-10 years	$ 730,000
PS Construction	2033-2034	0-10 years	$ 6,570,000
Total Anticipated Project Cost			$ 37,900,000

Project Location Map:

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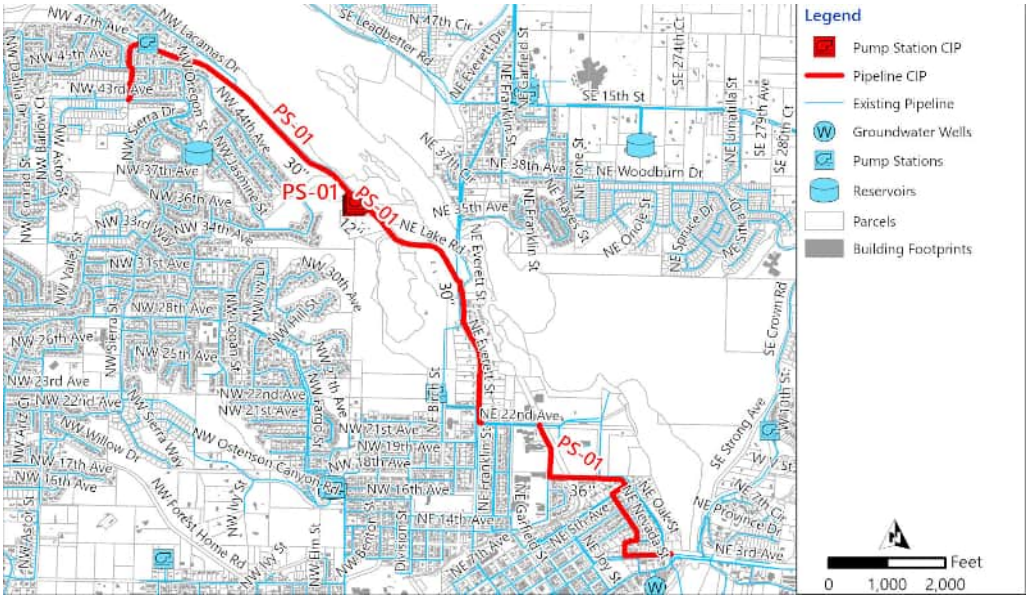

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: PS-02
Project Title: 542 Zone Pumping Improvements
Facility Type: Pump Station
Pressure Zone: 542

Go to CIP Summary Table

Priority: 10-20 years
Project Status (Completed?): No

Project Description:

Project Description: To reduce reliance on New Gregg PS and address pumping capacity deficiencies it is recommended to add a 800 gpm pump in the remaining empty can at Crown Road PS.

Reasoning Demand growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
Pump Station	1	No.	$ 350,000	$ 350,000	$ 110,000	$ 260,000	$ 720,000
Total Anticipated Project Cost							$ 720,000

Notes on Cost Estimation:

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Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 720,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 720,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2045	10-20 years	$ 720,000
Total Anticipated Project Cost			$ 720,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: PS-03
Project Title: Francis Road Pump Station Improvements
Priority: 0-10 years
Facility Type: Pump Station
Pressure Zone: Francis Road
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: To address fire flow deficiencies and low pressures in the neighboring areas, it is recommended to replace Francis Road PS and expand the service area to increase pressures to high elevation customers. Additionally, to supply sufficient fire flow a 1,000 gpm fire pump is recommended at the site. To meet the City's reliability criteria an on-site generator is included as part of this project.

Reasoning Fire flow and low pressures

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
Pump Station	1	No.	$ 1,230,000	$ 1,200,000	$ 360,000	$ 840,000	$ 2,400,000
Generators	1	No.	$ 500,000	$ 500,000	$ 150,000	$ 350,000	$ 1,000,000
Total Anticipated Project Cost							$ 3,400,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 3,400,000
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 3,400,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2035	0-10 years	$ 3,400,000
Total Anticipated Project Cost			$ 3,400,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: ST-01
Project Title: 343 Zone Storage
Facility Type: Storage
Pressure Zone: 343
Priority: 0-10 years
Project Status (Completed?): In Design

Go to CIP Summary Table

Project Description:

Project Description: Minimum of 1.84 MG of usable storage in the elevated reservoir at the Cemetery site to address a storage deficit and replace the aging Butler Reservoir. Once complete this reservoir will provide sufficient storage for the entirety of the planning period while Butler Reservoir is decommissioned. The elevated reservoir was the selected alternative and memorialized in Gray & Osborne's New 343 Reservoir Alternatives Analysis report in September 2025.

Reasoning Storage needs

Anticipated Project Cost:

Project Element	Total Cost
New Storage Reservoir	$ 25,700,000

Total Anticipated Project Cost	$ 25,700,000

Notes on Cost Estimation:

Total estimated cost is from Gray and Osborne (G&O) 343 New Reservoir Alternatives Analysis, Sept 2025

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	36%	$ 9,252,000
Upgrade:	64%	$ 16,448,000
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 25,700,000

Project Timing:

Project Element	Timing	Priority	Cost
Construction	2030-2031	0-10 years	$ 25,700,000
Total Anticipated Project Cost			$ 25,700,000

Project Location Map:

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City of Camas
Water System Plan
Capital Improvement Plan

Project ID: ST-02
Project Title: 542 Zone Storage
Facility Type: Storage
Pressure Zone: 542

Go to CIP Summary Table

Priority: 0-10 years
Project Status (Completed?): No

Project Description:

Project Description: 1.5 MG reservoir at the Gregg Standpipeline site is recommended to address the storage deficit in the 542 zone. Approximately 3,800 feet of 24-inch transmission pipeline will be needed from Crown Road pump station to the new reservoir. The transmission pipeline will alleviate hydraulic bottlenecks, allowing more pumps at Crown Road pump station to operate simultaneously and fill the new reservoir.

Reasoning Storage needs

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Reservoir	1.5	MG	$ 10	$ 15,000,000	$ 4,500,000	$ 9,800,000	$ 29,300,000
Pipeline: 24-inch	3,800	LF	$ 575	$ 2,200,000	$ 660,000	$ 1,440,000	$ 4,300,000

Total Anticipated Project Cost	$ 33,600,000

Notes on Cost Estimation:

To reduce annual CIP cost, the pipe portion of this project can be completed a year prior to the reservoir (estimated completion in 2032).

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Cost Allocation:

Project Type	Percent	Cost
Growth:	22%	$ 7,224,000
Upgrade:	79%	$ 26,376,000
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 33,600,000

Project Timing:

Project Element	Timing	Priority	Cost
Pipeline Design	2029	0-10 years	$ 430,000
Pipeline Construction	2030	0-10 years	$ 3,870,000
Reservoir Design	2034	0-10 years	$ 2,930,000
Reservoir Construction	2035-2036	0-10 years	$ 26,370,000
Total Anticipated Project Cost			$ 33,600,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: ST-03
Project Title: 544 Zone Storage
Facility Type: Storage
Pressure Zone: 544

Go to CIP Summary Table

Priority: 10-20 years
Project Status (Completed?): No

Project Description:

Project Description: 0.75 MG reservoir at the 18th Avenue site is recommended to address the storage deficit in the 544 zone.

Reasoning Storage needs

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 50%	Total Cost
Reservoir	0.75	MG	$ 3	$ 2,300,000	$ 690,000	$ 1,510,000	$ 4,500,000

Total Anticipated Project Cost	$ 4,500,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 4,500,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 4,500,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2045	10-20 years	$ 4,500,000
Total Anticipated Project Cost			$ 4,500,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: S-01
Project Title: Well 8, 11, 12 Expansion + PFAS Treatment
Priority: 0-10 years
Facility Type: Supply and Treatment
Pressure Zone: N/A
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: The City will need to increase supply capacity to serve projected future demands. The City's water supply strategy identified capacity upgrades in the Lower Washougal Wellfield can be acheived by upsizing the well screen and pump at Well 8 and upsizing pumps at Well 11 and 12. Additionally, treatment will be needed for wells with PFAS detections exceeding regulatory limits. This project will consist of well upgrades, initial PFAS treatment capacity of 2,725 gpm, an intermediate reservoir/PS, chemical facility upgrades, and standby power. Details regarding this project are further discussed in the LWWF PFAS Treatment Alternatives Analysis (Carollo 2026).

Reasoning Supply capacity needs

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
Well Upgrades	1	LS	$ 3,819,400	$ 3,800,000	$ 1,100,000	$ 2,600,000	$ 7,500,000
PFAS Treatment	1	LS	$ 6,112,600	$ 6,100,000	$ 1,800,000	$ 4,400,000	$ 12,300,000
Reservoir/PS	1	LS	$ 6,668,000	$ 6,700,000	$ 2,000,000	$ 4,800,000	$ 13,500,000
Chemical Facilities	1	LS	$ 2,692,308	$ 2,700,000	$ 810,000	$ 1,890,000	$ 5,400,000
Standby Power	1	LS	$ 769,231	$ 770,000	$ 230,000	$ 600,000	$ 1,600,000

Total Anticipated Project Cost	$ 40,300,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

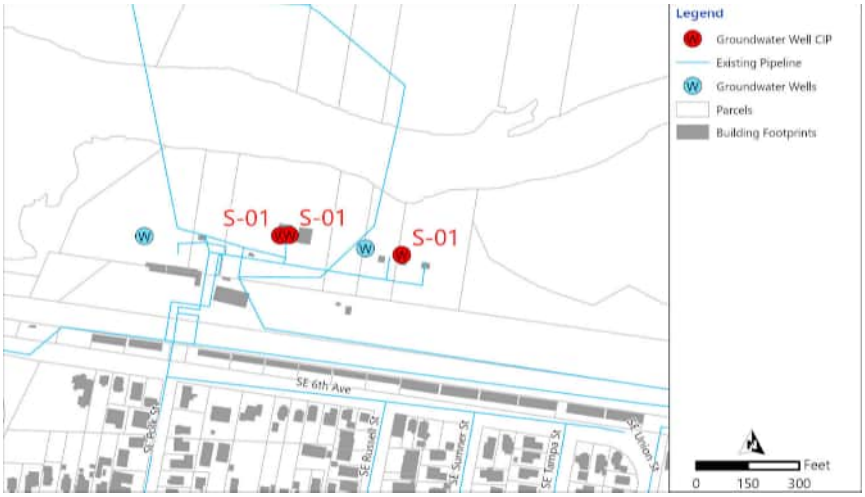
Project Type	Percent	Cost
Growth:	13%	$ 5,239,000
Upgrade:	87%	$ 35,061,000
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 40,300,000

Project Timing:

Project Element	Timing	Priority	Cost
Design	2027	0-10 years	$ 4,030,000
Construction	2028-2030	0-10 years	$ 36,270,000
Total Anticipated Project Cost			$ 40,300,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: S-02
Project Title: Well 18 Development
Facility Type: Supply and Treatment
Pressure Zone: N/A

Go to CIP Summary Table

Priority: 10-20 years
Project Status (Completed?): No

Project Description:

Project Description: Increase production capacity in the Lower Washougal Wellfield by approximately 2,000 gpm to meet future demands by developing Well 18. Development of Well 18 would include the drilling, equipping (building and mechanical equipment), and installation of an on-site generator for reliability. As water quality for the new well is unknown, it is assumed for planning purposes that PFAS treatment will be needed.

Reasoning Supply capacity needs

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
Well 18 Drilling	1	LS	$ 150,000	$ 150,000	$ 50,000	$ 110,000	$ 310,000
Well 18 Equipping	1	LS	$ 1,750,000	$ 1,800,000	$ 540,000	$ 1,260,000	$ 3,600,000
PFAS Treatment	1	LS	$ 2,310,000	$ 2,300,000	$ 690,000	$ 1,610,000	$ 4,600,000
Generators	1	No.	$ 500,000	$ 500,000	$ 150,000	$ 350,000	$ 1,000,000

Total Anticipated Project Cost	$ 9,510,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 9,510,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 9,510,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2037	10-20 years	$ 9,510,000
Total Anticipated Project Cost			$ 9,510,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: S-03
Project Title: Well 13B Development
Facility Type: Supply and Treatment
Pressure Zone: N/A

Go to CIP Summary Table

Priority: 10-20 years
Project Status (Completed?): No

Project Description:

Project Description: Increase production capacity in the Lower Washougal Wellfield by approximately 1,000 gpm to meet future demands by Well 13B. The location of this well is assumed to be at the Well 13 site or nearby at Louis Bloch Park. Development of this well would include the drilling, equipping (building and mechanical equipment), and installation of an on-site generator for reliability. As water quality for the new well is unknown, it is assumed for planning purposes that PFAS treatment will be needed.

Reasoning Supply capacity needs

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
Well 13B Drilling	1	LS	$ 150,000	$ 150,000	$ 50,000	$ 110,000	$ 310,000
Well 13B Equipping	1	LS	$ 1,375,000	$ 1,400,000	$ 420,000	$ 980,000	$ 2,800,000
PFAS Treatment	1	LS	$ 2,310,000	$ 2,300,000	$ 690,000	$ 1,610,000	$ 4,600,000
Generators	1	No.	$ 500,000	$ 500,000	$ 150,000	$ 350,000	$ 1,000,000
Total Anticipated Project Cost							$ 8,710,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 8,710,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 8,710,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2044	10-20 years	$ 8,710,000
Total Anticipated Project Cost			$ 8,710,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: S-04
Project Title: Well 19 Development
Facility Type: Supply and Treatment
Pressure Zone: N/A

Go to CIP Summary Table

Priority: 10-20 years
Project Status (Completed?): No

Project Description:

Project Description: Increase production capacity in the Lower Washougal Wellfield by approximately 1,000 gpm to meet future demands by developing Well 19. Development of this well would include the drilling, equipping (building and mechanical equipment), and installation of an on-site generator for reliability. As water quality for the new well is unknown, it is assumed for planning purposes that PFAS treatment will be needed.

Reasoning Supply capacity needs

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
Well Drilling	1	LS	$ 150,000	$ 150,000	$ 50,000	$ 110,000	$ 310,000
Well Equipping	1	LS	$ 1,375,000	$ 1,400,000	$ 420,000	$ 980,000	$ 2,800,000
PFAS Treatment	1	LS	$ 2,310,000	$ 2,300,000	$ 690,000	$ 1,610,000	$ 4,600,000
Generators	1	No.	$ 500,000	$ 500,000	$ 150,000	$ 350,000	$ 1,000,000

Total Anticipated Project Cost	$ 8,710,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 8,710,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 8,710,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2046	10-20 years	$ 8,710,000
Total Anticipated Project Cost			$ 8,710,000

Project Location Map:

Go to Maps Tab



City of Camas
Water System Plan
Capital Improvement Plan

Project ID: S-05
Project Title: LWWF PFAS Treatment Facility Expansion Phase 1
Priority: 0-10 years
Facility Type: Supply and Treatment
Pressure Zone: N/A
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: Expand the capacity at the LWWF PFAS Treatment Facility (~2,400 gpm) to treat additional wells that may become impacted by PFAS in the future. The Phase 1 expansion will increase the initial capacity of the treatment facility to approximately 5,125 gpm

Reasoning Future PFAS regulatory compliance

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
PFAS Treatment	1	LS	$ 4,620,000	$ 4,600,000	$ 1,400,000	$ 3,300,000	$ 9,300,000

Total Anticipated Project Cost	$ 9,300,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 9,300,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 9,300,000

Project Timing:

Project Element	Timing	Priority	Cost
Design	2032	0-10 years	$ 930,000
Construction	2033-2034	0-10 years	$ 8,370,000
Total Anticipated Project Cost			$ 9,300,000

Project Location Map:

Go to Maps Tab

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: S-06
Project Title: LWWF PFAS Treatment Facility Expansion Phase 2
Priority: 10-20 years
Facility Type: Supply and Treatment
Pressure Zone: N/A
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: Expand the capacity at the LWWF PFAS Treatment Facility (~2,400 gpm) to treat additional wells that may become impacted by PFAS in the future. The Phase 2 expansion will increase the initial capacity of the treatment facility to approximately 7,525 gpm

Reasoning Future PFAS regulatory compliance

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
PFAS Treatment	1	LS	$ 4,620,000	$ 4,600,000	$ 1,400,000	$ 3,300,000	$ 9,300,000

Total Anticipated Project Cost	$ 9,300,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 9,300,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 9,300,000

Project Timing:

Project Element	Timing	Priority	Cost
Design	2036	0-10 years	$ 930,000
Construction	2037-2038	10-20 years	$ 8,370,000
Total Anticipated Project Cost			$ 9,300,000

Project Location Map:

Go to Maps Tab

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: S-07
Project Title: LWWF PFAS Treatment Facility Expansion Phase 3
Priority: 10-20 years
Facility Type: Supply and Treatment
Pressure Zone: N/A
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: Expand the capacity at the LWWF PFAS Treatment Facility (~2,400 gpm) to treat additional wells that may become impacted by PFAS in the future. The Phase 3 expansion will increase the capacity of the treatment facility to the initial buildout capacity of 9,925 gpm. Future expansions from initial buildout to ultimate buildout will occur as future wells in the LWWF are drilled and developed.

Reasoning Future PFAS regulatory compliance

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 55%	Total Cost
PFAS Treatment	1	LS	$ 4,620,000	$ 4,600,000	$ 1,400,000	$ 3,300,000	$ 9,300,000
Total Anticipated Project Cost							$ 9,300,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 9,300,000
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	0%	$ -
Total Anticipated Project Cost	100%	$ 9,300,000

Project Timing:

Project Element	Timing	Priority	Cost
Design	2040	0-10 years	$ 930,000
Construction	2041-2042	10-20 years	$ 8,370,000
Total Anticipated Project Cost			$ 9,300,000

Project Location Map:

Go to Maps Tab

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: G-01
Project Title: 2036 Water System Plan Update
Facility Type: General
Pressure Zone: System-wide

Go to CIP Summary Table

Priority: 0-10 years
Project Status (Completed?): No

Project Description:

Project Description: Update Water System Plan every 10-years.

Reasoning Regulatory requirements

Anticipated Project Cost:

Project Element	Total Cost
Water System Plan	$ 525,000
Total Anticipated Project Cost	$ 525,000

Notes on Cost Estimation:

Total cost includes 5% factor applied to direct costs for the City to administer the project.

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	100%	$ 525,000
Total Anticipated Project Cost	100%	$ 525,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2035-2036	0-10 years	$ 525,000
Total Anticipated Project Cost			$ 525,000

Project Location Map:

Go to Maps Tab

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: G-02
Project Title: 2046 Water System Plan Update
Facility Type: General
Pressure Zone: System-wide

Go to CIP Summary Table

Priority: 10-20 years
Project Status (Completed?): No

Project Description:

Project Description: Update Water System Plan every 10-years.

Reasoning Regulatory requirements

Anticipated Project Cost:

Project Element	Total Cost
Water System Plan	$ 525,000
Total Anticipated Project Cost	$ 525,000

Notes on Cost Estimation:

Total cost includes 5% factor applied to direct costs for the City to administer the project.

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	100%	$ 525,000
Total Anticipated Project Cost	100%	$ 525,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2045-2046	10-20 years	$ 525,000
Total Anticipated Project Cost			$ 525,000

Project Location Map:

Go to Maps Tab

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: G-03
Project Title: Water Rights Investigation
Facility Type: General
Pressure Zone: System-wide

Go to CIP Summary Table

Priority: 0-10 years
Project Status (Completed?): No

Project Description:

Project Description: Conduct a study to evaluate the transfer or acquisition of additional groundwater rights in the Lower Washougal Wellfield.

Reasoning General Study

Anticipated Project Cost:

Project Element	Total Cost
General Fund for Studies	$ 290,000
Total Anticipated Project Cost	$ 290,000

Notes on Cost Estimation:

Total cost includes 5% factor applied to direct costs for the City to administer the project.

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	100%	$ 290,000
Total Anticipated Project Cost	100%	$ 290,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2027-2028	0-10 years	$ 290,000
Total Anticipated Project Cost			$ 290,000

Project Location Map:

Go to Maps Tab

City of Camas
Water System Plan
Capital Improvement Plan

Project ID: G-04
Project Title: Pipeline Replacement Prioritization Study
Priority: 0-10 years
Facility Type: General
Pressure Zone: System-wide
Project Status (Completed?): No

Go to CIP Summary Table

Project Description:

Project Description: Conduct a study to develop a prioritization schedule for cast iron and steel pipelines identified in the pipeline replacement program.

Reasoning General Study

Anticipated Project Cost:

Project Element	Total Cost
General Fund for Studies	$ 160,000
Total Anticipated Project Cost	$ 160,000

Notes on Cost Estimation:

Total cost includes 5% factor applied to direct costs for the City to administer the project.

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
Repair & Replacement:	0%	$ -
General:	100%	$ 160,000
Total Anticipated Project Cost	100%	$ 160,000

Project Timing:

Project Element	Timing	Priority	Cost
Entire Project	2034	0-10 years	$ 160,000
Total Anticipated Project Cost			$ 160,000

Project Location Map:

Go to Maps Tab

APPENDIX X

ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

Section IV

Engineering Design Standards and Submittal Requirements

Section Index

- **Submittal Requirements**
- **Design Standards**
- **Small Wireless Facilities**
- **As-Built Submittal Requirements**
- **Plan Review Checklists**
- **Donated Infrastructure Quantity Tracking (Pending)**

ENGINEERING DESIGN SUBMITTAL REQUIREMENTS

Drawing submittals

Drawings shall be submitted on standard 24” x 36” bond paper for engineering review and approval. Each sheet shall be numbered and titled. Each sheet shall have a minimum text height of 0.10 inches.

Cover Sheet

Minimum information required shall include a vicinity map, site map, project title, sheet index, owner/developer address and phone number, revision block, engineers stamp, city signature block (locate in lower right corner). General notes and legend may also be shown on this sheet.

Existing Conditions Sheet

All pertinent as-built and existing utility information on and adjacent to the project shall be noted on this sheet. Existing utilities shall include: all manhole rim and invert flow line elevations, existing street lighting, gas mains, valves and services, water mains, valves and services, sanitary mains and services, electrical, TV, phone lines, power pole locations, utility risers and transformers, curb lines, catch basins, driveways, sidewalks, curb ramps and sign locations. All existing wells, septic drain fields, irrigation systems, and any other private or public service lines or easements shall be shown on this sheet. All sensitive lands, archeological sites, wetlands, stream courses and buffers including existing contours shall be shown.

Grading and Erosion Sediment Control Sheet (see design stds for grading/ESC)

Information shown shall include a legend showing shaded or hatched cut and fill locations and erosion control BMP’s. Existing contours screened back and proposed contours shall be shown including any grading associated with the storm water facilities. Locations of stripping stockpiles, building envelopes, and areas to be protected from damage shall be shown. Grading and Erosion control notes shall also be shown on this sheet. A table listing the total cubic yards of cut, fill, and strippings shall also be shown.

Street and Storm Plan Sheet (see design stds for street and storm)

Information shown shall include the proposed storm system including manhole locations, catch basin locations and types. The rim, grate and pipe invert in and out elevations shall be listed to the hundredth of a foot. All pipe runs and catch basin lateral lines shall list pipe size, length, slope, and pipe material. The required street information shall include street centerline stationing and centerline curve information including radius, length, and central angle. Centerline tangent bearings shall be listed. All high and low points shall be identified. Curb return information shall include radius, length, and central angle. Sidewalk and curb ramp locations shall be shown. Street and Storm construction notes shall be included on this sheet.

Water and Sewer Plan Sheet (see design stds for water and sewers)

Information shown shall include the proposed water and sewer system and service line locations. Water and Sewer main line lengths, sizes, material types, and where appropriate, slopes shall be listed. Sewer manhole rim and pipe invert elevations in and out shall be listed to the hundredth of a foot. All water and sewer system appurtenances including AARV's, cleanouts, blowoffs, hydrants, valves and PRV's shall be called out on the plans. The water and sewer construction notes shall be included on this sheet.

Street and Storm Profile Sheet

Profile sheets shall include the street centerline proposed vertical alignment and vertical curve information including PVI station and elevation, high and low point station and elevation, vertical curve length, begin and end stationing, grades in and out of the vertical curve, algebraic differences, and "K" values shall be listed. Proposed finished grade and existing ground lines shall be shown. Where curb elevations left and right are not the same due to shed sections or cul-de-sacs, the left and right top of curb profiles shall also be shown on the profile sheet. Street intersections shall be identified. The proposed storm system shall be shown including manhole and catch basin stations and elevations of all pipe inverts, rims and grates. All pipe runs and laterals shall have line sizes, pipe diameters, slopes and materials labeled or noted. All proposed and existing utility crossings shall be shown.

Water and Sewer Profile Sheet

The proposed finished grade and existing ground lines shall be shown. Street intersections shall be identified. The proposed water system shall be shown including blowoff, hydrant, valve, PRV and AARV locations and minimum depth of cover requirements. The proposed sewer system shall be shown including stations and elevations of all manholes, pipe inverts, rims and cleanouts. All pipe runs and laterals shall have line sizes, pipe diameters, slopes and materials labeled or noted. All proposed and existing utility crossings shall be shown.

Detail Sheets

The detail sheets shall show specific city standard details for water, sewer, and storm system appurtenances as proposed on the engineering drawings. The typical street width sections and structural section requirements shall also be shown. Other detail sheets may include street intersection details, stormwater detention and treatment facility details, trail location, section and construction details, sanitary sewer pump station facility details, landscaping layout, irrigation and planting detail and or street signage and striping details.

Miscellaneous

Based on submittal review the engineering department may require additional information to provide a complete understanding of the project. These requirements are provided as a minimum for a timely review.

ENGINEERING DESIGN STANDARDS FOR GRADING/ESC PLAN

Drawing submittals

Each sheet shall be clearly labeled as “Grading” or “Grading/Erosion Control”.

Subdivisions & Short Plats (see engineering design submittal requirements)

The required minimum information to be shown on the grading plan shall include existing 2-foot contour intervals screened back with listed elevations. The proposed finished grade 2-foot contour intervals with listed elevations shall also be shown. Sod stripping stockpile locations, proposed street and lot layout configurations, a quantities table listing the total cut, fill and stripping amounts, hatching or shading of the cut and fill locations, any tree removal or preservation and the grading notes shall also be shown.

The required minimum information to be shown on the erosion control plan shall include inlet protection on all proposed catch basins on site and any adjacent existing catch basins off site, sediment trap locations, silt fence locations, gravel construction entrance locations. The details of the required erosion control measures shall be shown. All stream courses and buffer areas shall be identified and protected.

If an NPDES, HPA, FPA, or an Erosion Control Bond are required for the project there shall be a note to that requirement along with the erosion control and grading notes.

ENGINEERING DESIGN STANDARDS FOR STREETS

Drawing submittals

Each sheet shall be clearly labeled as “Street” or “Street/Storm”.

Subdivisions and Short Plats

- Design of the proposed streets shall incorporate the recommendations of the traffic study if one was required and shall meet the requirements of the current AASHTO A Policy on Geometric Design for Highways and Streets manual and the current MUTCD manual.

- Neighborhood Traffic Management (NTM) elements may be required on the existing or proposed streets based on projected traffic volumes.

- The pavement design and structural section shall be based on the soil type and the recommendations of the geotechnical report, but shall not be less than the current City standard minimum.

- Alleys, half-street improvements, and private streets shall meet the minimum City standard structural section.

Commercial, multifamily or Industrial

- The City engineer will give specific recommendations on pavement design, width, geometric requirements, safety, and pavement markings based on the submitted proposal.

TABLE 1 - GUIDELINES FOR GEOMETRY OF PRIVATE ROADWAY

ITEM	ALLEY PRIVATE	ACCESS TO FOUR OR LESS DWELLING UNITS (LESS THAN OR EQUAL TO 150' IN LENGTH) PRIVATE STREET 'A' [3]	ACCESS TO FIVE OR MORE DWELLING UNITS (LESS THAN OR EQUAL TO 100' IN LENGTH) PRIVATE STREET 'B'	ACCESS TO FIVE OR MORE DWELLING UNITS (GREATER THAN 100' AND NOT OVER 300' IN LENGTH) PRIVATE STREET 'C'	ACCESS TO FIVE OR MORE DWELLING UNITS (GREATER THAN 300' IN LENGTH) PRIVATE STREET 'D'
TRACT WIDTH (PRIVATE)	20 FEET	20 FEET (TRACT OR EASEMENT)	30 FEET	42 FEET	48 FEET
STREET WIDTH	18 FEET [2]	12 FEET	20 FEET	28 FEET	28 FEET
CUL-DE-SAC TURNAROUND RADIUS	N/A	35 FEET	35 FEET	35 FEET	35 FEET
SIDEWALK / PLANTER WIDTH	N/A	OPTIONAL 5-FEET / NO PLANTER STRIP	ONE SIDE 5-FEET WITH 4- FOOT PLANTER STRIP	ONE SIDE 5-FEET WITH 4.5 FOOT PLANTER STRIP	BOTH SIDES 5-FEET WITH 4.5-FOOT PLANTER STRIP
BIKE LANES	N/A	N/A	N/A	N/A	N/A
MIN. CENTERLINE RADIUS	70 FEET	100 FEET	100 FEET	200 FEET	200 FEET
PARKING	NO PARKING BOTH SIDES	NO PARKING BOTH SIDES	NO PARKING BOTH SIDES	PARKING ONE SIDE ONLY	PARKING ONE SIDE ONLY
CLEAR ZONE*	1.5 FEET MIN.	1.5 FEET	1.5 FEET MIN.	1.5 FEET MIN.	1.5 FEET MIN.
ACCESS CONTROL	N/A	N/A[1]	N/A[1]	N/A[1]	N/A[1]
LIGHTING REQUIRED	NO	YES	YES	YES	YES

* LAG MANUAL, WSDOT DESIGN MANUAL
[1] POSSIBLE BY COUNCIL MANDATE LIMITING CERTAIN LOTS DURING DEVELOPMENT REVIEW
[2] OR GREATER IF REQUIRED BY FMO
[3] ROADWAYS IN EXCESS OF 150' IN LENGTH WITH FOUR OR FEWER DWELLING UNITS ARE SUBJECT TO ADDITIONAL REQUIREMENTS FROM THE FIRE MARSHALL

NOTES:

1. ACCESS TO TWO OR LESS LOTS MAY BE DESIGNED AND ESTABLISHED AS AN EASEMENT RATHER THAN A TRACT. GARBAGE AND RECYCLING CONTAINERS SHALL BE PLACED AT THE PUBLIC RIGHT-OF-WAY.
2. OFF-STREET PARKING:
    a. STANDARD SIZE SPACES: MINIMUM 9-FEET WIDE; MINIMUM 18-FEET LONG
    b. SMALL CAR SPACES: MINIMUM 8-FEET WIDE; MINIMUM 15-FEET LONG; MARKED 'COMPACTS ONLY'
    c. AISLE DIMENSIONS: ONE-WAY AISLE MINIMUM 15-FEET WIDE; TWO-WAY AISLE MINIMUM 24-FEET WIDE
    d. INGRESS AISLES SETBACK FROM BACK OF SIDEWALK: COLLECTORS MINIMUM 40-FEET; ARTERIALS MIMINUM 50-FEET
3. DEAD-END ROADS IN EXCESS OF 150-FEET, AS MEASURED FROM THE CENTERLINE OF THE ADJACENT ROAD, REQUIRE A DEAD-END TURNAROUND.
4. A DEAD-END TURNAROUND MAY BE REQUIRED ON ROADS LESS THAN 150-FEET WHEN ADJACENT ROAD IS A COLLECTOR OR ARTERIAL.
5. CONFIGURATION OF DEAD-END TURNAROUNDS SHALL BE PER STREET DETAIL ST36A 'DEAD-END TURNAROUND ON PRIVATE STREETS; OR AS APPROVED BY ENGINEERING AND THE FIRE MARSHAL.

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REVISED: 01/20/2023

Approved by:

2862

TABLE 2 - GENERAL GUIDELINES FOR GEOMETRY OF ROADWAY

ITEM	COMMERCIAL/ INDUSTRIAL (PRIVATE)	2 LANE LOCAL SPRINKLERED[4]	2 LANE LOCAL - NEIGHBORHOOD	2 LANE[2] COLLECTOR / ARTERIAL	3 LANE COLLECTOR / ARTERIAL	5 LANE ARTERIAL
R.O.W. WIDTH	40 FEET (TRACT)	52 FEET	60 FEET	60 FEET	74 FEET	100 FEET
STREET WIDTH	24 FEET	28 FEET	36 FEET	36 FEET	46 FEET / INCLUDES 12 FOOT MEDIAN	74 FEET / INCLUDES 14 FOOT MEDIAN
CUL-DE-SAC RADIUS	N/A	35 FEET	35 FEET	N/A	N/A	N/A
SIDEWALK / PLANTER WIDTH	ONE SIDE 5-FEET WITH 4.5-FOOT PLANTER STRIP	BOTH SIDES 5-FEET WITH 4.5-FOOT & 7.5-FOOT PLANTER STRIPS	BOTH SIDES 5-FEET WITH 4.5-FOOT & 7.5-FOOT PLANTER STRIPS	BOTH SIDES 6-FEET WITH 4.5-FOOT & 5.5-FOOT PLANTER STRIPS	BOTH SIDES 6-FEET WITH 5.5-FOOT & 7.5 FOOT PLANTER STRIPS	BOTH SIDES 6-FEET WITH 4.5-FOOT & 6.5-FOOT PLANTER STRIPS
BIKE LANES	N/A	N/A	N/A	5-FEET	5-FEET	6-FEET
MIN. CENTERLINE RADIUS	42 FEET FIRE ACCESS	70 FEET	70 FEET	200 FEET	300 FEET[3]	300 FEET[3]
PARKING	NO PARKING BOTH SIDES	PARKING ONE SIDE ONLY	PARKING BOTH SIDES	NO PARKING BOTH SIDES	NO PARKING BOTH SIDES	NO PARKING BOTH SIDES
CLEAR ZONE*	1.5 FEET MIN.	1.5 FEET	1.5 FEET MIN.	1.5 FEET MIN.	1.5 FEET MIN.	AS DIRECTED
ACCESS CONTROL	YES	N/A[1]	N/A[1]	YES	YES	YES
LIGHTING REQUIRED	YES	YES	YES	YES	YES	YES
CURB RADII	30 FEET MIN.	25 FEET MIN.	25 FEET MIN.	35 FEET MIN. [5]	35 FEET MIN. [5]	35 FEET MIN. [5]
OFF-STREET PARKING SETBACKS	N/A	N/A	N/A	INGRESS AISLES 40' FROM BACK OF SIDEWALK	INGRESS AISLES 50' FROM BACK OF SIDEWALK	INGRESS AISLES 50' FROM BACK OF SIDEWALK

* LAG MANUAL, WSDOT DESIGN MANUAL
[1] POSSIBLE BY COUNCIL MANDATE LIMITING CERTAIN LOTS DURING DEVELOPMENT REVIEW
[2] LEFT TURN LANES REQUIRED AT INTERSECTIONS
[3] MUST MEET AASHTO GUIDELINES FOR SPEED AND SIGHT DISTANCE
[4] STREET SECTION REQUIRES APPROVAL FROM THE CITY ENGINEER.
[5] LARGER RADII MAY BE REQUIRED AT THE DIRECTION OF THE CITY ENGINEER

FOR INTERSECTION SPACING AND SETBACK, SEE ACCESS SPACING STANDARDS – TABLE 3 (NEXT PAGE)

TABLE 3 - ACCESS SPACING STANDARDS

RESOLUTION 17-005

ROADWAY CLASS	MINIMUM ACCESS SPACING***	MAXIMUM ACCESS SPACING	MINIMUM INTERSECTION & DRIVEWAY SETBACK	NEW RESIDENTIAL ACCESS PERMITTED
ARTERIAL	660-FEET	1,000-FEET****	300-FEET	NO**
COLLECTOR	330-FEET	600-FEET	110-FEET*	NO**
LOCAL	110-FEET	600-FEET	N/A	YES

* BASED ON TURN DESIGN SPEED OF 20 MPH
** TEMPORARY ACCESS MAY BE PERMITTED OR COMBINED FOR LANDLOCKED PARCELS
*** INCLUDES NON-RESIDENTIAL DRIVEWAYS
**** BLOCK LENGTHS IN EXCESS OF 600-FEET SHALL PROVIDE A MID-WAY PEDESTRIAN CONNECTION

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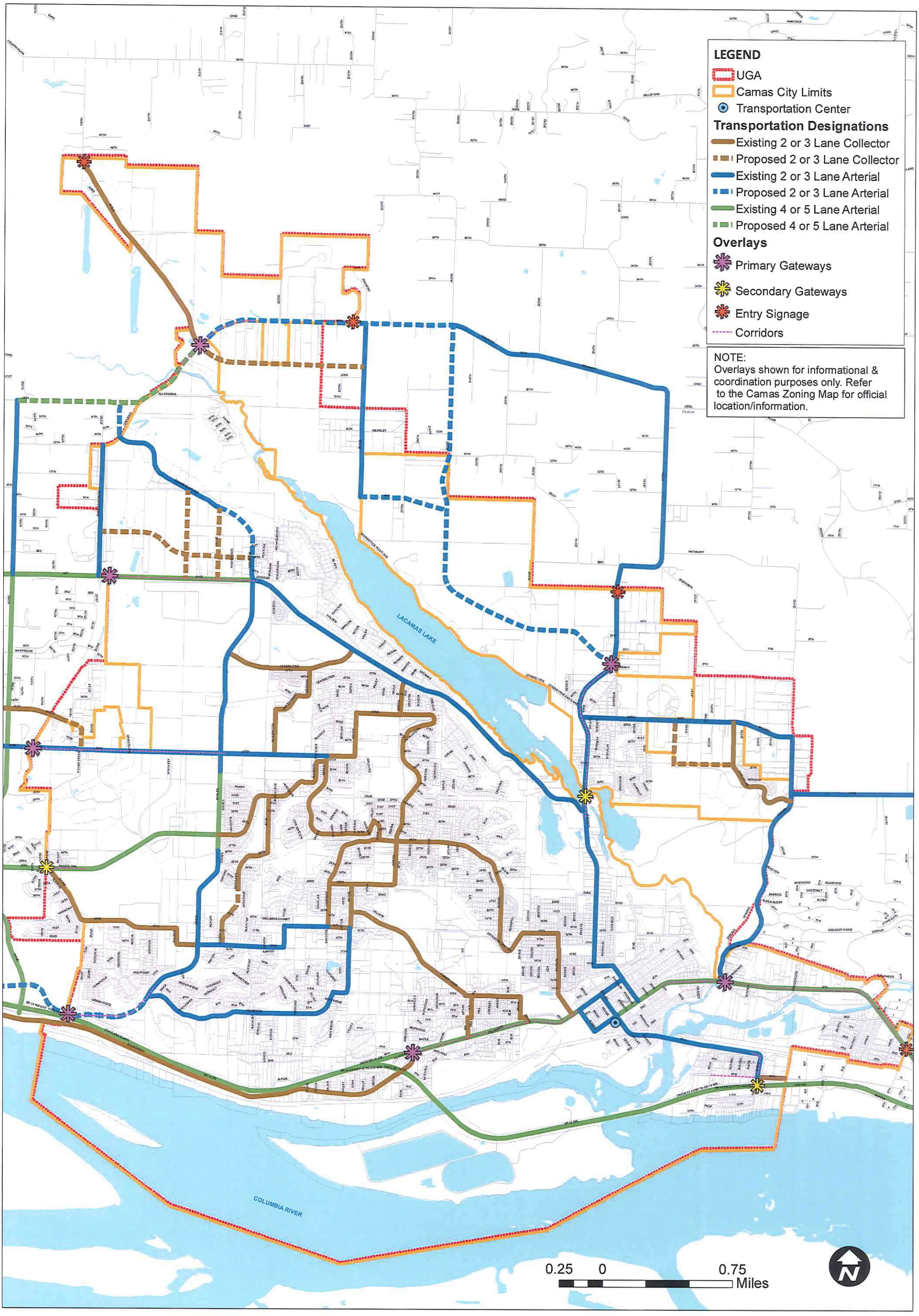

CAMAS TRANSPORTATION COMPREHENSIVE PLAN MAP

CAMAS, WA I Ordinance 16-010 Adopted June 2016

2035 Camas
Your voice, Your vision, Your future

ENGINEERING DESIGN STANDARDS FOR ADA ACCESSIBILITY

Policy

It is City of Camas policy to provide appropriate pedestrian facilities along and across sections of City roadways. It is City of Camas, FHWA and WSDOT policy that pedestrian facilities be given full consideration in the planning and design of new construction and reconstruction projects.

Drawing submittals

Each sheet shall be clearly labeled as “Street” or “Street/Storm”.

The appropriate sidewalk and ADA Ramp details shall be included on a sheet labeled as “Details”, “Street Details” or “Accessibility Details.” Only City of Camas details from the most current Design Standard Manual (DSM) shall be used. In the case where the Camas DSM does not contain an appropriate detail, current WSDOT Standard Plan Details or site specific details may be used.

Accessibility Design

Design of proposed sidewalks shall meet the requirements of the USDOJ’s *ADA Standards for Accessible Design*; the USDOT’s current *ADA Standards for Transportation Facilities*; the FHWA’s current MUTCD; the current Americans with Disabilities Act requirements, the US Access Board’s current *Public Rights-of-Way Accessibility Guidelines* (PROWAG), and the current WSDOT Design Manual, Chapter 1510 and any referenced documents therein.

ADA Accessibility Triggers

All new construction, reconstruction, or alteration of existing transportation facilities shall be designed and constructed to be accessible and useable by those with disabilities. Existing facilities shall be retrofitted to be accessible when required per the WSDOT Design Manual, Chapter 1510.

The following are some examples that are considered alterations, which can potentially trigger the need to improve accessibility to meet ADA requirements:

- HMA overlay or inlay
- Traffic signal installation or retrofit
- Realignment of a roadway (vertical or horizontal)
- Sidewalk improvements
- Bridge replacement
- Concrete panel repair/replacement
- Raised channelization

The following are not considered alterations:

- Spot pavement repair
- Liquid asphalt sealing, chip seal, or crack sealing
- Lane restriping that does not alter the usability of the shoulder

Matching Facilities

In the case where a new development installation ends with a sidewalk and curb ramp at an intersection, a matching curb ramp installation shall be required at the other end of the crosswalk. A third ramp will not be required across from the second ramp.

Crosswalk Accessibility

Design consideration shall be made such that not only curb ramps meet ADA requirements, but street crossings shall also meet the above requirements. For retrofit situations where existing street crossings will be out of compliance with ADA requirements, an MEF submittal shall be required.

Design slopes

Designs shall not be based on design standard maximum limits. Allow for field adjustment based on actual conditions when specifying ramp lengths and slopes.

Maximum Extent Feasible (MEF)

Design deviation allowances will be considered on a case-by-case basis for retrofit situations, or when new construction meets existing facilities. The MEF memo shall be submitted to the City Engineer for approval when an element of a design will not meet the accessibility requirements. The MEF memo is required:

- Prior to Engineering plan approval.
- When unanticipated field issues arise during the construction phase.

Use of WSDOT's MEF Template or an abbreviated version with the following elements shall be used to formally request of deviation of the standards noted above:

- Project description;
- Existing pedestrian / road conditions;
- Applicable design standards that apply;
- Justification of design constraints;
- ***Cost is not a justification for not meeting accessibility criteria;***
- Proposal, including details;
- Stamped and signed by an Engineer.

ENGINEERING DESIGN STANDARDS FOR STORM SYSTEM

Drawing submittals

Each sheet shall be clearly labeled as “Street” or “Street/Storm”.

Subdivisions & Short Plats (see engineering design submittal requirements)

- For application construction standards, see *Section IV Engineering Details: Storm Detail SD1.*

- Design of the proposed stormwater treatment and detention system shall be in accordance with the latest edition of the Washington State Department of Ecology’s Stormwater Management Manual for Western Washington.

- All main line locations shall be located within the proposed or existing street right-of-way where ever possible, unless otherwise approved.

- All roof drainage shall be directed to the stormwater facility for detention, except as follows: Lots adjacent to streams, wetlands, and wetland/stream management zones are to be evaluated on the basis of aquifer recharge and fish and wildlife issues. When considered necessary roof drains, french drains, and foundation drains are to be directed, by approved means, back into the wetland or stream.

- If runoff from the proposed building envelope is not directed to the stormwater facility, an approved house connection plan for roof drains and foundation drains will be required. Method and location of discharge must have prior approval.

- When required along proposed roadways, based on site conditions, french drains shall be located behind sidewalks and shall be owned and maintained by the home owner or Homeowner’s Association.

- Spacing between catch basins shall be a maximum of 400-feet and shall be located at all intersections. Roadways in excess of 10% slope shall require a reduced spacing. Catch basins shall be tied into manholes at a minimum slope of 1%. Flow calculations may be required to analyze curb flow depths and widths.

- Spacing between manholes is to be a minimum of 400-feet; min. 48-inch dia.

- Stormwater main lines shall not be laid flatter that 0.4% slope. Slopes over 18% will require pipe anchors.

- Stormwater mains are to be 12-inch min. and laterals are to be 10-inch min.

- The stormwater design report shall include a project overview stating any assumptions made. Requests to deviate from the stormwater manual shall be fully stated and the reasons clearly outlined. The pervious and impervious acreage totals, site maps, soil maps, and full size basin maps showing the actual basin; even if beyond the project limits shall be included. Isopluvial charts for the 2, 10, and 100 year 24-hour storm events, runoff curve numbers, and downstream impact analysis shall be included.

ENGINEERING DESIGN STANDARDS FOR WATER SYSTEMS

Drawing submittals

Each sheet shall be clearly labeled as “Water” or “Water/Sewer”.

Subdivisions & Short Plats (see engineering design submittal requirements

- All main line locations shall be located within the proposed or existing street right of way where ever possible unless otherwise approved.
- Each lot shall have a water meter box location shown on the plan. Meter boxes shall be located in the right-of-way, near or at lot lines, in the planter strip or located behind the sidewalk in curb tight situations, and shall maintain 10-feet of horizontal separation from sewer services.
- Irrigation service meter box locations and backflow prevention devices shall be shown on the plan for all landscape islands, open space tracts or other areas as identified on the plan.
- Fire hydrant locations shall be shown on the plan and shall be located as nearly as possible at lot lines or as directed by the Fire Marshal.
- AARV’s, low point blowoffs, valve cluster locations and dead end blowoffs shall be called out on the plans and profile sheets.
- The system design may require sizing analysis for fire flow capacity, pressure zones and or pressure reducing valve vault locations upstream or downstream of the project site at the City’s discretion.
- Possible line upsizing may be required for future extensions at the City’s discretion. Upsizing will be based on the City’s latest *Water System Plan Update*.
- Any existing services not used or existing main lines that will be replaced or relocated may require abandonment and or removal at the City’s discretion.

Commercial, Multifamily, or Industrial

In addition to the above requirements, the following requirements may apply for these types of uses.

- Fire flow calculations/analysis for fire sprinkler systems.
- The locations of fire department connection (FDC) ports shall be shown.
- Separate domestic water main lines and fire system main lines may be required.
- Each unit of a duplex shall have its own water service.
- Multifamily units shall have one service for each building.
- Fire lines are to be shown for informational purposes only. NFPA 24 fire permit application is to be submitted to the Fire Marshal for review and approved, prior to construction.

ENGINEERING DESIGN STANDARDS FOR PRESSURE REDUCING VALVE STATIONS

When a water system PRV station is required as part of a residential development, the following minimum components shall be included with the PRV submittal.

1. An existing water system area plan shall be submitted by the developer's engineer. The area plan shall show the elevation and location of existing PRV's adjacent to the development site. High side and low side pressures shall be included. The plan shall also show the proposed development layout with elevation of all street intersections, lots, and other high and low points within the site.
2. The PRV station shall be a pre-assembled, pre-tested, and packaged system from G.C. Systems or approved equal.
3. The PRV station shall include a catch basin located adjacent to the station and tied to the stormwater system for the 3" pressure relief bypass flows.
4. There shall be a minimum 9" air gap from the bypass pipe to the catch basin. And acceptable bug screen shall be included on the end of the bypass pipe.
5. A vault drain or sump pump tied into the storm system will be required.
6. The valve vault access shall be a rated H-20, a spring assisted 36" x 72" double door, lockable, diamond plated hatch with safety grate, centered over the largest PRV.
7. The PRV station shall be located within the right-of-way in a widened planter strip or located outside of the right-of-way in an easement dedicated to the City.
8. The City of Camas reserves the right to determine the size of the PRV devices and the vault.
9. All interior piping shall be schedule 40, 306 stainless steel with flanges, and Victaulic coupling as required for disassembly.

ENGINEERING DESIGN STANDARDS FOR SANITARY SEWERS

Drawing submittals

Each sheet shall be clearly labeled as “Sewer” or “Water/Sewer”.

Subdivisions & Short Plats (see engineering design submittal requirements)

- For application construction standards, see *Section IV Engineering Details: Gravity Sewer Detail SG1; STEF Sewer Detail SF1; or STEP Sewer Detail SP1*.
- Detached units shall have their own sewer service and STEP or STEF or conventional gravity system as required.
- Duplex units may have up to two sewer services at the discretion of the engineering and public works departments.
- Multifamily units shall have one sewer lateral per building.
- All main line locations shall be located within the proposed or existing right of way where ever possible unless otherwise approved.
- Service lateral locations shall be located in the planter strip for STEP systems and 8-feet past the right of way line for gravity or STEF systems.
- Main line grades shall not be designed flatter than 0.5% slope. Slopes over 18% will require pipe anchors.
- AARV, cleanout, valve, odor control, and manholes shall be shown on the plan and profile sheets.
- The system design may require sizing analysis for line size and capacity. The system may also require a pump station based on the type of sewer system being proposed, the location of the project, or other factors. Future pump station upsizing may also be required.
- There may be downstream capacity analysis required for the project depending on project location and the type of sewer system proposed.
- Design shall take into account the capacity and grade to allow for desirable extension beyond the development.
- Additional odor control analysis and/or measures may be required.
- Septic tank sizing if required shall be based on the proposed use and in conformance with the CC&R’s. If pools are allowed then tank sizes may increase.

Commercial, Multifamily or Industrial

- Tank sizing submittal documentation and material submittals will be required.
- Material submittals, materials list and supplier information will be required prior to construction.
- Required as-built information shall include the depth of service, location of main lines, AARV’s, odor control, cleanouts, manholes, and valve locations.

ENGINEERING DESIGN STANDARDS FOR SANITARY SEWER PUMP STATIONS

For design of sanitary sewer pump stations, see ***'Sanitary Sewer Pump Station Design Manual'*** located under the Engineering Standards section of this document.

ENGINEERING DESIGN STANDARDS FOR COMMUNITY STEF TANKS

When a community STEF tank system is proposed for a residential development to retain sanitary sewer solids, the following minimum requirements shall apply.

1. The community tanks will only be allowed if lot sizes are 4,000 S.F. or less. For lots over 4,000 S.F. an individual 1,500 gallon minimum tank will be required on each individual lot.
2. The community tank(s) shall be a fiberglass reinforced single walled Xerxes tank or approved equal. The tank submittal shall include buoyancy calculations with minimum factor of safety of 1.5 for dead man sizing.
3. An approved odor control system is required for the tanks. If the development includes a pump station, a vent line from the tank(s) to the odor control system will be required. If no pump station is proposed, chemical injection, soil filter beds, or other odor control systems acceptable to the City shall be included in the design.
4. A minimum of one permanent ground water monitoring and dewatering well(s) acceptable to the City shall be included in the design and site construction.
5. An Orenco liquid level alarm, AMAHW or AMLAHW series, high level alarm and float system, or approved equal, will be required on each tank that contains bio tube filters. A 12” wide by 18” tall sign shall be included to read as follows:

   THIS BOX IS THE PROPERTY OF THE CITY OF CAMAS PUBLIC WORKS DEPARTMENT. IT IS TO BE OPENED BY AUTHORIZED PERSONNEL ONLY. ALARM – IF THE ALARM SOUNDS, PRESS THE RED LAMP COVER TO SILENCE, THEN CALL CAMAS OPERATIONS CENTER AT (360) 817-1563 (DAYS) OR (360) 737-0592 (NIGHTS, WEEKENDS OR HOLIDAYS).

   The sign and alarm panel shall be mounted at the tank location in accordance with the City requirements.
6. Tank sizing requirements shall be as determined by the City of Camas.
7. The tank(s) shall be located in such a fashion as to allow for the future excavation and replacement of the tank(s) if necessary. Building foundation, infrastructure main line utilities, and other facilities including streets and street intersections, stormwater facilities, retaining walls or other improvements shall not be located within the future excavation zone of the installed tank(s).
8. A water service with an approved backflow protection device is required at the tank location as directed by the City.
9. The tank location shall include an area light if no street light is within 50 feet.
10. The tank(s) shall be accessible for future solids pumping and maintenance.

ENGINEERING DESIGN STANDARDS FOR STREET LIGHTING

ALL INFORMATION IS INTENDED TO PRODUCE A LIGHTING DESIGN WITH LUMINANCE LEVELS AND LUMINANCE UNIFORMITY WHICH MEETS OR EXCEEDS THOSE IN THE I.E.S. "RECOMMENDED MAINTAINED LUMINANCE FOR ROADWAYS" FROM THE I.E.S. LIGHTING HANDBOOK. INSTALLATION OF ADDITIONAL LIGHTS MAY BE NECESSARY TO MEET THE INTENT OF THIS STANDARD.

1. WHERE THE AVERAGE RESIDENTIAL DENSITY IS GREATER THAN 12 DWELLING UNITS PER ACRE, USE COMMERCIAL OR INTERMEDIATE FOR LAND USE.
2. AVERAGE MAINTAINED LUMINANCE IS MEASURED IN FOOT CANDELAS PER SQUARE METER.
3. AT SIGNALIZED INTERSECTIONS, THE AVERAGE MAINTAINED LUMINANCE SHALL BE OF THE AVERAGE FOR THE TWO INTERSECTING STREETS.
4. LUMINANCE UNIFORMITY IS THE RATIO OF AVERAGE OR MAXIMUM MAINTAINED LUMINANCE TO MINIMUM LUMINANCE. LUMINANCE VALUES OUTSIDE THE ROADWAY SHALL NOT BE INCLUDED IN THE RATIO. ALL SIDEWALK AREAS AND THE AREA BETWEEN THE SIDEWALK AND THE STREET CURB SHALL BE INCLUDED WHEN DETERMINING THE MAINTAINED LUMINANCE.
5. ALL LIGHTING FIXTURES SHALL BE LIGHT EMITTING DIODE (LED). LIGHTING CIRCUITS SHALL BE 120 VOLTS.
6. THE MOUNTING HEIGHT OF THE FIXTURE IS MEASURED FROM THE ROADWAY SURFACE TO THE CENTER OF THE LIGHT SOURCE WITH THE FIXTURE LOCATED OVER THE BIKE LANE LINE OR SIX FEET FROM THE FACE OF CURB.
7. ALTERNATIVE LIGHTING LAYOUTS MAY BE SUBMITTED FOR REVIEW. WHERE LIGHTING IS REQUIRED ON BOTH SIDES, DESIGNS SHALL BE "OPPOSITE LIGHTING" ON MAJOR ROADWAYS 46 FEET OR GREATER IN WIDTH. THE USE OF STAGGERED LIGHTING SHALL ONLY BE USED WHERE "OPPOSITE LIGHTING" IS NOT PRACTICAL. LIGHTING LAYOUTS ON LOCAL RESIDENTIAL STREETS WITHIN A SUBDIVISION MAY VARY FROM SIDE TO SIDE.
8. COBRA STYLE LIGHT POLES ARE REQUIRED ON ALL COLLECTOR AND ARTERIAL ROADWAYS.
9. MAXIMUM POLE HEIGHT SHALL BE LIMITED TO 34 FEET.
10. LIGHTING LAYOUTS WILL REQUIRE APPROVAL AND POSSIBLE ADJUSTMENT TO MEET THE CITY OF CAMAS LIGHTING OBJECTIVES AND I.E.S. STANDARDS. THIS MAY INCLUDE ADJUSTMENT TO THE POLE SPACING AS LISTED AND MAY RESULT IN ADDITIONAL OR FEWER LIGHTS.
11. A LIGHTING DESIGN CONSISTENT WITH THESE REQUIREMENTS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE CITY, PRIOR TO SUBMITTAL TO CLARK PUBLIC UTILITY DISTRICT (CPU) FOR APPROVAL.
12. STREET LIGHTS ON LOCAL AND NEIGHBORHOOD LEVEL STREETS SHALL BE LOCATED AT PROPERTY LINES.
13. THE STREET LIGHTS SHALL BE LOCATED IN THE PLANTER STRIP UNLESS OTHERWISE APPROVED BY THE CITY.

14. STREET LIGHT SPACING:

	ARTERIAL ROADWAY		COLLECTOR ROADWAY		NEIGHBORHOOD ROADWAY		LOCAL ROADWAY	
LAND USES	COMMERCIAL INDUSTRIAL	RESIDENTIAL	COMMERCIAL INDUSTRIAL	RESIDENTIAL	COMMERCIAL INDUSTRIAL	RESIDENTIAL	PUBLIC	PRIVATE
MAX. POLE SPACING (A)	170	160	130	160	150	170	N/A	N/A
MAX. POLE SPACING (B)	N/A	N/A	N/A	N/A	150	150	150	150

(A) STANDARD COBRA STYLE
(B) POLE TOP STYLE

15. PEDESTRIAN CROSSINGS AND VERTICAL SAG CURVES SHALL BE ILLUMINATED.

16. STREET LIGHTING IS REQUIRED ON ALL PRIVATE STREETS OVER 100 FEET IN LENGTH AND SERVING MORE THAN FIVE DWELLING UNITS.

17. PRIVATE STREETS WITH STREET LIGHTING SHALL HAVE A SEPARATE METER THAT THE HOME OWNERS ASSOCIATION WILL BE RESPONSIBLE FOR.

ENGINEERING AS-BUILT SUBMITTAL REQUIREMENTS

Drawing submittals

- Submitted on standard 24” x 36” bond paper for engineering review and approval.
- Each sheet shall be numbered and titled.
- Each sheet shall have a minimum text height of 0.10 inches.
- Each sheet shall be clearly labeled as “As-Built” or “Record Drawings” and dated.
- Shaded areas, satellite photography, or aerial photography is not acceptable due to reproducibility.
- Any hatched area shall be transparent or hatched at such a scale that it will not show as a black area after scanning.
- Upon engineering department review and approval, the “As-Builts” shall be submitted in a PDF digital format on a CD-ROM disc. CAD files shall be submitted as directed below.

Required Information

- As-Built elevations, if different than design, of all rims, pipe inverts in and out of manholes, catch basins, and outfalls shall be labeled next to the crossed out design elevation.
- Any change in the lot numbering or configurations from what was originally proposed or approved and shall conform to the final plat lot numbering.
- All as-built pipe lengths, depths and slopes shall be recorded next to the crossed out design information on the plan view sheet as well as on the appropriate profile and or detail sheet(s).
- Stormwater facility as-built verification note shall appear on the as-built sheet showing the facilities and indicate the following:
    - The engineer has performed an as-built inspection of the facilities
    - The constructed facilities meet the design criteria per the stormwater report for stormwater treatment and detention requirements for the site.
- Stormwater detention and treatment facilities shall show:
    - As-built elevations of all pipe inverts, control structures and orifices
    - Pond and swale lengths, depths, widths and slopes.
    - Overflow structures, pond berms and access roads as-built information for slopes, heights, widths, lengths and locations.
- Final as-built grading/topographical site plan shall be submitted with the as-built plans indicating the following:
    - Final finished grade contours and elevations over all lot areas.
    - Elevation of all lot corners shall be noted
    - Physical distance ties to the sanitary sewer service laterals that are marked with a 10 foot long 2x4 board. There shall be a minimum of two distances to each lateral from adjacent lot corners or arcs in the curb line.

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Project/Development Name: _____
City Project Number: _____
Reviewer's Initials and Date: _____

Please mark completed items in the space provided. Mark N/A if not applicable. Items left blank are incomplete.

COVER SHEET AND GENERAL REVIEW

___ Project Name (Title) (Past Project Names if applicable)
___ Owner's / Developers Name, Address, & Phone Number
___ Engineer's Name, Address and Phone Number
___ Architect's Name, Address and Phone Number
___ City of Camas Approval Block (Locate in lower right hand corner of cover sheet)
___ Vicinity Map
___ Legend
___ General Notes
___Reference to Standard Specifications
___City of Camas
___WSDOT/APWA
___ North Arrow and Scale
___ Preliminary State of Washington Engineer's Stamp (Signed at final review)
___ Memo Stating the Total Linear Feet of Improvements
___Street
___Water
___Storm
___Sanitary
___ Sheet Index
___ Benchmark, Datum Elevations
___ Complies with Request for Utility Services (R.U.S.)
___ Complies with Council's Decision (Staff to Review Notice of Final Decision)
___ Submitted Four Full-Sized & One Half-Size Set of Plans (1st review only)

Comments: _____

_____

_____

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Project/Development Name: _____
City Project Number: _____
Reviewer's Initials and Date: _____

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GRADING & EROSION CONTROL

___ Preliminary State of Washington Engineer's Stamp
___ North Arrow and Scale
___ Standard City of Camas Erosion Prevention & Sediment Control and Grading Detail Sheets
__ Construction Entrance __ Silt Fence __ Cut-off Ditches
__ Inlet Protection __ Slope Stability __ Temp. Sediment Ponds
__ Temp. Stockpile Area(s) Shown w/ Protection
___ Special Details Required
___ Easement(s) Required, Shown, Called Out
___ Property Lines / Adjoining Tax Lots Shown
___ Street Names (Names to be Assigned by Building Official)
___ Proposed Right of Way
___ Identify All Sensitive Areas (Wetlands and Buffers, Floodplains, Tree Resource Area, Streams, Creeks, Springs, etc.)
___ Existing and Finished Contours (**Finished Grade Slope No Greater than 2:1**)
___ Existing Area of Potential Slope Instability and Structures
___ Location of 100 Year Flood Plain & Shoreline Management Area Limits on the Site
___ Proposed Impervious Surfaces Other than Streets and Sidewalks
___ Drainage Flow Routes and Existing Discharge Points to and from Site
___ Edge of Pavement
___ Existing Trees, Trees to be Removed (w/ Diameter), Utility Poles, Wells, Septic Tanks, Drainage Structures, Fire Hydrants, Street Lights, Etc.)
___ Site Acreage
___ Area of Cut/Fill
___ Quantity of Cut/Fill
___ Wetland Area and Buffers – Cannot be Used for Treatment or Detention
___ Location of Buildable Lot Area
___ Testing Requirements / Frequency Matrix

Comments: _____

_____

_____

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Project/Development Name: _____
City Project Number: _____
Reviewer's Initials and Date: _____

Please mark completed items in the space provided. Mark N/A if not applicable. Items left blank are incomplete.

SANITARY SEWER

___ Preliminary State of Washington Engineer's Stamp
___ North Arrow and Scale
___ Sewer: ___ STEP; ___ STEF; ___Gravity; ___ Combo
___ Standard City of Camas Sewer Detail Sheets
___ Special Details Required
___ Easement(s) Required, Shown, Called Out
___ Property Lines / Adjoining Tax Lots Shown
___ Street Names and Widths
___ Pipe size, Lengths, & Material meet City standards and are shown
___ Stationing
___ Existing and Proposed Utilities Shown
___ Existing and Possible Conflicts Shown (Structures, Trees, etc.)
___ Lateral Table
___Lateral Size ___Length ___Depth ___Pipe Material
___ Dimensioning (Lateral ends 8' from curb and cleanout at property line)
___ Manhole Spacing (max. 400' for gravity system)
___ Cleanout Spacing (max. 200' or every 90° of Bend for STEF system)
___ All manholes with Coated Lining Called Out (STEP/STEF/Gravity)
___ Special Manhole Frame or Cover Required
___ Separation from Water Utility (10' horizontal, 18" vertical)
___ Invert Elevations
___ Rim Elevations
___ Check Slopes
___ Minimum Design Slopes (0.004 for gravity and STEF mains)
___ Minimum Depth and Cover (6' for gravity and STEF, 5' for STEP mains)
___ Concrete Pipe Anchors for Main Lines (Slopes greater than 20%)
___ Service to Each Lot
___ Shown on Profile

Comments: _____

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Project/Development Name: _____
City Project Number: _____
Reviewer's Initials and Date: _____

Please mark completed items in the space provided. Mark N/A if not applicable. Items left blank are incomplete.

STORMWATER

Plans

___ Preliminary State of Washington Engineer's Stamp
___ North Arrow and Scale
___ Standard City of Camas Stormwater Detail Sheets
___ Special Details Required
___ Property Lines / Adjoining Tax Lots Shown
___ Street Names and Widths
___ Pipe size, Lengths, & Material meet City standards and are shown. Mains 12" minimum and Laterals 10" minimum per CSDS*
___ Stationing
___ Existing and Proposed Utilities Shown
___ Existing and Possible Conflicts Shown (Structures, Trees, etc.)
___ Location and dimensions of proposed stormwater facilities, including typical cross sections of proposed facilities)
___ Stormwater Profile for all Systems in R.O.W.
___ Drainage Flow Routes and Existing Discharge Points to and from site
___ Check All Pipe Slopes and Invert Elevations. Mains 0.25% minimum and Laterals 0.3% minimum per CSDS*
___ All changes in pipe size, material, direction, or grade require a catch basin or manhole per CSDS*
___ Connections to Pipe Systems at Catch Basin or MH Only, min. slope 1%
___ If pipe cover is less than what is required in the on Details G2 & G3, provide minimum pipe cover for vehicular loads per manufacturer's specifications
___ Catch basins at low points, not to be located at base of ADA ramps
___ Catch basin spacing 400' max., located all intersections, reduced spacing on roads in excess of 10%
___ Manhole spacing 400' maximum
___ Concrete pipe anchors for main lines with slopes greater than 15%

*CSDS – Camas Stormwater Design Standards

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

STORMWATER Continued

WQ Treatment Facility

___ Detail of any flow control structures
___ Provide overflow structure in fine grained soils or if low percolation
___ Check if Oil/water Separator is required
___ Show sufficient dimensions on all stormwater facility(s) for construction
___ Provide typ. Swale Cross section
___ 4:1 slopes preferred for mowing (Max. 3:1) ___ Min. width 2'
___ 1'Freeboard on Ponds & Swales ___ 0.5%-4% slope
___ Minimum 6" topsoil mix for the swale grass if in permeable soils
___ Permeable soils require impermeable liner or 1 ft. clay liner under 6" topsoil layer in swale to be less than 2.4 in/hr to be field verified by design engineer prior to sodding or seeding.
___ List swale seeding specifications
___ Finish elevations on all outfall inverts, top of level spreader, top of grates
___ Energy Dissipater at end of outfall piping
___ If rip rap used, detail length, width, depth, and size
___ Debris barrier/grate for all pipes entering a closed pipe system
___ Retaining Walls – specify top and bottom of wall elevations, dimensions, type of material, backfill material, installation, wall section, footing drainage, etc.
___ Maintenance access to swale or pond from street (min.15' wide, less than 18% slope, min. 15' easement, access 12% or greater required to be paved, & around pond as needed)
___ Barrier or fencing around the stormwater facility, if safety is a concern, (fence type, height (max. 6'), gate opening (10' min), top rail on fence
___ Stenciling / medallions at all catch basins
___ Label Stormwater facility as tract of land, where applicable
___ Stormwater facilities in subdivisions and short plats are shown in separate tract/s, with access.
___ Stormwater facilities on commercial / industrial sites are accessible and a note is on the plans that states 'Facility is owned and maintained by the property owner and right-of-entry shall be granted to the City for inspection purposes.'
___ Types & Number of plantings around pond perimeter to be reviewed by Planning
___ Operating and Maintenance Manual for Storm Facilities (Ref. TIR)
___ Wetlands & Buffers (Sensitive areas labeled and shown)

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

STORMWATER Continued

___ Roof Downspout Connection:
- ___ To approved drainage structure; Include sizing on plans
- ___ To curb weep holes on crown streets or low side of shed streets

Infiltration Facility

___ Cross section of infiltration system
- ___ Drywells
- ___ Building roof drain
- ___ Perforated pipe trench
- ___ Infiltration pond

___ Check landscaping plan against stormwater facility (no trees in treatment area, etc.)

___ Design Infiltration Rate & Contractors design table for length of perf. pipe required per 1000 sq. feet of roof area

___ Pre-sedimentation manhole required for all drywells without water quality treatment

___ Verify that no wells or other facilities are adjacent to infiltration pond.

___ Provisions for roof drains for all lots.

Comments: _____

_____

_____

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Project/Development Name: _____

City Project Number: _____

Reviewer's Initials and Date: _____

Please mark completed items in the space provided. Mark N/A if not applicable. Items left blank are incomplete.

Transportation Plan

___ Plan is consistent with traffic study recommendations and decision
___ Signing and striping Plan
___ Sight Distance Triangles and Calculations
___ Sight Distance Triangle Easements on all corner lots (label and Dimension)
___ Road Modifications
___ Pavement Design
___ Preliminary State of Washington Engineer's Stamp
___ North Arrow and Scale
___ Legend
___ Easement(s) Required, Shown, Called Out
___ Property Lines / Adjoining Tax Lots Shown
___ Street Names
___ Existing and proposed Right of Way
___ Stationing
___ Tangent Bearings
___ Statement of ownership, maintenance, and repair of all utilities at private streets
___ Curve Data (per CMC 17.19.040.B.12.c): Centerline Radius 300' minimum on Primary Arterials, and 200' minimum on Secondary Arterials)
___ Curb
  ___ Radii (35' minimum on Arterials and Collectors, 25' minimum on others)
  ___ Elevation at Radius Returns (½'s' ¼'s)
  ___ Elevations at Lot Lines
___ Dimensions
  ___ Streets
  ___ Driveways
  ___ Hammerheads, per Detail ST36
  ___ Temporary Turnarounds, per Detail ST36
  ___ Cul-de-sacs & Dead Ends, per Detail ST36 (Over 300' require approval)
___ Grades (per CMC 17.19.040.B.12.b): Arterials 6% max.; Collectors 10% max.; Others 12% max.)
___ Driveway locations shown on all corner lots – Access control issue
___ Sidewalks
  ___ Pedestrian Ramps (check alignment)
  ___ Connectivity
___ Turning lanes
___ Traffic Signals
___ Vertical Curves per AASHTO (see "Policy on Geometric Design of Highway & Streets", Exhibit 3-76, page 274)

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Transportation Plan Continued

___ Intersection alignments and curb return minimums
___ K value Shown
___ Superelevation
___ Design Speed ____ mph; Posted speed ____ mph
___ Typical Street Section
    ___ Street Classification _____
___ ½ street improvement __ ½ street inlay __ resurfacing of ex.
    ___ Soil Classification _____
    ___ Crown Street 2% Min., 4% Max. Cross Slope
    ___ Shed Street 2% Min., Slopes in excess of 2% require prior approval, 6% Max. Cross Slope
    ___ Controlled Density Fill (CDF)
    ___ Center Line
    ___ Width of Right of Way
    ___ Width of Street
    ___ Public Utility Easement (P.U.E.)
    ___ Subgrade and pavement including depth and type
    ___ Curb Type
___ Sidewalk location, width, depth, compacted subgrade
___ Misc. Typical Sections
    ___ Standard Concrete Driveway
    ___ Concrete Vertical Curb
    ___ Concrete Curb and Gutter
    ___ ADA Curb Ramps
        ___ Ramp detectable warning detail
    ___ Barricade (Type III)
    ___ Sidewalk Cross Section
    ___ Mailbox Location
___ Letter for Road Modification from Engineer
___ Sign and Striping locations in accordance with MUTCD
___ Signs and Mailboxes located in planter strip (5’ horizontal clearance; min. 7’ vertical clearance).
___ Street configuration and lot numbering conforms to preliminary plat.
___ Bike lanes required
___ Traffic signal plan or loop & conduit installation for future.
___ Neighborhood Traffic Management Compliant

Comments: _____

_____

_____

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Project/Development Name: _____
City Project Number: _____
Reviewer's Initials and Date: _____

Please mark completed items in the space provided. Mark N/A if not applicable. Items left blank are incomplete.

Water Plan

___ Preliminary State of Washington Engineer's Stamp
___ North Arrow and Scale
___ Standard City of Camas Water Detail Sheets
___ Special Details Required
___ Easement(s) Required, Shown, Called Out
___ Property Lines / Adjoining Tax Lots Shown
___ Street Names & Widths
___ Pipe Size, Lengths, & Material per Standards
___ 8" Minimum
___ Stationing
___ Existing and Proposed Utilities Shown/Conflicts
___ Existing and Possible Conflicts Shown (Structures, Trees, etc.)
___ Dimensioning (6' from North/East Curb)
___ Fire Hydrant w/ Fire Marshal's Approval
___400' Between Hydrants
___ 600' from Property Lines
___No Fire Hydrant on Dead End 6"
___ Valves: 3 on a Tee, 4 on a Cross, and Valves Every 600' (minimums)
___ Fittings / Blocks, Shown & Called Out
___ Pipe Deflection Checked for Pipe Sections
___ Blow-off (Standard or Construction)
___ Separation from Sanitary (10' Horizontal, 18" Vertical)
___ Encased in Concrete
___ Ductile Iron Sleeve, 10' Each Side of Crossing.
___ Water Depths and Crossings Shown on Profile
___ Water Meter Locations and Size
___ Irrigation Meter Locations, Size, and Backflow Prevention Device
___ G.P.M. Available
___ Cross-Connection Control for irrigation and business services
___ Service to Each Lot

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Water Plan Continued

___ Verify Correct Locations, Size, & Type of Existing Water Facilities (Booster Stations, Reservoirs, etc.)
___ Engineered Vacuum Relief Locations for Large Water Mains
___ Air / Vacuum Relief Location Shown - High Point Typical
___ PRV Location / Settings

Comments:

GENERAL PLAN REVIEW CHECKLIST
ENGINEERING DEPARTMENT

Project/Development Name: _____

City Project Number: _____

Reviewer's Initials and Date: _____

Please mark completed items in the space provided. Mark N/A if not applicable. Items left blank are incomplete.

Donated Infrastructure Quantity Tracking Submittal Sheets

Vacant

Water Details

City of Camas Water Details ~ INDEX

Detail No.	Detail Name	Rev.	Rev. Date
W1	Water Notes	7	3/2/2022
W2	1" Water Service - New	11	7/6/2026
W3	1" Water Service - Replacement	9	1/3/2024
W4	H20 Rated 1" Water Service	1	6/11/2019
W5	1" Water Service - Infill Lot	3	7/6/2026
W6	2" Water Service	10	5/20/2024
W6A	2" Water Service For Irrigation	4	5/20/2024
W6B	1" Water Service For Irrigation	1	7/6/2026
W7a & b	3"-8" Water Service	4	3/24/2022
W8	2" Standard Blowoff	5	1/3/2024
W9	6" Low Point Blowoff - Ditch	2	1/1/2011
W10	6" Low Point Blowoff - Street	2	1/1/2011
W11	Fire Hydrant	8	1/3/2024
W12	Valve Box and Riser	4	10/21/2014
W13	Water Main Line and Valve	2	1/1/2011
W14	Pipe Joint Restraint	3	1/1/2011
W15	Thrust Blocks	3	1/1/2011
W16	2" Air/Vacuum Release Valve	7	1/3/2024
W17	2" Air/Vacuum Release Valve in 48" MANHOLE	4	1/3/2024
W17A	2" Air/Vacuum Release Valve in 48" Outside of Curb	2	1/3/2024
W17B	1" Air/Vacuum Release Valve	1	7/6/2026
W18	2" Pressure Relief Valve Assembly	3	1/3/2024
W19	4" Vacuum Relief Valve	2	1/1/2011
W20A	6"x2" PRV Station with 3" Relief	2	1/1/2011
W20B	6"x2" PRV Station with 3" Relief	3	10/21/2014
W21	Above Ground PRV Relief Drain	4	5/16/2019
W22	Water Quality Sampling Station	5	1/3/2024
W23A	Standard Double Check Detector Valve Assembly	3	10/21/2014
W23B	Standard Double Check Detector Valve Assembly	3	10/21/2014
W24	Reduced Pressure Backflow Assembly, 1” and 2”	1	10/2/2017
W25	Reduced Pressure Backflow Assembly, 2.5” & Larger	1	10/2/2017
W26	Water Locate Station Plan	1	3/28/2022
W26A	Locate Station For Water	1	3/28/2022
W27	Water Meter Manifold Assembly	2	1/3/2024
W27A	Water Meter Manifold Assembly	1	2/12/2026

WATER CONSTRUCTION NOTES:

1. ALL TRENCH EXCAVATION AND PIPE INSTALLATION SHALL CONFORM TO THE MOST CURRENT A.W.W.A. STANDARDS, AND THE MOST RECENTLY ADOPTED EDITION OF THE W.S.D.O.T. STANDARD SPECIFICATIONS SECTION 7-08.3(1) AND SECTION 7-08.3(2). ALL EXCESS MATERIAL FROM THE TRENCH EXCAVATION SHALL BE LOADED DIRECTLY INTO A DUMP TRUCK AND DISPOSED OF AT AN APPROVED SITE.

2. PIPE BEDDING AND PRE-COVER (PIPE ZONE) MATERIAL SHALL BE 5/8 INCH MINUS CRUSHED ROCK.

3. TRENCH BACKFILL MATERIAL SHALL BE 1-1/4 INCH MINUS CRUSHED ROCK.

4. TRENCH COMPACTION SHALL CONFORM TO THE MOST RECENTLY ADOPTED EDITION OF THE W.S.D.O.T. STANDARD SPECIFICATIONS SECTION 7-08.3(3). CONTRACTOR TO DETERMINE THE TYPE OF EQUIPMENT AND METHOD USED TO ACHIEVE THE REQUIRED COMPACTION AND BE APPROVED BY THE CITY OF CAMAS. EACH LIFT SHALL BE COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY THE A.A.S.H.T.O. T-180 TEST METHOD.

5. SETTLEMENT OF THE FINISHED SURFACE WITHIN THE WARRANTY PERIOD SHALL BE CONSIDERED TO BE A RESULT OF IMPROPER COMPACTION AND SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR AT NO EXPENSE TO THE CITY.

6. ALL VALVES 10 INCHES OR LESS IN DIAMETER SHALL BE A.W.W.A. APPROVED RESILIENT WEDGE GATE VALVES, BUBBLE TIGHT AT 200PSI, HAVE NON RISING STEMS, AND OPEN BY TURNING TO THE LEFT. PROVIDE A 2 INCH SQUARE NUT TO CONFORM TO A.W.W.A. C-504. ALL VALVES 12 INCHES OR LARGER IN DIAMETER SHALL BE A.W.W.A. APPROVED BUTTERFLY VALVES.

7. ALL WATER PIPE 12 INCHES OR LESS IN DIAMETER SHALL BE DUCTILE IRON CLASS 52 PIPE. ALL WATER PIPE 14 INCHES IN DIAMETER AND LARGER SHALL BE DUCTILE IRON CLASS 51 PIPE. RUBBER GASKET TYPE SHALL BE U.S. PIPE, TYTON OR APPROVED EQUAL. ALL FITTINGS SHALL BE DUCTILE IRON AND SHALL CONFORM TO THE A.W.W.A. STANDARD C-110.

8. ALL TEES, FLANGES, CAPS, BENDS AND OFFSETS, AS WELL AS ALL OTHER APPURTENANCES WHICH ARE SUBJECT TO UNBALANCED THRUST, SHALL BE PROPERLY BRACED BY ONE OF THE FOLLOWING METHODS:

   A. PRIMARY METHOD IS MECHANICAL JOINT RESTRAINT, AS SHOWN IN DETAIL W14 – USE "EBBA IRON SERIES 1100 MEGA LUG" MECHANICAL JOINT THRUST RESTRAINT OR APPROVED EQUAL. CONTRACTOR TO RESTRAIN THE MINIMUM REQUIRED PIPE LENGTH WITH "FIELD-LOK" GASKETS OR APPROVED EQUAL.

   B. ALTERNATE METHOD IS CONCRETE THRUST BLOCKING, AS SHOWN IN DETAIL W15 – BLOCKING SHALL BE 3000 PSI CONCRETE POURED IN PLACE. THRUST BLOCKING SHALL ONLY BE USED WHEN OTHER MEANS OF RESTRAINT CANNOT BE USED, OR EXISTING PIPE BEING CONNECTED IS NOT RESTRAINED.

9. ALL WATER MAINS SHALL BE TESTED AT 200PSI IN ACCORDANCE WITH SECTION 7-09.3(23) OF THE STANDARD SPECIFICATIONS. THE CITY SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ACCEPTANCE TESTING. MAXIMUM LENGTH OF PIPE TO BE TESTED AT ONE TIME IS 1000 FT.

10. CHLORINATION SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 7-09.3(24) OF THE STANDARD SPECIFICATIONS. CITY INSPECTOR WILL TAKE SAMPLES AND DELIVER TO LABORATORY FOR BACTERIA TESTING, NEGATIVE SAMPLE RESULTS SHALL BE CONFIRMED, PRIOR TO PRESSURE TESTING. DECHLORINATION OR DISPOSAL TO SANITARY MAIN MAY BE REQUIRED.

11. APPROPRIATE DISPOSAL AND OR DECHLORINATION OF FLUSHED WATER DURING BLOWOFF IS THE RESPONSIBILITY OF THE CONTRACTOR. METHOD USED SHALL BE APPROVED BY CITY AND OTHER REGULATING AUTHORITIES.

12. WATER MAIN TO HAVE A MINIMUM COVER OF 30 INCHES. WATER SERVICES TO HAVE A MINIMUM 24" OF COVER.

13. ALL EXISTING VALVES TO BE OPERATED BY CITY OF CAMAS WATER/SEWER DEPARTMENT PERSONNEL ONLY.

14. NO CONNECTIONS TO EXISTING WATER MAINS SHALL BE MADE PRIOR TO SATISFACTORY PRESSURE TESTING, DISINFECTION, AND THE CONFIRMATION OF A NEGATIVE BACTERIA TEST.

15. WATER MAINS SHALL BE LOOPED WHEREVER POSSIBLE.

16. WATER MAINS SHALL BE 8" DIAMETER MINIMUM LINE SIZE. LARGER LINE SIZES MAY BE REQUIRED.

17. SEE IRRIGATION CONSTRUCTION NOTES, DETAIL IR1, FOR APPROVED BACKFLOW PREVENTION DEVICES.

City of Camas WASHINGTON

WATER DETAIL

WATER CONSTRUCTION NOTES

3-2-22

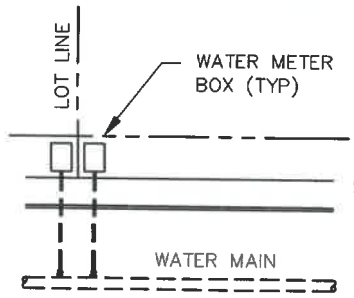
DETAIL APPROVED BY — DATE

NOT TO SCALE

DETAIL NO. W1

REVISION: 7 DATE: 03/02/2022

WTR-NOTES.DWG



PLAN VIEW LOCATION OF ADJOINING LOT METER BOXES

PROFILE VIEW

DUCTILE IRON MAIN

6" OR LARGER REQUIRES DIRECT TAP.
4" MAIN – DOUBLE STRAP SADDLE REQUIRED FOR SERVICE CONNECTION

NOTES:

1. METER BOX SHALL BE EITHER OLDCASTLE FIBRELYTE FL12BOX WITH NO MOUSE HOLES OR ARMORCAST ROTOCAST P6000485.
2. COVER SHALL BE OLDCASTLE FIBRELYTE FL12D "WATER" OR ARMORCAST A6000484–H9 WITH OFFSET AMR RADIO READ ANTENNA HOLE FOR NEPTUNE METER
3. INSTALL METER BOX OUTSIDE OF SIDEWALK OR IN PLANTER STRIP, EXCEPT WHERE NOTED IN PLANS.
4. SEE TRENCH SECTION DETAILS G2 OR G3 FOR BACKFILL REQUIREMENTS.
5. METER BOXES FOR ADJOINING LOTS SHALL BE WITHIN 2' OF LOT LINE WHERE POSSIBLE (SEE ABOVE LEFT).
6. WATER METER SHALL BE INSTALLED BY THE CITY.
7. TONING WIRE SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSULATION, NO SPLICES ALLOWED.
8. SEAL TONING WIRE SPLICE CONNECTIONS WITH COPPERHEAD 12 AWG SNAKEBITE LOCKING CONNECTORS (TYPICAL).
9. NEW WATER MAINS REQUIRE TONING WIRE TO A LOCATE STATION
10. TONING WIRE FROM MAIN TO SERVICE REQUIRES A SNAKEBITE LOCKING CONNECTOR
11. PREFERRED BRASS FITTINGS TO BE USED, IN ORDER:
    1. FORD
    2. AY MCDONALD

City of Camas WASHINGTON

WATER DETAIL

1" WATER SERVICE – NEW

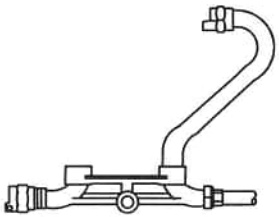
DETAIL APPROVED BY 7/6/2026 DATE

NOT TO SCALE

DETAIL NO. W2

REVISION: 11 DATE: 07/02/2026

S1.DWG



METER RISER
SEE NOTE 4

PROFILE VIEW

DUCTILE IRON MAIN

6" OR LARGER REQUIRES DIRECT TAP.
4" MAIN – DOUBLE STRAP SADDLE
REQUIRED FOR SERVICE CONNECTION

NOTES:

1. METER BOX SHALL BE OLDCASTLE FIBRELYTE FL12BOX WITH NO MOUSE HOLES OR ARMORCAST ROTOCAST P6000485.
2. COVER SHALL BE OLDCASTLE FIBRELYTE FL12D "WATER" OR ARMORCAST A6000484–H9 WITH OFFSET AMR RADIO READ ANTENNA HOLE FOR NEPTUNE METER
3. REPLACE ALL SERVICES WHICH MEET ANY OF THE FOLLOWING CONDITIONS:
   – METER BOX IS RELOCATED
   – SUBSTANDARD EITHER BY MATERIALS OR LACK OF COVER
4. IF SERVICE LINE TO HOUSE IS DEEP, HALF OF A METER RISER MAY BE REQUIRED.
5. SEE TRENCH SECTION DETAILS G2 OR G3 FOR BACKFILL REQUIREMENTS. WATER METER SHALL BE INSTALLED BY THE CITY.
6. TONING WIRE SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSULATION, NO SPLICES ALLOWED.
7. SEAL TONING WIRE SPLICE CONNECTIONS WITH COPPERHEAD 12 AWG SNAKEBITE LOCKING CONNECTORS (TYPICAL).
8. PREFERRED BRASS FITTINGS TO BE USED, IN ORDER:
   1. FORD
   2. AY MCDONALD

City of Camas WASHINGTON

WATER DETAIL

1" WATER SERVICE – REPLACEMENT

1/3/24

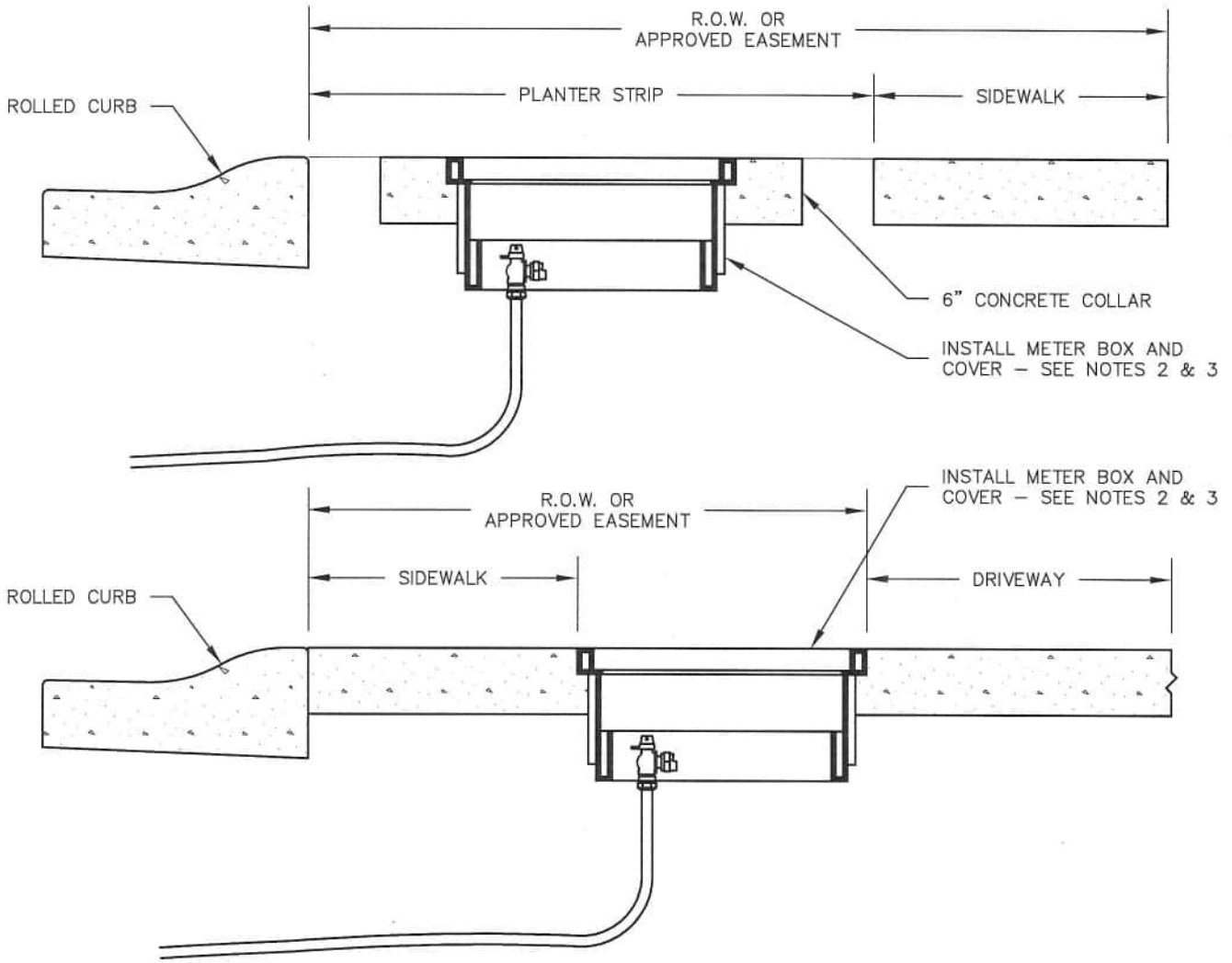
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. 2892

REVISION: 9 DATE: 01/02/2024

WTR–WS1.DWG



NOTES:
1. FOR INSTALLATIONS BEHIND ROLLED CURBS OR IN DRIVEWAYS WHERE H20 TRAFFIC RATING IS REQUIRED.
2. THE METER BOX SHALL BE SIGMA RAVEN HDPE STRAIGHT WALL BOX, BLACK, WITH NO MOUSE HOLES, M/N RMB132412–SW–B.
3. COVER SHALL BE SIGMA RAVEN POLYETHYLENE LID WITH OFFSET AMR RADIO READ ANTENNA HOLE FOR NEPTUNE METER, M/N N1324BLKWAT–TS.
4. BACKFILL AROUND METER BOX SHALL BE 5/8" MINUS CRUSHED SURFACING TOP COURSE. PLACE 2X6 WOOD SUPPORT ACROSS THE SHORT SIDE IN THE BASE OF BOX, PRIOR TO COMPACTION AROUND THE BOX, TO PREVENT INWARD BOWING.
4. METER BOX SHALL BE SET AT FINISH GRADE PRIOR TO CONCRETE BEING PLACED AROUND THE BOX.
5. METER BOXES SET IN PLANTER STRIPS AND IN HOT–MIX ASPHALT SHALL HAVE A 6 INCH CONCRETE COLLAR POURED AROUND THE METER BOX PRIOR TO PAVING.

City of Camas WASHINGTON

WATER DETAIL

H20 RATED 1" WATER METER BOX

Jan E. Carlton 6-17-19

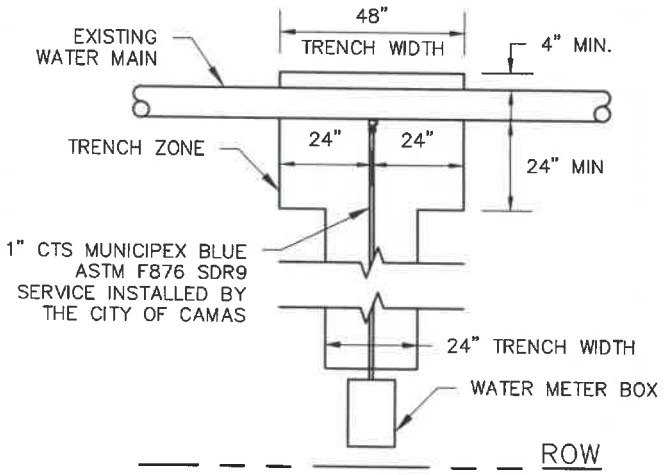
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W4

REVISION: 1 DATE: 6/11/2019

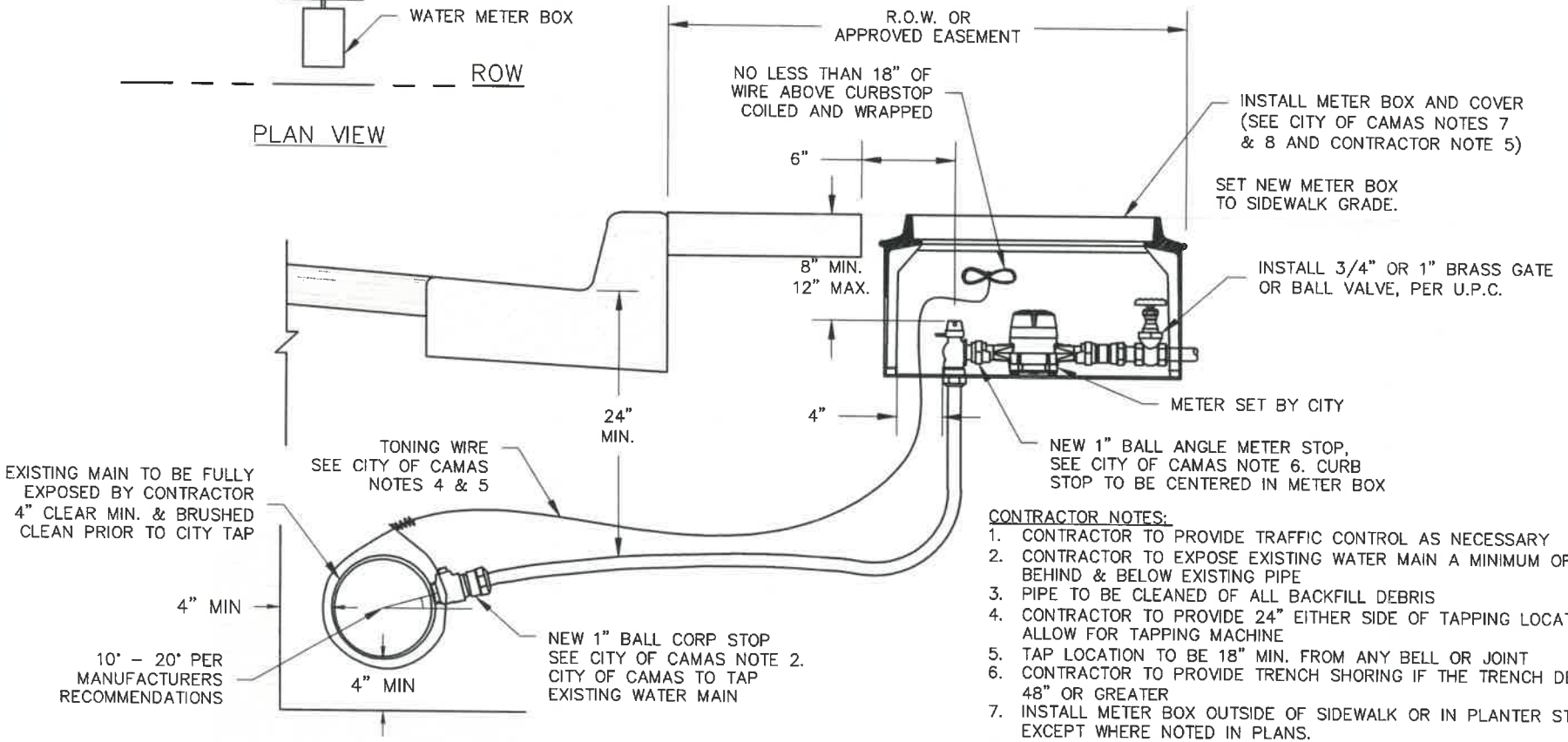
WTR–WS1 2019.DWG



PLAN VIEW

CITY OF CAMAS NOTES:

1. TAPPING OF THE EXISTING WATER MAIN IS TO BE PERFORMED BY THE CITY OF CAMAS.
2. CORP STOP SHALL BE 1" BALL CORP STOP, CC THREAD X COMPRESSION, WITH STIFFENER INSERT 6133T OR EQUIVALENT. PROVIDED AND INSTALLED BY THE CITY OF CAMAS
3. WATER SERVICE SHALL BE 1" CTS MUNICIPEX BLUE ASTM F876 SDR9, PROVIDED AND INSTALLED BY THE CITY OF CAMAS
4. TONING WIRE SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSULATION, NO SPLICES ALLOWED. PROVIDED AND INSTALLED BY THE CITY OF CAMAS.
5. SEAL TONING WIRE SPLICE CONNECTIONS WITH COPPERHEAD 12 AWG SNAKEBITE LOCKING CONNECTORS (TYP)
6. METER STOP SHALL BE 1" BALL ANGLE METER STOP, COMPRESSION X METER SWIVEL NUT, WITH STIFFENER INSERT 6133T OR EQUIVALENT. PROVIDED AND INSTALLED BY THE CITY OF CAMAS
7. METER BOX SHALL BE OLDCASTLE FIBRELYTE FL12BOX WITH NO MOUSE HOLES OR ARMORCAST ROTOCAST P6000485. CITY OF CAMAS TO PROVIDE METER BOX, CONTRACTOR TO INSTALL
8. COVER SHALL BE OLDCASTLE FIBRELYTE FL12D "WATER" OR ARMORCAST A6000484-H9 WITH OFFSET AMR RADIO READ ANTENNA HOLE FOR NEPTUNE METER. CITY OF CAMAS TO PROVIDE COVER, CONTRACTOR TO INSTALL.
9. WATER METER SHALL BE INSTALLED BY THE CITY OF CAMAS



PROFILE VIEW

CONTRACTOR NOTES:

1. CONTRACTOR TO PROVIDE TRAFFIC CONTROL AS NECESSARY
2. CONTRACTOR TO EXPOSE EXISTING WATER MAIN A MINIMUM OF 4" BEHIND & BELOW EXISTING PIPE
3. PIPE TO BE CLEANED OF ALL BACKFILL DEBRIS
4. CONTRACTOR TO PROVIDE 24" EITHER SIDE OF TAPPING LOCATION TO ALLOW FOR TAPPING MACHINE
5. TAP LOCATION TO BE 18" MIN. FROM ANY BELL OR JOINT
6. CONTRACTOR TO PROVIDE TRENCH SHORING IF THE TRENCH DEPTH IS 48" OR GREATER
7. INSTALL METER BOX OUTSIDE OF SIDEWALK OR IN PLANTER STRIP, EXCEPT WHERE NOTED IN PLANS.
8. SEE TRENCH SECTION DETAIL G2 FOR BACKFILL REQUIREMENTS.
9. SEE DETAIL G2A FOR LIMITS OF REQUIRED SURFACE RESTORATION

City of Camas WASHINGTON

WATER DETAIL

1" WATER SERVICE – INFILL LOT

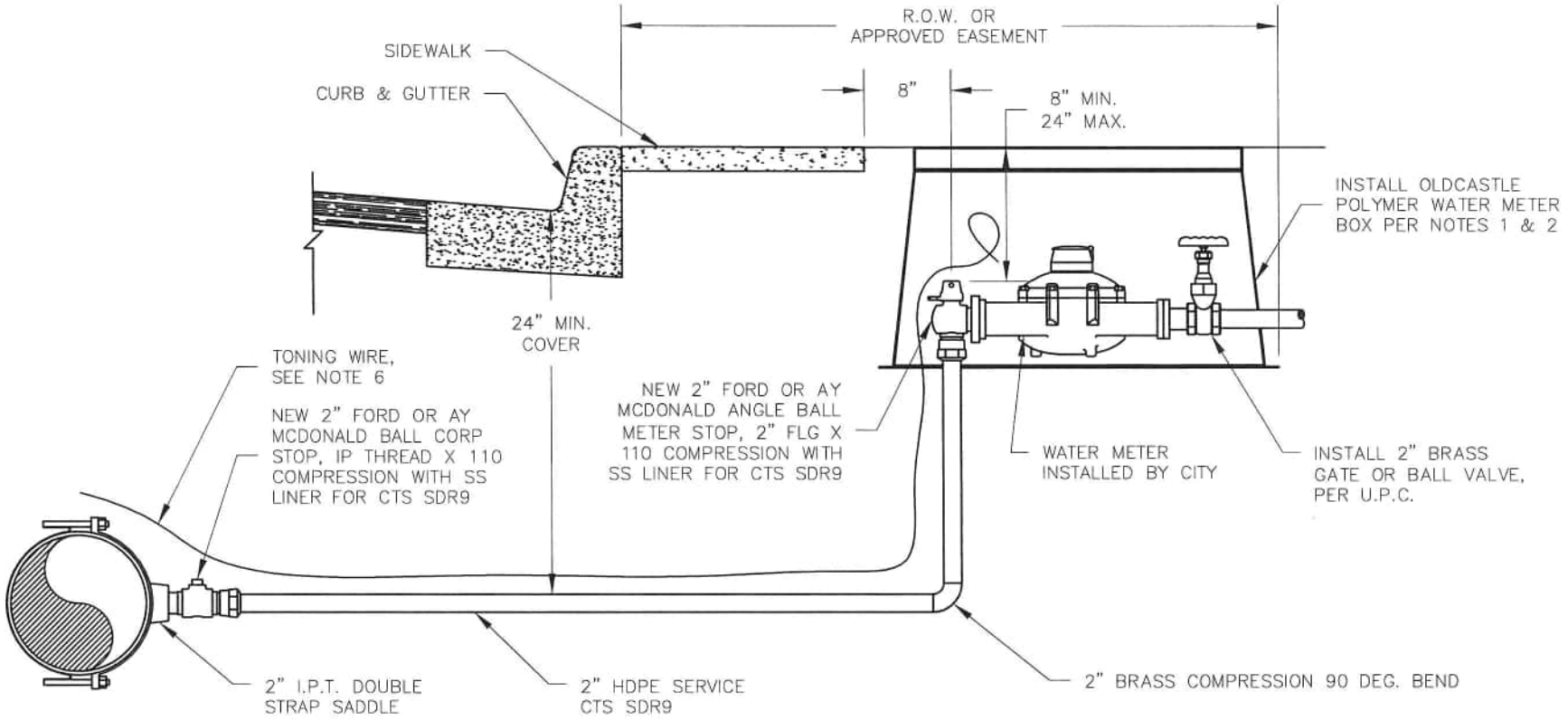
DETAIL APPROVED BY 7/6/2026 DATE

NOT TO SCALE

DETAIL NO. W5

REVISION: 3 DATE: 7/02/2026

W5S1.DWG



NOTES:
1. METER BOX SHALL BE OLDCASTLE FIBRELYTE FL36BOX18. INSTALL FL36X6 OR FL36X8 BASE EXTENSIONS AS REQUIRED.
2. COVER SHALL BE OLDCASTLE FIBRELYTE FL36 P "WATER" WITH OFFSET AMR RADIO READ ANTENNA HOLE FOR NEPTUNE METER
3. REPLACE ALL SERVICES WHICH MEET ANY OF THE FOLLOWING CONDITIONS:
   - METER BOX IS RELOCATED
   - SUBSTANDARD EITHER BY MATERIALS OR LACK OF COVER
4. SEE TRENCH SECTION DETAILS G2 OR G3 FOR BACKFILL REQUIREMENTS.
5. AFTER FEES HAVE BEEN PAID WATER METER SHALL BE ORDERED AND INSTALLED BY THE CITY.
6. TONING WIRE IS REQUIRED AND SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSULATION, NO SPLICES ALLOWED.

City of Camas WASHINGTON

WATER DETAIL

2" WATER SERVICE

DETAIL APPROVED BY

5/20/24
DATE

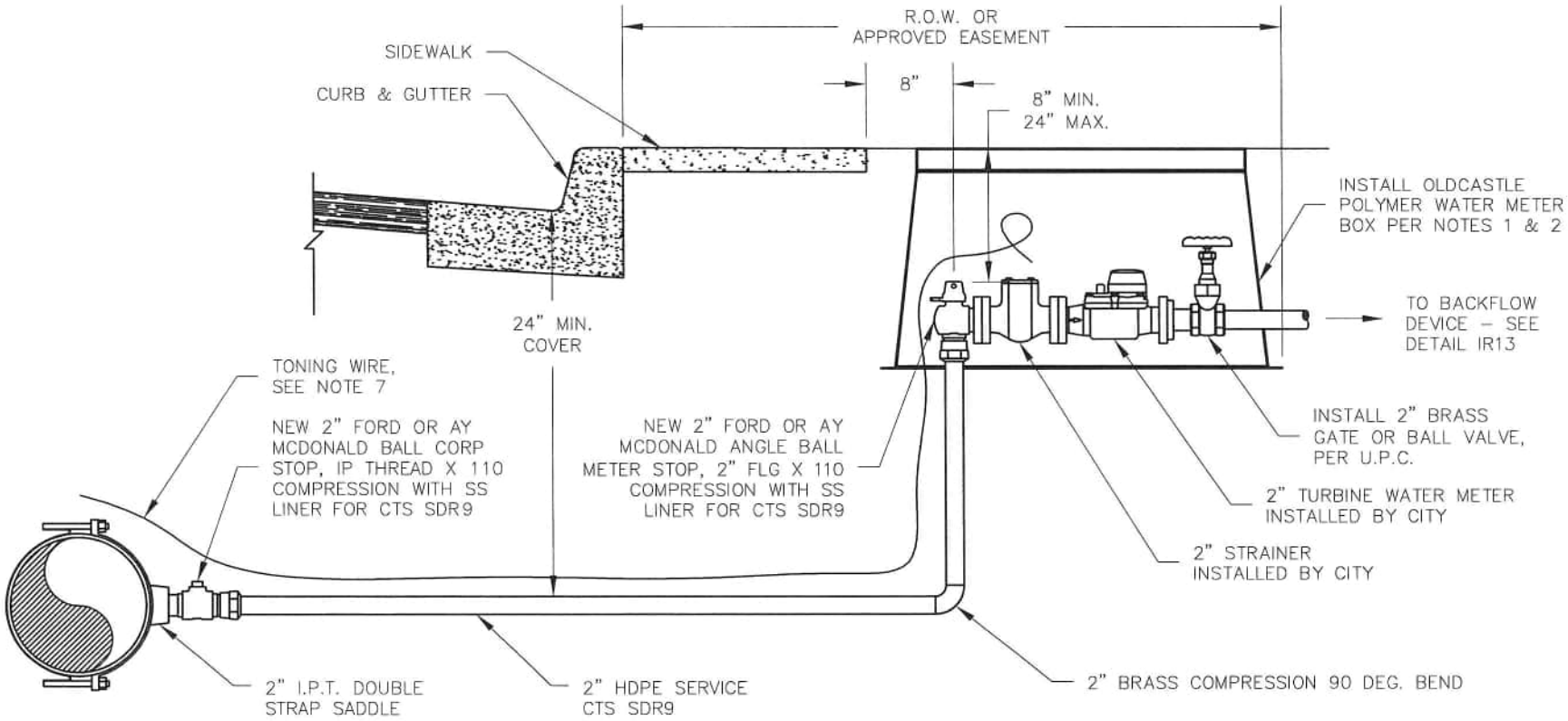
NOT TO SCALE

DETAIL NO. W6

REVISION: 10

DATE: 05/20/2024

WTR-WS2.DWG



NOTES:

1. METER BOX SHALL BE OLDCASTLE FIBRELYTE FL36BOX18. INSTALL FL36X6 OR FL36X8 BASE EXTENSIONS AS REQUIRED.
2. COVER SHALL BE OLDCASTLE FIBRELYTE FL36 P "WATER" WITH OFFSET AMR RADIO READ ANTENNA HOLE FOR NEPTUNE METER
3. REPLACE ALL SERVICES WHICH MEET ANY OF THE FOLLOWING CONDITIONS:
   - METER BOX IS RELOCATED
   - SUBSTANDARD EITHER BY MATERIALS OR LACK OF COVER
4. SEE TRENCH SECTION DETAILS G2 OR G3 FOR BACKFILL REQUIREMENTS.
5. AFTER FEES HAVE BEEN PAID WATER METER SHALL BE ORDERED AND INSTALLED BY THE CITY.
6. 1–1/2" METER WILL REQUIRE A 2" X 1–1/2" REDUCER FITTING AND MAY REQUIRE ADDITIONAL METER BOX, OR SEPARATE VALVE BOX FOR GATE VALVE.
7. TONING WIRE IS REQUIRED AND SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSULATION, NO SPLICES ALLOWED.

City of Camas WASHINGTON

WATER DETAIL

2" WATER SERVICE FOR IRRIGATION

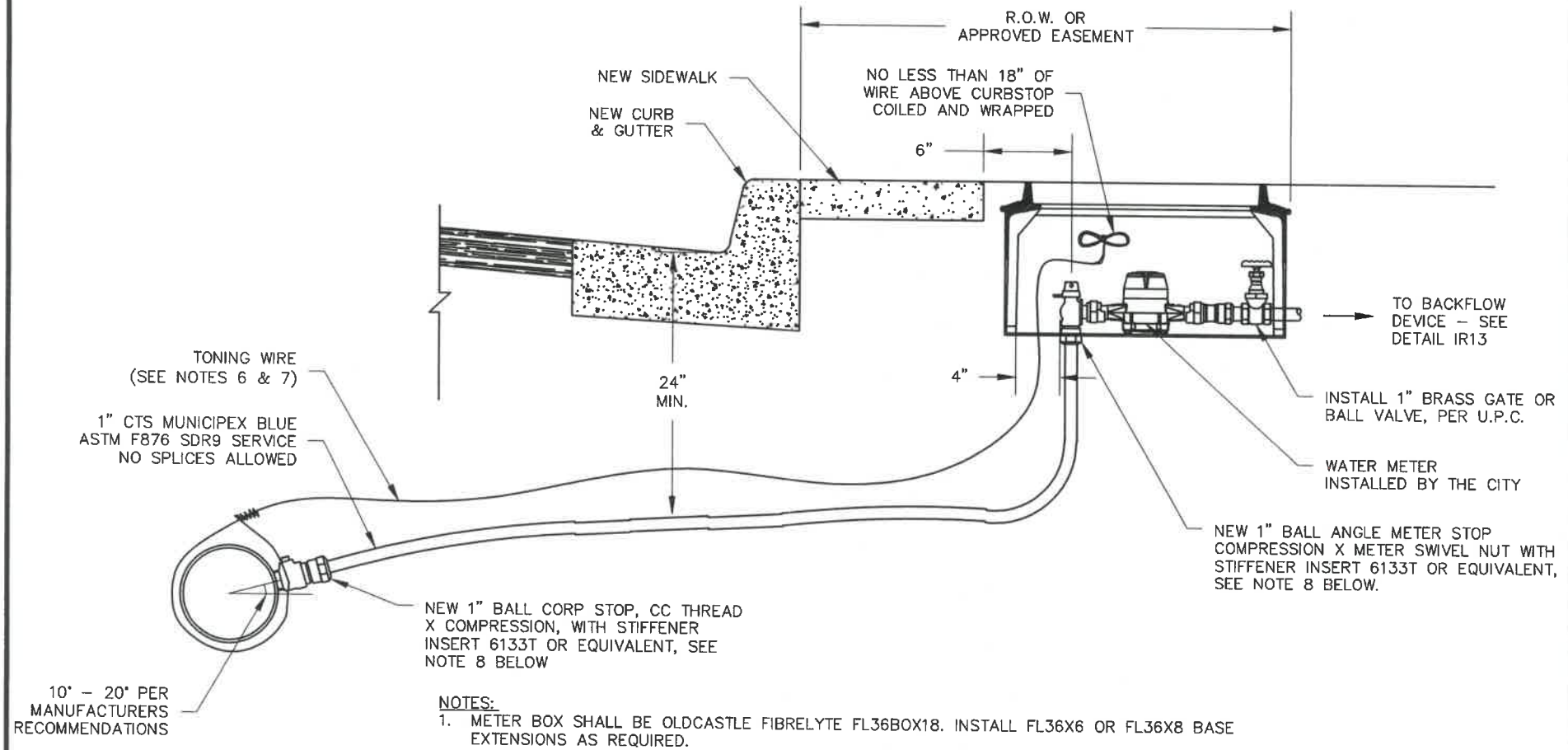
DETAIL APPROVED BY — DATE 5/20/24

NOT TO SCALE

DETAIL NO. W6A

REVISION: 4 DATE: 05/20/2024

WTR-WS2.DWG



NOTES:

1. METER BOX SHALL BE OLDCASTLE FIBRELYTE FL36BOX18. INSTALL FL36X6 OR FL36X8 BASE EXTENSIONS AS REQUIRED.
2. COVER SHALL BE OLDCASTLE FIBRELYTE FL36 P "WATER" WITH OFFSET AMR RADIO READ ANTENNA HOLE FOR NEPTUNE METER
3. REPLACE ALL SERVICES WHICH MEET ANY OF THE FOLLOWING CONDITIONS:
   - METER BOX IS RELOCATED
   - SUBSTANDARD EITHER BY MATERIALS OR LACK OF COVER
4. SEE TRENCH SECTION DETAILS G2 OR G3 FOR BACKFILL REQUIREMENTS.
5. AFTER FEES HAVE BEEN PAID WATER METER SHALL BE ORDERED AND INSTALLED BY THE CITY.
6. TONING WIRE IS REQUIRED AND SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSULATION, NO SPLICES ALLOWED.
7. SEAL TONING WIRE SPLICE CONNECTIONS WITH COPPERHEAD 12 AWG SNAKEBITE LOCKING CONNECTORS (TYPICAL).
8. PREFERRED BRASS FITTINGS TO BE USED, IN ORDER:
   1. FORD
   2. AY MCDONALD

City of Camas WASHINGTON

WATER DETAIL

1" WATER SERVICE FOR IRRIGATION

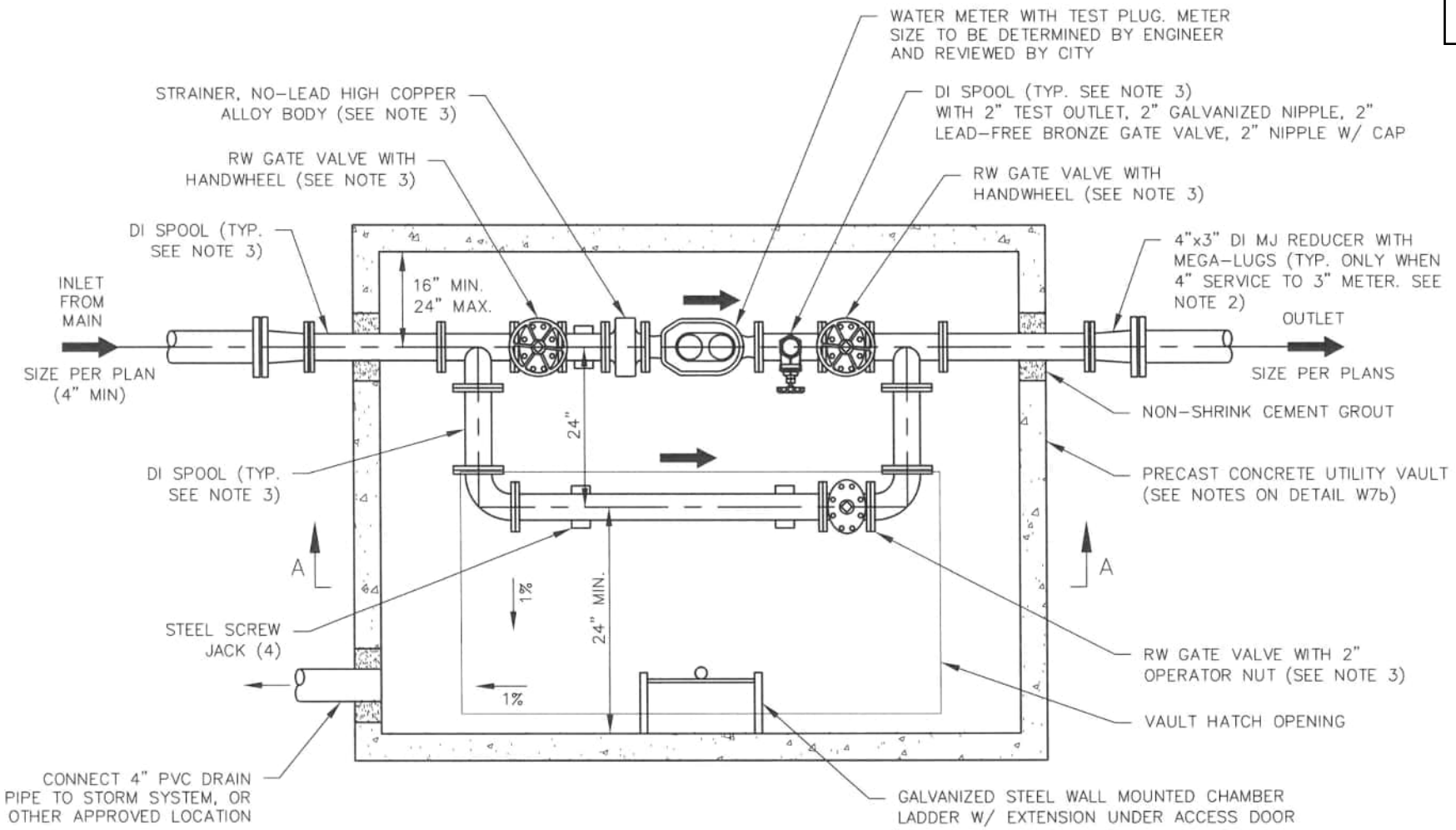
DETAIL APPROVED BY — DATE: 7/6/2026

NOT TO SCALE

DETAIL NO. W6B

REVISION: 1 DATE: 7/02/2026

S2.DWG



PLAN VIEW

WATER METER NOTES:

1. FOR NEW MAINS, INSTALL MAIN SIZE MJ x NEW SERVICE FL TEE (4" MIN). FOR EXISTING MAINS, LIVE TAP TO BE PERFORMED BY APPROVED TAPPING CONTRACTOR.
2. ALL COMPONENTS TO MATCH METER SIZE.
3. PROVIDE FLANGED CONNECTIONS FOR ALL JOINTS ON 3" DUCTILE IRON PIPE AND FITTINGS; FOR 4" AND BIGGER PROVIDE APPROVED JOINT RESTRAINT FOR ALL JOINTS.
4. CONSTRUCTION AND MAINTENANCE WITHIN VAULTS MAY BE SUBJECT TO CONFINED SPACE ENTRY PERMITTING REQUIREMENTS AND/OR SAFETY PRECAUTIONS.
5. WATER METER TO BE ORDERED, PAID, AND INSTALLED BY CONTRACTOR. BRAND AND TYPE TO BE APPROVED BY WATER DEPARTMENT.

City of Camas WASHINGTON

WATER DETAIL

3" – 8" WATER SERVICE

Jan E. Cutler 3-24-22

DETAIL APPROVED BY DATE

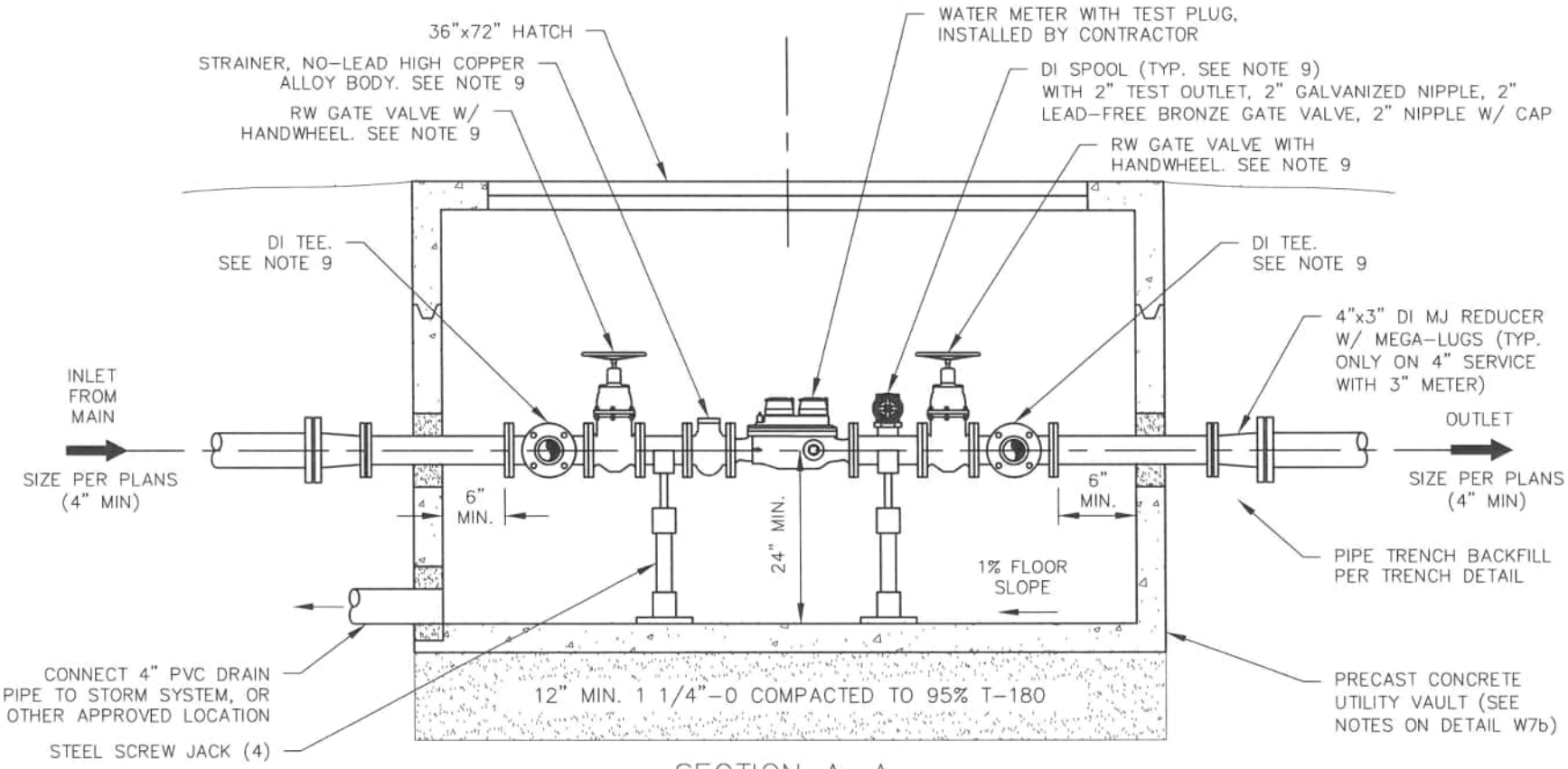
NOT TO SCALE

DETAIL NO. W7A

REVISION: 4 DATE: 03/22/2022

2898

WTR-WS3.DWG



SECTION A-A

(BY-PASS LINE REMOVED FOR CLARITY)

VAULT CONSTRUCTION NOTES:

1. VAULT SHALL BE PRE-APPROVED PRIOR TO INSTALLATION.
2. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
3. APPROVED VAULT SHALL BE RATED FOR H20 LOADING AND INCLUDE AN EXTENSION LADDER, MINIMUM INSIDE DIMENSIONS 8'Lx6'Wx5'H.
4. VAULT SHALL BE SET FOR 1% SLOPE TO DRAIN.
5. ALL BACKFILL SHALL BE APPROVED GRANULAR MATERIAL.
6. HATCH SHALL BE AN H20 RATED, 36"x72" SPRING ASSISTED, HOT DIPPED GALVANIZED DIAMOND PLATE DOUBLE DOOR. FOR TRAFFIC INSTALLATIONS A 30" MANHOLE LID SHALL BE USED INSTEAD OF A HATCH.
7. SUMP PUMP MAY BE REQUIRED ON INSTALLATIONS WHERE DRAIN PIPE CANNOT BE CONNECTED TO ADEQUATE STORM DRAIN SYSTEM. THE APPROVED SUMP PUMP SHALL BE A COMMERCIAL GRADE WATER POWERED VENTURI DESIGN WITH BACKFLOW PREVENTION, SIZED TO PROVIDE 10GPM AT 10 FEET OF HEAD AT THE AVAILABLE SYSTEM WATER PRESSURE. BACKFLOW DEVICE SHALL BE CERTIFIED BY WASHINGTON STATE CERTIFIED BACKFLOW TESTER AFTER INSTALLATION AND PRIOR TO ACCEPTANCE. TEST RESULTS SHALL BE SENT TO CITY OF CAMAS WATER DEPARTMENT.
8. CONSTRUCTION AND MAINTENANCE WITHIN VAULTS MAY BE SUBJECT TO CONFINED SPACE ENTRY PERMITTING REQUIREMENTS AND/OR SAFETY PRECAUTIONS.
9. PROVIDE FLANGED CONECTIONS FOR ALL JOINTS 3" DI PIPE AND FITTINGS; FOR 4" AND BIGGER PROVIDE APPROVED JOINT RESTRAINTS.

City of Camas WASHINGTON

WATER DETAIL

3" - 8" WATER SERVICE

Jim C. Carothers 3-24-22

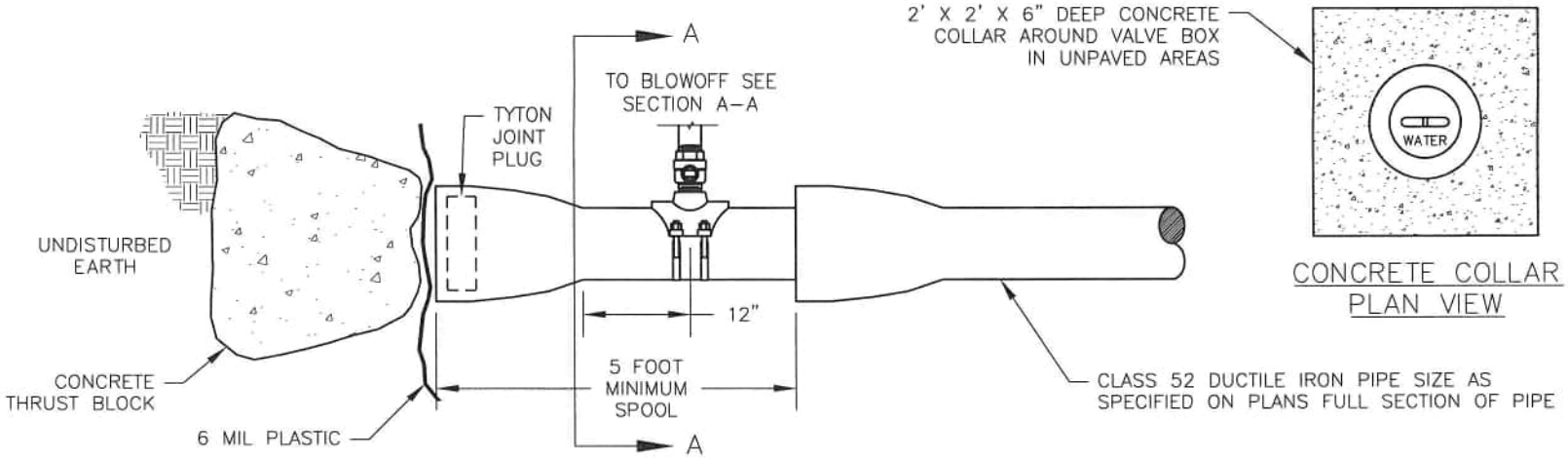
DETAIL APPROVED BY DATE

NOT TO SCALE

REVISION: 4 DATE: 03/22/2022

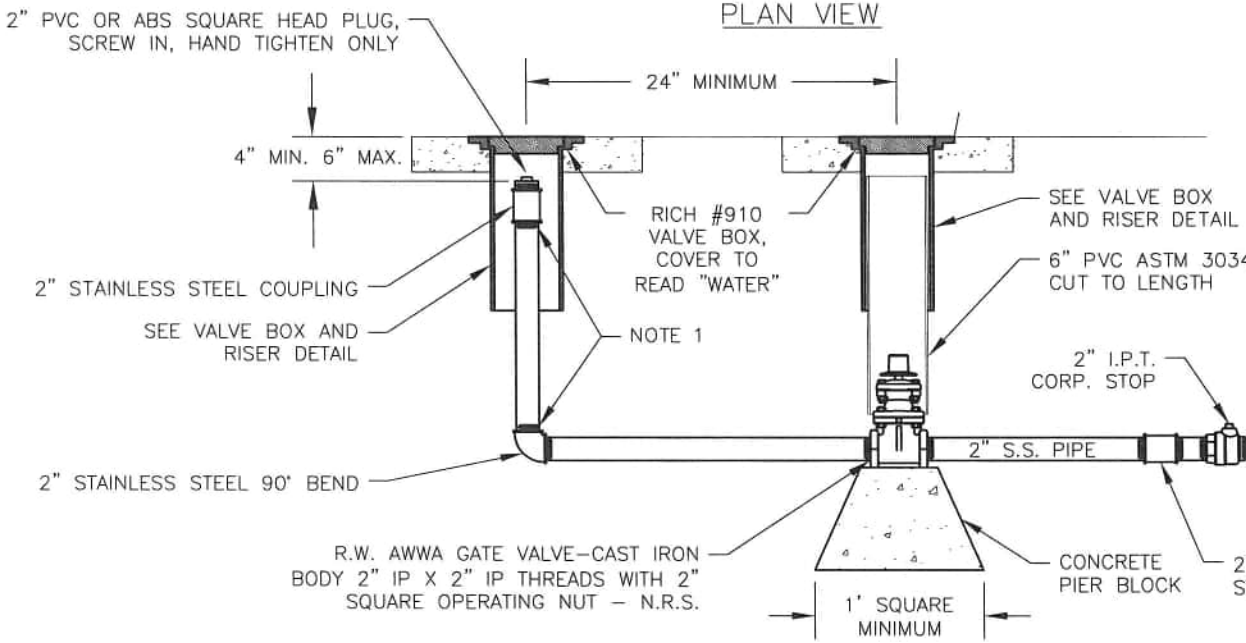
DETAIL NO. W7B

WTR-WS3.DWG



PLAN VIEW

CONCRETE COLLAR
PLAN VIEW



SECTION A–A

NOTES:
1. TIGHTEN ALL THREADED PIPE JOINTS SECURELY. USE LOCTITE THREADLOCKER RED, OR APPROVED EQUAL, ON THREADED ELBOW AND COUPLING. VISUAL INSPECTION REQUIRED PRIOR TO BURY.
2. SWAB ALL PIPE WITH CHLORINE MIXTURE PRIOR TO SERVICE.

City of Camas WASHINGTON

WATER DETAIL

2" STANDARD BLOWOFF

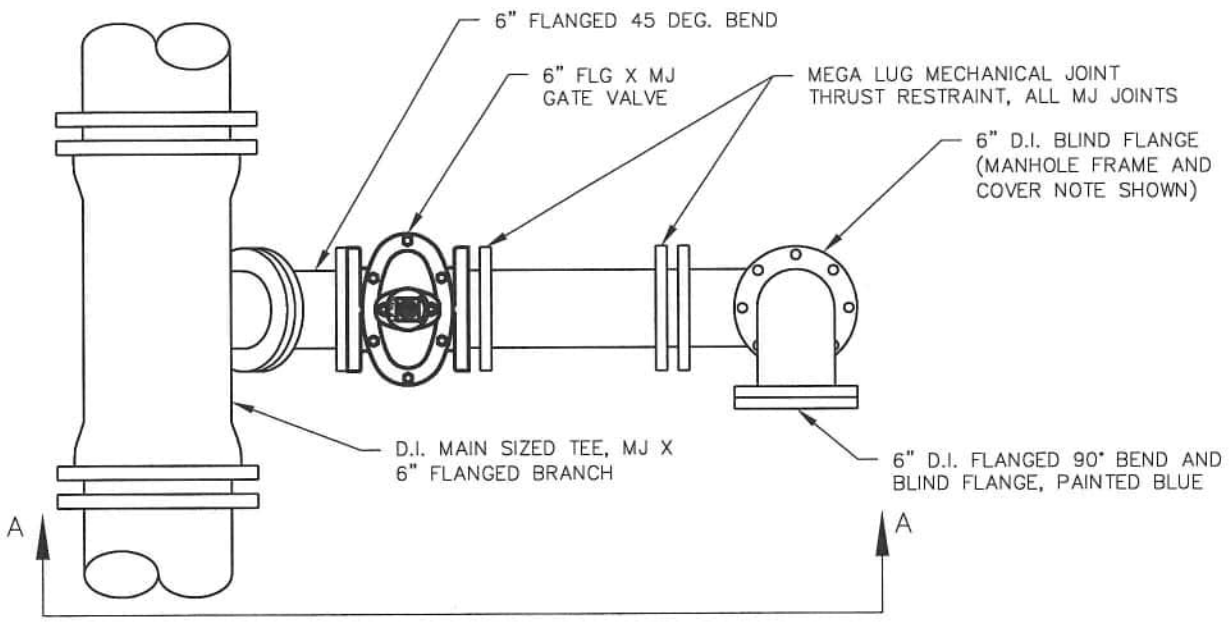
DETAIL APPROVED BY — DATE: 1/3/24

NOT TO SCALE

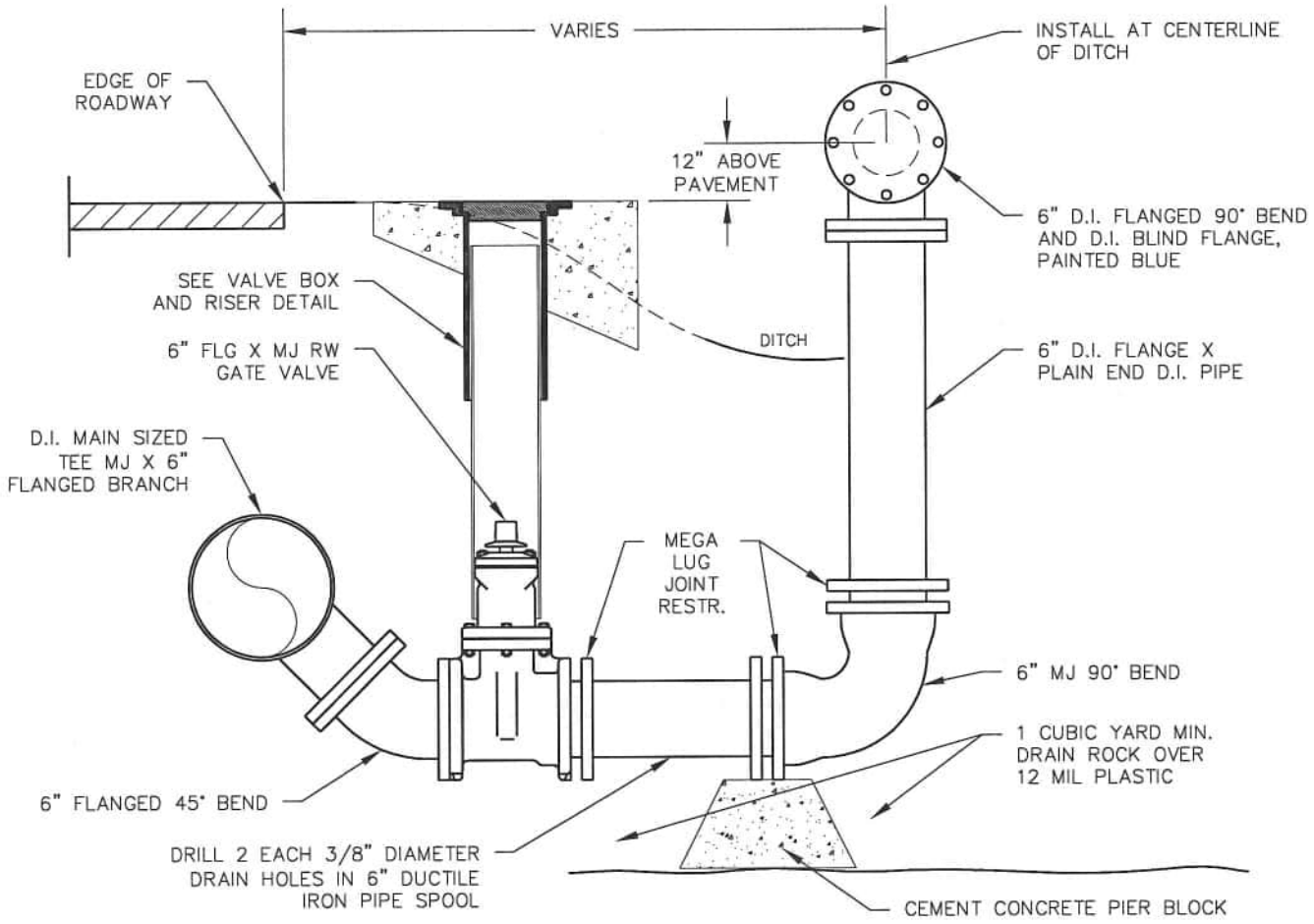
DETAIL NO. 2900

REVISION: 7 DATE: 01/02/2024

WTR–BLOWOFF.DWG



PLAN VIEW



SECTION VIEW A–A

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

6" LOW POINT BLOW OFF – DITCH

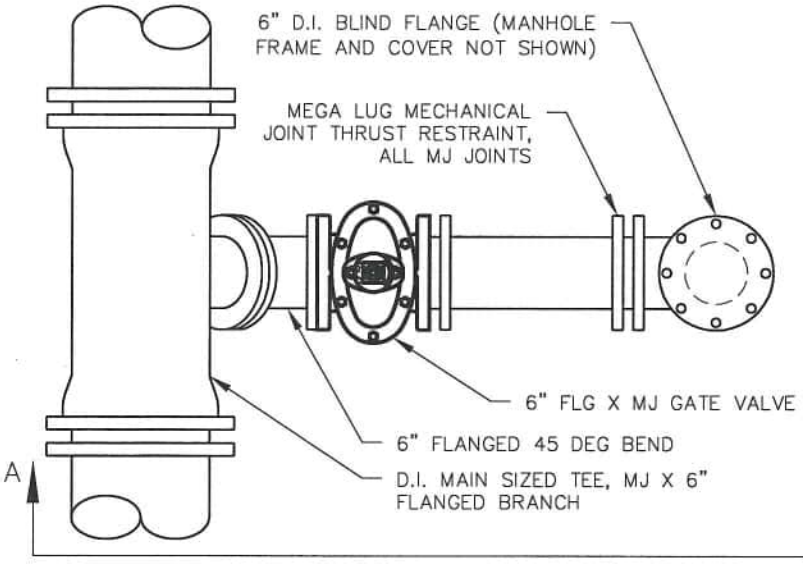
Jan E Carothers 1-4-11

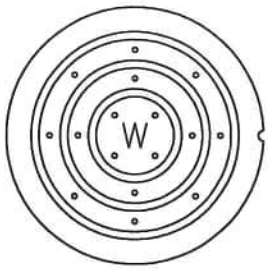
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W9

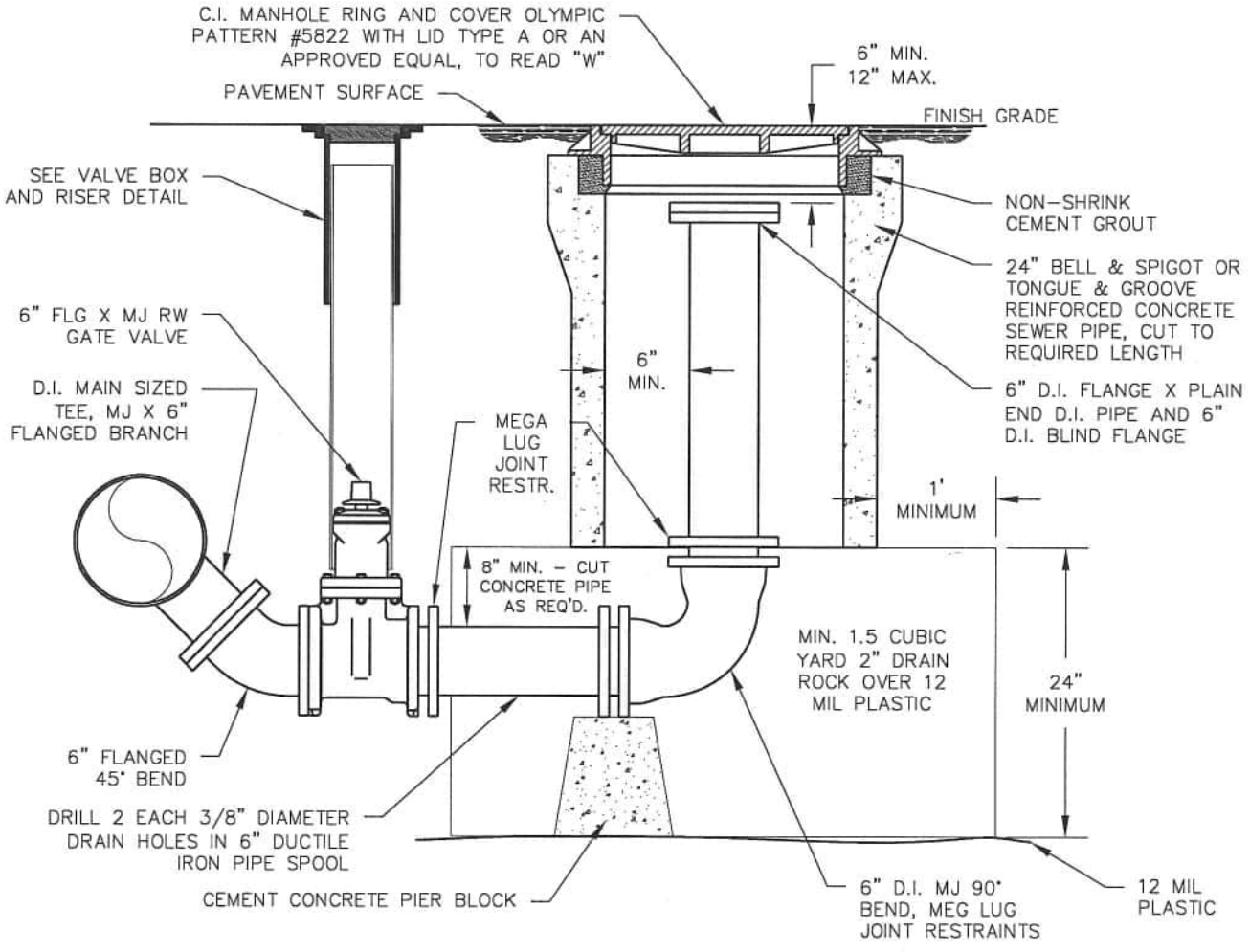
6BLOWOFF.DWG





WATER COVER

PLAN VIEW



SECTION VIEW A-A

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

6" LOW POINT BLOW OFF - STREET

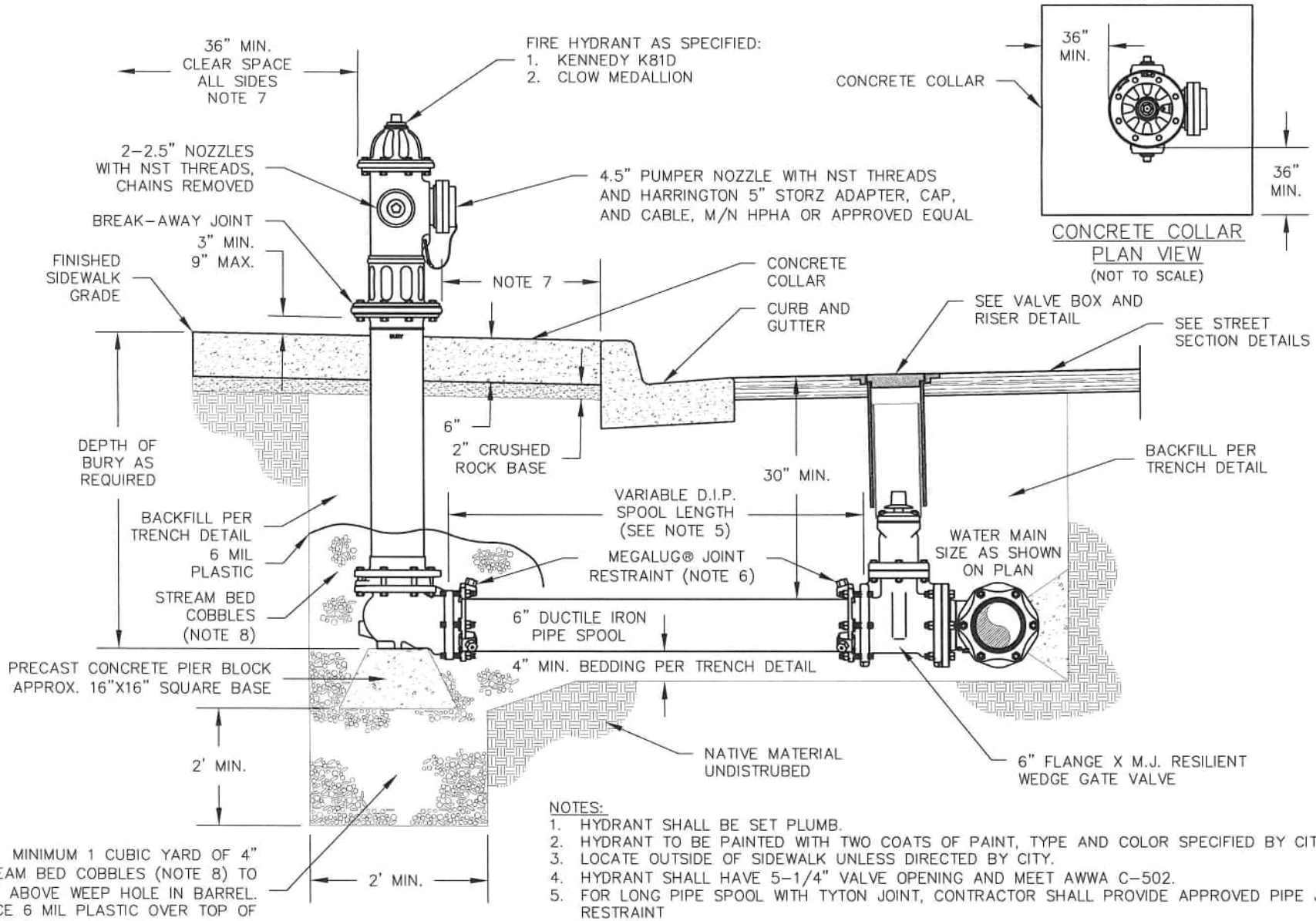
Jon P. Carothers 1-4-11

DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W10

6BLOWOFF.DWG



NOTES:

1. HYDRANT SHALL BE SET PLUMB.
2. HYDRANT TO BE PAINTED WITH TWO COATS OF PAINT, TYPE AND COLOR SPECIFIED BY CITY.
3. LOCATE OUTSIDE OF SIDEWALK UNLESS DIRECTED BY CITY.
4. HYDRANT SHALL HAVE 5-1/4" VALVE OPENING AND MEET AWWA C-502.
5. FOR LONG PIPE SPOOL WITH TYTON JOINT, CONTRACTOR SHALL PROVIDE APPROVED PIPE JOINT RESTRAINT
6. EBAA IRON SERIES 1100 MEGALUG®MECHANICAL JOINT THRUST RESTRAINT.
7. 36" MINIMUM CLEARANCE ON ALL SIDES (MAY INCLUDE SIDEWALK), 20" MINIMUM ONLY ON CURB SIDE
8. 4 INCH STREAM BED COBBLES PER WSDOT SPEC WSDOT 9-03.11(2)

City of Camas WASHINGTON

WATER DETAIL

FIRE HYDRANT

DETAIL APPROVED BY

1/3/24

DATE

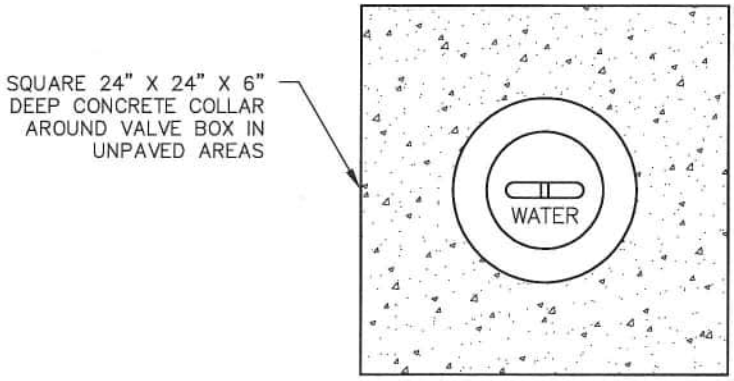
NOT TO SCALE

DETAIL NO.

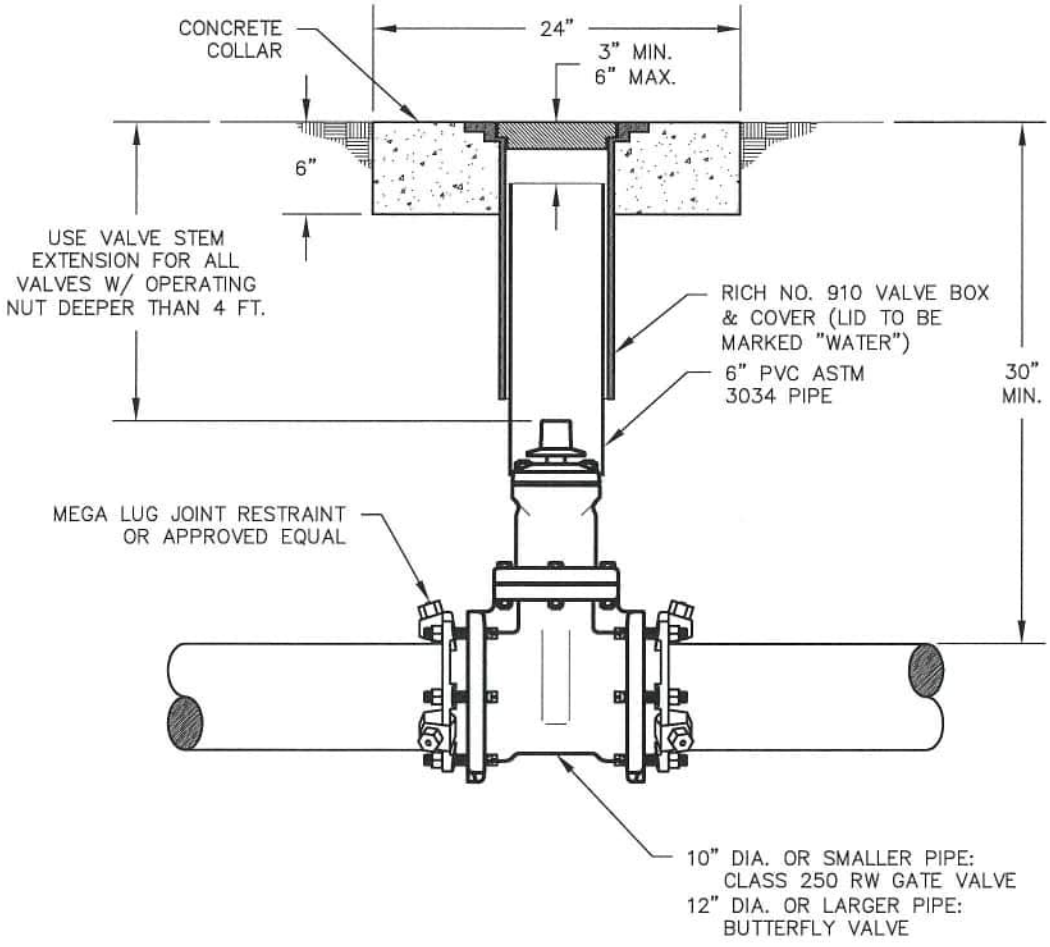
2903

REVISION: 8 DATE: 01/02/2024

WTR-FHYD.DWG



CONCRETE COLLAR PLAN VIEW



REV. NO.	DATE	BY	APPR.
1	7/17/06	SCD	RES1076
2	5/1/07	SCD	JC
3	1/1/11	SCD	JC
4	10/21/14	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

VALVE BOX AND RISER

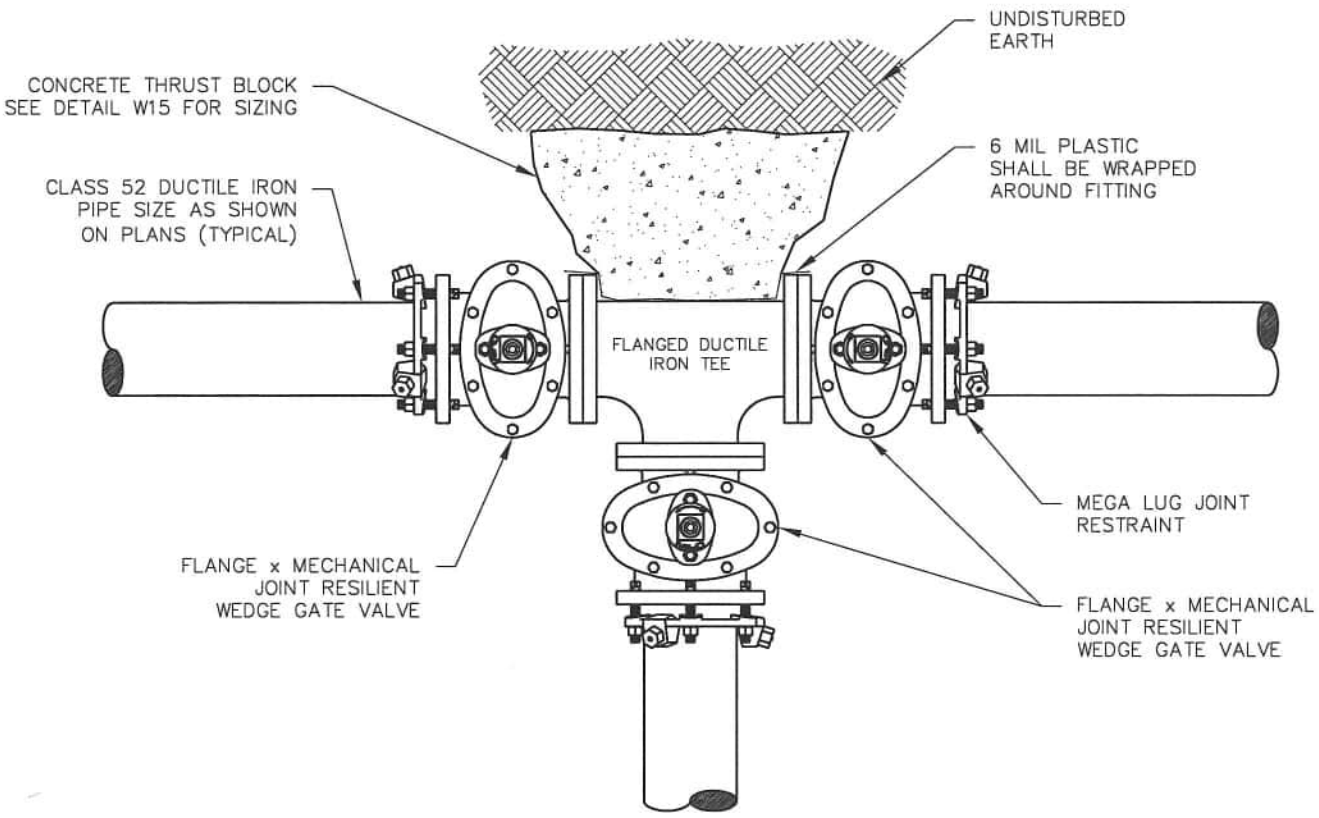
10-21-14

DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W12

-RISER.DWG



NOTES:
1. VALVES TO BE INSTALLED AT ALL BRANCHES. FOR LONG MAIN LINE RUNS, INLINE VALVE SPACING NOT TO EXCEED 500'. LOOP WATER SYSTEM WHEREVER POSSIBLE. KEEP DEAD ENDS TO A MINIMUM.
2. MECHANICAL THRUST RESTRAINT MAY BE USED DUE TO UNSTABLE SOILS OR THE ENGINEER'S DISCRETION.
3. SEE DETAIL W15 FOR THRUST BLOCK REQUIREMENTS.

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

WATER MAIN LINE AND VALVE

Jon E. Cauthorn 1-4-11

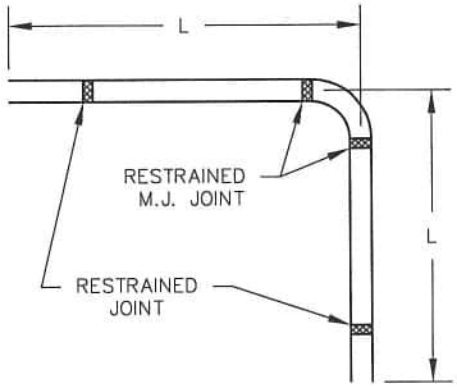
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W13

-VALVE.DWG

FOR HORIZONTAL BENDS:



MINIMUM REQUIRED PIPE LENGTHS FOR RESTRAINED JOINTS

BEND IN DEGREES	PIPE DIAMETER 6"	8"	10"	12"
90°	25'	33'	39'	45'
45°	10'	13'	16'	19'
22 1/2°	5'	6'	8'	9'
11 1/2°	3'	3'	4'	4'

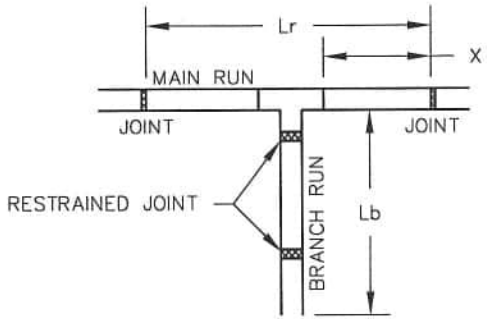
NOTE: CHART USES WORKING PRESSURE OF 200 PSI

FOR PRESSURES OTHER THAN 200 PSI USE:

$$\frac{(L) \times (\text{PRESSURE})}{200}$$

NOTE:
FIELD–LOCK GASKETS ARE APPROVED FOR RESTRAINED JOINT INSTALLATION.

FOR TEES:



MINIMUM REQUIRED PIPE LENGTHS FOR RESTRAINED JOINTS

FOR 6" TEES USE FORMULA
Lb= 50 – 1.63 (Lr)

WHERE:
Lb= THE MINIMUM REQUIREDRESTRAINED PIPE (IN FEET)ON THE BRANCH LINE
Lr= THE TOTAL LENGTH (IN FEET) BETWEEN THE FIRST JOINTS ON EITHER SIDE OF THE TEE ON THE MAIN RUN.

NOTE:
CONDITIONS TO BE FIELD VERIFIED BY ENGINEER.

IF (X) IS LESS THAN 5 FEET THEN PIPE MUST BE RESTRAINED TWO FULL LENGTHS.

FOR 8" TEE USE FORMULA
Lb= 64 – 1.65(Lr)

FOR 12" TEE USE FORMULA
Lb= 90 –1.67(Lr)

REV. NO.	DATE	BY	APPR.
1	7/17/06	SCD	RES1071
2	5/1/07	SCD	JC
3	1/1/11	SCD	JC

CITY OF CAMAS ~ WATER DETAIL
PIPE JOINT RESTRAINT

Jon P. Castles 1-4-11
DETAIL APPROVED BY DATE

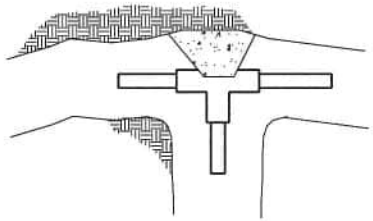
NOT TO SCALE

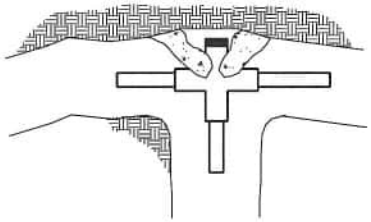
DETAIL NO.
W14

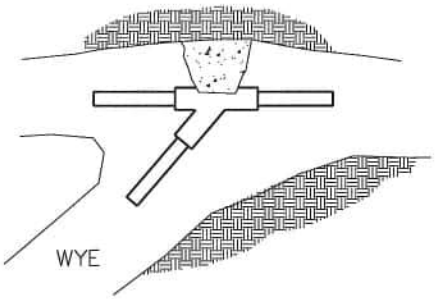
R-THRUST.DWG

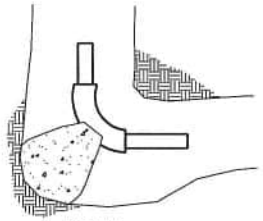
FITTING SIZE	TEE, WYE, PLUG OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22 1/2° BEND	11 1/2° BEND
			A1	A2			
4	1.0	1.4	1.9	1.4	1.0	--	--
6	2.1	3.0	4.3	3.0	1.6	1.0	--
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.4	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14	11.5	16.3	23.0	16.3	8.9	4.6	2.3
16	15.0	21.3	30.0	21.3	11.6	6.0	3.0
18	19.0	27.0	38.0	27.0	14.6	7.6	3.8
20	23.5	33.3	47.0	33.3	18.1	9.4	4.7
24	34.0	48.0	68.0	48.0	26.2	13.6	6.8

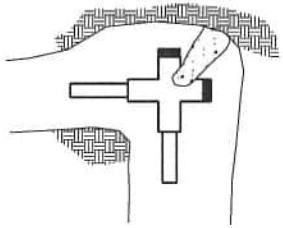
NOTES:
1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH
2. KEEP CONCRETE CLEAR OF JOINTS AND ACCESSORIES.
3. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS. e.g. (15) INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.
4. IF NOT SHOWN ON PLANS THE REQUIRED BEARING AREAS AT FITTINGS SHALL BE AS INDICATED IN TABLE, ADJUSTED IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWED SOIL BEARING STRESS(ES) STATED IN THE SPECIAL SPECIFICATIONS.
5. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.
6. ALL FITTINGS SHALL BE WRAPPED IN 6 MIL PLASTIC PRIOR TO THRUST BLOCK PLACEMENT MAKING SURE THE BOLTS AND NUTS ARE PROTECTED.
7. THRUST BLOCKS SHALL BE GIVEN 72 HOURS TO SET UP PRIOR TO PRESSURIZING LINE OR AS DIRECTED BY CITY INSPECTOR.

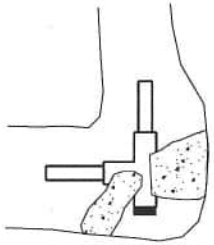

TEE

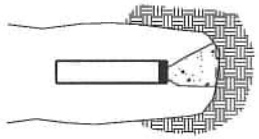

PLUGGED CROSS


WYE


BEND


PLUGGED CROSS


PLUGGED TEE


PLUG OR CAP

NOTES:
1. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 LBS. PER SQUARE FOOT.
2. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES USE THE FOLLOWING EQUATION:
   BEARING AREA=(TEST PRESSURE/150)x(2000/SOIL BEARING STRESS)x(TABLE VALUE)
3. EACH AREA IS 1/2 OF REQUIRED TOTAL AREA

REV. NO.	DATE	BY	APPR.
1	7/17/06	SCD	RES1071
2	5/1/07	SCD	JC
3	1/1/11	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

THRUST BLOCKS

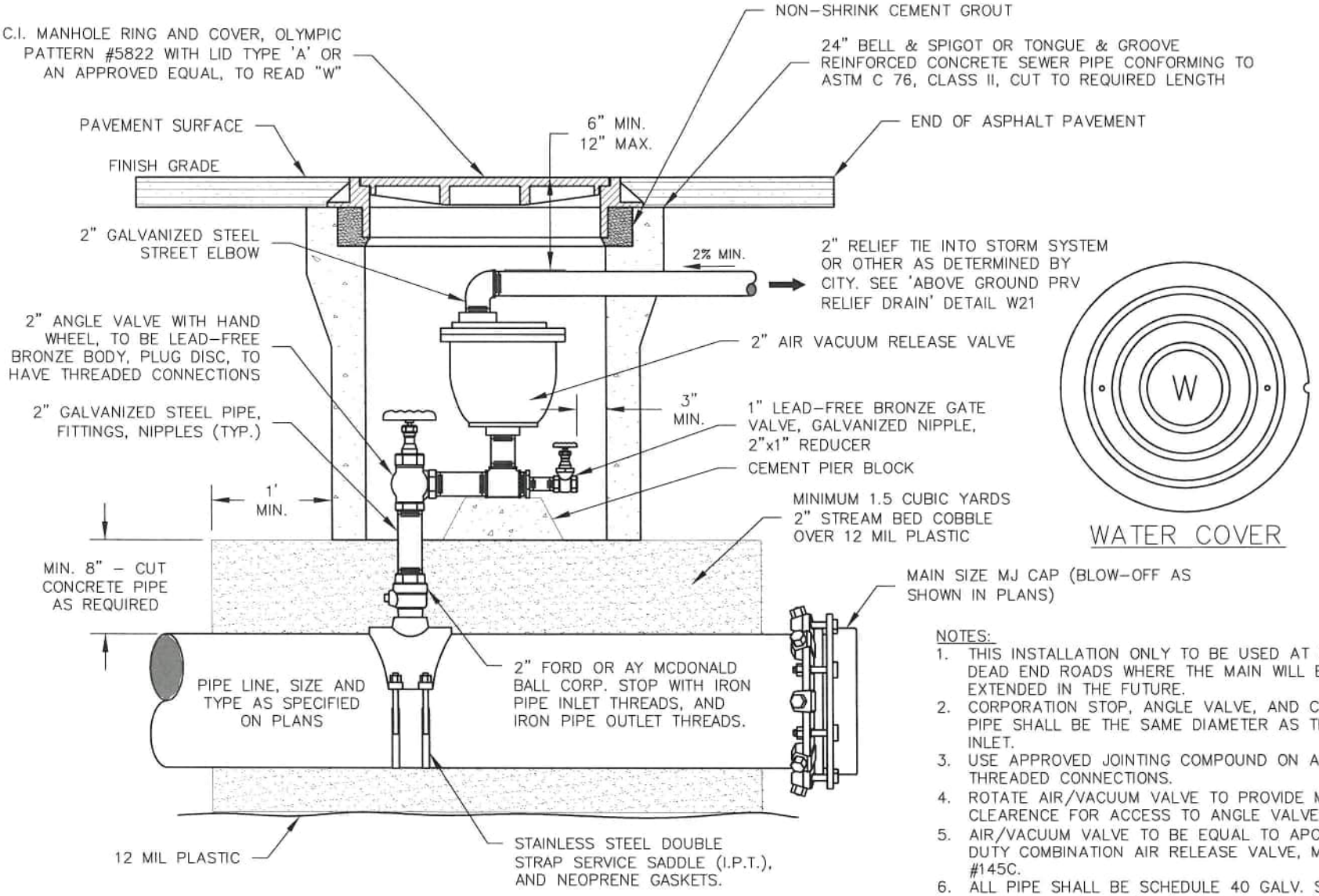
Jan E Carothers 1-4-11

DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W15

– THRUST.DWG



WATER COVER

NOTES:

1. THIS INSTALLATION ONLY TO BE USED AT HIGH-POINT DEAD END ROADS WHERE THE MAIN WILL BE EXTENDED IN THE FUTURE.
2. CORPORATION STOP, ANGLE VALVE, AND CONNECTING PIPE SHALL BE THE SAME DIAMETER AS THE AIR INLET.
3. USE APPROVED JOINTING COMPOUND ON ALL THREADED CONNECTIONS.
4. ROTATE AIR/VACUUM VALVE TO PROVIDE MAXIMUM CLEARENCE FOR ACCESS TO ANGLE VALVE.
5. AIR/VACUUM VALVE TO BE EQUAL TO APCO HEAVY DUTY COMBINATION AIR RELEASE VALVE, MODEL #145C.
6. ALL PIPE SHALL BE SCHEDULE 40 GALV. STEEL PIPE CONFORMING TO ASTM A 120.
7. DETAILS SHOWN ON THE PLANS TAKE PRECEDENCE OVER THIS STANDARD DETAIL.
8. AIR/VAC ASSEMBLY MAY BE LOCATED ADJACENT TO MAIN LOCATION AT THE DISCRETION OF ENGINEER.

City of Camas WASHINGTON

WATER DETAIL

2" AIR/VACUUM RELEASE VALVE

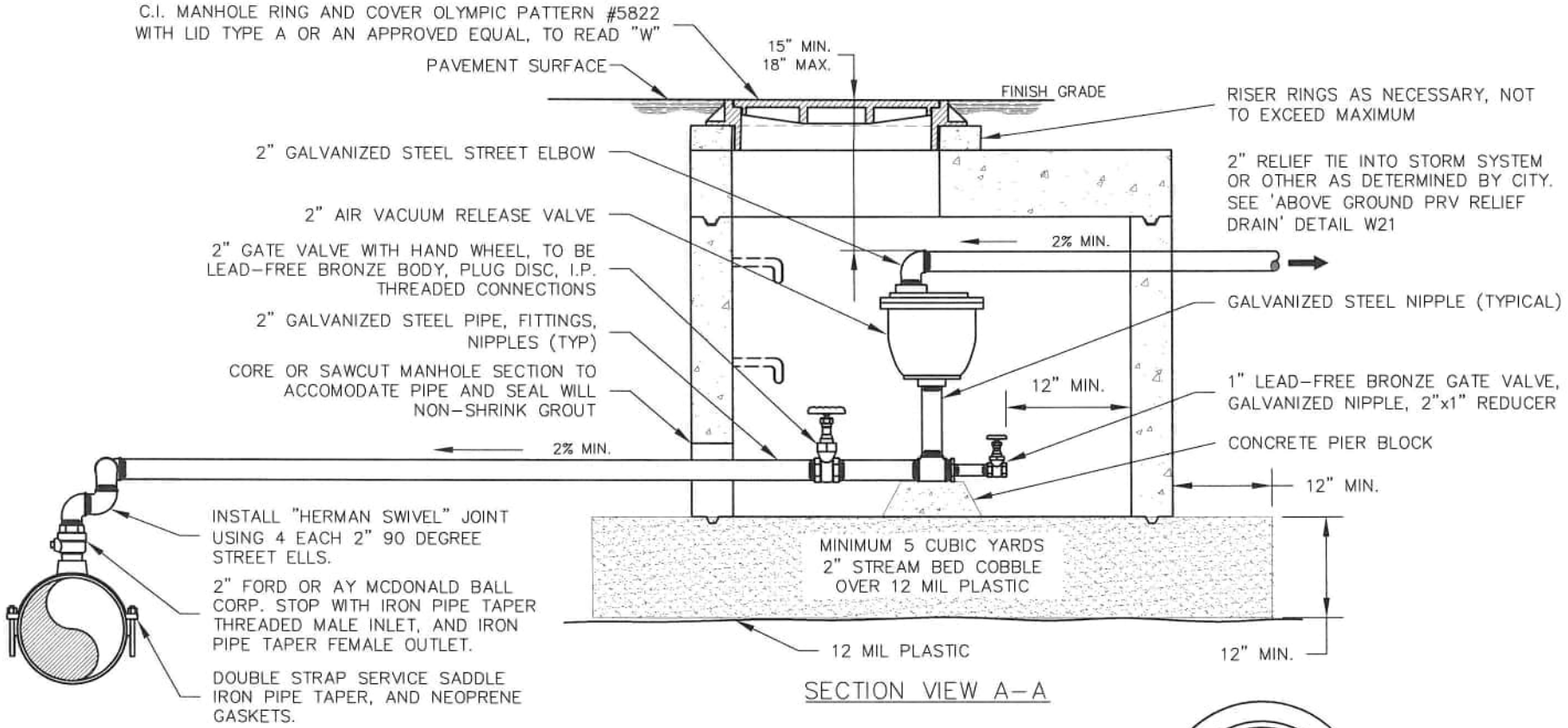
DETAIL APPROVED BY 1/3/24 DATE

NOT TO SCALE

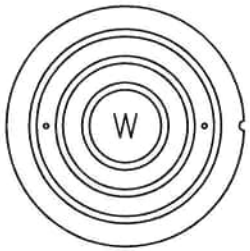
DETAIL NO. 2908

REVISION: 7 DATE: 01/02/2024

WTR-2VACVLV.DWG



SECTION VIEW A-A



WATER COVER

WATER NOTES:

1. MANHOLE SECTION SHALL BE LOCATED WITHIN ONE TRAVEL LANE WITH MANHOLE FRAME CENTERED IN THE TRAVEL LANE.
2. CORPORATION STOP, GATE VALVE, AND CONNECTING PIPE SHALL BE THE SAME DIAMETER AS THE AIR INLET.
3. USE APPROVED JOINTING COMPOUND ON ALL THREADED CONNECTIONS.
4. LOCATE AIR/VACUUM VALVE TO PROVIDE MAXIMUM CLEARANCE FOR ACCESS TO GATE VALVE.
5. AIR/VACUUM VALVE TO BE EQUAL TO APCO HEAVY DUTY COMBINATION AIR RELEASE VALVE, MODEL #145C.
6. ALL PIPE SHALL BE SCHEDULE 40 GALVANIZED STEEL PIPE CONFORMING TO ASTM A 120.
7. DETAILS SHOWN ON THE PLANS TAKE PRECEDENCE OVER THIS STANDARD DETAIL.
8. AIR/VAC ASSEMBLY MAY BE LOCATED ADJACENT TO MAIN LOCATION AT THE DISCRETION OF ENGINEER.
9. MANHOLES SHALL CONFORM TO ASTM C-478.
10. NON-SHRINK GROUT SHALL BE USED BETWEEN FRAME, RISER RINGS, AND MANHOLE.
11. 3" TALL FRAME IS STANDARD, 7" TALL FRAME (NOT SHOWN) IS OPTIONAL.
12. ANY COMBINATION OF RISER RING THICKNESS, GROUT, AND FRAME SHALL BE USED TO ACHIEVE THE 12" MAXIMUM DEPTH FROM FINISH GRADE TO TOP OF CONE OR FLAT TOP.

City of Camas WASHINGTON

WATER DETAIL

2" AIR/VACUUM RELEASE VALVE IN 48" MANHOLE

Kurt Bourguin 1/3/24

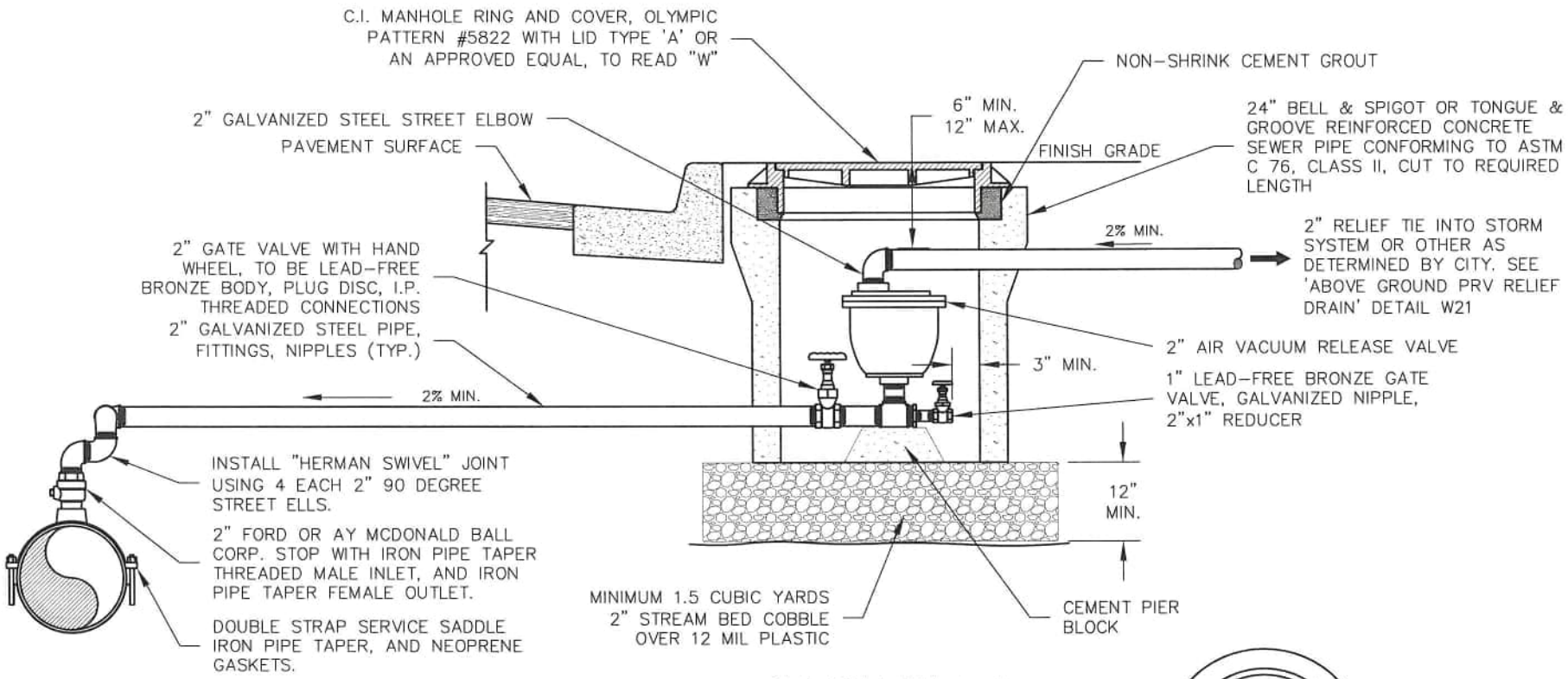
DETAIL APPROVED BY DATE

NOT TO SCALE

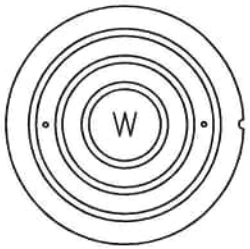
DETAIL NO. 2909

REVISION: 4 DATE: 01/02/2024

WTR-2VACVLV.DWG



SECTION VIEW A-A



WATER COVER

WATER NOTES:

1. AIR/VACUUM VAULT SHALL BE LOCATED WITHIN THE PLANTER STRIP OR BEHIND THE SIDEWALK. PART OF THE MANHOLE COVER MAY BE IN THE SIDEWALK IF NEEDED.
2. CORPORATION STOP, GATE VALVE, AND CONNECTING PIPE SHALL BE THE SAME DIAMETER AS THE AIR INLET.
3. USE APPROVED JOINTING COMPOUND ON ALL THREADED CONNECTIONS.
4. LOCATE AIR/VACUUM VALVE TO PROVIDE MAXIMUM CLEARANCE FOR ACCESS TO GATE VALVE.
5. AIR/VACUUM VALVE TO BE EQUAL TO APCO HEAVY DUTY COMBINATION AIR RELEASE VALVE, MODEL #145C.
6. ALL PIPE SHALL BE SCHEDULE 40 GALVANIZED STEEL PIPE CONFORMING TO ASTM A 120.
7. DETAILS SHOWN ON THE PLANS TAKE PRECEDENCE OVER THIS STANDARD DETAIL.
8. AIR/VAC ASSEMBLY MAY BE LOCATED ADJACENT TO MAIN LOCATION AT THE DISCRETION OF ENGINEER.

City of Camas WASHINGTON

WATER DETAIL

2" AIR/VACUUM RELEASE VALVE OUTSIDE OF CURB

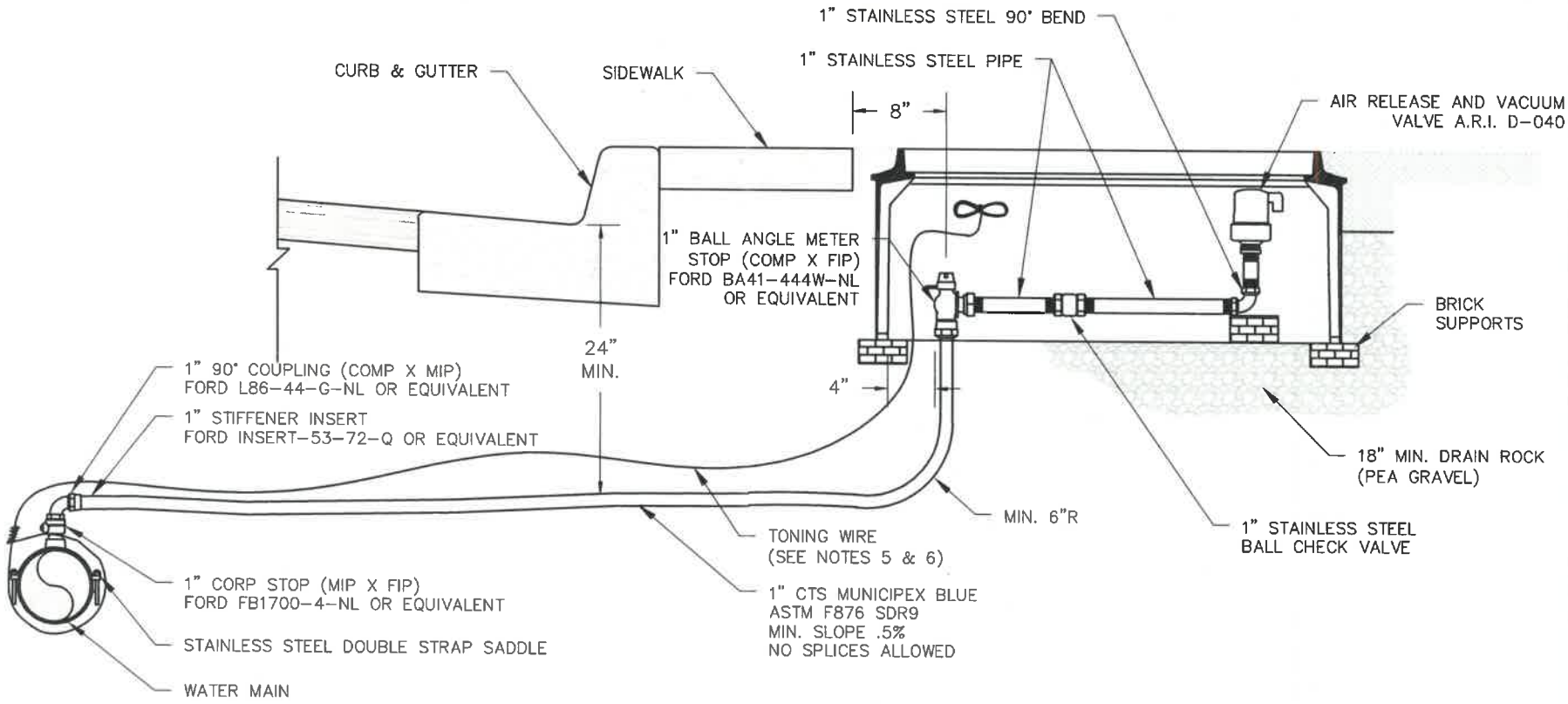
DETAIL APPROVED BY — DATE 1/3/24

NOT TO SCALE

DETAIL NO. 2910

REVISION: 4 DATE: 01/02/2024

WTR-2VACVLV.DWG



NOTES:
1. METER BOX SHALL BE OLDCASTLE FIBRELYTE FL36BOX WITH NO MOUSE HOLES.
2. COVER SHALL BE OLDCASTLE FIBRELYTE FL36 FLUSH SOLID "WATER"
3. INSTALL METER BOX OUTSIDE OF SIDEWALK OR IN PLANTER STRIP, EXCEPT WHERE NOTED IN PLANS.
4. SEE TRENCH SECTION DETAILS G2 OR G3 FOR BACKFILL REQUIREMENTS.
5. TONING WIRE SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSULATION, NO SPLICES ALLOWED.
6. SEAL TONING WIRE SPLICE CONNECTIONS WITH COPPERHEAD 12 AWG SNAKEBITE LOCKING CONNECTORS (TYPICAL).
7. NEW WATER MAINS REQUIRE TONING WIRE TO A LOCATE STATION
8. TONING WIRE FROM MAIN TO SERVICE REQUIRES A SNAKEBITE LOCKING CONNECTOR
9. PREFERRED BRASS FITTINGS TO BE USED, IN ORDER:
    1. FORD
    2. AY MCDONALD

City of Camas WASHINGTON

WATER DETAIL

1" AIR RELEASE AND VACUUM VALVE ASSEMBLY (FOR 6" AND 8" WATER MAINS)

DETAIL APPROVED BY

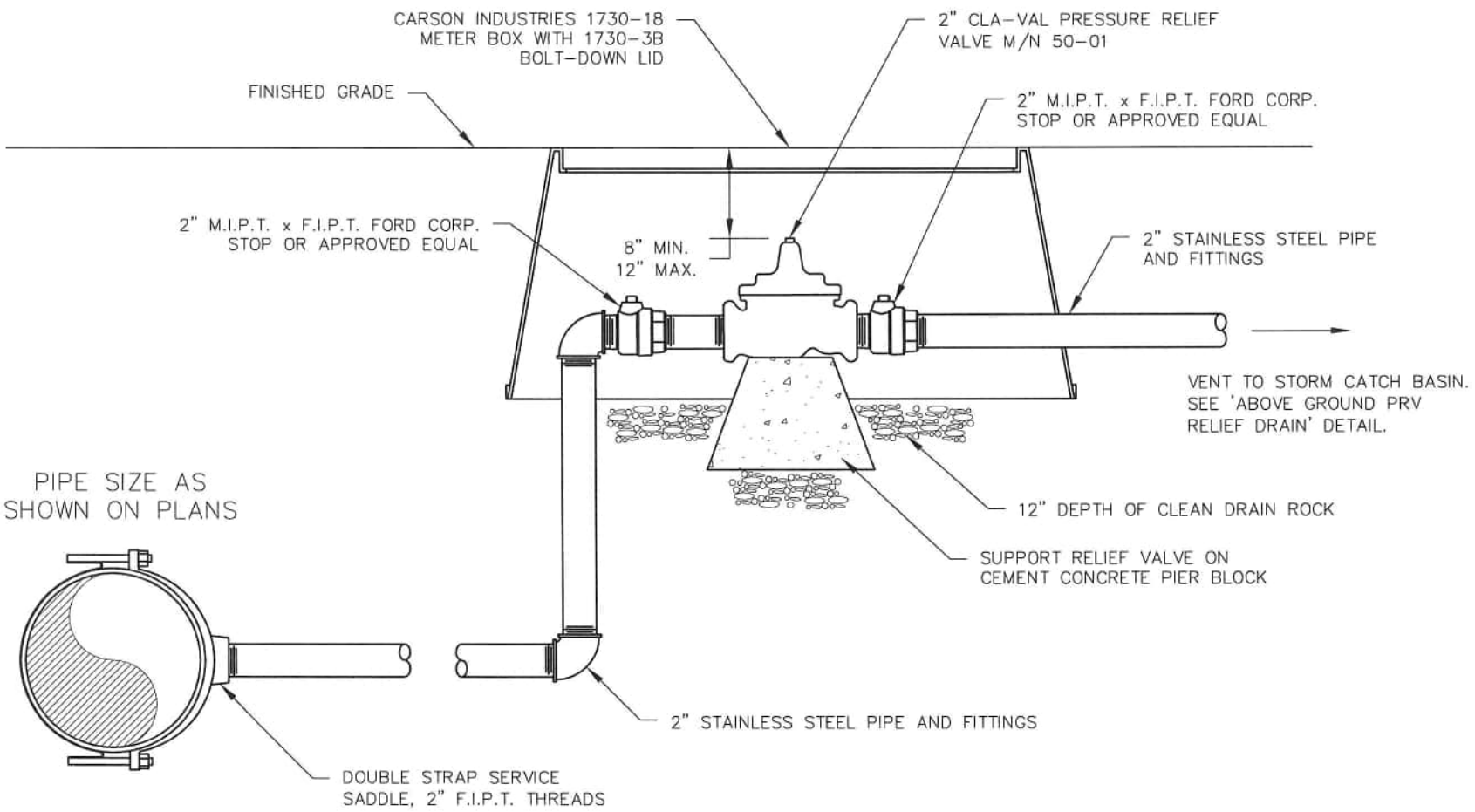
7/6/2026
DATE

NOT TO SCALE

DETAIL NO. W17B

REVISION: 1 DATE: 7/02/2026

S1.DWG



City of Camas WASHINGTON

WATER DETAIL

2" PRESSURE RELIEF VALVE ASSEMBLY

DETAIL APPROVED BY

1/3/24

DATE

NOT TO SCALE

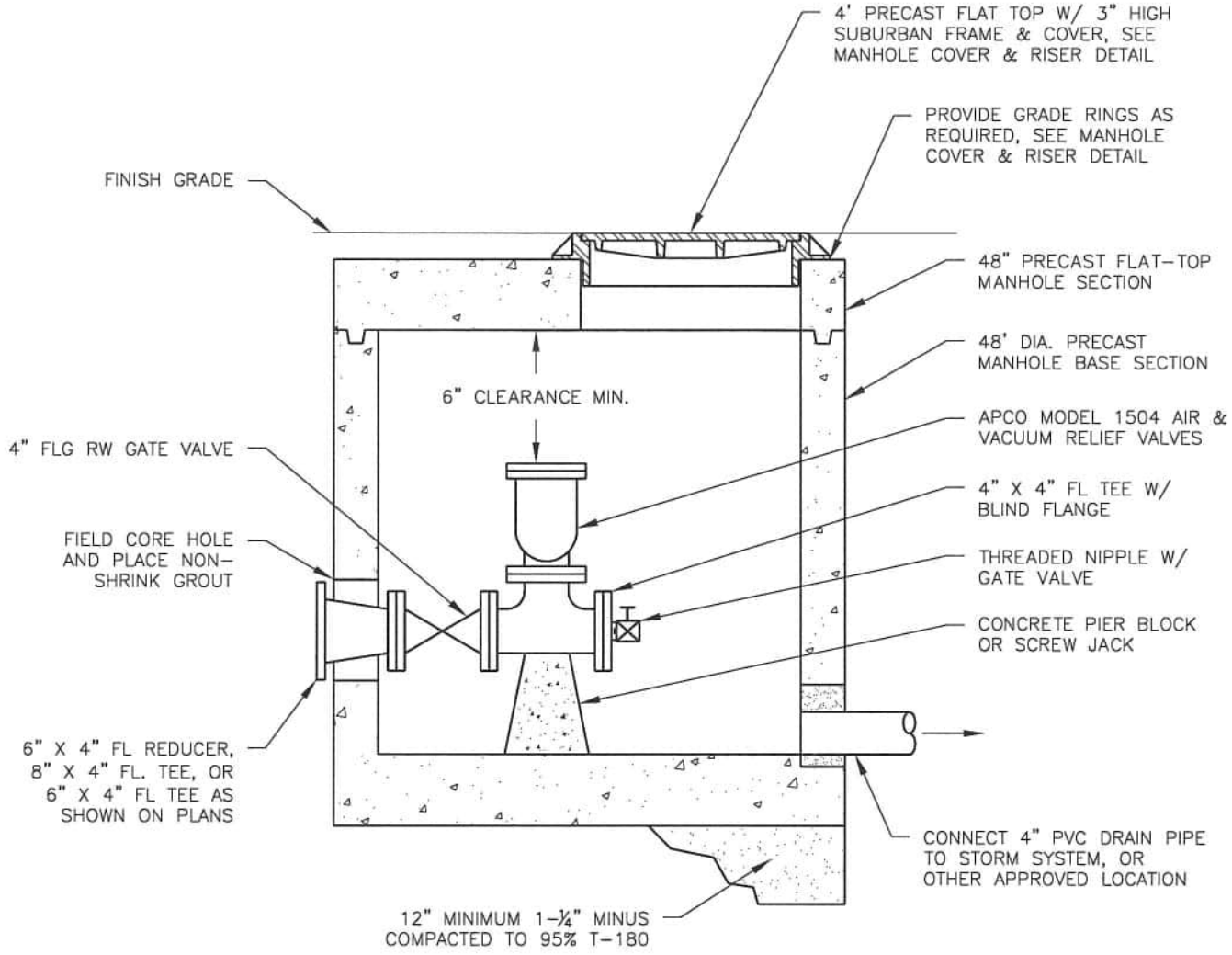
DETAIL NO.

2912

REVISION: 4

DATE: 01/02/2024

2PRV.DWG



NOTES:
1. MANHOLE SHALL CONFORM TO ASTM C-478.
2. MASTIC SEAL REQUIRED ON ALL KEYLOCK JOINTS.
3. VAULT SHALL BE SET FOR 1% SLOPE TO DRAIN.
4. ALL BACKFILL SHALL BE APPROVED GRANULAR MATERIAL.
5. SUMP PUMP MAY BE REQUIRED ON INSTALLATIONS WHERE DRAIN PIPE CANNOT BE CONNECTED TO ADEQUATE STORM DRAIN SYSTEM. THE APPROVED SUMP PUMP SHALL BE A COMMERCIAL GRADE WATER POWERED VENTURI DESIGN WITH BACKFLOW PREVENTION, SIZED TO PROVIDE 10GPM AT 10 FEET OF HEAD AT THE AVAILABLE SYSTEM WATER PRESSURE. BACKFLOW DEVICE SHALL BE CERTIFIED BY WASHINGTON STATE CERTIFIED BACKFLOW TESTER AFTER INSTALLATION AND PRIOR TO ACCEPTANCE. TEST RESULTS SHALL BE SENT TO CITY OF CAMAS WATER DEPARTMENT.

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

4" VACUUM RELIEF VALVE

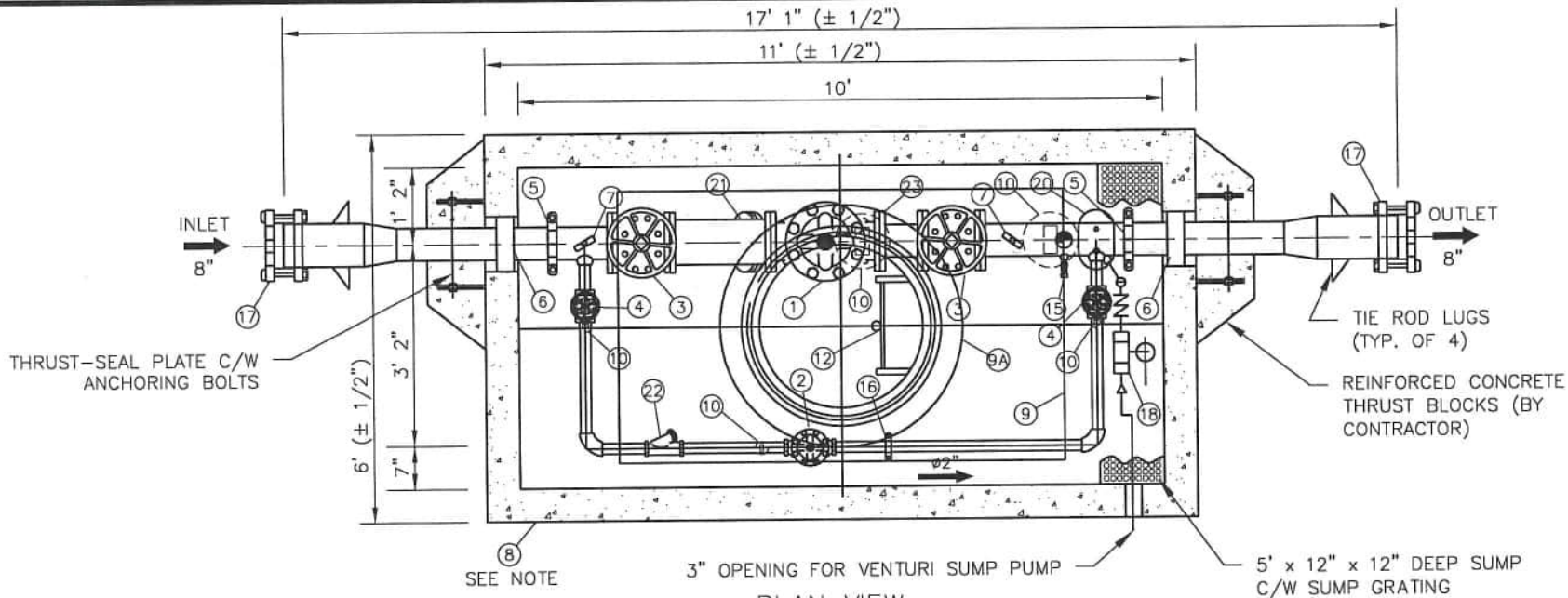
Jim C. Carothers 1-4-11

DETAIL APPROVED BY DATE

NOT TO SCALE

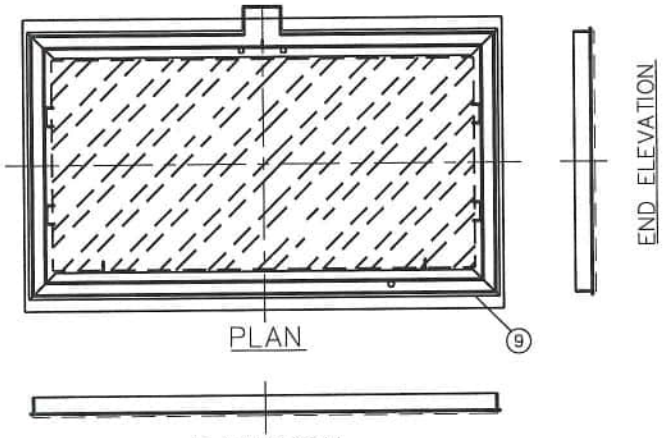
DETAIL NO. W19

4ARV.DWG



PLAN VIEW

50" x 82" OPENING FOR
36" x 72" ALUMINUM HATCH



36" x 72" ALUMINUM HATCH
(30"ø MANHOLE SHALL BE USED
AS APPROVED BY CITY OF CAMAS)

NOTES:
1. PRV STATION SHALL BE A PRE-ASSEMBLED, PRE-TESTED, PACKAGED UNIT BY GC SYSTEMS, INC., OR APPROVED EQUAL.
2. VAULT #10565 (H20 LOADING) INSIDE DIMENSIONS 10'LX5'WX6'6"H.

STANDARD FABRICATION & FINISHING SPECIFICATION:
ALL 2" AND SMALLER PIPE TO BE THREADED BRASS. ALL 3" AND LARGER PIPE, INSIDE WETTED SURFACES TO BE SANDBLASTED, EPOXY LINED AND COATED TO AWWA C-210 AND NSF-61 SPECIFICATION. FINISH COATING WILL BE BLUE ENAMEL.

FABRICATED STEEL PIPE & FITTINGS TO BE SCHEDULE NO. 40 STEEL PIPE FOR SIZES TO 10" AND ⅜" WALL FOR 12" AND LARGER.

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

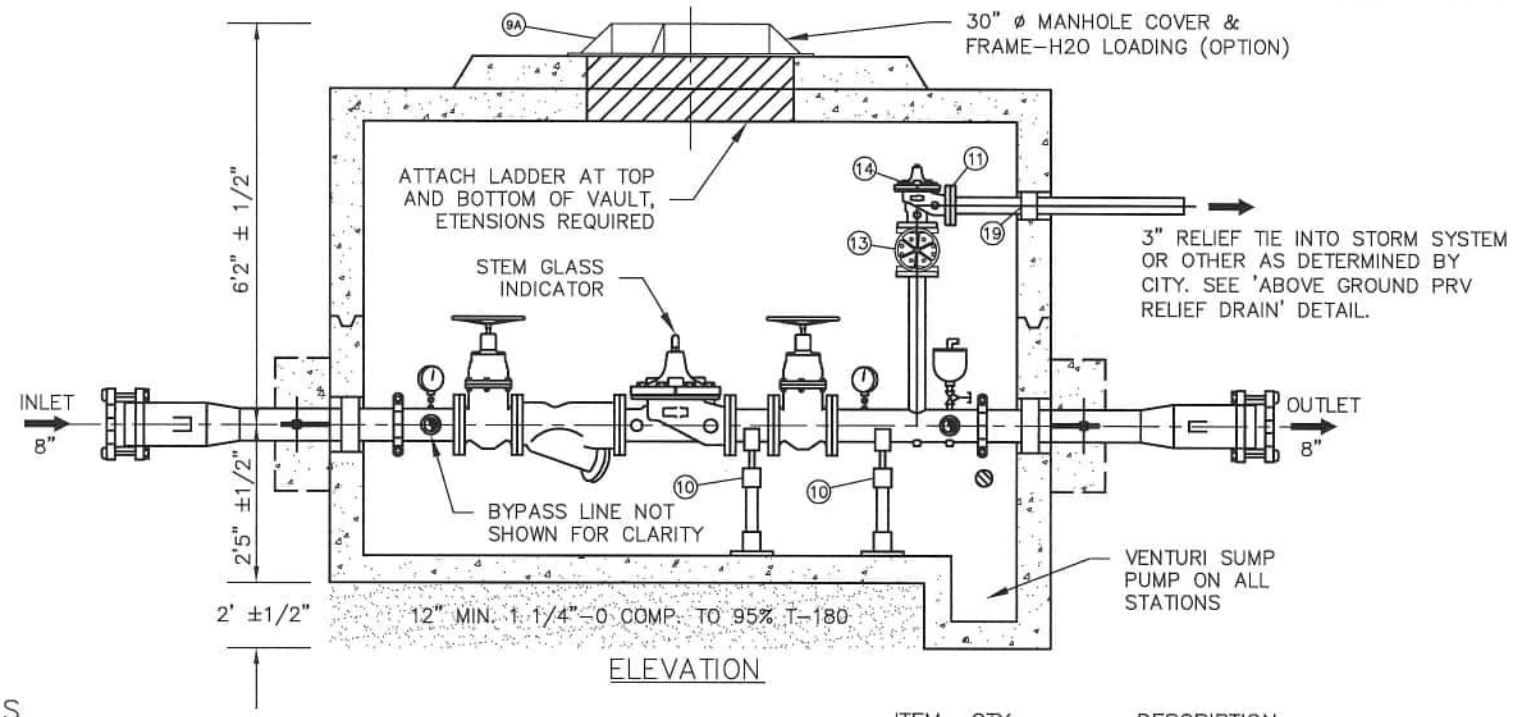
6"X2" PRV STATION W/ 3" RELIEF

Jan E. Cauthorn 1-4-11
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.
W20A

R-PRV3RELIEF.DWG



ELEVATION

MATERIALS

ITEM	QTY.	DESCRIPTION
1	1	6" CLA–VAL 90–01YBCS PRESSURE REDUCING VALVE
		C/W X 101 POSITION INDICATOR, DIBT–#150 FLG (15–75PSI)
2	1	2" CLA–VAL 90–01YBCS PRESSURE REDUCING VALVE
		C/W X 101 POSITION INDICATOR, DIBT–THREADED (15–75 PSI)
3	2	6" MUELLER A2360–6W41 NRS GATE VALVE C/W HANDWHEEL –#125 FLGD
4	2	2" MUELLER A2360–8 RW NRS GATE VALVE C/W HANDWHEEL–THREADED
5	2	6" VICTAULIC #07 COUPLING
6	2	6" PIPE SEAL ASSEMBLY
7	2	4" WIKA (0–200PSI) PRESSURE GAUGE C/W GAUGE COCK
8	1	#10565 PRECAST CONCRETE VAULT C/W WHITE INTERIOR, BLACK EXTERIOR
9	1	36"x72" ALUMINUM HATCH W/ SPRING ASSIST
10	5	ADJUSTABLE PIPE SUPPORTS
11	1	3" VICTAULIC #741 FLANGE ADAPTER ADAPTOR

ITEM	QTY.	DESCRIPTION
12	1	ALUMINUM LADDER WITH LADDER–UP ASSEMBLY
13	1	3" MUELLER A2360–6W41 NRS GATE VALVE C/W
		HANDWHEEL–#125 FLGD.
14	1	3" CLA–VAL 50A–01B PRESSURE RELIEF VALVE
		C/W DIBT–150# FLG (20–200 PSI)
15	1	3/4" HOSE BIB ASSEMBLY
16	1	2" VICTAULIC #07 COUPLING
17	1	8" SMITH BLAIR ST X DI TRANSITION COUPLING
18	1	VENTURI SUMP PUMP
19	1	3" PIPE SEAL ASSEMBLY
20	1	1" APCO 143C.1 COMB. A.R.V. C/W ISOLATION VALVE
21	1	6" MUELLER 758 Y–STRAINER – #125 FLGD
22	1	2" MUELLER 351M Y–STRAINER – THD
23	1	6" VICTAULIC #741 FLANGE ADAPTOR

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	1/1/11	SCD	JC
3	10/21/14	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

6"X2" PRV STATION W/ 3" RELIEF

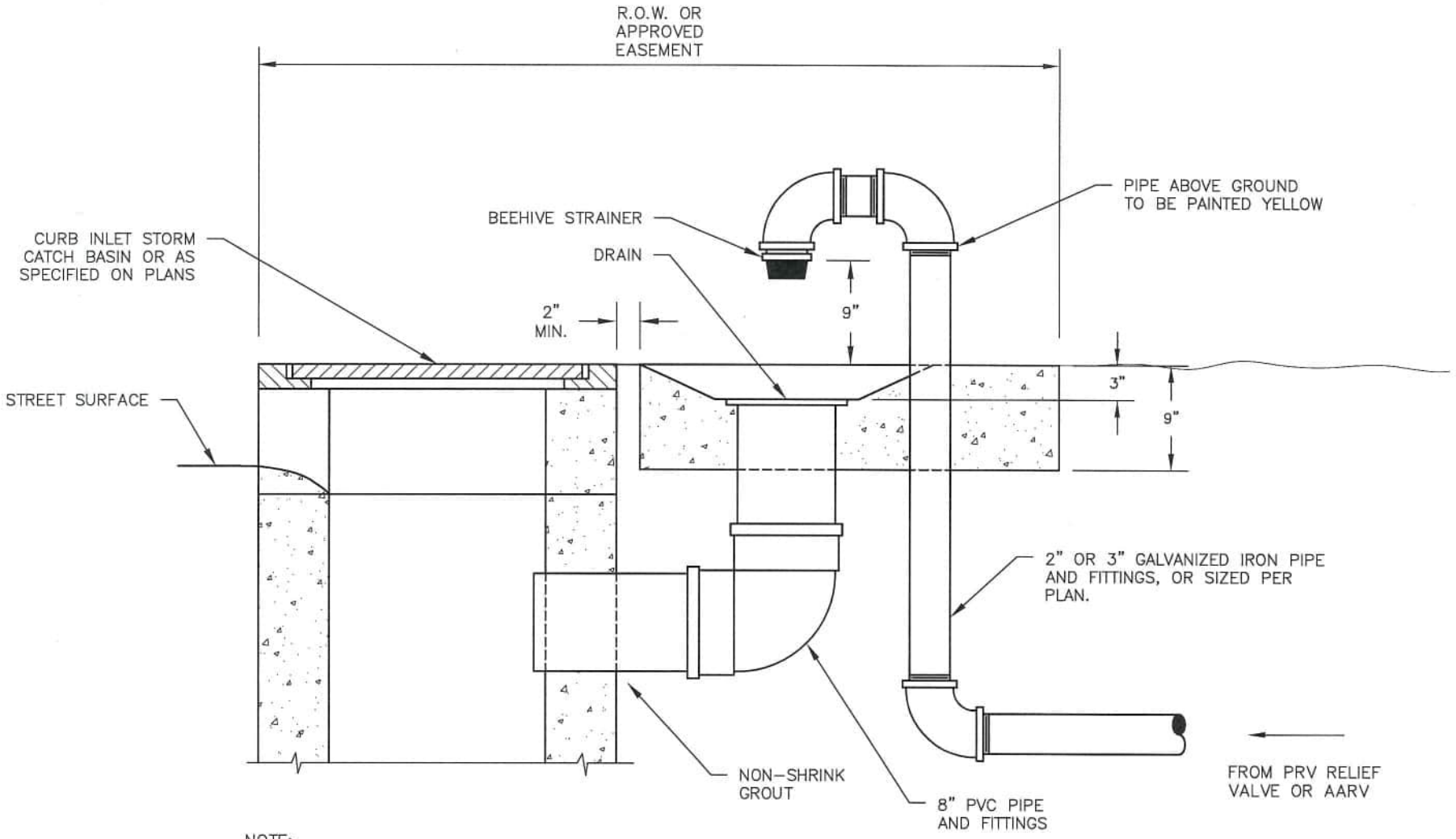
10-21-14

DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W20B

–PRV3RELIEF.DWG



NOTE:
1. IF CATCH BASIN IS NOT AVAILABLE, A DEDICATED STORM LATERAL MAY BE REQUIRED.

City of Camas WASHINGTON

WATER DETAIL

ABOVE GROUND PRV RELIEF DRAIN

5-16-19

DETAIL APPROVED BY DATE

NOT TO SCALE

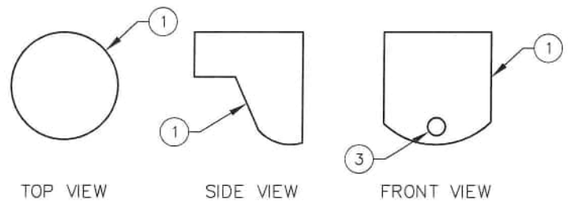
REVISION: 4 DATE: 5/16/2019

DETAIL NO. W21

WTR-RELIEFDRN.DWG

KORALEEN WATER QUALITY SAMPLING STATION:

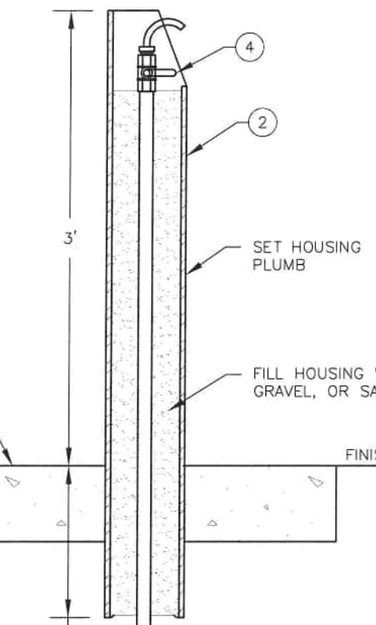
1.	ALUMINUM LID – 6" DIA. I.D.
2.	ALUMINUM HOUSING – 6" DIA. O.D.
3.	FLUSH MOUNTED LOCK
4.	½" X 1" BALL VALVE

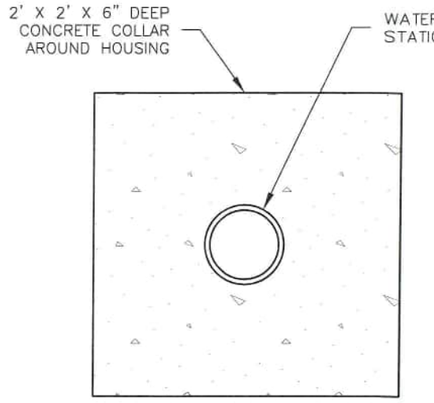


TOP VIEW SIDE VIEW FRONT VIEW

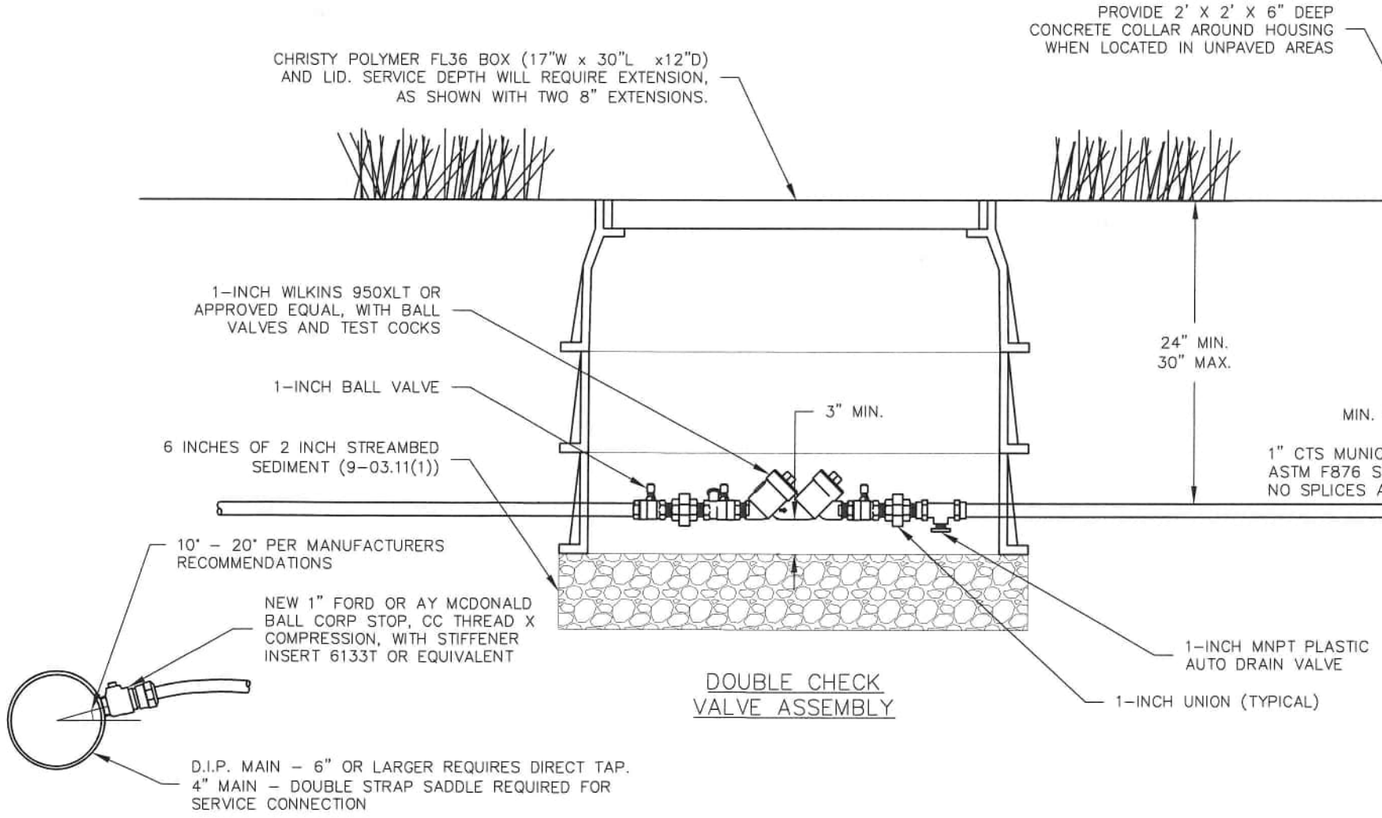
ALUMINUM LID

SAMPLING STATION





CONCRETE COLLAR DETAIL
PLAN VIEW
N.T.S.



DOUBLE CHECK VALVE ASSEMBLY

NOTES:

1. THE DOUBLE CHECK VALVE ASSEMBLY (DCVA) SHALL LAY HORIZONTAL ONLY. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
2. THE DCVA MUST BE ACCESSIBLE TO ALLOW FOR ANNUAL TESTING.
3. THE WATER LINE SHALL BE DISINFECTED, FLUSHED AND PRESSURE TESTED PRIOR TO INSTALLING THE DCVA.
4. THE DCVA SHALL BE INSTALLED WITHIN THE RIGHT–OF–WAY, WITHIN AN EASEMENT, OR AT A LOCATION APPROVED BY CITY OF CAMAS WATER DEPARTMENT.
5. THE DCVA SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE,
6. ALL NEWLY INSTALLED FITTINGS IN CONTACT WITH WATER SHALL BE IN COMPLIANCE WITH THE REVISED SECTION 1417 OF THE EPA SAFE WATER DRINKING ACT AND CERTIFIED LEAD FREE USING NSF 372 STANDARDS.

TYPICAL MAIN CONNECTION

City of Camas WASHINGTON

WATER DETAIL

WATER SAMPLING STATION

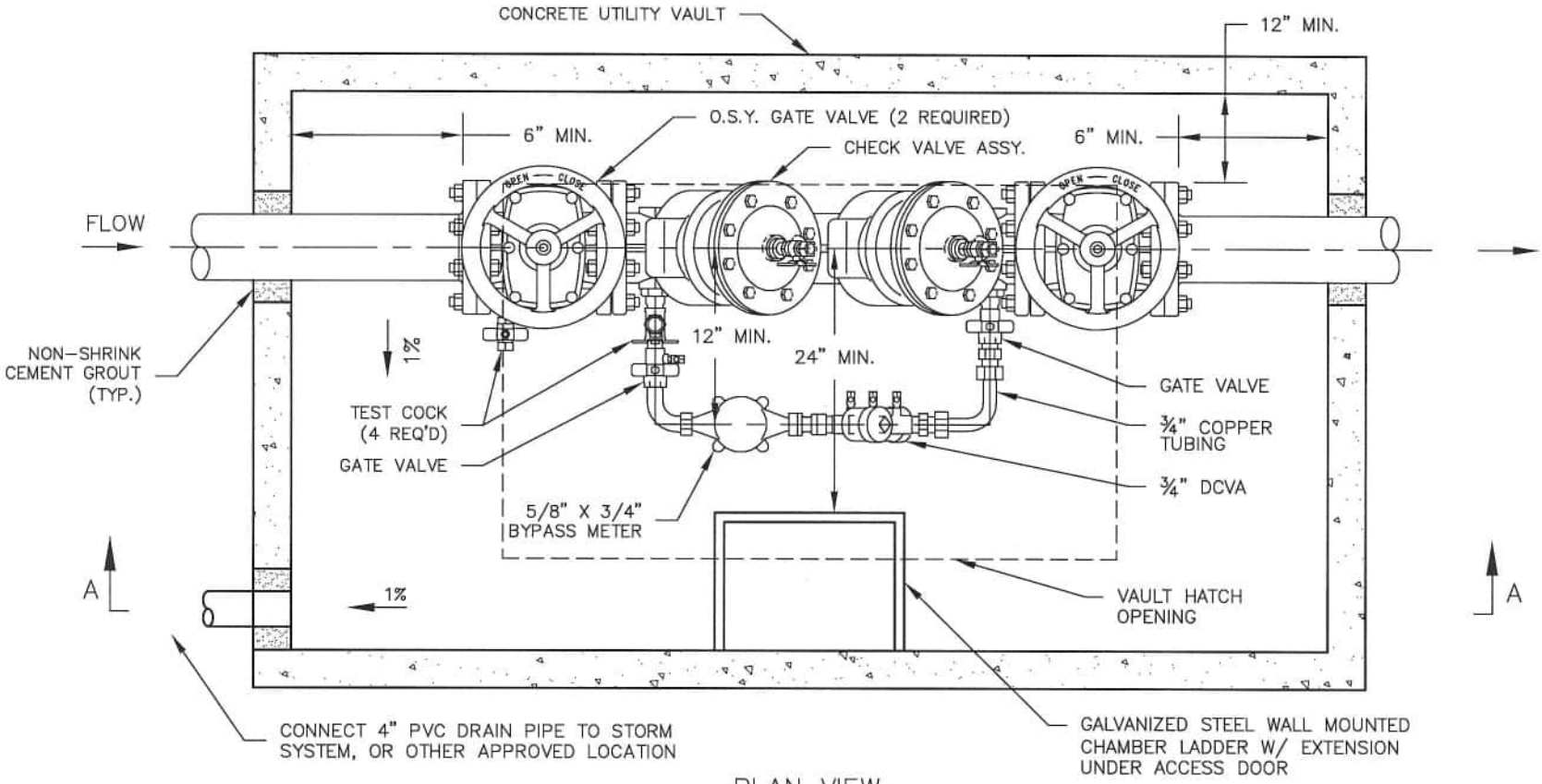
DETAIL APPROVED BY 1/3/24 DATE

NOT TO SCALE

DETAIL NO. W2

REVISION: 5 DATE: 01/02/2024

W2 SMPL.DWG



PLAN VIEW

DOUBLE CHECK DETECTOR VALVE ASSY. NOTES:

1. APPROVED DOUBLE CHECK DETECTOR VALVE ASSEMBLY TO LAY HORIZONTAL WITH THE GROUND, SHALL BE INSTALLED ON FIRE PROTECTION SYSTEMS WHEN CONNECTED TO POTABLE WATER SUPPLY. THE ASSEMBLY SHALL BE A COMPLETE ASSEMBLY INCUDING UL LISTED RESILIENT SEATED OSY SHUTOFF VALVES AND TEST COCKS. THE UNIT SHALL BE UL/FM APPROVED WITH UL/FM APPROVED OSY SHUTOFF VALVES. THE AUXILIARY LINE SHALL CONSIST OF AN APPROVED BACKFLOW PREVENTER AND WATER METER. THE ASSEMBLY SHALL MEET THE BASIC REQUIREMENTS OF ASSE 1048; AWWA STD. C510 FOR DOUBLE CHECK VALVES, AND BE APPROVED BY THE FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH AT THE UNIVERSITY OF SOUTHERN CALIFORNIA. THE DOUBLE CHECK DETECTOR VALVE ASSEMBLY SHALL BE A ZURN WILKINS MODEL 950DA OR APPROVED EQUAL.
2. SYSTEM SHALL BE DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
5. THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACKFLOW ASSEMBLY. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
4. ALL PIPE, VALVE, AND FITTING JOINTS FROM THE SUPPLY MAIN SHALL BE FLANGED AND RESTRAINED. MINIMUM COVER 30". GROUT PIPE ENTRANCE AND EXIT IN VAULT WITH WATER TIGHT GROUT.
5. THE BACKFLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF CAMAS WATER DEPARTMENT.
6. ALL BACKFILL SHALL BE APPROVED GRANULAR MATERIAL.

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	1/1/11	SCD	JC
3	10/21/14	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

STANDARD DOUBLE CHECK DETECTOR VALVE ASSY.

Jan E. Cauthra 10-21-14

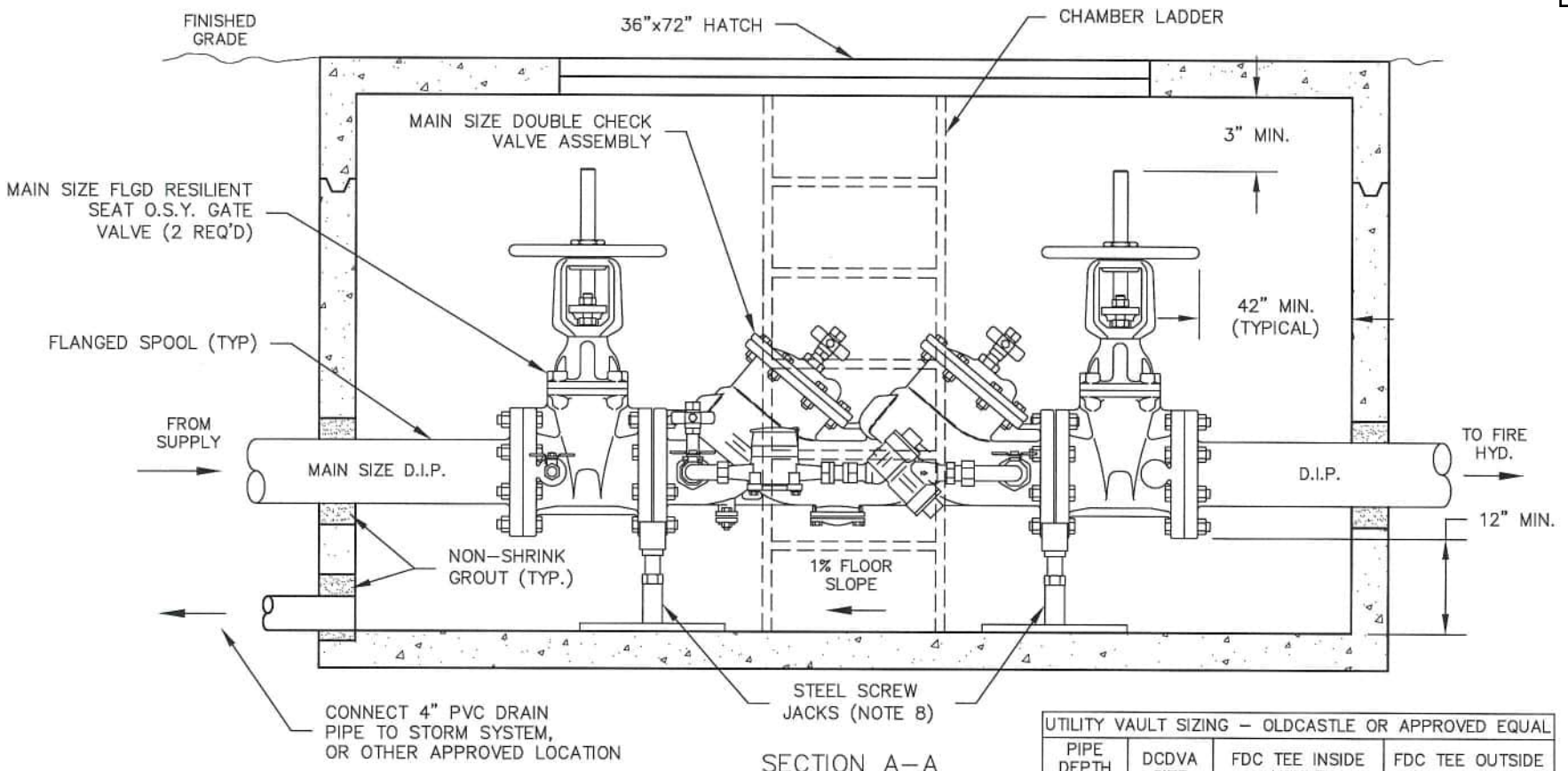
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.

W23A

-DCDVA.DWG



SECTION A-A

UTILITY VAULT SIZING – OLDCASTLE OR APPROVED EQUAL			
PIPE DEPTH UP TO	DCDVA SIZE	FDC TEE INSIDE VAULT	FDC TEE OUTSIDE VAULT
6'	4"	676-WA	577-WA
4'	6"	687-WA	675-WA
6'	6"	–	676-WA
6'	8"	5106-WA	687-WA
6'	10"	5106-WA	5106-WA

VAULT CONSTRUCTION NOTES:

1. VAULT SHALL BE PRE-APPROVED PRIOR TO INSTALLATION.
2. VAULT SHALL BE INSTALLED AT PROPERTY LINE OR EASEMENT LINE AND ON OWNERS PROPERTY.
3. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
4. APPROVED VAULT SHALL BE RATED FOR H20 LOADING AND INCLUDE AN EXTENSION LADDER
5. VAULT SHALL BE SET FOR 1% SLOPE TO DRAIN.
6. ALL BACKFILL SHALL BE APPROVED GRANULAR MATERIAL.
7. HATCH SHALL BE AN H20 RATED, 36"x72" SPRING ASSISTED, HOT DIPPED GALVANIZED DIAMOND PLATE DOUBLE DOOR. FOR TRAFFIC INSTALLATIONS A 30" MANHOLE LID SHALL BE USED INSTEAD OF A HATCH.
8. SUMP PUMP MAY BE REQUIRED ON INSTALLATIONS WHERE DRAIN PIPE CANNOT BE CONNECTED TO ADEQUATE STORM DRAIN SYSTEM. THE APPROVED SUMP PUMP SHALL BE A COMMERCIAL GRADE WATER POWERED VENTURI DESIGN WITH BACKFLOW PREVENTION, SIZED TO PROVIDE 10GPM AT 10 FEET OF HEAD AT THE AVAILABLE SYSTEM WATER PRESSURE. BACKFLOW DEVICE SHALL BE CERTIFIED BY WASHINGTON STATE CERTIFIED BACKFLOW TESTER AFTER INSTALLATION AND PRIOR TO ACCEPTANCE. TEST RESULTS SHALL BE SENT TO CITY OF CAMAS WATER DEPARTMENT.
9. FOUR (4) STEEL SCREW JACKS REQUIRED FOR SUPPORT OF DOUBLE CHECK VALVE ASSEMBLY AND BYPASS ASSEMBLY.
10. FIRE DEPARTMENT CONNECTION (FDC) MAY BE LOCATED THROUGH THE VAULT LID (NOT SHOWN), OR MAY BE LOCATED OUTSIDE OF THE VAULT DEPENDING UPON SITE.

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	1/1/11	SCD	JC
3	10/21/14	SCD	JC

CITY OF CAMAS ~ WATER DETAIL

STANDARD DOUBLE CHECK DETECTOR VALVE ASSY.

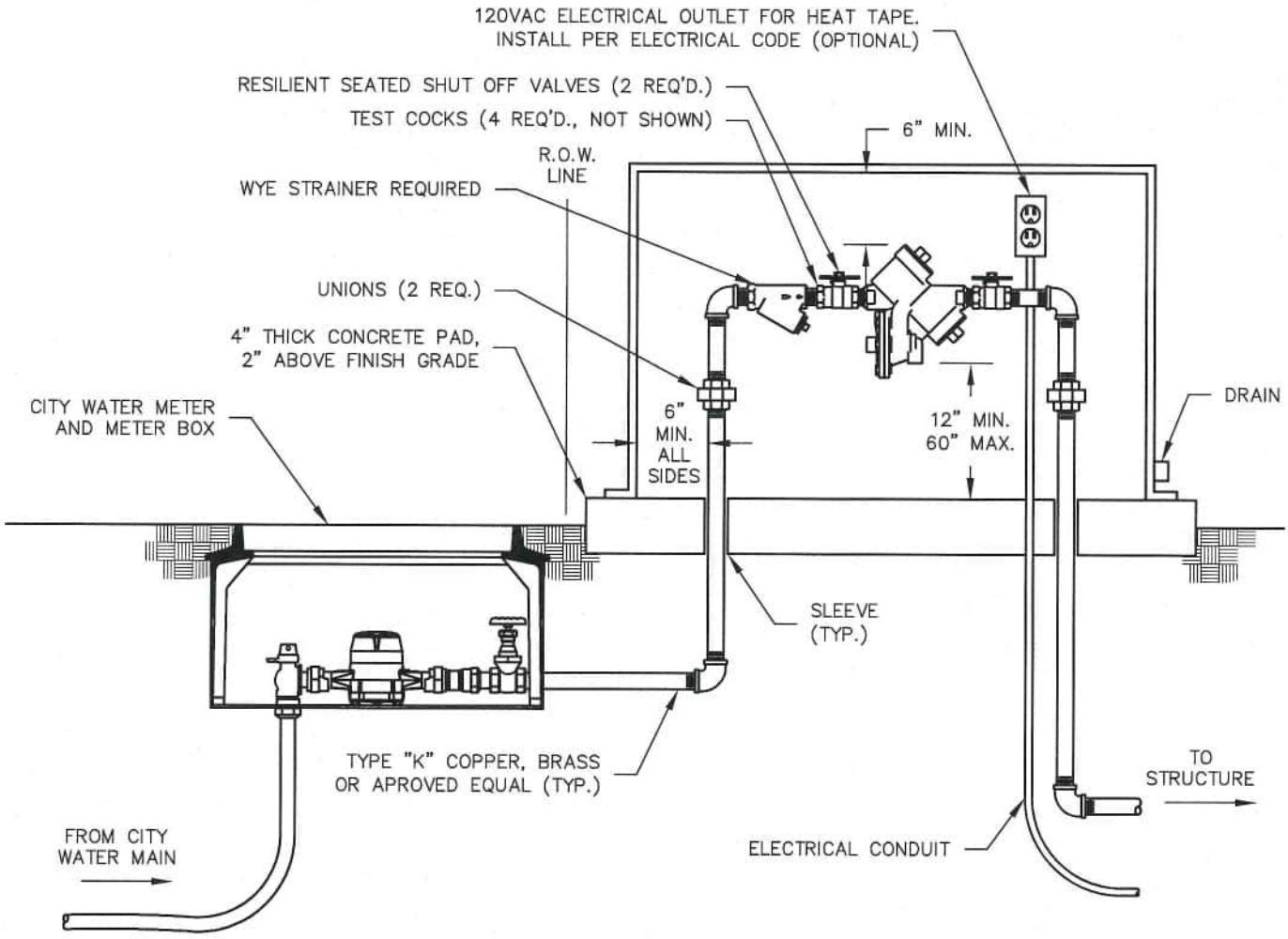
Jon E. Castelton 10-21-14

DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W23B

DCDVA.DWG



NOTES:

1. REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) SHALL BE DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE, AND APPROVED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE RPBA SHALL LAY HORIZONTAL ONLY (VERTICAL IF APPROVED BY DEPT. OF HEALTH). DO NOT INSTALL IN A PIT, TRENCH OR AN AREA SUBJECT TO FLOODING.
3. THE RPBA MUST BE ACCESSIBLE TO ALLOW FOR ANNUAL TESTING.
4. THE DRAIN SHALL BE SIZED PER THE AWWA CROSS CONTAMINATION CONTROL MANUAL.
5. PLUMBING PERMIT IS REQUIRED – CONTACT THE APPROPRIATE JURISDICTION FOR PERMIT.
6. THE WATER LINE SHALL BE DISINFECTED, FLUSHED AND PRESSURE TESTED PRIOR TO INSTALLING THE RPBA. THE RPBA SHALL BE PROTECTED FROM FREEZING AND FLOODING.
7. THE RPBA SHALL BE INSTALLED ON OWNER'S PROPERTY AT PROPERTY LINE OR EASEMENT LINE, OR AT A LOCATION APPROVED BY CITY OF CAMAS WATER DEPARTMENT.
8. ALL ENCLOSURES SHALL BE PRE–APPROVED BY THE CITY OF CAMAS WATER DEPARTMENT PRIOR TO INSTALLATION
9. THE RPBA SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE, ALSO YEARLY THEREAFTER BY A WASHINGTON STATE DEPARTMENT OF HEALTH CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF CAMAS WATER DEPARTMENT.
10. HEAT AND/OR INSULATION SHALL BE PROVIDED TO PREVENT FREEZING.
11. RPBA SHALL BE RETESTED IF MOVED OR REPAIRED.
12. ALL NEWLY INSTALLED FITTINGS IN CONTACT WITH WATER SHALL BE IN COMPLIANCE WITH THE REVISED SECTION 1417 OF THE EPA SAFE WATER DRINKING ACT AND CERTIFIED LEAD FREE USING NSF 372 STANDARDS.

City of Camas WASHINGTON

WATER DETAIL

REDUCED PRESSURE BACKFLOW ASSEMBLY, 1" AND 2"

NOT TO SCALE

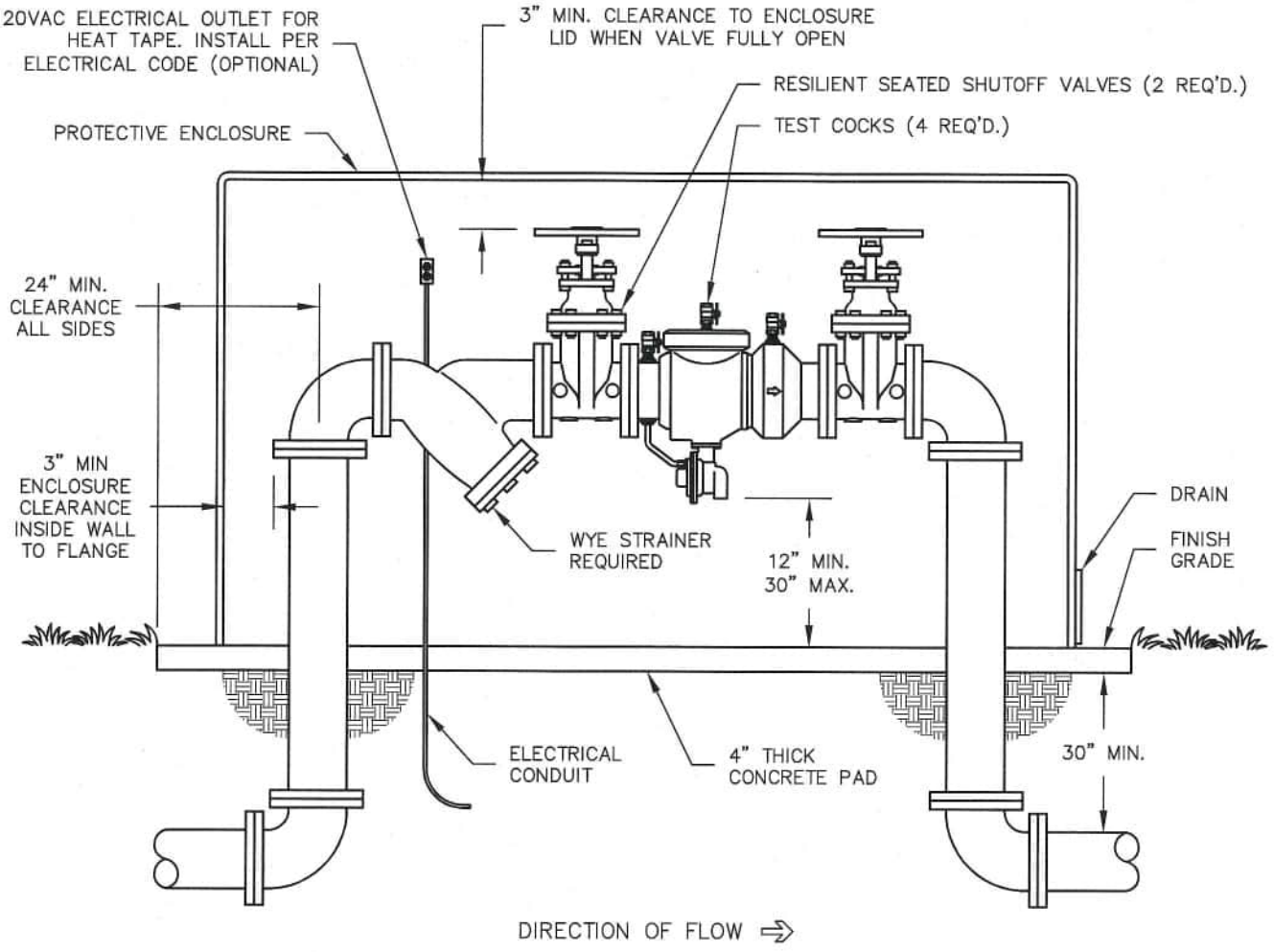
DETAIL NO. W24

Tom Adams 9-28-17

DETAIL APPROVED BY DATE

REVISION: 1 DATE: 09/2017

RPBA.DWG



NOTES:

1. REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) SHALL BE DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE, AND APPROVED BY THE STATE OF WASHINGTON DEPARTMENT OF HEALTH.
2. THE RPBA SHALL LAY HORIZONTAL ONLY (VERTICAL IF APPROVED BY DEPT. OF HEALTH). DO NOT INSTALL IN A PIT, TRENCH OR AN AREA SUBJECT TO FLOODING.
3. THE RPBA MUST BE ACCESSIBLE TO ALLOW FOR ANNUAL TESTING.
4. THE DRAIN SHALL BE SIZED PER THE AWWA CROSS CONTAMINATION CONTROL MANUAL.
5. PLUMBING PERMIT IS REQUIRED – CONTACT THE APPROPRIATE JURISDICTION FOR PERMIT.
6. THE WATER LINE SHALL BE DISINFECTED, FLUSHED AND PRESSURE TESTED PRIOR TO INSTALLING THE RPBA. THE RPBA SHALL BE PROTECTED FROM FREEZING AND FLOODING.
7. ALL UNDERGROUND PIPE, VALVES AND FITTING JOINTS SHALL BE RESTRAINED FROM THE SUPPLY MAIN. ALL ABOVE GROUND JOINTS SHALL BE FLANGED.
8. ALL ENCLOSURES SHALL BE PRE–APPROVED BY THE CITY OF CAMAS WATER DEPARTMENT PRIOR TO INSTALLATION.
9. THE RPBA SHALL BE INSTALLED ON OWNER'S PROPERTY AT PROPERTY LINE OR EASEMENT LINE, OR AT A LOCATION APPROVED BY CITY OF CAMAS WATER DEPARTMENT.
10. ADEQUATE GRAVITY DRAINAGE SYSTEM REQUIRED WITH APPROVED AIR GAP.
11. MINIMUM 24" CLEARANCE ON ALL SIDES AROUND RPBA.
12. THE RPBA SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE, ALSO YEARLY THEREAFTER BY A WASHINGTON STATE DEPARTMENT OF HEALTH CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF CAMAS WATER DEPARTMENT.
13. HEAT AND/OR INSULATION SHALL BE PROVIDED TO PREVENT FREEZING.
14. RPBA SHALL BE RETESTED IF MOVED OR REPAIRED.
15. ALL NEWLY INSTALLED FITTINGS IN CONTACT WITH WATER SHALL BE IN COMPLIANCE WITH THE REVISED SECTION 1417 OF THE EPA SAFE WATER DRINKING ACT AND CERTIFIED LEAD FREE USING NSF 372 STANDARDS.

City of Camas WASHINGTON

WATER DETAIL

REDUCED PRESSURE BACKFLOW ASSEMBLY, 2.5" & LARGER

NOT TO SCALE

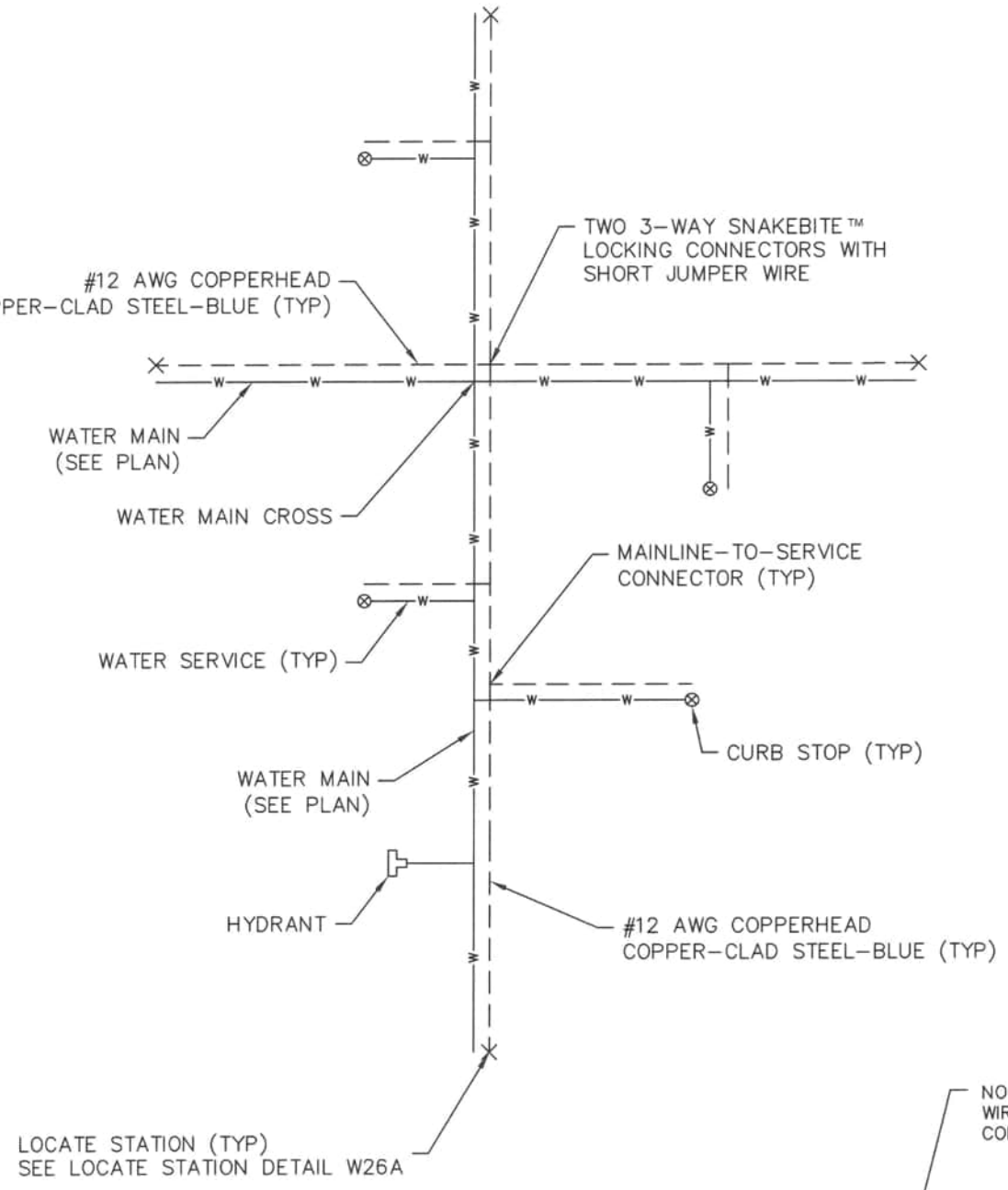
DETAIL NO. W25

Steve Adams 9-28-17

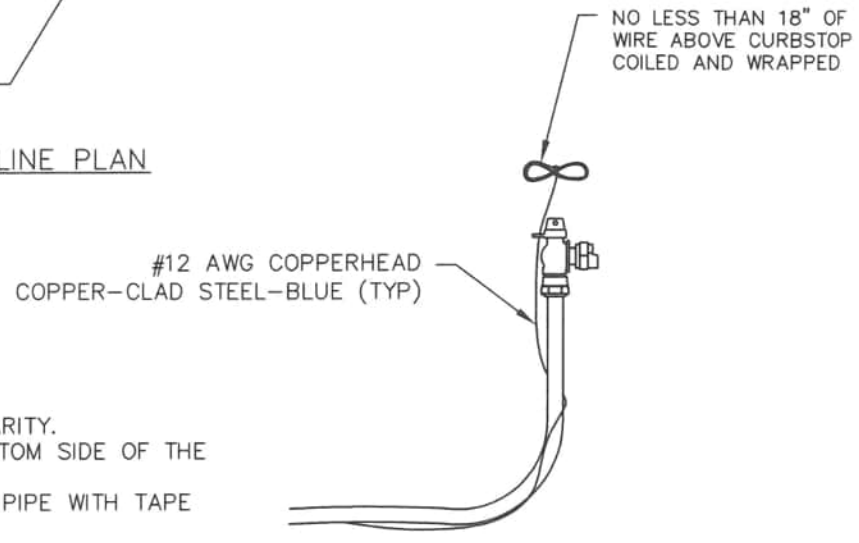
DETAIL APPROVED BY DATE

REVISION: 1 DATE: 09/2017

RPBA.DWG



WATERLINE PLAN



WATER SERVICE

NOTES:
1. WIRE SHOWN AWAY FROM PIPE FOR CLARITY.
2. WIRE SHALL BE INSTALLED ON THE BOTTOM SIDE OF THE PIPE, BELOW THE SPRING LINE.
3. THE WIRE SHALL BE FASTENED TO THE PIPE WITH TAPE OR PLASTIC TIES AT 10' INTERVALS.
4. LOCATE STATIONS TO BE LOCATED AT 1000' INTERVALS OR AS DIRECTED BY THE CITY OF CAMAS

City of Camas WASHINGTON

SANITARY SEWER DETAIL

WATER LOCATE STATION PLAN

3-28-22

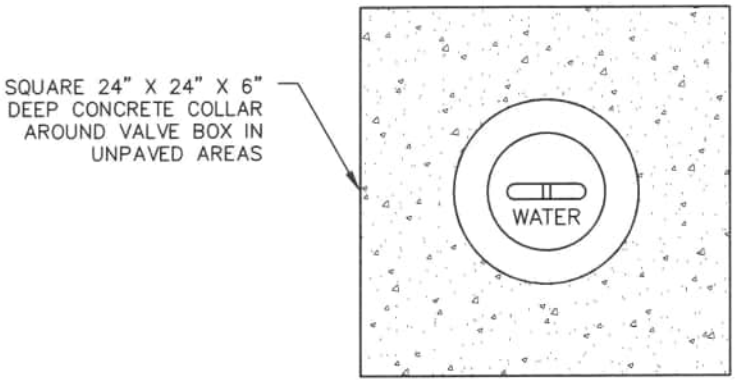
DETAIL APPROVED BY DATE

NOT TO SCALE

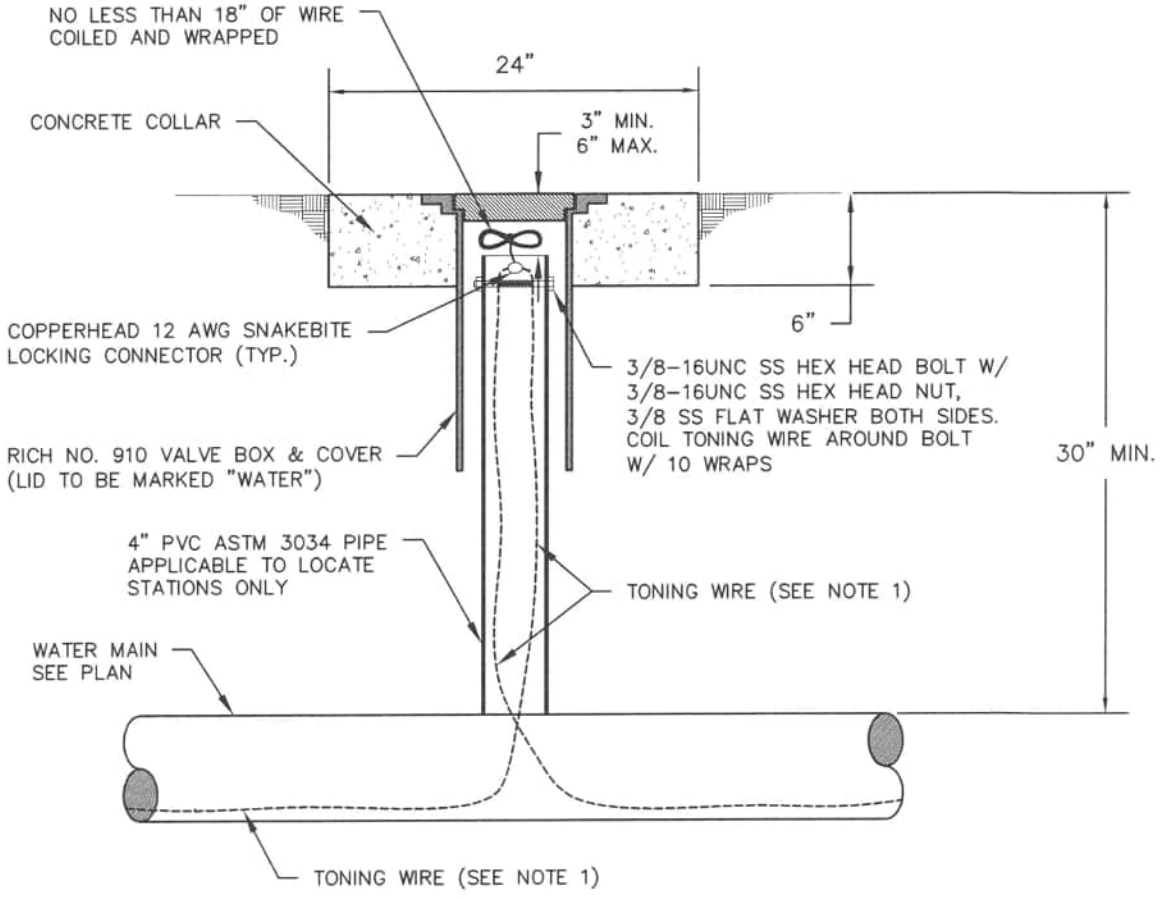
DETAIL NO. W2

REVISION: 1 DATE: 03/28/2022

WTR-RISER.DWG



CONCRETE COLLAR PLAN VIEW



NOTES:
1. TONING WIRE SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSULATION, NO SPLICES ALLOWED.
2. SEAL TONING WIRE SPLICE CONNECTIONS WITH COPPERHEAD 12 AWG SNAKEBITE LOCKING CONNECTORS (TYPICAL)
3. WIRE SHALL BE INSTALLED ON THE BOTTOM SIDE OF THE PIPE, BELOW THE SPRING LINE.
4. THE WIRE SHALL BE FASTENED TO THE PIPE WITH TAPE OR PLASTIC TIES AT 10' INTERVALS.
5. LOCATE STATIONS TO BE LOCATED AT 1000' INTERVALS OR AS DIRECTED BY THE CITY OF CAMAS

City of Camas WASHINGTON

SANITARY SEWER DETAIL

LOCATE STATION FOR WATER

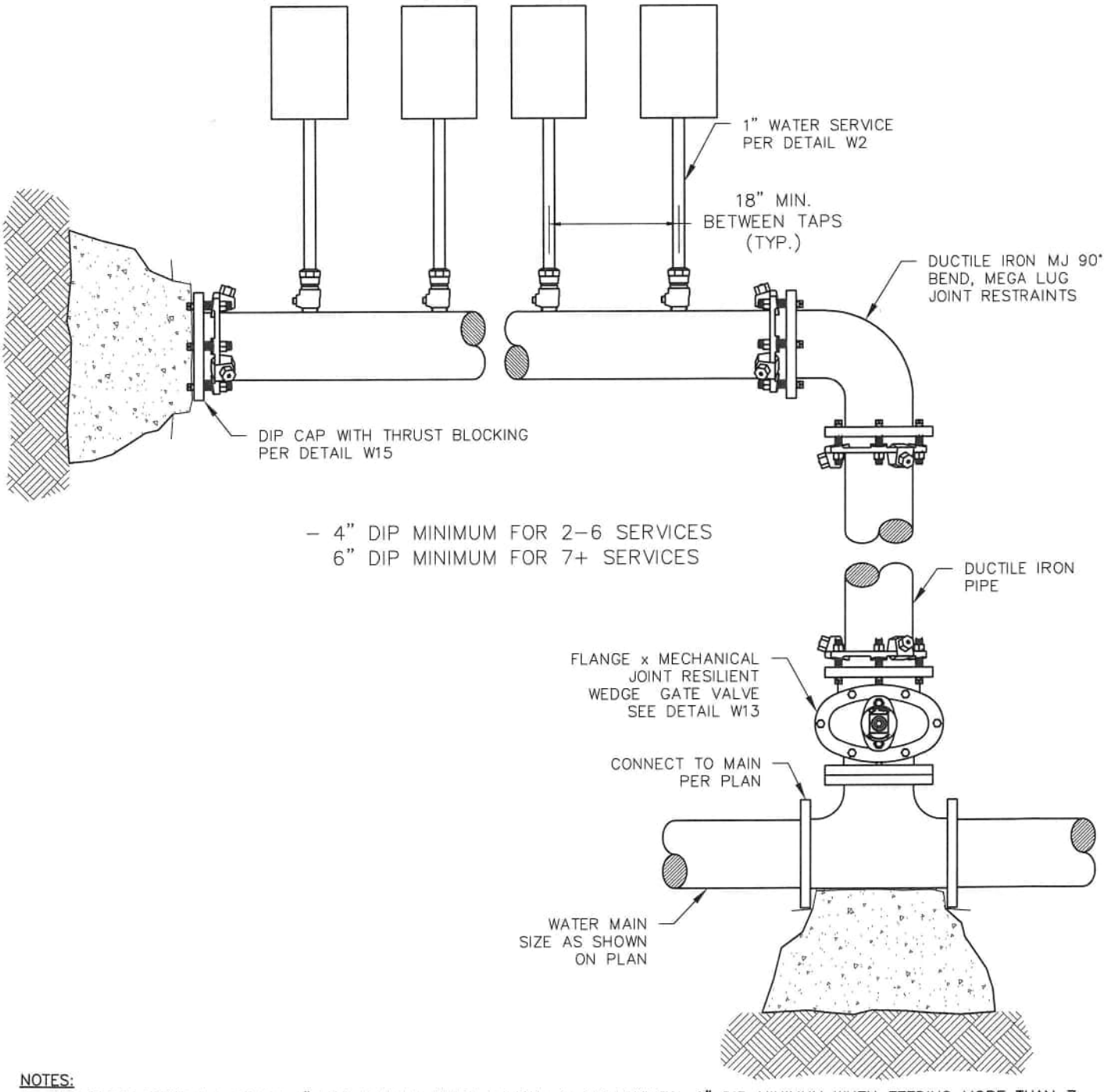
DETAIL APPROVED BY 3-28-22 DATE

NOT TO SCALE

DETAIL NO. W26A

REVISION: 1 DATE: 03/28/2022

WTR-RISER.DWG



NOTES:

1. WATERLINE MANIFOLD TO BE 4" DIP MINIMUM WHEN FEEDING 2–6 SERVICES, 6" DIP MINIMUM WHEN FEEDING MORE THAN 7 SERVICES
2. MANIFOLD LEG TO BE LOCATED UNDER PLANTER STRIP OR BEHIND SIDEWALK, AVOID PLACING UNDER IMPERVIOUS SURFACE.
3. MANIFOLD LEG TO BE AT A DEPTH OF 24" MIN/48" MAX.
4. NEW WATERLINE MANIFOLDS REQUIRE TONING WIRE, PLACED ON THE BOTTOM SIDE OF THE PIPE, BELOW THE SPRING LINE.
5. TONING WIRE SHALL BE FASTENED TO THE PIPE WITH TAPE OR PLASTIC TIES AT 10' INTERVALS.
6. TONING WIRE SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSLATION, NO SPLICES ALLOWED.
7. SEAL TONING WIRE SPLICE CONNECTIONS WITH COPPERHEAD 12 AWG SNAKEBITE LOCKING CONNECTORS (TYPICAL)
8. WATER SERVICES TO BE SPACED 18" MINIMUM AND INSTALLED PER DETAIL W2
9. METER BOXES TO BE LOCATED OUTSIDE OF SIDEWALK OR IN PLANTER STRIP, EXCEPT WHERE NOTED IN PLANS
10. TONING WIRE FROM THE MANIFOLD TO SERVICE REQUIRES A SNAKEBITE LOCKING CONNECTOR
11. PREFERRED BRASS FITTINGS TO BE USED, IN ORDER: 1) FORD 2) AY MCDONALD

City of Camas WASHINGTON

WATER DETAIL

WATER METER MANIFOLD ASSEMBLY

1/3/24

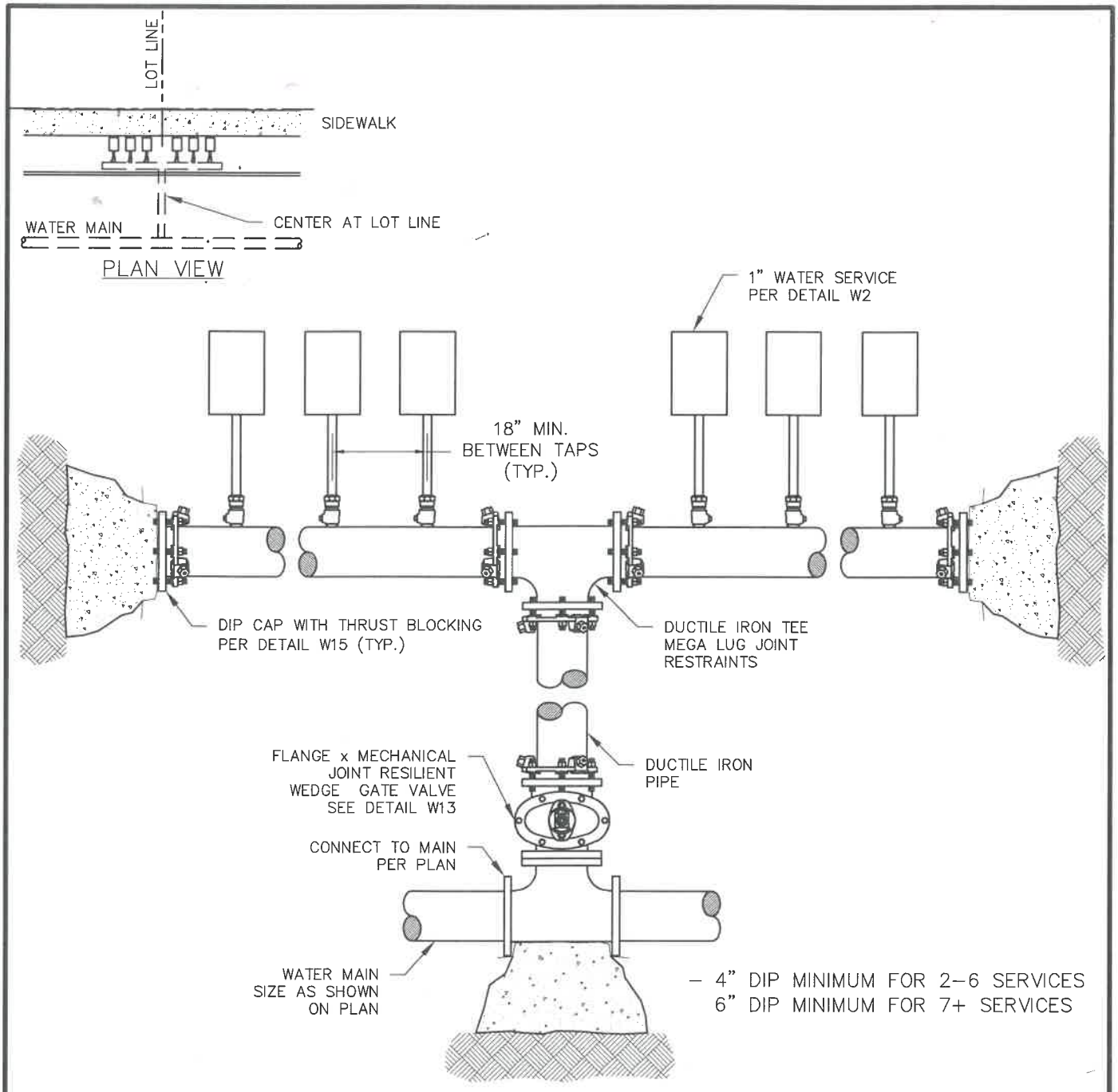
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W27

REVISION: 2 DATE: 01/02/2024

WTR-MNFLD.DWG



NOTES:

1. WATERLINE MANIFOLD TO BE 4" DIP MINIMUM WHEN FEEDING 2–6 SERVICES, 6" DIP MINIMUM WHEN FEEDING MORE THAN 7 SERVICES
2. MANIFOLD LEG TO BE LOCATED UNDER PLANTER STRIP OR BEHIND SIDEWALK, AVOID PLACING UNDER IMPERVIOUS SURFACE.
3. MANIFOLD LEG TO BE AT A DEPTH OF 24" MIN/48" MAX.
4. NEW WATERLINE MANIFOLDS REQUIRE TONING WIRE, PLACED ON THE BOTTOM SIDE OF THE PIPE, BELOW THE SPRING LINE.
5. TONING WIRE SHALL BE FASTENED TO THE PIPE WITH TAPE OR PLASTIC TIES AT 10' INTERVALS.
6. TONING WIRE SHALL BE COPPERHEAD SUPERFLEX 12 AWG 45MIL BLUE HDPE INSLATION, NO SPLICES ALLOWED.
7. SEAL TONING WIRE SPLICE CONNECTIONS WITH COPPERHEAD 12 AWG SNAKEBITE LOCKING CONNECTORS (TYPICAL)
8. WATER SERVICES TO BE SPACED 18" MINIMUM AND INSTALLED PER DETAIL W2
9. METER BOXES TO BE LOCATED OUTSIDE OF SIDEWALK OR IN PLANTER STRIP, EXCEPT WHERE NOTED IN PLANS
10. TONING WIRE FROM THE MANIFOLD TO SERVICE REQUIRES A SNAKEBITE LOCKING CONNECTOR
11. PREFERRED BRASS FITTINGS TO BE USED, IN ORDER: 1) FORD 2) AY MCDONALD

City of Camas WASHINGTON

WATER DETAIL

WATER METER MANIFOLD ASSEMBLY

DETAIL APPROVED BY 2/12/2026 DATE

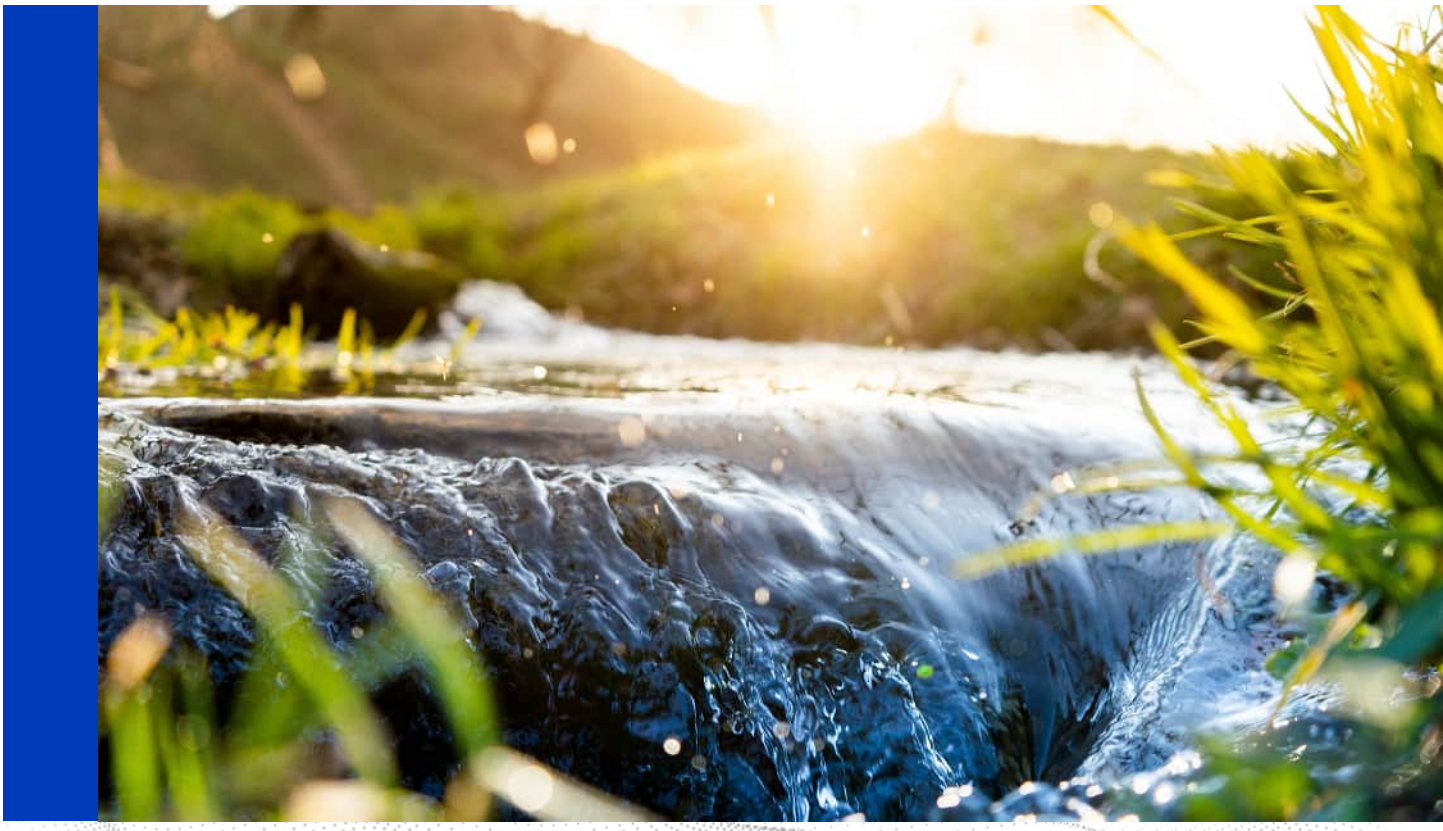
NOT TO SCALE

DETAIL NO. W27a

REVISION: 1 DATE: 02/10/2026

VTR-MNFLD.DWG

Appendix O: Camas General Sewer Plan



General Sewer Plan

October 2026 / DRAFT

General Sewer Plan

October 2026 / DRAFT

This document is released for the purpose of information exchange review and planning only under the authority of Matthew Huang, October 2026, State of Washington PE No. 54002

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Abbreviations

°F	degrees Fahrenheit
2010 GSP	2010 General Sewer/Wastewater Facility Plan
AACE	American Associate of Cost Estimators
AAF	average annual flow
AAL	average annual load
AB	aeration basin
AD	Anaerobic Digesters
ADF	average day flow
ADWF	average dry weather flow
AKART	all known, available and reasonable methods of prevention, control and treatment
aSRT	Aerobic solids retention times
ATS	automatic transfer switch
BNR	biological nutrient removal
BOD	biochemical oxygen demand
BOD_5	5-day biochemical oxygen demand
CARA	critical aquifer recharge areas
$cBOD_5$	5-day carbonaceous biological oxygen demand
CCTV	closed-circuit television
cf/hr	cubic feet per hour
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIP	Capital Improvement Program
City	City of Camas
CMC	City municipal code
CMMS	Computerized Maintenance Management System
CMP	corrugated metal pipe
CWA	Clean Water Alliance
d/D	depth versus diameter
DNS	determination of non-significance
DSHT	Digested Sludge Holding Tank
DWF	dry weather flow
Ecology	Washington State Department of Ecology
EI&C	Electrical, instrumentation, and control
ELA	engineering, legal, and administration
ENR	Engineering News Report
FOG	fats, oil, and grease
FONSI	finding of no significant impact
fps	feet per second

ft^3	cubic feet
GIS	geographic information system
GMA	Growth Management Act
gpad	gallons per acre per day
gpcd	gallons per capita day
gpd	gallons per day
gpm	gallons per minute
GSP	General Sewer Plan
GWI	groundwater infiltration
H_2S	hydrogen sulfide
HARL	Hills at Round Lake
HGL	hydraulic grade line
HP	horsepower
HST	high speed turbo
I/I	infiltration and inflow
IDWF	influent dry weather flow
kcal/day	kilocalories per day
kVA	kilovolt-amperes
kW	killowatts
LS	lift station
M	million
MCC	motor control center
MDDF	maximum daily design flow
MDDL	maximum daily design load
MDF	minimum daily flow
MDS-EB	main distribution switchboard - elevator board
MG	million gallons
$Mg(OH)_2$	Magnesium hydroxide
mg/L	milligrams per liter
mgd	million gallons per day
MH	manhole
mL	milliliter
mL/g	milliliters per gram
MLSS	mixed liquor suspended solids
mm	millimeter
MMF	maximum monthly flow
MML	maximum month load
MS4	Municipal Separate Storm Sewer System
MWD	maximum week design load
MWDF	maximum week design flow

N/A	not applicable
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NH_3	ammonia
NH_3-N	ammonia-nitrogen
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
PARIS	Permitting and Reporting Information System
PC	primary clarifier
PCB	polychlorinated biphenyls
PDF	peak day flow
PDL	peak day load
PFAS	per- and polyfluoroalkyl substances
PHDF	peak hour demand flow
PHDL	peak hour design load
PHF	peak hour flow
PIDF	peak instantaneous design flow
PLC	programmable logic controller
ppd	pounds per day
ppd/sf	pounds per day per square foot
ppm	parts per million
psig	pounds per square inch gauge
PVC	polyvinyl chloride
PWWF	peak wet weather flow
QA/QC	quality assurance and quality control
R&R	repair and replacement
RAS	return activated sludge
RCW	Revised Code of Washington
RDII	rainfall dependent infiltration and inflow
RDT	rotary drum thickener
RPA	Reasonable Potential Analysis
SC	secondary clarifier
SCADA	supervisory control and data acquisition
scfm	standard cubic feet per minute
SEPA	State Environmental Policy Act
SOR	surface overflow rate
SR	State Route
SRT	solids retention time
SS	stainless steel

SSF	slow sand filtration treatment plant
STE	septic tank effluent
STEF	septic tank effluent filter
STEG	septic tank effluent gravity
STEP	septic tank effluent pump
SU	standard units
SVI	sludge volume index
SWBD	switch board
SWCAA	Southwest Clean Air Agency
SWD	side water depth
SWPP	stormwater pollution prevention plan
TCLP	toxic characteristic leachate procedure
TDH	total dynamic head
TKN	total Kjeldahl nitrogen
TPS	thickened primary sludge
TSMC	Taiwan Semiconductor Manufacturing Co.
TSS	total suspended solids
UGA	urban growth area
UGB	urban growth boundary
USEPA	United States Environmental Protection Agency
UT1	Utility Transformer No. 1
UT2	Utility Transformer No. 2
UV	ultraviolet
UVT	ultraviolet transmittance
VCP	vitrified clay pipe
VFD	variable frequency drive
WAC	Washington Administrative Code
WAS	waste activated sludge
WRF	water reclamation facility
WSE	water surface elevation
WWF	wet weather flow
WWTF	wastewater treatment facility
WWTFO	Washington Wastewater Treatment Facility Operator

EXECUTIVE SUMMARY

ES.1 Introduction

The City of Camas (City) is located in Clark County, Washington, near the border of Washington and Oregon, along the Columbia River near Vancouver, Washington. The City owns and operates most of the sewer collection system within the City limits and its urban growth area (UGA). The collection system is a combination of gravity sewers, lift stations (LS), force mains (FM), and septic tank effluent pump (STEP) systems. Wastewater is collected and treated by the City at the Camas Wastewater Treatment Facility (WWTF) and then discharged to the Columbia River.

The purpose of the City's General Sewer Plan (GSP) is to provide a roadmap for managing the wastewater collection system over the next 20 years, accommodating growth, and maintaining a high level of service for existing customers. The Plan addresses key issues such as the replacement of older, deteriorating sanitary sewer facilities, evaluation of collection and treatment capacity for existing deficiencies and future development, assessment of sanitary sewer lift stations and force mains, and the City's infiltration and inflow (I/I) reduction program. The GSP and its recommendations were prepared in accordance with Washington Administrative Code (WAC) 173-240-050 and meet the requirements of the Washington Growth Management Act (GMA). The City owns and operates most of its sewer collection system, which includes gravity sewers, pump stations, force mains, and Septic Tank Effluent Pump (STEP) systems, and treats wastewater at the Camas Wastewater Treatment Plant (WWTF) before discharge to the Columbia River. Key elements addressed in the GSP include:

- The need and timing of the replacement of older, deteriorating sanitary sewer facilities within large, neighborhood-size areas within the City.
- The evaluation of the City's collection system and treatment capacity to address both existing system deficiencies and future development, as well as plan for future potential development-driven deficiencies.
- The evaluation of sanitary sewer LS and FM for removal, rehabilitation and replacement.
- The City's infiltration and inflow (I/I) program to evaluate options and needs for I/I reduction.
- Implementation of recommended improvements by priority which maintains affordable rates for the system users.

ES.1.1 Sewer Service Area

The current sewer service area covers approximately 7,600 acres, including properties within the City limits, and the future service area extends to the UGA, totaling 8,900 acres. A map of the sewer service area is presented in Figure ES.1.

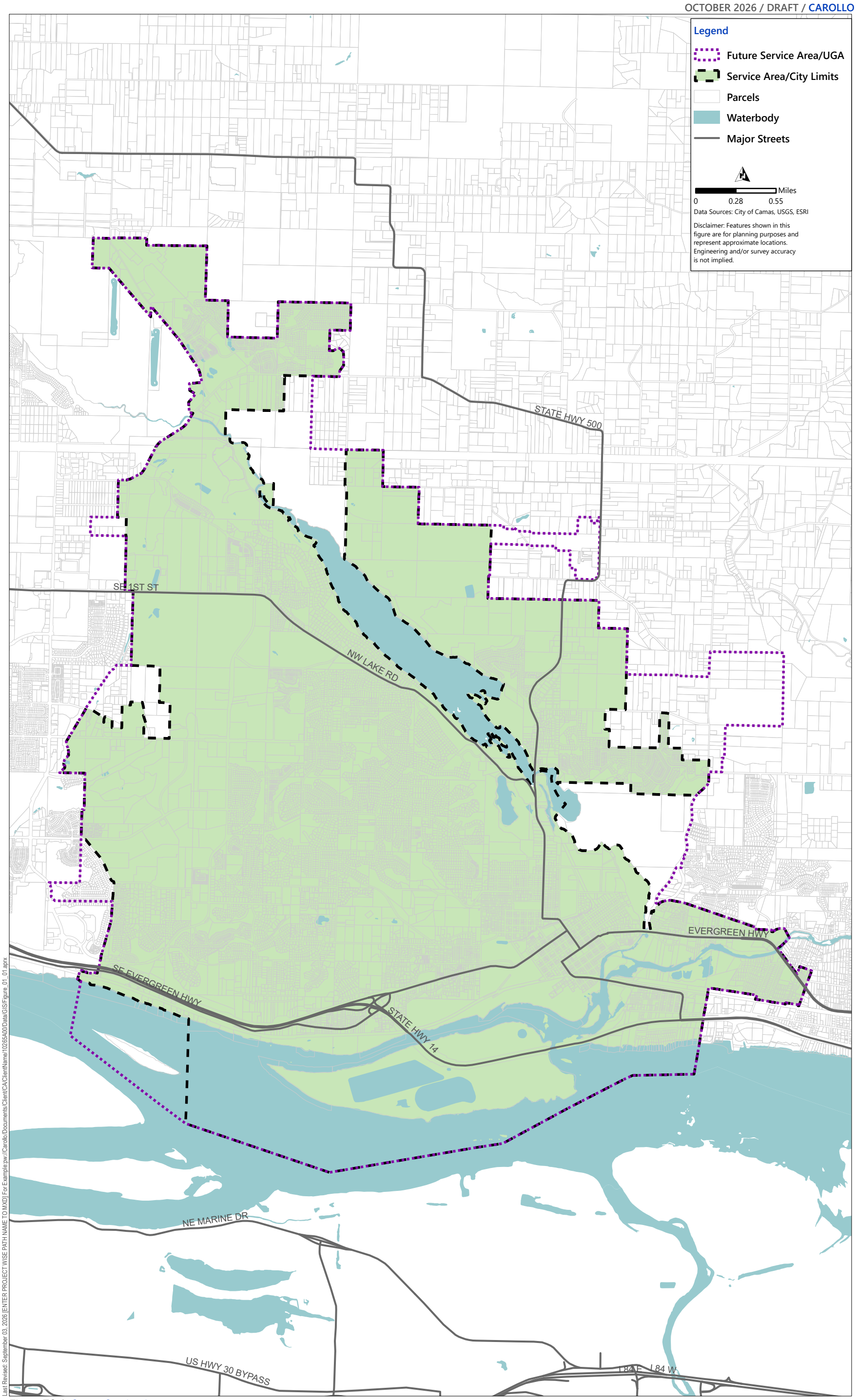

Figure ES.1 Sewer Service Area

ES.2 Policies

The City is responsible for managing and operating its wastewater system in accordance with all local, state, and federal regulations. To best manage the wastewater system and comply with regulations, the City has adopted wastewater system policies and criteria. These policies guide the development and financing of the infrastructure required to provide wastewater service and document the City's commitments to current wastewater system customers as well as those considering service from the City. The policies and criteria are organized into the following categories:

- Sewer Service.
- Environmental Stewardship.
- Design Criteria and Standards.
- Financial Policies.
- Regulatory Requirements.

ES.3 Basis of Planning

Chapter 3 of the GSP presents flow and load projections for the collection system and WWTF based on planned development and future population growth through 2045. Slightly different methodologies were used to project wastewater flows for the collection system and the WWTF due to the specific requirements of each analysis and the availability of data. For example, collection system flow monitoring data was collected from January 15, 2025, to April 29, 2025, while WWTF flow and load projections are based on an evaluation of historical plant data. The collection system was projected for both 2045 and buildout conditions, while the WWTF analysis was projected through 2045.

ES.3.1 Collection System Flow Projections

The collection system flow projections were developed for use in the City's calibrated hydraulic model of the sewer system. The modeled system primarily includes gravity sewers that are 8-inch or larger and the trunk of the STEP system. The data collected during the flow monitoring program, along with population growth projections, land use development projections, and wastewater flow factors, were used to develop the flow projections. The updated hydraulic model flow projections summary is presented below, reflecting 2025, 2045, and buildout planning horizons:

Table ES.1 Hydraulic Model Flow Projections Summary

Planning Horizon	ADWF (mgd)	PWWF (mgd)	Peaking Factor (PWWF:ADWF)
2025	2.85	22.9	8.04
2045	5.32	26.8	5.04
Buildout	7.55	35.2	4.67

Notes:
ADWF - average dry weather flow; mgd - million gallons per day; PWWF - peak wet weather flow.

ES.3.2 WWTF Flow and Load Projections

The City's WWTF receives flows from the gravity collection system, septic tank effluent from the City's STEP system, and the septage receiving station. Load and flow projections were developed independently for the WWTF based on historical influent flow and raw wastewater pollutant concentrations, typical septage and STEP system characteristics and population growth projections, and industrial flow contributions. The influent flow projections developed for the WWTF for 2025 and 2045 are summarized in Table ES.2:

Table ES.2 Current and Projected WWTF Flows

Flow Parameter	2025 Flow (mgd)	2045 Flow (mgd)
Average Annual Flow (AAF)	2.9	5.4
Maximum Monthly Flow (MMF)	4.0	7.5
Minimum Daily Flow (MDF)	5.7	10.7
Peak Hourly Flow (PHF)	10.8	20.4
Peak Instantaneous Design Flow (PIDF)	11.8	22.2

Wastewater loading data, related to effluent limitations contained in the City's WWTF National Pollution Discharge Elimination System (NPDES) permit, were also projected to evaluate treatment capacity for future conditions. Historical values for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and Total Kjeldahl Nitrogen (TKN) and projections to 2045 are detailed and summarized in Table ES.3:

Table ES.3 Current and Projected WWTF Loads

Load Parameter	2025 Influent Load (ppd)	2045 Influent Load (ppd)
Sewered Population	30,056	37,080
BOD_5 (ppd)		
Average Annual	3,200	6,000
Maximum Month	4,000	7,500
Maximum Week	4,500	8,500
TSS (ppd)		
Average Annual	3,100	5,800
Maximum Month	3,900	7,300
Maximum Week	4,300	8,100
TKN (ppd)		
Average Annual	1,300	2,500
Maximum Month	1,500	2,800
Maximum Week	1,600	3,000

Notes:
ppd - pounds per day.

ES.4 Existing System

Chapter 4 describes the sewer system within the City's service area, which is owned, maintained, and operated by the City. A map of the existing system is shown in Figure ES.2. The City's conventional gravity sewer system includes 405,499 (76.8 miles) linear feet of gravity mains, while STEP systems account for 290,019 linear feet (54.9 miles). The earliest portions of the gravity system date back to the 1920s. There are 28 lift stations operated within the service area and approximately 65,218 linear feet (12.4 miles) of force main. These systems convey wastewater to the City's WWTF. The septic tanks provide preliminary wastewater treatment, solids settling, and some digestion such that the effluent is not as strong as raw sewage collected in the conventional system. The City pumps out the septage from the STEP systems on a 5 to 7-year cycle.

The City's WWTF is located along the Columbia River in the southeastern portion of its sewer service area. The WWTF was originally constructed in 1972 and has had several modifications since that time to increase capacity and improve treatment capabilities to continue to meet all effluent permit requirements. The City's NPDES effluent discharge limitations, prohibitions, and requirements are similar to other municipal facilities, with standard 30/30 monthly TSS and BOD concentration limits and a mandatory 85 percent reduction in each. Additionally, the WWTF has ammonia limits of 20 milligrams per liter (mg/L) (NH_3 as N) in the summer and 7 mg/L (NH_3 as N) in the winter. An aerial view of the WWTF with each unit process and building identified is shown in Figure ES.3.

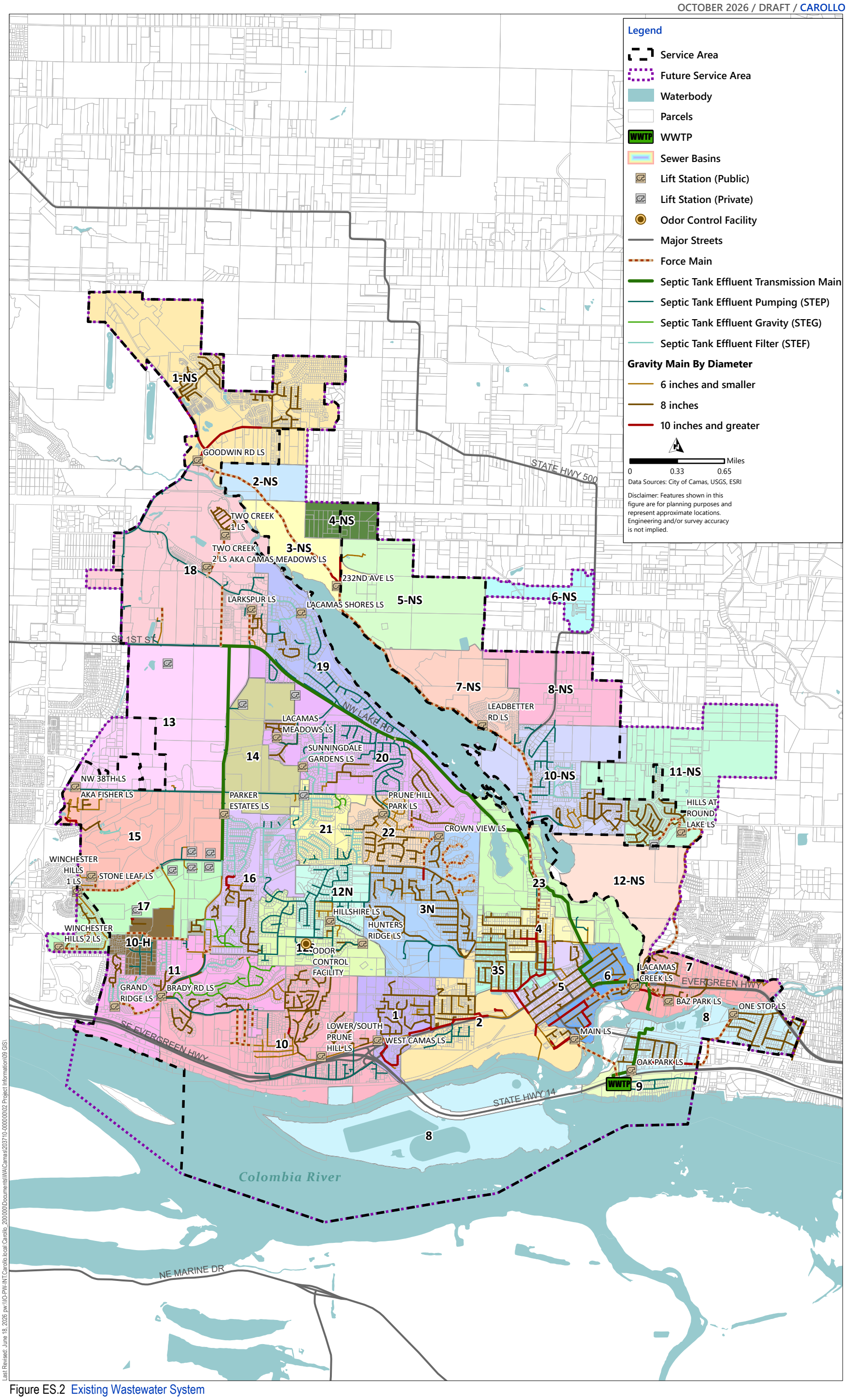

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Figure ES.2 Existing Wastewater System



Figure ES.3 WWTF Aerial Image with Site Plan

ES.5 Infiltration and Inflow Program

Chapter 5 of this GSP summarizes the City's efforts to reduce I/I from 2016 through 2024 and the quantifiable, positive improvement that has been accomplished. I/I consist of two components which may combine or act independently to increase flow volume and peak flows in the sewer system. If too much I/I enters the sewer system such that it operates at or above capacity, sanitary sewer overflows (SSO) could occur. More dilute wastewater can also be more difficult to treat under percent removal NPDES permits, such as those held by the City. The City has a long history of I/I studies and control efforts, investing over $4.55 million (M) in collection system I/I work and $750,000 in WWTF improvements to address I/I flows. I/I, comprising infiltration (groundwater entering through defects) and inflow (stormwater entering directly), can lead to surcharging, sewage backups, hydraulic overloading, and reduced treatment efficiency.

Though the City has reduced I/I on a gpcd basis and the 2025 NPDES permit no longer requires annual I/I reporting, the City is continuing to invest in the collection system to further reduce I/I through its ongoing repair and replacement program. Specifically, it is recommended to investigate I/I sources in flow meter basins with high I/I based on the recent flow monitoring completed in 2025 as part of this planning effort, including 5-1-2 (upstream of Crown View LS and South Prune Hill LS) and 4-1-3 (downtown).

ES.6 System Analysis

Chapter 6 describes the hydraulic modeling analysis conducted for gravity pipes, STEP main, force main, and LS in the modeled portion of the City's collection system. The modeled collection system includes primarily gravity sewers 8-inch or larger, force mains, lift stations, and the trunk of the STEP system. The analysis identified capacity deficiencies associated with current and projected future use and recommends improvements to alleviate any identified concerns. The collection system was evaluated by applying three planning scenarios:

- **Existing:** Matching existing (2026) calibrated conditions.
- **20-Year:** Incorporating growth through 2045 as identified in the 2045 Comprehensive Plan.
- **Build-Out:** Development of the full-service area including UGA.

Performance and design criteria for the conveyance system are outlined below:

- **Performance Criteria:**
  - Sewer pipes can be surcharged. If surcharging is within 3-feet from manhole (MH) rim, then the sewer was deemed deficient.
  - No surcharging (d/D>1) is allowed at shallow MHs which is defined as MHs where the distance between crown of pipe and MH rim is less than 3-feet.
- **Design Criteria:**
  - The City defines the acceptable d/D value of 0.92 for design of new sewers under design storm conditions and build out scenario.
  - The City's lift station should have sufficient firm capacity to pump the PWWF during the design storm with the largest pump out of service.
  - The City's force main and STEP should not exceed a maximum pipe velocity of 8 feet per second (fps) during the design storm.

ES.6.1 Gravity Collection System Evaluation

For each planning scenario, the associated PWWF was routed through the hydraulic model. The peak hydraulic grade line in manholes and gravity pipelines was compared to the established performance criteria. Under existing conditions, ten potential problem areas were identified where capacity is deficient to convey the PWWF. Three additional deficiency problem areas occur under 20-year (2045) conditions due to additional projected flows. Table ES.5 shows a summary of the pipe capacity improvements.

ES.6.2 STEP and Force Main System Evaluation

The evaluation of the City's wastewater collection system extended beyond gravity pipes to include the STEP system and force mains, with the force mains associated with lift stations incorporated into the hydraulic model. A primary performance criterion for both existing force mains and STEP mains was that their maximum pipe velocity should not exceed 8 fps during the design storm. Additionally, lift stations were assessed to ensure sufficient firm capacity to handle the PWWF from their tributary areas, meaning they could operate with the largest pump out of service. The hydraulic analysis revealed that the STEP system transmission main exceeds this velocity criterion under both existing and projected 2045 PWWF conditions, particularly in areas with steep downhill slopes like NW Parker Street and NW Lake Road. However, no practical improvement project was identified to address these high velocities because the STEP system operates under low pressure, and the steep downhill segments function hydraulically more like gravity mains than pressurized force main. As a result, improvements typically used to address high velocities in pressurized systems would not be practical in these locations. Table ES.5 shows a summary of the pipe capacity improvements.

ES.6.3 Lift Station Evaluation

The City's hydraulic model includes twelve of the City's 28 lift stations. The estimated current and future PWWFs were compared to the firm capacities of these modeled lift stations. Six of the modeled lift stations are considered deficient in the existing system scenario, and an additional three lift stations are identified as deficient under the 20-year conditions. Table ES.6 shows a summary of the lift stations' capacity improvements.

ES.6.4 General System Evaluation

The evaluation of the collection system also identified a need for general improvements to enhance overall system management, safety, and future planning capabilities. These general improvement projects are crucial for supporting current operations, improving accuracy in future evaluations, and informing subsequent capital improvement planning efforts. informing subsequent capital improvement planning efforts. Table ES.7 summarizes the recommended general improvements.

ES.6.5 Annual Repair and Replacement Evaluation

The City has established an Annual Repair and Replacement Program as a vital component of its CIP, dedicating $67.9 M over the 19-year planning horizon (2027 to 2045) with an average annual cost of approximately $3.6 M. These annual projects are critical for maintaining existing infrastructure, ensuring reliable service, and proactively addressing wear and tear across the entire wastewater collection and treatment system. These programs are essential for continuous system functionality, prolonging asset life,

and supporting the long-term goals of the General Sewer Plan. Table ES.8 shows a summary of the City's annual programs.

ES.6.6 Recommended Improvements

The collection system evaluation identified improvements needed to address existing deficiencies, accommodate projected 20-year demands, and support reliable system operation. The recommended improvements generally fall into the following categories:

- **Pipe Capacity Improvements:** Improvements to gravity sewers, force mains, and STEP transmission main where additional capacity is needed. Table ES.4 summarizes these pipe capacity improvements.
- **Lift Station Improvements:** Upgrades to pump capacity and redundancy at lift stations that do not meet existing or projected 20-year firm capacity requirements. Table ES.5 summarizes the recommended improvements for the lift stations identified as deficient.
- **General Improvements:** Improvements to support system monitoring, data collection, asset management, and ongoing system planning. Table ES.6 summarizes these recommended general improvements.

The recommended improvements include both short-term and long-term projects. Short-term improvements are generally intended to address existing system deficiencies or operational needs identified under current conditions and are recommended for implementation between 2027-2035. Long-term improvements are primarily associated with projected growth and are intended to accommodate increased demands through the 20-year planning horizon, with implementation recommended between 2036 and 2045. The timing of individual projects should be coordinated with system needs, development, and available funding and may be adjusted as conditions change. The recommended improvements are incorporated into the Capital Improvement Plan presented in Chapter 9.

Table ES.4 Recommended Pipe Capacity Improvement Projects

Project ID	Improvement Type	Location	Existing Size (inches)	Proposed Size (inches)	Length (feet)	Phase
P-01	Gravity	NW 6th Place West Upsize Improvements	8 8 8 12	12 15 18 18	814 179 386 86	Short-term
P-02	Gravity	NW 6th Place East Upsize Improvements	8 12	18 18	577 105	Short-term
P-03	Gravity	NW 6th Place Avenue West Upsize Improvements	12 12	18 21	333 2,302	Short-term
P-04	Gravity	NW 6th Place Avenue East Upsize Improvements	12 18 21 21 24 21	24 27 27 30 36 36	402 446 532 519 1,009 909	Long-term
P-05	Gravity	NW Fargo Street, NW 18th Loop, and NW 18th Avenue Upsize	8 8	12 15	1,736 1,008	Short-term

Project ID	Improvement Type	Location	Existing Size (inches)	Proposed Size (inches)	Length (feet)	Phase
P-06	Gravity	NE Garfield Street to NE 15th Avenue to NE Franklin Street to along the Creek Improvements	8 15 21 15	15 18 30 30	1,222 256 254 1,217	Long-term
P-07	Force Main	South Prune Hill Force Main Improvements	10	18	925	Short-term
P-08	Force Main	West Camas Lift Station Force Main Improvements	6	15	574	Short-term
P-09	Force Main	Main Lift Station Force Main Improvements	18	24	2,348	Long-term
P-10	Force Main	Leadbetter Road Lift Station Dual Force Main Improvements	-	10	6,500	Long-term
P-11	Gravity	Division Street Upsize	8 8 8	12 15 18	247 580 2,032	Short-term
P-12	Gravity	SE Everett Road to Leadbetter Rd Extension	-	8 12 18	2,031 692 6,036	Long-term
P-13	Gravity	SE 283rd Avenue to NE Woodburn Drive Extension	-	12	6,782	Long-term
S-01	STEP	NW Parker Street to NW Lake Road STEP Main Improvements	-	30	14,032	Long-term

Table ES.5 Recommended Lift Station Improvement Projects

Project ID	Location	Description	Phase
LS-01	Lower/South Prune Hill	Construct a new Lower/South Prune Hill LS with a pump capable of pumping 3.0 mgd of firm capacity to provide additional capacity and support future system needs. The station's firm capacity needs to convey more than double its current firm capacity from 0.86 mgd. Extensive upgrades to the station are recommended in the short term. An additional planning-level allowance of $150,000 was included for odor control improvements. The estimated cost is $5,381,000 and is planned for 2033.	Short-term
LS-02	West Camas	Construct a new West Camas LS with a pump capable of pumping 3.3 mgd of firm capacity to provide additional capacity and support future system needs. The LS is downstream of Lower/South Prune Hill LS, so this project should be implemented after the Lower/South Prune Hill LS Improvements (LS-01). An additional allowance of $100 per linear foot was included for asbestos cement pipe removal. The estimated cost is $5,204,000 and is planned for 2031.	Short-term
LS-03	Crown View	Construct a new Crown View LS with a pump capable of pumping 1.0 mgd of firm capacity to provide additional capacity and support future system needs. The LS is not able to serve existing system PWWF, nor 20-year and buildout PWWF. The station's firm capacity needs to convey more than triple its current firm capacity from 0.32 mgd. Extensive upgrades are recommended in the short-term. The estimated cost is $4,290,000 and is planned for 2034.	Short-term

Project ID	Location	Description	Phase
LS-04	Lacamas Creek	Replace the two existing pumps capable of pumping 2.13 mgd each to meet the required firm capacity. The LS receives more PWWF than its firm capacity during 20-year conditions (2.13 mgd vs 1.37 mgd firm capacity). Replacing the pumps in this station is recommended in the long-term. The estimated cost is $1,245,000 and is planned for 2045.	Long-term
LS-05	Main LS	Construct a new Main LS with pumps capable of pumping 21.0 MGD of firm capacity to provide additional capacity and support future system needs. An additional planning-level allowance of $150,000 was included for odor control improvements. The estimated cost is $10,640,000 and is planned for 2029.	Long-term
LS-06	Goodwin Road	Add a pump capable of pumping 0.49 mgd. The LS receives more PWWF than its firm capacity during the 20-year conditions (0.71 mgd vs 0.49 mgd firm capacity). Adding an additional third pump to the station is recommended in the long-term. The estimated cost is $502,000 and is planned for 2043.	Long-term
LS-07	232nd Avenue	Add a pump capable of pumping 0.53 mgd. The LS receives more PWWF than its firm capacity during existing and 20-year conditions (2.60 mgd vs 0.53 mgd firm capacity). Adding an additional third pump to the station is recommended in the long-term. The estimated cost is $502,000 and is planned for 2042.	Long-term
LS-08	Leadbetter Road	Add a pump capable of pumping 0.87 mgd. The LS receives more PWWF than its firm capacity during existing and 20-year conditions (3.63 mgd vs 0.87 mgd firm capacity). Activating the station's 8-inch dual force main and adding an additional third pump to the station is recommended in the long-term. The estimated cost is $2,379,000 and is planned for 2041.	Long-term
LS-09	Hills at Round Lake	Replace the two existing pumps with three new pumps, each capable of pumping 0.65 mgd to meet the required firm capacity. The LS receives more PWWF than its firm capacity during 20-year conditions (1.21 mgd vs 0.96 mgd firm capacity). Replacing the pumps in this station is recommended in the long-term. The estimated cost is $1,504,000 and is planned for 2044.	Long-term

Table ES.6 Recommended General Improvement Projects

Project ID	Project Name	Description	Phase
G-01	Basin 4-1-3 Pilot I/I Study	This program will investigate the source and magnitude of I/I of storm and groundwater into the wastewater system at locations where suspected high I/I is currently or is forecast to exceed conveyance and/or Lift Station capacity. Identifying and removing non-sewage flow where that would reduce surcharging such that costly capacity improvements might be avoided. The estimated cost is $200,00 and is planned for 2027.	Short-Term

Project ID	Project Name	Description	Phase
G-02	Basin 5-1-2 Flow Monitoring	This project is to install temporary flow meters in Basin 5-1-2 to capture flows from the Camas LS and Upper Prune Hill contributing areas separately. Both areas have pipe and LS capacity deficiencies and additional flow monitoring within this basin would help to understand if part of the basin is contributing a greater portion of I/I. This study should evaluate if projects within the basin have the potential to reduce I/I such that projects to increase hydraulic capacity within the system can be avoided. Reducing I/I has downstream benefits at the treatment plant as well. The estimated cost is $300,00 and is planned for 2027.	Short-Term
G-03	Geographic Information System (GIS)	This program will implement ongoing enhancements to the GIS, including asset mapping, data collection, database maintenance, and integration with utility management systems. Maintaining accurate and up-to-date spatial information will improve infrastructure planning, field operations, emergency response, and asset management while supporting informed decision-making and efficient delivery of utility services. The estimated cost is $250,00 and is planned for 2027.	Short-Term
G-04	Hydraulic Modeling	The City's collection system model is heavily skeletonized, only 28 percent of the City's collection system pipes are included. A full pipe or less skeletonized model is needed for a more robust evaluation of the system. In order to expand the model, accurate and updated GIS for the collection system should be developed. The estimated cost is $200,00 and is planned for 2029.	Short-Term
G-05	Electrical System Arc Flash Study	No arc flash labels were found on the plant's distribution equipment, and the owner confirmed that an Electrical System Study is not maintained. Carollo recommends completing this study as soon as possible and applying arc flash labels in accordance with Occupational Safety and Health Administration requirements to ensure worker safety. The estimated cost is $75,00 and is planned for 2027.	Short-Term
G-06	Hazardous Area Classification Study	To ensure regulatory compliance, and safety, Carollo recommends conducting a hazardous area classification study per NFPA 820 and upgrading any areas that do not meet code. The estimated cost is $50,00 and is planned for 2027.	Short-Term
G-07	Flood Risk Assessment	This project is a comprehensive flood risk analysis for all major electrical and control systems to assess vulnerabilities and strengthen flood resilience at the WWTF. The estimated cost is $100,00 and is planned for 2027.	
G-07	General Sewer Plan	2035 General Sewer Plan Update. The estimated cost is $700,00 and is planned for 2035.	Short-Term
		2045 General Sewer Plan Update. The estimated cost is $700,00 and is planned for 2045.	Long-Term

Table ES.7 Recommended Annual Maintenance Improvement Projects for Collection System

Project ID	Project Name	Description	Phase
R-01	Sewer Main R&R Program	This project includes miscellaneous improvements at the existing WWTF to address operational, maintenance, and reliability needs, with an estimated total cost of $20.4 M over the 19-year planning horizon	Annual
R-02	Miscellaneous Lift Station Projects	This program focuses on miscellaneous improvements at existing LSs, including pump and piping replacement, electrical upgrades, and wet well improvements, with an estimated total cost of $38,000,000 over the 19-year planning horizon	Annual

ES.7 Wastewater Treatment Facility

Chapter 7 summarizes efforts to identify shortfalls in WWTF capacity that will prevent the City from reliably treating and disposing of projected flow and loads in compliance with their NPDES permit at the end of the planning period (i.e., year 2045). To address the identified deficiencies, an alternatives analysis of the most viable improvement options was conducted, which resulted in the development of 25 projects to be incorporated into the GSP's capital improvement program (CIP).

The recommended WWTF improvement projects were prioritized based on the anticipated timing of the need for each improvement and categorized as short-term and long-term projects similar to the collection system projects. Because many of the recommended improvements are relatively smaller scale projects, their implementation timing is primarily based on when the improvement is needed to address existing operational or capacity needs, maintain reliable treatment, or accommodate projected increases in flow and loads. The 25 recommended WWTF projects with their respective priorities are summarized in Table ES.8. The annual WWTF miscellaneous projects are summarized in Table ES.9.

Table ES.8 Recommended WWTF Improvement Projects

Project ID	Description	Project Priority
TP-01	Replace existing Parshall Flume with a new, higher-capacity one to accommodate peak flow conditions and prevent influent wastewater spraying, including structural modifications.	Short-Term
TP-02	Construct a bypass around Primary Clarifiers No. 1 and 2 to route flows greater than the maximum day flow around the primary treatment process, including installation of a new 30-inch bypass pipeline.	Short-Term
TP-03	Construct a new Aeration Basin Influent Flow Splitter Box to improve flow distribution to the aeration basins, including new slide gates and piping.	Short-Term
TP-04	Replace existing screens and slide gates at the Plant Headworks to improve reliability and operation of the screening process.	Short-Term
TP-05	Relocate the internal recycle (IR) piping at the three existing aeration basins to the beginning of the Anoxic Selector to improve the treatment process and flow distribution.	Short-Term
TP-06	Modify baffle walls separating the anaerobic selectors within the existing aeration basins to improve flow distribution and maintain proper separation, including replacing plywood baffles with stainless steel.	Short-Term
TP-07	Demolish existing Secondary Clarifier No. 1 and construct a new one to match the size, slope, and criteria of Secondary Clarifier No. 3, improving reliability and performance.	Short-Term
TP-08	Replace the Return Activated Sludge (RAS) pumps for Secondary Clarifier No. 2 to match the size (1,400 gpm) of those serving Secondary Clarifier No. 3, improving pumping capacity.	Short-Term
TP-08	Replace the RAS pumps for Secondary Clarifier No. 2 to match the size (1,400 gpm) of those serving Secondary Clarifier No. 3, improving pumping capacity.	Short-Term
TP-09	Replace existing Plant Drain Lift Station No. 1 pumps and rehabilitate the wet well, addressing concrete corrosion and end-of-life equipment.	Short-Term
TP-10	Replace existing Plant Drain Lift Station No. 2 pumps and rehabilitate the wet well, addressing concrete corrosion and end-of-life equipment.	Short-Term
TP-11	Plantwide replacement of existing electrical conduit and support stands to improve the reliability and condition of the plant electrical infrastructure.	Short-Term

Project ID	Description	Project Priority
TP-12	Plantwide improvements to equipment enclosures and cable protection to enhance the reliability and security of the instrumentation and control system.	Short-Term
TP-13	Replace MCC-A and relocate associated electrical equipment to improve reliability and maintainability of the plant electrical system, allowing the Old Controls Building to be repurposed.	Short-Term
TP-14	Replace existing diffusers in the three aeration basins and add diffusers to one of the anoxic zones within each basin to function as swing zones, providing greater operational flexibility.	Short-Term
TP-15	Replace the two existing Disk Filtration Units with new units (6.0 mgd capacity) to improve filtration performance and operational reliability.	Short-Term
TP-16	Construct a new second UV disinfection channel outside the existing building to provide sufficient disinfection capacity for the entire plant effluent at peak hour flow (22.2 mgd).	Short-Term
TP-17	Replace the existing effluent transfer pumps with larger impellers, motors, and associated VFDs to provide sufficient capacity to pump the entire plant effluent flow (22.2 mgd) during high river conditions.	Short-Term
TP-18	Construct a second new plant outfall to the Columbia River to provide additional discharge capacity and improve reliability and flexibility.	Short-Term
TP-19	Construct a new electrical building west of the Digester complex to house electrical equipment serving the digester facilities, meeting hazardous area classification requirements.	Short-Term
TP-20	Construct a second Rotary Drum Thickener (RDT) for Waste Activated Sludge (WAS) thickening to provide redundancy and improve reliability.	Short-Term
TP-21	Construct a new Primary Clarifier No. 3 to improve primary treatment performance and provide additional process capacity.	Long-Term
TP-22	Construct a new Secondary Clarifier No. 4 to provide additional secondary treatment capacity and accommodate future growth.	Long-Term
TP-23	Replace the two existing 150-hp multistage centrifugal blowers with two new 150-hp high-speed turbo (HST) blowers to provide sufficient aeration capacity for future peak oxygen demands.	Short-Term
TP-24	Replace the existing sludge dryer with new sludge drying equipment to maintain reliable biosolids processing as the existing equipment approaches the end of its useful life.	Long-Term
TP-25	Replace the existing biofilters with new biofilters (biotrickling filters) to maintain reliable odor control as existing equipment approaches the end of useful life.	Long-Term

Table ES.9 Recommended Annual Maintenance Improvement Projects for WWTF

Project ID	Project Name	Description	Phase
R-03	Miscellaneous WWTF Projects	This program is dedicated to the replacement of wastewater pipelines constructed prior to the 1940s, with an estimated total cost of approximately $9.5 M over the 19-year planning horizon.	Annual

ES.8 Operations and Maintenance

Chapter 8 provides an overview of the City's wastewater utility organization, staffing, and operations and maintenance (O&M) program. The City has recently separated the water and sewer groups into two divisions. Staff work to provide effective and efficient service for utility rate payers through regular O&M activities on these systems.

ES.9 Capital Improvement Plan

The CIP presented in Chapter 9 includes projects needed to accommodate growth, repair and replace aged infrastructure, and attain level of service goals. As shown on Table ES.10, the CIP is organized and prioritized in two separate project categories: short-term (2027-2036) and long-term (2037-2045) periods. Projects are grouped into pipelines, LSs, STEP mains, annual rehabilitation and repair, treatment plant, and general types of infrastructure work. The total recommended CIP is estimated at $270.3 M. The CIP recommends budgeting $132.4 M in the short-term. The average annual short-term cost for all recommended projects is approximately $14.8 M per year from 2027 through 2035. The CIP recommends $137.8 M in the long-term with an average annual long-term cost of approximately $13.8 M per year from 2036 through 2045. The average annual cost over the 19-year planning horizon from 2027 through 2045 is $14.2 M. Table ES.11 presents the costs by project category and planning period.

Table ES.10 Capital Improvement Plan Summary(1)

Planning Period	Total Cost (M$)	Annual Cost (M$)
Short-term (2027 to 2036)	$132.4	$14.8
Long-term (2037 to 2045)	$137.8	$13.8
Total	**$270.3**	**$14.2**

Notes:
(1) Totals may not sum due to rounding.

Table ES.11 CIP Summary by Project Type(1)

Project Category	Total Capital Cost	Short-term (2027-2036)	Long-term (2037-2045)
Treatment Plant	$95,830,000	$51,280,000	$44,550,000
Gravity and Force Main	$39,570,000	$21,585,000	$17,980,000
STEP Main	$32,760,000	$0	$32,760,000
Lift Station	$31,310,000	$25,201,000	$6,109,000
General	$2,575,000	$1,875,000	$700,000
Annual Programs	$67,880,000	$32,154,000	$35,730,000

Notes:
(1) Totals may not sum due to rounding.

ES.10 Financial Analysis

[To be completed and included in next draft GSP.]

CHAPTER 1 INTRODUCTION

1.1 Introduction

The purpose of the City of Camas' (City) General Sewer Plan (GSP) is to present policies and an assessment of the system to recommend facility improvements. The GSP is intended to provide a road map for accommodating growth and maintaining a high level of service for existing customers. The existing system is aging and will continue to require investment to maintain a high level of service.

The GSP presents findings from evaluations of the existing sanitary sewer system which provides the groundwork for recommendations to resolve existing deficiencies and concerns, as well as accommodating growth. This chapter presents the objectives of this GSP, and a brief overview of the City's wastewater collection system. A list of abbreviations is provided in the Table of Contents to assist the reader in understanding the information presented in this GSP.

This GSP and recommended improvements were prepared in accordance with requirements of Washington Administrative Code (WAC) 173-240-050, which is administered by the Washington State Department of Ecology (Ecology) and meets the requirements of the Washington Growth Management Act (GMA).

This GSP addresses the following key issues:

- The need and timing of the replacement of older, deteriorating sanitary sewer facilities within large, neighborhood-size areas within the City.
- The evaluation of the City's collection system and treatment capacity to address both existing system deficiencies and future development, as well as plan for future potential development-driven deficiencies.
- The evaluation of sanitary sewer lift stations and force mains for removal, rehabilitation, and replacement.
- The City's infiltration and inflow (I/I) program to evaluate options and needs for I/I reduction.
- Implementation of recommended improvements by priority which maintains affordable rates for the system users.

1.2 Background and Goals

The City is located in Clark County, Washington near the border of Washington and Oregon. It is between the cities of Vancouver and Washougal along the Columbia River as shown in Figure 1.1. The City owns and operates most of the sewer collection system within the City limits and the Urban Growth Boundary (UGB). The collection system is a combination of gravity sewers, lift station, force mains, and septic tank effluent pump (STEP) systems. Wastewater is collected and treated by the City at the Camas Wastewater Treatment Facility (WWTF) and then discharged to the Columbia River.

The City completed its last General Sewer Plan in 2024. The GSP provides a recognized framework for making decisions about Camas's sanitary sewer service area which includes properties both inside the City and UGB limits. It is intended to aid decision-makers as well as users, including Public Works staff, City Council members, the Mayor, City staff, builders, developers, community groups, and other government agencies.

1.3 Referenced Documents

The following documents were referenced in the preparation of this GSP:

- City of Camas 2024 General Sewer Plan.
- Camas 2035 Comprehensive Plan and draft 2045 Comprehensive Plan
- Camas Code of Ordinances.
- Washington Administrative Code, Title 173. Defines the structure of general sewer plans.
- Criteria for Sewage Works Design (Ecology, 2008). Provides guidance for the design of municipal sewer systems and establishes minimum requirements in the State of Washington.
- Camas 2016 Water System Plan and draft 2026 Water System Plan (concurrent).

1.4 Washington State Requirements

The goals of this GSP include:

- Prepare the GSP in compliance with WAC Chapter 173-240-050.
- Meet the requirements of the Washington State Criteria for Sewage Works Design.

Each WAC requirement is detailed in Table 1.1 as well as in the specified location within the GSP.

Table 1.1 WAC GSP Requirements

Requirement	Location in GSP	Reference
Purpose and need for the proposed GSP	Chapter 1	WAC 173-240-050(3)(a)
Discussion of who will own, operate, and maintain the system	Chapter 2	WAC 173-240-050(3)(b)
Existing and proposed service boundaries	Chapter 4	WAC 173-240-050(3)(c)
Layout map including: ▪ Boundary lines of municipality or district and vicinity. ▪ Existing sewers and areas served by each. ▪ Proposed sewers and areas served by each. ▪ Existing and proposed pump stations and force mains. ▪ Topography and elevations of existing and proposed ground. ▪ Information on streams, lakes, other bodies of water, and discharges. ▪ Information on water systems.	 Figure 1.1 Figures 4.1 and 4.2 Figure 4.1 Figure 4.1 Figure 4.5 Figure 4.7 and 4.9 Figure 4.10	WAC 173-240-050(3)(d)(i) through WAC 173-240-050(3)(d)(vii)
Population trends and methods used to determine those trends	Chapter 3	WAC 173-240-050(3)(e)
Information on existing wastewater facilities in the area	Chapter 4, Chapter 7	WAC 173-240-050(3)(d)(vii)
Discussion of infiltration and inflow problems	Chapter 5	WAC 173-240-050(3)(g)
Discussion of the provisions for treatment and adequacy of treatment	Chapter 6, Chapter 7	WAC 173-240-050(3)(h)
Information on facilities producing industrial wastewater	Chapter 4	WAC 173-240-050(3)(i)

Requirement	Location in GSP	Reference
Information on existing wells or other water supply sources	Chapter 4	WAC 173-240-050(3)(j)
Discussion of alternatives evaluated, and alternatives chosen	Chapter 6, Chapter 7	WAC 173-240-050(3)(k)
Information on existing and proposed cost per service	Chapter 10	WAC 173-240-050(3)(l)
Statement regarding compliance with any adopted water quality management plan under the Federal Water Pollution Control Act	Appendix A	WAC 173-240-050(3)(m)
Statements regarding compliance with SEPA and, if applicable, NEPA	Appendix A	WAC 173-240-050(3)(n)

Notes:
NEPA - National Environmental Policy Act; SEPA - State Environmental Policy Act.

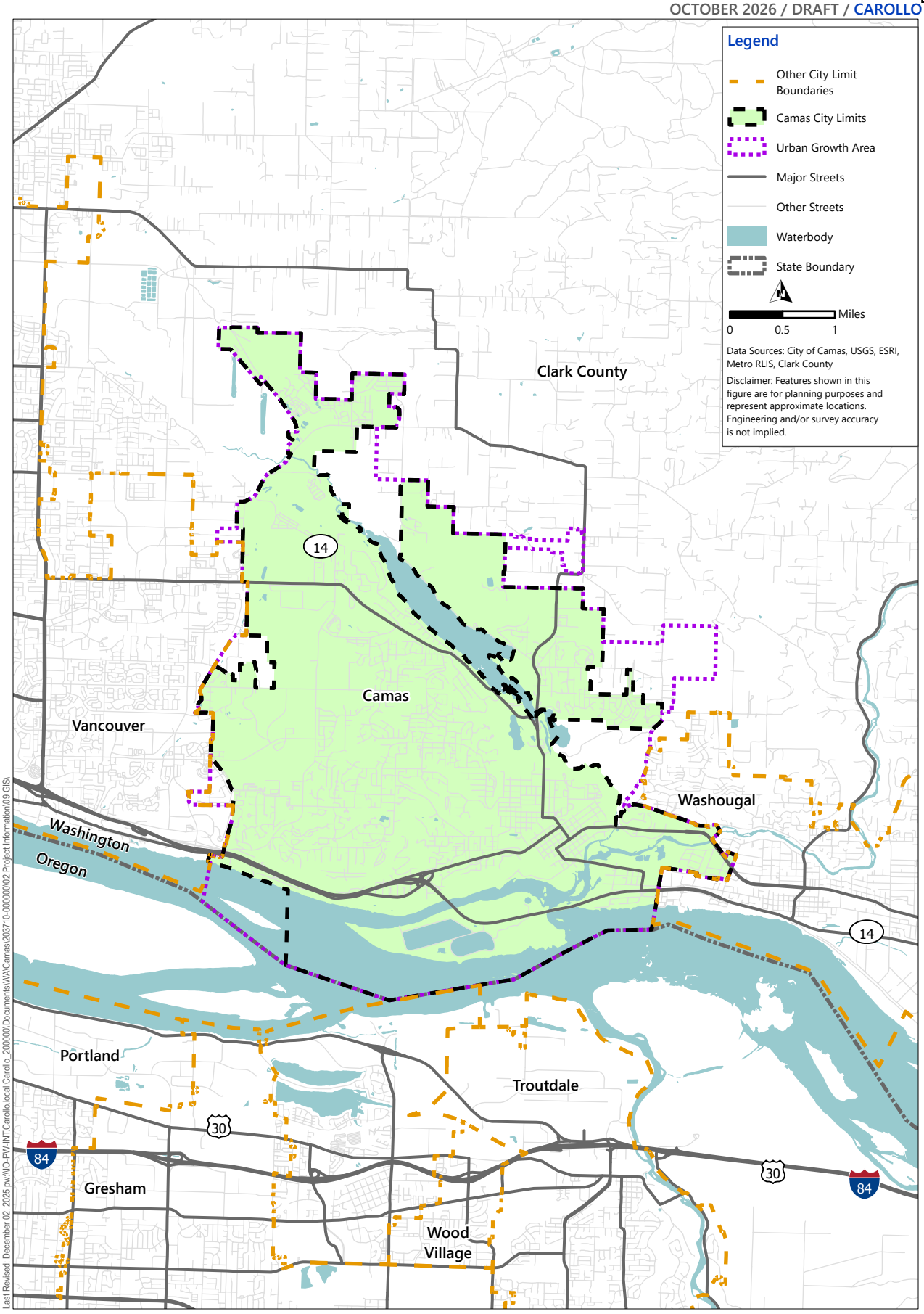

Figure 1.1 Vicinity Map

1.5 Report Organization

This GSP contains 10 chapters, followed by appendices that provide supporting documentation for the information presented in the report. The chapters are briefly described below:

- **Chapter 1 - Introduction:** This chapter presents the need for this GSP and the objectives of the study. Lists of abbreviations and reference materials are also provided to assist the reader in understanding the information presented.
- **Chapter 2 - Policies and Criteria:** This chapter documents applicable regulations, summarizes City policies impacting long-term sewer system planning, and presents the City's design criteria which are relevant to sewer system evaluation and planning.
- **Chapter 3 - Basis of Planning:** This chapter presents an evaluation of historical wastewater flows and loads through the City's collection system and entering the WWTF. This chapter also establishes the WWTF's flow and load projections based upon future population growth for 2045 and build out.
- **Chapter 4 - Existing System:** This chapter describes the City's existing sewer collection system, adjacent sewer service areas, and WWTF.
- **Chapter 5 - Infiltration and Inflow Program:** This Chapter focuses on summarizing the City's efforts on I/I reduction from 2016 through 2024. It summarizes the amount of I/I for these years and specific projects completed to address I/I.
- **Chapter 6 - Collection System:** This chapter presents an evaluation of the available capacity of the existing system to convey current and future sewer flows. Recommendations are provided for improvement projects to address capacity deficiencies and level of service goals.
- **Chapter 7 - Wastewater Treatment Facility:** This chapter summarizes the WWTF Engineering report including condition of existing processes, capacity of existing processes and recommendations that will allow the City to reliably and cost-effectively serve their customers now and into the future.
- **Chapter 8 - Operations and Maintenance:** This chapter provides an overview of the City's Public Works organization, staffing, and operation and maintenance (O&M) program. This chapter documents existing practices and identifies changes that may improve system operation and maintenance.
- **Chapter 9 - Capital Improvement Plan:** This chapter describes the improvements necessary to resolve existing and future deficiencies and accommodate growth. The proposed improvements are also listed by priority and project type.
- **Chapter 10 - Financial Analysis:** This chapter evaluates the financial status of the City's wastewater utility and the ability to finance Capital Improvement Program (CIP) projects.

Appendices are included as follows:

- Appendix A - SEPA Checklist/Approvals.
- Appendix B - References.
- Appendix C - Demographic Projections.
- Appendix D - Camas Flow Monitoring Report 2025.
- Appendix E - Hydraulic Model Update Technical Memorandum.
- Appendix F - I/I Program Reports.

- Appendix G - Local Limits Program Reports.
- Appendix H - Wastewater Treatment Plant Permits.
- Appendix I - Evaluation of the Wastewater Treatment Facility Report.
- Appendix J - Reasonable Potential Analysis Project Memorandum.
- Appendix K - Condition Assessment of Camas Wastewater Treatment Facility Project Memorandum
- Appendix L - CIP Project Sheet.
- Appendix M - Financial Backup.

1.6 SEPA and Approval Process

A SEPA Checklist has been prepared for this GSP and is presented in Appendix A. It is anticipated that this proposed GSP will not have a probable significant adverse impact on the environment and that an environmental impact statement will not be required. However, many of the projects proposed herein will require SEPA checklists and an engineering determination will be made with each individual project.

1.7 Acknowledgements

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- Jacob Taylor, Lead WWTP Operator.
- Angelica Vazquez, Lab Analyst WWTP.
- Jay Martell, Sewer Maintenance Lead.
- Alan Peters, Community Development Director.
- Debra Brooks, Financial Analyst.
- Matthew Thorup, Assistance Finance Director.

CHAPTER 2 POLICIES AND CRITERIA

2.1 Introduction

The City is responsible for managing and operating its wastewater system in accordance with all local, state, and federal regulations. To best manage the wastewater system and comply with regulations, the City has adopted wastewater system policies and criteria. These policies guide the development and financing of the infrastructure required to provide wastewater service and document the City's commitments to current wastewater system customers as well as those considering service from the City. The following sections outline the City's policies and design criteria that are relevant to sewer system planning. Existing policies are listed in Table 2.2 through Table 2.5. Proposed new policies are also listed in each table. These policies and criteria will guide the planning process throughout this GSP. Once adopted by the City, they are implemented through updates to municipal code provisions, engineering standards, and utility review processes.

The policies and criteria are organized into the following categories:

- Table 2.1 - Service Policies and Extensions.
- Table 2.2 - Environmental Stewardship.
- Table 2.3 - Design Policies and Criteria.
- Table 2.4 - Wastewater Treatment Plant Redundancy and Reliability Requirements.
- Table 2.5 - Financial Policies.
- Table 2.6 - Regulatory Requirements.
- Table 2.7 - National Pollutant Discharge Elimination System (NPDES) Influent Design Criteria and Effluent Limits.

2.2 Sewer Service

Table 2.1 summarizes the existing policies regarding the wastewater service area and extension of sewer service to new customers. The City is committed to serving customers in its sewer service area in accordance with established policies. The current sewer service area includes approximately 7,600 acres within its corporate boundaries. The future service area has been defined as the City's Urban Growth Area (UGA) and is shown in Figure 2.1.

Table 2.1 Service Policies and Extensions

Subject	Policy	Source
Service Area	Where service is available, require connection to public water for domestic and irrigation needs and connection to sewer systems. Promote connection to sewer and water before system failure of private well or septic.	Camas 2045 Comprehensive Plan Policy PFS-4.2 (Appendix C)
Service Area	The City should be the sole provider of urban services, including water and sewer, within the UGA for sewer services and the Water Service Area for water. Require all new construction to connect to City systems.	Camas 2045 Comprehensive Plan Policy PFS-4.3 (Appendix C)
Service Area	Coordinate plans for providing public utility services in UGAs and rural areas with plans for transitioning undeveloped land to urban uses.	Camas 2045 Comprehensive Plan Policy PFS-4.5 (Appendix C)
Utility Extension	Do not extend utilities without annexation or commitments for annexation. Exceptions may be made in cases where human health is threatened. In areas where utilities presently extend beyond City limits, but are within UGAs, plan development jointly with the County. A joint development must be consistent with City standards.	Camas 2045 Comprehensive Plan Policy PFS-4.5 (Appendix C)
Utility Extension	Extend public sanitary sewer service, as required, throughout urban areas. Service may be provided outside urban areas to serve areas where imminent health hazards exist.	Camas 2045 Comprehensive Plan Policy PFS-4.14 (Appendix C)
Coordination with Other Agencies	Plan public utility services so that service provision maximizes efficiency and cost effectiveness and ensures concurrency. Coordinate with other entities to provide services within the urban area.	Camas 2045 Comprehensive Plan Policy PFS-4.6 (Appendix C)
System Policies	Maintain and improve City utility systems through preventative maintenance and regular assessments and improvements to meet regulatory standards.	Camas 2045 Comprehensive Plan Policy PFS-4.1 (Appendix C)
System Ownership	The sanitary sewage disposal system of the City, including the treatment plant and all other parts of such system and all additions and improvements thereto and extensions thereof, which may be made hereafter, shall be considered as a part of and belonging to the water works utility of the City. The cost of the construction and installation of the hereinafter provided additions, improvements and extensions and the cost of maintenance and operation of such system as improved shall be charged to the water works utility of the City, and any rates and charges which may be collected hereafter for sewage disposal service shall be paid into the "water and sewer revenue fund" of the City, to be hereafter created.	CMC 13.60.010
Ownership of System - Commercial and Industrial	All STEP systems serving commercial, industrial, and other nonresidential properties shall be owned by the owner of the subject property, except for the service box at the point where the STEP system connects to the City sanitary sewer system, which shall be owned by the City. The owner shall be responsible for maintaining all components of the STEP system and its ownership and shall be responsible for pumping the STEP tank as needed and for disposing of the waste in an approved manner. The owner shall further be responsible for paying all electrical costs associated with the operation of the STEP system.	CMC 13.62.060(B)
Ownership of System - Residential	After inspection and acceptance of an installed STEP system on residential property, the City shall be the owner of all components of the STEP system with the exception of the sewer line from the structure to the tank, which shall be owned by the property owner. The City will be responsible for maintaining the components of the STEP system owned by the City, and in addition will be responsible for pumping the STEP tank and disposing of waste material when required. The owner will be responsible for maintaining the sewer line connecting the tank to the structure on the subject property. The owner will further be responsible for paying for all electrical costs associated with the operation of the STEP system.	CMC 13.62.060(A)
Construction	On and after May 1, 1949, it shall be unlawful to construct any means of sewerage or excreta disposal such as septic tanks without having first obtained a permit from the City health officer or his authorized representative.	CMC 13.60.040
Sewer Lien and Ownership	The City shall have a lien against premises to which sewer service is available for delinquent and unpaid charges for sewer services, for penalties levied pursuant to Section 13.60.050(B), for unpaid connection charges, and for unpaid sewer system development charges. All such delinquent charges shall bear interest at the rate of eight percent per annum. Such lien shall be superior to all other liens and encumbrances except general taxes and local and special assessments.	CMC 13.60.055(A)
Connections	All property owners whose property abuts a street or alley in which there is a public sanitary sewer or which is within one hundred fifty feet of a public sanitary sewer may be required to connect their ~~private drains and~~ sewers to the City sanitary sewer system at the direction of the City Engineer. Those properties which abut a street or alley in which there is a public sanitary sewer or which are located within one hundred fifty feet of a public sanitary sewer, and which are located within a designated health hazard area or which pose a threat to the general health, shall be connected to the sanitary sewer. Such connection shall be in the most direct manner possible and with a separate connection for each residence or structure.	CMC 13.60.050(A) - suggest deleting stricken text
Connections	Use traditional gravity sewer systems (in lieu of STEP systems) to serve future customers and reduce maintenance and power costs.	Camas 2045 Comprehensive Plan Policy PFS-4.15 (Appendix C)
Prohibited Connection	Prohibit construction of new private wells and subsurface sewage disposal systems in new developments.	Camas 2045 Comprehensive Plan Policy PFS-4.3 (Appendix C)

Subject	Policy	Source
Application to Connect a STEP System	Any property owner seeking to connect their property to the sanitary sewer system of the City by means of a STEP system shall file an application with the public works department on a form provided by the City. The application shall contain the name and address of the owner, the location of the property to be connected to the sanitary sewer system, the nature of the structure to be constructed on the subject property, the proposed use of the subject property, the proposed location of the STEP system, the design of the STEP system, and such other information as the public works department may require. Upon receipt of any such application, the public works director, or their authorized designee, shall review the application and grant the same if he determines that the subject property is suitable for use of a STEP sanitary sewer system, and if the design, location and other information set forth in the application comply with the standards and specifications adopted by the City for STEP systems and the criteria set forth in this chapter.	CMC 13.62.030
Installation Responsibility of a STEP system	The individual owner shall be responsible for and shall pay for the installation of the STEP/ STE system, including but not limited to, service connection per CMC 13.64.050 if required, the tank, pump apparatus, control box, electrical wiring, conduit, plumbing from the structure to the tank, plumbing from the tank to the service box, excavation and backfill material. The City shall, prior to installation, determine the appropriate size tank.	CMC 13.62.040(A)
Sewer Responsibility	Sanitary sewers shall be provided to each lot at no cost to the City and designed in accordance with City standards: ▪ Detached units shall have their own sewer service and STEP or STEF or conventional gravity system as required. ▪ Duplex units may have up to two sewer services at the discretion of the engineering and public works departments. ▪ Multifamily units shall have one sewer lateral per building. ▪ Commercial or industrial units shall have privately owned and maintained sewer systems acceptable to the City.	CMC 17.19.040(C)
Right-of-Entry Agreement	Any owner seeking to connect their property to the sanitary sewer system of the City by means of a STEP system shall be required to execute a right-of-entry agreement authorizing the City and its employees to have access to the owner's property for the purpose of maintaining and inspecting the STEP system and appurtenances thereto. Such right-of-entry agreement shall be executed upon approval of an application for a STEP system.	CMC 13.62.050
Inspection	The superintendent and other duly authorized employees of the City bearing proper credentials and identification shall be permitted to enter upon all properties for the purpose of inspecting, observing, measuring, sampling, and testing sewer connections, operations, and facilities in accordance and to ensure compliance with the provisions of this chapter. No such entry or inspection shall be made without the consent of the owner or occupant of such building or premises unless the City employee shall have obtained a search warrant, or unless exigent circumstances exist that would justify an inspection and entry without obtaining a warrant.	CMC 13.68.030
Enforcement	It shall be the duty of the City health officer or their authorized agent to enforce the provisions of Sections 13.60.020 through 13.60.110 and in the performance of this duty the health officer or his duly authorized agent is authorized to enter at any reasonable hour any premises as may be necessary in the enforcement of Sections 13.60.020 through 13.60.110.	CMC 13.60.080
FOG and Capacity	Grease, oil and sand interceptors shall be provided, when in the opinion of the superintendent, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, and other harmful ingredients, except that such interceptors shall not be required for private living quarters. All interceptors shall be of a type and capacity approved by the superintendent and shall be located as to be readily and easily accessible for cleaning and inspection.	CMC 13.68.020(H)
Private System - Flush toilet	Every residence, place of business or other building or place where persons congregate, reside or are employed and which does not abut a street or alley in which there is a public sanitary sewer shall be provided with a private water-flush toilet by the owner or agent of the premises; said water-flush toilet system to be built or rebuilt, constructed and maintained in such a manner as to meet the requirements of construction and maintenance hereinafter described.	CMC 13.60.060

Notes:
CMC - Camas Code of Ordinances; FOG - fats, oil, and grease; STE - septic tank effluent; STEF - septic tank effluent filter.

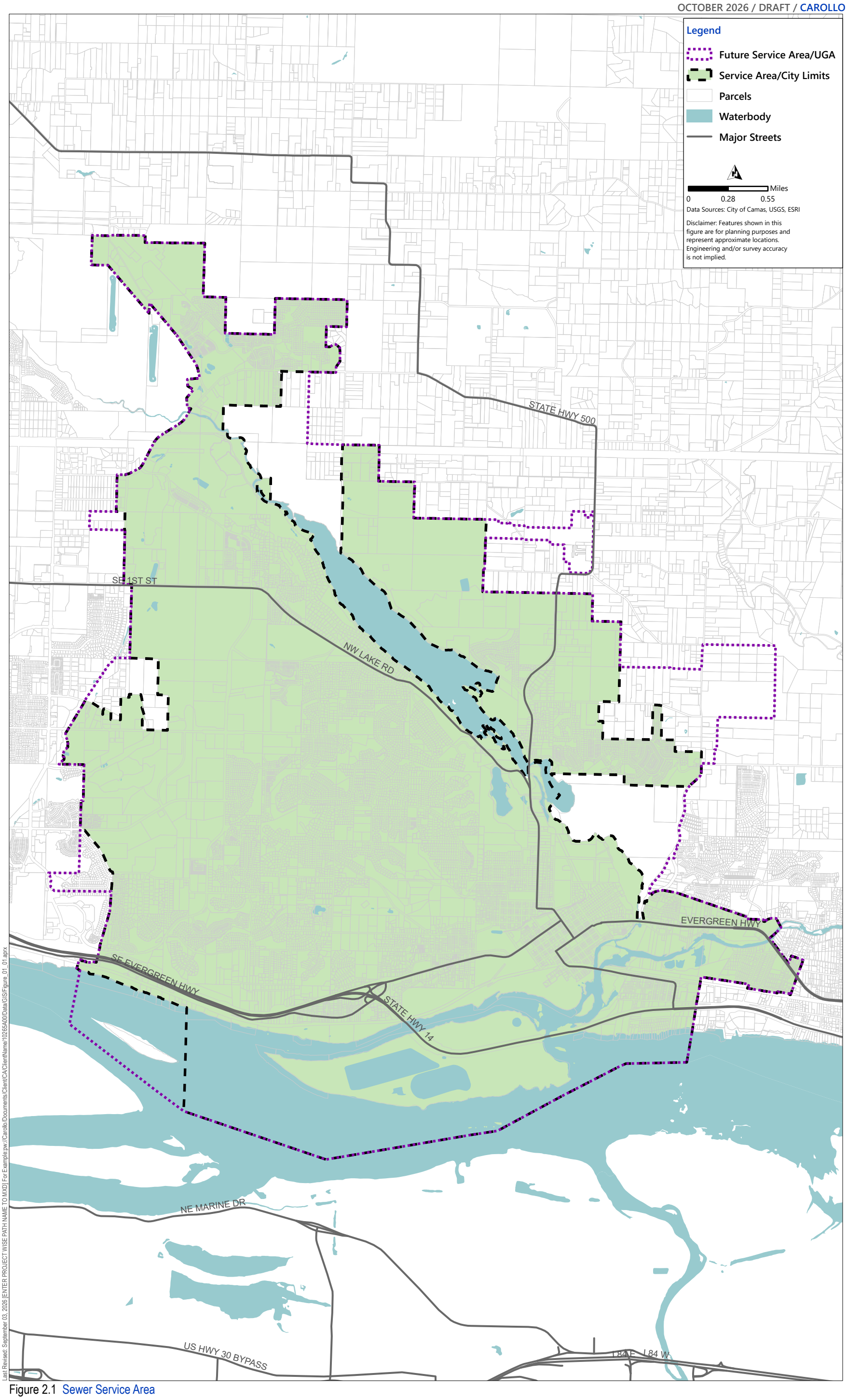


Figure 2.1 Sewer Service Area

2.2.1 Environmental Stewardship

The following section summarizes existing policies regarding environmental stewardship. Stormwater is included in the environmental stewardship because while the GSP focuses on the sanitary sewer, stormwater has a direct impact on sewer capacity, treatment efficiency, and environmental protection. Inflow and infiltration (I/I) or direct stormwater connections to the sanitary system increase flow that do not belong in the sewer, leading to capacity limitations and/or potential overflows. The inclusion of stormwater in this GSP emphasized that these flows should be managed through the stormwater system rather than the sanitary sewer, consistent with the regulatory requirements and best practices, unless otherwise stated.

Table 2.2 Environmental Stewardship Policies

Subject	Policy	Source
Minimizing Impacts of Utility Facility Siting and Operations	Minimize the effects on adjacent properties, the environment, and the visual quality of the community of siting, developing, operating, and maintaining facilities.	Camas 2045 Comprehensive Plan Policy PFS-4.29 (Appendix C)
Allowable Discharges (Stormwater)	Examples of allowable discharges include the following: ▪ Broken water mains. ▪ Diverted stream flows. ▪ Rising ground waters. ▪ Uncontaminated ground water infiltration, as defined in 40 CFR 35.2005(20). ▪ Uncontaminated pumped ground water. ▪ Foundation drains. ▪ Air conditioning condensation. ▪ Irrigation water from agricultural sources that is commingled with urban stormwater. ▪ Springs. ▪ Water from crawl space pumps. ▪ Footing drains. ▪ Flows from riparian habitats and wetlands. ▪ Discharges from emergency firefighting activities.	CMC 14.04.070
Conditional Discharges (Stormwater)	The following types of discharges shall not be considered illegal discharges for the purposes of this chapter if they meet the stated conditions, or unless the Director determines that the type of discharge, whether singly or in combination with others, is causing or is likely to cause pollution of surface water or groundwater: ▪ Potable water, including water from water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted, if necessary and in volumes and velocities controlled to prevent re-suspension of sediments in the stormwater system. ▪ Lawn watering and other irrigation runoff are permitted but shall be minimized. ▪ De-chlorinated swimming pool discharges. These discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted, if necessary and in volumes and velocities controlled to prevent re-suspension of sediments in the stormwater system. ▪ Street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents are permitted if the amount of street wash and dust control water used in minimized. At active construction sites street sweeping must be performed prior to washing the street. ▪ Non-stormwater discharges covered by another NPDES permit, provided, that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations; and provided, that written approval has been granted for any discharge to the storm drain system. ▪ Other non-stormwater discharges. The discharges shall be in compliance with the requirements of a SWPPP, reviewed and approved by the City, which addresses control of such discharges by applying AKART to prevent contaminants from entering surface or ground water.	CMC 14.04.080
Septic System Elimination (Sanitary Sewer)	Coordinate with Clark County to eliminate septic systems.	Camas 2045 Comprehensive Plan Policy PFS-4-16 (Appendix C)
Illicit Connections (Stormwater)	The following connections, both past, current, and future, to the stormwater system are expressly prohibited: ▪ The construction, use, maintenance, or continued existence of illicit connections to the storm drain system is prohibited. ▪ This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection. ▪ A person is considered to be in violation of this chapter if the person connects a line conveying sewage to the MS4 or allows such a connection to continue.	CMC 14.04.090
Wastewater Discharges (Sanitary Sewer)	Except as hereinafter provided, no person shall discharge or cause to be discharged any of the following described water or wastes to any public sewer: ▪ Any liquid or vapor having a temperature higher than 150 °F. ▪ Any water or waste which may contain more than 100 ppm by weight, of FOG. ▪ Any gasoline, benzene, naphtha, fuel oil, motor oil, lubricants or other flammable or explosive liquid, solid or gas. ▪ Any garbage that has not been properly shredded. ▪ Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch manure, or any other solid or viscous substance capable of causing obstruction to the flow in sewers or other interference with the proper operation of the sewage works. ▪ Any waters or wastes having a pH lower than 5.5 or higher than 9.0 or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the sewage works. ▪ Any waters or wastes containing a toxic or poisonous substance in sufficient quantity to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, or create any hazard in the receiving waters of the sewage treatment plant. ▪ Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant. ▪ Any noxious or malodorous gas or substance capable of creating a public nuisance.	CMC 13.68.020(C)

Notes:
°F - degrees Fahrenheit; AKART - all known, available and reasonable methods of prevention, control and treatment; CFR - Code of Federal Regulations; MS4 - Municipal Separate Storm Sewer System; ppm - parts per million; SWPP - stormwater pollution prevention plan.

2.2.2 Design Criteria and Standards

The City's wastewater system design standards, design details, specifications, and construction standards are documented in the Camas Design Standards Manual (2019) available from this City's Public Works department website. Additional design requirements and recommendations applicable to the City's sewer system are found in the Ecology *Criteria for Sewage Works Design* book, also known as the Orange Book. Current design criteria policies are outlined in Table 2.3.

The following section summarizes the existing and proposed policies regarding system design. It is recommended that the proposed new policies listed below be adopted by the City. Within this GSP, the capacity limitations of the collection system are evaluated against the proposed new design criteria policies.

Table 2.3 Design Criteria Policies

Subject	Policy	Source
Design	▪ Sewer systems shall be designed and constructed to achieve total containment of sanitary wastes and maximum exclusion of I/I. No new combined sewers will be approved.	Orange Book Section C1-1.3
Sewer location	▪ Siting of public sanitary sewer mains and MHs shall be restricted to the public right-of-way and/or easement dedicated for this utility.	Orange Book SectionC1-1.5
Design Period	▪ Service laterals shall be designed for the ultimate development of the parcel being served. ▪ Collection sewers (that is, laterals and submains) shall be designed for the ultimate development of the tributary area. ▪ Selection of the design period for trunk and interceptor sewers shall be based on an evaluation of economic, functional, and other considerations.	Orange Book Section C1-3.2
Design Flows	▪ Sewer systems shall be designed on the basis of per capita flows for the design period in conjunction with a peaking factor or approved alternative methods. ▪ Generally, the sewers shall be designed to carry at least the peak hourly flow when operating at capacity. Peak hourly flow should be the design average daily flow in conjunction with a peaking factor.	Orange Book Section C1-3.3
Lift Station Design Criteria	▪ The firm capacity of a pumping station shall be equal to or greater than the peak hourly design flow. Because mechanical and electrical equipment is typically designed for a 20-year life, it is recommended that the peak design flow be based on a 20-year forecast or greater. ▪ The number of pumps selected shall allow the station to provide the peak design flow with the largest pump out of order. ▪ The station shall be designed to remain fully operational during the 100- year flood/wave event.	Orange Book Sections C2-1.2.1 C2-1.2.3 C2-1.1
Lift Station Pump	▪ Pumps should be designed for pumping sewage and capable of passing solids at least three inches in diameter. Pump suction and discharge should be four inches or greater.	Orange Book Section C2-1.2.4
Design Storm	▪ In accordance with all applicable federal, state, and local regulations, the City should design its wastewater system facilities to adequately and reliably convey peak hour flows associated with a Design Storm event without overflowing or discharging to any water bodies. The Design Storm is defined as a 20-year interval, 24-hour storm recorded at Portland International Airport rain gauge.	2024 General Sewer Plan

Subject	Policy	Source
Emergency Back-up Power	▪ All sewage pump stations should be designed with capability for emergency power in case the primary electrical feed is out of service. A portable engine generator unit that is plugged into a pigtail at the pump station commonly provides emergency power for small pump stations. Larger pump stations should have permanent engine generator units with automatic transfer switches to transfer the electrical feed from the primary to the standby unit when a power failure is detected by the instrumentation and control system.	Orange Book Section C2-1.8.3
Surcharging	▪ The City's design criteria require the depth of flow versus the diameter of the pipe (d/D) ratio to be equal to or less than 1 during the design storm (no surcharging).	2024 General Sewer Plan
Inflow/Infiltration	▪ Future development shall be designed for a peak inflow and infiltration rate of 1,000 gpad.	Proposed New Policy

Notes:
d/D - depth versus diameter; gpad - gallons per acre per day; MH - manhole.

2.2.2.1 Wastewater Treatment Plant Design Criteria

Ecology maintains requirements for hydraulic and loading capacities as well as the redundancy of treatment processes and equipment. These requirements are presented in the Orange Book, Ecology's guidelines for WWTF design (2008) and are derived from the Federal standards developed by the United States Environmental Protection Agency (USEPA).

Ecology's criteria for designation of WWTFs are divided into three reliability classes based on the nature of their receiving water. Corresponding redundancy and reliability requirements are presented in Table 2.4 based on Ecology's guidelines and Federal standards. These requirements are the basis of the capacity analysis.

Table 2.4 Wastewater Treatment Plant Redundancy and Reliability Requirements From Washington Criteria for Sewage Works Design (Ecology, 2008)

WWTF Component	Flow Criteria	Load Requirement	Class 1 Reliability Criteria
Plant Headworks Mechanical Screens Manual Bar Rack	Pass all flows	-	A backup screen designed for mechanical or manual screening must be provided
Primary Clarifiers	PHF + Recirculation	PHDL(1)	50% of flow with largest unit out of service
Aeration Basins	MWDF	MWDL	At-least two equal volume basins shall be provided
Aeration Systems (Blowers)	-	PHDL(2)	Enable design oxygen transfer to be maintained with the largest capacity unit out of service
Aeration Systems (Diffusers)	-	PHDL(2)	Air diffuser system for each aeration basin shall be able to provide the design oxygen transfer of the system with the largest section of diffusers taken out o
Secondary Clarifiers	PHF + Recirculation	PHDL(1)	75% of flow with largest unit out of service

WWTF Component	Flow Criteria	Load Requirement	Class 1 Reliability Criteria
Effluent Filters	Pass all flows	-	-
UV Channel	PHF (Hydraulic Considerations), MDDF (For Disinfection Requirements)	-	-
Effluent Pump Station	PIDF	-	Have capacity to handle peak flow with largest capacity pump out of service
Pumps (Internal Recycle, RAS, WAS, Thickened Sludge, Digester Heat Recirculation, Centrifuge Feed, Scum, in-plant lift stations, Septage etc.)	Peak flow as for appropriate process	-	A backup pump shall be provided for each set of pumps performing the same function
Sludge Digestion and Dewatering Equipment	-	MDDL(2)	-
Major yard piping	PIDF	-	Sized for peak flows and to allow bypassing of each unit process
Power source	-	-	Sufficient to operate all vital components during peak flow conditions, together with critical lighting and ventilation
Emergency power generator	-	-	Sufficient to operate all vital components during peak flow conditions, together with critical lighting and ventilation

Notes;
(1) TSS loading only.
(2) BOD_5 loading only.
MDDF - maximum daily design flow, MDDL - maximum daily design load; MMF - maximum monthly flow; MWD - maximum week design load; MWDF - maximum week design flow; PHDF - peak hour design flow. PHDL - peak hour design load; PHF - peak hour flow; PIDF - peak instantaneous design flow; RAS - return activated sludge; UV - ultraviolet; WAS - waste activated sludge.

2.2.3 Financial Policies

The City's financial policies support the operation of the wastewater utility. A summary of financial policies applicable to the GSP are outlined in Table 2.5.

2.2.4 Regulatory Requirements

The City's criteria is developed based on federal and state statues, regulations, and permits. These laws help to determine the design criteria for the City's collection, treatment, and disposal facilities. These regulatory requirements are outlined in Table 2.6.

Table 2.5 Financial Policies

Subject	Policy	Source
Connection – Required when	▪ There is imposed upon those property owners who are within the area served by the sanitary system and who refuse to connect to such sanitary sewer system a penalty in an amount equal to the charge that would have been made for sewer service if such property had been connected to the sanitary sewer system. Such penalties as provided herein shall accrue monthly until such property is connected to the sanitary sewer system. All penalties collected pursuant to this provision shall be considered revenue of the sanitary sewer system.	CMC 13.60.050(B)
Credits	▪ Those properties that have been disconnected from the City sewer system since January 1, 1972, shall receive a credit for the prior connection. The credit for the prior connection shall be in an amount equal to the sewer system development charge for the use classification of the prior connection. The sewer system development charge imposed under this chapter shall be the difference between the amount due under the present use classification less the amount that would have been assessed under the use classification for the prior connection, provided however, that the City shall not be required to reimburse the property owner in the event the credit exceeds the sewer system development charge for the new connection.	CMC 13.72.040(A)
Credits	▪ Those properties that are not presently connected to the City's sewer system but which have been assessed and paid a monthly penalty pursuant to Section 13.60.050(B) shall receive a credit against the sewer system development charge in an amount equal to the total monthly penalties paid prior to connection, provided however, that the City shall not be required to reimburse the property owner in the event the credit exceeds the sewer system development charge for the new connection.	CMC 13.72.040(B)
Lien	▪ The city shall have a lien against premises to which sewer service is available for delinquent and unpaid charges for sewer services, for penalties levied pursuant to Section 13.60.050(B), for unpaid connection charges, and for unpaid sewer system development charges. All such delinquent charges shall bear interest at the rate of eight percent per annum. Such lien shall be superior to all other liens and encumbrances except general taxes and local and special assessments. ▪ Notice of such sewage lien shall be provided in accordance with RCW 35.67.210, and such sewage lien may be foreclosed as provided by RCW 35.67.220 through 35.67.250.	CMC 13.60.055
Violation – Penalty	▪ Any person, firm or corporation who violates or refuses or fails to comply with any of the provisions of Sections 13.60.020 through 13.60.110 shall be guilty of a misdemeanor and shall be punished by a fine of not less than 25 dollars nor more than one hundred dollars or imprisoned in the City jail for a period of thirty days or by both such fine and prison term.	CMC 13.60.090
Violation – Each day a separate offense	▪ Every person, firm or corporation shall be deemed guilty of a separate offense for each and every day during any portion of which any violation of any provisions of Sections 13.60.020 through 13.60.110 is committed, continued, or permitted by such person, firm or corporation and shall be punishable therefore as provided by Sections 13.60.020 through 13.60.110.	CMC 13.60.100
Inflow Connection	▪ There is imposed upon those property owners who are within the area served by the sanitary system and who refuse to connect to such sanitary sewer system a penalty in an amount equal to the charge that would have been made for sewer service if such property had been connected to the sanitary sewer system. Such penalties as provided herein shall accrue monthly until such property is connected to the sanitary sewer system. All penalties collected pursuant to this provision shall be considered revenue of the sanitary sewer system.	CMC 13.60.050(B)
Installation Responsibility – Inspection fee	▪ The individual owner shall be responsible for and shall pay for the installation of the STEP/STE system, including but not limited to, service connection per CMC 13.64.050 if required, the tank, pump apparatus, control box, electrical wiring, conduit, plumbing from the structure to the tank, plumbing from the tank to the service box, excavation and backfill material. The city shall, prior to installation, determine the appropriate size tank. ▪ During and at the completion of installation, the STEP/STE system shall be inspected by the city to ensure that it has been properly installed. There shall be a fee as per the fee schedule established by the city council per resolution for inspection of the STEP system, which fee shall be collected by the building department at the time the permit for connection to the municipal sewer system is issued.	CMC 13.62.040
Ownership of system	▪ Residential. After inspection and acceptance of an installed STEP system on residential property, the city shall be the owner of all components of the STEP system with the exception of the sewer line from the structure to the tank, which shall be owned by the property owner. The city will be responsible for maintaining the components of the STEP system owned by the city, and in addition will be responsible for pumping the STEP tank and disposing of waste material when required. The owner will be responsible for maintaining the sewer line connecting the tank to the structure on the subject property. The owner will further be responsible for paying for all electrical costs associated with the operation of the STEP system. ▪ Commercial and Industrial. All STEP systems serving commercial, industrial, and other nonresidential properties shall be owned by the owner of the subject property, except for the service box at the point where the STEP system connects to the city sanitary sewer system, which shall be owned by the city. The owner shall be responsible for maintaining all components of the STEP system and its ownership, and shall be responsible for pumping the STEP tank as needed and for disposing of the waste in an approved manner. The owner shall further be responsible for paying all electrical costs associated with the operation of the STEP system.	CMC 13.62.060
Sewer Service Development	▪ Pursuant to the authority conferred upon cities and towns by RCW 35.92.020 and 35.92.025, the City Council of the City finds that property owners who seek to connect property to the sewer system of the City should be assessed a charge in order that such property shall bear its equitable share of the cost of the sewer system. The council further finds that the charge should be based upon the property owner's anticipated use of the sewer system as related to the historical cost of the sewer system and the projected cost of additions to the sewer system to meet new demand. That portion of the charge based upon the historical costs of the sewer system shall be measured by the undepreciated value of the sewer system and plant in service at the time the charge is imposed. That portion of the charge based upon the projected cost of future improvements shall be based upon appropriate studies by engineers and/or financial consultants. The charge imposed by this chapter shall be denominated as a "sewer system development charge" and shall be in addition to any sewer connection or permit fees imposed by other ordinances of the City.	CMC 13.72.010
Damage to STEP	▪ The cost of repairing any damage to a STEP system which has resulted from the negligence, gross negligence, or intentional acts of the owner shall be the responsibility of the owner. This responsibility includes any clogging which may result due to improper use of the STEP system by the owner.	CMC 13.62.070
Septage users	▪ There is imposed upon customers of the city of Camas water and sewer utility who have septic tanks or chemical toilets and reside within the city limits a service charge as per the fee schedule established by the city council per resolution when waste from the septic tank or chemical toilet is dumped into the city sanitary sewer system. ▪ Septic tank waste or chemical toilet waste generated outside of the city limits of Camas may not be dumped into the city sanitary sewer system.	CMC 13.64.040
Connection Charges for STEP	▪ Except as hereinafter provided, the connection charge for connecting a STEP/STE sewer system to the Camas municipal sewer system shall be the cost of materials, the costs of labor for City personnel at then prevailing rate for such personnel, and the amount of any fees or charges required to be paid to any third parties in order to make such connection. ▪ The connection charge for connecting a STEP/STE sewer system to the Camas municipal sanitary sewer system with a one-inch service line or less shall be as per the fee schedule established by the City Council per resolution, or the actual cost to the City calculated in accordance with subsection A of this section, whichever is greater. ▪ No connection charge will be assessed if a service line has already been installed connecting the subject property to the City sanitary sewer system.	CMC 13.64.050

Subject	Policy	Source
Sewer Volume Charges	The sewer volume charges for each residential customer from November 1 through February 28 shall be based upon that customer's actual water consumption during that period. The four billing cycles between November I through February 28 shall be the customer's "four billing cycle water consumption history." The sewer volume charges for each residential unit for the remainder of the year shall be based on the average water consumption in the previous "four billing cycle water consumption history." Zero water consumption in any of the four water consumption history billing periods shall not constitute a "complete four billing cycle water consumption history." ▪ Residential customers that have a "complete four billing cycle water consumption history" as specified above shall be charged the applicable inside city or outside city monthly sewer charge and volume charge as set forth in the chart in Section 13.64.010 above. ▪ Residential customers that do not have a "complete four billing cycle water consumption history" as specified above, shall be charged the applicable inside city or outside city monthly service charge set forth in Section 13.64.010 and a volume charge equivalent to seven hundred cubic feet of water usage as the monthly sewer billing rate. ▪ Residential customers may apply for a reduction in sewer rates when, due to a qualifying leak as defined in Section 13.44.030, the sewer charge is substantially increased. The amount of the reduction shall be calculated in the same manner as a water leak credit as set forth in Section 13.44.030.	CMC 13.64.060
Sewer Service Development Charge - Credits	▪ Development Credit: » A developer (as defined in CMC 3.88.030.K) shall be entitled to a credit against the applicable system development charge for the dedication of land or for the design or engineering or construction of an "eligible improvement". For purposes of this section, an eligible improvement shall mean an improvement or real property that is: required as a condition of development approval; identified in the general sewer plan or capital improvement plan; and included in the current system development charge calculation as being funded by system development charges. » The amount of the credit shall be the dollar amount assigned to the improvement or to the land in the system development charge calculation. Where only a portion of the improvement is constructed, or a portion of the land is dedicated, the amount of the credit shall be pro-rated. » Credits earned for one category of system development charge, e.g. water, may not be applied against a different system development charge, e.g. sewer. » Approval from the city council shall be required prior to the start of construction or dedication of any eligible improvement. "Approval" in the context of this subsection (4) shall be satisfied if the city requires the construction or dedication of the eligible improvement as a condition of approval for a land use application. If a developer wishes to construct an eligible improvement that is not otherwise a condition to an approved land use application, prior approval must be obtained from the city council. » No system development charge credit shall be granted until either the eligible improvements have been designed, engineered, or constructed by the developer, and such work has been accepted by the city; or until the land has been dedicated by the developer and such dedication has been accepted by the city. » If system development charges become due and payable prior to the developer becoming eligible for the issuance of credits as provided in section (5), the developer may apply to the public works director to defer collection of the charges until construction or dedication is completed. The public works director may condition deferral upon: • The developer posting a bond or other financial security satisfactory to the city in an amount equal to one hundred twenty-five percent (125%) of the deferred system development charges, which bond or other financial security shall be conditioned upon the developer either paying the deferred system development charges or completing construction or dedication within a specified time, • The withholding of an occupancy permit, or • Such other conditions acceptable to the city. » If the developer is dissatisfied with the decision of the community development director, the developer may seek to have that decision reviewed by the city council. » Upon acceptance of the eligible improvement, the developer may submit an application for the system development charge credit to the finance department on a form to be created by the finance department. After submission of the application and verification of entitlement thereto, the finance department shall issue a credit voucher to the developer specifying the amount of the system development charge credit and the type of credit. » The credit may, at the option of the developer, be applied all or in part to the system development charges owing for the developer's project. » To the extent the credit exceeds the amount of the system development charges owed by the developer, or the developer chooses not to apply the credit to the developer's project, the unused credit may be applied to a different project of the developer or to the project of a different developer. » Before the system development charge can be transferred to a different project or a different developer, the holder of the system development charge credit shall file with the finance department an application to transfer the credit on a form to be created by the finance department. The application shall identify the transferee, and the amount of the system development charge credit being transferred. The transfer application shall be accompanied by an administrative fee in an amount as may be set by resolution of the city council. » When credits are to be redeemed, the holder of the system development charge credit shall file an application for redemption on a form to be created by the finance department. Redemption shall be permitted only in increments equal to whole system development charge, or when redemption will exhaust the entire system development charge credit. The application for redemption shall be accompanied by an administrative fee in such amount as may be set by resolution of the city council. When system development charge credits are being redeemed, such redemption shall not allow for system development charge credits to be pro-rated among more than one residential lot in amounts that are less than the existing system development charge per lot. For example, where system development charges are five thousand dollars per residential lot and a developer wishes to redeem eleven thousand dollars worth of credits, the developer shall not be allowed to apply one thousand dollars per residential lot over eleven lots. The developer may apply five thousand dollars to two residential lots and the remaining one thousand dollars to one residential lot. » The finance department shall be responsible for maintaining appropriate records documenting the issuance, transfer, and redemption of system development charge credits. » Expiration of Credits. Any credits issued after the effective date of this ordinance shall expire and become null and void ten years from the date of approval of the original credit by the city council. Transfer of credits or partial use of credits shall in no event extend the expiration date of those credits.	CMC 13.72.040
Sewer Service Development Charge – Payment of Sewer System Development Charge	▪ The sewer system development charge owing under the provisions of this chapter shall be paid by the applicant at the time of issuance of the plumbing permit or building permit, whichever shall first occur, or as scheduled by a separate agreement with the city. ▪ No sewer service shall be furnished to the property of any person seeking to connect to the sewer system of the city until the sewer system development charge imposed by this chapter has been paid to the city treasurer or until such time as the city and the applicant have entered into a separate agreement providing for the payment of such sewer system development charge.	CMC 13.72.070
Sewer Service Development Charge – Revenue Disposition	▪ All revenues collected pursuant to this chapter shall be paid into the water and sewer capital reserve fund, and shall be used for the purpose of financing system improvements. Such revenues shall not be used to offset current operation or maintenance costs.	CMC 13.72.080

Subject	Policy	Source
Sewer Service Development Charge – Appeal	▪ Any applicant aggrieved by the amount of the sewer system development charge found by the engineer to be required under the provisions of this chapter, may appeal to the board of adjustment from such finding by filing a written notice of appeal with the city clerk within twenty days from the time such property owner is given notice of such amount. The chairman of the board of adjustment shall cause a notice of the time and place of hearing to be mailed to the applicant. At such hearing, the applicant shall be entitled to be heard and to introduce evidence on his own behalf. The board of adjustment shall thereupon ascertain the correct amount of the sewer system development charge, and the city clerk shall immediately notify the appellant thereof, by mail, which amount, together with the costs of appeal, if appellant is unsuccessful therein, must be paid within ten days after such notice is given. ▪ The chairman of the board of adjustment may, by subpoena, require the attendance at any appeal of any person, and may also require him to produce any pertinent books and records. Any person served with such subpoena shall appear at the time and place therein stated, and shall produce the books and records required, if any, and shall testify truthfully under oath administered by the chairman in charge of the hearing on appeal, as to any matter required of him pertinent to the appeal, and it is unlawful for him to fail or refuse to do so.	CMC 13.72.090

Notes:
(1) Some provisions of the Camas Municipal Code are not shown in this table because they are regulatory in nature (e.g., permit requirements, violation enforcement) rather than financial policy measures. For complete information, the Camas Municipal Code is available on the City's website.

Table 2.6 Regulatory Requirements

Subject	Policy
Federal Clean Water Act Condition S1	Condition S.1 of the City's permit requires the treatment plant effluent to meet limits for BOD_5, TSS, fecal coliform bacteria, pH, and total ammonia.
Federal Clean Water Act Condition S2	Condition S.2.lists monitoring requirements including influent and effluent flow, BOD_5, TSS, pH, temperature, total ammonia, fecal coliform, priority pollutant metals, oil and grease and cyanide. A program to address oil and grease is also required. The City must monitor twice per 5 years for effluent whole effluent toxicity and conduct quarterly and yearly priority pollutant monitoring of its influent and effluent in support of its industrial pretreatment program. Additionally, per the terms of the City's coverage under the Statewide Biosolids permit, the City must annually test its biosolids for pollutants and compliance with pathogen reduction and vector attraction reduction criteria.
Federal Clean Water Act Condition S4	Condition S.4.A specifies the WWTF design capacity for maximum month BOD_5 loading is 5,616 ppd and 6,405 ppd for TSS. The peak hour flow, dry weather monthly average, and maximum month average flow capacities for the WWTF are 11.09, 2.86 and 6.10 mgd, respectively. Condition S.4.B requires the City to prepare a plan to maintain adequate capacity when flows and loadings to the WWTF exceed 85% of design capacity for 3-consecutive months.
NEPA	The NEPA was established in 1969 and requires federal agencies to determine environmental impacts on all projects requiring federal permits or funding. Federally delegated activities such as NPDES permits or Section 401 Certification are considered state actions and do not require NEPA compliance. If a project involves federal action (through, for example, an Army Corps of Engineers Section 404 permit), and is determined to be environmentally insignificant, a FONSI is issued, otherwise an Environmental Assessment or EIS would be required. NEPA is not applicable to projects that do not include a federal component.
Federal Clean Air Act	The Federal Clean Air Act requires all wastewater facilities to plan to meet the air quality limitations of the region. The City falls in the jurisdiction of the SWCAA. The SWCAA is responsible for enforcing federal, state and local outdoor air quality standards and regulations in Clark, Cowlitz, Lewis, Skamania and Wahkiakum counties of southwest Washington state. The Camas generator is permitted by SWCAA.
State Water Pollution Control Act	The intent of the state Water Pollution Control Act is to "maintain the highest possible control standards to ensure the purity of all waters of the state consistent with public health and the enjoyment…the propagation and protection of wildlife, birds, game, fish and other aquatic life, and the industrial development of the state." Under the RCW 90.48 and the WAC 173-220, Ecology issues permits for wastewater treatment facilities and land application of wastewater under WAC 173-216.
Criteria for Sewage Works Design, Ecology	Ecology has published design criteria for collection systems and wastewater treatment plants. While these criteria are not legally binding, their use is strongly encouraged by Ecology since the criteria are used by the agency to review engineering reports for upgrading wastewater treatment systems. Commonly referred to as the "Orange Book," these design criteria primarily emphasize unit processes through secondary treatment, and also includes criteria for planning and design of wastewater collection systems. Any expansion or modification of the City collection system and/or WWTF plant will require continued conformance with Ecology criteria.
Certification of Operators of Wastewater Treatment Plants, WAC 173-230	Wastewater treatment plant operators are certified by the state Water and Wastewater Operators Certification Board. The operator assigned overall responsibility for operation of a wastewater treatment plant is defined by WAC 173-230 as the "operator in responsible charge." This individual must have state certification at or above the classification rating of the plant. The City WWTF is currently assigned a Class 4 rating and the operating staff assigned to the plant have the required certification. (One of the operators has a Class 4 certification; two have Class 3 certification, and one has Class 2 certification).
Surface-Water Quality Standards (WAC 173-201A)	In the State of Washington, WAC 173-201A establishes water quality standards for surface waters based on maintaining public health, recreational use and protection of fish, shellfish, and wildlife. Table 2.4 includes surface water criteria for many toxic substances, including ammonia, residual chlorine, several heavy metals, PCBs, and pesticides.
State Environmental Policy Act	WAC 173-220 requires a statement in all wastewater comprehensive plans regarding proposed projects in compliance with the SEPA, if applicable. The capital improvements proposed in this plan will fall under SEPA regulations. A SEPA checklist is included in Appendix A of this report for use in the environmental review for the project. In most cases a DNS is issued; however, if a project will have a probable significant adverse environmental impact an EIS will be required.
Accreditation of Environmental Laboratories (WAC 173-050)	The State of Washington established a requirement that all laboratories reporting data to comply with NPDES permits must be generated by an accredited laboratory. This accreditation program establishes specific tasks for QA/QC that are intended to ensure the integrity of laboratory procedures. Accreditation requirements must be met for any on-site laboratory or outside laboratory used to analyze samples. Only accredited laboratories may be used for analyses reported for compliance with NPDES permits. In planning for an on-site laboratory, staffing must be sufficient to allow for QA/QC procedures to be performed. The Camas WWTF lab is currently accredited for determination of the following parameters TSS, BOD_5, ammonia, dissolved oxygen, pH and fecal coliform.
Minimal Standards for Solid Waste Handling (WAC 173-304)	Grit and screenings are subject to the minimal standards for solids waste handling under WAC 173-308, and their disposal is regulated under the state solid waste regulations, WAC 173-304. Waste placed in a municipal solid waste landfill must not contain free liquids, nor exhibit any of the criteria of a hazardous waste as defined by WAC 173-303. To be placed in a municipal solid waste landfill, grit, screenings, and incinerator ash must pass the paint filter test. This test determines the amount of free liquids associated within the solids, and includes the TCLP test, which determines if the waste has hazardous characteristics.
Shoreline Management Act	The Shoreline Management Act of 1971 (RCW 90.58) establishes a broad policy giving preference to shoreline uses that protect water quality and the natural environment, depend on proximity to the water, and preserve or enhance public access to the water. The Shoreline Management Act jurisdiction extends to lakes or reservoirs of 20 acres or greater, streams with a mean annual flow of 20 cfs or greater, marine waters, and an area inland 200 feet from the ordinary high-water mark. Projects are reviewed by local governments according to state guidelines and a local Shoreline Master Program. The Camas wastewater treatment plant and portions of the collection system are located within shoreline areas.

Notes:
BOD_5 - 5-day biochemical oxygen demand; cfs - cubic feet per second; DNS - determination of non-significance; FONSI - finding of no significant impact; mgd - million gallons per day; PCB - polychlorinated biphenyls; ppd - pounds per day; QA/QC - quality assurance and quality control; RCW - Revised Code of Washington; SWCAA - Southwest Clean Air Agency; TCLP - toxic characteristic leachate procedure; TSS - total suspended solids.

2.2.4.1 NPDES Permit

Table 2.7 presents a brief overview of relevant design criteria and effluent limitations contained in the City's WWTF NPDES Permit No. WA0020249. The City's current permit was issued July 1, 2025 and was effective as of August 1, 2025. This NPDES permit places limits on various water quality parameters, flow rates, and waste loading pertaining to the discharge of treated effluent from the WWTF.

Table 2.7 NPDES Influent Design Criteria and Effluent Limits

NPDES Influent Design Criteria and Effluent Limits		
NPDES Influent Design Criteria		
Parameter		**Value**
MMF		6.1 mgd
Monthly Average Dry Weather Flow		2.86 mgd
BOD_5 Max Month Loading		5,616 ppd
TSS Max Month Loading		8,011 ppd
NPDES Effluent Limits		
Parameter	**Average Monthly Limit**	**Average Weekly Limit**
BOD_5	▪ 20 mg/L ▪ 842 ppd ▪ 85% removal of influent	▪ 30 mg/L ▪ 1,264 ppd
TSS	▪ 20 mg/L ▪ 1,017 ppd ▪ 85% removal of influent	▪ 30 mg/L ▪ 1,525 ppd
Heat Load(1)	▪ 5.87 x 10^8 kcal/day	▪ N/A
Fecal Coliform Bacteria(2)	▪ 200 organisms/100 mL	▪ 400 organisms/100 mL
NH_3-N Summer(3)	▪ 20 mg/L	▪ 30 mg/L
NH_3-N Winter	▪ 7 mg/L	▪ 11 mg/L

Notes:
(1) Applicable only from June 1 – September 30.
(2) Geometric mean.
(3) Summer ammonia limits apply to the months of June through September.
kcal/day - kilocalories per day; mg/L - milligrams per liter; mL - milliliter; N/A - not applicable; NH_3-N - ammonia.

CHAPTER 3 BASIS OF PLANNING

3.1 Introduction

This chapter presents an evaluation of historical wastewater flows and loads through the City's collection system and entering the WWTF. This chapter establishes the WWTF's flow and load projections based upon planned development and future population growth through 2045.

The remainder of this Chapter is divided into four sections:

- Section 3.2 provides definitions for the wastewater flow terminology used in this chapter, as many of the terms are not commonly used outside of planning and design evaluations.
- Section 3.3 presents the collection system flow monitoring results, which are used to set a baseline for flow projections and development of the hydraulic model.
- Section 3.4 presents projected flows for the City's collection system, which are used in hydraulic modelling evaluations.
- Section 3.5 presents projected flows and loads for the WWTF, which are based on an evaluation of historical plant data. They are used in unit process capacity evaluations.

The collection system and WWTF projections were developed in conjunction with the City's *Draft 2045 Comprehensive Plan* updated and reflect the latest available land use and demographic information. While both analyses are based on the same overall growth projections, different methodologies and available data were used to develop the collection system and WWTF flow projections. The collection system was projected for both 2045 and buildout conditions, while the WWTF analysis was projected through 2045. The specific methodologies and data used to develop each projection are described in the applicable sections of this chapter.

3.2 Definitions

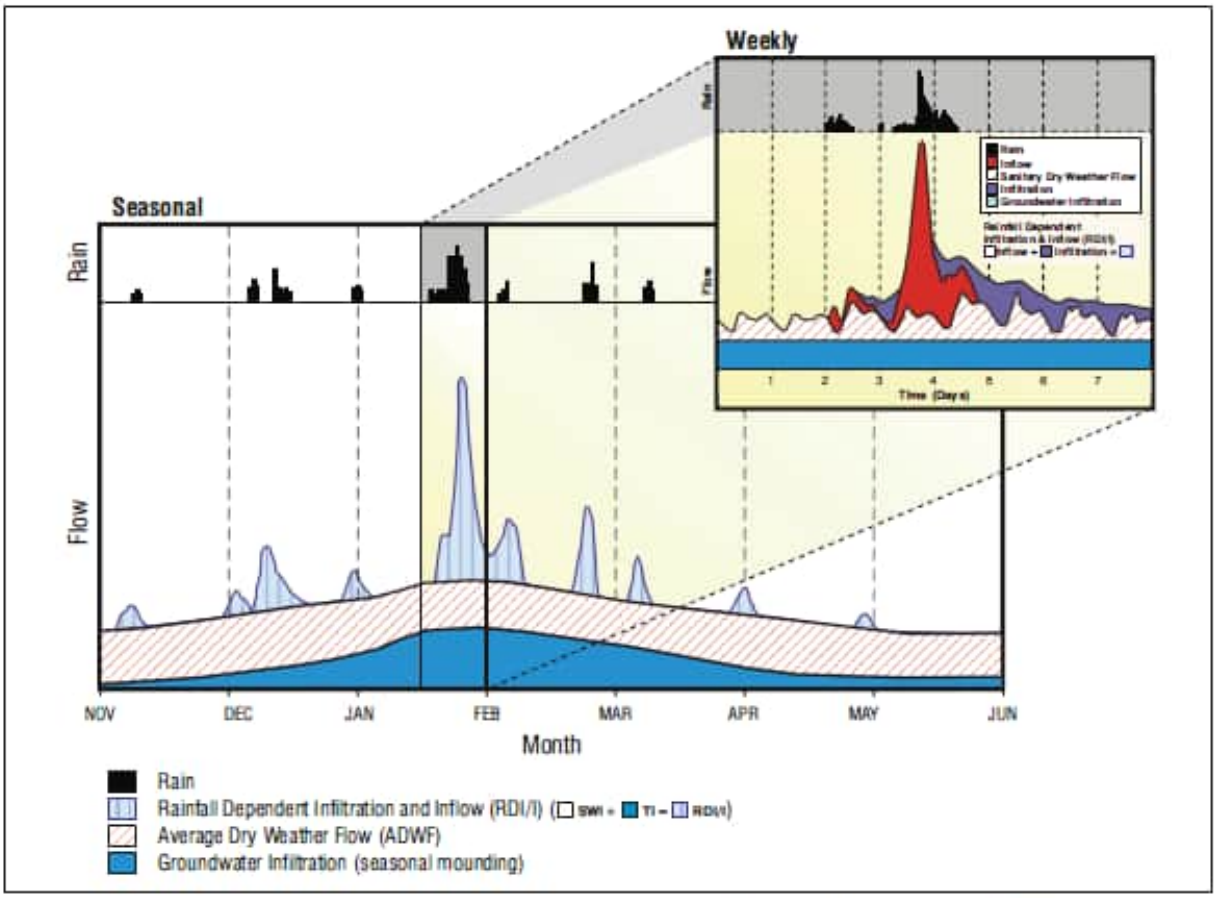
Wastewater flows are analyzed by separating dry weather flow (DWF) from wet weather flow (WWF) to establish base flows. These base flows identified during dry weather are then used as the basis to project both wet and dry weather flows. The different flow components for the sewer collection system are illustrated in Figure 3.1.

Due to the separate collection system and WWTF projections established, the following terminology was used to differentiate the various flow parameters:

- **Average Dry Weather Flow (ADWF)** establishes a similar flow parameter as influent dry weather flow (IDWF); ADWF was differentiated as it was based on a period of record for the collection system flows that differs from the IDWF.
- **Average Annual Flow/Load (AAF/AAL)** is the average flow or load that occurs over a calendar year. AAF and AAL were estimated based on the historical influent flow and concentration data from the City's WWTF.
- **Groundwater Infiltration (GWI)** in a sewer is the process where surrounding groundwater inadvertently enters into the sanitary sewer system through sewer pipes and manholes through

defects like cracks, porous joints, root intrusion, and structural failure. The ADWF used in this analysis includes both wastewater (WW) and GWI. Including the GWI component results in a higher flow basis for the projections and provides a conservative estimate of future wastewater flows.

- **Influent Dry Weather Flow (IDWF)** is the average daily flow during the two driest months of the year (July and August). The IDWF includes the base flow generated by the City's connections plus the dry weather GWI component. For the City, the IDWF was estimated throughout the service area based on the historical influent flow data from the WWTF.
- **Maximum Month Flow/Load (MMF/MML)** is the maximum 30-day running average influent flow observed at the WWTF during a calendar year. MMF and MML were estimated based on the historical influent flow and load data from the City's WWTF.
- **Peak Day Flow/Load (PDF/PDL)** is the maximum 24-hour average flow and load observed at the WWTF during a calendar year. PDF and PDL were estimated based on the historical influent flow and concentration data from the City's WWTF.
- **Peak Hour Flow (PHF)** is the highest hourly flow predicted to occur during the design storm. Rainfall derived inflow and infiltration (RDII) causes flows in the collection system to increase during wet-weather conditions. PHF is typically used for designing sewers and lift stations. Therefore, the PHF and the collection system "Design Flow" are synonymous and will be used interchangeably throughout this GSP.
- **Peak Wet Weather Flow (PWWF)** is the maximum one-minute flow rate predicted in the collection system during a wet weather event, resulting from the combination of DWF and RDII. The collection system model is simulated at one minute time steps, and PWWF represents the maximum modeled flow within one minute interval. PWWF represents the design condition used to evaluate the capacity of collection system facilities under wet weather conditions and is presented for existing and future planning scenarios. PWWF differs from PHF, which represents the highest hourly flow during the design storm.
- **Rainfall Dependent Infiltration and Inflow (RDII)** is the additional flow entering the sanitary sewer collection system as a direct result of rainfall events. RDII includes inflow, which enters the collection system quickly through direct connections such as roof drains, catch basins, and cross-connections with stormwater facilities, and infiltration, which enters more gradually through defects such as cracked pipes, faulty joints, and deteriorated manholes. RDII is added to the DWF to determine the total WWF used for capacity evaluations of collection system facilities.



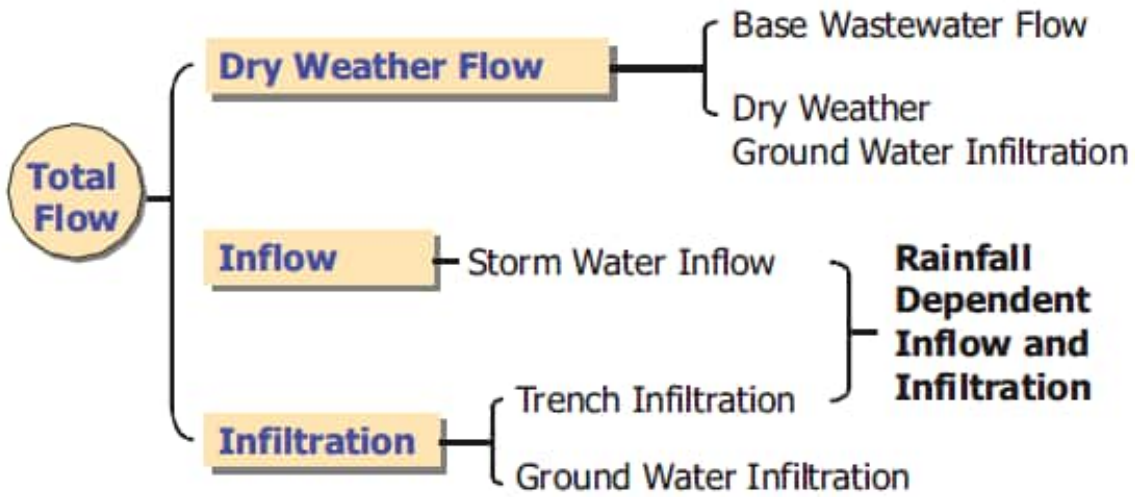


Figure 3.1 Typical Wastewater Flow Components

Note: This figure is not based on flow data specific to the City.

3.3 Collection System Flow Monitoring Results

As part of the project, ADS conducted a temporary flow monitoring program within the City's sanitary sewer collection system. The purposes of the Flow Monitoring Program were to collect data for correlating real collection system flows with the hydraulic model's predicted flows, evaluate the system's capacity, and estimate basin I/I. The temporary flow monitoring data was collected from January 15, 2025, to April 29, 2025. The "Camas Flow Monitoring Report 2025" prepared by ADS summarizes the flow monitoring program and was submitted to the City as a stand-alone report. The report is included as Appendix D.

3.3.1 Flow Monitoring Sites

Four sewer basins were monitored by ADS during the flow monitoring period, and three additional areas were evaluated using City supervisory control and data acquisition (SCADA) data. The additional areas included the STEP system, for which flows were estimated using WWTF influent data, and two North Shore areas upstream of Basin 4-1-3. Figure 3.2 provides a flow monitoring schematic showing the monitoring locations and connections between the monitored basins within the collection system. Figure 3.3 shows the flow monitoring basins. For additional information on the flow monitoring program and data analysis, see Appendix E - *Hydraulic Model Update* (Carollo, 2026).

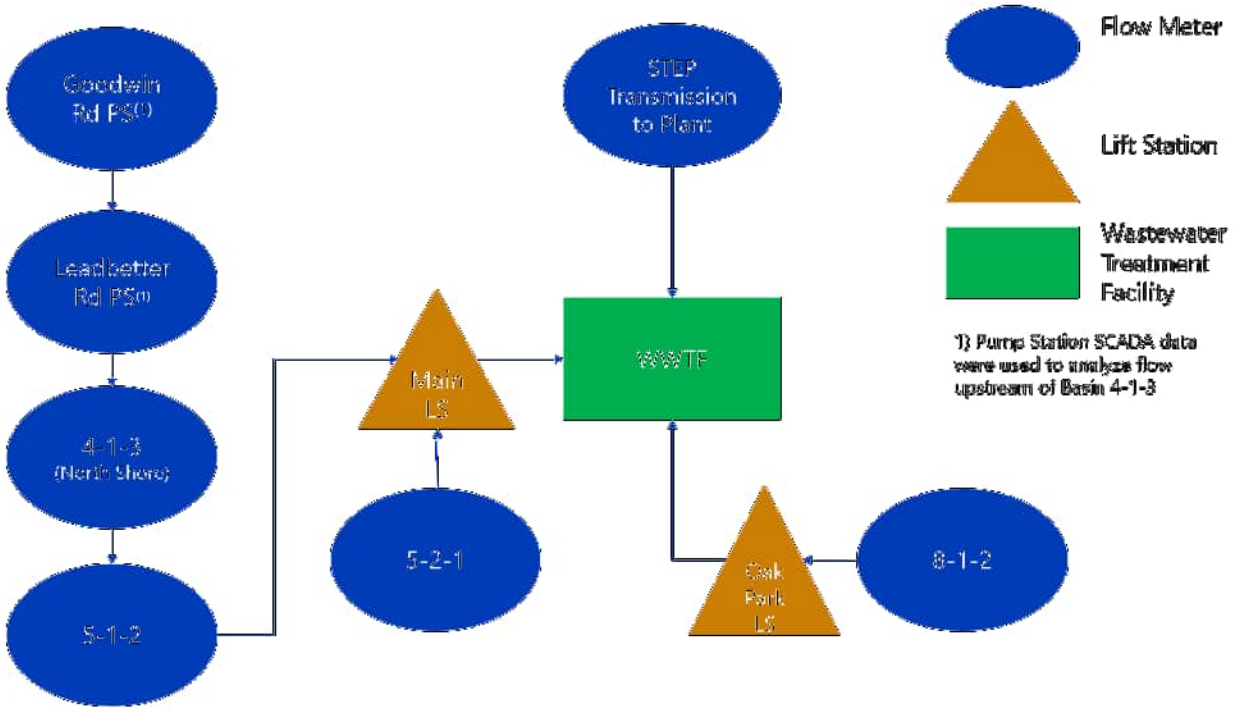


Figure 3.2 Flow Monitoring Schematic

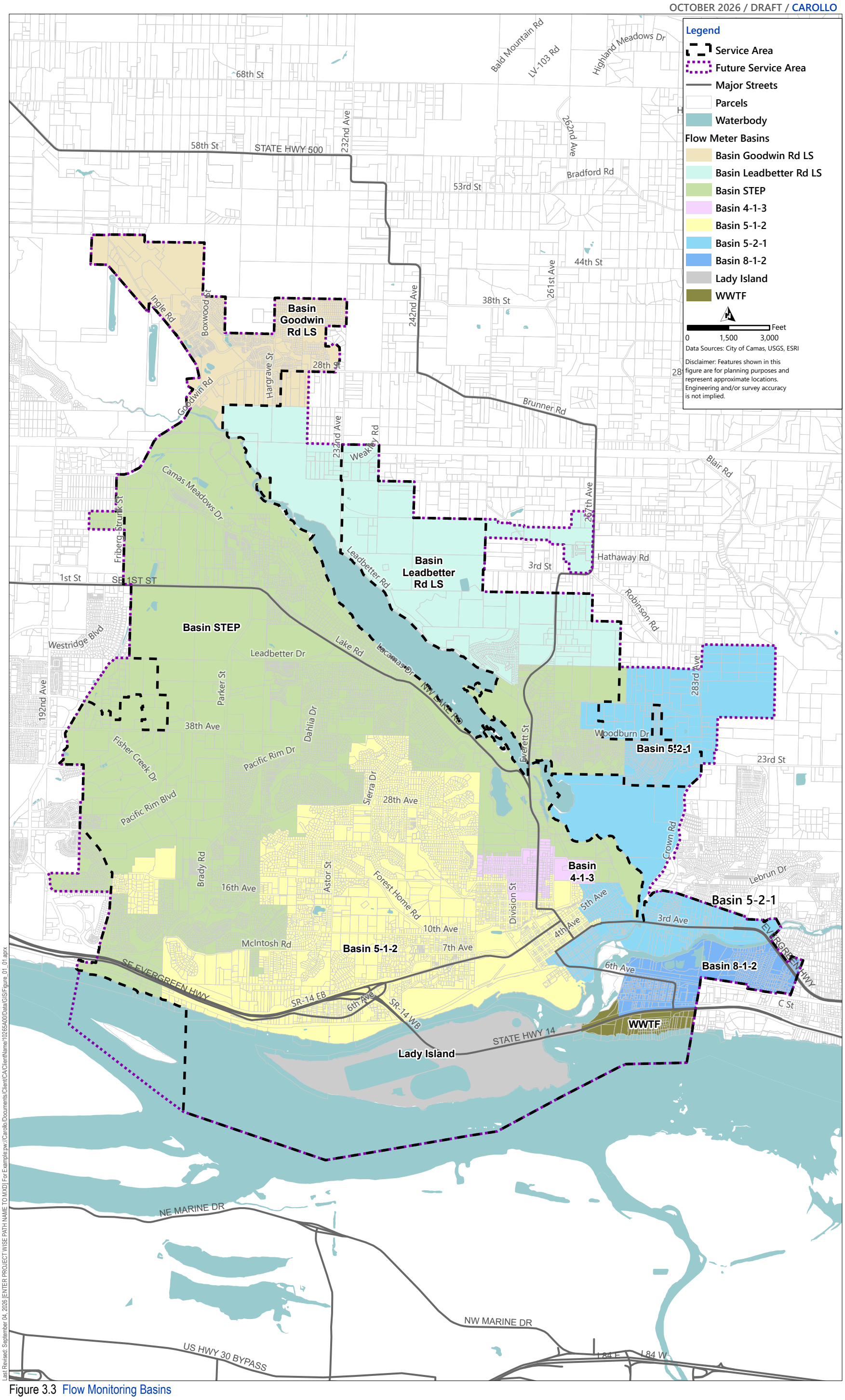


Figure 3.3 Flow Monitoring Basins

3.3.2 Average Dry Weather Flow Data

The ADWF projections are derived from land use category data and corresponding wastewater flow factors. This method assumes that areas with similar land uses, such as low-density residential parcels, produce equivalent quantities of wastewater flow on a per area basis. In this GSP, the resulting ADWF represents the base wastewater flow generated by the population and land uses within the service area. GWI is estimated separately and added to the wastewater flow for collection system modeling. System-wide flow projections can be compared with recorded flows from temporary collection system flow monitors, and WWTF influent data to evaluate reasonableness of the projections. This method of estimating base flows is consistent with the previous GSP.

3.3.2.1 ADWF Development

Existing ADWFs for each basin were estimated using data from the Camas flow monitoring report for each of the flow monitoring basins. ADWF was then developed using the dry days from the flow monitoring period based on the following set of minimum criteria, where all of the following criteria must be met:

- Less than 0.1 inch of rain in the previous day.
- Less than 0.4 inches of rain in the previous three days.
- Less than 1.0 inch of rain in the previous five days.
- In addition, those dry days that exhibited unusual flow patterns were not used to generate ADWF values for a basin.

Characteristic dry weather 24-hour diurnal flow patterns were developed for each basin from hourly data. The patterns represent the observed dry weather flow response for each basin and therefore include the combined effects of wastewater flow and GWI. GWI was considered separately during the flow estimation and modeling process; however, it was not removed from the monitored flow data prior to developing the diurnal patterns. The hourly flow data were also used to calibrate the hydraulic model to the observed DWFs during the flow monitoring period. Weekday and weekend flow patterns were developed separately to account for differences in daily flow characteristics. An example of the DWF diurnal patterns from one of the City's flow meters, Flow Meter 5-1-2 is shown in Figure 3.4. For more information regarding all of the City's flow meters, see Chapter 4 - Existing System.

Carollo calculated representative average weekday and weekend DWF levels and velocities at each monitoring site using the flow monitoring data provided by ADS. The meter data were aggregated from 15-minute to hourly intervals and used to develop representative weekday and weekend DWF patterns for model calibration. Further details on DWF development and mode calibration are provided in Appendix E - *Hydraulic Model Update* (Carollo, 2026).

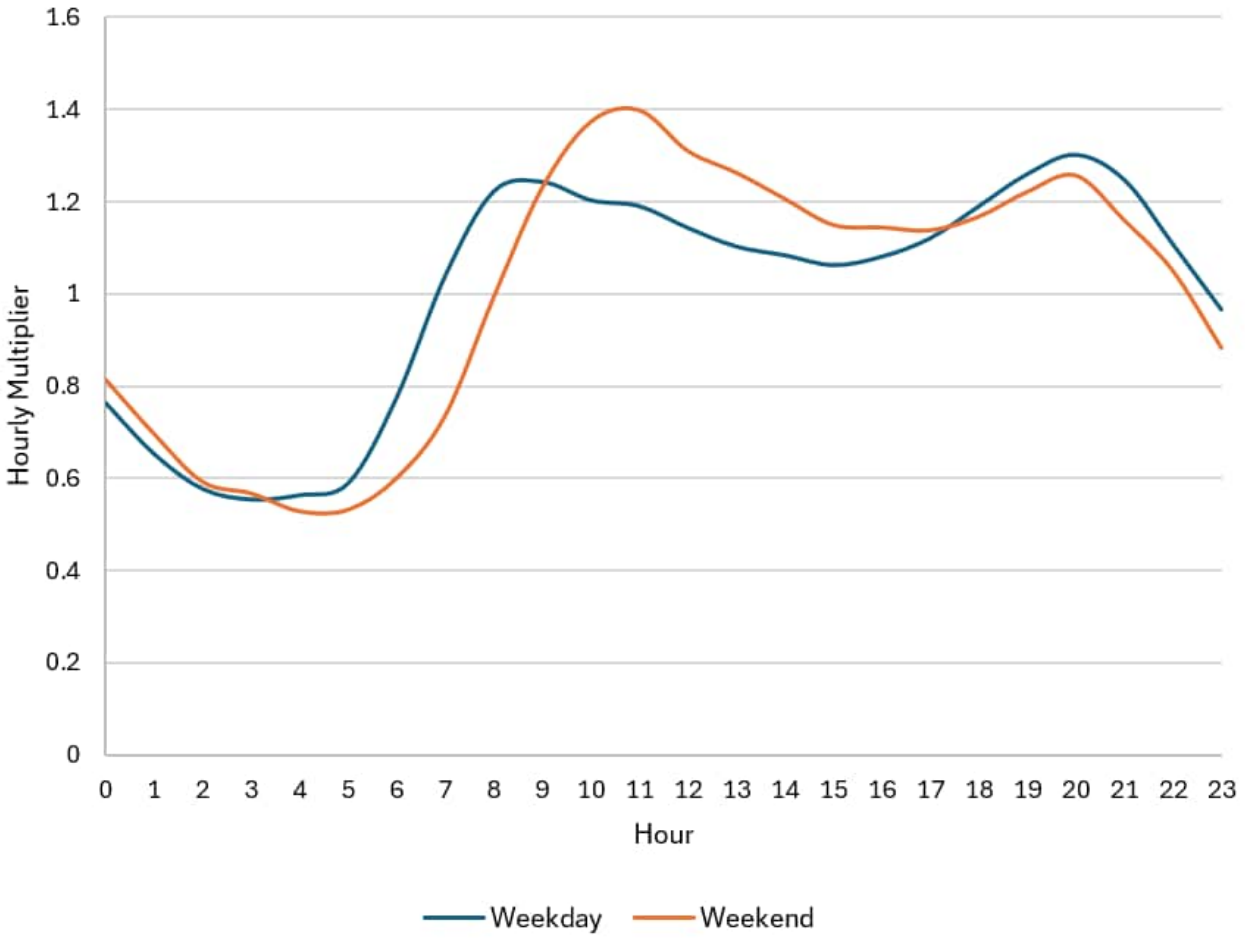


Figure 3.4 Typical Weekday vs Weekend Dry Weather Flow Variation (Meter 5-1-2)

3.3.3 Rainfall Data

An important part of the flow monitoring program was the collection and analysis of rainfall data. Rainfall events were screened based on a minimum rainfall intensity of 0.1 inches per hour within a 48-hour period. Back-to-back rainfall events were also considered to evaluated the cumulative rainfall depth and resulting I/I response in the collection system. Based on this screening, three significant rainfall events were selected for I/I analysis and hydraulic model calibration. Table 3.1 summarizes a range of events that occurred during the course of the flow monitoring period available and recorded at the ADS rain gauge for calibration. Further detail on the rainfall data and three storms used to calibrate the model can be found in Appendix E - *Hydraulic Model Update* (Carollo, 2026).

Table 3.1 Identified Storm Events

Storm Event	Start Date	End Date	Total Event Rainfall (inch)	Total 24-hour Volume (inch)	Maximum Peak Intensity (inch/hour)
1	1/31/2025	2/5/2025	0.82	0.63	0.11
2	2/14/2025	2/19/2025	1.34	1.04	0.16
3	2/21/2025	2/25/2025	2.82	1.82	0.23
4	3/2/2025	3/5/2025	0.24	0.13	0.04
5	3/12/2025	3/19/2025	2.45	1.18	0.14
6	3/20/2025	4/1/2025	2.74	1.12	0.18
7	4/5/2025	4/9/2025	1.15	0.94	0.23

3.3.4 Wet Weather Flow Data

The flow monitoring data was also evaluated to determine how the collection system responds to wet weather events. As mentioned in Section 3.3.2, the flow monitoring program captured three main rainfall events. The rainfall event that occurred on February 23, 2025, was associated with the largest RDII response during the flow monitoring period and is the most appropriate to be used for RDII analysis.

Figure 3.5 shows an example of the wet weather response at Meter 5-1-2 during the February 23, 2025, rainfall event. This figure also illustrates the volume of RDII that entered the system from the collection system upstream of Meter 5-1-2. The grey line represents the ADWF, while the green line represents the measured flow during the storm event. As can be seen in the figure, the flow increased by 5 to 10 times ADWF due to RDII entering the system during the wet weather events.

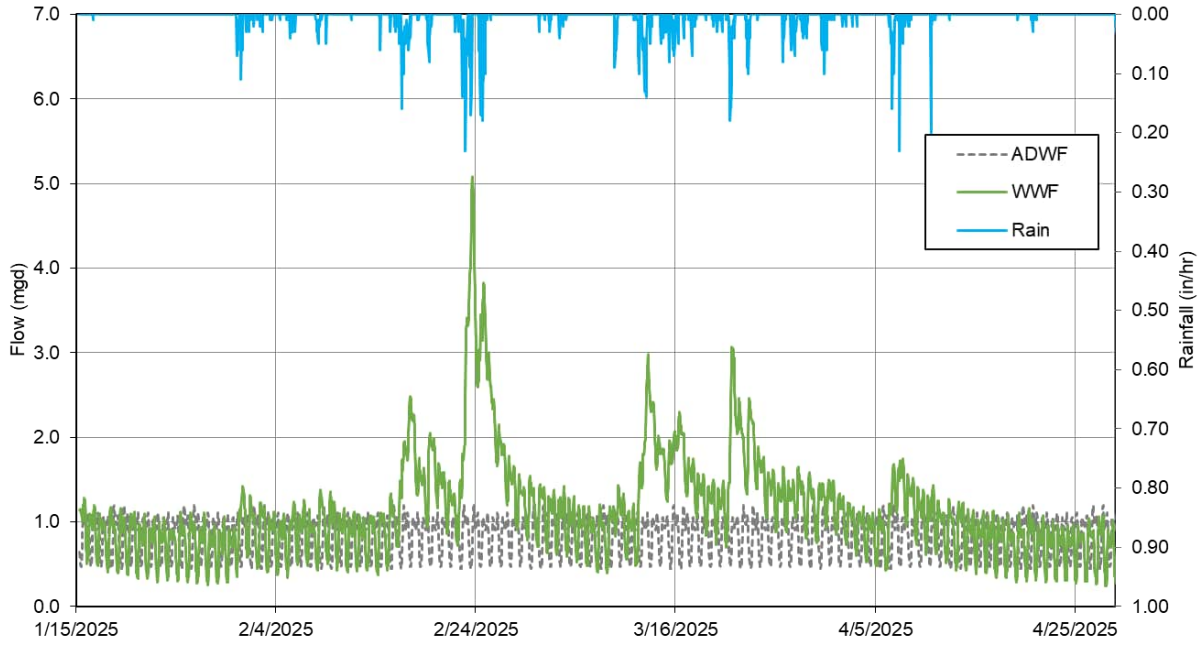


Figure 3.5 Example Wet Weather Response (Meter 5-1-2)

3.4 Collection System Flow Projections

Wastewater collection systems have several distinct flow sources based on the contributors in the service area:

1. Residential flow.
2. GWI.
3. Commercial and industrial flow.
4. RDII.

The flow from these sources have been grouped into these categories based on typical analytical procedures and the availability of information for each source. Residential flows include contributions from single family homes and multifamily units. Ecology issues discharge permits for the City's large industrial customers since the City does not have a pretreatment program in place. RDII is caused by rainfall events and includes contributions from connected impervious areas such as roof drains and catch basins (inflow), and groundwater (infiltration) leaking into the collection system. The sum of these components is the total flow through the collection system into the WWTF.

The flows throughout the collection system were estimated using the calibrated hydraulic model to predict dry and wet weather flows, as presented in Appendix E - *Hydraulic Model Update* (Carollo, 2026).

3.4.1 Sewered Population

Population projections are determined from the *Draft Comprehensive Plan 2045* which are summarized by year in Table 3.2. The *Draft Comprehensive Plan 2045* is included in Appendix C - Demographic Projections.

Table 3.2 Population Summary

Year	Population Projections	Source
2023	29,352	(1)
2026	30,421	(2)
2045	37,080	(1)

Notes:
(1) City *Draft Comprehensive Plan 2045*.
(2) Assumes a growth rate of 1.2 percent per year based on the City *Draft Comprehensive Plan 2045*.

3.4.2 Land Use

Land use designations and regulations provide important information for evaluating sewer system capacity. Existing and future land use information is an integral component in projecting wastewater generation within the service area. The type of land use in an area will affect the volume and strength of the wastewater generated. Adequately estimating the generation of wastewater from various land use types is important in sizing collection system facilities.

The City has nine land use designations for parcels within the UGA in the *Draft 2045 Comprehensive Plan*, as shown in Figure 3.6 excluding water, which are categorized into the nine GSP designations. The land use designations used in this GSP align with those in the 2024 GSP which can be related back to the Comprehensive Plan designations. Area totals for each land use category are summarized by acreage in Table 3.3.

Table 3.3 Comprehensive Plan Land Use Summary

Comprehensive Plan Designation	General Sewer Plan Designation	Total Area (acres)(1)(3)
Residential Low	Single Family High	355
	Single Family Medium	2,398
	Single Family Low	972
Residential Medium	Multi Family Low	136
Residential High	Multi Family High	403
Mixed Use/Commercial	Commercial	1,251
Mixed Employment/Industrial	Industrial	2,048
Public Facility(2)	City	34
Parks and Open Space	Park/Open Space	1,687
	Total	**9,286**

Notes:
(1) Total area within each comprehensive plan designation within the urban growth boundary.
(2) The acreage for Public Facility is based on the City's GIS data because the Comprehensive Plan does not provide acreage or land use information for this designation.
(3) Totals may not match due to rounding.
GIS - geographic information system.

Maps of the City's existing and future land use within the future service area were developed with data provided by the City's Planning Department. Existing development information was taken from zoning data, and future land use is the preferred land use from the *Draft 2045 Comprehensive Plan*. Additional details on developing flows by land use type can be found in Appendix E - *Hydraulic Model Update* (Carollo, 2026).

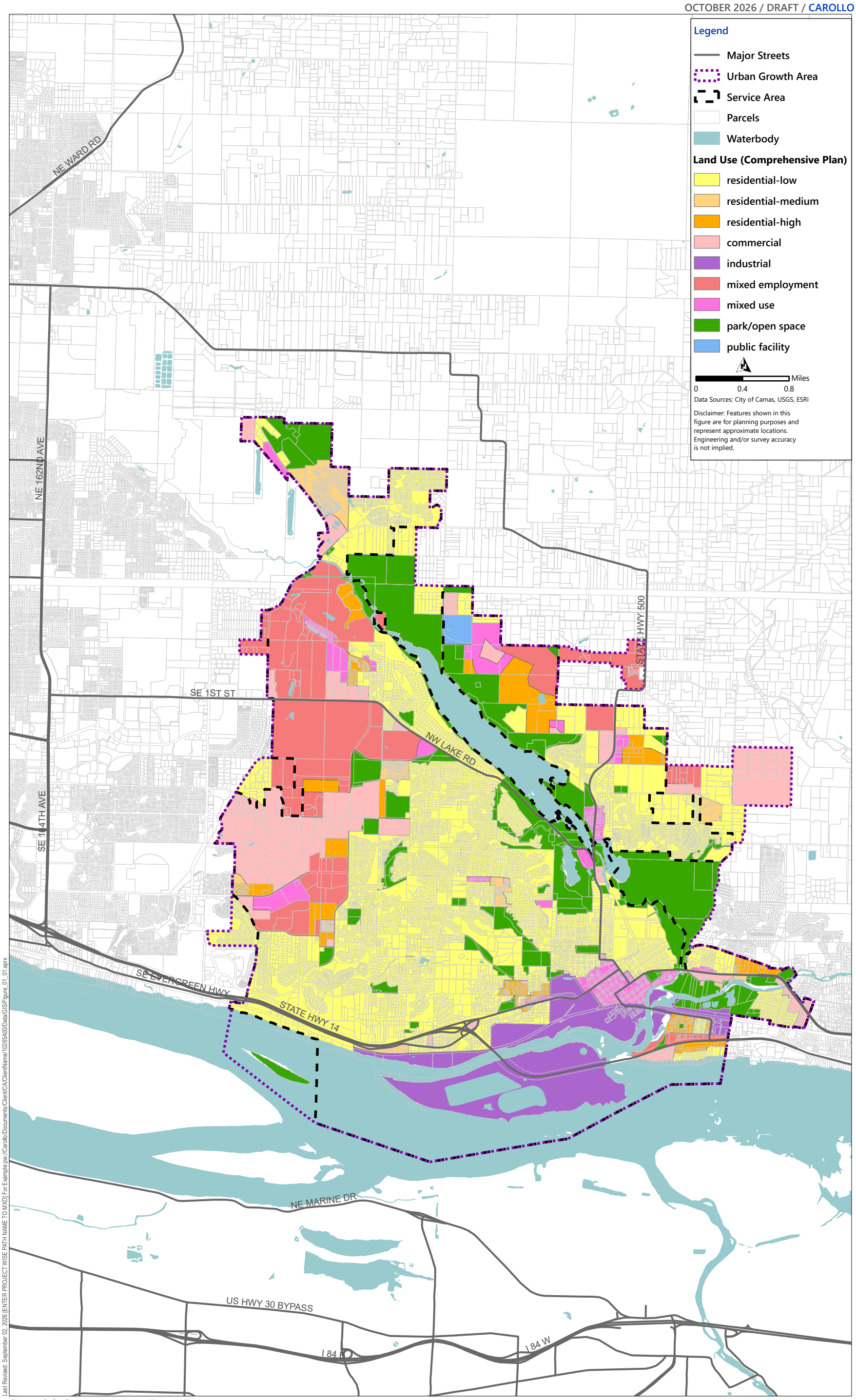


Figure 3.6 Current Land Use Based Zoning

3.4.3 Wastewater Flow Factors

In order to develop wastewater flow projections and allocate future flows to the collection system, relationships between land use and wastewater generation were developed. These relationships, called wastewater flow factors, are established based on the average wastewater flow generated for each existing land use type. The land use flow factors were established to project the estimated ADWF through future development of the City's wastewater collection system and project future flows within the Study Area boundary.

Average wastewater flow coefficients are volume rates, usually expressed in gpad, applied to either gross or net acres to calculate average day flow generated from a particular land use. A flow coefficient was developed for each of the land use classifications that were discussed previously. The flow coefficient provides a means to transform a land use category from acreage into wastewater flow. The resulting flow is then input into the appropriate sewer area in the sewer system model. Municipalities in the Pacific Northwest area, wastewater flow coefficients for residential areas typically range between 500 to 3,000 gpad, and commercial and industrial areas might range from 1,000 to 4,000 gpad, with typical values averaging approximately 1,500 gpad. Land uses designated as open space and parks are assumed to generate negligible amounts of sewage flow, and as a result have a flow coefficient of zero.

The wastewater flow coefficient developed for the City's STEP basin is lower than the typical residential flow coefficients discussed above. The STEP basin contains the majority of the City's population; however, wastewater flows from the basin are collected through a septic tank effluent pumping system rather than a conventional gravity collection system. Because there was no direct flow monitoring of the STEP basin, the basin wastewater flow was estimated by subtracting the flows measured in the other monitored basins from the total WWTF influent flow. The resulting STEP basin flow was then used to develop the basin-specific wastewater flow coefficient.

The lower coefficient is likely related to the operating characteristics of the STEP system. STEP tanks discharge wastewater through individual pumps that operate between defined pump-on and off levels. As a result, wastewater is discharged intermittently rather than a continuously, and the timing and volume of discharges are influenced by tank storage and pump cycling. The selected coefficient reflects the average wastewater flow estimated for the STEP basin and the observed operating characteristics of the STEP collection system.

3.4.3.1 Vacant Parcels

It is assumed that vacant parcels do not generate wastewater flows, therefore, are excluded from the development of wastewater flow factors. Large amounts of parcel area are only partially developed. Allowing a flow factor to represent the entire area of a parcel when the parcel is not fully developed would misrepresent flows and deflate the flow factors. For this reason, partially vacant parcels were determined through the maximum lot size for each zoning category, defined in the CMC 18.09.040. If a parcel exceeded that maximum area lot size, the area used for flow factor development was the maximum lot size of that zoning category. This assumption was performed for single family land use types and allowed for more realistic flow factors to be used.

3.4.3.2 Flow Factor Development

The coefficients are developed using the following procedure:

- Average flows for each flow metering tributary area were derived from the flow-monitoring data (see Section 4).
- The acres for each land use type contained in each flow-monitoring tributary area were calculated using GIS data.
- Preliminary coefficients for each land use type were assumed based on typical values, which can be estimated from the approximate number of dwelling units per acre, an assumed per capita wastewater generation rates, and/or the typical number of people per dwelling unit for each land use type.
- The flow factors for each meter basin were adjusted up or down (balanced) within a reasonable range (based on engineering judgment) until the calculated average flows from each basin matched what was measured during the flow monitoring period. Flow factors are developed using the field estimated ADWF excluding parks, open space, water, vacant, and the Top 2 large industrial users: Taiwan Semiconductor Manufacturing Co., also known as "TSMC" (formerly, WaferTech) and Analog Devices, Inc. (formerly known as Linear Technology, Inc.). If the flow coefficients produced average flows that were significantly different from the field measured flows, further investigation was conducted to verify that the tributary basins were delineated correctly and if the collection system configuration was correct.
- Once the flow factors for each of the five meters basins were balanced, a weighted average of the flow factors for each land use type was calculated based on the acreage contribution from each basin. The weighted average flow factors for each land use type represent wastewater generation by land use for the City as a whole and are used to project future wastewater flows.
- If the projected flow factor for an area is lower than its existing flow factor, the existing flow factor will be used to maintain a conservative estimate.

For example, flow meter 8-1-2 ADWF during the flow-monitoring period was approximately 0.12 mgd. The tributary service area upstream of this flow meter is developed with buildings falling into a variety of zoning categories, including commercial, industrial, multi-family high, and single-family medium. The preliminary flow factors were multiplied by the acreages for each land use designation and adjusted until the flows equaled 0.12 mgd. This process was repeated for each flow meter basin, and weighted flow factors were calculated for each land use category. The resulting basin-specific flow factors and system-wide weighted average flow factors are presented in Section 3.4.3.3.

3.4.3.3 Existing and Future Flow Factors

The existing wastewater flow factors developed for each flow monitoring basin are presented and each land use type is presented in Table 3.4. Column 2 of Table 3.4 presents the system-wide weighted average flow factors. For more information regarding the City's flow monitoring program, see Appendix E - *Hydraulic Model Update* (Carollo 2026).

Table 3.4 Basin-Specific Flow Factors by Land Use Classification Summary (in gpad)

Land Use Type(1)	Average(2)	Basin 5-2-1	Basin 8-1-2	Basin 5-1-2	Basin 4-1-3(3)	Basin STEP
Single Family Low	270	530	N/A	220	520	175
Single Family Medium	380	600	510	320	610	180
Single Family High	620	720	N/A	400	700	190
Multi-Family Low	730	770	N/A	610	800	220
Multi-Family High	750	800	800	700	800	250
Commercial	780	900	790	700	800	250
Industrial	800	950	800	800	800	150
City	700	N/A	N/A	N/A	700	N/A

Notes:
(1) Land use types such as open space, water, parks, and vacant lots are not included in this table as they are assumed to contribute zero flows.
(2) Weighted average flow factors exclude the STEP/WWTF, since this basin operates differently from the rest of the system and represents a septic tank effluent pumping basin rather than a gravity basin. This weighted average flow factors were used to project future flows.
(3) The Goodwin Road LS and Leadbetter Road LS basins were originally included within Basin 4-1-3 during development of the DWF calibration flow factors. As a result, separate DWF flow factors were not developed for these upstream basins after the original Basin 4-1-3 area was subdivided. Instead, the calibrated Basin 4-1-3 flow factors were applied to both the Leadbetter Road LS and Goodwin Road LS basins. The original Basin 4-1-3 area was later divided into three separate basins to better represent the significant upstream inflows identified in the ADS flow monitoring data, and SCADA data from the Leadbetter Road LS and Goodwin Road LS was used to redistribute flows during the wet weather event calibration.
(4) Land Use types shown as zero indicate that those land use categories were not present within the basin.
LS - lift station.

Land uses designated as open space and parks are not shown in Table 3.3 because they are assumed to generate negligible wastewater flow and therefore have a flow factor of zero. Table 3.3 summarizes the wastewater flow factors used to project dry weather flow. The weighted average flow factors shown in the table exclude the Basin STEP because it operates differently from the City's gravity collection system. The exclusion is due to the Basin STEP operating differently since solids are stored on-site and only the liquid effluent is pumped into the City's sewer system.

Basin-specific wastewater flow factors were applied to existing developed land use areas to estimate existing ADWF. For future conditions, the system-wide weighted average flow factors were applied to projected future land use areas to estimate future ADWF. Using the weighted average factors for future projections reflect wastewater generation patterns across the City as a whole, while the basin-specific factors better represent existing conditions within each monitored basin.

3.4.4 Industrial Customer Flows

The City currently has two major industrial customers which must submit industrial discharge monitoring reports to Ecology for various flows, constituents, and characteristics as a condition of their discharge permits. The collective AAF from these contributors is 0.97 mgd with a PDF of 1.1 mgd as shown in Table 3.5. These flows can represent a large portion of influent flows for the WWTF. Flow data was taken from Ecology's Permitting and Reporting Information System (PARIS) data from 2022 to 2025, as reported to and recorded on Ecology's Water Quality Permitting and Reporting Information System.

Table 3.5 Industrial Customer Flows

Industry	MDF (gpd)	PDF (gpd)	AAF (gpd)
TSMC Washington (formerly known Wafertech Industries)(1)	669,774	756,000	688,249
Analog Devices(2)	229,296	368,452	278,222
All Flows	**889,070**	**1,124,452**	**966,471**

Notes:
(1) Flows shown are data from 2025.
(2) Flows shown are data from 2024.
gpd - gallons per day; MDF - minimum daily flow.

Table 3.6 presents the projected flows for the existing, 2045, and buildout conditions. Flows for the two largest water users were estimated using their historical water consumption data and the medium growth projections. The projected water use was multiplied by 95 percent to account for the assumed water-to-sewer return ratio.

Table 3.6 Industrial Customer Projected Flows

Industry	Existing (mgd)	2045 (mgd)	Buildout (mgd)
TSMC Washington (formerly known Wafertech Industries)	0.739	0.884	1.058
Analog Devices	0.249	0.293	0.317
All Flows			

Notes:
(1) Projected sewer flows for the two largest users were developed using historical water consumption data and the medium projected growth scenario, which represents the average of the low and high projected growth scenarios.

3.4.5 Hydraulic Model Dry Weather Flow Projections

Developing an accurate estimate of the future quantity of wastewater generated at buildout of the collection system is an important step in sizing sewer system facilities for future scenarios. Wastewater flow factors, described in Section 3.4.3, and projected developed acreage for each planning period were used to develop wastewater flow projections based on future land use. The projected developed acreage was determined using the City's GIS development map to identify parcels that are currently under development, planned for development, or identified for future development. Parcels identified for development within the City limits were assumed to be developed by 2045 and were included in the corresponding planning period acreage. For buildout conditions beyond 2045, all parcels within the UGA were assumed to be developed and connected to the sewer system. Table 3.7 outlines the projected ADWFs for each flow monitoring basin for current, 2045, and buildout conditions. Figure 3.7 shows parcels and its projected planning growth between existing, 2045, and buildout conditions.

Table 3.7 ADWF for Hydraulic Modelling

Flow Meter Basin	Existing ADWF (mgd)	Projected 2045 ADWF (mgd)	Projected Buildout ADWF (mgd)
5-1-2	0.62	0.86	1.06
5-2-1	0.20	0.44	0.53
4-1-3	0.07	0.07	0.07
8-1-2	0.11	0.11	0.15
WWTF/STEP	1.70	3.00	4.39
Leadbetter Road LS	0.04	0.68	1.02
Goodwin Road LS	0.10	0.17	0.33
Total(1)	**2.85**	**5.32**	**7.55**

Notes:
(1) Totals may not sum due to rounding.

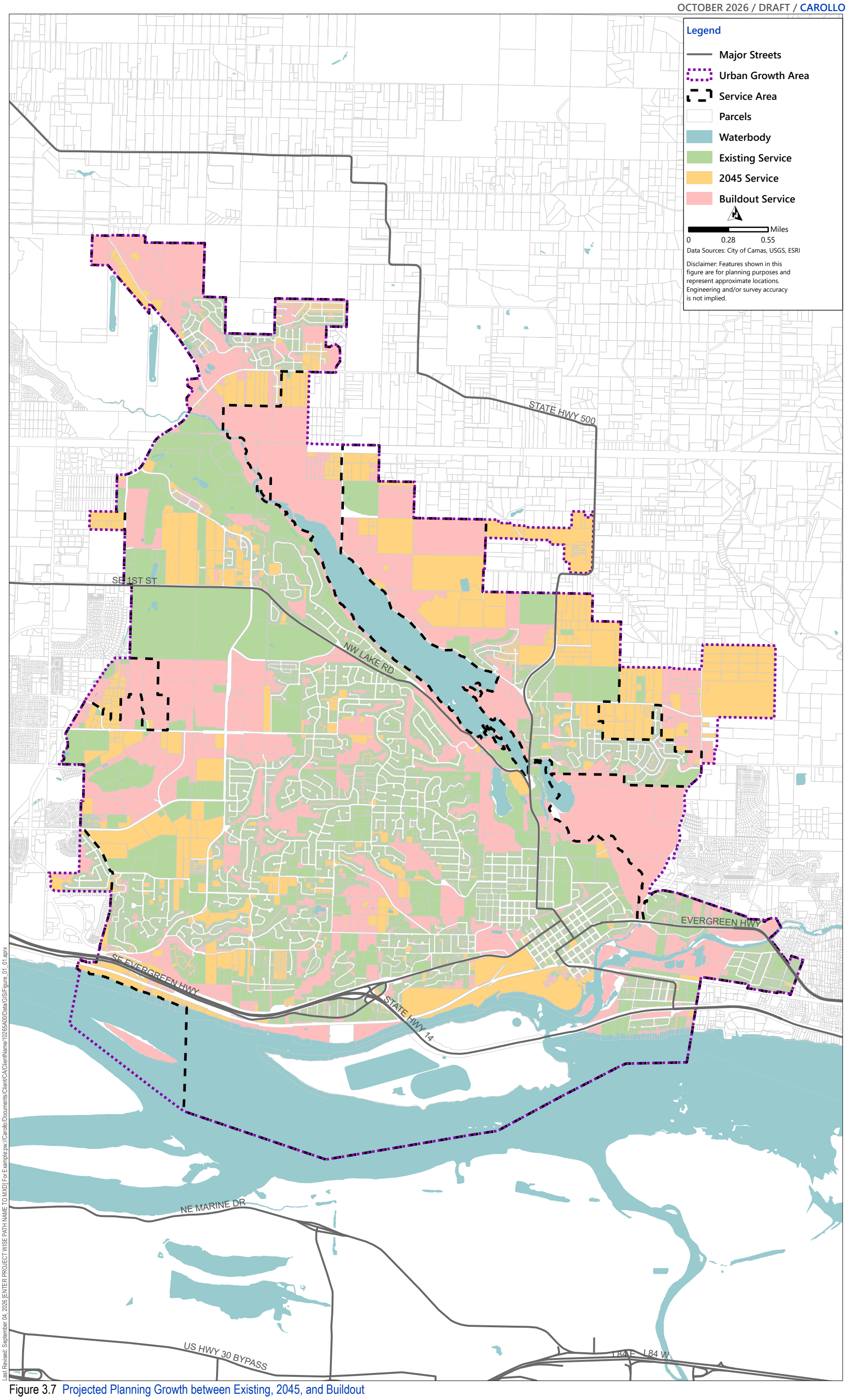


Figure 3.7 Projected Planning Growth between Existing, 2045, and Buildout

3.4.6 Design Storm

Design storms are rainfall events used to analyze the performance of a collection system during peak flows and volumes and have a specific recurrence interval and rainfall duration. The design storm is used for sizing projects. The National Oceanic and Atmospheric Administration (NOAA) publishes isopluvial (rainfall contour) maps[1] that approximate the total rainfall depth for a range of storm size recurrence intervals for standardized storm durations.

The first step in the development or selection of the design storm is to define its recurrence interval and rainfall duration. The recurrence interval is based on the probability that a given rainfall event will occur or be exceeded in any given year. For example, a "100-year storm" means there is a 1 in 100 chance that a storm as large as, or larger, than this event will occur at a specific location in any year. Duration is the length of time in which rainfall occurs.

Discrete storm events are defined as rainfall events separated by a minimum of 48 hours with no precipitation. A 20-year recurrence interval is recommended to match the pump station life cycle sizing in Ecology's Criteria for Sewage Works Design book (Orange Book); therefore, the collection system must also be able to convey a 20-year storm.

The NOAA information is based on older rainfall data and does not provide a hydrograph corresponding to the accumulated rainfall. To identify a suitable storm hydrograph, a statistical analysis of historical rainfall recorded by the City and nearby gauges were conducted. Approximately 20 years of rainfall records from the City's HYDRA Rainfall Network and 60 years of records from Portland International Airport were reviewed to identify a representative historical storm. The December 7, 2015, storm was selected because its rainfall pattern and 24-hour rainfall depth of 3.37 inches provided a reasonable match to the 10-year design rainfall identified by NOAA and was consistent with rainfall records from other regional gauges. Therefore, the December 7, 2015, rainfall pattern was used to develop the 10-year design storm hydrograph shown in Figure 3.8.

[1] Miller, J., R. Frederick, and R, Tracey. Precipitation-Frequency Atlas of the Western United States, Volume IX-Washington. Washington DC, NOAA 1973.

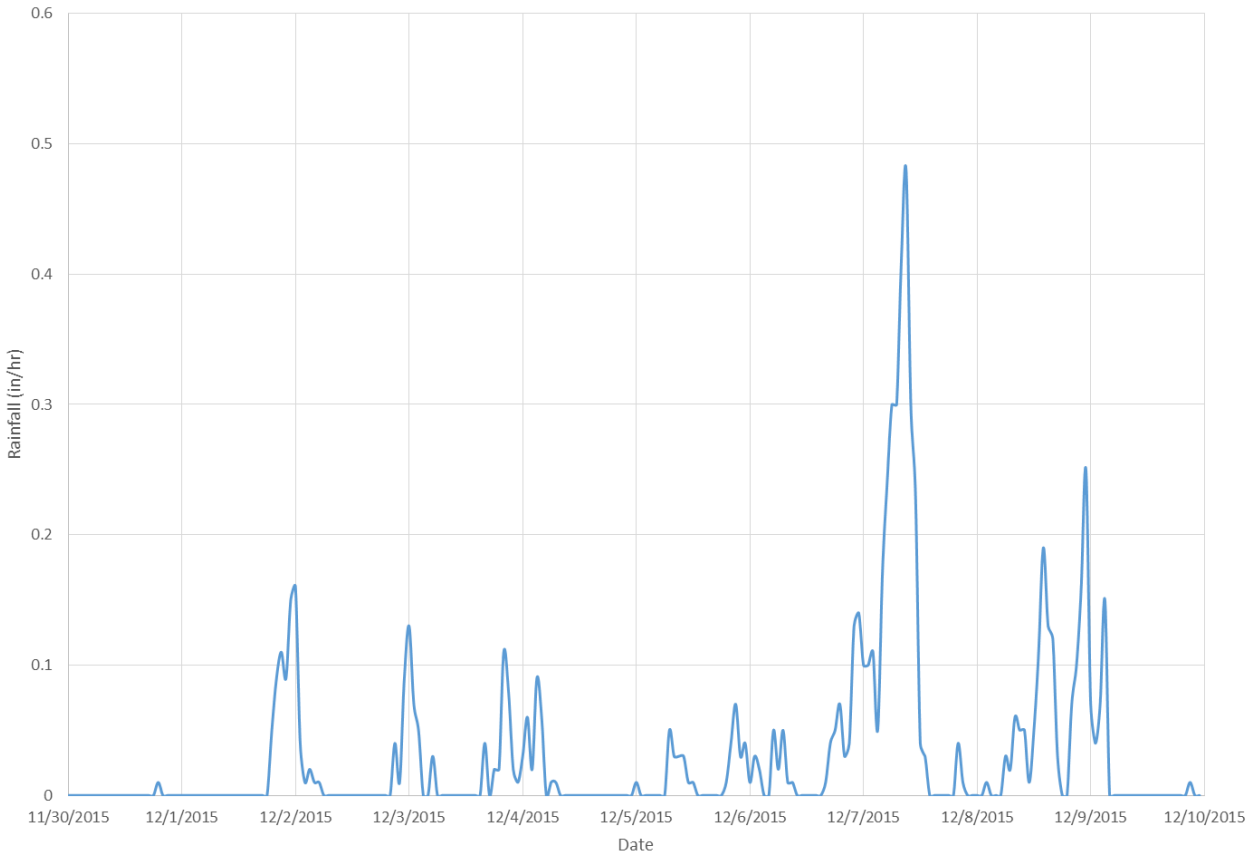


Figure 3.8 Design Storm Hyetograph

3.4.7 Hydraulic Model Wet Weather Flow Projections

The existing STEP Basin flow was estimated using WWTF influent flow data because the basin was not directly monitored. The estimated STEP Basin flow was calculated by subtracting the combined flow measured at the gravity flow monitoring meters from the total flow measured at the WWTF. This estimated flow was used to represent the STEP Basin contribution in the model.

To project future PWWF, I/I within the future service area was defined. No increase in I/I was assumed within the existing service area that are currently sewered parcels, based on the assumption that ongoing maintenance will offset system degradation over time. For future system conditions, additional undeveloped areas within the Urban Growth Boundary, including the Basin WWTF/STEP area and North Shore area were added to the model and assumed to contribute additional I/I to the system. These growth areas were assigned the calibrated I/I parameters from Basin 8-1-2, because Basin 8-1-2 exhibits a relatively low I/I response characteristic of newer infrastructure. This corresponded to an I/I flow rate of approximately 2,000 gpad.

Table 3.8 summarizes the projected PWWF's for each flow monitoring basin under existing, 2045, and buildout conditions. To evaluate the system's unconstrained peak flows, upstream pipes and pump stations were significantly upsized in the model to eliminate hydraulic restrictions; therefore, this is not equal to the actual peak influent flows to the WWTF.

Table 3.8 PWWF Flow Projections for Hydraulic Modelling

Flow Meter Basin	Existing PWWF (mgd)	2045 PWWF (mgd)	Buildout PWWF (mgd)
5-1-2	15.9	17.9	19.4
5-2-1	0.6	1.5	1.7
4-1-3	5.5	7.3	8.3
8-1-2	0.3	0.3	0.4
WWTF(2)	22.9	26.8	35.2
STEP(2)	6.1	7.1	13.7
Leadbetter Road LS	1.1	3.1	4.1
Goodwin Road LS	0.4	0.7	1.3

Notes:
(1) Flows shown are gross peak wet weather flow.
(2) WWTF flows represent measured influent flow at the wastewater treatment facility. STEP Basin flows were estimated by subtracting the combined flows measured at the gravity flow monitoring meters from the total WWTF influent flow.

3.4.8 Hydraulic Model Flow Projections Summary

Table 3.9 presents the total projected ADWF and PWWF for the three planning periods for the modeled portion of the system (gravity and STEP areas upstream of the gravity system). The table also includes the ratio of PWWF to ADWF, referred to as the peaking factor. The peaking factor decreases from 8.04 under existing conditions to 5.04 in 2045 and 4.67 at buildout. This decrease is primarily a result of wastewater flows increasing with projected growth while existing system I/I was held constant. No increase in I/I was assumed for the existing sewered area, based on the assumption that the City's ongoing annual maintenance program will help offset system degradation over time. Note that the flows presented in Table 3.9 are unconstrained flow which represent the maximum flow to the WWTF if all capacity deficiencies are addressed and bottlenecks are removed.

Table 3.9 Flow Projections Summary

Planning Horizon	ADWF (mgd)	PWWF (mgd)	Peaking Factor (PWWF:ADWF)
2025	2.85(1)	22.9	8.04
2045	5.32	26.8	5.04
Buildout	7.55	35.2	4.67

Notes:
(1) The ADWF value shown for 2025 represents ADWF during the flow monitoring period used for the hydraulic model calibration, not the historical dry weather influent flow to the treatment plant of 2.5 mgd.

3.5 Wastewater Treatment Facility Flow and Load Projections

The City's WWTF receives flows from the gravity collection system, septic tank effluent from the City's STEP system, and the septage receiving station.

The WWTF uses different flow parameters for designing and evaluating wastewater process capacity. The influent flow projections developed for the WWTF are consistent with the collection system flow projections and are summarized in Table 3.10. The 2045 PHF projection was developed by multiplying the

projected PDF of 19.3 mgd by a diurnal peaking factor of 3.6 recorded during a peak flow event in January 2024. This peaking factor is based on historical influent flow data and differs from the one presented in Table 3.9 which is a theoretical unconstrained flow.

Table 3.10 WWTF Influent Flow Projection

Flow Parameter	2025 Flow (mgd)	2045 Flow (mgd)
AAF	2.9	5.4
MMF	4.0	7.5
MDF	5.7	10.7
PHF	10.8	20.4
PIDF	11.8	22.2

Wastewater loading data is important for sizing several critical treatment processes. The wastewater loading components of principal interest are the BOD_5, the TSS, and total Kjeldahl nitrogen (TKN). Influent loading projections were developed based on historical influent flows and raw wastewater pollutant concentrations, typical septage and STEP system characteristics, population growth projections and industrial flow contributions. Historical values for BOD_5, TSS, and ammonia (NH_3) and projections to 2045 are detailed in Table 3.11 and Figure 3.9.

Table 3.11 Current and Projected WWTF Loads

Load Parameter	2025 Influent Load (ppd)	2045 Influent Load (ppd)
Sewered Population	30,056(1)	37,080(2)
BOD_5 (ppd)		
Average Annual	3,200	6,000
Maximum Month	4,000	7,500
Maximum Week	4,500	8,500
TSS (ppd)		
Average Annual	3,100	5,800
Maximum Month	3,900	7,300
Maximum Week	4,300	8,100
TKN (ppd) (3)		
Average Annual	1,300	2,500
Maximum Month	1,500	2,800
Maximum Week	1,600	3,000

Notes:
(1) Assuming a growth rate of 1.2 percent per year based on the Camas 2045 Comprehensive Plan.
(2) Sewered population is based on the Camas 2045 Comprehensive Plan.
(3) Influent TKN concentrations are not monitored by the WWTF. Influent TKN values were estimated, assuming an average ratio of NH_3:TKN of 0.7.

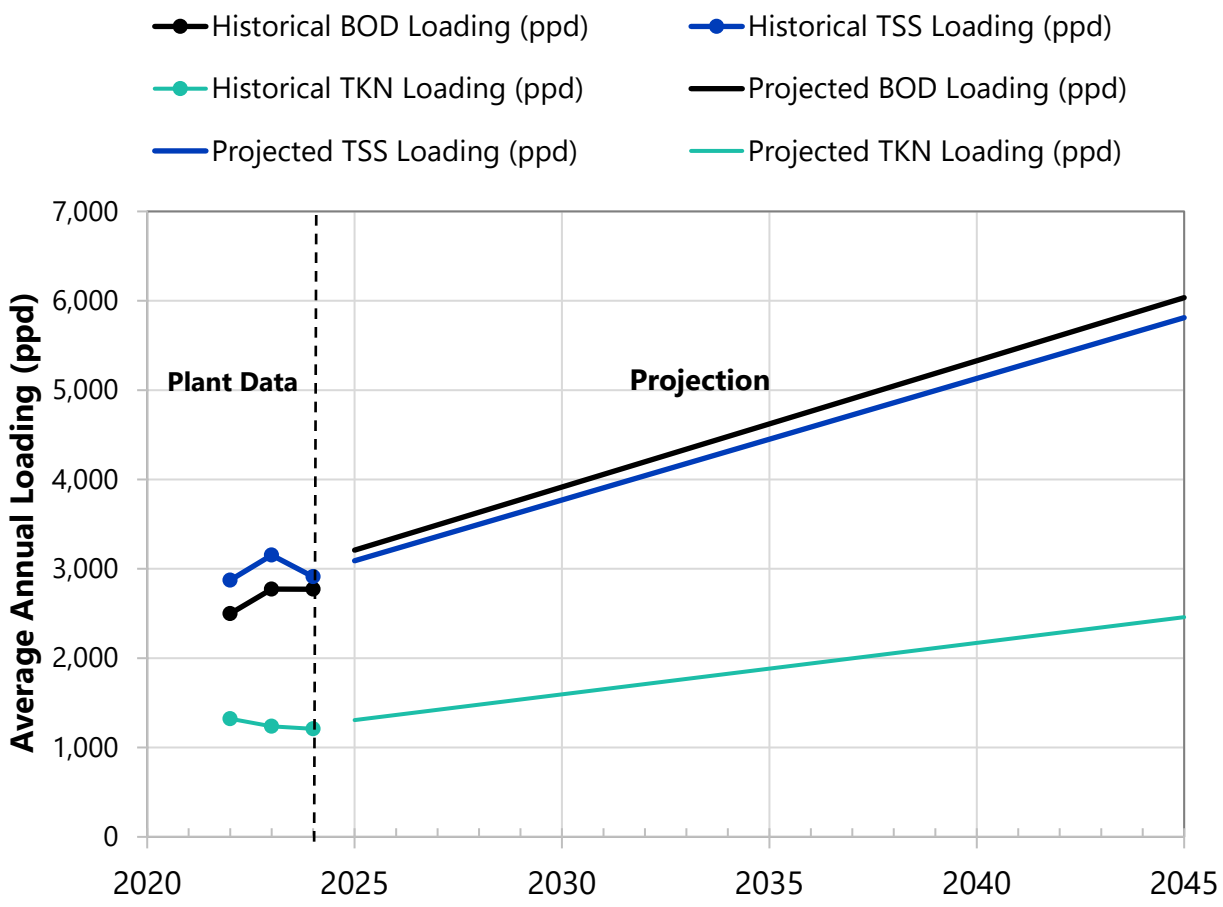


Figure 3.9 Current and Projected WWTF Average Annual Pollutant Loading

CHAPTER 4 EXISTING SYSTEM

4.1 Introduction

The purpose of a sewage collection system is to adequately convey sewage to locations where it can be treated and safely discharged. This chapter describes the City's existing sewer collection system, adjacent sewer service areas, and WWTF. The City's collection system utilizes both conventional gravity sewer with lift stations as well as STEP pumping stations, STEF, and septic tank effluent gravity systems (STEG) to convey wastewater to the WWTF. These systems are influenced by the natural environment, critical areas, and the service area which are summarized in this Chapter.

This chapter will serve as the framework on which to base the GSP, which was last updated in 2024. These considerations establish the basis of planning for the demographic and system analysis which will be the framework for identifying potential for development within the established service area. Consideration for the adequacy of the system to serve the anticipated development within the service area study boundaries is also reliant upon existing system characteristics.

4.2 Sewer Service Area

The City's service area is shown in Chapter 2 - Existing System in Figure 2.1. The service area contains approximately 7,600 acres. The current service area includes the City limits, and the future service area extends to the UGA which totals 9,300 acres. Adjacent sewer systems include City of Vancouver, the Discovery Clean Water Alliance (CWA), and City of Washougal. These systems are described in greater detail in Section 4.5.

4.3 Collection System

The City's sewer system is comprised of four major facility types:

1. Conventional Gravity Sewer.
2. STE Systems - Includes STEP mains less than 21-inches in diameter, STEF, and STEG.
3. STEP Transmission Mains - Includes STEP mains 21-inches in diameter and above.
4. LSs with Force Mains.

The conventional gravity sewer system is the most common sewer conveyance method in the region and relies on a downward slope throughout the profile to convey flow to a WWTF or intermediate lift station. In addition to the conventional gravity sewer system and lift station, three STE systems are utilized in the City's collection system: STEF, STEG, and STEP, which are explained in further detail in Section 4.3.2. There are 28 lift stations that are located within the service area which convey sewage and STE for treatment where gravity sewers are not effective, as well as one separate remote odor control station. Properties within the sewer service area outside of the gravity sewer portion of the City's collection system use on-site septic tank systems which provide some wastewater treatment, solids settling, and digestion. Similar to lift stations, STEP systems allow service where gravity systems may not be effective, or which were originally located outside the boundaries of a public sewer system service area.

Figure 4.1 and Table 4.1 summarize the City's pipe infrastructure by sewer type, based on data from the City's GIS database. Some pipe segments appear disconnected in Figure 4.1 due to gaps or missing information in the GIS records. As previously noted, the infrastructure is predominantly gravity sewer (405,500 feet) while the STE systems account for 290,019 feet. Figure 4.2 shows the direction of flow through the collection system.

Table 4.1 Summary of Pipe Infrastructure by Type

Sewer Type	Pipe Length (feet)	Pipe Length (miles)
Gravity Main	405,499	76.8
Force Main(1)	65,218	12.4
STEP Transmission Main	20,449	3.9
STEP Main	191,742	36.3
STEF Main	63,524	12.0
STEG Main	14,304	2.7
Total	**760,736**	**144.1**

Notes:
(1) Force main pipe length was determined by incorporating both existing GIS data and newly drawn force main segments identified in the North Shore area.

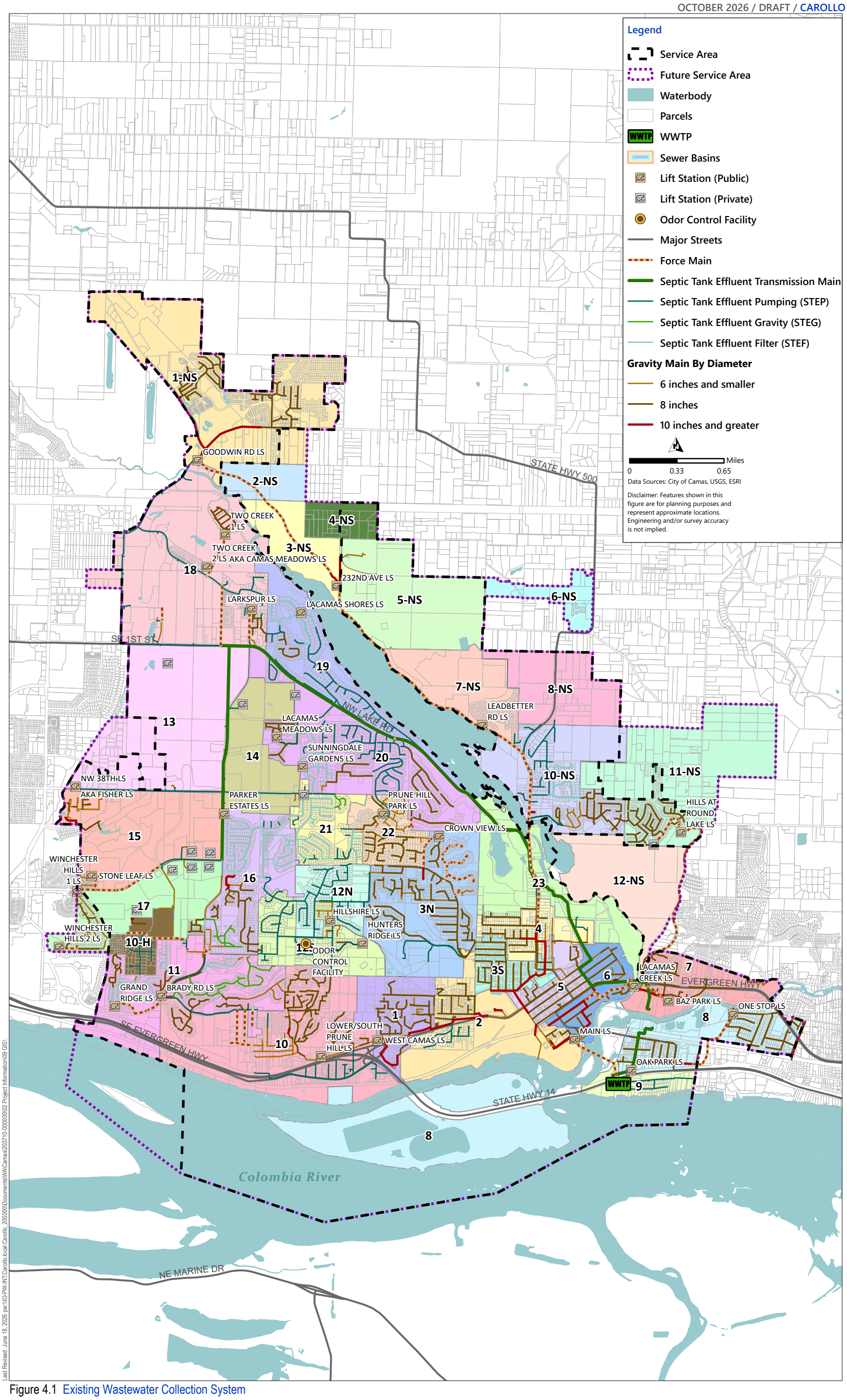


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Figure 4.1 Existing Wastewater Collection System

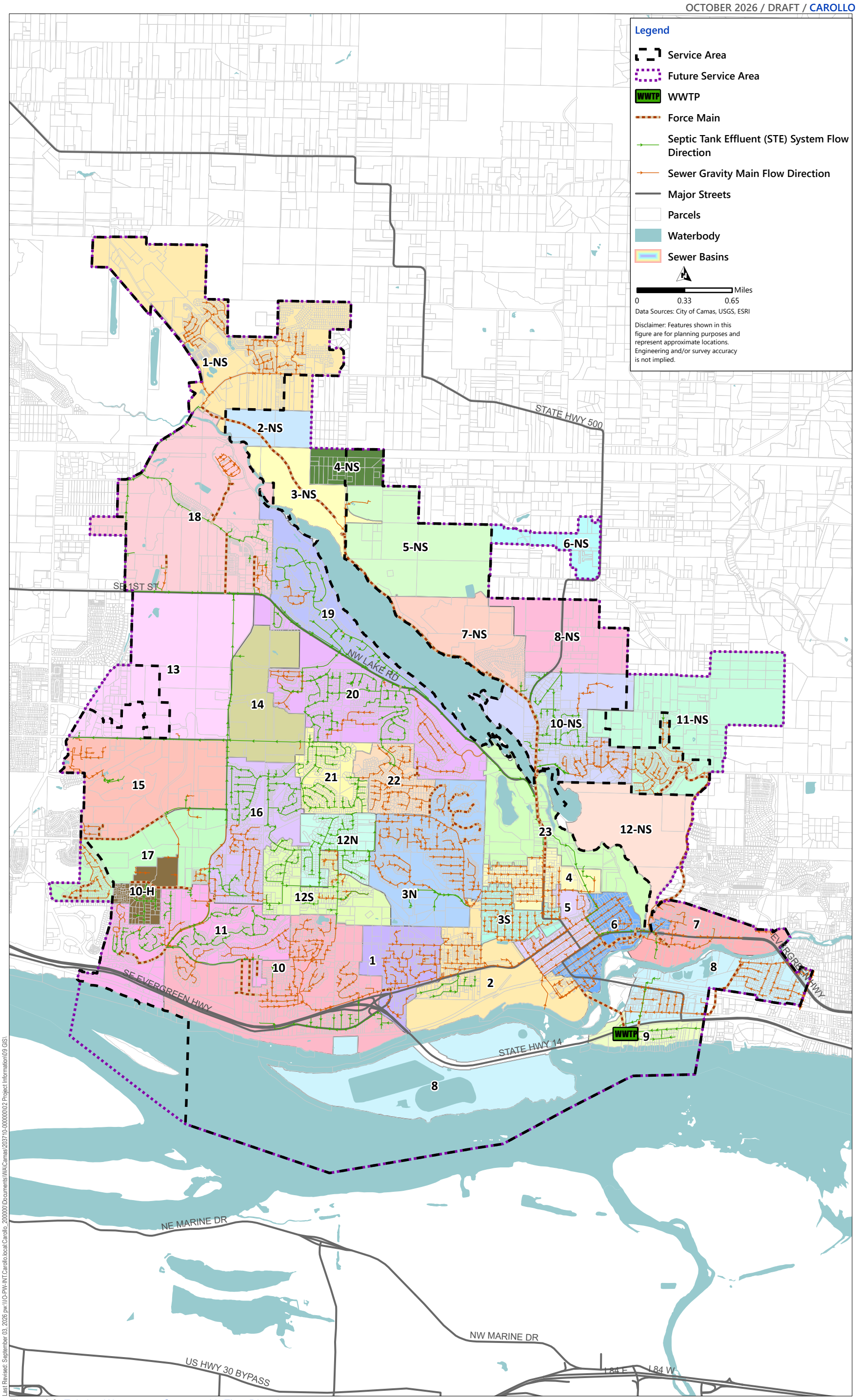


Figure 4.2 Existing Wastewater System with Flow Direction

4.3.1 Gravity System

Portions of the system served by conventional gravity sewers date from its beginning in the 1920's and includes the following basins identified in Figure 4.1: Downtown, Oak Park, Parkers Landing, basins along the Columbia River and State Route (SR) 14, and portions of Prune Hill (Basin 2, 3S, 4, 5, 6, 8, 10, and 11). The North Shore area is and will continue to be served by conventional gravity sewers. A new transmission main for the North Shore was constructed in December 2018.

The earliest portions of the gravity sewer system were constructed with vitrified clay pipe (VCP). Much of this VCP was later replaced with cast iron, concrete, and eventually polyvinyl chloride (PVC). Therefore, the relative age of sanitary sewer can be identified by the material type. The system utilizes a pipe diameter ranging from 4 inch to 24-inch segments where the majority of the system is 8 inches or less in diameter. A summary of pipe infrastructure by diameter is shown in Table 4.2.

Table 4.2 Summary of Gravity Sewer Infrastructure by Size

Pipe Diameter (inches)	Pipe Length (feet)	Pipe Length (miles)
8 inches and below	295,393	55.9
10	9,809	1.9
12	13,769	2.6
15	2,365	0.4
18	2,772	0.5
20	259.1	0.0
21	2,345	0.4
24	370.9	0.1
Other	976	0.2
Unknown(1)	77,441	14.7
Total(2)	**405,500**	**76.8**

Notes:
(1) Pipes with unknown diameter also include segments where the diameter field is null.
(2) Totals may not exactly match due to rounding.

4.3.2 STE Systems

Starting in 1985, the City required new customers in the western portion of the service area to be served using the STE system. Due to the City's topography and shallow bedrock, the STE systems allowed the City to serve areas without the costly installation of gravity sewers. The three STE systems address site specific challenges within the City's collection system. STEP systems consist of a septic tank equipped with a pump at the outlet to convey effluent flows to the STEP transmission main, rather than an on-site drain field. STEG systems consist of a septic tank with an outlet that conveys effluent flows by gravity to the STE transmission main. STEF systems utilize a siphon to convey effluent flows to the STE transmission main. Figure 4.1 shows the STEF, STEG, and STEP systems and STE transmission mains within the City's conventional gravity collection system.

The City owns and maintains the residential STE systems described above. The City pumps out the septage from the STE systems on a 5 to 7-year cycle. Commercial and Industrial systems are owned and maintained by the property owner. The City receives and treats septage from all systems at the WWTF. STE system pipes are shown on Figure 4.1 designated as STEP, STEF or STEG.

Table 4.3 Summary of STE Infrastructure by Size

Pipe Diameter (inches)	Pipe Length (feet)	Pipe Length (miles)
8 inches and below	215,383	40.8
10	23,111	4.4
12	4,586	0.9
18	2,535	0.5
20	2,932	0.6
24	3,338	0.6
Unknown(1)	17,111	3.2
Total(2)	**21,024**	**4.0**

Notes:
(1) Pipes with unknown diameter also include segments where the diameter field is null.
(2) Totals may not exactly match due to rounding.

4.3.3 STEP Transmission Main

The STEP transmission main is a transmission main that conveys STE system flows and major industrial dischargers to the WWTF. The pressurized transmission main is shown in Figure 4.1; the STEP transmission main is approximately 34,402 linear feet in length and is 21-inches to 24-inches in diameter. The transmission main conveys flow directly to the WWTF and does not receive flows from other sewer systems.

4.3.4 Lift Stations

The City currently operates 28 LS whose characteristics are summarized in Table 4.4. Of these 28 lift stations, 13 serve the gravity system and 15 serve the STE systems. Lift stations are identified in Figure 4.1. There are approximately 65,218 feet, or 12.4 miles, of force main associated with the lift station ranging from 4-inches to 18-inches in diameter. The majority of lift stations serve relatively small service areas and have capacities of less than 500 gallons per minute (gpm). The North Shore is served by three lift stations: Goodwin LS, 232nd Avenue LS, and Leadbetter LS which were installed in December 2018. The Main LS, with a capacity of 7,700 gpm, conveys the majority of the gravity system to the WWTF through an 18-inch diameter force main under Lacamas Creek.

4.3.5 Odor Control Station

The City operates two odor control stations located at 325 NE 23rd Avenue in Basin 23 and 2806 NW 18th Avenue in Basin 12. The stations' purpose within the collection system is to mitigate nuisance odors associated with the collection system. These facilities help improve air quality near sewer facilities and reduce potential impacts on nearby residents and businesses. The stations are not designed to provide flow conveyance or pumping capacity.

Table 4.4 Summary of Lift Stations

Lift Station		Location	Basin Number	STE or RAW	Number of Pumps	Pump Motor Size (HP)	Pump Capacity (gpm, each)	Total Station Capacity (gpm, 1 standby)	TDH (feet)
1	232nd Avenue	Near 618 NE 232nd Avenue	3-NS	RAW	2(1)	15.2	365	365	87
2	Baz Park	1906 NE 3rd Loop	7	RAW	2	7.5	488	488	38
3	Brady Road	919 NW Brady Road	11	STE	2	35	511	511	60
4	Camas Meadows	6902 NW Morgan Way	20	STE	2	35	221	221	222
5	Crown View	3222 NW Ivy Lane	3N	RAW	2	20	222	222	124
6	Fisher (NW 38th Ave)	5870 NW 38th Avenue	13	STE	2	23	126	126	206
7	Goodwin Rd	2305 NE Goodwin Road	1-NS	RAW	2(1)	15.2	300	300	94
8	Grand Ridge	843 NW Grande Ridge Road	11	STE	2	11	133	133	160
9	Hills at Round Lake	1960 NE Tanoak Drive	11-NS	STE	2	11	256.9	256.9	93.2
10	Hillshire	2303 NW Artz Court	12S	RAW	2	10	175	175	70.1
11	Hunters Ridge	2021 NW 17th Avenue	12S	RAW	2	23	152	152	174
12	Lacamas Creek	1641 NE 3rd Avenue	6	RAW	2(1)	25	950	950	67
13	Lacamas Meadows	3263 NE 45th Avenue	20	STE	2	23	173	173	203
14	Lacamas Shores	6230 NW El Rey Drive	19	STE	2	23	195	195	168
15	Larkspur	6162 NW Larkspur Street	18	STE	2	23	264	264	154
16	Leadbetter Rd	1050 SE Leadbetter Road	7-NS	RAW	2(1)	26.6	605	605	111
17	Lower (aka South) Prune Hill	2381 NW 6th Place	10	RAW	2	10	600	600	39
18	Main Station	480 SE 3rd Avenue	6	RAW	3	125	3850	7700	85
19	Oak Park	907 SE Polk Street	8	RAW	2	10	350	350	57
20	One Stop	200 SE Yale Street	8	RAW	2	5	231	231	36.2
21	Parker Estates	3436 NW Parker Street	16	STE	2	20	339	339	103
22	Prune Hill Park	3403 NW Sierra Drive	22	STE	2	7.5	350	350	53
23	Stone Leaf	5713 NW 26th Avenue	15	STE	2	23	423	423	81.2
24	Sunningdale Gardens	4043 NW Dahlia Loop	20	STE	2	10	260	260	63
25	Two Creeks	7402 NW Morgan Way	18	STE	2	10	166	166	70.7
26	West Camas	1625 NW 6th Place	1	RAW	2	30	1000	1000	74
27	Winchester Hills 1	19617 SE 34th Street	17	STE	2	6.5	97.9	97.9	66.7
28	Winchester Hills 2	19320 SE 42nd Circle	17	STE	2	5	125	125	65

Notes:
(1) Two pumps installed; space for a third pump.
HARL - Hills at Round Lake; HP - horsepower.

4.4 Drainage Basins

This section summarizes the previously discussed system elements in the context of the drainage basins in the City's sewer service area. The attributes of the 23 flow basins are summarized in Table 4.5.

Table 4.5 Drainage Basin Attributes

Drainage Basin No.	Flow Meter Basin	Area (acres)	Connected Acreage	No. of LS	Miles of Sewer			
					Total STE	Gravity	Force Main	Total(1)
1	5-1-2	169	80.3	1	-	3.8	0.09	3.9
2	5-1-2	341	65.2	0	0.95	3.8	-	4.7
3N	5-1-2	398	231.5	1	1.00	6.4	0.94	8.3
3S	5-1-2	91	57.1	0	-	3.2	-	3.2
4	4-1-3	117	82.4	0	0.94	3.2	0.11	3.4
5	5-1-2	99	56.0	0	0.04	3.4	-	3.5
6	5-2-1	128	68.1	2	0.49	3.8	0.73	5.5
7	5-2-1	174	66.5	1	0.23	2.2	0.15	2.8
8	8-1-2	477	120.7	2	0.53	5.0	0.37	6.4
9	8-1-2	87	30.3	0	0.83	0.1	0.50	1.5
10	5-1-2	622	241.2	1	2.27	7.0	0.63	9.8
10-H	5-1-2	78	60.7	0	0.72	0.2	0.43	1.4
11	5-2-1	394	182.1	2	5.23	3.6	0.65	9.6
12N	WWTF/STEP	134	92.6	0	3.52	0.0	-	3.2
12S	5-1-2	192	96.8	2	2.44	1.3	-	4.1
13	WWTF/STEP	557	285.2	1	1.45	0.0	0.00	2.0
14	WWTF/STEP	235	92.2	0	1.04	0.1	-	1.5
15	WWTF/STEP	383	126.3	1	1.92	1.7	0.39	4.0
16	WWTF/STEP	274	129.5	1	4.68	2.5	0.00	7.5
17	WWTF/STEP	254	84.5	2	0.20	2.9	0.66	3.7
18	WWTF/STEP	671	345.8	3	3.88	1.9	1.21	7.0
19	WWTF/STEP	267	181.4	1	5.60	0.5	0.00	5.1
20	WWTF/STEP	461	213.7	2	7.21	4.2	0.02	14.6
21	WWTF/STEP	139	86.1	0	3.74	-	-	3.7
22	WWTF/STEP	128	86.0	1	0.27	3.4	0.26	3.9
23	WWTF/STEP	295	60.9	1	1.18	0.7	0.02	4.5
1-NS	Goodwin Road	615	89.3	1	0.03	5.8	-	5.9
2-NS	Leadbetter Road	90	0.0	0	-	-	-	-
3-NS	Leadbetter Road	157	0.0	1	-	2.9	0.46	3.3
4-NS	Leadbetter Road	79	0.0	0	-	-	-	-
5-NS	Leadbetter Road	364	34.0	0	-	1.6	-	1.6

Drainage Basin No.	Flow Meter Basin	Area (acres)	Connected Acreage	No. of LS	Miles of Sewer			
					Total STE	Gravity	Force Main	Total(1)
6-NS	Leadbetter Road	83	0.0	0	0.00	-	-	-
7-NS	Leadbetter Road	215	14.2	1	0.09	2.1	0.57	2.8
8-NS	Leadbetter Road	93	36.7	0	-	-	-	-
9-NS	Leadbetter Road	119	0.0	0	-	-	-	-
10-NS	WWTF/STEP	345	193.4	0	4.38	3.4	1.33	9.3
11-NS	5-2-1	500	65.1	1	0.05	3.0	0.52	3.6
12-NS	5-2-1	270	0.0	0	-	0.2	3.75	4.0
				Total(1)	**54.9**	**76.8**	**12.4**	**144.1**

Notes:
(1) Totals may not match exactly due to rounding.

4.5 Wastewater Treatment Facility

The City's WWTF is located along the Columbia River in the southeastern portion of its sewer service area. The WWTF was originally constructed in 1972 and has had several modifications since that time. The first major upgrade and expansion of liquid stream processes was completed in February of 2000. A subsequent Phase 2A upgrade, primarily addressing solids treatment, including anaerobic digesters and sludge drying facilities, was completed in 2012. Phase 2B, completed in 2014, improved blower controls, added a third secondary clarifier, new effluent filters, and digester gas treatment facilities. The WWTF will soon undergo a significant upgrade project to replace the internal mechanism of the two primary clarifiers, new sludge degritting system, install second dewatering centrifuge, new septage receiving and screening equipment, replacement of two of the multi-stage centrifugal blowers with high-speed turbo blowers and associated controls modification, new emergency generator, and new UV disinfection system to increase the efficiency of plant equipment.

The facility process flow diagram is shown in Figure 4.2. An aerial view of the WWTF with each unit process and building identified is shown in Figure 4.3. The liquid stream treatment begins with climbing bar screens at the plant headworks to remove larger material which is washed, compacted, and disposed of at a landfill. Primary solids-liquid separation occurs in two circular primary clarifiers with the primary effluent discharging to a splitter box where it is combined with RAS from the secondary clarifiers (SC) and split between three aeration basins (AB), where biomass is aerated to promote biological oxidation and improve water quality. Secondary treatment in the ABs consists of influent channel selector zones followed by two anoxic and three aerobic zones to remove carbonaceous material and reduce ammonia concentrations. Magnesium hydroxide ($Mg(OH)_2$) is added at the SC splitter box to provide supplemental alkalinity.

Mixed liquor from the three ABs is combined and split between three secondary clarifiers. The three clarifiers provide separation of the biomass from the secondary treatment processes (termed activated sludge) and discharge of liquid effluent to two mechanical disc filters. UV disinfection is provided in an open channel system with four banks of UV lamps prior to discharge to the outfall in the Columbia River. One of the SCs is not used due to its flat bottom.

The effluent either flows by gravity or is pumped to the outfall via the three effluent pumps, which are operated in a two duty and one standby configuration. Transitions between gravity and pumped effluent

flow are performed automatically when the pumps are placed in "auto" mode. When the Columbia River level rises, gravity effluent discharge is stopped by closing the flap gate in the effluent manhole. The existing outfall is a 36-inch corrugated metal pipe (CMP) and extends approximately 850 feet south into the Columbia River channel. The diffuser portion of the outfall is located along the outer 150 feet of the pipe and is equipped with 16 vertical risers, each oriented vertically with rubber Tideflex check valve-type nozzles. The vertical risers discharge effluent perpendicular to the flow of the Columbia River.

Solids from the primary clarifiers are first conveyed to two hydro-cyclones and a classifier for degritting then thickened in the gravity thickener. Thickened primary sludge (TPS) is then pumped to anaerobic digesters. Solids from the secondary clarifiers are moved by a sludge-scraper mechanism to a wet well and then withdrawn by pumps. The settled solids (RAS) are pumped back to the aeration basin splitter box. Excess activated sludge wasted (WAS) from all three secondary clarifiers is sent to a storage tank and thickened in a rotary drum thickener. Thickened primary and secondary solids are then combined in anaerobic digesters for stabilization, reduction of volatile solids, and production of biogas. Dewatering of the digested sludge is accomplished through a centrifuge and then conveyed to a belt dryer, which evaporates most of the remaining water content in the biosolids. The dewatered and dried biosolids are dried to achieve Class A and are hauled off-site for land application.

Odors are controlled at the plant through unit-specific odor control ductwork. Air from the digesters and sludge holding tank is filtered through a hydrogen sulfide (H_2S) scrubber with a bark media bed. Other orders from the process (centrifuge room, grit room, influent channel, etc.) are blown through a biofilter bed located to the west of the dryer building.

The unit capacity for each major component at the WWTF is summarized in Table 4.6.

Table 4.6 Unit Process Capacity

Unit	Number of Units	Design Criteria(1)
Bar Screens		
Climbing Bar Screens	2	▪ Perforation Size: 1/4 inches (6 mm)
Manual Coarse Bar Screen (Bypass)	1	▪ Bar Spacing: 3/4 inches (19 mm)
Primary Clarifiers	2	▪ Diameter: 60 feet (each) ▪ Depth: 10 feet ▪ Volume: 211,500 gallons (each)
Aeration Basins	3	▪ Volume: 100,800 ft^3 (each)
Aerobic	3	▪ Total Volume: 176,400 ft^3
Anoxic	2	▪ Total Volume: 108,360 ft^3
Selector (SAx)	3	▪ SAx-1 Volume: 2,700 ft^3 ▪ SAx-2 Volume: 1,600 ft^3 ▪ SAx-3 Volume: 4,500 ft^3 ▪ SAx-4 Volume: 9,000 ft^3

Unit	Number of Units	Design Criteria[1]
Secondary Clarifiers		
SC No. 1	1	▪ Diameter: 75 feet ▪ Depth: 13 feet ▪ Volume: 424,000 gallons
SC No.2	1	▪ Diameter: 75 feet ▪ Depth: 17 feet ▪ Volume: 461,800 gallons
SC No.3	1	▪ Diameter: 75 feet ▪ Depth: 14 feet ▪ Volume: 462,700 gallons
Effluent Disc Filters	2	▪ Capacity: 3.0 mgd (each)
UV Disinfection[1]	4	▪ Peak Day Process Flow: 10.04 mgd
Hydrocyclones	2	▪ Capacity: 220 gpm
Gravity Thickener	1	▪ Diameter: 30 feet ▪ Depth: 10 feet
Anaerobic Digesters	2	▪ Volume: 24,500 ft^3 (each)
Centrifuge	1	▪ Capacity: 130 gpm
Rotary Screen Thickener	1	▪ Capacity: 100-300 gpm

Notes:
ft^3 - cubic feet; mm - millimeter.

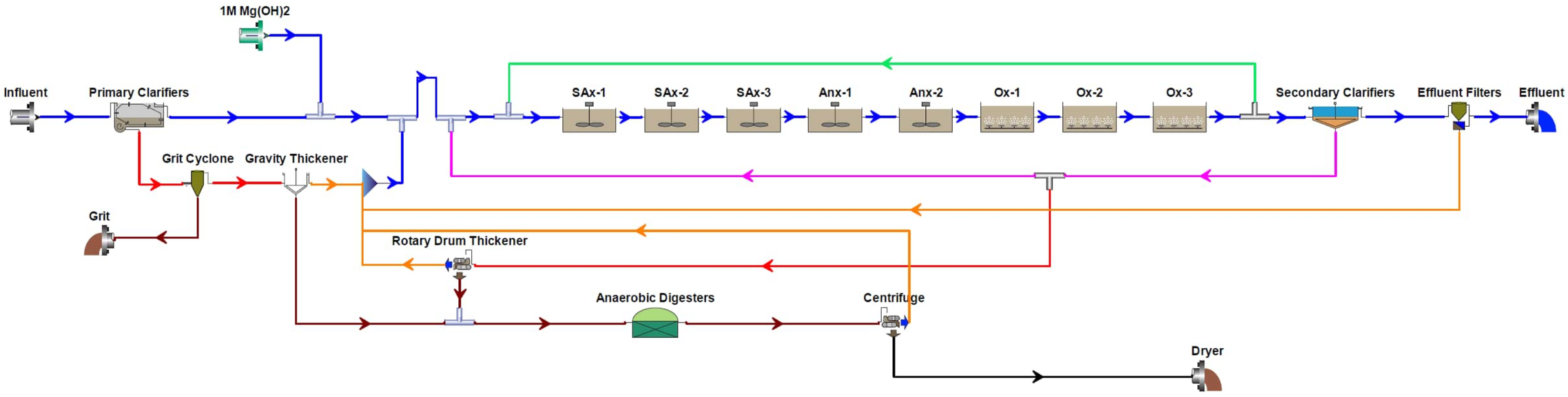


Figure 4.3 BioWin Process Flow Diagram



Figure 4.4 WWTF Aerial Image with Site Plan

4.5.1 Recent Plant Upgrades

Several upgrades have taken place at the WWTF since the previous GSP (Carollo, 2024), which have improved the plant's efficiency and reliability:

- WWTP UV Disinfection Improvements (HDR TO4):
  - Replacement of the primary sludge grit classifiers.
  - Install a second dewatering centrifuge.
  - Increase in the septage receiving capacity with new screen.
  - Replacement of two of the multi-stage centrifugal blowers with high-speed turbo blowers and associated controls modification to have two turbo blowers operate in tandem with two centrifugal blowers.
  - Replacement of the internal mechanisms in the primary clarifiers with all 316 stainless steel (SS).
  - Replacing the UV disinfection system with new UV equipment and controls.
  - Moving the electrical generator out of the Equipment Building.

Additionally, the plant recently had the channels in the headworks structure rehabilitated (recoated) due to extensive damage to the concrete from H_2S.

4.5.2 Plant Flows

The WWTF receives influent flows from the Main and Oak Park pump stations and a septage truck unloading station. STEP flows in the collection system are conveyed to the plant and intersect the Main line just before the influent structure. The combined flow from the STEP system, the pump stations, and septage truck unloading station are measured by a Parshall flume. The combined flow measured by the Parshall flume is recorded as the WWTF influent flow.

The WWTF has a three-year AAF of 2.73 mgd from the collection system with approximately 33 percent of the AAF from industrial users. This relatively high percentage of industrial users increases the influent ammonia concentrations but decreases the TSS and biochemical oxygen demand (BOD) concentrations resulting in a high nitrogen and low carbon influent compared to a typical municipal facility. The previously described STEP and STEF system contributes nearly 60 percent of the average day dry weather influent flows (which includes the 33 percent of flow from industrial users) also contributes to unique influent characteristics when brought into the facility due to an estimated 35 percent reduction of BOD in the 5-day test (BOD_5) and a 60 percent reduction of TSS in the septic tank.

Although septic tank solids are also returned to the facility through septic delivery, these solids also have reduced BOD_5 and TSS loadings due to the nearly five-year detention time. NPDES effluent discharge limitations, prohibitions, and requirements are similar to other municipal facilities with standard 30/30 monthly TSS and BOD concentration limits with a mandatory 85 percent reduction in each. However, the WWTF has ammonia limits of 20 mg/L (NH_3 as N) in the summer and 7 mg/L (NH_3 as N) in the winter.

4.5.3 NPDES Violations

The current NPDES permit became effective on August 1, 2025, and will expire on July 31, 2030. From 2019 to 2024 the plant had eight permit violations all involving reported low effluent pH values which were caused by default readings during the cleaning and calibration of the effluent pH probe. The WWTF has a minimum effluent pH requirement of 6.0; however, the probe defaults to a value of 3.0 when being cleaned. As the low readings were caused by instrumentation error and not actual effluent violations, there was no enforcement action necessary.

4.6 Adjacent Sewer Service Areas

Four sewer service areas with their own WWTFs are within a 20-mile radius of the Camas WWTF. All of the facilities listed in Table 4.7 have Columbia River outfalls. Distances vary from the closest, Washougal WWTF, approximately 3.5 miles away, to the farthest, Salmon Creek WWTF, approximately 20 miles away.

Table 4.7 Adjacent Service Areas WWTFs

Facility/Service Area	MMF (mgd)	Biological Treatment Process	Disinfection	Biosolids
Salmon Creek (Clark County)	10.3	Aeration Basins	UV	Land Applied
Marine Park (Vancouver)	16.1	Aeration Basins	UV	Incinerated
Westside (Vancouver)	28.3	Aeration Basins	UV	Incinerated
Washougal	2.2	Oxidation Ditch	UV	Lagoon

All of these nearby treatment facilities utilize activated sludge treatment processes and UV disinfection; however, the greatest variation in treatment can be seen in the processing of biosolids. Salmon Creek WWTF operates similarly to Camas through the land application of biosolids. Marine Park and Westside incinerate solids produced at those City of Vancouver facilities.

4.6.1 City of Vancouver

The City of Vancouver currently uses 716 miles of sanitary sewer and forty-one pump stations to convey sewage to Vancouver's Marine Park and Westside WWTFs. Vancouver's collection system is divided into three basins currently: the Westside Basin, Eastside Basin, and Diversion Basin. Wastewater generated in the Eastside Basin is conveyed to and treated exclusively at the Marine Park facility. Diversion Basin wastewater is conveyed to and treated at either the Marine Park or Westside WWTF. Westside Basin sewage is conveyed to and treated exclusively at the Westside Treatment Facility.

The largest nearby treatment facility is Westside in Vancouver at 28.3 mgd average annual flow. Altogether, Marine Park and Westside WWTFs serve 200,000 residents per 2025 census data. Currently, Marine Park does not treat its solids on-site and instead conveys them to Westside through a force main and gravity sewer. Once at Westside, a fluidized bed furnace incinerates scum and solids from the primary and secondary clarifiers at both plants.

4.6.2 City of Washougal

The City of Washougal currently operates fourteen LS throughout the City and conveys sewage through more than 1.5 miles of force mains to the Washougal Treatment Plant. The treatment plant consists of an oxidation ditch followed by a secondary clarifier and UV disinfection. Similar to other plants in the region, effluent is discharged to the Columbia River.

4.6.3 Clark County

Clark County formed the Discovery CWA in January 2013 to provide framework for regional wastewater collection. The CWA serves unincorporated Clark County, the City of Battle Ground, the City of Ridgefield, and Clark Regional Wastewater District.

Nearby Salmon Creek WWTF is part of the CWA and serves approximately 100,000 residents. Although the average annual flow is typically between 8-10 mgd, the plant has the capacity to treat up to 15 mgd. Future expansion is underway to improve the Columbia River outfall as well as increase capacity to 17.5 mgd. Odor control will be built as well due to odorous air present particularly during the summer and early fall.

4.7 Natural Environment and Critical Areas

Topics considered to describe the existing system's natural environment include topography, soils and geology, and climate including rainfall. Critical areas within the natural environment highlight the connection between the sewer system and these characteristics. Critical areas include wetlands, critical aquifer recharge areas (CARA), geologically hazardous areas, frequently flooded areas, and fish and wildlife habitat conservation areas.

4.7.1 Natural Environment

Relatively steep topography with slow to moderate infiltration rates comprise a majority of the City's geography. The City enjoys moderate temperatures between the average high of 62°F and average low of 37°F. Heavy rainfall, characteristic of the Pacific Northwest region, provides an average annual precipitation of 50 inches while snowfall is not typically heavy, annually averaging 9 inches.

4.7.1.1 Topographical Characteristics

As shown in Figure 4.4, elevation ranges from slightly above sea level (20 feet) to greater than 750 feet in the City. Steep slopes comprise a large portion of the landscape which range from 5 to 15 percent. A relatively flat plateau is present at the most central portion of the City near Prune Hill while the older, denser zones lie along the Columbia River. Similarly, the UGA was developed on a steep slope with a plateau at 470 feet elevation residing just outside of the City Limits.

4.7.1.2 Soils and Geology

According to the National Resources Conservation Service, Clark County is approximately 5 percent cinebar stony silt loam with 30 to 70 percent slopes. However, the City has a much higher percentage of Lauren gravelly loam from 0 to 8 percent slopes and Hesson Clay loam from 0 to 8 percent slopes. These soil types are categorized as hydrological soil groups B and C, respectively, which indicate slow to moderate infiltration rates when wet with a slow to moderate rate of water transmission. This indicates moderate runoff coefficients for the region. Additional details on the soil groups are available in Figure 4.6.

4.7.1.3 Climate

The City's climate is characterized by a combination of rainfall, wind, and temperature patterns for the nearby region. The average high temperature is 62°F and the average low is 37°F. The temperature is known to vary from 36°F to 84°F throughout the year with a warm season from June to September. Altogether, summers last approximately three months with warm weather and winters are cold with the heaviest rainfall occurring in late November or early December.

Historical precipitation data was gathered from Airport Way No.2 Rain Gage (Station 111) of the City of Portland HYDRA Rainfall Network and a rain gauge installed by ADS. The average three and a half-year rainfall patterns indicate the November through February period average 5 inches per month or more with a peak in January at approximately 10.1 inches. The maximum annual rainfall occurred in 2022 at 54.61 inches total which is 12.3 percent greater than the 2022-2025 average. The driest month of the year is typically July with less than one inch of rainfall recorded between 2022 and 2024. The average annual rainfall patterns are detailed in Table 4.8. Average annual snowfall is 9 inches, and average annual precipitation is approximately 50 inches.

Table 4.8 City of Portland Airport Way 2 Pump Station (Hydra 111) Precipitation 2022-2025

Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	**Annual**
2022	7.25	3.28	5.69	7.1	5.77	4.47	0.3	0	0.28	4.27	7.16	9.04	**54.61**
2023	3.84	2.64	5.84	6.54	0.96	1.3	0.04	0.57	1.97	2.81	6.95	9.33	**42.79**
2024	10.1	5.25	4.08	2.38	3.61	1.5	0.11	0.76	1.77	3.71	8.51	7.55	**49.33**
2025(1)	3.48	5.91	5.95	1.85	-	-	-	-	-	-	-	-	**17.19**
Average	**6.17**	**4.27**	**5.39**	**4.47**	**3.45**	**2.42**	**0.15**	**0.44**	**1.34**	**3.60**	**7.54**	**8.64**	**47.87**
Minimum	**3.48**	**2.64**	**4.08**	**1.85**	**0.96**	**1.3**	**0.04**	**0**	**0.28**	**2.81**	**6.95**	**7.55**	**31.94**
Maximum	**10.1**	**5.91**	**5.95**	**7.1**	**5.77**	**4.47**	**0.3**	**0.76**	**1.97**	**4.27**	**8.51**	**9.33**	**64.44**

Notes:
(1) Rain Gauge data obtained from Camas Flow Monitoring 2025 by ADS dated May 28, 2025.

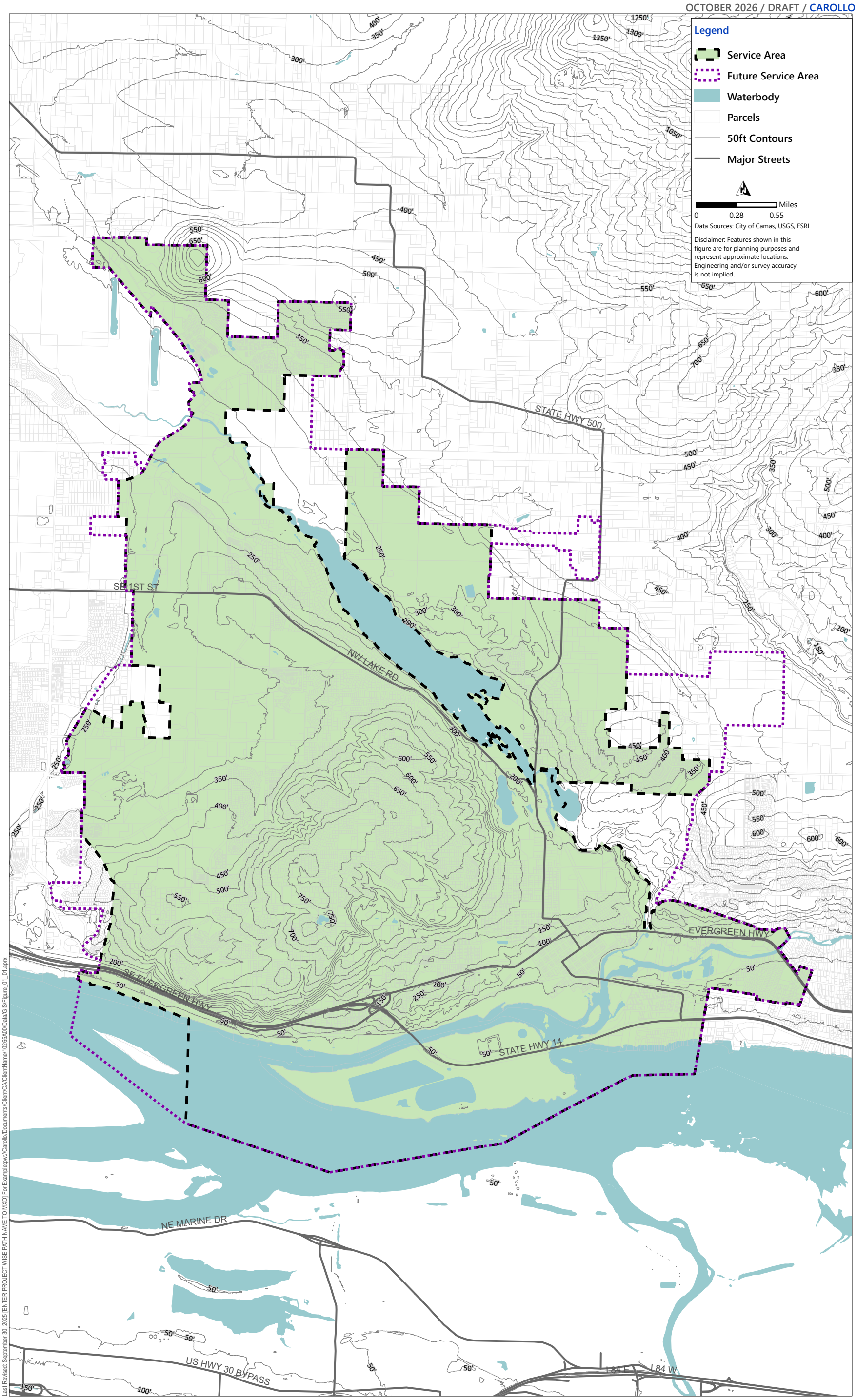


Figure 4.5 Topography

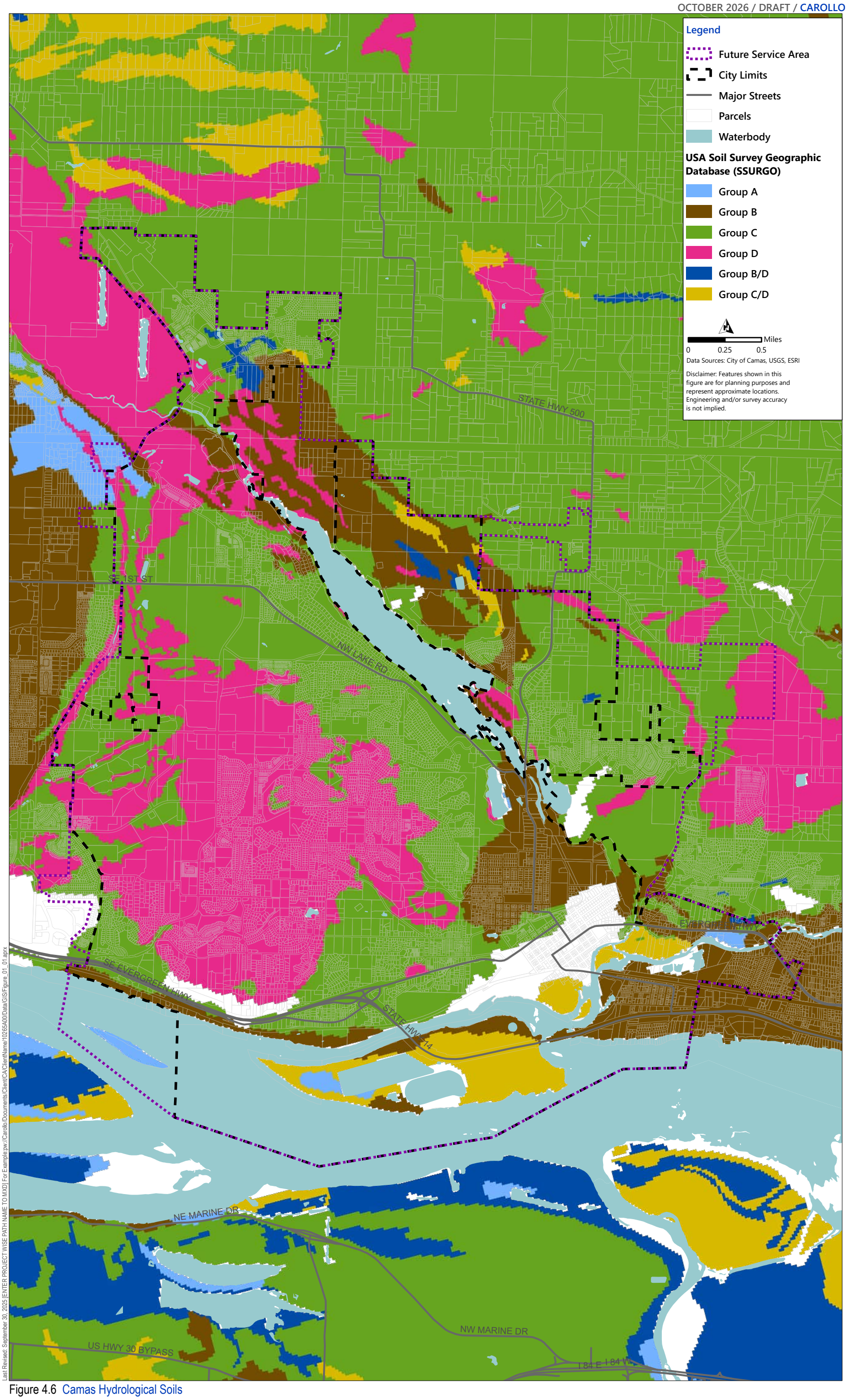


Figure 4.6 Camas Hydrological Soils

4.7.2 Critical Areas

Critical areas define crucial components for planning in an area including protected lands, e.g., wetlands, CARAs, and conservation areas, as well as areas with greater risk to its inhabitants, e.g., frequently flooded areas and geologically hazardous areas. Identifying these areas allows for the mitigation of unnecessary risk or harm to protected lands; additionally, policies in the City's *Draft 2045 Comprehensive Plan* (Camas, 2025) outline goals to protect and restore these sites.

4.7.2.1 Wetlands

Ecology currently rates wetlands based upon several key factors including their 'ability to be replaced, sensitivity to disturbances, rarity, functional performance, and importance in biodiversity' (Ecology, 2006). These levels include categories I-IV with a Category I wetland requiring the greatest protection. As defined by the wetland rating system, Category I wetlands have valuable biodiversity and hydrogeomorphic functionality in pollutant removal, stormwater storage, and even buffering natural disasters.

Within the City, there are >1,200 acres of recognized wetland which are protected by several local, state, and federal ordinances and laws including the Growth Management Act, Critical Areas Ordinance, CWAs, and CMC 16.53.050. These regulations entail the study of a wetland's functionality and that adverse impacts be avoided or reduced. Figure 4.7 illustrates the City's wetlands delineated using reports filed with the city and published data.

4.7.2.2 Critical Aquifer Recharge Areas

The majority of raw water supply for the City is provided by groundwater resources. This critical resource is protected by the CARA ordinance and the CMC. CMC 16.55.070 focuses on Aquifer Recharge Areas and required reports for proposed activities.

CARAs are located in multiple regions of the City and surrounding areas. Currently, two wellhead-protected areas are within the City limits with the southernmost protected area extending beyond the UGA. Figure 4.8 shows these regions in relation to wells which serve more than 20 people.

4.7.2.3 Frequently Flooded Areas

Frequently flooded areas are defined as regions with >1 percent chance of flooding per year. These regions are near surface water bodies which include Lacamas Lake, Columbia River, Washougal River, Jones Creek, Boulder Creek, Round Leaf Lake, and Fallen Leaf Lake, as shown in Figure 4.8. Due to low elevations, portions of the southeastern region of the City are located within the 100-and 500-year Federal Emergency Management Agency floodplain. Construction regulations focus on decreasing flood hazards of the structure which are detailed in a critical area report.

4.7.2.4 Geologically Hazardous Areas

Geologically hazardous areas are typically defined by the possibility of natural disasters including earthquakes and volcanic activity. These hazard potentials are then increased by the presence of steep slopes prone to landslide, particular soil groups prone to liquefaction, and other circumstances which have the potential to compound emergency scenarios. The United State currently operates on a Category 1-4 system to determine building code stringency as it pertains to natural disasters where Category 4 is the most stringent. The City is rated as a Category 4, which indicates a high potential for landslides and other events.

In the Clark County Code Chapter 40.430, Clark County defines three types of geologic hazard areas which include seismic, landslide, and steep slope. The county's Geologic Hazard regulation requires developers to have a Geologic Hazard Area Study completed on any property which is identified in a hazard area.

4.7.2.5 Fish and Wildlife Habitat Conservation Areas

As defined in the City's *Draft 2045 Comprehensive Plan*, one of the primary plans for the City is to protect "Key aquatic habitats in Camas include the Columbia and Washougal Rivers, Lacamas Creek, Camas Slough, Lacamas Lake, and various streams, ponds, and wetlands, all often bordered by riparian zones" (Camas, 2025). Multiple threatened species have been found to inhabit or pass through the region, and regulations are currently in place to prevent harm to any habitat including WAC 365-190-130. These regions are defined as Fish and Wildlife Habitat Conservation Areas which are protected.

Regulations include completing a habitat assessment before construction. These regulations impact any proposed sanitary sewer pipelines or lift stations in order to protect the fish and wildlife habitat.

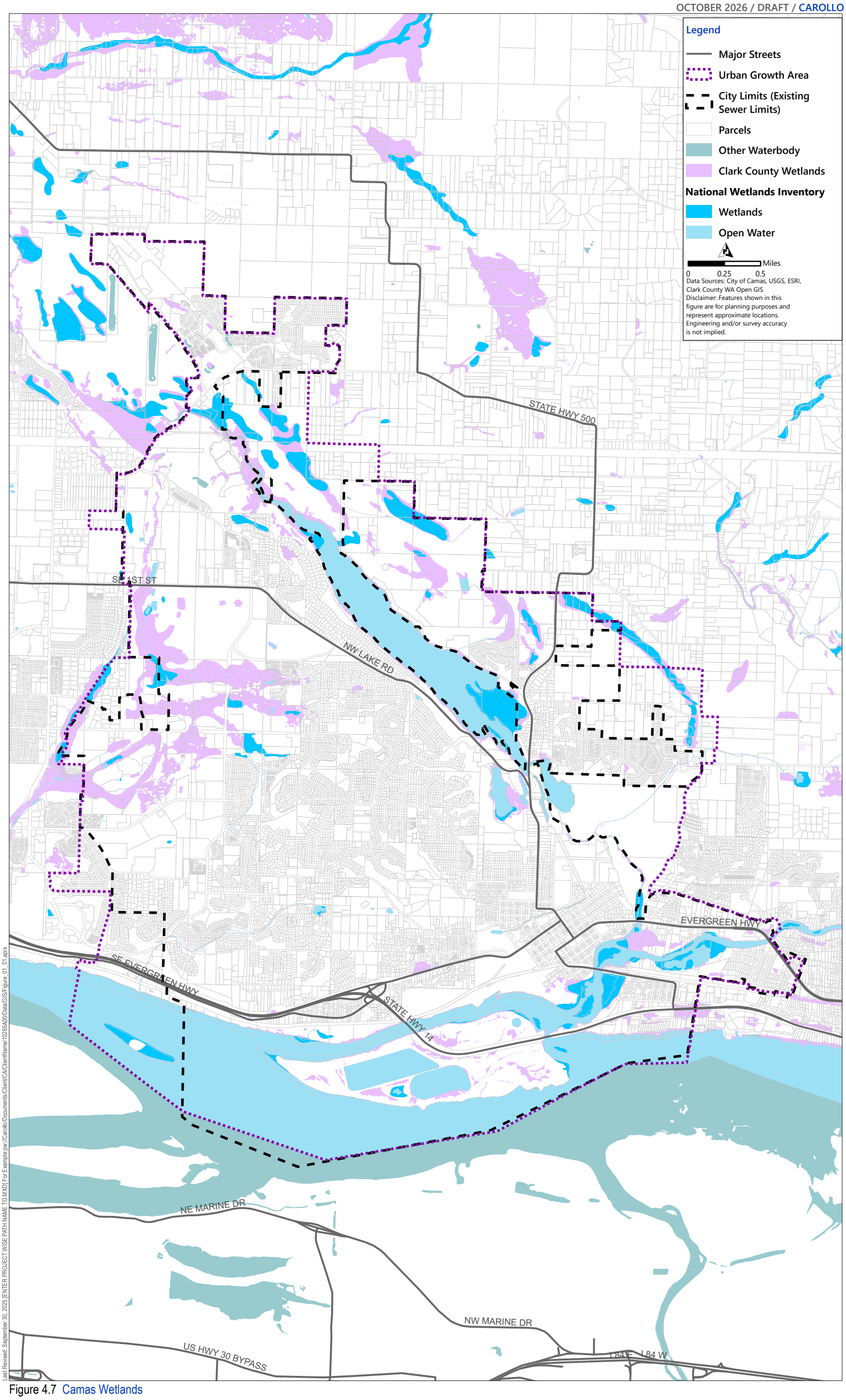


Figure 4.7 Camas Wetlands

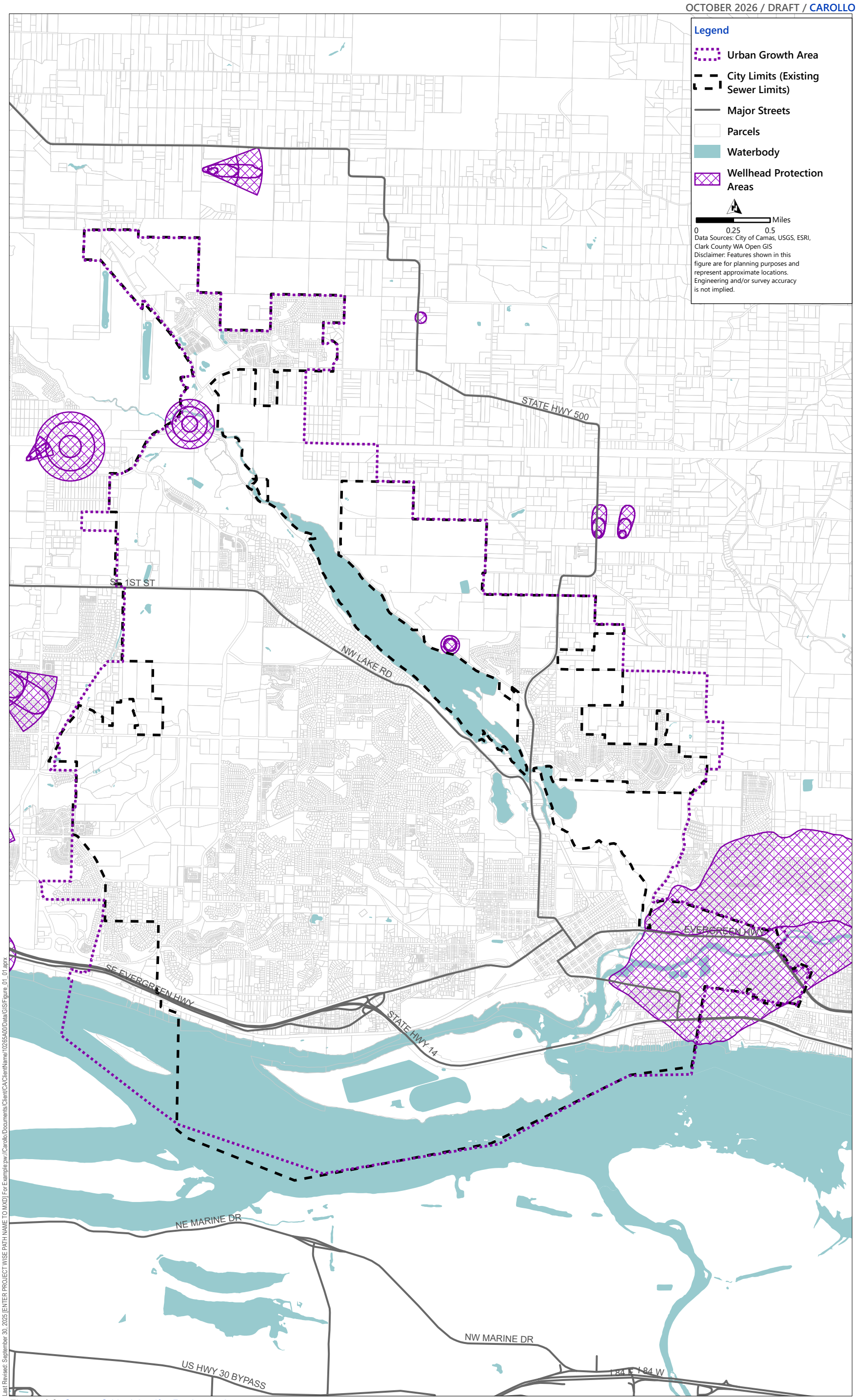


Figure 4.8 Camas Critical Aquifer Recharge Areas

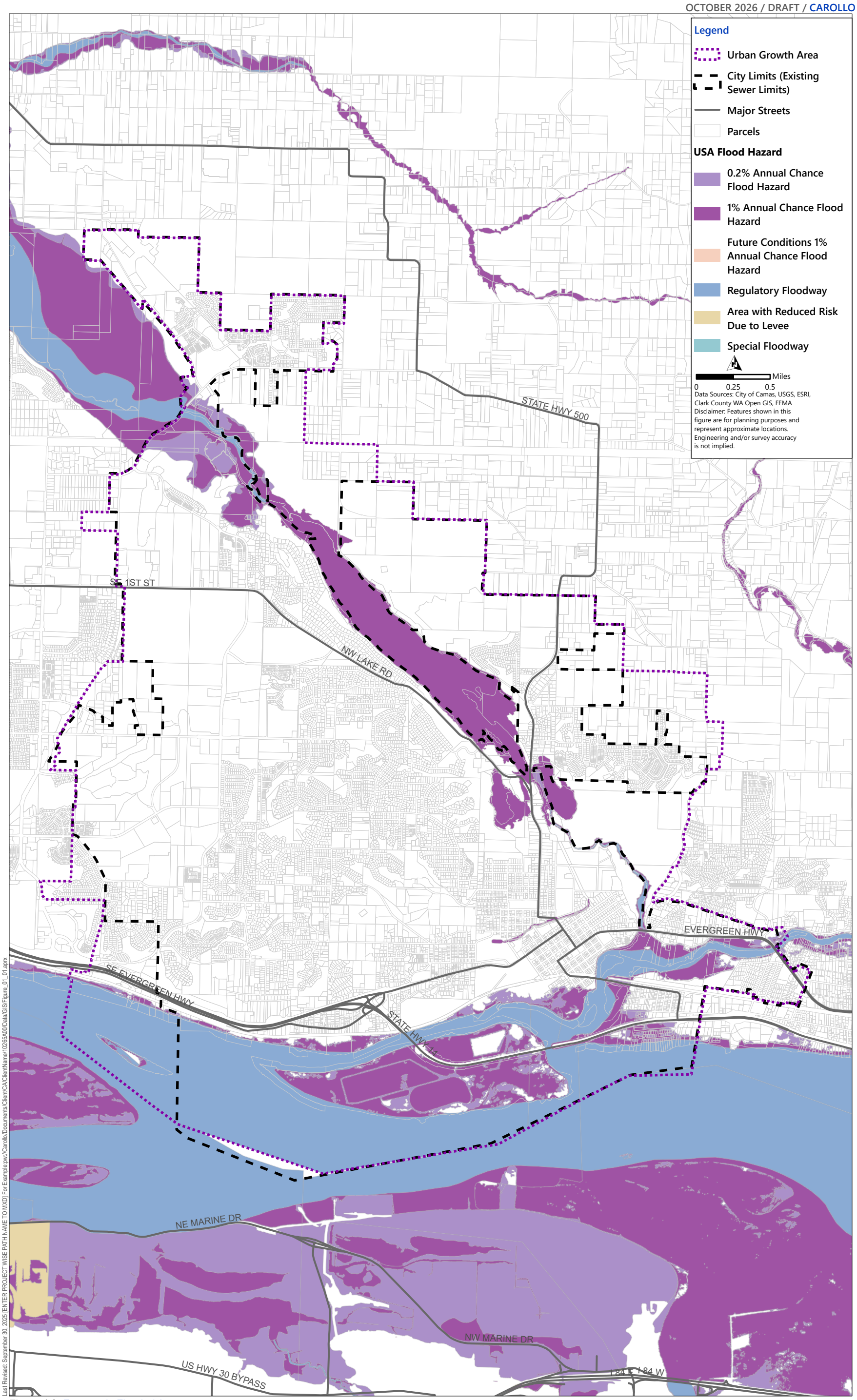


Figure 4.9 Frequently Flooded Areas

4.8 Water System

The City owns and operates a multi-source municipal water system, shown in Figure 4.10, which uses ground water and surface water to supply, treat, store, and distribute potable water to residential and commercial customers. The City currently obtains its water from 10 groundwater wells and two surface water resources. The wellhead protection areas are regulated to prevent leakage from the sanitary sewer system from infiltrating a well; these areas are shown in Figure 4.11.

The surface water resources include the Jones Creek Intake constructed in 1913 and the Boulder Creek Intake constructed in 1931. Surface water sources may be operated between November 1st and May 15th. Seasonal raw water from the Boulder and Jones Creek intakes is conveyed to the recently constructed slow sand filtration treatment plant (SSF Plant) where the water is filtered prior to chemical treatment and discharge to the distribution system. The SSF Plant has the capacity to treat the entire permitted flow of 1,570 gpm from the City's surface water sources. The surface water sources have lower operating expenses than groundwater sources. The ten groundwater wells are located in the 343 Zone excluding Well 9 which is located in the 544 Zone.

The City currently maintains and operates seven storage facilities with a combined total capacity of 9.95 million gallons (MG) including Butler Reservoir (1.2 MG), Gregg Reservoir (0.1 MG), Lacamas Reservoir (2.0 MG), 18th Avenue Reservoir (2.0 MG), Lower Prune Hill Reservoir No. 2 (1.5 MG), and the Upper Prune Hill Reservoirs (3.15 MG). This capacity is available for normal and emergency conditions, such as fire suppression. Ten booster pump stations are used to move water between pressure zones. Table 4.9 lists the booster pump stations and their capacities.

Table 4.9 Booster Pump Stations

Booster Pump Station	Capacity (gpm)
Butler	1,400
New Gregg	3,500
Forest Home	1,000
Lower Prune Hill	2,750
Lacamas	2,500
Angelo	4,000
Upper Prune Hill	4,300
Crown Road	2,400
Francis Road	80
Green Mountain Estate	1,840

The City owns over 159 miles of pipelines in its water transmission and distribution system compared to only 87.5 miles of collection system. Approximately 43 percent of the pipeline is Ductile Iron followed by Cast Iron at 14 percent. Additionally, the distribution system includes numerous meters, isolation valves, and hydrants. Two emergency interties are available with the City of Washougal. These interties provide water from the City to the City of Washougal under low pressure conditions. The City's intertie with Vancouver is located at the intersection of SE Columbia Palisades Drive and SE Brady Road. Additionally, the City has an agreement for emergency use of two fire hydrants located at SE 1st and Friberg for firefighting purposes.

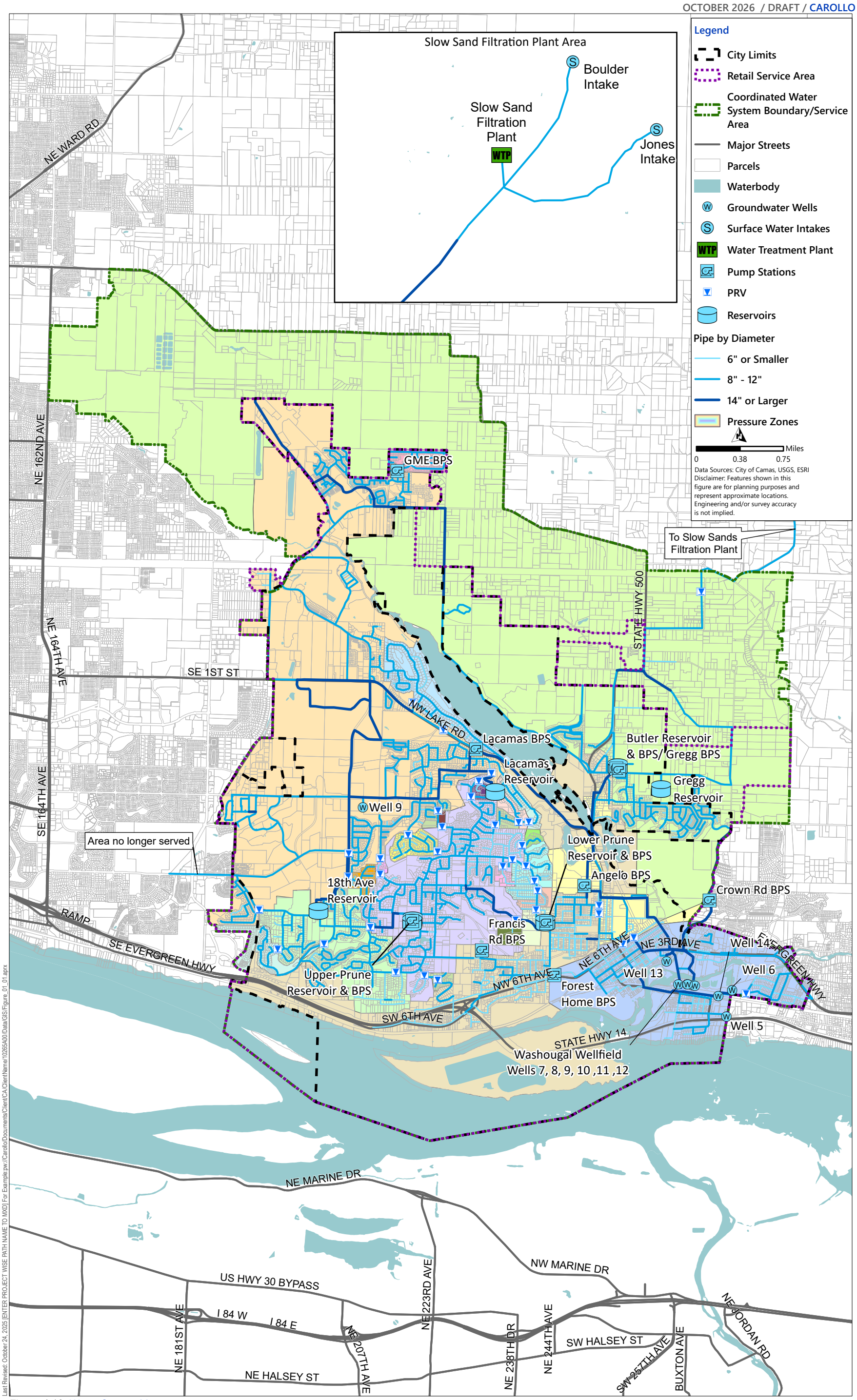
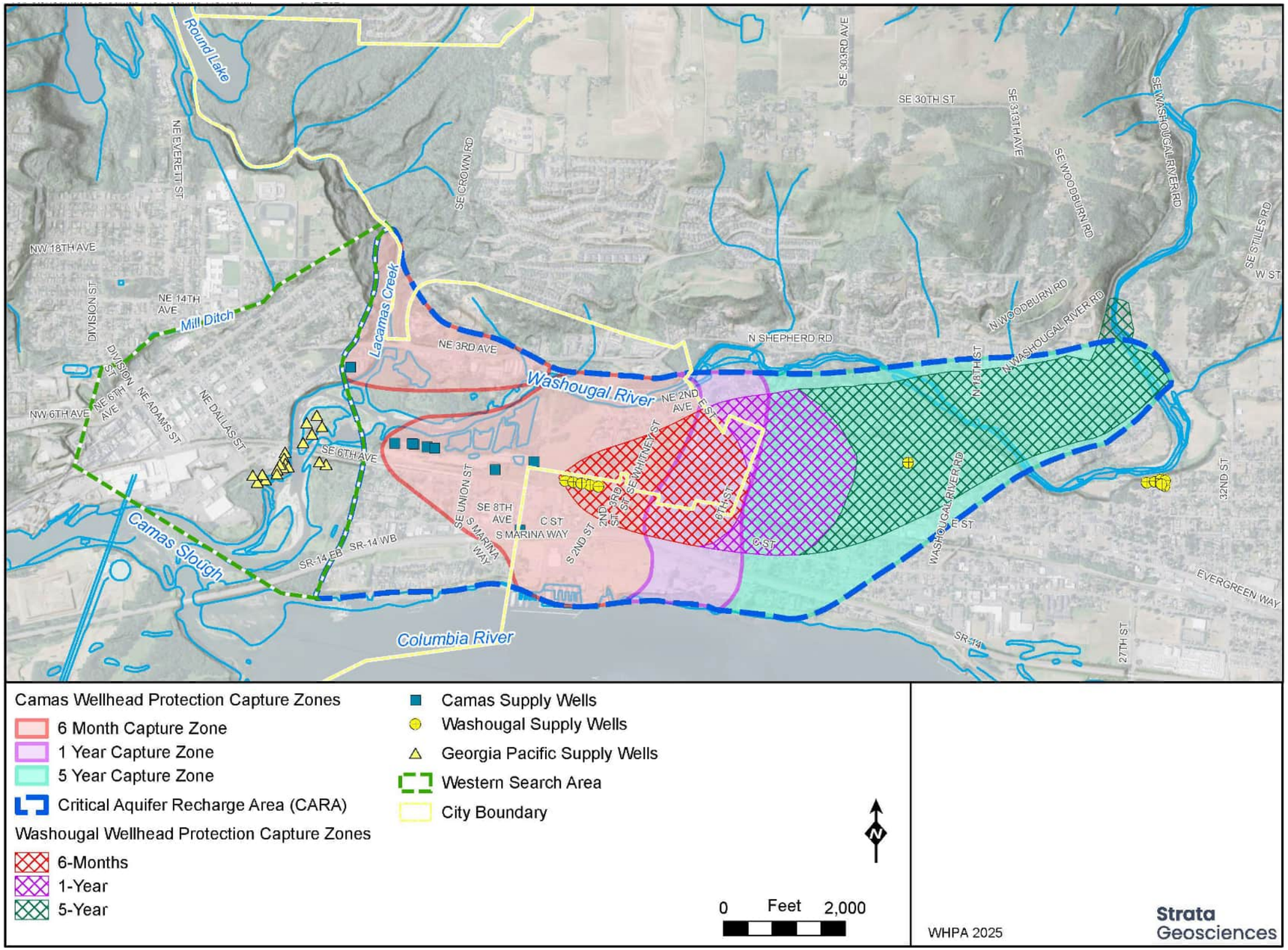


Figure 4.10 Water System Map



Source: City Of Camas Wellhead Protection Plan Update, Strata Geosciences, LLC, July 2026

Figure 4.11 Wellhead Protection Capture Zones

CHAPTER 5 INFLOW/INFILTRATION PROGRAM

5.1 Introduction

Infiltration and inflow (I/I) consist of two components which may combine or act independently to increase flow volume and peak flows in the sewer system. If too much I/I enters the sewer system such that the sewer system is operating at or above its capacity, sanitary sewer overflows could occur. More diluted waste can also be difficult to treat if using percent removal criteria as the basis. Proper attention to the lower than typical biological solids loading under these conditions is warranted in the design and operation of the WWTF. The definitions of infiltration and inflow are described below:

- **Infiltration:** Infiltration is defined as stormwater or groundwater flows that enter the sewer system by percolating through the soil and then through defects in pipelines, MHs, and joints. Examples of infiltration entry points are cracks in pipelines, misaligned joints, and root penetration. Due to this process, infiltration may be seen hours after a storm has occurred.
- **Inflow:** Inflow may be seen immediately after or during the storm. Inflow occurs when stormwater enters the sewer system via storm drain cross connections, leaky MH covers, or cleanouts. Examples of inflow entry points are roof drains and downspout connections, leaky MH covers, and illegal storm drain connections. Gross pipeline or system structural defects can be severe enough to allow storm or groundwater to enter the system rapidly and exhibit response time characteristics that could be categorized as inflow.

Key adverse effects of I/I on wastewater collection and treatment facilities include:

- Surcharging of sewer MHs.
- Sewage backups in facilities.
- Hydraulic overloading of unit processes at the WWTF.
- Reduced treatment efficiency at the WWTF due to dilute concentrations.
- Prematurely reaching capacity for collection systems and/or WWTF components.

This Chapter focuses on summarizing the City's efforts on I/I reduction from 2016 through 2024 and the quantifiable, positive improvement that has been accomplished in reducing I/I. It summarizes the amount of I/I for these years and specific projects completed to address I/I. This chapter also discusses recommendations for future I/I activities.

5.2 Historical I/I Control Efforts

The City has conducted I/I studies since 1977. The City has spent more than $4.55 million (M) in collection system I/I work and $750,000 on wastewater treatment facility improvements to address I/I flows.

The 1977 I/I Report attributed approximately 2.6 mgd to infiltration and 2.1 mgd to inflow. Major infiltration sources identified included roof and foundation drains, catch basins and multi-hole MH covers. By 1987, a sealing project was underway for individual sewer services.

In 1994, a consultant wrote a memorandum stating that estimated I/I entering the system was 3.54 mgd and the major source was likely faulty service connections. It was concluded that a more cost-effective alternative to reducing I/I would be to increase treatment capacity.

In 1997, a Facility Plan determined the City had excessive I/I based on USEPA criteria, and an 8-year sewer system rehabilitation program began based on monitored basins with the highest risk of I/I. During this study, a peak I/I flow of 3.4 mgd was determined.

In 2007, excessive inflow was determined at 62 gallons per capita day (gpcd) for infiltration and 383 gpcd for inflow. This is based on the USEPA criteria for excessive I/I to be 120 gpcd for infiltration and 275 gpcd for inflow. A total of 26 collection system projects were identified to address capacity and condition issues, 18 of which would reduce I/I.

In 2016, the City commissioned an evaluation of the collection system to document existing infiltration and inflow as a condition of their new stormwater permit. This evaluation utilized pump station run time, WWTF flow, and precipitation records to identify basins that were yielding high I/I values. This provided data to confirm the basins with high I/I, which were 3S, 3N, 4, and 10 (shown in Figure 4.1). Then smoke testing, manhole inspection, and closed-circuit television (CCTV) inspection were used to identify specific locations within these basins to determine source of I/I. The results of the 2016 I/I Study were used to plan and prioritize projects in order to reduce I/I.

In 2020, the City commissioned a follow-up study to document the reduction in I/I achieved by implementing the recommendations of the 2016 evaluation. The specific objectives of the 2020 study included:

1. Comparing the I/I with that measured in previous flow monitoring efforts completed for the 2016 I/I Study to assess the efficacy of rehabilitation efforts.
2. Identifying areas of the City where the I/I related peaking factor exceeds 3.4:1.
3. Identifying additional areas of high I/I in order to identify new areas for rehabilitation.

The 2020 Study demonstrated that since 2016, the City has observed a reduction in peak WWTF flows and high flow events, even though the population of the City and the extent of the sewer system have both increased over this time. Additionally, the City's WWTF no longer experiences excessive infiltration or inflow as defined by the USEPA, which is examined below in Section 5.7.3.

5.3 Required I/I Reporting

Special condition S.4.E of the 2015 Camas WWTF NPDES permit required the City to conduct a study of inflow sources and annual analysis of I/I using the Ecology Information Manual for Treatment Plant Operators. Special Condition S.4.E has been removed in the 2025 Camas WWTF NPDES permit and the City is no longer required to conduct annual I/I reporting. However, for completeness, this section summarizes the I/I Reporting completed through 2024 under the previous permit. Special condition S.4.E indicates the Annual I/I Report included:

1. Average monthly flow and total precipitation for each month for the past year.
2. Maximum monthly and peak hourly hydraulic design capacity for the plant.
3. Design population equivalent for the treatment plant and population served by the facility for the past year.

4. The amount of I/I for each year since the base year and the percentage of maximum monthly design capacity each year's I/I represents.
5. Percent increase or reduction in I/I for each year after the base year I/I.
6. Additional lengths of sewer lines added to the collection system for the past year.

The Annual I/I reports for 2021 through 2025 and the City's I/I Program are provided in Appendix F and summarized throughout this chapter. Values in this Chapter are based on numbers that were reported in the Annual Reports. It is recommended that the City continue to calculate and monitor these I/I values although it is not required in the NPDES permit. Please note that the City is updating their treatment plant capacity and values may change after completion.

5.4 Calculated I/I at the WWTF

Special condition S4.E.3 of the 2015 NPDES permit states that the annual period for the required I/I reporting is May 1st through April 30th. WWTF flow records are utilized to characterize I/I in the collection system. Table 5.1 shows the calculated I/I at the WWTF based on the annual I/I reports. The 2016 Annual Report selected May 2011-April 2012 to be the base year to compare future I/I against. This base year was selected because it represents the 20-year median rainfall. The average 12-month rainfall in Camas from the 20-year period of 1997 to 2017 was approximately 46.4 inches, and from May 2011 to April 2012 the rainfall was approximately 47.6 inches, which was the 50th percentile of all 20, 12-month totals and only 1.2 inches more than the 20-year average. Additionally, using 2011 to 2012 as the selected base year incorporates the City's recent growth. Per permit requirements, the I/I was compared with maximum monthly hydraulic design capacity for the Camas Wastewater Treatment Facility. Additionally, I/I was compared with the previous year. The fluctuations seen in I/I in Table 5.1 are largely due to variations in rainfall. Reductions in I/I from specific projects are presented in further sections.

Table 5.1 Annual Report Calculated I/I at the WWTF(1)

Year	Calculated I/I (mgd)	I/I as Percent of Design Capacity	I/I Percent Increase/Decrease
2011	1.511	25%	N/A
2012	2.340	38%	+55%
2013	0.591	10%	-75%
2014	0.985	16%	+67%
2015	2.277	37%	+131%
2016	1.920	31%	-16%
2017	1.021	17%	-47%
2018	1.052	17%	+3%
2019	1.541	25%	+47%
2020	1.334	22%	-13%
2021	1.400	23%	+5%
2022	1.264	21%	-16%
2023	2.266	37%	+79%
2024	1.734	28%	-23%

Notes:
(1) Values presented in this table are obtained from annual I/I reports.

5.5 Field Investigation

Several evaluations were conducted to determine areas of excessive I/I. Field investigation methods include flow monitoring and analysis, smoke testing, MH inspection, and video inspection.

5.5.1 Flow Monitoring and Analysis

Under the City's 2015 NPDES permit, the City was required to:

- Quantify the level of inflow from each collection system basin or sub-basin in order to identify areas exceeding a peak day to monthly average peaking factor of 3.4:1 during the design rainfall event.
- Prioritize the list of projects to most cost-effectively reduce the level of inflow to a peaking factor of 3.4:1 or less.

While the current permit does not include these requirements, this section summarizes the analyses carried out to date. The analysis for flow monitoring includes evaluation of WWTF flow data, pump station run-time data, and collection system flow monitoring data. As part of this GSP, ADS conducted a wet-weather analysis to assess RDII attributed to each of the 4 monitored tributary areas. During the flow monitoring period there were 5 storm events captured. A storm is defined as a rain event with at least 0.8 inch of rain with no rain interruption of more than 12 hours. Captured storm volumes ranged from 1.15 inches (April 6, 2025) to 2.84 inches (February 21, 2025). The storm event on February 21, 2025 has roughly a 2-year, 24-hour return frequency. Gross I/I is calculated for each storm and each flow meter tributary area as the difference between the actual recorded flow minus the ADF weekend and weekday pattern. Wet weather responses are normalized according to basin size in order to properly characterize relative I/I performance among the basins evaluated. As a general rule, basins may be considered to yield excessive RDII if such normalized values are much greater than 5. Two of the 4 metered basins evaluated, Basin 4-1-3 and Basin 5-1-2 (shown in Figure 3.3), slightly exceeded this value with 6.0 percent and 7.1 percent rainfall ingress, respectively. The highest RDII is attributed to Basin 5-1-2 that encompasses Basin 3N, 3S, and 10 consistent with previous studies.

The highest-ranking storm event identified occurred on February 21, 2025 with 2.84 inches rainfall and 6.664 mgd total WWTF influent flow on February 23, 2025, followed by March 11, 2025 at 2.47 inches rainfall and 4.820 mgd total WWTF influent flow of March 13, 2025. Crown View, South Prune Hill, Hillshire and Baz Park lift stations were identified to exceed the peaking factor criterion of 3.4:1.

Based on the ADS flow monitoring and pump station I/I evaluation, Basins 10, 12S, 22, and 4 which are tributary to these lift stations are recommended for further flow assessment. Basins are shown in Figure 4.2 in Chapter 4.

5.5.2 Video Inspection

Until 2023, the City contracted with specialist firms to perform regular CCTV inspections of its gravity sewer system. In 2024, the City purchased a CCTV van to perform inspections in-house. The inspections identify structural and operational defects, such as broken pipes, cracks, grease, roots, sag, separated and offset joints, and other problems. Several structural defects identified in CCTV inspections were repaired when identified. Other defects may be addressed through increased preventative maintenance, repair, or monitoring. The results are being used to develop a list of projects which the City incorporated into their ongoing repair and replacement program.

5.6 Completed I/I Projects

Completed I/I projects are shown in Table 5.2. These projects have cost the City in excess of $6.5M over the past decade.

Table 5.2 Completed I/I Projects

Year	Basin	Project Title	Description	Project Cost(1)
2026	1,10	6th Pl Emergency	Replaced collapsed pipe on 6th Pl east of NW Sierra St to West Camas PS wet well. Two contracts (emergency) and full replacement of approx. 200 LF gravity pipe.	$100,431 $125,348
2026	1,10	Design-South Prune Hill trunkline replacement	Design and construct replacement of South trunk line from West Camas PS along 6th P to NW 2nd (cross country) then to NW View Ridge vicinity.	RR funds future
2025	14	Prune Hill Park PS	Rehab wet well, valve vault, electrical, etc.	$876,393
2023	14	Lacamas Shores PS	Rehab pump station controls and electrical system.	$120,000
2023	13	Sunningdale Garden PS	Rehab wet well, valve vault, piping, and electrical system.	$415,286
2022	3S	NW 14th Street Improvements	Replaced 22 LF gravity pipe at intersection of NW 14th and NW Benton and repaired manhole.	$10,000
2021	6,7	Lacamas Creek PS Improvements	Demolished existing Lacamas Creek PS and constructed two new satellite stations Lacamas Creek and Baz Park. Replaced existing force main and gravity main and lined existing manholes.	$3,217,664
2019	10	View Ridge Court Sewer Replacement	Replacement of sewers.	$370,000(3)
2018	3S	Mill Ditch Repair	Replaced section of sewer line between Dallas Street and Birch Street.	$417,105(2)
2018	3S	Mill Ditch Repair	Rehabilitate or replace 15-inch CONC from MH 3-2-6 to 3-1-1 (1,370 feet).	
2017	4	NE Dallas Street Sewer Replacements	Replacement of several sewer pipes.	$129,000(3)
2017	4	NE Adams Street Sewer Replacements	Replacement of several sewer pipes.	$100,000(3)
2017	4	Everett and Franklin Sewer Replacement	Replacement of sewer line from 19th and Franklin to Everett and Everett to 21st.	$352,000(3)
2016	4	Franklin Street Sewer Improvement	Replaced sewer line between MH 4-1-1 and MH 4-1-4.	$952,883(2)

Notes:
(1) Cost values reflect actual construction costs at the time of completion.
(2) Value from the 2017 Annual Report.
(3) Value from the I/I Follow-Up Study.

5.7 Planned I/I Projects

The City will continue to address I/I throughout the collection system through their ongoing repair and replacement program. Based on replacing all gravity and STEP mains installed prior to 1940 by the end of the planning horizon (2045), the City's annual pipeline repair and replacement program is $1,100,000 annually.

It is also recommended the City investigate sources of I/I in flow meter basins 5-1-2 (specifically upstream of Crown View LS and South Prune Hill LS) and 4-1-3 (downtown), as these basins exhibit high I/I and have potential to reduce or eliminate downstream capacity projects (discussed in Chapter 6 and Chapter 9). Priority basins were historically 3N, 3S, and 4. Based on the 2025 flow monitoring and potential for I/I reduction to reduce or eliminate capacity-related improvement projects identified in this GSP, current priority basins are 22, 10, 12S, and 4.

Flow monitoring basin 5-1-2 contains two sewer pathways. To the north, sewer basins 12N and 22 flow through 3N which in turn flows through 3S. To the south, sewer basin 12S flows south to basin 10 and then east through basin 1 and then 2. It is recommended that the City conduct flow monitoring within Basin 5-1-2 to assess where in the basin the I/I is generated, what the sources of I/I are, and if projects to reduce I/I can be cost effective alternatives to capacity projects in these areas (discussed in Chapter 6 and Chapter 9) and in the downstream system. A combination of night-time reconnaissance, flow monitoring, and CCTV inspection is recommended.

Basin 4-1-3 is a smaller basin which overlaps with sewer basin 4. In this area, it is recommended that the City identify sources of I/I in the basin, implement I/I reduction projects, and perform post-construction flow monitoring to quantify the impact of the projects in I/I. Results from the I/I pilot study can be used to estimate potential I/I reduction from similar projects in other areas, for example Basin 5-1-2.

It is recommended that both the Basin 5-1-2 Flow Monitoring and the Basin 4-1-3 Pilot I/I Study be completed in 2027 prior to design and construction of the capacity projects in these basins and downstream of these basins in order to evaluate if I/I projects are cost-effective and can eliminate or reduce the need for the capacity projects.

Table 5.3 presents the planning projects and project costs. These projects are included in the annual program and general projects of the Capital Improvement Plan presented in Chapter 9. Capital improvements from these studies would be paid for from ongoing rehabilitation and replacement budgets.

Table 5.3 Planned I/I Projects

Year	Basin	Project Title	Description	Project Cost
Ongoing	N/A	Gravity and STEP Main Repair and Replacement	Ongoing repair and replacement of gravity mains at end of useful life	$1,100,000/year
2027	10,1,2,12N, 12S,22,3N, 3S	Basin 5-1-2 Flow Monitoring	Install temporary flow meters in Basin 5-1-2 to separately monitor flows from the area along 6th Avenue and the area of Upper Prune Hill to identify areas contributing high I/I.	$300,000
2027	4	Basin 4-1-3 Pilot I/I Study	Investigate the source and magnitude of I/I. Identify opportunities to reduce non-sewage flow and measure the impact of I/I reduction projects in the area. Information from the pilot study should be used to assess cost of I/I reduction vs capacity improvements.	$200,000

CHAPTER 6 COLLECTION SYSTEM

6.1 Introduction

The City's customer base continues to increase through system expansion. With this growth, some of the City's sewer infrastructure may reach conveyance capacity. This chapter presents an evaluation of the available capacity of the existing system to convey current and future sewer flows. The City's collection system is broken up between gravity mains and STEP systems that flow to the treatment plant separately.

Using the City's updated sewer model, major pipes and lift stations in the modeled collection system were evaluated for meeting established capacity criteria. The modeled collection system is primarily gravity sewers that are 8-inch or larger where data is available and the trunk of the STEP system. The model represent a skeletonized version of the system. An overview of the modeled collection system is shown in Figure 6.1. The system was calibrated with seven flow basins of which four are flow meters installed by ADS during the 2025 flow monitoring study, two are lift station SCADA data, and one is the wastewater treatment facility SCADA data which helped calibrate the STEP basin system by subtracting the gravity collection system to isolate the STEP basin system. The model was delineated into seven flow monitoring basins with similar diurnal patterns and wet weather flow parameters, also shown in Figure 6.1. Additional details on the model used to evaluate the collection system can be found in Appendix E - Hydraulic Model Development. This chapter identifies recommended projects to address capacity deficiencies and to serve future users.

6.2 Evaluation Criteria

Defining performance criteria is a critical step in the master planning process because it sets metrics by which the collection system infrastructure will be evaluated to meet service goals set by the City. Sewer pipe capacities are dependent on many factors, including roughness of the pipe, the maximum allowable depth of flow, and slope of pipe. The City's applications of these factors and established requirements are discussed in Sections 6.2.1 and 6.2.2.

It is important to differentiate performance and design criteria when judging the performance of collection system infrastructure. Design criteria establish the standards for designing and constructing new sewers. Performance criteria establish the standards that are used to analyze adequacy of existing facilities and to trigger future infrastructure needs. Performance criteria are commonly less stringent than design criteria because existing sewer systems typically have aged significantly and would require extensive reconstruction to meet standards for new design. It is generally inappropriate to use standard design criteria as performance criteria, especially when significant wet weather flows impact an existing collection system (as is the case with an aged sewer system). For instance, new sewers are designed to convey flow under non-surcharged conditions (assuming limited I/I), while surcharging may be permissible during the analysis of existing sewers, especially during PWWFs. The following sections describe the City's established design criteria and performance criteria used herein.

6.2.1 Design Criteria

The design criteria are used to size new infrastructure recommended to alleviate system deficiencies.

6.2.1.1 Conveyance System

It is common practice to use diameter-based flow depth criteria for pipes when designing new gravity sewers. The d/D ratio is defined as the depth of flow in a pipe during peak flow conditions divided by the pipe's diameter. The City defines the acceptable d/D value of 0.92 for design of new sewers under design storm conditions and build out scenario. The City's Sewer Standards also define the minimum pipe diameter, which is 8-inch.

6.2.1.2 Lift Stations and Force Mains

Any new lift stations recommended will need to follow the City's Sewer Standards for lift stations and force main construction to meet Ecology requirements. These are detailed in Section 2.2.2 of Chapter 2 - Policies and Criteria.

6.2.2 Performance Criteria

6.2.2.1 Design Storm

The sewer system hydraulic capacity analysis was performed using a historical 10-year, 24-hour rainfall event (Station Portland Airport, HYDRA Rain Gauge Network) on December 6, 2015. This design storm is discussed in Section 3.4.6 of Chapter 3 - Basis of Planning.

For this GSP, the HYDRA historical event referenced above was selected as the design storm for modeling system response and system performance evaluation to realistically represent peak wet weather conditions. The historical HYDRA event was chosen for three reasons:

- NOAA Precipitation Atlas isopluvial mapping indicates that a 10-year, 24-hour storm at Camas produces approximately 3.5 inches of rainfall.
- The selected historical storm produced 3.37 inches of rainfall in 24 hours and provides a measured storm hydrograph for modeling.

6.2.2.2 Conveyance System

When evaluating existing sewers, using a conservative d/D ratio may lead to unnecessary replacement of existing pipelines. Therefore, the following performance criteria for the conveyance system was developed and used to evaluate the system under design storm PWWF conditions. The PWWF was defined using the standards summarized in Section 6.2.1.1.

- Sewer pipes can be surcharged. If surcharging is within 3-feet from manhole rim, then the sewer was deemed deficient.
- No surcharging (d/D>1) is allowed at shallow manholes. Shallow manholes are defined as MHs where the distance between crown of pipe and manhole rim is less than 3 feet. Shallow manhole locations are shown on Figure 6.1.

6.2.2.3 Lift Stations and Force Mains/Pressurized Mains

The City's performance criteria for existing lift stations include firm capacity, which is capacity with the largest pump out of service and force main and STEP main velocities. According to City Sewer Standards:

- Firm pump capacity shall be provided to handle the PWWF from the lift station's tributary area.
- Existing force mains shall not exceed a maximum pipe velocity of 8 feet per second (fps) for the design storm.
- The existing STEP mains and force mains shall not exceed a maximum velocity of 8 fps.

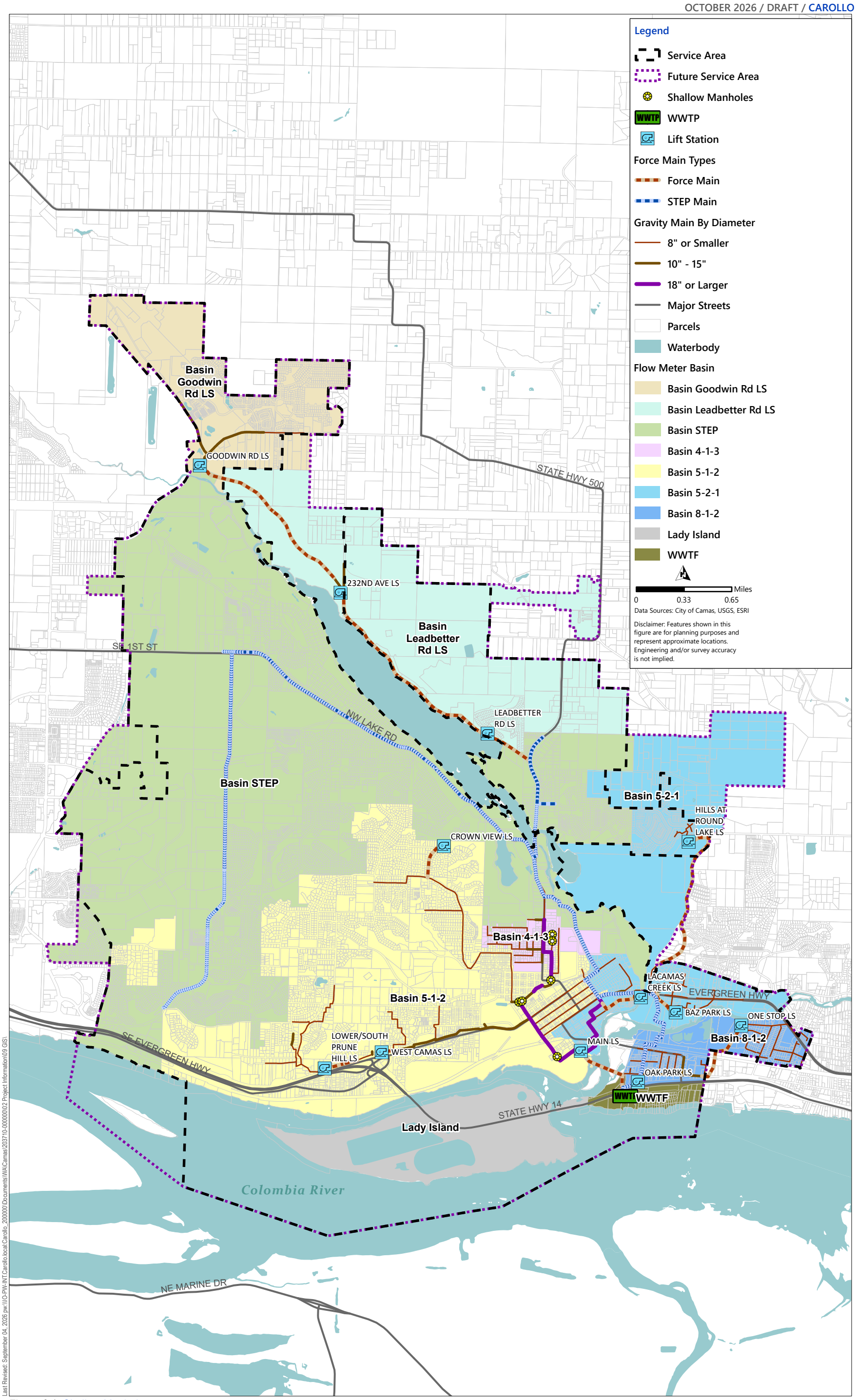


Figure 6.1 Shallow Manholes
CITY OF CAMAS
GENERAL SEWER PLAN

6.3 Gravity Collection System Evaluation

A capacity analysis of the modeled collection system was performed using the City's calibrated hydraulic model and using the evaluation criteria identified above in Section 6.2. The capacity analysis identified areas in the sewer system where the performance criteria for surcharging were exceeded, or where the capacity of lift stations were exceeded. The collection system was evaluated for three development scenarios:

- Existing: Matching existing conditions.
- 20-Year: Incorporating growth through 2045 as identified in the 2045 Comprehensive Plan.
- Buildout: Development of the full-service area including UGA.

For the remainder of the chapter, the system evaluation focuses on existing and 20-year system conditions to identify capacity deficiencies and improvement projects for the 20-year planning horizon. The buildout scenario was used to size projects needed in the 20-year planning horizon to accommodate buildout conditions.

6.3.1 Key Causes of Deficiencies

The calibrated hydraulic model was exercised under design storm conditions, and the predicted results were analyzed using the performance criteria to identify segments of the system not meeting those criteria. The key causes triggering deficiencies in the City's collection system include:

- Adverse slopes and misaligned inverts.
- Shallow MHs.
- Pipe restrictions caused by a single, or a few, smaller diameter pipes between larger diameter pipes.
- Pipe diameter not sufficient to convey the PWWF.
- Lift station firm capacity not sufficient to pump the PWWF.
- Backwater condition.

6.3.2 Existing System Problem Areas

For the existing sewer collection system, the PWWF was routed through the hydraulic model to assess performance. In accordance with the established criteria for existing sewers, where the model predicted potential deficiencies, these were identified. Existing deficiencies are primarily located in Flow Monitoring Basin 5-1-2, with primary capacity issues in the downstream larger trunk lines receiving flow from smaller tributary areas and delivering sewage to NE Adams to SE 3rd Avenue Basin 5-1-2 experiences elevated I/I that contributes to the observed deficiencies along 6th Avenue, Division Street, and NW Fargo Street. Basin 4-1-3 is a smaller basin that also shows elevated I/I which causes observed deficiencies along NE Franklin Street and along the Mill Ditch. The locations of these predicted deficiencies under existing PWWF conditions are shown in Figure 6.2.

6.3.3 20-Year System Problem Areas

The 20-year (2045) system analysis was performed in a similar manner to the existing system analysis. The 20-year condition evaluated whether or not the sewers would be adequately sized to convey the future PWWFs, including projected growth in the North Shore area. This analysis incorporates the preliminary assumptions made for how and where to connect the growth areas to the existing system. The City's preference is for new development to connect to the gravity system and not the STEP system, where practical.

Three additional deficiency problem areas occur during 20-year PWWF conditions. The additional projected flows from the North Shore area add significant amounts of flow and are predicted to exceed the evaluation criteria and cause additional surcharging in the system. Additional growth upstream of 6th Avenue NW causes existing deficiencies to worsen under 20-year. The 20-year deficiency problem areas are shown in Figure 6.3.

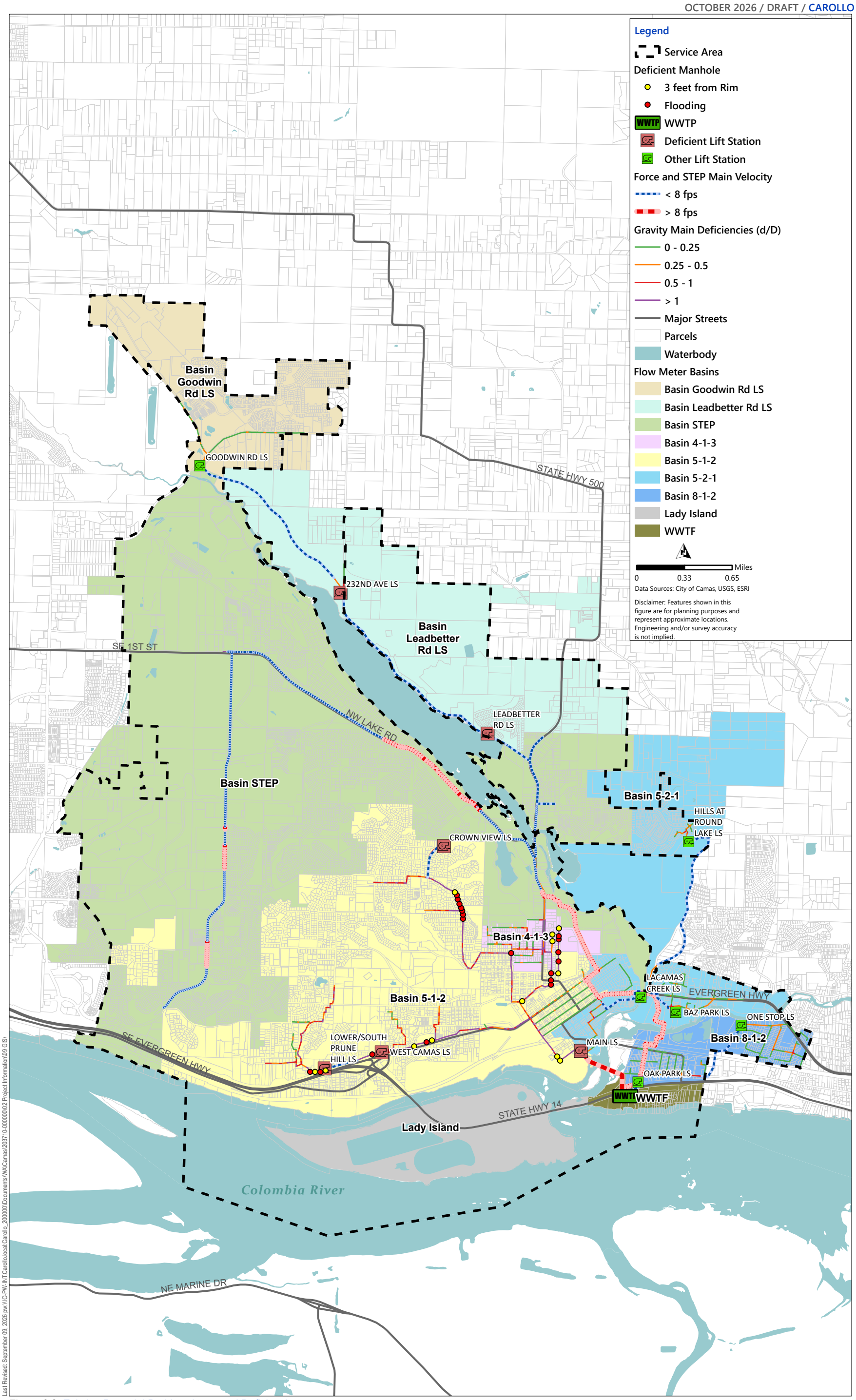


Figure 6.2 Existing Potential Problem Areas and Deficiencies

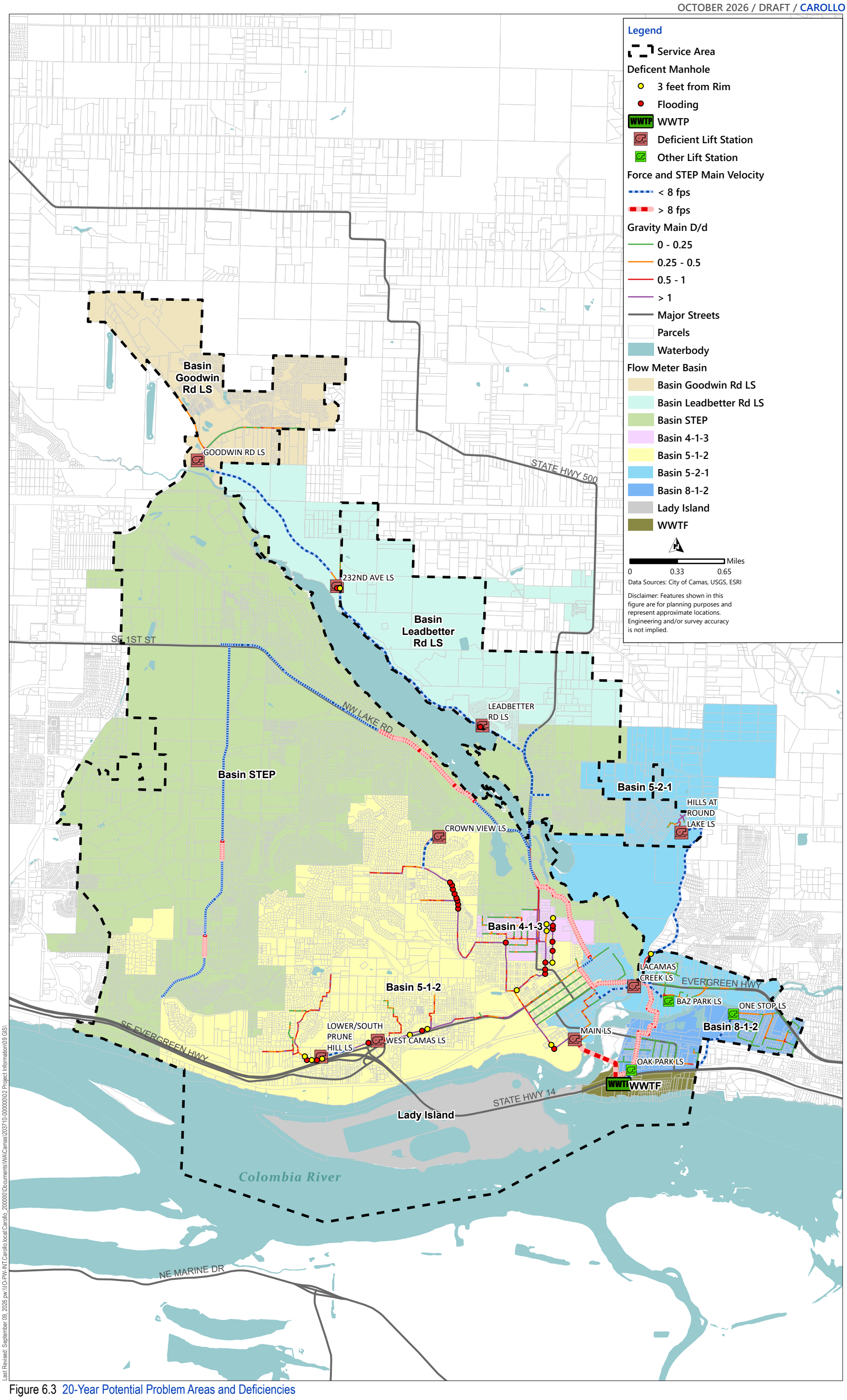


Figure 6.3 20-Year Potential Problem Areas and Deficiencies

6.4 STEP System Evaluation

The STEP system area was incorporated into the model with the main pipeline modeled as seen in Figure 6.3. The hydraulic analysis results show that the STEP system transmission main exceeds the performance criteria velocity of 8 fps under the existing PWWF and projected 2045 PWWF flows. These exceedances are located mainly where there are steep downhill slopes. Because the velocity is exceeded due to steep slopes under low pressure, there is no practical improvement project to address the high velocity. These velocity exceedance areas are mainly located along NW Parker Street from NW PacificRimBoulevard to NW 38th Avenue and along NW Lake Road from NW Leadbetter Drive to NW Lacamas Lane.

6.5 Lift Station Evaluation

Ensuring that lift stations have adequate capacity to convey peak flows is important to prevent sewage overflows at or near lift stations. In accordance with the established performance criteria, the City's existing lift stations were evaluated using results from the calibrated hydraulic model to determine if the lift stations have available capacity to convey existing and future PWWFs. If a lift station has inadequate capacity to pump the PWWFs, the water level in the wet well may rise to the overflow point, spilling sewage. Lift stations predicted to experience an influent PWWF greater than the existing firm capacity of the station were flagged as deficient.

The City's hydraulic model includes 12 of the City's 28 lift stations. The modeled lift stations are located in the City's gravity collection system. All flow from the gravity collection system goes through Main LS except for a small portion of gravity flow that enters the WWTP via One Stop LS and Oak Park LS. All 12 modeled stations are shown in Figure 6.1 in light blue. The estimated current and future peak flows were compared to the lift station firm capacities. The firm capacity of a lift station is defined as the capacity with the largest pump out of service. Table 6.1 summarizes the results of the lift station evaluation. Table 6.1 includes the total capacity at each station, as an additional point of reference for the modeled PWWF's. Firm and total capacities were provided by the City through as-built drawings and spreadsheet. Figures 6.2 and 6.3 show deficient lift stations in red and lift stations meeting the firm capacity in green.

Table 6.1 Lift Station Evaluation

Lift Station Name	No. of Pumps	Total Capacity (mgd)	Firm Capacity (mgd)	Existing Modeled PWWF (mgd)(4)	20-Year Modeled PWWF (mgd)(4)	Firm Excess Deficiency	20-Year Excess Deficiency
232nd Ave(1)(3)	2	1.05	0.53	0.70	1.42	Yes	Yes
Baz Park(1)	2	1.29	0.65	0.19	0.19	No	No
Crown View	2	0.64	0.32	0.85	0.85	Yes	Yes
Goodwin Rd(1)(3)	2	0.98	0.49	0.37	0.71	No	Yes
Hills at Round Lake(2)	2	0.74	0.37	0.20	0.96	No	Yes
Lacamas Creek(1)	2	2.74	1.37	0.96	1.54	No	Yes
Leadbetter Rd(1)(3)	2	1.74	0.87	0.88	2.6	Yes	Yes
Main(2)	3	16.6	11.1	15.9	18.5	Yes	Yes
Oak Park(2)	2	1.0	0.5	0.32	0.32	No	No
One Stop(2)	2	0.66	0.33	0.17	0.17	No	No
South Prune Hill(2)	2	1.73	0.86	2.40	2.60	Yes	Yes
West Camas(2)	2	2.88	1.44	3.10	3.13	Yes	Yes

Notes:
(1) Total and firm capacity from as-built drawings.
(2) Total and firm capacity provided by the City "Lift Station info List (updated 11-2-21).xlsx" spreadsheet.
(3) Has space for a third pump.
(4) PWWF Results shown are without any constrictions.

Based on the analysis and the results presented in Table 6.1, six of the modeled lift stations are considered deficient in the existing system scenario per the City's firm capacity performance criteria. These deficiencies are exacerbated and an additional three lift stations are identified as deficient under the 20-year conditions.

6.6 Recommended Collection System Improvements

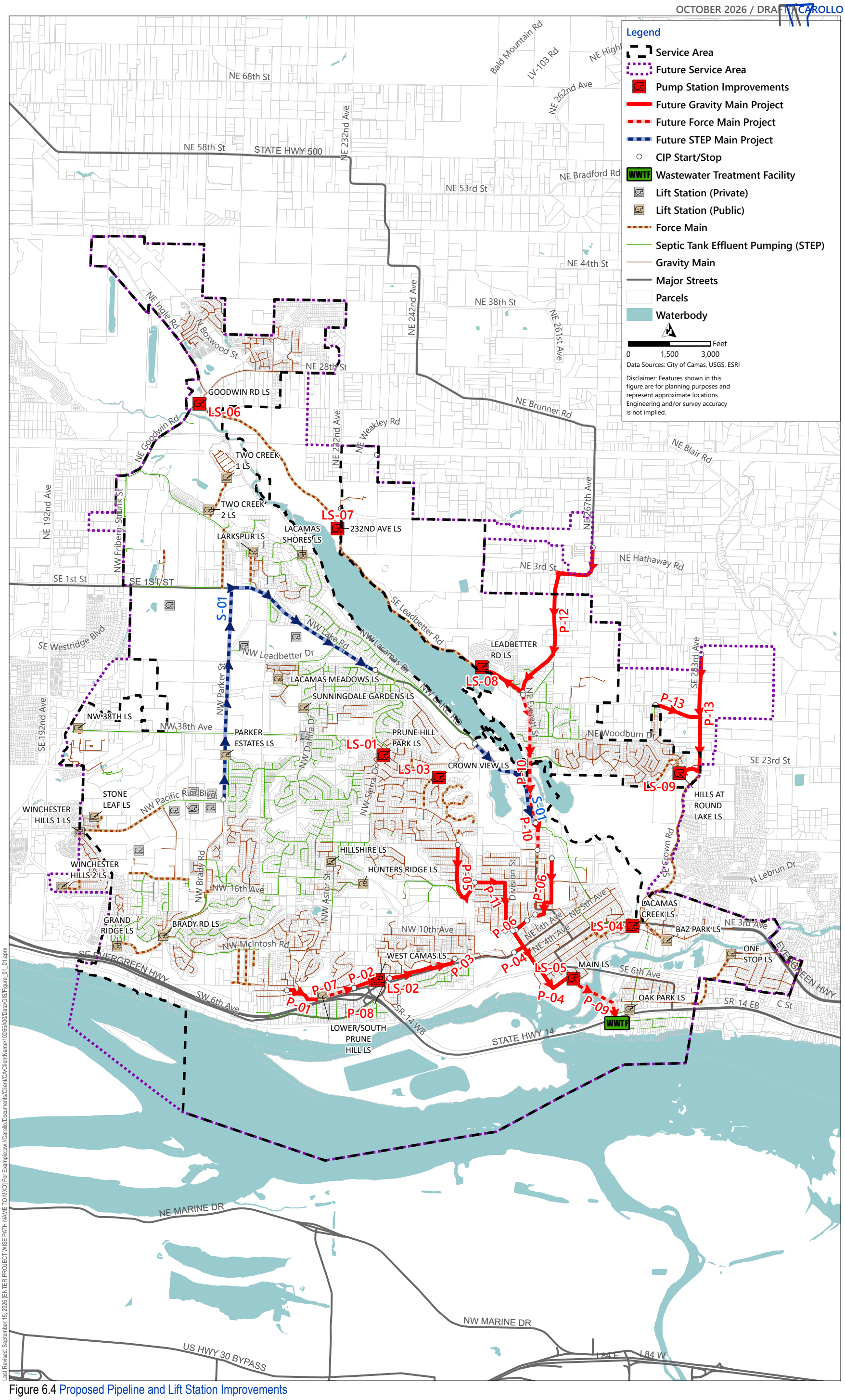
Following completion of the existing and 20-year system analyses, improvement projects and alternatives were developed to address the identified capacity deficiencies. These improvements are sized to meet buildout PWWF. The analysis identified 10 localized areas with pipeline capacity deficiencies and nine lift stations requiring upgrades to meet the established firm capacity criteria. In addition to these deficiency-driven projects, three system expansion improvements were developed to provide new conveyance capacity for planned future growth in the North Shore area and to connect future development to the existing sewer system.

The proposed improvements were not necessarily extended to achieve a d/D ratio of 0.92 or less in every pipe segment. Instead, the improvement extents were established to address identified capacity deficiencies while allowing some surcharging of the system. In locations where localized d/D ratios remain above 0.92, the hydraulic grade line (HGL) was evaluated to confirm that it remains at least 3 feet below the MH rim during PWWF. This approach provides a practical and cost-effective balance between improving system performance and limiting the extent of improvements while avoiding conditions that could result in manhole flooding. Localized d/D ratios greater than 0.92 may occur due to the existing

pipe geometry and hydraulic profile and do not necessarily indicate an unresolved capacity deficiency when the HGL remains at least 3 feet below the MH rim.

Figures 6.4, Table 6.2, and Table 6.3 identify the location and extents of the recommended system improvement projects. Tables 6.2 and 6.3 provide details of the recommended improvement (length, diameter, street location, etc.). The improvements summarized in Tables 6.2 and 6.3 utilize a numbering system cross-referenced with Figure 6.4. The deficiencies addressed by each project are explained in Section 6.5. Individual project summaries with additional project details are included in Appendix L - CIP Project Sheets. The columns used in Tables 6.2 and 6.3 refer to the following:

- Project ID: Assigned unique identifier associated with each improvement project. This is an alphanumeric number that starts with one or two letters indicating the type of improvement and continues with a number and a letter:
  - P= Pipe,
  - S= STEP,
  - LS = Lift Station.
- Improvement Type: Gravity pipelines, STEP pipes, or lift stations.
- Location: Street in which the improvement is proposed.
- Existing Size: This represents the diameter of the existing pipelines (inches), or the total capacity of existing lift stations (mgd).
- Proposed Size: This represents the diameter of the proposed pipelines, or the total capacity of lift stations after proposed improvement, or upon construction if a new facility to serve future growth.
- Length: Estimated length of the proposed improvement in feet. It should be noted that the length estimates do not account for re-routing the alignment to avoid unknown conditions, if more detailed planning and design identifies such constraints.



Last Revised: September 15, 2026 [ENTER PROJECT WISE PATH NAME TO MXD] For Example:pw://Carollo/Documents/Client/CA/ClientName/10265A00/Data/GIS/Figure_01_01.aprx

Figure 6.4 Proposed Pipeline and Lift Station Improvements

6.6.1 Recommended Pipeline Improvements

These are the recommended collection system improvements projects:

P-01: NW 6th Place West Improvements

P-01 experiences surcharging upstream of the South Prune Hill LS under existing conditions, as illustrated in Figure 6.4. The model also identified potential manhole flooding during the design storm at modeled MHs 10-1-8, 10-1-7, and 10-1-6. These deficiencies are caused by capacity limitations associated with the existing pipe diameters and slope constraints within the reach.

The proposed NW 6th Place West Upsize Improvements consist of upsizing approximately:

- 422 LF of pipe between MHs 10-6-1 and 10-1-11 should be upsized from 8- to 12-inch;
- 809 LF of pipe between MHs 10-1-11 to 10-1-7 from 8-inch to 15-inch, and;
- 472 LF of pipes between MH 10-1-7 and the South Prune Hills LS wet well from 8- to 18-inch.

The proposed improvements provide additional gravity conveyance capacity, alleviate the modeled surcharging and potential manhole flooding, and allow the system to meet the City's design criteria.

P-02: NW 6th Place East Improvements

P-02 experiences surcharging along NW 6th Place under existing conditions. The model also identified potential manhole flooding during the design storm at modeled MHs 10-1-3 and 10-1-1. This deficiency is caused by capacity limitations within the flatter gravity sewer pipelines in the reach.

The proposed NW 6th Place East Improvements consist of upsizing approximately:

- 682 LF of pipe between MH 10-1-3 to West Camas LS wet well from 8- to 21-inch.

The proposed gravity sewer improvements are located along NW 6th Place between South Prune Hill LS and West Camas LS, at an approximate depth of 5 to 10 feet. These improvements provide additional conveyance capacity, alleviate the modeled surcharging and potential manhole flooding, and allow the system to meet the City's design criteria.

P-03: NW 6th Place Avenue West Improvements

A capacity deficiency exists immediately downstream of the West Camas LS along NW 6th Avenue. The model identified surcharging and potential MH flooding at MHs 1-1-10, 1-1-6, and 1-1-4 under existing conditions. This deficiency is caused by capacity limitations in the existing gravity sewer and backwater conditions from downstream deficiencies.

The proposed NW 6th Avenue West Improvements consist of upsizing approximately:

- 1,943 LF of pipe between MHs 1-1-10 and 2-1-11 from 12- to 24-inch, and;
- 592 LF of pipe between MHs 2-1-11 and 2-1-9 from 12- to 21-inch.

The proposed gravity sewer improvements are located along NW 6th Avenue, immediately downstream of the West Camas LS and extending through Forest Home Park, at an approximate depth of 5 feet. These improvements will provide additional conveyance capacity to alleviate the modeled surcharging and potential manhole flooding and accommodate projected future growth.

Under the buildout scenario, additional segments were identified that exceed the City's design criterion of d/D less than 0.92. To meet the d/D criterion under buildout conditions:

- 446 LF of pipe between MHs 3-1-1 and 5-8-1 should be upsized from 18- to 27-inch;
- 260 LF of pipe between MHs 5-8-1 and 5-1-12 should be upsized from 21- to 30-inch,
- 402 LF of pipe between MHs 2-1-1 and 5-1-12 should be upsized from 12- to 30-inch;
- 545 LF of pipe between MHs 5-1-12 and 5-1-11 should be upsized from 21- to 36-inch;
- 947 LF of pipe between MHs 5-1-10 and 5-1-7 should be upsized from 24- to 36-inch;
- 1,126 LF of pipe between MHs 5-1-7 and 5-1-2 should be upsized from 21- to 36-inch, and;
- 34 LF of pipe between MHs 5-1-2 and 5-1-1 should be upsized from 24- to 36-inch.

These additional improvements are not needed under the 20-year scenario because the modeled surcharging remains more than 3 feet below the MH rim, but are recommended to meet the City's d/D criterion under full buildout conditions.

P-04: NW 6th Place Avenue East Improvements

Following implementation of the upstream P-03 (NW 6th Place Avenue West Improvements), the model identified surcharging along NW 6th Avenue between MHs 2-1-2B and 2-1-2. The additional upstream conveyance capacity results in increased downstream flows and reveals a capacity deficiency within the gravity sewer extending toward Main LS.

The proposed NW 6th Avenue East Improvements consist of upsizing gravity along NW 6th Avenue and SE 3rd Avenue to the Main LS. To alleviate surcharging, the proposed pipeline profile between MHs 5-1-5 and 5-1-1 was modified to provide a steeper downward slope through the relatively flat portion of the alignment, improving hydraulic conveyance through this segment. The shallow MH at 5-1-6 should also be evaluated during future project planning and design to determine whether an adjustment to the pipeline profile or MH invert could provide additional hydraulic benefit while maintaining adequate cover.

The proposed improvements consist of upsizing approximately:

- 446 LF of pipe between MHs 3-1-1 and 5-8-1 from 18- to 27-inch;
- 260 LF of pipe between MHs 5-8-1 and 5-1-12 from 21- to 30-inch;
- 402 LF of pipe between MHs 2-1-1 and 5-1-12 from 12- to 30-inch;
- 545 LF between MHs 5-1-12 and MHs 5-1-11 from 21- to 36-inch;
- 947 LF between MHs 5-1-10 and 5-1-7 from 24- to 36-inch;
- 1,126 LF of pipe between MHs 5-1-7 and 5-1-2 from 24- to 36-inch, and;
- 34 LF between MHs 5-1-2 and 5-1-1 from 21- to 36-inch.

The proposed improvements consist of gravity sewer pipelines generally located at an approximate depth of 5 feet.

Portions of the proposed improvements are located beneath an existing building, and a portion of the proposed alignment crosses an existing railroad. The proposed improvements may also be affected by an existing bridge along the alignment. An alternative alignment analysis was not performed as part of this GSP because future redevelopment and land use changes may affect the continued presence of the existing building and the feasibility of potential alternative alignments. Alternative alignments should be

evaluated during future project planning and design, when additional information regarding redevelopment and future land use is available. Depending on the condition and structural constraints of the existing bridge, replacement or modification of the bridge may be required to accommodate the proposed improvements.

P-05: NW Fargo, NW 18th Loop, NW 18th Avenue Improvements

The model identified surcharging and potential manhole flooding downstream of Crown View LS area along NW Fargo Street, NW 18th Loop, and NW 18th Avenue, indicating the need for additional gravity sewer capacity. Model surcharging and manhole flooding were identified between MHs 3-1-33 to 3-1-25. The deficiency is caused by a combination of pipe capacity limitations and changes in pipe slope. While portions of the upstream system have relatively steep slopes, several downstream pipe segments flatten, reducing hydraulic capacity and causing the HGL to increase.

The proposed NW Fargo Street, NW 18th Loop, and NW 18th Avenue Improvements consist of upsizing approximately:

- 2,744 LF of pipe between MHs 3-1-26 to 3-1-14 should be upsized from 8- to 15-inch.

The proposed gravity sewer improvements are located at an approximate depth of 10 feet. These improvements will provide additional conveyance capacity and alleviate the modeled surcharging and manhole flooding.

Under the buildout scenario, additional segments were identified that exceed the City's design criterion of d/D less than 0.92. To meet the d/D criterion under buildout conditions:

- 763 LF of pipe between MHs 3-1-36 and 3-1-33 should be upsized from 8- to 12-inch, and;
- 1,218 LF of pipe between MHs 3-1-33 and 3-1-26 should be upsized from 8- to 15-inch.

These additional improvements are not required under the 20-year scenario because the modeled surcharging remains more than 3 feet below MH rim but are recommended to accommodate full buildout conditions.

P-06: NE Garfield Street to NE 15th Avenue to NE Franklin Street along the Mill Ditch Improvements

P-06 experiences surcharging and potential manhole flooding along Division Street between NE Garfield Street and NE 15th Avenue, continuing toward NE Franklin Street and along the Creek Improvements area during the design storm. The model identified deficiencies at MHs 4-2A-1, 4-2-1, 4-1-2, 4-1-1, and 3-2-2 due to insufficient capacity in the existing gravity mains.

The proposed improvements include upsizing:

- 282 LF of pipe between MHs 4-2A-2 to 4-2A-Q should be upsized from 8- to 12-inch;
- 115 LF of pipe between MHs 4-2A-Q and 4-2A-1 from 8- to 15-inch;
- 795 LF of pipe between MHs 4-2A-1 and 4-2-2 from 8- to 18-inch;
- 427 LF of pipe between MHs 4-2-2 and 4-2-1 from 8- to 24-inch;
- 256 LF of pipe between MHs 4-2-1 and 4-1-2 from 8- to 27-inch;
- 254 LF of pipe between MHs 4-1-2 and 4-1-1 from 21- to 30-inch;
- 158 LF of pipe between MHs 4-1-1 and 3-2-6 from 21- to 30-inch, and;
- 347 LF of pipe between MHs 4-1-1 and 3-2-4 from 15- to 36-inch.

The portion of pipe between MHs 3-2-4 and 3-2-2 along the Mill Ditch is excluded from the project because these pipes were recently upsized, are in good condition, and meet performance criteria (i.e., they do not surcharge within 3 feet from MH rim). The proposed gravity sewer improvements would be constructed at an approximate depth of 10 feet and provide additional conveyance capacity to address the modeled surcharging and potential manhole flooding under the existing and 20-year conditions.

Under the buildout scenario, additional segments were identified that would exceed the City's design criterion of d/D less than 0.92. To meet the d/D criterion under buildout conditions, approximately:

- 290 LF of pipe between MHs 4-1-6 and 4-1-4 should be upsized from 18- to 24-inch;
- 269 LF of pipe between MHs 4-1-4 and 4-1-3 should be upsized from 21- to 24-inch;
- 422 LF of pipe between MHs 4-1-3 and 4-1-2 should be upsized from 18- to 30-inch, and;
- 376 LF of pipe between MHs 3-2-4 and 3-2-2 should be upsized from 21- to 30-inch.

These additional improvements are not required under the 20-year scenario because the modeled surcharging remains more than 3 feet below MH rim but are recommended to accommodate full buildout conditions.

P-07: South Prune Hill LS Force Main Improvements

P-07 experiences velocities above the City's maximum design criterion in the existing 10-inch force main serving the South Prune Hill LS. The South Prune Hill LS captures flows from the eastern portion of the City's gravity collection system. Based on the modeled flows and hydraulic conditions, the existing force main has the potential to exceed the City's maximum design criterion of 8 fps under existing and 20-year conditions.

The proposed improvement consists of upsizing approximately:

- 925 LF of force main between the South Prune Hill LS wet well and MH 10-1-3 from 10- to 18-inch.

The proposed improvement provides additional conveyance capacity and reduces force main velocities to improve system performance under future conditions.

It should be noted that the existing-condition velocity may appear to be below the City's 8 fps criterion because upstream hydraulic restriction limit the flow entering the force main. When P-01 improvements are implemented, the increased conveyance capacity upstream allows additional flow to reach the South Prune Hill LS, resulting in increased force main velocities and periods of unstable hydraulic performance. The proposed P-07 improvement addresses the interaction between the upstream gravity system and the force main provides more stable performance as additional system capacity is made available.

P-08: West Camas LS Force Main Improvements

The West Camas force main, located downstream of the P-01 and P-07 improvements along NW 6th Place, experiences a capacity deficiency under existing conditions. Implementation of the upstream improvements will increase conveyance capacity and allow additional flows to reach the West Camas LS, reaching in increased flows within the existing force main between the West Camas wet well and MH 1-1-10. The existing 6-inch force main does not have sufficient capacity to convey these increased flows.

The proposed improvement consists of upsizing approximately:

- 574 LF of force main between the West Camas wet well and MH 1-1-10 from 6- to 15-inch.

This improvement provides the additional conveyance capacity needed to accommodate the increased flow resulting from the upstream improvements.

P-09: Main LS Dual Force Main Improvements

P-09 includes the Main LS force main, which conveys flows from the majority of the City's sewer collection system, excluding the STEP Basin and Flow Meter 8-1-2, to the WWTF. As the downstream force main for the preceding system improvements, the Main LS force main conveys the increased flows resulting from the proposed upstream improvements. Under both existing and 20-year conditions, the modeled PWWF velocity in the existing 18-inch force main is approximately 14 fps, exceeding the City's design criteria of greater than 8 fps.

The proposed improvement consists of installing approximately:

- 2,347 LF of 21-inch force main from the Main LS wet well to the WWTF, creating a dual force main system.

The additional force main provides increased conveyance capacity for existing and future flows and reduces the hydraulic loading on the existing 18-inch force main. The existing force main would remain in service as part of the dual force main system.

The proposed dual 18-inch and 21-inch force main configuration should be evaluated as part of the system modeling to confirm PWWF velocities, available conveyance capacity, and operating conditions under 20-year and buildout conditions. Although the 20-year PWWF velocity remains slightly above the City's 8 fps criterion, further upsizing would reduce velocities during lower-flow conditions below the minimum velocity required to flush pipes (2.5 fps). Therefore, the proposed 24-inch force main provides a balance between reducing PWWF velocities and maintaining adequate velocities during lower-flow conditions.

P-10: Leadbetter Road Dual Force Main Improvements

The Leadbetter Road LS captures all flows from the North Shore area. Based on the modeled flows to the LS wet well, the existing single 8-inch force main does not have sufficient capacity to convey projected flows under 20-year system conditions, resulting in velocities that exceed the City's 8 fps design criterion and potential manhole flooding upstream of the Leadbetter Rd LS.

The proposed improvement consists of activating the existing parallel 8-inch force main and installing approximately:

- 6,500 LF of parallel 10-inch force main from Node_161, near the intersection of SE Leadbetter Road and NE Everett Street, to Node_27, near the intersection of NE 23rd Avenue and NE Everett Street.

These improvements increase force main capacity and alleviate the potential for upstream MH flooding under 20-year conditions. While the modeled PWWF velocity slightly exceeds the City's maximum design criterion of 8 fps, further upsizing would reduce velocities during lower-flow conditions below the minimum velocity required to flush pipes (2.5 fps). Therefore, the proposed 10-inch force main provides a balance between reducing PWWF velocities and maintaining adequate velocities during lower-flow conditions.

P-11: Division Street Improvements

Along Division Street, downstream of P-05, the model identified surcharging and manhole flooding between MHs 3-1-11 to 3-1-10, and 3-1-6 under the existing system, indicating the need for additional pipe capacity. To alleviate surcharging:

- 827 LF of pipe between MHs 3-1-14 and 3-1-11 from 8- to 15-inch;
- 505 LF of pipe between MHs 3-1-11 and 3-1-9 from 8- to 21-inch, and;
- 1,526 LF of pipe between MHs 3-1-9 and 3-1-2 from 8- to 18-inch.

These improvements provide additional conveyance capacity, alleviate the modeled surcharging and potential manhole flooding, and allow the system to meet the City's design criteria.

Under the buildout scenario, the gravity sewer segment between MHs 3-1-2 and 3-1-1 was identified as exceeding the City's design criterion of d/D less than 0.92. To meet the d/D criterion under buildout conditions:

- 276 LF of pipe between MHs 3-1-2 and 3-1-1 should be upsized from 15- to 18-inch.

This improvement is not required under the 20-year scenario because the surcharging is not within 3 feet from MH rim but are recommended to accommodate full buildout conditions. This project is at a depth of approximately 10 feet.

P-12: SE Everett Road to Leadbetter Road Extension

The proposed project will extend the existing sanitary sewer system to serve planned development. The improvements consist of installing approximately:

- 2,031 LF of 8-inch,
- 692 LF of 12-inch, and;
- 6,036 LF of 18-inch gravity sewer along the proposed alignment from NE Everett Road to NE Leadbetter Road.

New sewer infrastructure will provide the capacity necessary to accommodate projected development and connect the new development to the existing public sewer system. Project timing and implementation will be driven by development needs and coordinated with the developer. For more information, see Chapter 9 - Capital Improvement Plan.

P-13: SE 238rd Avenue to NE Woodburn Drive Extension

The proposed project will extend the existing sanitary sewer system to serve planned development. The improvements consist of installing approximately:

- 6,782 LF of 12-inch, 692 LF of 12-inch gravity sewer along the proposed alignment from SE 283rd Avenue to NE Woodburn Drive.

New sewer infrastructure will provide the capacity necessary to accommodate projected development and connect the new development to the existing public sewer system. Project timing and implementation will be driven by development needs and coordinated with the developer. For more information, see Chapter 9 - Capital Improvement Plan.

S-01: NW Parker Street to NW Lake Road STEP Main

The NW Parker Street to NW Lake Road STEP Main conveys flows from the STEP Basin areas associated with NW Parker Street and NW Lake Road. Based on the modeled flows and velocity results, the existing 21- and 24-inch STEP mains do not have sufficient capacity to convey projected flows under 20-year system conditions, resulting in elevated hydraulic grade lines. To address this deficiency and provide additional capacity for future conditions, a parallel STEP main is proposed. The existing STEP main will remain in place for emergency bypass.

The proposed improvement consists of approximately:

- 14,032 LF of 30-inch STEP main.

Following construction, the existing STEP main in this area will be taken out of active service and retained for emergency bypass conditions or use during PWWF events. The proposed 30-inch STEP main will provide the primary conveyance capacity for flows from the STEP Basin and accommodate projected future flows. For more information, see Chapter 9 - Capital Improvement Plan.

There are 11 projects recommended to address existing system deficiencies and three projects recommended to address future growth-driven deficiencies. Some projects address deficiencies that are existing and are exacerbated by future growth.

Table 6.5 shows a summary of the City's recommended pipe capacity improvements and expansion.

Table 6.2 Recommended Pipe Capacity Projects

Project ID	Improvement Type	Location	Existing Size (inch)	Proposed Size (inch)	Length (feet)
P-01	Gravity	NW 6th Place West Upsize Improvements	8 8 8	12 15 18	422 809 472
P-02	Gravity	NW 6th Place East Upsize Improvements	8	21	682
P-03	Gravity	NW 6th Place Avenue West Upsize Improvements	12 12	24 21	1,943 592
P-04	Gravity	NW 6th Place Avenue East Upsize Improvements	18 21 12 21 24 21 21	27 30 30 36 36 36 36	446 260 402 545 947 1,126 34
P-05	Gravity	NW Fargo Street, NW 18th Loop, and NW 18th Avenue Upsize	8	15	2,744
P-06	Gravity	NE Garfield Street to NE 15th Avenue to NE Franklin Street to along the Creek Improvements	8 8 8 8 8 21 21 15	12 15 18 24 27 30 36 36	282 115 795 427 256 254 158 347

Project ID	Improvement Type	Location	Existing Size (inch)	Proposed Size (inch)	Length (feet)
P-07	Force Main	South Prune Hill Force Main Improvements	10	18	925
P-08	Force Main	West Camas LS Force Main Improvements	6	15	574
P-09	Force Main	Main LS Dual Force Main Improvements	-	21	2,348
P-10	Force Main	Leadbetter Road LS Dual Force Main Improvements	-	10	6,500
P-11	Gravity	Division Street Upsize	8 8 8	15 21 18	827 505 1,526
P-12	Gravity	SE Everett Road to Leadbetter Road Extension	- - -	8 12 18	2,031 692 6,036
P-13	Gravity	SE 283rd Avenue to NE Woodburn Drive Extension	-	12	6,782
S-01	STEP	NW Parker Street to NW Lake Road STEP Main Improvements	-	30	18,063

6.6.2 Recommended Lift Station Improvements

It is recommended that nine lift stations all be upgraded to improve pump capacity and redundancy and to accommodate existing and 20-year system demands. South Prune Hill, West Camas, Crown View, and Main LSs do not currently meet the City's required firm capacity under existing conditions. Improvements at these stations consist of adding redundant pumping capacity to allow the stations to maintain service during a pump outage or maintenance event. Table 6.2 shows the recommended lift station improvements.

Table 6.3 Recommended Lift Station Improvement Projects

Project ID	Improvement Type	Location	Description
LS-01	Lift Station	Lower/South Prune Hill	Construct a new Lower/South Prune Hill LS with a pump capable of pumping 3.0 mgd of firm capacity to provide additional capacity and support future system needs.
LS-02	Lift Station	West Camas	Construct a new West Camas LS with a pump capable of pumping 3.3 mgd of firm capacity to provide additional capacity and support future system needs. This LS is downstream of Lower/South Prune Hill LS, so this project should be implemented after the Lower/South Prune Hill LS improvements.
LS-03	Lift Station	Crown View	Construct a new Crown View LS with a pump capable of pumping 1.0 mgd of firm capacity to provide additional capacity and support future system needs.
LS-04	Lift Station	Lacamas Creek	Replace the two existing pumps capable of pumping 2.13 mgd each to meet the required firm capacity.
LS-05	Lift Station	Main LS	Construct a new Main LS with pumps capable of pumping 21.0 mgd of firm capacity to provide additional capacity and support future system needs.
LS-06	Lift Station	Goodwin Road	Add a pump capable of pumping 0.49 mgd.
LS-07	Lift Station	232nd Avenue	Add a pump capable of pumping 0.53 mgd

Project ID	Improvement Type	Location	Description
LS-08	Lift Station	Leadbetter Road	Add a pump capable of pumping 0.87 mgd
			Replace the three existing pumps with pumps capable of pumping 1.82 mgd each.
LS-09	Lift Station	Hills at Round Lake	Replace the two existing pumps with three new pumps, each capable of pumping 0.65 mgd to meet the required firm capacity.

6.6.3 Recommended General Projects

The recommended sewer improvements identified in this GSP are critical to maintaining reliable and adequate wastewater collection and conveyance as the City continues to grow. The improvements address existing capacity deficiencies, accommodate projected future flows, and provide additional capacity to support planned development and 20-year conditions. Improvements include gravity sewer upsizing, force main, and STEP main improvements, lift station upgrades, and extensions of the existing sewer collection system to serve future growth areas. In addition to these capital improvements, several general system improvements are recommended to support ongoing sewer system management, improve understanding of system conditions, and inform future capital improvement planning. Table 6.3 shows a summary of the recommended general improvement projects.

Table 6.4 Recommended General Projects

Project ID	Improvement Type	Project Name	Description
G-01	Study	Basin 4-1-3 Pilot I/I Study	This program will investigate the source and magnitude of I/I of storm and groundwater into the wastewater system at locations where suspected high I&I is currently or is forecast to exceed conveyance and/or lift station capacity. Identifying and removing non-sewage flow where that would reduce surcharging such that costly capacity improvements might be avoided.
G-02	Study	Basin 5-1-2 Flow Monitoring	This project is to install temporary flow meters in Basin 5-1-2 to capture flows from the Camas LS and Upper Prune Hill contributing areas separately. Both areas have pipe and LS capacity deficiencies and additional flow monitoring within this basin would help to understand if part of the basin is contributing a greater portion of I/I. This study should evaluate if projects within the basin have the potential to reduce I/I such that projects to increase hydraulic capacity within the system can be avoided. Reducing I/I has downstream benefits at the treatment plant as well.
G-03	General	Basin 5-1-2 Flow Monitoring	This project includes general GIS improvements to maintain and update wastewater asset information, improve data accuracy, and support ongoing system planning and management.
G-04	Study	Systemwide	Update and expand the City's hydraulic model to include additional collection system pipes and provide a more complete evaluation of system capacity and deficiencies.
G-08	General	Systemwide	2035 General Sewer Plan Update
	General	Systemwide	2045 General Sewer Plan Update

6.6.4 Recommended Annual Repair and Replacement Program

The City has established an annual maintenance program as part of its CIP to maintain and improve the existing wastewater system. These improvements will help the City address aging infrastructure, maintain reliable operation of the collection system, and extend the useful life of existing assets. Continued investment in these projects will also help the City address maintenance needs as they arise and support the long-term goals of the GSP. Table 6.4 shows a summary of the City's annual repair and replacement program.

Table 6.5 Recommended Annual Repair and Replace Program Projects

Project ID	Improvement Type	Project Name	Description
R-01	R&R	Sewer Main R&R Program	This program will investigate the condition of wastewater collection system pipelines identified as having been installed prior to 1940s. The program will evaluate the condition and performance of these older pipelines to identify potential structural, operational, or capacity concerns and determine whether rehabilitation or replacement is needed.
R-02	R&R	Miscellaneous LS Projects	This project includes miscellaneous improvements at existing lift stations to address operational and maintenance needs. Improvements may include pump and piping replacement, electrical and controls upgrades, instrumentation, wet well improvements, odor control, and other equipment or site improvements as needed. These improvements will help maintain reliable operation and address deficiencies that may be identified through regular operation and maintenance of the lift stations.

6.7 Additional Recommendations

Our collection system evaluation was limited to the collection system that was modeled. The collection system includes gravity and STEP elements, but only portions of the gravity system and the STEP transmission main are set up for capacity evaluation with the hydraulic model. Other factors such as lack of extensive city-wide GIS limited the scope of the collection system evaluation. The following bullet points explain future projects the City should undergo to allow more effective evaluation of the gravity and STEP system, respectively:

- **Gravity Collection System Model:** The gravity collection system model is skeletonized, with only 28 percent of the gravity system pipes, STEP trunk mains, force mains are connected to the 12 modeled lift stations. While most of the critical trunks are included, a full pipe or less skeletonized model is needed for a more robust evaluation of the system. To expand the model, accurate and updated GIS for the collection system should be developed.
- **STEP Main Model Calibration:** The STEP system model should be further calibrated to verify and refine the modeled results. Additional metering at lift stations farther upstream would provide data necessary to properly calibrate the STEP portion of the model. While these individual lift stations do not necessarily need to be explicitly represented in the hydraulic model, accurate data on their flows and contributions to the STEP system should be collected and incorporated into the model. The current STEP system model primarily includes the major trunk lines; therefore, incorporating additional STEP mains and piping would provide a more detailed representation of the system and improve the accuracy of future hydraulic evaluations and model refinement. The addition of a manhole with a flow meter near the intersection of NW Lake Road and NW Lacamas Drive or near NW

Parker Street and NW Knapp Lane should also be considered to provide additional flow data and aid in model calibration.

- **STEP Main Condition Assessment:** The addition of manholes to the STEP system would help facilitate investigation of the STEP mains condition and allow any partially obstructed portion of the STEP Main to be identified. A future investigation of debris, solids, and other obstruction is recommended in the sags in the system.
- **STEP System Lift Stations:** The STEP system lift stations could not be fully evaluated under PWWF conditions using the system model due to limited operational data. Implementing SCADA systems with historian capabilities would allow the City to monitor and record pump operation, flow conditions, and pump run times, providing the data necessary to evaluate lift station performance and improve future system modeling. SCADA implementation should be prioritized at lift stations where the City anticipates receiving the highest flows, as well as at all future City-owned lift stations as they are expanded or constructed.

CHAPTER 7 WASTEWATER TREATMENT FACILITY

7.1 Introduction

The City serves the water quality needs of approximately 8,500 residential, industrial, and commercial accounts by maintaining and operating their WWTF which has a maximum month design flow of 6.1 mgd.

To support development of the City's GSP, a unit process analysis was completed to identify shortfalls in plant capacity that will prevent the City from reliably treating and disposing of projected flow and loads at the end of the planning period (i.e., year 2045). To address the identified deficiencies, an alternatives analysis of the most viable improvement options was conducted, which resulted in the development of 25 projects to be incorporated into the GSP's CIP.

This chapter summarizes the methods and results of these tasks, thus defining the condition and capacities of the WWTF's unit processes and presenting sequenced recommendations that will allow the City to reliably and cost-effectively serve their customers now and into the future.

7.1.1 Current National Pollution Discharge Elimination System Permit

The City's WWTF effluent must comply with limits on BOD_5, TSS, ammonia, pH, summer heat load, and fecal coliform bacteria as conditions of their NPDES permit. The current permit, Permit No. WA0020249, is effective as of August 1, 2025. The current discharge limits are summarized in Table 7.1. See Appendix H for the City's Permit.

A Reasonable Potential Analysis (RPA) was prepared to identify any new reasonable potential for the projected 2035 discharges to cause or contribute to any excursions above state water quality standards with the current design effluent water quality. The *Reasonable Potential Analysis Project Memorandum*, included in Appendix J, did not identify any new reasonable potentials.

Table 7.1 NPDES Permit Effluent Limits for Permit No. WA0020249

NPDES Permit Effluent Limits		
Parameter	**Average Monthly**	**Average Weekly**
BOD_5	▪ 20 mg/L ▪ 842 ppd ▪ 85% removal	▪ 30 mg/L ▪ 1,264 ppd
TSS	▪ 20 mg/L ▪ 1,017 ppd ▪ 85% removal	▪ 30 mg/L ▪ 1,525 ppd
Ammonia (NH_3 as N) during summer (1)	▪ 20 mg/L	▪ 30 mg/L
Ammonia (NH_3 as N) during winter (2)	▪ 7 mg/L	▪ 11 mg/L
Parameter	**Minimum**	**Maximum**
pH	▪ 6 SU	▪ 9 SU

NPDES Permit Effluent Limits		
Parameter	**Monthly Geometric Mean**	**7-day Geometric Mean**
Heat Load during summer (1)	▪ 5.87 x 10^8 kcal/day	▪ N/A
Fecal Coliform Bacteria	▪ 200 organisms/100 mL	• 400 organisms/100 mL

Notes:
(1) Applicable only from June 1 to September 30.
(2) Applicable only from October 1 to May 31.
SU - standard units.

7.1.2 Past Evaluation of Reuse

In the *2010 General Sewer/Wastewater Facility Plan* (Gray & Osbourne, Inc. 2010) (2010 GSP), the City explored their potential to practice wastewater reclamation, or the production and beneficial use of reclaimed water. As such, an evaluation was completed to understand the feasibility of reusing effluent from the WWTF or constructing a new water reclamation facility (WRF) to treat wastewater for reuse.

The evaluation determined that, though environmental and social benefits are difficult to quantify and assess, the City and their surrounding communities can benefit indirectly from the use of reclaimed water in the following ways:

- Development of additional outdoor recreational sites for the community.
- Irrigation of parks and playfields, which can potentially increase property values.
- Conservation of the quality and quantity of the City's water resources.
- A flexible and reliable alternative water source for industrial water customers.

However, the evaluation also confirmed that the production of reclaimed water is only economically feasible if the cost of producing reclaimed water is less than or equal to the cost of purchasing water or developing additional water rights.

Capital, operation, and maintenance costs for the two alternatives were taken from the 2010 general sewer plan and converted from 2006 dollars to 2025 dollars. A new 20-year present worth analysis was conducted with the updated values. Both the 2010 GSP and the current 20-year present worth analysis found that neither the costs to modify the existing WWTF nor construct a satellite WRF were less than or equal to the cost of developing additional water rights, which are available at notably lower costs. The cost to develop and acquire additional water rights was expected to not exceed $5 million in 2006, which would be $15 million in 2025.

Comparisons of the two alternatives are shown in Table 7.2. Alternative 1 has a 20-year present worth of $30.5 million and alternative 2 has a 20-year present worth $81.6 million. Both alternatives are considerably larger than the 15 million dollars to develop and acquire additional water rights. Therefore, water reclamation and reuse were determined to be economically infeasible and not pursued at the City's WWTF. As the potential for reclaimed water demands have not significantly changed since 2010, the previous analysis remains applicable to current conditions.

Chapter 10 of the 2010 GSP documents the feasibility evaluation of reuse in further detail.

Table 7.2 Reuse Alternative Cost Comparison

	Alternative 1 Modify Existing WWTF	Alternative 2 Construct Satellite WRF
Capital Cost(1)	$24,414,000	$68,235,000
Annual O&M Cost(2)	$317,000	$705,000
20-year Present Worth(3)	$30,457,000	$81,662,000

Notes:
(1) 2010 GSP used 2006 costs. The Handy-Whitman Index for the Pacific Region in July 2006 and July 2025 were used.
(2) 2010 GSP reported 2004 costs. Costs were updated using the Handy-Whitman Index for the Pacific Region in January 2004.
(3) Discount rate assumed 5% bond repayment rate and 4% inflation for a total rate of 1%.

7.2 Unit Process Analysis

A unit process analysis comparing the design or rated capacity of each WWTF unit process against its requisite treatment demands under current and projected flows and loads. This is detailed in Appendix I - *Evaluation of the Wastewater Treatment Facility Report*. This comparison identified deficiencies or limitations in the plant's current installed capacity to meet its various regulatory and operational requirements by 2045.

To this end, the unit process analysis was completed in the following six sequential tasks:

- Compile and analyze three years (January 2022 to December 2024) of WWTF data.
- Develop a hydraulic model of the collection system (collection system model) to estimate future average day flow (ADF), MMF, MDF, and peak hour flow (PHF) at the WWTF under the design storm.
- Estimate future flows and mass loadings through the planning year 2045.
- Prepare spreadsheet-based capacity estimates of existing liquid and solids processes to meet anticipated permit conditions under current and future influent characteristics.
- Update and recalibrate hydraulic and BioWin models with recent plant data (May to June 2025) to assess future flows and loadings impacts on existing plant facility performance. Both models were originally developed for the previous GSP (2024).
- Conduct plant tours in June 2025 to review and update prior condition assessments completed as part of the 2024 GSP and identify any limitations.
- Using both the spreadsheet-based capacity assessment and the results of the calibrated hydraulic and BioWin modes, determine future treatment capacities required for each unit processes and estimate the ideal timing of future plant improvements.

The following sections highlight key points and findings from the above tasks.

7.2.1 Flows and Loads

Flows and loads and presented are in Chapter 3 - Basis of Planning. Tables 3.10 and 3.11 present the current and projected flows and loads, which must be treated and discharged to the Columbia River. These projections were developed according to historical influent flows and raw wastewater pollutant concentrations, typical septage and STEP system characteristics, population growth projections, and industrial flow contributions. Projected future flows are based on Comprehensive Plan 2045 land uses and

wastewater flow factors developed for the various land uses. Chapter 3 Basis of Planning details the method by which these flows and loads were analyzed.

7.2.2 Hydraulic Modeling

Carollo Engineers' Hydraulix® modeling software was used to establish the hydraulic capacities of individual unit processes and water surface elevations (WSE) under 2045 peak flows. More specifically, this software modeled the flow through the WWTF by calculating both energy grade lines and hydraulic grade lines according to head loss and velocity at each hydraulic element under various influent flow conditions identified in Table 7.3.

Each individual unit process was considered "at risk" when the model indicated less than 18 inches of freeboard in a structure or less than six inches of fall from flow over a weir to the downstream water surface. A unit process was considered "overloaded," or as having a true hydraulic limitation, when the model indicated less than 12 inches of freeboard or a weir was submerged. Less than 12 inches of freeboard in an open channel puts the WWTF at risk of flow overtopping a structure and must be avoided at all costs. Additional details about the hydraulic model assumptions and results can be found in Section 5.5 of the Evaluation of the Wastewater Treatment Facility Report in Appendix I.

7.2.3 State Point Analysis

The relationship between mixed liquor suspended solids (MLSS) concentrations, plant flows, and clarifier capacity can also be illustrated by another graphical method commonly called state point analysis as described below.

A clarifier state point analysis determines the effect of operating conditions on secondary clarifier capacity by comparing the actual solids loading to the theoretical maximum solids loading rate in pounds per day per square foot (ppd/sf) of the clarifier surface area as a function of the MLSS concentration. Key factors in a state point analysis are the MLSS concentration, the flow fed to the clarifiers, and the settling velocity of the MLSS as predicted by the selected correlation between SVI and settling velocity. State point analyses are very useful for predicting the ability of secondary clarifiers to operate successfully under peak flow conditions. Additional information on the state point analysis is provided in the Evaluation of the Wastewater Treatment Facility Report in Appendix I.

The desktop analysis indicates that the City should reconstruct Secondary Clarifier No. 1 with a new sloped bottom and spiral scraper mechanism identical to the existing Secondary Clarifier No. 3, as well as constructing a fourth Secondary Clarifier (No. 4) in the future (by 2040) to provide adequate capacity to treat flows and loads through 2045 and beyond.

The statistical evaluation of historical plant data revealed periodic occurrences of sludge bulking in the biological nutrient removal (BNR) process. For the three years of data examined there were three periods where the sludge volume index (SVI) exceeded the proposed design SVI of 160. Although these periods present less than 10 percent of the days in that two-year period, they are a concern as they indicate that the current method of bulking control (chlorination) takes weeks to be effective. All three episodes occurred in winter or early spring when peak wet weather flows typically occur. The secondary clarifiers could fail in the future (when both plant flow and peak flows are projected to be higher than existing flows) if the peak flows occur during a bulking episode.

There have been significant advances in the last decade in the use of selectors and other methods of obtaining a densified activated sludge that provides lower and more stable operating SVIs. It is recommended that the WWTF evaluate the causes of the bulking including identification of the causative organisms and evaluate the feasibility of implementing at least one of the methods before or during the next design and construction project at the WWTF.

7.2.4 BioWin Modeling

BioWin version 6.3 was used to simulate the real-world physical, chemical, and biological treatment processes of the WWTF. This model was updated and recalibrated using existing treatment facility operational data from January 2022 through December 2024 supplemented by data obtained from the special sampling events, and by running a dynamic simulation using the daily plant influent and effluent values (BOD_5, TSS, ammonia) and MLSS concentrations from May 2025.

Once the calibration effort was deemed acceptable, parameters were established for future conditions under which the WWTF must operate. Specifically, this effort adopted the flows and load projections presented in Tables 7.3 and 7.4 while assuming that effluent limits on ammonia would be as low as 7 mg/L for all scenarios.

Finally, the BioWin model was used to model performance of the entire WWTF under the following anticipated future conditions:

- TSS removal rates of 54, 47, 44 and 34 percent were assumed for the primary clarifiers under 2045 average annual, maximum monthly, maximum week, and maximum day conditions (Table 7.4)
- A minimum aerobic solids retention times (aSRT) of 8.0 days under maximum month conditions and 6.05 days under maximum week conditions. These aSRTs result in nitrification safety factors of 2.9 and 2.2 under maximum month and maximum week flow conditions, respectively.
- An SVI, which is a quantification of MLSS settling velocity, of 160 milliliters per gram (mL/g).

Additional details about the process simulation (BioWin modeling) including the model configuration and results can be found in Section 5.4 of the Evaluation of the Wastewater Treatment Facility Report in Appendix I.

7.2.5 Condition Assessment

A condition assessment was conducted as part of the 2024 GSP to identify major facility deficiencies and provide a general priority rating for mechanical equipment, treatment units, structures, and electrical, instrumentation, and control (E&IC) systems. The compiled information was updated during the plant tours conducted in June 2025 as part of this GSP Update to determine which portions of the facility can be retained, which require major upgrades, and which should be abandoned or replaced.

To begin, the assessment team reviewed drawings and design criteria for each unit process, including the recommended WWTF redundancy criteria for flows and loads as published in the *Criteria for Sewage Works Design* (August 2008, Department of Ecology) and summarized in Table 2.4 of Chapter 2.

Next, the team discussed maintenance history, plant shortcomings, and general operational issues with City staff, who also accompanied the team on walk-through inspections of the WWTF following the general occurrence of the processes and associated major equipment in the direction of flow.

Table 7.5 summarizes each key WWTF component's condition and rated capacity. For more information, see Appendix K, *Condition Assessment of Camas Wastewater Treatment Facility Project Memorandum*.

Table 7.3 2025 Condition Assessment Summary

WWTF Component	Rated Capacity	2019 Condition Assessment Associated with 2024 GSP(1)	2025 Condition Assessment
Plant Headworks			
Influent Pipe	▪ N/A	▪ Headworks influent pipe configuration occasionally causes upstream overflow at the Parshall Flume during high flows.	▪ Same observation as in 2019 Condition Assessment. Influent piping should be modified by installing a rigid plate or concrete cover.
Influent Screens and associated washer/compactors	▪ Two mechanical screens. 7 mgd per screen, total 14 mgd. ▪ Washer/compactors are rated for 10 cf/hr.	▪ No significant condition issues identified.	▪ One of the influent screens needs a bearing replacement, and the plant is planning to perform this repair in-house.
Manual Bar Rack	▪ One manual bar rack.	▪ No significant condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Slide Gates	▪ Seven slide gates.	▪ No significant condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Primary Clarifiers (PC)	▪ 60-foot diameter, 10-foot SWD. ▪ SOR - 3,608 gpd/sf at PHF with both units operational.	▪ No significant condition issues identified.	▪ Severe corrosion of clarifier mechanisms; city replacing internals of both clarifiers as part of ongoing project.
Aeration Basin Influent flow splitter box	▪ N/A.	▪ N/A	▪ One shaft mixer was non-operational; staff noted the structure's freeboard is limited during high-flow events.
Aeration Basins (AB)	▪ Three ABs - 120 feet long, 40 feet wide and 21 feet SWD. ▪ ~3.9 to 5.7 mgd on max. week loading (3 AB, 3 SC at SVI of 90 - 160 mL/g).	▪ Flow split between the 3 basins is uneven. ▪ Weir walls between the zones are uneven. Wooden walls in anaerobic zones.	▪ Same observation as in 2019 Condition Assessment. Also, the internal recycle from the end of the aerobic zone is sent to the end of the anaerobic zone.
Secondary Clarifiers (SC)	▪ Three 75-foot diameter SC, 15 feet SWD.	▪ SC. No. 1 is non-operational due to its flat bottom	▪ Same observation as in 2019 Condition Assessment.
Aeration System	▪ Four 150 hp centrifugal blowers. ▪ Firm capacity of 4,890 scfm at 10 psig.	▪ Unable to control blowers when operating multiple in parallel	▪ Same observation as in 2019 Condition Assessment. City is replacing two 150 hp blowers with 100 hp high speed turbos; however, the new and old blowers will not be able to operate together.
Effluent Filters	▪ Two Cloth disk filters (10 micron). 3 mgd per filter, total 6 mgd.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment. Plant staff indicated the filters are backwashing 30% of the time, which is higher than the anticipated 20% or less.
UV Channel	▪ Four UV banks. ▪ 13.7 mgd at 65% UVT.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment. City is replacing the existing UV system with new UV system as part of an ongoing project.
Effluent Transfer Pumps	▪ Three 4,550 gpm at 16-feet TDH, 30 hp pumps. Firm Capacity is 13.09 mgd.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Non-potable Water Transfer Pumps	▪ Three 200 gpm at 185-feet TDH, 15 hp pumps.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment. City is replacing the motors for these pumps with new motors and variable frequency drives as part of an ongoing project.
RAS Pumps	▪ Each SC has two RAS pumps. ▪ SC No. 1 has two pumps 1,000 gpm each. ▪ SC No. 2 has two pumps 1,050 gpm each. ▪ SC No. 3 has two pumps 1,400 gpm each	▪ No condition issues identified. SC No. 1 is not operation.	▪ Same observation as in 2019 Condition Assessment. ▪ City is replacing the VFD for a couple of RAS pumps as part of an ongoing project.
WAS Pumps	▪ Each SC has one WAS pump. ▪ SC No. 1 has one pump 85 gpm. ▪ SC No. 2 has one pump 85 gpm. ▪ SC No. 3 has one pump 240 gpm.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Primary Sludge Pumps	▪ Two pumps. Each 220 gpm.	▪ No condition issues identified.	▪ One of the primary sludge pumps was making a very loud noise.
Internal Recycle Pumps	▪ Each AB has one submersible pump. 3,125 gpm.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Degritting Cyclone ang grit classifier	▪ Two units. Each 220 gpm.	▪ End of useful life.	▪ Same observation as in 2019 Condition Assessment. City is replacing both units with new as part of an ongoing project.
Gravity Thickener	▪ One unit. 30-foot diameter, 10-foot SWD.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment. ▪
Thickened Primary Sludge Pumps	▪ Two units. Progressive Cavity pumps, 130 gpm each.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Rotary Drum Thickener	▪ One unit. 100-300 gpm.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Thickened WAS Pumps	▪ Two units. Progressive Cavity pumps, 50 gpm each .	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Anaerobic Digesters (AD) and Digested Sludge Holding Tank (DSHT)	▪ Two AD tanks. 32-foot diameter, 29-feet SWD. ▪ One DSHT tank. 32-foot diameter, 29-feet SWD.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
AD mixing and heating equipment	▪ Each digester has one draft tuber mixer and spiral heat exchanger. ▪ One hot water boiler with hot water pumps.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.

WWTF Component	Rated Capacity	2019 Condition Assessment Associated with 2024 GSP(1)	2025 Condition Assessment
Digested Sludge Pumps	▪ Two units. Progressive Cavity pumps, 130 gpm each	▪ N/A	▪ N/A
Dewatering Centrifuge	▪ One unit. 130 gpm at 2-2.5% solids	▪ Near end of useful life.	▪ No issues observed with the existing unit. ▪ City is adding one new centrifuge (unit) as part of an ongoing project.
Sludge Thermal Dryer	▪ One complete belt-drying system.	▪ No condition issues identified.	▪ Same observation as in 2019 Condition Assessment.
Plant Drain Pump Station No. 1	▪ Two submersible pumps. 250 gpm each.	▪ Shows signs of concrete corrosion and pumps at the end of useful life.	▪ Same observation as in 2019 Condition Assessment.
Plant Drain Pump Station No. 2	▪ Two submersible pumps. 450 gpm each	▪ Shows signs of concrete corrosion and pumps at the end of useful life.	▪ Same observation as in 2019 Condition Assessment.
Electrical Components			
Utility Transformer No. 1 (UT1)	▪ 500 kVA	▪ N/A	▪ Owned and maintained by power utility. ▪ UT1 shows some signs of rusting but no major concerns.
▪ UV Electrical Room ▪ MDS-UV ▪ MCC-D1 ▪ MCC-D2 ▪ MCC-D3	▪ N/A	▪ N/A	▪ No major issues observed. ▪ City is replacing the UV system and associated power distribution panels and a new ATS.
▪ Old Controls Building ▪ MCC-A ▪ PLC-A ▪ Network Rack ▪ Transformer TL and Panel L	▪ N/A	▪ N/A	▪ The main concern in this building is the working clearance around electrical equipment seems low, increasing likelihood of tripping hazard.
Utility Transformer No. 2 (UT2)	▪ 1000 kVA	▪ N/A	▪ Owned and maintained by power utility. ▪ UT2 shows some signs of rusting but no major concerns.
▪ Equipment Blower Building ▪ MDS-EB ▪ MCC-C1/C1A ▪ MCC-C2/C2A ▪ Blower VFDs	▪ N/A	▪ N/A	▪ No major issues observed. ▪ City is replacing as part of an ongoing project the following: ▪ Two blowers and associated VFDs. ▪ New centrifuge control panels and VFDs
Emergency Generator	▪ 250 kW	▪ N/A	▪ City is replacing with new 450 kW generator as part of an ongoing project.
▪ Digester Electrical Building ▪ SWBD-F ▪ MCC-F	▪ N/A	▪ N/A	▪ Main concern in this room is that it seems to be sharing walls with process areas. As such, it is very important to understand hazardous area classification of the area per NFPA 820. ▪ City is adding a new MCC-F as part of the ongoing project.
▪ Biosolids Electrical Building ▪ SWBD-F ▪ MCC-F	▪ N/A	▪ N/A	▪ Main concern in this room is that it seems to be sharing walls with process areas. As such, it is very important to understand hazardous area classification of the area per NFPA 820.
Instrumentation and Controls			
SCADA system	▪ N/A	▪ N/A	▪ The current control system operates on standalone desktop PCs. When the remote display interface is engaged, control functionality on the primary desktop becomes inaccessible. This configuration presents a single point of failure and limits operational flexibility. To address this, a transition to multi-user control architecture is recommended. Additionally, the system must support routine Windows updates without requiring downtime of the primary control workstation, which currently manages all plant operations.
PLC Infrastructure and Upgrade Status	▪ N/A	▪ N/A	▪ Progress on PLC upgrades have progressed. Several PLC components in use have reached end-of-life status, posing reliability and supportability risks. It is strongly advised to prioritize the replacement of these legacy PLCs to ensure continued system integrity and maintainability.

Notes:
(1) Condition Assessment performed as part of the 2024 GSP.
ATS - automatic transfer switch; cf/hr - cubic feet per hour; hp - horsepower; kVA - kilovolt-amperes; kW - kilowatts; MCC - motor control center; MDS-EB - main distribution switchboard - elevator board; N/A - not applicable; NFPA - National Fire Protection Association; PLC - programmable logic controller; psig - pounds per square inch gauge; scfm - standard cubic feet per minute; SOR - surface overflow rate; SWBD - switch board; SWD - side water depth; TDH - total dynamic head; UVT - ultraviolet transmittance; VFD - variable frequency drive.

7.3 Summary of Key Improvements and Preferred Alternatives

Comprehensive analysis of the WWTF's unit processes identified several current and anticipated condition or capacity issues in WWTF's hydraulic, liquid treatment, solids treatment, and plant support systems. The following sections highlight key issues with unit processes at the WWTF and also recommend improvements to mitigate them.

Each unit process's complete description; condition findings, hydraulic capacity, and process capacity analyses; 2045 design criteria, and recommendations for improvements and alternatives are available in Appendix I - Evaluation of Wastewater Treatment Facility Report.

7.3.1 Preliminary Treatment

1. To prevent spraying of the influent wastewater during peak flow events, add a concrete cap over the portion of the channel where the influent pipe enters vertically into the structure upstream of the Parshall Flume.
2. Conduct a structural investigation, perform required structural repairs, add appropriate coatings to the channels.
3. Remove Influent Channel and Parshall Flume and replace with next larger size.
4. Replace the two screens and associated washer/compactors by 2030. The existing screens size have sufficient capacity to handle the 2045 PIDF of 22.2 mgd with both mechanical screens operating (11.1 mgd per screen) at the design blinding of 30 percent.
5. Replace all seven slide gates at the same time as replacing the influent screens.
6. Collect appropriate samples to measure incoming TKN and NH_3 as well as influent alkalinity daily.

7.3.2 Septage Receiving Station

The City is replacing the septage screening equipment as part of an ongoing project. Therefore, no recommendations for further improvements are made at this time.

7.3.3 Primary Treatment

1. Add a weir, dropbox, and piping as needed to construct a bypass around the primary clarifiers. This bypass will direct all flows greater than the MDFs around the primary clarifiers.
2. Add a third clarifier to:
    a. Maintain high removals of BOD_5 and TSS during normal flow.
    b. Operate the aeration tanks at lower MLSS concentrations during maximum month organic loadings.
    c. Reduce oxygen demands in the BNR process and increase gas production in the digesters.

7.3.4 Secondary Treatment

1. Relocate the internal recycle piping such that the recycle is introduced just upstream of the first of the two anoxic zones and not in the last anerobic zone for the three existing aeration basins.
2. The baffle walls that divide the zones within the existing aeration basins should be repoured to a smooth level. Plywood baffle walls in the anaerobic selector zone should be removed and replaced with 316 stainless steel baffle plates for rigidity.
3. Evaluate (and implement modifications if advantageous) the ability of reconfiguring the selector zones to improve the settling characteristics of the mixed liquor.
4. Demolish and rebuild Secondary Clarifier No. 1 to match the size, slope, and other criteria of Secondary Clarifier No. 3. Install new RAS, WAS, and scum pumps matching the size of those serving Secondary Clarifier No. 3.
5. Replace the RAS pumps for Secondary Clarifier No. 2 to match the size as that of Secondary Clarifier No. 3.
6. Implement hydraulic solids retention time (SRT) control by programming a hydraulic SRT control system in the plant PLC.
7. Replace the diffusers in the existing three aeration basins. Add diffusers to the second of the two anoxic zones in each aeration basin to convert it to a swing zone. Supports for diffusers in the swing zone should be adequately designed to withstand the forces exerted by the existing submersible mixers.
8. Construct a new Secondary Clarifier No. 4 with new RAS, WAS and scum pumps matching the size of that of Secondary Clarifier No. 3.
9. Construct a new Aeration Basin No. 4 with fine bubble diffusers and aeration piping and internal recirculation pump matching the size of the existing aeration basin. With four aeration basins, the plant can take one of the aeration basins out of service for cleaning and preventative maintenance and still maintain an eight-day SRT necessary for stable complete nitrification using three aeration basins by adding air to the swing zone and operating all four secondary clarifiers.

7.3.5 Aeration Blowers

Remove and replace the two existing 150 hp multistage centrifugal blowers with two 150 hp high-speed turbo (HST) blowers. It is assumed that all four blowers will need to be on-line to satisfy the 2045 peak oxygen demand.

7.3.6 Tertiary Filtration

As the existing tertiary filters approach the end of their useful life, they should be replaced with similar units.

7.3.7 UV Disinfection

The City is planning to build a new UV Channel replace the existing UV Trojan 3000+ system with a new Trojan 3000+ system as part of an ongoing project.

1. Rehabilitate the old UV Construct a new second UV channel outside the existing building on the west to allow disinfection of the entire plant effluent at PHF (22.2 mgd).

7.3.8 Effluent Pump Station and Pumps

Under high river water level conditions, when the headloss is too great for gravity flow to the Columbia River, the effluent is pumped using three vertical propeller effluent pumps, located in the second compartment of the effluent wet well. Each pump has a capacity of 4,550 gpm (6.54 mgd). The total capacity of the effluent transfer pump station is 19.6 mgd with a firm capacity of 13.09 mgd.

1. The process implications of exceeding the effluent pumps' capacity are catastrophic, under the high river level conditions. Such conditions could quickly submerge upstream plant processes. Therefore, it is recommended to replace the existing pumps with larger impellers, motor, and associated VFDs to allow pumping of the entire plant effluent (PIDF of 22.2 mgd).

7.3.9 Primary Sludge Pumping, Degritting and Thickening

The City is already planning to replace the two primary sludge degritting equipment (hydrocyclones and classifiers). Sludge pumping equipment should last for 10 to 15 years depending on the amount of grit and wear and tear they experience, so they should be replaced and repaired as needed. No additional recommendations are made for the primary sludge and degritting equipment at this time.

1. The thickened primary sludge pumps are too large for the system. For this reason, the existing units are recommended for replacement with new, appropriately sized, 70 gpm progressive cavity pumps.

7.3.10 WAS Pumping and Thickening System

No recommendations are made for the WAS pumping equipment at this time:

1. There is only one rotary drum thickener (RDT) for WAS thickening, which has been in service for more than 10 years so a second RDT is recommended for redundancy.
2. To meet hazardous area classification per NFPA 820, a new electrical building constructed to the west of the Digester complex serving all the digester equipment is purposed.

7.3.11 Anaerobic Digestion and Waste Gas Flare

The digester equipment should last for 20 to 25 years depending on the amount of grit and wear and tear they experience. Pumps should be repaired and replaced as needed. No recommendations for the Anaerobic Digestion system are made currently.

7.3.12 Dewatering Centrifuge

The City is already planning to add a second dewatering centrifuge as part of an ongoing project. With two dewatering centrifuges, the plant should be able to process the anaerobically digested sludge for the foreseeable future and therefore no recommendations are made at this time.

7.3.13 Biosolids Belt Dryer

The sludge dryer will need to be operated 7 days a week, 24 hours a day to process the maximum day sludge produced. Alternatively, if the capacity of the dryer is exceeded, the cake can be diverted for off-site disposal. The sludge dryer was installed in 2014 and is about 10+ years old. Typical sludge drying equipment will need major overhaul in the next 10 years (20-year life). City should plan to replace the

dryer in the next 10 to 15 years. However, for the 2025 GSP, a firm recommendation is not made as some of the regulations, in particular with respect to per- and polyfluoroalkyl substances (PFAS) in biosolids are still evolving.

7.3.14 Plant Drain Pump Stations

The condition assessment noted signs of concrete corrosion, and its pumps are nearing the end of useful life. As such, it is recommended that Pump Station No. 1 and 2 be rehabilitated by:

- Replacing the pumps (500 gpm each).
- Installing a liner in the wet well to extend the line of the existing structure.
- Replacing control panel, pump guide rails, and discharge piping within the wet well.
- Adding a totalizing flow meter and composite sampler.

7.3.15 Non-Potable Water Pumps

The City is planning to install new VFDs for each of the three non-potable water pumps and a new motorized strainer as part of an ongoing project. No recommendations are made at this time.

7.3.16 WWTF Electrical Upgrades

Reference section 7.9.8 of the WWTF Evaluation Report in Appendix I for more information on the current electrical system and background on previous upgrades.

1. MCC-A currently serves two WAS pumps, one general-purpose sludge pump, a compressor, two heaters, and a hoist. Carollo recommends removing MCC-A from the plant's distribution system and refeeding its remaining loads from nearby sources.
2. Carollo recommends removing PLC-A from the Old Controls Building, and controlling the current PLC-A loads from another nearby PLC. This would allow the Old Controls Building to be fully repurposed as a maintenance and workshop area, which reflects its current use.
3. The electrical equipment installed in 2002 remains in generally good condition and does not require immediate replacement; upgrades should instead coincide with future plant process improvement projects to minimize repeated modifications. However, when replacing gear in the UV or Equipment Building electrical rooms, updated layouts will likely be required to meet current National Electrical Code working clearance standards.
4. Electrical gear from 2012 remains in excellent condition and does not need replacement in the near term.
5. During the site visit, it was also noted that the water utility has no in-house electrician or instrumentation technician and no on-call agreements with outside specialists. Carollo recommends establishing either internal staffing or on-call contracts with qualified electricians and system integrators to ensure prompt response to electrical and controls issues.
6. No arc flash labels were found on the plant's distribution equipment, and the owner confirmed that an Electrical System Study is not maintained. Carollo recommends completing this study as soon as possible and applying arc flash labels in accordance with Occupational Safety and Health Administration requirements to ensure worker safety.

7. The owner also reported that the last major flood affecting the plant occurred in 1997. Carollo recommends a comprehensive flood risk analysis for all major electrical and control systems to assess vulnerabilities and strengthen flood resilience.
8. Electrical rooms from the 2002 upgrade were found to be dusty, poorly ventilated, and not fully sealed from adjacent areas. These conditions can accelerate equipment degradation and lead to premature failures of PLCs, VFDs, and network components. Carollo recommends installing dedicated ventilation systems, sealing the rooms from process and generator areas, and performing heating, ventilation, and air conditioning load calculations to determine whether air-handling units or cooling systems are needed to manage internal temperatures.
9. Throughout the plant, exposed network hardware, wiring, and cables were also observed, leaving them at risk of accidental damage. Carollo recommends installing dedicated, wall-mounted network enclosures and routing all cables through conduits for better protection and organization.
10. To ensure regulatory compliance, and safety, Carollo recommends conducting a hazardous area classification study per NFPA 820 and upgrading any areas that do not meet code.
11. Extensive corrosion was noted on outdoor conduits and equipment enclosures at several locations, including the influent/screens structure and biological basins. Carollo recommends replacing these components with PVC-coated or corrosion-resistant materials to enhance reliability and reduce any potential disruptions to plant operations due to power or control failures.

7.3.17 Facility Control Systems, Including the PLC and Central SCADA

Multiple network switches are currently installed in operational areas where they are exposed to environmental conditions. To mitigate risks associated with dust, moisture, and physical damage, the following recommendations are made:

1. Relocate switches into protective enclosures, consistent with best practices already implemented elsewhere on site.
2. As a short-term fix to minimize the risks to the network switches, place dust filter foam over vents on the switches to reduce the intrusion of dust. Additionally, place tape over unused network ports on the face of the switch until an enclosure is provided for the switches.

It was observed that the centrifuge cannot initiate operations when the system is in Automatic mode. Manual intervention is required to start the centrifuge, after which the system can be returned to Automatic. This behavior indicated a controls problem and should be investigated and resolved.

Magnesium Oxide tank level sensors are ultrasonic instruments, which are highly susceptible to condensate in the tank and will provide false readings. This sensor should be replaced with a Guided Wave Radar level instrument to eliminate the noise caused by condensate.

7.4 Recommendations

This section summarizes recommendations for WWTF improvement projects. Cost estimates and timing of projects are included in the CIP presented in Chapter 9. Each project is assigned a unique identifier which is an alphanumeric number that starts with one or two letters indicating the type of improvements and is consistent with the collection system identifiers. “TP” stands for Treatment Plant, “R” stands for Renewal and “G” stands for General. Individual project sheets are included in Appendix L - CIP Summary Sheets.

7.4.1 Recommended WWTF Improvement Projects

The improvements recommended to address WWTF capacity limitations over the next 20 years and address current condition issues that prohibit reliability or performance are summarized in this section. The recommended alternatives presented in Section 7.3 were re-organized and, in some cases, grouped together to suggest construction sequencing and project timing the city should consider when implementing these improvements. The following 25 distinct projects were developed for incorporation into the City's general sewer system plan CIP. The cost estimates of these projects can be found in Chapter 9 - Capital Improvement Plan.

- **TP-01: Parshall Flume Replacement**

  This project includes replacement of the existing Parshall Flume with a new higher-capacity Parshall Flume to accommodate peak flow conditions and structural modifications to prevent influent wastewater from spraying during peak flow events. The improvements include demolition of the existing top slab, walls, foundation slab, and guardrails; extension of the influent channel wall footing; construction of new influent channel walls and foundation slab; excavation and backfill; installation of new guardrails; construction of shoring and an elevated slab to support the new Parshall Flume; and associated electrical, instrumentation, and controls improvements. This project addresses existing and future growth-driven capacity issues.

- **TP-02: Primary Clarifier Bypass**

  This project includes construction of a bypass around Primary Clarifiers No. 1 and 2 to route flows greater than the maximum day flow around the primary treatment process. The improvements include installation of a new 30-inch bypass pipeline, structural modifications at the Plant Headworks Effluent, and installation of weir gates to control and direct flow through the bypass. Additional site work will also be required to support construction of the bypass improvements. This project is driven by growth, predominantly development in the North Shore area. This project addresses existing capacity issues and process upgrades.

- **TP-03: Aeration Basin Influent Flow Splitter Box**

  This project includes construction of a new aeration basin influent flow splitter box to improve mixing and flow distribution to the aeration basins. The splitter box should also be designed to address the issue of very little head available between the primary clarifier and aeration basins. The improvements include an 18-inch foundation slab, 12-inch-thick walls, new guardrails and aluminum grating, and associated excavation and backfill. New 60-inch by 30-inch and 24-inch by 24-inch stainless steel slide gates will be provided to control flows through the splitter box. The project also includes demolition of the existing Aeration Basin Flow Splitter Box, temporary pumping and piping during construction, installation of piping to and from the new splitter box, and additional site work as needed to complete the improvements. This project addresses existing capacity issues and process upgrades.

- **TP-04: Plant Headworks**

  This project includes replacement of the existing screens and slide gates at the WWTF Headworks to improve the reliability and operation of the screening process. The improvements include replacement of the existing screens/washer compactors with new units and installation of new 66-inch by 48-inch, 66-inch by 36-inch, and 72-inch by 36-inch stainless steel slide gates. The project also includes associated installation, electrical, instrumentation, and controls improvements, as well as

additional site work required to complete the improvements. This project addresses growth-driven capacity issues.

- **TP-05: Anoxic Selector IR Re-Piping**

  This project includes relocation of the internal recycle piping at the three existing aeration basins to improve the treatment process. The IR piping will be relocated to introduce recycled flow at the beginning of the Anoxic Selector, just upstream of the first of the two anoxic zones, rather than discharging into the last anaerobic zone. The project also includes associated electrical, instrumentation, and controls improvements, as well as additional site work required to complete the improvements. The City currently has two options for where recycled flow is discharged to: one from the splitter box (currently used) and the other at the end of the selector zone. It is recommended that the City use switch to discharge at the end of the selector zone and to monitor and test before and after the switch to assess improvement in treatment performance from this change to see if it is sufficient. TP-05 could potentially be completed in-house. This project addresses existing capacity issues and process upgrades.

- **TP-06: Anaerobic Selectors Baffle Wall**

  This project includes modifications to the baffle walls separating the anaerobic selectors within the existing aeration basins to improve flow distribution and maintain proper separation between treatment zones. The existing baffle walls between the anoxic and anaerobic zones will be repoured to provide a smooth and level surface. Gradient should be evaluated for improved settleability. Existing plywood baffle walls within the anaerobic selector zones will be removed and replaced with 316 stainless steel baffle plates to provide increased rigidity and durability. The project also includes associated electrical, instrumentation, and controls improvements. This project addresses existing capacity issues and process upgrades.

- **TP-07: Replace Secondary Clarifier No. 1**

  This project includes demolition and replacement of Secondary Clarifier No. 1 to improve the reliability and performance of the secondary treatment process. The new clarifier will be constructed as a 75-foot-diameter clarifier with a 15-foot SWD, matching the size, slope, and other design criteria of Secondary Clarifier No. 3. The improvements include a new concrete foundation slab and walls, sludge collection box, launder and effluent structures, aluminum grating, stairs, platforms, and railings, as well as new internal clarifier mechanisms. New RAS and WAS pumps will also be installed to match the size of those serving Secondary Clarifier No. 3. The project also includes associated demolition, installation, electrical, instrumentation, and controls improvements, and additional site work required to complete the improvements. The City is currently evaluating this project. This project addresses existing capacity issues and process upgrades.

- **TP-08: SC No. 2 RAS Pump Replacement**

  This project includes replacement of the RAS pumps serving Secondary Clarifier No. 2 to improve pumping capacity and maintain consistency with the existing Secondary Clarifier No. 3 facilities. Two new non-clog submersible RAS pumps, each rated at 1,400 gpm, will be installed to match the pump capacity serving Secondary Clarifier No. 3. The project also includes associated installation, electrical, instrumentation, and controls improvements. This project addresses existing capacity issues, age-related issues, and process upgrades. This project is driven by growth, predominantly development in the North Shore area.

- **TP-09: Replace Plant Drain Pump Station 1**

  This project includes rehabilitation of Plant Drain Pump Station No. 1 to address concrete corrosion identified during the condition assessment and replace pumps that are nearing the end of their useful life. The improvements include replacement of the existing pumps with new pumps rated at 500 gpm each, installation of a liner in the wet well to extend the service life of the existing structure, and replacement of the control panel, pump guide rails, and discharge piping within the wet well. A totalizing flow meter and composite sampler will also be installed to improve flow monitoring and sampling capabilities. The project includes associated demolition and temporary piping, electrical, instrumentation, and controls improvements, installation, and additional site work required to complete the rehabilitation. The City may consider constructing a single Plant Drain Pump Station to replace No. 1 and 2. This project addresses existing capacity issues, age-related issues, and process upgrades.

- **TP-10: Replace Plant Drain Pump Station 2**

  This project includes rehabilitation of Plant Drain Pump Station No. 2 to address concrete corrosion identified during the condition assessment and replace pumps that are nearing the end of their useful life. The improvements include replacement of the existing pumps with new pumps rated at 500 gpm each, installation of a liner in the wet well to extend the service life of the existing structure, and replacement of the control panel, pump guide rails, and discharge piping within the wet well. A totalizing flow meter and composite sampler will also be installed to improve flow monitoring and sampling capabilities. The project includes associated demolition and temporary piping, electrical, instrumentation, and controls improvements, installation, and additional site work required to complete the rehabilitation. The City may consider constructing a single Plant Drain Pump Station to replace nos. 1 and 2. This project addresses existing capacity issues, age-related issues, and process upgrades.

- **TP-11: PLANTWIDE: Electrical Conduit and Stand Replacement**

  The project includes plantwide replacement of existing electrical conduit and support stands to improve the reliability and condition of the plant electrical infrastructure. Existing conduit and support stands will be demolished, with existing conductors protected for reuse where feasible. New electrical conduit and support stands will be installed throughout the plant as needed. This project addresses existing age-related issues.

- **TP-12: NETWORK: Equipment Enclosure and Cable Protection Upgrade**

  This project includes plantwide improvements to equipment enclosures and cable protection to improve the reliability and protection of the instrumentation and control system. Improvements include installation of new instrumentation and control cabinets, de-termination and re-termination of existing conductors, and installation of conduit to provide additional protection for cables and conductors. This project addresses existing age-related issues.

- **TP-13: MCC-A Replace and Electric Equip Relocation**

  This project includes replacement of MCC-A and relocation of associated electrical equipment to improve the reliability and maintainability of the plant electrical system. MCC-A currently serves two WAS pumps, one general-purpose sludge pump, a compressor, two heaters, and a hoist. MCC-A will be removed from the plant distribution system, and its remaining loads will be re-fed from nearby electrical sources. PLC-A will also be removed from the Old Controls Building, with its current loads

transferred to another nearby PLC. This will allow the Old Controls Building to be fully utilized as a maintenance and workshop area, consistent with its current use. The project includes replacement of MCC-A and relocation of electrical equipment from the Old Controls Building, along with associated electrical, instrumentation, and controls work. The City is currently evaluating this project. This project addresses existing age-related issues.

- **TP-14: Replace Aeration Basin Diffusers**

  This project includes replacement of the existing diffusers in the three aeration basins and installation of additional diffusers in the second of the two anoxic zones within each basin. The additional diffusers will allow the anoxic zones to function as swing zones, providing greater operational flexibility and treatment capacity. New diffuser supports within the swing zones will be designed to withstand the forces exerted by the existing submersible mixers. This project addresses existing age-related issues.

- **TP-15: Disk Filtration Replacement**

  This project includes replacement of the two existing disk filtration units with new units to improve filtration performance and operational reliability. The new disk filtration units will be sized for a capacity of 6.0 mgd. Plant staff indicated that the existing filters are currently backwashing approximately 30 percent of the time, which is higher than the anticipated 20 percent or less. The project includes removal of the existing disk filtration units, installation of the new units, and associated electrical, instrumentation, and controls improvements. The City will assess the need for the disk filters, which are currently not run all the time, prior to completing this project. This project addresses existing age-related issues.

- **TP-16: Second UV Channel**

  This City recently constructed a second UV disinfection channel which will be used going forward while the existing channel will serve as bypass. This project is to rehabilitate the existing channel and put back into service for UV disinfection to provide sufficient disinfection capacity for the entire plant effluent at peak hour flow conditions of 22.2 mgd. The project includes installation of the new UV equipment and associated electrical, instrumentation, and controls improvements will also be included. This project addresses growth-driven capacity and process constraints, primarily from development in the North Shore Area.

- **TP-17: Effluent Transfer Pump Replacement**

  This project includes replacement of the existing effluent transfer pumps with larger impellers, motors, and associated VFDs to provide sufficient capacity to pump the entire plant effluent flow of 22.2 mgd. Under high river water level conditions, when gravity flow to the Columbia River is not sufficient due to increased headloss, the effluent transfer pumps are required to convey plant effluent. The existing station consists of three vertical propeller pumps, each rated at 4,550 gpm (6.54 mgd), with a total station capacity of 19.6 mgd and a firm capacity of 13.09 mgd. The existing capacity is insufficient to convey the full peak flow, and failure to provide adequate pumping capacity during high river conditions could result in elevated water levels and potential impacts to upstream plant processes. The replacement pumps will be rated at approximately 4,700 gpm and will include associated structural and mechanical modifications, installation, and electrical, instrumentation, and controls improvements. This project addresses existing age-related issues.

- **TP-18: Outfall**

  This project includes construction of a second plant outfall to the Columbia River to provide additional discharge capacity and improve the reliability and flexibility of the plant effluent discharge system. The new outfall will consist of approximately 36-inch corrugated metal pipe with a 16-port, 160-foot diffuser. The project includes mobilization, cleanup, and demobilization; erosion control; additional pipe fittings; trench safety; excavation and backfill; and installation of the new outfall. Associated electrical, instrumentation, and controls improvements will also be included. This project addresses growth-driven capacity and process constraints, primarily from development in the North Shore Area.

- **TP-19: Digester Electrical Building**

  This project includes construction of a new electrical building west of the Digester complex to house electrical equipment serving the digester facilities. The new CMU block electrical building will be designed to meet the hazardous area classification requirements of NFPA 820 and provide a suitable location for electrical equipment serving the digester process. The project includes construction of the new building, electrical equipment and installation, and associated electrical, instrumentation, and controls improvements. This project addresses code compliance issues.

- **TP-20: New Rotary Drum Thickener**

  This project includes construction of a second RDT for WAS thickening to provide redundancy and improve the reliability of the thickening process. The existing RDT has been in service for more than 10 years, and a second unit is recommended to provide additional operational flexibility and backup capacity. The project includes a new RDT, associated polymer blending unit, thickened sludge pump, access platform, stairs, and supporting structures. The project also includes installation, additional site work, and associated electrical, instrumentation, and controls improvements. This project provides reliability and redundancy for the thickening process.

- **TP-21: Primary Clarifier No. 3**

  This project includes construction of a new Primary Clarifier No. 3 to improve primary treatment performance and provide additional process capacity. The additional clarifier will help maintain high BOD_5 and TSS removals during normal flow conditions, allow the aeration basins to operate at lower MLSS concentrations during maximum month organic loadings, and reduce oxygen demands in the BNR process while increasing gas production in the digesters. The new clarifier will be approximately 60 feet in diameter with a 10-foot SWD and will include new internal mechanisms, sludge collection box, concrete foundation and walls, launder structure, aluminum stairs, catwalk framing, grating, and railing. The project also includes new LS pumps, excavation and backfill, installation, additional site work, and associated electrical, instrumentation, and controls improvements. This project addresses growth-driven capacity and process constraints, primarily from development in the North Shore Area.

- **TP-22: Secondary Clarifier No. 4**

  This project includes construction of a new Secondary Clarifier No. 4 to provide additional secondary treatment capacity and accommodate future growth. The new clarifier will be approximately 75 feet in diameter with a 15-foot SWD and will include new internal mechanisms, sludge collection box, effluent box, launder structure, concrete foundation and walls, aluminum grating, stairs, platforms, and railings. The project also includes new RAS and WAS pumps and approximately 36-inch piping to connect the new clarifier to the existing system. Associated excavation and backfill, installation,

additional site work, and electrical, instrumentation, and controls improvements will also be included. This project addresses growth-driven capacity and process constraints, primarily from development in the North Shore Area.

- **TP-23: Centrifugal Blower Replacement**

  This project includes replacement of the two existing 150 hp multistage centrifugal blowers with two new 150 hp HST blowers to provide sufficient aeration capacity for future peak oxygen demands. The existing centrifugal blowers will be removed and replaced with two HST blowers (Model HST 10-3600-1-U150-48). It is assumed that all four blowers will need to operate simultaneously to meet the projected 2045 peak oxygen demand. The project also includes associated installation and electrical, instrumentation, and controls improvements. The City is currently working on a project to increase capacity of blowers 3 and 4. This project addresses existing capacity issues and process upgrades.

- **TP-24: Biosolids Dryer Replacement**

  This project includes replacement of the existing sludge dryer with new sludge drying equipment to maintain reliable biosolids processing as the existing equipment approaches the end of its useful life. The existing sludge dryer was installed in 2014 and is more than 10 years old. Typical sludge drying equipment may require a major overhaul within approximately 10 years, and the City should plan for potential replacement within the next 10 to 15 years. However, a firm recommendation for replacement is not made as part of this 2025 GSP, because regulations related to biosolids, particularly per- and polyfluoroalkyl substances (PFAS), continue to evolve and may affect future biosolids management requirements. The project includes new sludge belt drying equipment (BDS-10) and associated components, partial demolition and expansion of the existing building, additional site work, installation, and associated electrical, instrumentation, and controls improvements. The City has contracted for an evaluation of the dryer and alternatives for solids handling. This project addresses growth-driven capacity and process constraints, primarily from development in the North Shore Area.

- **TP-25: Biofilter Replacement**

  This project includes replacement of the existing biofilters with new biofilters to maintain reliable odor control as the existing tertiary filters approach the end of their useful life. The new biofilter odor control system will be designed for approximately 10,000 cubic feet per minute and will include associated ductwork, sump pumps, water panels, and other necessary components. The project also includes construction of a structural pad, installation, and associated electrical, instrumentation, and controls improvements. Prior to completion of this project, the City may consider replacing the biofilters with trickling filters which have a smaller footprint. This project addresses growth-driven capacity and process constraints, primarily from development in the North Shore Area.

7.4.2 Recommended Annual WWTF Repair and Replacement Program

The City has established an annual maintenance program as part of its CIP to maintain and improve the WWTF. These improvements will help the City address aging infrastructure, maintain reliable operation of the WWTF, and extend the useful life of existing assets. Continued investment in these projects will also help the City address maintenance needs as they arise and support the long-term goals of the GSP. Table 7.4 shows a summary of the City's annual repair and replacement program for the WWTF.

Table 7.4 Recommended Annual Repair and Replacement Program for the WWTF

Project ID	Improvement Type	Project Name	Description
R-03	R&R	Miscellaneous WWTF Projects	This project includes miscellaneous improvements at the existing WWTF to address operational, maintenance, and reliability needs. Improvements may include replacement or rehabilitation of process equipment, electrical and controls upgrades, instrumentation, piping, structural improvements, and other equipment or site improvements as needed. These improvements will help maintain reliable plant operation and address deficiencies that may be identified through regular operation, maintenance, and future condition assessments.

7.4.3 Recommended General WWTF Projects

General project recommendations for the WWTF include the following studies and assessments:

- **G-05: Electrical System Arc Flash Study**

  No arc flash labels were found on the plant's distribution equipment, and the owner confirmed that an Electrical System Study is not maintained. Carollo recommends completing this study as soon as possible and applying arc flash labels in accordance with Occupational Safety and Health Administration requirements to ensure worker safety. This project should be completed in the near term to address the identified safety concern.

- **G-06: Hazardous Area Classification Study**

  For regulatory compliance, and safety, Carollo recommends conducting a hazardous area classification study per NFPA 820 and upgrading any areas that do not meet code. This project should be completed in the near term to address the identified safety concern.

- **G-07: Flood Risk Assessment**

  Carollo recommends a comprehensive flood risk analysis for all major electrical and control systems to assess vulnerabilities and strengthen flood resilience.

7.4.4 Additional Recommendations

The following sections present additional recommendations, some of which can be performed by City staff, such as sampling, and therefore are not included in the CIP.

7.4.4.1 Additional Monitoring of Plant Influent

Carollo recommends that the City expand monitoring of the plant influent wastewater to include TKN, NH4 and alkalinity.

7.4.4.2 Mixed Liquor Settling Characteristics

Historical SVI data (Appendix I - *Evaluation of the Wastewater Treatment Facility Report*) shows that poor settling of the mixed liquor occurs during the late winter and spring each year. During these bulking episodes, the SVI can increase to values between 250 and 350. These episodes of poor settling present a significant risk of operational upset since peak wet weather flows often occur during this same period.

Carollo recommends that the microorganisms and probable causes for the bulking episodes be found, and methods evaluated for reducing or stopping the bulking.

7.4.4.3 Supplemental Alkalinity

The treatment plant currently uses magnesium hydroxide to supplement the natural wastewater alkalinity so that sufficient alkalinity is present to allow nitrification in the activated sludge process. Essentially complete nitrification is needed to meet the plant's NPDES permit. While magnesium hydroxide is often a desirable chemical for adding alkalinity, it does contribute to the formation of struvite scale in sludge processes, piping, and appurtenances. Struvite is a sparingly soluble mineral that is composed of ammonium, magnesium, and phosphate (NH4MgPO4·6H2O). Often magnesium is the element that limits the formation of struvite.

The alkalinity (and oxygen) consumed by the nitrification process can be partially recovered by denitrification. Denitrification (aka nitrogen removal) converts the nitrate formed by the nitrification process into nitrogen gas which then escapes from the water. Although denitrification is not required by the City's NPDES permit and is not likely to be required in the future, it can be used to reduce the need for supplemental alkalinity. There are several factors to be considered, but the City may be able to enhance denitrification through operational controls of the treatment process.

Carollo recommends that the City investigate switching to an alternative chemical to provide the needed alkalinity for the nitrification process to reduce the formation of struvite scaling. In addition, the City should evaluate alternative strategies for enhancing denitrification with the dual goals of reducing the need for supplemental alkalinity and reducing oxygen demands.

7.4.4.4 Potentially Toxic Compounds

During calibration of the BioWin model matching predicted effluent 5-day carbonaceous biological oxygen demand ($cBOD_5$) and NH_4 concentrations with measured values required reducing kinetic coefficients for both types of reactions. This suggests the presence in the municipal wastewater of one or more compounds that are toxic to both ordinary heterotrophic organisms and nitrifying bacteria. Semiconductor manufacturing is known to use compounds that are toxic to the bacteria in activated processes, so it is possible that the biological process at the treatment plant experiences inhibition. The intermittent recycling of ammonia with the dewatering centrate is responsible for intermittently high effluent ammonia concentrations but it does not appear to be entirely responsible for the elevated effluent ammonia concentrations.

Carollo recommends both evaluation of the biological reaction rates and discussions with the industrial customers are called for to proactively identify these toxins and develop methods or procedures for minimizing their presence in the raw wastewater.

7.4.4.5 Selector Design and Densified Activated Sludge

Over the course of the last few decades the design of biological selectors and various methods of achieving densified activated sludge has advanced considerably. A densified activated sludge has been operationally defined as one with larger, denser floc particles that settle faster. Mixed liquor settling can be improved through the use of improved selector design, operational controls, the use of cyclones, and mobile-biofilm carriers.

In conjunction with an evaluation of bulking at the plant, Carollo recommends that the City also investigate the potential for implementing one or a combination of the methods for achieving a densified activated sludge. Ideally this should be completed before the next design and construction project at the wastewater treatment facility.

CHAPTER 8 OPERATION AND MAINTENANCE

8.1 Introduction

This chapter provides an overview of the City Wastewater Utility organization, staffing, and O&M program. This chapter documents existing practices and identifies changes that may improve system O&M.

8.2 Organization Structure

The City Public Works Department is organized as shown in Figure 8.1 and is managed by Scott Collins. The Utility group is managed by Rob Charles. There are various groups relevant to this Plan including the WWTF, and a combined group with responsibilities pertaining to sewer and water disciplines. The WWTF is supervised by Kyle Stephens.

Note, Stormwater and Sewer/Water groups assist each other during abnormal conditions, such as cleanup after a major storm or repairs requiring specialized staff and equipment.

The Capital Engineering group, managed by James Carothers, leads major wastewater capital projects, such as new lift stations. The Utility group leads lift station retrofits, repair and replacement projects, and operations and maintenance projects.

8.3 Staffing

8.3.1 Maintenance and Operations Staff

The City has recently separated the water and sewer groups into two divisions. Staff under the sewer division work on sewer mains including the STE systems. They are also in charge of making sewer system repairs. Operational staff work full shifts on weekdays and there is always at least one person on duty during the day on weekends. There is always at least one person on call in the evenings to address emergencies.

No additional positions are sought although as of October 2025, there is one vacant water/sewer staff position the City is seeking to fill. There is also a vacant water/sewer supervisor position in the budget that has remained unfilled for several years.

8.3.2 Wastewater Utility Engineering Staff

WWTF staff work primarily on the treatment plant and are also in charge of the sewer lift stations in the conveyance system. The City's WWTF NPDES permit requires a Washington Wastewater Treatment Facility Operator (WWTFO) Class IV certified operator to be responsible for the plant at all times. Table 8.1 lists WWTF staff certifications. The City has two Class IV operators in the event that one is unavailable. The NPDES permit does not require anyone other than the responsible operator(s) to hold a certification, but the City requires all operators to have a Class I certification or have the ability to acquire one within six months of employment.

Table 8.1 Wastewater Utility Operator Certifications

Name	Position	Certification
Kyle Stephens	WWTF Manager	WWTFO Class IV
Jacob Taylor	WWTF Operator Lead	WWTFO Class IV
Ken Murray	WWTF Operator	WWTFO Class I
Steve Carroll	WWTF Operator	WWTFO Class II
Joe Calderone	WWTF Operator	WWTFO Class I
Matt Golphenee	WWTF Operator	WWTFO Class II
Casey Chase	WWTF Operator	WWTFO Class I
Aaron Eyler	WWTF Operator	WWTFO Class I
Angelica Vazquez	WWTF Laboratory Analyst	WWTFO Class I

8.4 Records

For O&M record keeping, the WWTF uses a Computerized Maintenance Management System (CMMS) called Fiix, which is a Rockwell software, data-tracking Excel spreadsheets, handwritten logbooks, and an electronic repository of equipment documentation. The WWTF staff have a "WWTF" shared drive at the plant, which is a reference library of construction documents, O&M documentation for individual equipment, training materials, etc.

The STEP systems tanks are set using iAUDIT on an iPad. Once the tank set is complete and the City accepts the system, the data is entered into Tyler to track the asset and its 8-year preventative maintenance schedule. An as-built drawing is also created and saved to the shared drive for future reference. The City currently uses iAUDIT to document work and plans to move to the same software as the WWTF in the future to better track current activities. The implementation plan is to add new activities to the software as it comes up.

City staff and third-party customer service representatives receive utility-related calls made by system users, and information is dispatched to the appropriate utility staff.

8.5 Current Operation and Maintenance Program

8.5.1 Maintenance

8.5.1.1 Lift Station Inspection and Maintenance

Lift station inspection and maintenance is completed by City WWTF Operators listed in Table 8.1.

For all lift stations, pump run hours are closely tracked to identify potential issues. Additionally, periodic maintenance is completed. Table 8.2 presents each activity and frequency staff completes for the sewer lift stations.

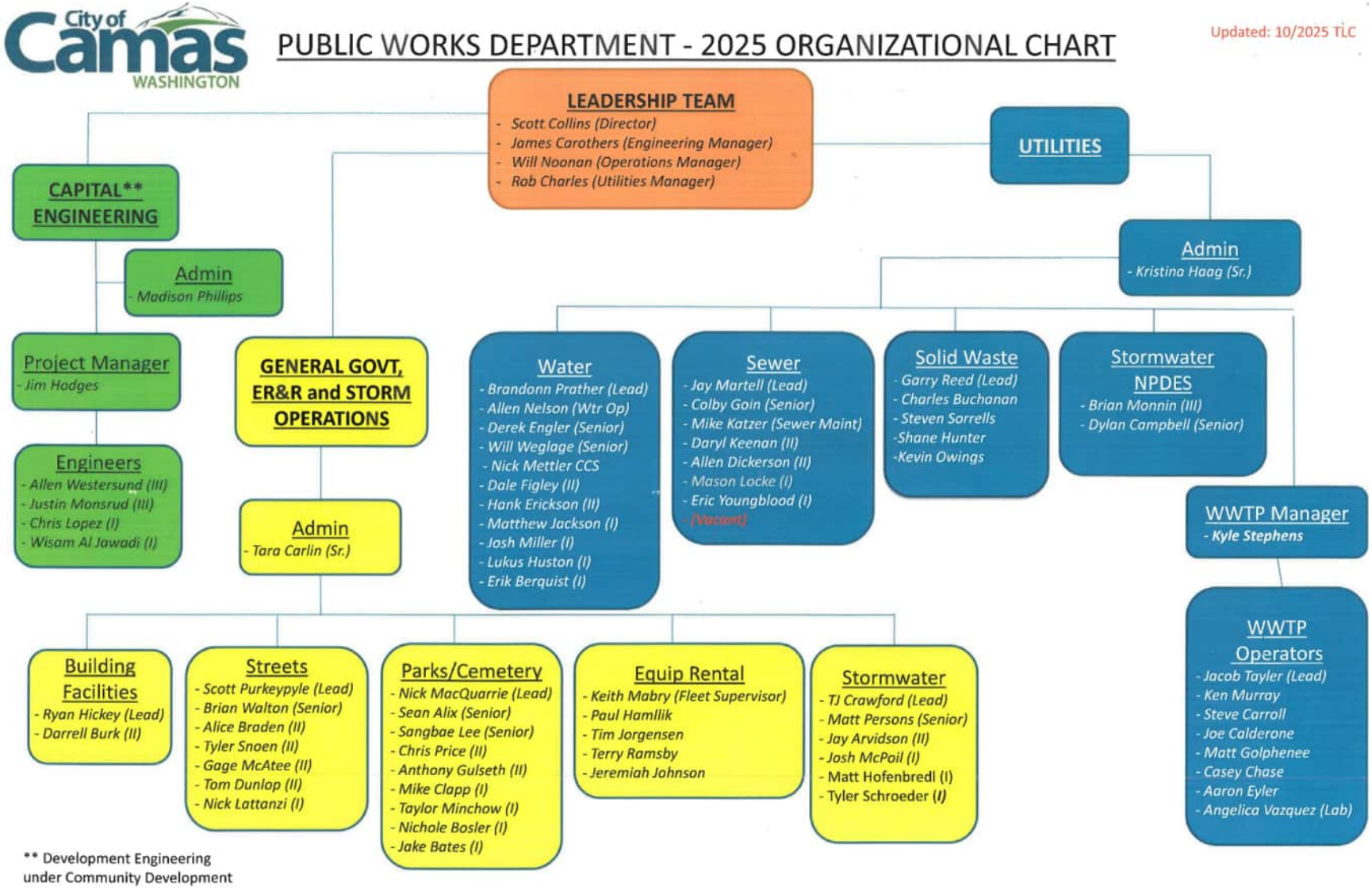


Figure 8 1 Organization Structure Chart

Table 8.2 Summary of WWTF and Sewer Lift Station Maintenance

Frequency	Component	Activity
Daily	SCADA	Review lift station alarm history. Check pump/level/pressure/flow trend charts.
	Record Keeping	Update pump runtime tracking spreadsheets. Review updated sheets for anomalies. Submit requests for any necessary maintenance via CMMS.
Weekly	Controller	Check for active alarms. Verify pumps, level indicator, and other controller-monitored equipment is operating normally in "AUTO". Document pump run hours. Verify no tripped breakers.
	Pumps	Run pumps in hand to verify proper operation. Inspect for unusual sounds, vibration, or leaks.
	Generator Set	Check ATS status and verify there are no faults and system is ready for emergency operation. Check generator fuel. Check generator for leaks or signs of mechanical failure. Check generator control paned for faults. Generator auto-exercises on Thursdays.
	Dry Well	Verify dry well is dry. Verify sump pump or floor drain is functioning properly. When running pumps, verify check valves open/close. Verify force main pressure (static and pumping). Check for piping leaks.
	Wet Well	Inspect influent flow, verifying it is not abnormally high or low, color, odor, etc. Inspect for excess debris or grease accumulation. If able, break up FOG and pump out. Verify level sensors are free of debris or obstructions, clean, as necessary.
	Odor Control System	Verify proper operation and odor level. Inspect for unusual sounds, vibration, odor, and leaks.
	Surge Tank	Verify proper operation, checking controller for any faults.
	Grounds	Monitor physical appearance of station. Remove any accumulated trash or debris. Monitor and control vegetation. Monitor for odors emanating from station.
Quarterly	Pumps	Perform drawdown testing for each pump.
	Record Keeping	Update pump tracking spreadsheet with draw down test results.
	Odor Control System	Change out carbon media at Lacamas Meadows Lift Station. In depth check of biofilter systems.
Bi-Annually	Gas Sensors	Calibrate lower explosive limit meters.
	Grounds	Herbicide application, where necessary.
	Odor Control System	Change out odor control media on carbon absorber units.
	Isolation Valves	Exercise isolation valves at all lift stations to maintain operability.
Annually	Generator	Third-party preventative maintenance.
	Pumps	Pull pumps for visual inspection.
	Main Pump Station Pumps	Third-party preventative maintenance.
	Piping	Winterize any water piping.
	Odor Control System	Winterize biofilters prior to freezing weather. Turn off odor control units that are not operated during winter months. Turn on odor control units that are operated during summer months.
	Wet Well	Cleaning of any wet wells that have accumulated excessive FOG/floatables/debris.
Every 3 Years	Pumps	Third-party pump inspections and testing.

8.5.1.2 Pipeline Video Inspection

A CCTV inspection of the gravity main by push camera was completed in 2013. For future pipe and manhole inspections, the City purchased a CCTV van in 2024 and is currently televising gravity mains in the system. The City uses Granite data management software along with GIS to manage the CCTV data. The City's goal is to CCTV all 45 miles of gravity pipe over the next two years. Once the baseline data is collected and hot spots are identified a maintenance schedule can be developed. Inspections will be performed in accordance with all industry standards and best practices.

8.5.1.3 Manhole Inspection and Maintenance

The City inspects manholes on an as-needed basis. The City may choose to implement their own standards for manhole inspections, rather than rely on the National Association of Sewer Service Companies standards.

8.5.1.4 Root Cutting

Root maintenance is completed as needed. It is anticipated that additional root cutting tasks may be identified through contracted video inspection on an as needed basis.

8.5.1.5 Grease Removal

The City educates customers on FOG as part of their general education program. The City is also using the FOG Best Management Practices platform to administer and oversee ongoing FOG management and handling practices. Through video inspection, the City has identified pipes with heavy FOG. These hot spots are shown in Figure 8.2.

8.5.1.6 Hydraulic Line Cleaning

Flushing is done every month for flat areas in the system. Where normal flushing is insufficient to address known problem areas, pipe jetting is completed either as preventative maintenance or on an as needed basis.

8.5.1.7 Repair Sewers

Point repairs are conducted to address pipe deficiencies identified through CCTV inspection and are undertaken as required and as resources allow. Work may be completed by City staff or through a small works type contract.

8.5.1.8 STEP Maintenance

The City owns and maintains the STEP system. Currently, the City conducts solids pumping from about 5,000 STEP tanks annually through city staff and contractors. Additionally, it maintains the STEP tanks, pumps, and telemetry concurrently. The City has an active STEP tank education program with customers. It is recommended to conduct a STEP tank condition assessment to identify repair and replacement needs including inspection of the STEP tank and connections to the STEP tank as well as an inspection of the proper function of the STEP tank. From this condition assessment, a STEP repair and replacement program should be developed and included in the City's CIP. Current STEP tank replacement costs are about $11,000 per STEP tank to be installed by a contractor.

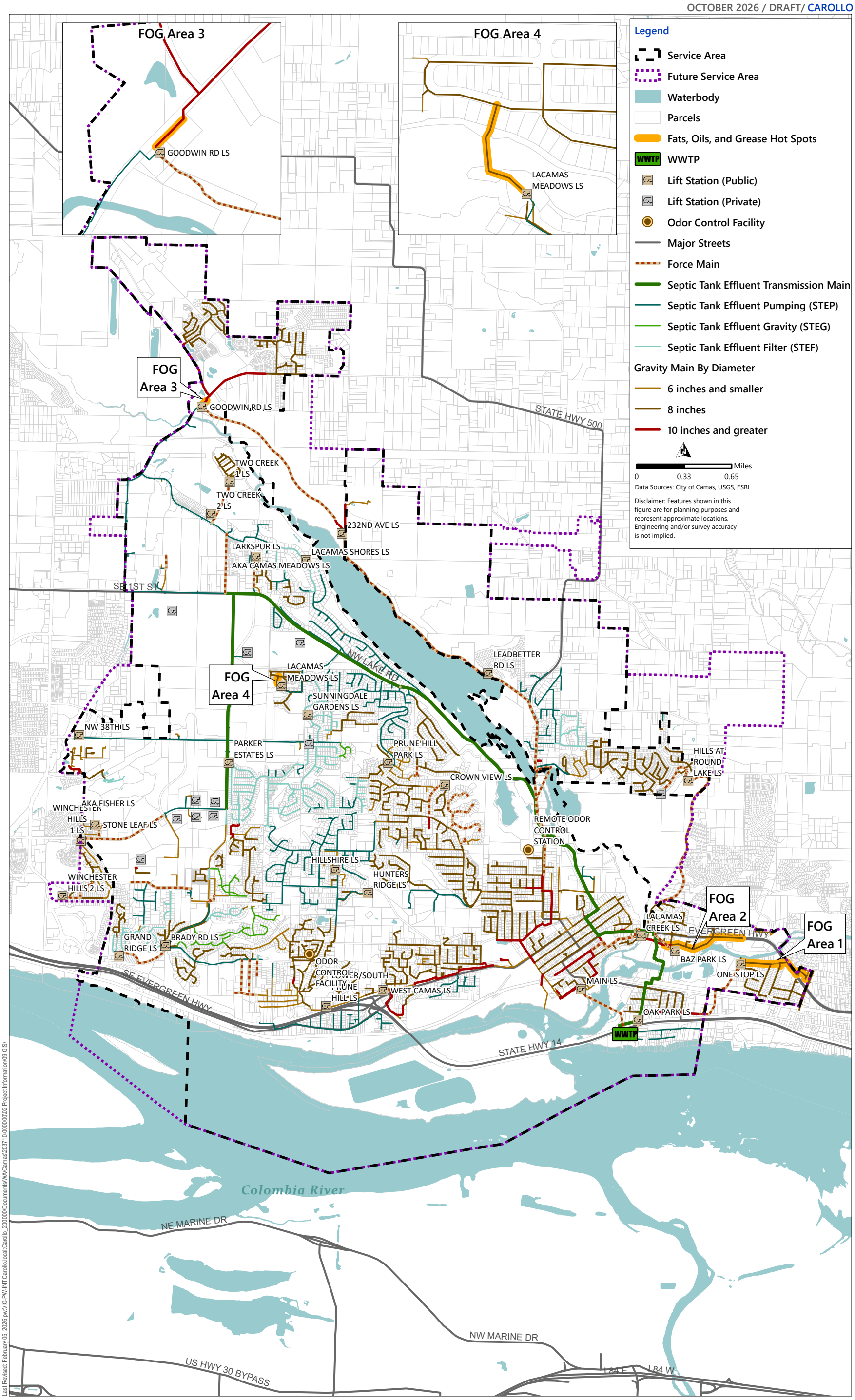


Figure 8.2 Fats, Oils, and Grease Hot Spots

8.5.2 Operations

The City operations group are generally divided into treatment, pump stations, and pipes. The City operators at the WWTF conduct various activities, including monitoring and adjusting treatment parameters, conducting water quality measurements and other related lab tests, and managing the City's Class A, Exceptional Quality Biosolids program. The WWTFOs are also responsible for monitoring the pump stations throughout the collection system. The treatment facility operators monitor the sanitary pump stations while the water/sewer staff monitor the septic tank effluent systems throughout the City. Water/sewer staff are responsible for pipe activities associated with operating the collection system, including repairing pipelines. City staff also lead operations during emergencies or natural disasters. Emergency operations include preparing and planning for emergencies and conducting drills.

Individual staff duties and operations include administration tasks, training, and tool maintenance. Staff have their own administrative duties to complete weekly as well as meetings to attend in addition to their normal operator duties. They are also in charge of maintaining and cleaning their tools and equipment. The City values the importance of training staff; thus, staff will also allocate time annually to training and conferences as a means to further develop their skills.

8.6 Future Operation and Maintenance Needs

The WWTF plans to expand their internal maintenance capabilities while reducing dependency on third-party maintenance contracting. The WWTF is working to develop deeper pump, clarifier and instrumentation inspection and maintenance skills. The WWTF plans to constantly expand and improve their usage of the CMMS and its work ordering and tracking capabilities. Furthermore, the WWTF has an ongoing effort to develop an extensive set of Standard Operating Procedures for common operations, maintenance, safety, and administrative tasks.

As stated above, the City purchased a CCTV van to complete video inspection of the collection system and is developing a hydraulic line cleaning program while completing the video inspection. The hydraulic line cleaning program can be completed by the City or third-party contractors. With this inspection and cleaning program, it is expected that other repair needs will be identified for roots, FOG, and point repairs.

Currently the City's staffing focus is to fill the current vacant water/sewer staff position. In the future, to aid in the development of non-capital utility projects, the City would like to add a staff civil engineer and an electrician to the utility team.

CHAPTER 9 CAPITAL IMPROVEMENT PLAN

9.1 Introduction

This chapter summarizes the Capital Improvement Plan (CIP). The CIP includes projects needed to accommodate growth, repair and replace aged infrastructure, and attain level of service goals. The CIP is arranged in terms of short-term (2027 to 2036) and long-term (2037 to 2045) periods. Projects are grouped into pipelines, lift stations, STEP mains, Rehabilitation and Replacement (R&R), treatment plant, and general types of infrastructure work. The CIP consists of the cost estimates and schedules for the recommended improvements.

The following sections present cost estimating assumptions, recommended projects, estimated costs for each project, and a summary of the CIP.

9.2 Cost Estimating Assumptions

Cost estimates were developed for each of the recommended projects in the CIP for budgeting purposes. The CIP costs are planning level estimates only and should be refined during pre-design of the projects as final costs of a project with depend on actual labor and materials costs, competitive market conditions, final project scope, implementation schedule, and other variable factors. The CIP cost estimates presented in this GSP do not include future inflation and should be reevaluated and updated as part of future CIP updates to account for changes in construction costs and inflation.

All costs are given in 2025 dollars. The Handy-Whitman Index for Water Utility Construction in the Pacific Region for January 2025 is 1,401. The CIP cost estimates in this chapter are Class 5 (budget-level estimates and has an expected accuracy range of -50 percent to +100 percent.

9.2.1 Conveyance Cost Assumption

This section provides the CIP for pipelines, lift stations, and STEP system. Cost estimates for conveyance infrastructure represent total project cost including materials, construction, engineering, legal, and administrative costs. Costs were represented as unit costs, as described in subsequent sections. Costs are based on costs provided by the City or similar projects completed by Carollo. The following are the total mark-ups to direct costs: 30 percent for construction contingency, 25 percent for general conditions and overhead, 20 percent for engineering, legal, and design costs (ELA), 5 percent for City administration, and 8.8 percent (applied to 65 percent of the construction cost) to account for Camas' sales tax.

9.2.1.1 Total Conveyance Project Capital Improvement Cost

The costs presented in this Plan are high-level planning costs to help the City in making financial decisions.

As shown in the following sample calculation of the conveyance projects capital improvement cost, the total cost of all project contingencies (construction and planning) and allied costs (engineering services, construction management, project administration and sales tax) is 106 percent of the baseline project cost.

Example:

Baseline Project Cost	**$1,000,000**
Construction Management Contingency (30%)	$300,000
Construction Cost	**$1,300,000**
General Conditions and Overhead (25%)	$325,000
Engineering, Legal, Design (20%)	$260,000
Administration (5%)	$65,000
Sales Tax (8.8%)	$114,400
Total Capital Improvement Cost	**$2,064,400**

9.2.1.2 Gravity Pipeline Unit Costs

For gravity pipes, baseline project costs are calculated by multiplying the estimated new pipe length by a proposed unit cost. All of the known pipelines involved in this CIP are between 8-inch and 36-inch. Pipeline unit costs are available in Table 9.1, broken down by pipeline diameter. These unit costs were used to estimate the baseline construction costs. The unit costs assume open-trench construction in improved areas. Costs include pavement cutting, excavation, hauling, shoring, pipe materials and installation, backfill material and installation, and pavement replacement.

Table 9.1 Pipeline Unit Costs

Pipe Size (inches)	Pipe Unit Cost(1) ($/linear foot)
8	$236
10	$268
12	$300
15	$378
16	$404
18	$443
20	$481
21	$505
24	$575
27	$736
30	$897
36	$1,203

Notes:
(1) Unit costs represent baseline construction costs and do not include additional cost factors for contingency, general conditions and overhead, engineering/planning, and City admin.

9.2.1.3 Lift Station Unit Costs

Lift station unit costs were based on costs of similar projects Carollo has completed in the past. Lift station upgrades include repair and replacement of the station itself and force main cleaning. LS telemetry includes upgrading or updating the SCADA system at the lift stations.

9.2.1.4 Force and STEP Main Unit Costs

Unit costs for force and STEP mains were based on the gravity pipeline unit costs presented in Table 9.1. These costs were used as a basis for estimating force and STEP main improvements, as the installation costs are generally similar to those of gravity pipelines of comparable diameter. Additional costs associated with appurtenances or other project-specific requirements were considered separately, where applicable.

9.2.2 Treatment Cost Assumptions

Cost estimates for treatment projects include 30 percent for construction contingency, 25 percent for general conditions and overhead, 25 percent for ELA, 5 percent for City administration, and 8.8 percent (applied to 65 percent of the construction cost) to account for Camas' sales tax.

9.2.2.1 Total Treatment Project Capital Improvement Cost

The costs presented in this GSP are high-level planning costs to help the City in making financial decisions.

As shown in the following sample calculation of the capital improvement cost, the total cost of all project contingencies (construction and planning) and allied costs (engineering services, construction management, and project administration) is 113 percent of the baseline project cost.

Example:

Baseline Project Cost	**$1,000,000**
Overall Construction Adjustment Factor (30%)	$300,000
Construction Cost	**$1,300,000**
General Conditions and Overhead (25%)	$325,000
Engineering, Legal, Design (25%)	$325,000
City Admin (5%)	$65,000
Sales Tax (8.8%)	$114,400
Total Capital Improvement Cost	**$2,129,400**

9.3 Capital Improvement Plan

As discussed, the CIPs are prioritized based on their urgency and risk to mitigate deficient systems. The timing for implementing these improvement projects is based on the affordability and urgency of the project. It is recommended that the City monitor growth and adjust project implementation accordingly.

9.3.1 Planning Periods

The following planning periods are used to define timing and prioritization of projects:

- **Short-term (2027 to 2035).** Proposed facilities determined to be a high priority.
- **Long-term (2036 to 2045).** Proposed facilities determined to be a low priority or proposed facilities to service major growth areas to be developed in the long-term.

The proposed project timing was based on existing deficiencies, City input, future growth, and the timing of other recommended improvements. Short-term projects generally include improvements needed to address existing deficiencies, projects identified by the City as a high priority, and general improvement projects such as flow monitoring and I/I studies. Some of these studies are scheduled in the short-term because the results may be used to further evaluate the need, timing, or scope of other recommended improvements, including pipeline capacity projects.

Long-term projects generally include improvements needed to address future growth and projects that are dependent on other improvements being completed first. Some projects that show deficiencies under future conditions are scheduled for the long-term because additional development is needed before the deficiency is expected to occur or because upstream improvements should be completed first. Project timing may be adjusted as the results of monitoring and other studies become available and as development and system conditions change.

9.3.2 Project Types

Projects are categorized by type. These types include the following:

- "Growth"
- "Upgrade"
- "R&R"
- "General"

Growth projects are focused on updating infrastructure to address the needs of expanding. Upgrade projects are focused on upgrading infrastructure to address level of service concerns. R&R projects are focused on renewing or replacing infrastructure in poor condition. General projects include studies and assessments. The types aid the City in determining the appropriate funding sources.

9.3.3 Project and Program Naming

An individual Project Sheet was generated for each CIP project and includes project identifiers, description, costs, project type, and comments to aid in future implementation. Project are separated into the following categories:

- "P" = Gravity and Force Main
- "LS" = Lift Station.
- "G" = General.
- "S" = STEP.
- "TP" = Treatment Plant.

A summary of all CIP projects by facility types and project type is shown in Table 9.2. A summary of costs by project category and type is presented at the end of the chapter.

9.4 Lift Station Projects

Lift stations in the CIP are recommended to be upgraded to provide pump redundancy and address PWWF greater than firm capacity during existing and future conditions. Some lift stations also have PWWF that exceeds their total pumping capacity and will require additional capacity improvements. Additional project details can be found in Chapter 6 Collection System and in the Capital Improvement Project Sheets in Appendix L.

- **LS-01: Lower/South Prune Hill LS Improvements**
  - **Description**: Upgrade the Lower/South Prune Hill LS to increase firm capacity from 0.86 mgd to 2.93 mgd, including an allowance for odor control improvements.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $5,381,000.
  - **Year:** 2033 and 2034. The timing should follow completion of G-02 (Basin 5-1-2 flow monitoring) so that the I/I evaluation can inform the need and scope of the proposed improvements. This project is also aligned with the P-01 (NW 6th Place West Improvements) and P-07 (Lower/South Prune Hill Force Main Improvements).
- **LS-02: West Camas LS Improvements**
  - **Description**: Upgrade West Camas LS to increase firm capacity from 1.44 mgd to 3.24 mgd, including an allowance for removal of existing asbestos cement force main.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $5,204,000.
  - **Year:** 2031. The timing of this project should follow completion of LS-01 (Main LS improvements), G-02 (Basin 5-1-2 flow monitoring), P-01 (NW 6th Place West Improvements), P-02 (NW 6th Place East Improvements) and P-07 (Lower/South Prune Hill Force Main Improvements). The additional downstream capacity provided by Main LS improvements should be in place before increasing pumping capacity at West Camas LS, and the G-02 I/I evaluation may reduce the scope or timing of the proposed improvements.
- **LS-03: Crown View LS Improvements**
  - **Description**: Upgrade the Crown View LS to increase firm capacity from 0.32 mgd to 0.85 mgd.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $4,290,000.
  - **Year:** 2035. The timing of this project should follow completion of G-01 (Basin 5-1-2 flow monitoring), P-05 (NW Fargo Street, NW 18th Loop, and NW 18th Avenue Improvements), and P-11 (Division Street Improvements) so that the flow monitoring and I/I evaluation can inform the need and scope of the proposed improvements. Upstream I/I reduction may reduce the scope or timing of this project and downstream improvements, and the downstream improvements should be completed first to provide adequate capacity for increased flows from the Crown View LS.

- **LS-04: Lacamas Creek Lift Station Improvements**
  - **Description**: Replace the two existing pumps at the Lacamas Creek LS to increase firm capacity from 1.37 mgd to 2.13 mgd.
  - **Reasoning:** Growth.
  - **Estimated Cost:** $1,222,000.
  - **Year:** 2045. The timing of this project is primarily driven by future flows from the Hills at Round Lake service area and should be done following the completion of LS-09 (Hills at Round Lake LS Improvements) and P-13 (SE 283rd Avenue to NE Woodburn Drive Extension). The pump replacement should follow completion of the Hills at Round Lake LS improvements to provide adequate downstream capacity and avoid creating a downstream capacity constraint.
- **LS-05: Main Lift Station Improvements**
  - **Description**: Construct a new wet well and associated pumping facilities with a minimum firm capacity of 21 mgd. Evaluate long-term conveyance and pumping options, including the existing 18-inch force main. Include a $150,000 planning-level allowance for odor control.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $10,640,000.
  - **Year:** 2040. The timing of this project depends on implementation of the recommended improvements to upstream collection system. As upstream capacity deficiencies are addressed and additional flows are conveyed through the collection system, the resulting flows will reach Main LS and increase demands on the station. The station upgrade should be evaluated following implementation of the upstream improvements to confirm the need and timing of the proposed upgrades.
- **LS-06: Goodwin Road Lift Station Improvements**
  - **Description**: Add a third pump to the Goodwin Rd LS to increase firm capacity from 0.49 mgd to 0.71 mgd.
  - **Reasoning:** Capacity Upgrade/Growth.
  - **Estimated Cost:** $502,000.
  - **Year:** 2043. The timing of this project is primarily driven by future development in the North Shore area. An additional pump should be added to the available third pump pad as development occurs, and flows increase within the upstream service area.
- **LS-07: 232nd Avenue Lift Station Improvements**
  - **Description**: Add a third pump to 232nd Avenue LS to increase firm capacity from 0.53 mgd to 2.60 mgd.
  - **Reasoning:** Growth.
  - **Estimated Cost:** $502,000.
  - **Year:** 2042. The timing of this project is primarily driven by future development within the 232nd Avenue LS service area, additional flows from the upstream Goodwin Road LS, and projected large user flows. The additional pump should be added to the available third pump pad as development occurs and flows increase within the service area.

- **LS-08: Leadbetter Road Lift Station Improvements**
  - **Description**: Activate the existing 8-inch dual force main and add a third pump to the available third pump pad at Leadbetter Road LS in the short-term. Upgrade the three existing pumps for buildout conditions in the long-term.
  - **Reasoning:** Growth.
  - **Estimated Cost:** $2,379,000.
  - **Year:** 2041. The long-term pump upgrades are primarily driven by future development, additional flows from the upstream Goodwin Rd and 232nd Avenue LS service areas, and a future airport connection. This project should align with P-10 (Leadbetter Road LS Dual Force Main Improvements) and P-12 (SE Everett Road to Leadbetter Road Extension). The long-term improvements should be implemented as development occurs and additional flows increase demands at the Leadbetter Road LS.
- **LS-09: Hills at Round Lake Lift Station Improvements**
  - **Description**: Replace the two existing pumps at the Hills at Round Lake LS to increase firm capacity from 0.96 mgd to 1.21 mgd.
  - **Reasoning:** Growth.
  - **Estimated Cost:** $1,504,000.
  - **Year:** 2044. The timing of this project is primarily driven by future development in the Hills at Round Lake service area and should be align with P-13 (SE 283rd Avenue to NE Woodburn Drive Extension). The pump replacement should be completed as development occurs and flows increase within the service area.

9.5 STEP Projects

The hydraulic model included the STEP main trunklines due to limited information available for the remaining components of the STEP system. Based on the model results, an improvement project was developed for the STEP main trunkline where deficiencies were identified. The individual STEP system components, including STEP tanks and associated infrastructure, could not be fully evaluated due to limited information. Future CIP projects should include monitoring, modeling, and condition assessments to collect additional information and support a more comprehensive evaluation of the STEP system.

- **S-01: NW Parker Street to NW Lake Road STEP Main**
  - **Description**: Install parallel STEP mains consisting of:
    - 14,002 LF of 30-inch pipe from Node 9 to Node J176 and;
    - 4,061 LF of 30-inch pipe from Node 13 to Node 15.
  - **Reasoning:** Growth.
  - **Estimated Cost:** $32,764,000.
  - **Year:** 2038. The timing of this project is primarily driven by future flows from the STEP basin area. The project should be implemented as development occurs and flows increase within the STEP basin to provide sufficient conveyance capacity for future system conditions. The parallel configuration will also provide operational flexibility by allowing one STEP main to remain in service while the other is taken out of service for maintenance and can provide additional conveyance capacity during peak wet weather conditions.

9.6 Pipeline Projects

CIP pipeline projects were determined from the results of a skeletonized model evaluation. Most pipeline projects address level of service concerns, and some are combined with growth and level of service projects.

- **P-01: NW 6th Place West Improvements**
  - **Description**:
    - Upsize 422 LF of 8-inch pipe to 12-inch;
    - 809 LF of 8-inch pipe to 15-inch, and;
    - 472 LF of 12-inch pipe to 18-inch gravity pipe.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $1,298,000.
  - **Year:** 2034. The timing of this project should follow completion of G-02 (flow monitoring in Basin 5-1-2). The flow monitoring and I/I evaluation may reduce the scope or timing of the proposed improvements.
- **P-02: NW 6th Place East Improvements**
  - **Description**:
    - Upsize 682 LF of 8-inch pipe to 21-inch gravity pipe.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $695,000.
  - **Year:** 2032. The timing of this project should follow completion of P-01 and LS-01 improvements. The proposed improvements should be evaluated after these projects are completed to confirm the need and scope of the upsizing.
- **P-03: NW 6th Place Avenue West Improvements**
  - **Description:**
    - Upsize 1,943 LF of 12-inch pipe to 24-inch, and;
    - 592 LF of 12-inch pipe to 21-inch gravity pipe.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $2,869,000.
  - **Year:** 2031. The timing of this project should follow completion of LS-02 (West Camas LS). The proposed improvements should be evaluated after the lift station upgrade is completed to confirm the need and scope of the downstream upsizing.

- **P-04: NW 6th Place Avenue East Improvements**
  - **Description:**
    - Upsize 446 LF of pipe between MHs 3-1-1 and 5-8-1 from 18- to 27-inch;
    - 260 LF of pipe between MHs 5-8-1 and 5-1-12 from 21- to 30-inch;
    - 402 LF of pipe between MHs 2-1-1 and 5-1-12 from 12- to 30-inch;
    - 545 LF between MHs 5-1-12 and manhole 5-1-11 from 21- to 36-inch;
    - 947 LF between MHs 5-1-10 and 5-1-7 from 24- to 36-inch;
    - 1,126 LF of pipe between MHs 5-1-8 and 5-1-2 from 21- to 36-inch, and;
    - 34 LF between MHs 5-1-2 and 5-1-1 from 24- to 36-inch.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $8,329,000.
  - **Year:** 2030. The timing of this project should follow completion of the upstream lift station, force main, and gravity sewer improvements. The proposed improvements should be evaluated after the upstream projects are completed to confirm the remaining need and scope.
- **P-05: NW Fargo, NW 18th Loop, NW 18th Avenue Improvements**
  - **Description:**
    - Upsize 2,744 LF of 8-inch pipe to 15-inch.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $2,099,000.
  - **Year:** 2028. The timing of this project should follow completion of G-02 flow monitoring study in Basin 5-1-2 and LS-03 (Crown View LS) improvements. The proposed improvements should be evaluated after these projects are completed to confirm the need and scope of the upsizing.
- **P-06: NE Garfield Street to NE 15th Avenue to NE Franklin Street along the Mill Ditch Improvements**
  - **Description:**
    - Upsize 282 LF of pipe between manholes 4-2A-2 to 4-2A-Q from 8- to 12-inch;
    - 115 LF of pipe between manholes 4-2A-Q and 4-2A-1 from 8- to 15-inch;
    - 795 LF of pipe between manholes 4-2A-1 and 4-2-2 from 8- to 18-inch;
    - 427 LF of pipe between manhole 4-2-2 and 4-2-1 from 8- to 24-inch;
    - 256 LF of pipe between manholes 4-2-1 and 4-1-2 from 8- to 27-inch;
    - 254 LF of pipe between manholes 4-1-2 and 4-1-1 from 21- to 30-inch;
    - 158 LF of pipe between manholes 4-1-1 and 3-2-6 from 21- to 30-inch, and;
    - 347 LF of pipe between manholes 4-1-1 and 3-2-4 from 15- to 36-inch.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $3,543,000.
  - **Year:** 2037. The timing of this project should follow completion of G-01 in Basin 4-1-3, which includes an I/I pilot study. The I/I evaluation may reduce the scope or timing of the proposed improvements.

- **P-07: Lower/South Prune Hill Lift Station Force Main Improvements**
  - **Description:**
    - Upsize 925 LF of force main between the Lower/South Prune Hill LS wet well and MH 10-1-3 from 10- to 18-inch.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $828,000.
  - **Year:** 2033. The timing of this project should follow completion of P-01 (NW 6th Place West Improvements) and coincide with LS-01 (Lower/South Prune Hill LS Improvements).
- **P-08: West Camas Lift Station Force Main Improvements**
  - **Description:**
    - Upsize 574 LF of the existing force main from 6- to 15-inch.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $556,000.
  - **Year:** 2031. The timing of this project should follow completion of LS-01 (Lower/South Prune Hill Lift Station Improvements), P-01 (NW 6th Place West Improvements, and P-02 (NW 6th Place East Improvements). The project should coincide with LS-02 (West Camas Lift Station Improvements).
- **P-09: Main Lift Station Force Main Improvements**
  - **Description:**
    - Upsize 2,348 LF of the existing force main from 18- to 24-inch.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $2,379,000.
  - **Year:** 2030. The timing of this project should coincide with LS-04 (Main LS Phase 1 Improvements) and be completed after upstream improvements. The proposed force main improvement should be evaluated after the upstream projects are completed to confirm the need and scope of the replacement.
- **P-10: Leadbetter Road Dual Force Main Improvements**
  - **Description:**
    - Activate the existing parallel 8-inch force main.
    - Install approximately 6,500 LF of parallel 10-inch force main between Node_161 to Node_27.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $3,526,000.
  - **Year:** 2041. The timing of this project should coincide with LS-08 (Leadbetter Road Lift Station Improvements) and be completed after the upstream improvements. The proposed force main improvement should be evaluated after the upstream projects are completed to confirm the need and scope of the improvement.

- **P-11: Division Street Improvements**
  - **Description:**
    - Upsize 827 LF of pipe between MHs 3-1-14 and 3-1-11 from 8- to 15-inch;
    - 505 LF of pipe between MHs 3-1-11 and 3-1-9 from 8- to 21-inch, and;
    - 1,526 LF of pipe between MHs 3-1-9 and 3-1-2 from 8- to 18-inch.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $2,514,000.
  - **Year:** 2032. The timing of this project should follow completion of P-05 and the other upstream improvements. The proposed improvements should be evaluated after the upstream projects are completed to confirm the need and scope of the upsizing.
- **P-12: SE Everett Road to Leadbetter Road Extension**
  - **Description:**
    - Install 2,031 LF of 8-inch pipe;
    - Install 692 LF of 12-inch pipe, and;
    - Install 6,036 LF of 18-inch pipe.
  - **Reasoning:** Growth.
  - **Estimated Cost:** $6,792,000.
  - **Year:** 2045. Project timing and implementation will be driven by development needs and coordinated with the developer.
- **P-13: SE 283rd Avenue to NE Woodburn Drive Extension**
  - **Description:**
    - Install 6,782 LF of 12-inch pipe.
  - **Reasoning:** Growth.
  - **Estimated Cost:** $4,119,000.
  - **Year:** 2045. Project timing and implementation will be driven by development needs and coordinated with the developer.

9.7 Treatment Plant Projects

Treatment plant projects in the CIP occur at the WWTF. The projects aim to mitigate capacity limitations over the next 19 years and address current condition issues that prohibit reliability or performance. Projects were grouped together to consider construction sequencing and project timing.

- **TP-01: Parshall Flume Replacement**
  - **Description:** Replace the existing Parshall Flume with a higher-capacity flume and make structural modifications to prevent influent wastewater from spraying during peak flow conditions.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $277,400.
  - **Year:** 2029. This project is timed to align with TP-04 (Replace Screens and Slide Gates).

- **TP-02: Primary Clarifier Bypass**
  - **Description:** Construct a bypass around Primary Clarifiers No. 1 and 2, including a new 30-inch bypass pipeline, structural modifications at the plant headworks effluent, and weir gates to control and direct flow.
  - **Reasoning:** Capacity Upgrade and Growth.
  - **Estimated Cost:** $816,000.
  - **Year:** 2030. This project is timed to align with TP-03 (Aeration Basin Flow Splitter Box).
- **TP-03: Aeration Basin Influent Flow Splitter Box**
  - **Description:** Construct a new aeration basin influent flow splitter box to improve mixing and flow distribution to the aeration basins and address limited head between the primary clarifiers and aeration basins.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $3,507,000.
  - **Year:** 2030. This project is timed to align with TP-02 (Primary Clarifier Bypass).
- **TP-04: Plant Headworks**
  - **Description:** Replace the existing headworks screens/washer compactors and slide gates, including associated electrical, instrumentation, controls, and site work.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $2,696,000.
  - **Year:** 2029.
- **TP-05: Relocating Internal Recycle Piping**
  - **Description:** Relocate the internal recycle piping at the three existing aeration basins at the beginning of the anoxic selector, upstream of the first anoxic zone. Include associated electrical, instrumentation, and controls improvements. Work can be performed in-house.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $0
  - **Year:** 2027. The City should monitor treatment performance before and after the change to confirm the effectiveness of the modification. The project could potentially be completed in-house.
- **TP-06: Modifying Anaerobic Selectors Baffle Wall**
  - **Description:** Modify the existing baffle walls within the aeration basins, including repouring the baffle walls between the anoxic and anaerobic zones and replacing existing plywood baffle walls with 316 stainless steel baffle plates.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $70,200
  - **Year:** 2027.
- **TP-07: Replace Secondary Clarifier No. 1**
  - **Description:** Demolish and replace Secondary Clarifier No. 1 with a new 75-foot-diameter clarifier, including new clarifier internals, RAS and WAS pumps, structures, and associated electrical, instrumentation, controls, and site work.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $5,329,000
  - **Year:** 2027. The City is currently evaluating this project.

- **TP-08: Secondary Clarifier No. 2 RAS Pump Replacement**
  - **Description:** Replace the RAS pumps serving Secondary Clarifier No. 2 with two new 1,400-gpm non-clog submersible pumps, including associated electrical, instrumentation, and controls improvements.
  - **Reasoning:** Capacity Upgrade and Growth
  - **Estimated Cost:** $440,000
  - **Year:** 2030.
- **TP-09 Replace Plant Drain Lift Station No. 1**
  - **Description:** Rehabilitate Plant Drain LS No. 1, including replacement of the existing pumps, wet well liner, control panel, guide rails, and discharge piping, and installation of a totalizing flow meter and composite sampler with associated electrical, instrumentation, controls, and site work.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $965,000
  - **Year:** 2030. This project is timed to align with TP-02 (Primary Clarifier Bypass).
- **TP-10: Replace Plant Drain Lift Station No. 2**
  - **Description:** Rehabilitate Plant Drain LS No. 2, including replacement of the existing pumps, wet well liner, control panel, guide rails, and discharge piping, and installation of a totalizing flow meter and composite sampler with associated electrical, instrumentation, controls, and site work.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $965,000
  - **Year:** 2030. The City may consider constructing a single Plant Drain LS to replace No. 1 and 2. This project is timed to align with TP-02 (Primary Clarifier Bypass).
- **TP-11: PLANTWIDE: Electrical Conduit and Stand Replace**
  - **Description:** Replace existing electrical conduit and support stands throughout the plant, including demolition of existing components and reuse of existing conductors where feasible.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $328,000.
  - **Year:** 2030.
- **TP-12: NETWORK: Equipment Enclosure and Cabled Protect Upgrade**
  - **Description:** Install new instrumentation and control cabinets and de-terminate and re-terminate existing conductors as needed to improve equipment protection and system reliability.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $44,000
  - **Year:** 2030.
- **TP-13: MCC-A Replace and Electric Equip Relocate**
  - **Description:** Replace MCC-A and relocate associated electrical equipment from the Old Controls Building, including removal and re-feeding of existing loads and transfer of PLC-A loads to another nearby PLC.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $491,000
  - **Year:** 2030. The City is currently evaluating this project.

- **TP-14: Replacement of Aeration Basin Diffusers and Additional Diffusers to Anoxic Zones**
  - **Description:** Replace the existing diffusers in the three aeration basins and install additional diffusers in the second anoxic zone of each basin, including new diffuser supports.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $888,000
  - **Year:** 2032.
- **TP-15: Disk Filtration Replacement**
  - **Description:** Replace the two existing disk filtration units with new 6.0-mgd units, including associated electrical, instrumentation, and controls improvements.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $2,528,000
  - **Year:** 2032.
- **TP-16: Second UV Channel**
  - **Description:** Rehabilitate the existing UV disinfection channel and install new UV equipment, including associated electrical, instrumentation, and controls improvements, to provide sufficient disinfection capacity for peak hour flows of 22.2 mgd.
  - **Reasoning:** Capacity Upgrade.
  - **Estimated Cost:** $5,040,100
  - **Year:** 2032.
- **TP-17: Effluent Transfer Pump Replacement**
  - **Description:** Replace the existing effluent transfer pump impellers, motors, and associated VFDs and complete the required structural, mechanical, electrical, instrumentation, and controls improvements to provide sufficient capacity for the full 22.2-mgd plant effluent flow.
  - **Reasoning:** Capacity Upgrade and Growth
  - **Estimated Cost:** $2,287,000
  - **Year:** 2035. This project is timed to align with TP-18 (Construct a New Plant Outfall).
- **TP-18: Construction of an Additional Outfall**
  - **Description:** Construct a second outfall to the Columbia River, including approximately 36-inch corrugated metal pipe with a 16-port, 160-foot diffuser and associated site, electrical, instrumentation, and controls improvements.
  - **Reasoning:** Capacity Upgrade and Growth
  - **Estimated Cost:** $20,387,000
  - **Year:** 2035. This project is timed to align with TP-17 (Effluent Transfer Pump Replacement).
- **TP-19: Construction of a New Digester Electrical Building**
  - **Description:** Construct a second outfall to the Columbia River, including approximately 36-inch corrugated metal pipe with a 16-port, 160-foot diffuser and associated site, electrical, instrumentation, and controls improvements.
  - **Reasoning:** Capacity Upgrade and Growth
  - **Estimated Cost:** $1,267,000
  - **Year:** 2030. This project is timed to align with TP-09 (Replace Plant Drain LS No. 1) and TP-10 (Replace Plant Drain LS No. 2).

- **TP-20: Construction of New Secondary Rotary Drum Thickener**
  - **Description:** Construct a second RDT for WAS thickening, including a polymer blending unit, thickened sludge pump, access platform, stairs, supporting structures, and associated electrical, instrumentation, and controls improvements.
  - **Reasoning:** Capacity Upgrade and Growth
  - **Estimated Cost:** $1,693,000
  - **Year:** 2030. This project is timed to align with TP-09 (Replace Plant Drain LS No. 1) and TP-10 (Replace Plant Drain LS No. 2).
- **TP-21: Construction of a New Primary Clarifier No. 3**
  - **Description:** Construct a new 60-foot-diameter Primary Clarifier No. 3 with associated sludge pumping, structures, equipment, electrical, instrumentation, controls, and site work.
  - **Reasoning:** Capacity Upgrade and Growth
  - **Estimated Cost:** $6,327,000
  - **Year:** 2039.
- **TP-22: Construction of a New Secondary Clarifier No. 4**
  - **Description:** Construct a new 75-foot-diameter Secondary Clarifier No. 4 with associated RAS and WAS pumps, 36-inch connecting piping, structures, equipment, electrical, instrumentation, controls, and site work.
  - **Reasoning:** Growth
  - **Estimated Cost:** $11,692,000
  - **Year:** 2039.
- **TP-23: Centrifugal Blower Replacement**
  - **Description:** Replace the two existing 150-hp multistage centrifugal blowers with two new 150-hp HST blowers, including associated installation, electrical, instrumentation, and controls improvements.
  - **Reasoning:** Growth
  - **Estimated Cost:** $1,261,000
  - **Year:** 2027. The City is currently working on a project to increase capacity of Blowers No. 3 and 4.
- **TP-24: Sludge Dryer Replacement**
  - **Description:** Replace the existing sludge dryer with new sludge drying equipment, including associated building modifications, site work, electrical, instrumentation, and controls improvements.
  - **Reasoning:** Growth
  - **Estimated Cost:** $22,726,000
  - **Year:** 2042. The project timing allows for the City's ongoing evaluation of the dryer and solids handling alternatives and consideration of evolving biosolids regulations.
- **TP-25: Biofilter Replacement**
  - **Description:** Replace the existing sludge dryer with new sludge drying equipment, including associated building modifications, site work, electrical, instrumentation, and controls improvements.
  - **Reasoning:** Growth
  - **Estimated Cost:** $3,802,000
  - **Year:** 2043.

9.8 Annual Projects

- **R-01: Sewer Main Repair and Replacement**
  - **Description:** Replace wastewater pipelines constructed prior to the 1940s that are approaching the end of their useful life. The identified pipelines will be prioritized over the 19-year planning horizon based on age, condition, system needs, and results of I/I studies. A summary of identified pipeline lengths and unit costs are presented in Table 9.2.
  - **Reasoning:** R&R.
  - **Estimated Cost:** Approximately 20.8 million or $1,100,000 per year over the planning horizon.
  - **Year:** 2027 through 2045. Improvements will be prioritized and implemented throughout the planning horizon based on pipeline condition, system needs, and I/I study results.

Table 9.2 Sewer Main Repair and Replacement Cost Estimate

Diameter (inches)	Length (feet)	Cost ($)
8	23,341	$11,151,000
10	1,853	$1,005,000
12	953	$580,000
15	5,376	$4,117,000
18	1,175	$1,053,000
20	113	$110,000
21	872	$891,000
24	1,265	$1,473,000
Total	34,948	**$20,380,000**

- **R-02: Miscellaneous Lift Station Repair and Replacement**
  - **Description:** Complete miscellaneous improvements at existing lift stations to address operational and maintenance needs. Improvements may include pump and piping replacement, electrical and controls upgrades, instrumentation, wet well improvements, odor control, and other equipment or site improvements as needed.
  - **Reasoning:** R&R.
  - **Estimated Cost:** Approximately 38 million or $2,000,000 per year over the planning horizon. No construction, engineering, legal, or administrative costs are applied because the annual amount is based on the City's sewer capital budget.
  - **Year:** 2027 to 2045. Ongoing improvements will be implemented throughout the planning horizon based on operational and maintenance needs.

- **R-03: Miscellaneous WWTF Repair and Replacement**
  - **Description:** Complete miscellaneous improvements at the existing WWTF to address operational, maintenance, and reliability needs. Improvements may include replacement or rehabilitation of process equipment, electrical and controls upgrades, instrumentation, piping, structural improvements, and other equipment or site improvements as needed.
  - **Reasoning:** R&R.
  - **Estimated Cost:** Approximately 9.5 million or $500,000 per year over the planning horizon. No construction, engineering, legal, or administrative costs are applied because the annual amount is based on the City's sewer capital budget.
  - **Year:** 2027 to 2045. Ongoing improvements will be implemented throughout the planning horizon based on operational and maintenance needs.

9.9 General Projects

- **G-01: Basin 4-1-3 Pilot I/I Study**
  - **Description:** Investigate the source and magnitude of inflow and infiltration (I&I) of storm and groundwater into the wastewater system at locations where suspected high I&I may exceed conveyance and/or lift station capacity. Identify opportunities to reduce non-sewage flow and potentially avoid costly capacity improvements.
  - **Reasoning:** General.
  - **Estimated Cost:** $200,000.
  - **Year:** 2027.
- **G-02: Basin 5-1-2 Flow Monitoring**
  - **Description:** Install temporary flow meters in Basin 5-1-2 to separately monitor flows from the Camas LS and Upper Prune Hill contributing areas and evaluate I/I.
  - **Reasoning:** General.
  - **Estimated Cost:** $300,000.
  - **Year:** 2027.
- **G-03: Geographic Information System (GIS)**
  - **Description:** Implement ongoing enhancements to the Geographic Information System (GIS), including asset mapping, data collection, database maintenance, and integration with utility management systems.
  - **Reasoning:** General.
  - **Estimated Cost:** $250,000.
  - **Year:** 2027.
- **G-04: Hydraulic Modeling**
  - **Description:** Expand the City's collection system hydraulic model to include additional system pipes and reduce the existing level of model skeletonization. Accurate and updated GIS information will be used to support the model expansion.
  - **Reasoning:** General.
  - **Estimated Cost:** $200,000.
  - **Year:** 2029. The timing of this project should follow completion of G-03 (Geographic Information Systems (GIS).

- **G-05: Electrical System Arc Flash Study**
  - **Description:** Complete an Electrical System Study and install arc flash labels on the plant's distribution equipment.
  - **Reasoning:** General.
  - **Estimated Cost:** $75,000.
  - **Year:** 2027.
- **G-06: Hazardous Area Classification Study**
  - **Description:** Conduct a hazardous area classification study in accordance with NFPA 820 and upgrade areas that do not meet applicable requirements.
  - **Reasoning:** General.
  - **Estimated Cost:** $50,000.
  - **Year:** 2027.
- **G-07 Flood Risk Assessment**
  - **Description:** Conduct a comprehensive flood risk analysis of major electrical and control systems at the WWTF to assess vulnerabilities and improve flood resilience.
  - **Reasoning:** General.
  - **Estimated Cost:** $100,000.
  - **Year:** 2027.
- **G-08: General Sewer Plan**
  - **Description:** Implement the General Sewer Plan twice over the 20-year planning horizon, with each occurrence approximately 10 years apart.
  - **Reasoning:** General.
  - **Estimated Cost:** $700,000 per occurrence.
  - **Year:** 2035 and 2045.

9.10 Summary of CIP

Recommended improvements include 10 LS projects, one STEP project, 13 pipeline projects, three rehabilitation and replacement programs, 25 treatment plant projects, and eight general projects. Breakdown by project category is shown in Figure 9.1. The largest portion of the CIP are allocated to treatment plant projects and the annual programs at $95.8 M and $67.9 M, respectively. Gravity and force main, STEP main, and lift station projects have a combined estimated cost of $104.0 M, while general projects have the lowest allocation at $2.6 M. The total recommended CIP is estimated $270.3 M.

The CIP recommends budgeting $132.4 M in the short-term, inclusive of annual project costs. The average annual short-term cost for all recommended projects is approximately $14.7 M per year from 2027 through 2035. The CIP recommends $137.8 M in the long-term with an average annual long-term cost of approximately $13.8 M per year from 2036 through 2045. The average annual cost over the 19-year planning horizon from 2027 through 2045 is $14.2 M. Figure 9.2 presents annual costs for the City's CIP for each year of this GSP, while Figure 9.3 illustrates annual cost breakdowns for projects funded by rates and SDCs. Annual program costs are assumed to be funded by rates.

Detailed sheets for each CIP project presented in this chapter can be found in Appendix K of the GSP. Table 9.3 summarizes the total cost and annual cost for each planning period.

Table 9.3 CIP Planning Period Summary

Planning Period	Total Cost (million $)	Annual Cost (million $)
Short-term (2027 to 2035)	$132.4	$14.7
Long-term (2036 to 2045)	$137.8	$13.8
Total	**$270.3**	**$14.2**

Notes:
(1) Totals may not sum due to rounding.

Treatment plant projects and annual programs account for 35.5 percent and 25.1 percent, respectively, followed by the gravity and force main projects at $40.0 M (14.6 percent), STEP Main projects at $32.8 M (12.1 percent), lift station projects at $31.6 M (11.7 percent), and general projects at $2.6 M (1.0 percent). Table 9.4 summarizes the total estimated capital costs by facility type. Figures 9.4 and 9.5 show the short-term and long-term projects, including the year each CIP project is scheduled for implementation.

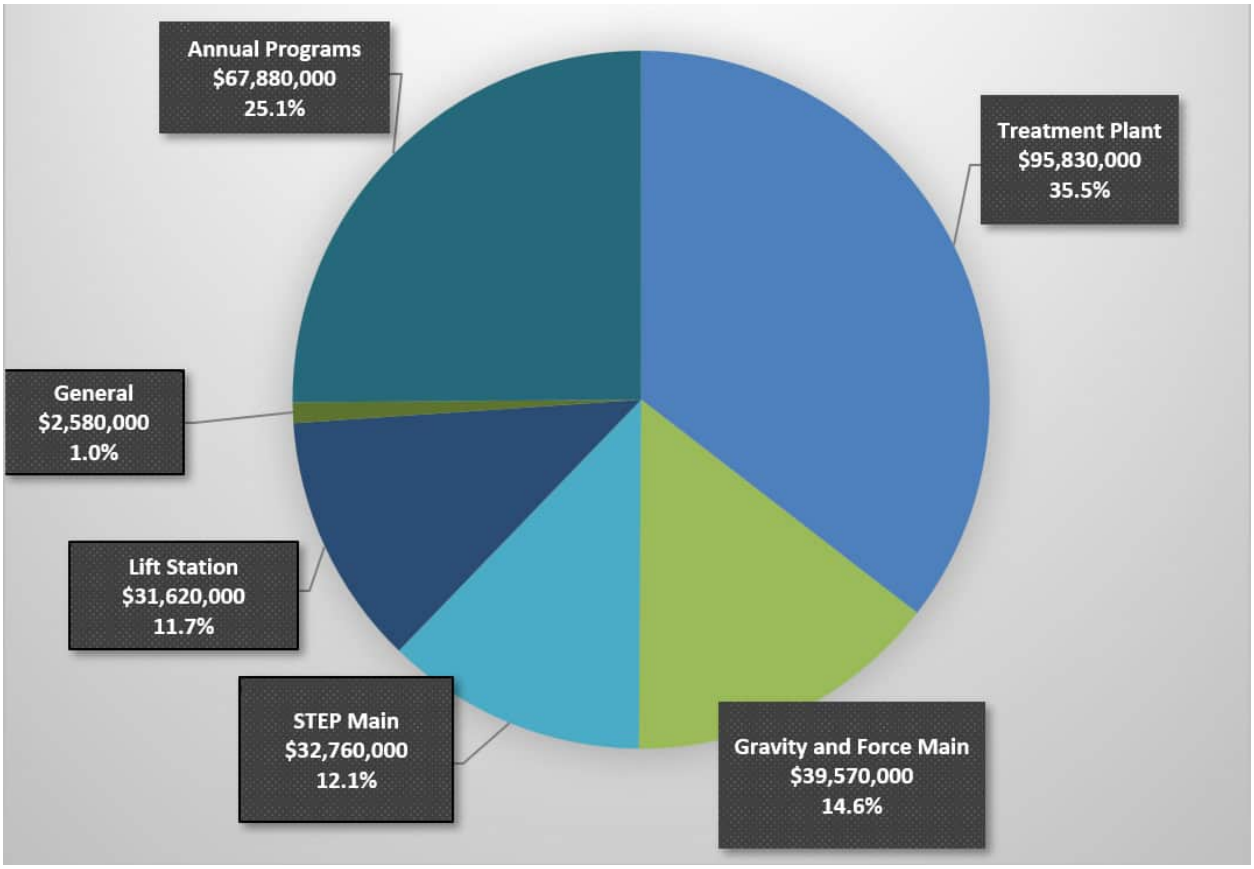


Figure 9.1 Cost by Project Category

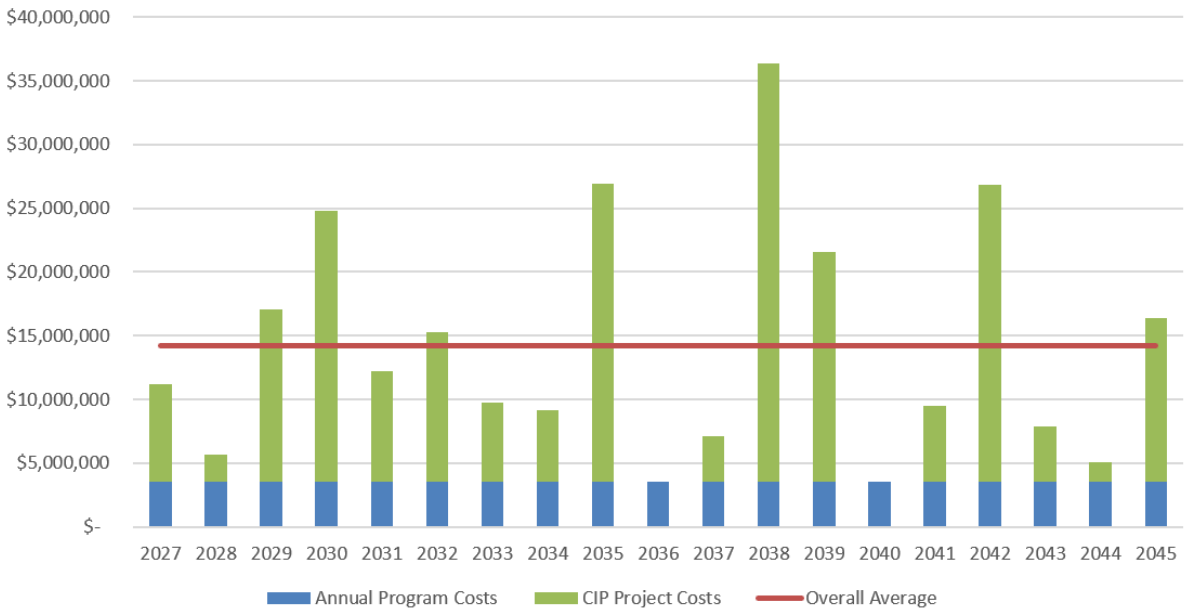


Figure 9.2 Overall CIP Annual Cost

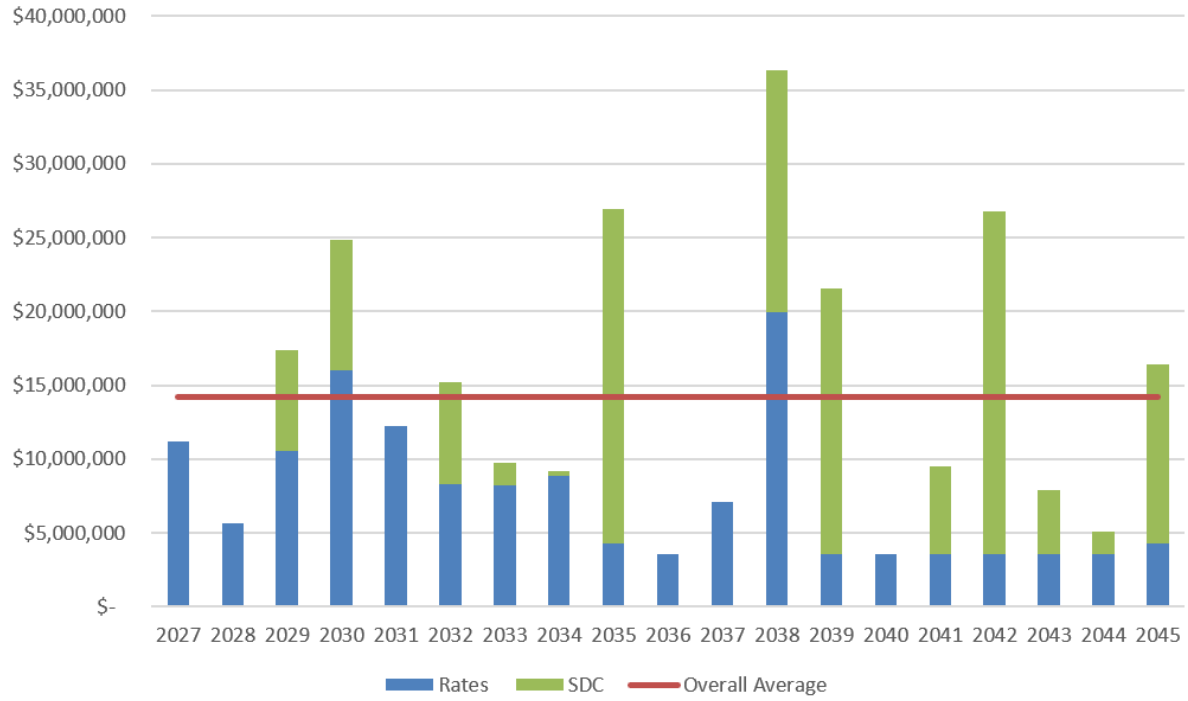


Figure 9.3 CIP Annual Cost by Project Allocation

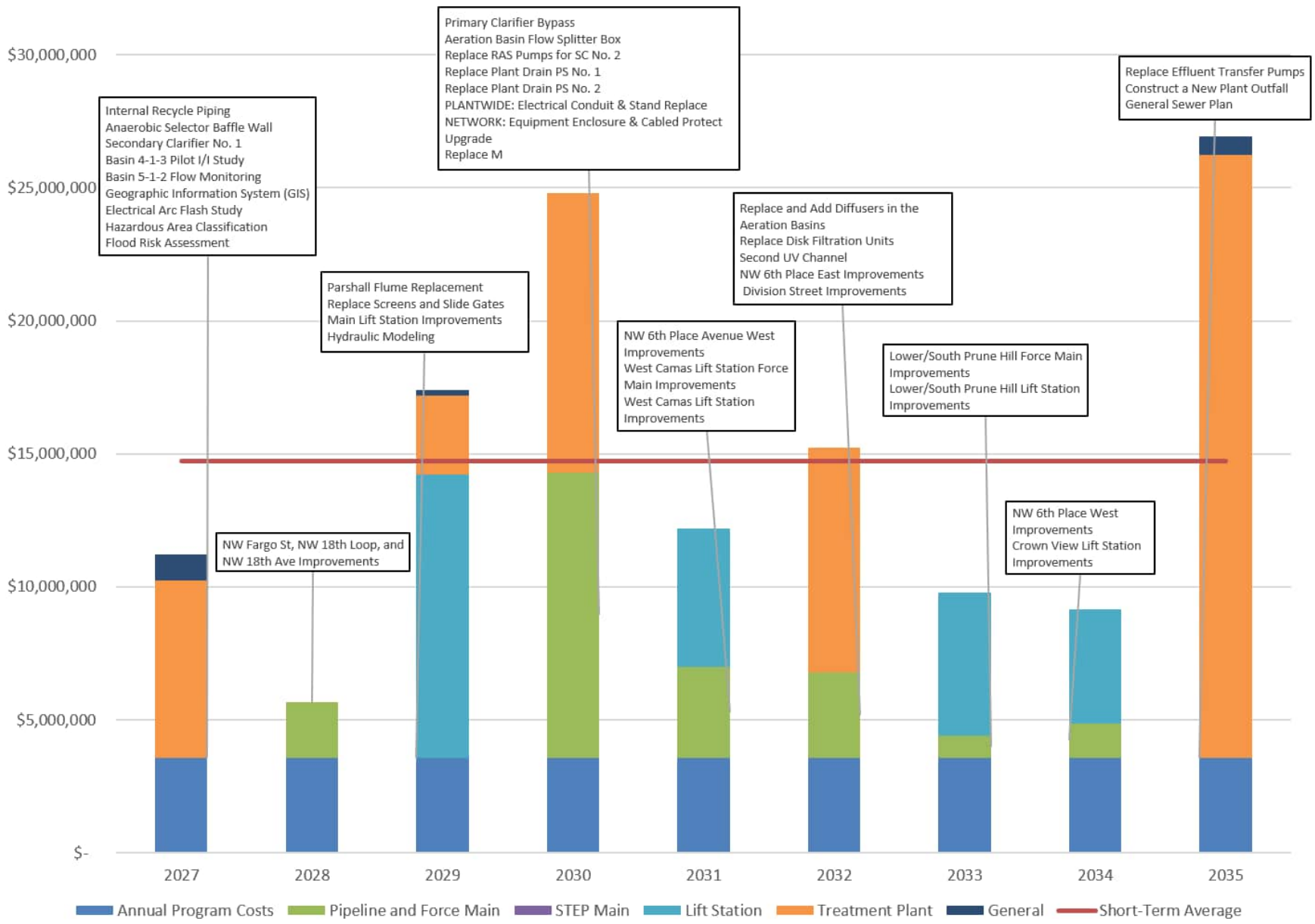


Figure 9.4 Short-term CIP Annual Cost

2030 Projects: Primary Clarifier Bypass, Aeration Basin Flow Splitter Box, Replace RAS Pumps for Secondary Clarifier No. 2, Replace Plant Drain LS No. 1, Replace Plant Drain LS No. 2, PLANTWIDE: Electrical Conduit and Stand Replace, NETWORK: Equipment Enclosure and Cabled Protect Upgrade, Replace MCC-A and Relocate Electric Equipment, Construct a New Electrical Building, Construct a Second RDT for WAS Thickening, NW 6th Place Avenue East Improvements, Main LS Dual Force Main Improvements.

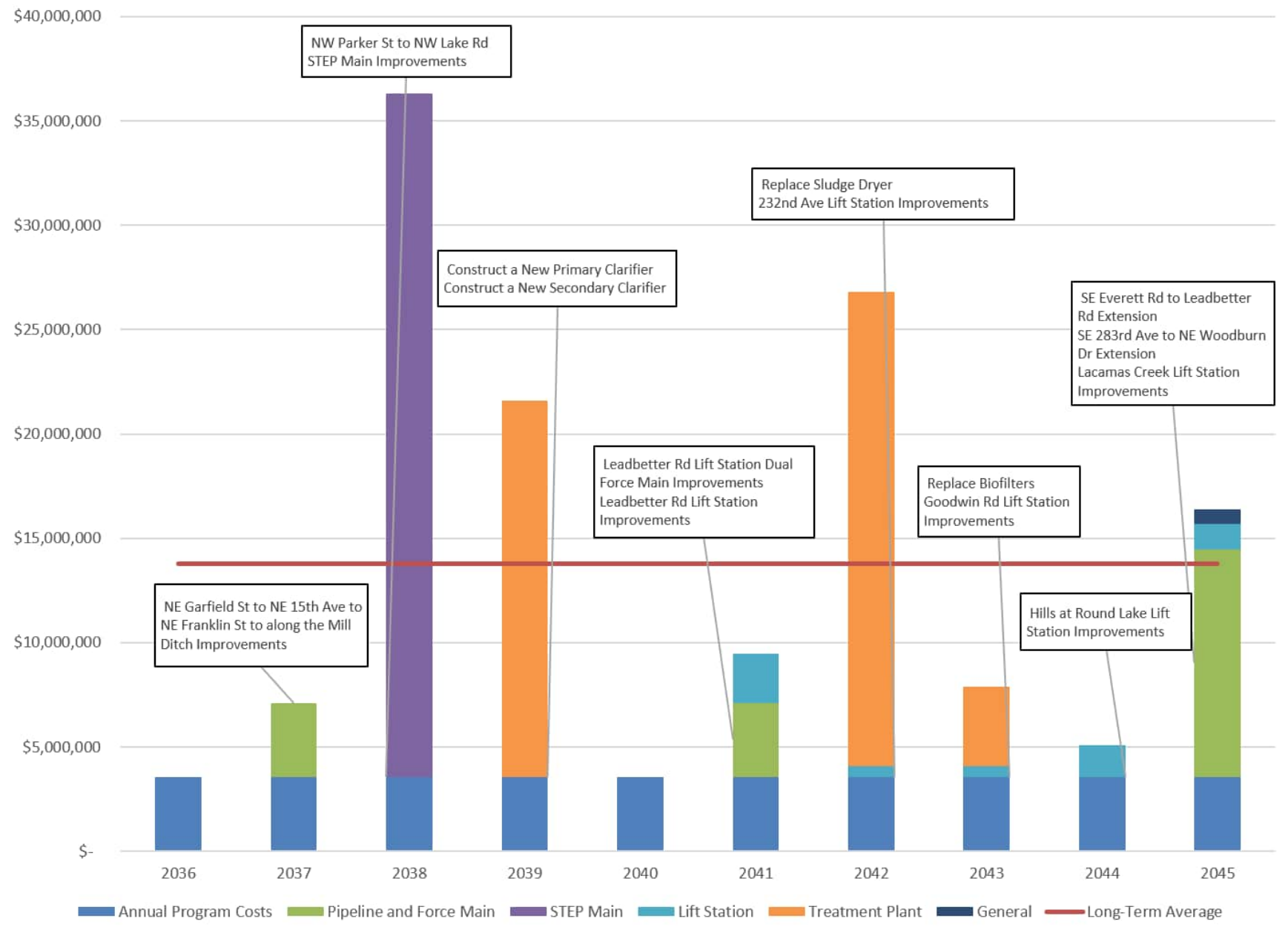


Figure 9.5 Long-term CIP Annual Cost

Table 9.4 CIP Summary by Project Type

Project ID	Title	Total Capital Cost (rounded)	Planning Period	
			Short-term (2027-2036)	Long-term (2037-2045)
Lift Station				
LS-01	Lower/South Prune Hills Lift Station Improvements	$5,400,000	X	
LS-02	West Camas Lift Station Improvements	$5,200,000	X	
LS-03	Crown View Hill Lift Station Improvements	$4,300,000	X	
LS-04	Lacamas Creek Lift Station Improvements	$1,200,000		X
LS-05	Main Lift Station Phase 2 Improvements	$10,600,000	X	
LS-06	Goodwin Road Lift Station Improvements	$500,000		X
LS-07	232nd Avenue Lift Station Improvements	$500,000		X
LS-08	Leadbetter Road Lift Station Improvements	$2,400,000		X
LS-09	Hills at Round Lake Lift Station Improvements	$1,500,000		X
STEP				
S-01	NW Parker Street to NW Lake Road STEP Main Improvements	$32,800,000		X
Pipeline				
P-01	NW 6th Place West Improvements	$1,300,000		X
P-02	NW 6th Place East Improvements	$700,000	X	
P-03	NW 6th Place Avenue West Improvements	$2,900,000	X	
P-04	NW 6th Place Avenue East Improvements	$8,300,000		X
P-05	NW Fargo Street, NW 18th Loop, NW 18th Avenue to Division Street Improvements	$2,100,000	X	
P-06	NE Garfield Street to NE 15th Avenue to NE Franklin Street to along the Creek Improvements	$3,500,000		X
P-07	Lower/South Prune Hill Force Main Improvements	$830,000	X	
P-08	West Camas Force Main Improvements	$560,000	X	
P-09	Main Lift Station Force Main Improvements	$2,400,000		X
P-10	Leadbetter Road Dual Force Main Improvements	$3,500,000		X
P-11	Division Street Improvements	$2,500,000	X	
P-12	SE Everett Road to Leadbetter Road Extension	$6,800,000		X
P-13	SE 283rd Avenue to NE Woodburn Drive Extension	$4,200,000		X
Treatment Plant				
TP-01	Parshall Flume Replacement	$280,000	X	
TP-02	Primary Clarifier Bypass	$820,000	X	
TP-03	Aeration Basin Influent Flow Splitter Box	$3,500,000	X	
TP-04	Plant Headworks	$2,700,000	X	
TP-05	Anoxic Selector Internal Recycle-Piping	$0	X	

Project ID	Title	Total Capital Cost (rounded)	Planning Period	
			Short-term (2027-2036)	Long-term (2037-2045)
TP-06	Anaerobic Selectors Baffle Wall	$70,000	X	
TP-07	Replace Secondary Clarifier No. 1	$5,300,000	X	
TP-08	Secondary Clarifier No. 2 RAS Pump Replacement	$400,000	X	
TP-09	Replace Plant Drain Lift Station No. 1	$1,000,000	X	
TP-10	Replace Plant Drain Lift Station No. 2	$1,000,000	X	
TP-11	PLANTWIDE: Electrical Conduit and Stand Replace	$330,000	X	
TP-12	NETWORK: Equip Enclosure and Cabled Protect Upgrade	$44,000	X	
TP-13	MCC-A Replace and Electric Equip Relocate	$500,000	X	
TP-14	Replace Aeration Basin Diffusers	$900,000	X	
TP-15	Disk Filtration Replacement	$2,500,000	X	
TP-16	Second UV Channel	$5,000,000	X	
TP-17	Effluent Transfer Pump Replacement	$2,300,000	X	
TP-18	Outfall	$20,400,000	X	
TP-19	Digester Electrical Building	$1,300,000	X	
TP-20	New Rotary Drum Thickener	$1,700,000	X	
TP-21	Primary Clarifier No. 3	$6,300,000		X
TP-22	Primary Clarifier No. 4	$11,700,000		X
TP-23	Centrifugal Blower Replacement	$1,300,000	X	
TP-24	Sludge Dryer Replacement	$23,000,000		X
TP-25	Biofilter Replacement	$3,800,000		X
General				
G-01	Basin 4-1-3 Pilot I/I Study	$200,000	X	
G-02	Basin 5-1-2 Flow Monitoring	$300,000	X	
G-03	Geographic Information System (GIS)	$250,000	X	
G-04	Hydraulic Modeling	$200,000	X	
G-05	Electric System Arc Flash Study	$75,000	X	
G-06	Hazardous Area Classification Study	$50,000	X	
G-07	Flood Risk Assessment	$100,000	X	
G-08	General Sewer Plan (2035 and 2045)	$1,400,000	X	X

APPENDIX A

SEPA CHECKLIST/APPROVALS

~ To be included in a future submittal. ~

APPENDIX B

REFERENCES

~ To be included in a future submittal. ~

APPENDIX C

DEMOGRAPHIC PROJECTIONS



ourCamas 2045

DRAFT - *Last Updated July 2025*

Comprehensive Plan

ourCamas 2045

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ourCamas 2045



Vision

01

01. Vision

Our Camas Vision Statement

This vision is written in the present tense, as if describing the city as it exists in 2045. Some aspects of the vision can be found in Camas today, while others represent aspirations. The vision provides a framework for the goals and policies of every element of Our Camas 2045.

Our Community



Camas is an inclusive community where residents experience a sense of belonging and connection. Community-wide events foster civic pride, strong bonds among neighbors and a welcoming atmosphere for new residents. Community amenities and recreation facilities throughout Camas promote active lifestyles and social interaction. Camas is recognized for excellent schools and its commitment to lifelong learning. The City promotes a strong culture of public safety, transparent communication, and good governance, allowing residents to thrive in their neighborhoods and engage in decision-making that shapes their community.

Our Environment



Camas embraces its connection to nature and enjoys a wealth of outdoor recreational opportunities. Access to forests, clean water, parks, and trails is foundational to Camas' quality of life. The community shares a deep reverence for Camas' beauty, scenery, and tranquility, and is committed to preserving and enhancing its natural resources and tree canopy. Through proactive planning, the City mitigates the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come.

Our Neighborhoods



Camas embraces its small-town feel while responsibly managing growth, ensuring a prosperous and livable future for all. Camas provides a variety of housing options that meet the needs of all residents, while ensuring the town's charm and livability are sustained. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities and access to high wage jobs. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity.

Our Downtown



Charming, vibrant, and walkable, Downtown Camas is the city's living room. Downtown's history is complemented by new businesses and inclusive housing options. Expansion, resiliency and a dynamic economic landscape are critical to its success. Downtown Camas anchors the community while fostering a culture of pride, support, and connection.

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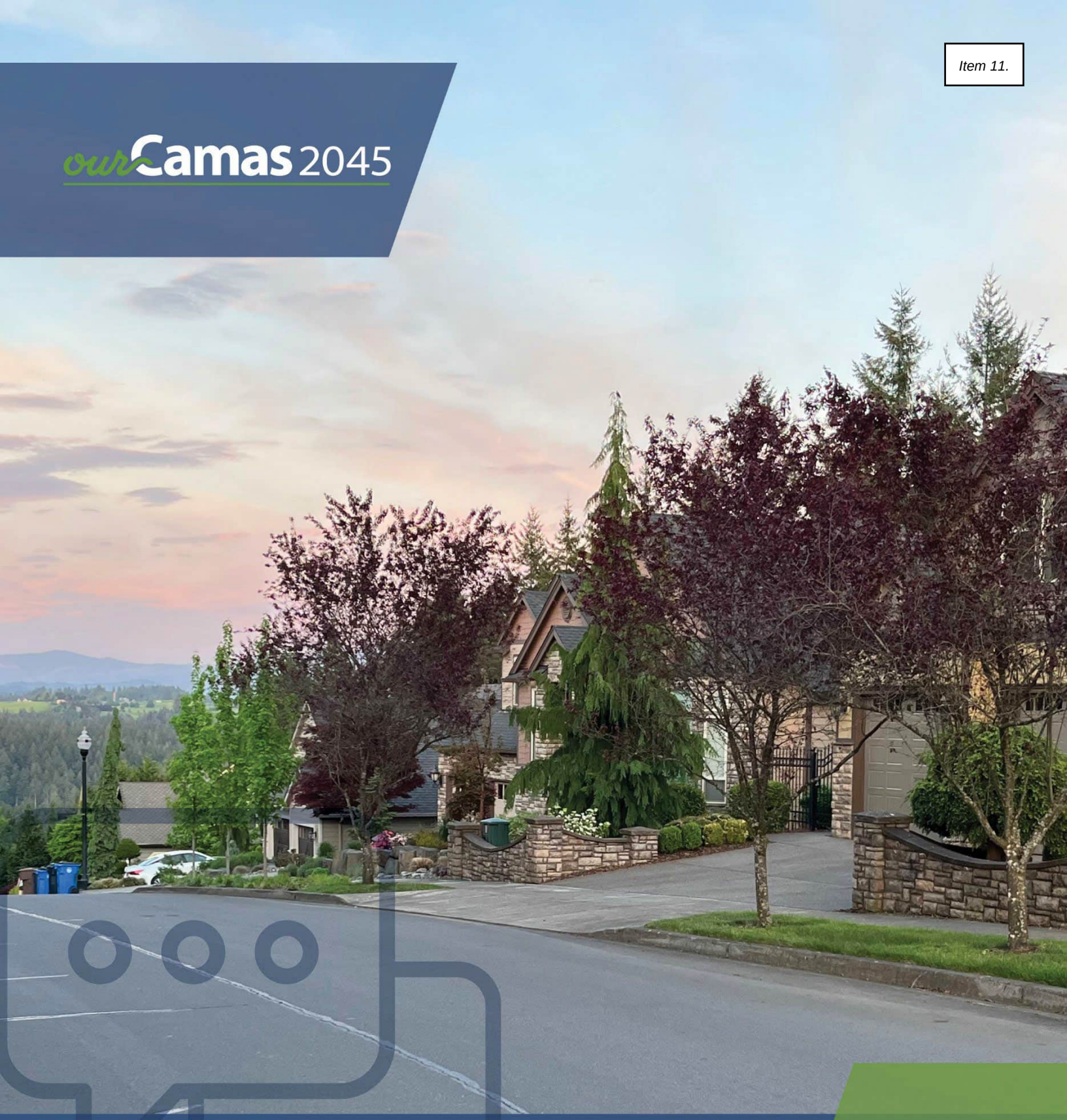


02 Introduction

02. Introduction

Our Camas 2045

Our Camas 2045 is a roadmap for the future of the city and guides land use development and public facility investment decisions between now and 2045.

Camas has a long and rich history. More than 10,000 years ago, Native Americans occupied the Columbia River Valley. The Lewis and Clark Corps of Discovery camped by the river in 1806. In the late 1800s, the La Camas Colony Company of Portland purchased 2,600 acres and began planning the construction of a paper mill to supply newsprint for The Oregonian. The construction of the mill brought the platting of the town and the City of Camas was incorporated in 1906. Today, Camas is a vibrant and diverse community that occupies approximately 16 square miles and is home to over 27,000 people.

Our Camas 2045 is an update to the prior City of Camas comprehensive plan, Camas 2035. This update incorporates new state legislation to support additional housing and climate planning and establishes a new vision for the community's future.

The history of Camas comprehensive planning dates back to 1963 when the first plan was prepared. In 1990, the state adopted the Growth Management Act (GMA) with the goal of managing the growth of cities that had previously grown in an uncoordinated fashion. GMA requires municipalities to update their comprehensive plans every 10 years to ensure future growth can be accommodated with housing and jobs, and public services and facilities are available to serve new residential, commercial, and employment areas.

The last major update to the City's comprehensive plan was in 2016. Since that time, the city has grown by over 5,000 people, added new residential areas in Grass Valley and Green Mountain, and completed the North Shore Subarea Plan, which established a new vision and zoning for the North Shore of Lacamas Lake and sets the stage for future residential, mixed use, and employment development. In conjunction with Our Camas 2045, the city prepared a downtown subarea plan. Our Downtown 2045 establishes a detailed vision and action plan to catalyze public and private investment in the historic downtown. Both plans work together to guide future development and ensure Camas' future remains as vibrant as its past.

What is a Comprehensive Plan?

Our Camas 2045 guides land use development and public facility investment decisions between now and 2045. Our Camas 2045 has eight elements that work together to achieve the community's vision and ensure long-term economic vitality:

- Community Character
- Land Use
- Housing
- Natural Environment
- Climate Change & Resiliency
- Transportation
- Public Facilities & Services
- Economic Development

Each element sets goals that will implement the vision and expresses policies that will guide land use and infrastructure decisions for the 20-year planning horizon. The elements are supported by the comprehensive plan map, which identifies land use designations throughout the City and within its urban growth area.1

Why Plan?

Planning is choosing what to do and how and when to do it. Planning is part of our everyday lives. We plan our vacations, our budgets, and even our trips to the grocery store. The detailed planning of our daily lives derives from a set of goals that we want to accomplish – in a day, in the next six months, or the next two years.

In the same way and for the same purpose, the City's plan is the basis of coordinated action – it enables public and private interests to undertake projects with a clear understanding of community goals and policies.

Our Camas 2045 helps the City identify deficiencies and take steps to remedy them. Planning can find desirable and reasonable solutions before the problem is beyond the community's economic capabilities. The plan is crucial to avoiding uncoordinated activities as the City adapts to changing conditions and experiences the population growth that is anticipated.

The plan is not intended as a rigid system of goals and development policies; rather, it is:

- Long range – looks ahead 20 years to anticipate growth and resulting community needs.
- Comprehensive – relates and integrates all types of uses and necessary public facilities.
- General – establishes general locations and areas for the elements and indicates their relationships to each other and the population they serve.
- Responsive – through regular updates, adjusts to changing conditions, unforeseen circumstances, and local and regional trends.

How is a Comprehensive Plan Related to Other Plans?

Our Camas 2045 is part of a family of state, regional, and local plans. Some, like statewide GMA and Clark County's Comprehensive Growth Management Plan, set the overall planning framework and guide the content of the Camas comprehensive plan.

Others, like plans that are specific to particular subareas, supply more detailed information about individual topics or smaller parts of the City.

Growth Management Act

The GMA establishes state goals, sets deadlines for compliance, and offers direction on how to prepare comprehensive plans and development regulations. GMA also establishes requirements for early and continuous public participation. GMA requires state and local governments to manage growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, and preparing comprehensive plans and implementing them through capital investments and development regulations.

The GMA legislation, which is Chapter 36.70A of the Revised Code of Washington (RCW), contains 15 goals.

For a community's plan to be valid, it must meet the requirements of the GMA through consistency with state statutory goals, countywide policies, and the plans of adjacent jurisdictions.

The fifteen statutory goals identified in the GMA (RCW 36.70A) are:

1. **Urban growth**. Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner.
2. **Reduce sprawl.** Reduce the inappropriate conversion of undeveloped land into sprawling, low-density development.
3. **Transportation.** Encourage efficient multimodal transportation systems that will reduce greenhouse gas emissions and per capita vehicle miles traveled, and are based on regional priorities and coordinated with county and city comprehensive plans.
4. **Housing.** Plan for and accommodate housing affordable to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage preservation of existing housing stock.
5. **Economic development.** Encourage economic development throughout the state that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons, promote the retention and expansion of existing businesses and recruitment of new businesses, recognize regional differences impacting economic development opportunities, and encourage growth in areas experiencing insufficient economic growth, all within the capacities of the state's natural resources, public services, and public facilities.
6. **Property rights.** Private property shall not be taken for public use without just compensation having been made. The property rights of landowners shall be protected from arbitrary and discriminatory actions.
7. **Permits.** Applications for both state and local government permits should be processed in a timely and fair manner to ensure predictability.

8. **Natural resource industries.** Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forestlands and productive agricultural lands, and discourage incompatible uses.
9. **Open space and recreation.** Retain open space and green space, enhance recreational opportunities, enhance fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities.
10. **Environment.** Protect and enhance the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
11. **Citizen participation and coordination.** Encourage the involvement of citizens in the planning process, including the participation of vulnerable populations and overburdened communities, and ensure coordination between communities and jurisdictions to reconcile conflicts.
12. **Public facilities and services.** Ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.
13. **Historic preservation.** Identify and encourage the preservation of lands, sites, and structures, that have historical or archaeological significance.
14. **Climate change and resiliency.** Ensure that comprehensive plans, development regulations, and regional policies, plans, and strategies under RCW 36.70A.210 and chapter 47.80 RCW adapt to and mitigate the effects of a changing climate; support reductions in greenhouse gas emissions and per capita vehicle miles traveled; prepare for climate impact scenarios; foster resiliency to climate impacts and natural hazards; protect and enhance environmental, economic, and human health and safety; and advance environmental justice.
15. **Shorelines of the state.** For shorelines of the state, the goals and policies of the shoreline management act as set forth in RCW 90.58.020 shall be considered an element of the county's or city's comprehensive plan.

Urban Growth Areas

An urban growth area is a defined area of land adjacent to city limits within which urban growth is encouraged and beyond which growth can occur only if it is not urban in nature.

Each county that adopts a comprehensive plan under the GMA must designate urban growth areas. The City of Camas has 11,848 acres of land within the urban growth areas. This land, combined with the vacant land available within the City limits, must accommodate the City's population and employment projections as established by the state's Office of Financial Management. The population and employment projections for the City for the year 2045 are 37,080 people and 11,615 jobs. The City is proposing urban growth area expansion to accommodate increased job capacity (see the Land Use Element for additional details).

County Planning Goals and Policies

The Comprehensive Growth Management Plan, adopted by Clark County and its cities and last updated in 2016, guides local jurisdictions as they work to decide questions of regional land use and services.

Clark County is in the final stages of fully updating this plan for 2025 through 2045. As County and city plans were developed, representatives of the City of Camas met on a regular basis over the span of two years with officials of the County and its cities to coordinate efforts. This level of communication helps ensure that the plans and capital projects of these jurisdictions are consistent when adopted. Our Camas 2045 is consistent with the concepts put forward in the County's Comprehensive Growth Management Plan, and the initial drafts of its pending comprehensive plan, and the countywide planning policies as required by RCW 36.70A.100 and 210, WAC 365-196-305; 400(2)(c); 510 and 520.

Local Plans

The goals and policies included in Our Camas 2045 are implemented through development regulations established in the Camas Zoning Code (Title 18 of the Camas Municipal Codes) as well as the standards set forth in existing plans and policy documents.

Our Camas 2045 has been developed to ensure consistency with all other relevant local plans as listed below:

- Strategic Plan (updated annually)
- Legacy Lands Master Plan (in development)
- Lake Management Plan (2024)
- North Shore Subarea Plan (October 2022)
- Camas Water System Plan (October 2019)
- Camas General Sewer Plan (June 2022)
- Camas General Sewer/Wastewater Facility Plan (November 2011)
- City of Camas Parks, Recreation, and Open Space Comprehensive Plan (March 2022)
- Camas Design Standards Manual–Engineering (adopted October 20, 2014, Res. 1308, updated annually)
- Camas Design Review Manual (May 2, 2016)
- Camas Shoreline Master Program (spring 2021)
- Downtown Design Manual (revision in process, to be adopted with Our Downtown Camas 2045, the Downtown Subarea Plan)
- Camas Stormwater Design Standards Manual (June 2022)
- Six-Year Street Plan (Updated annually)
- 2025–2030 Capital Facilities Plan Project List (to be updated with Our Camas 2045)
- Transportation Impact Fee Update (May 2012)

Amending a Comprehensive Plan

The City is required to review its comprehensive plan at least every ten years. However, the City's comprehensive plan and development regulations are reviewed and evaluated regularly.

Our Camas 2045 is based on the best available information. As years go by, new information or changing circumstances – for instance, a revised sewer or water plan – may prompt changes to this plan. By state law, amending a comprehensive plan can occur only once a year and must follow the procedures that are set forth in RCW 36.70A.130.

Amendments to a comprehensive plan require legislative action, which entails the adoption of a resolution or ordinance following notice and public hearing indicating, at a minimum, a finding that a review and evaluation has occurred and identifying the revisions made, or that a revision was not needed and the reasons.

The review and evaluation must include the consideration of critical area ordinances, population projections, and other plans and policies in effect.

Under certain circumstances, amendments can occur more frequently:

- The initial adoption of a subarea plan. Subareas must clarify, supplement, or implement jurisdiction-wide comprehensive plan policies, and may only be adopted if the cumulative impacts of the proposed plan are addressed by appropriate environmental review under chapter 43.21C RCW.
- The development of an initial subarea plan for economic development located outside of the 100 year floodplain in a county that has completed a state-funded pilot project that is based on watershed characterization and local habitat assessment
- The adoption or amendment of a shoreline master program under the procedures set forth in Chapter 90.58 RCW.
- The amendment of the capital facilities element of a comprehensive plan that occurs concurrently with the adoption or amendment of a county or city budget.
- The adoption of comprehensive plan amendments necessary to enact a planned action under RCW 43.21C.440, provided that amendments are considered in accordance with the public participation program established by the county or city under this subsection (2)(a) and all persons who have requested notice of a comprehensive plan update are given notice of the amendments and an opportunity to comment.

Developing Our Camas 2045

Our Camas 2045 began with a citywide outreach process to better understand the community's vision and priorities related to Camas' future. The Our Camas Visioning process reached over 1,000 community members through community conversations, community events, an online survey, online mapping tools, and the project website.

The City hosted two Community Summits. The first, held in June 2024, was an open house event where members of the public could provide feedback on the draft vision statement and goals, as well as provide ideas to achieve the vision and goals. The second Community Summit was held in October 2024 and provided a forum for community members to provide feedback on the draft land use alternatives, development scales, review development concepts for downtown, and learn about the County's climate planning efforts and greenhouse gas inventory.

There were several advisory committees that participated in the development of the plan.

- Project Advisory Committee (PAC) – technical stakeholders, agency partners, service providers
- Community Advisory Community (CAC) – broad cross-section of community interests

- Climate Policy Advisory Team (CPAT) – community members advising on climate goals and policies
- Existing advisory bodies that consulted on the vision, goals, policies, and plan:
    - Downtown Camas Association (DCA)
    - City Council
    - Planning Commission

Following preparation of the draft plan, the City hosted pop-up events throughout the summer and fall of 2025 to seek input on the preferred alternative map and draft goals and policies.

In addition to the outreach efforts described above, the City maintained a public engagement website throughout the visioning process and the development of Our Camas 2045. During spring 2024, a community survey and interactive map gathered feedback from the community on things they like about Camas, things they would change in the future, important topics to address in the plan, and areas of opportunity or concern both downtown and in the wider Camas community. A second online survey accompanied the second community summit to seek input on the draft land use alternatives and development concepts for downtown. The City prepared a Story Map in Spring 2025 to present and obtain feedback on the preferred land use alternative and proposed zoning and comprehensive plan land use designation changes.

The City of Camas values residents' opinions and is committed to being responsive. The final comprehensive plan incorporates the contributions and comments from those who participated in the project engagement. A summary of all engagement activities is included in Appendix X.

ourCamas 2045



03 Community Character

Community Character

This element integrates art, culture, growth and identity into the comprehensive plan, while ensuring community engagement is inclusive and open.

03. Community Character

Vision

In 2045, Camas is an inclusive community where residents experience a sense of belonging and connection. The city's unique identity is defined by its small-town feel and the incorporation of the natural landscape into walkable neighborhoods and high-quality development. Camas maintains its distinct sense of place through inclusive community engagement, sustainable development practices, and intentional placemaking that reinforces Camas' beauty, livability, and lasting connection to nature.

Introduction

The community character element establishes a framework for preserving and enhancing the physical, cultural, and social characteristics that make Camas feel like Camas. Community character is shaped not only by the built environment, but also by the natural landscape, cultural identity, historic context, and the ways in which people engage with their surroundings. As Camas plans for continued growth through the 2045 horizon, this element ensures that the qualities residents value—such as the City's small-town atmosphere, its connection to nature, and its strong civic identity—are maintained and reinforced through thoughtful development, design standards, public investment, and public engagement.

Camas' natural and built environment is defined by its integration of the natural features of the land with the development of housing, commercial buildings and its connecting infrastructure. In 2025, the City of Camas is home to 16 parks, 12 miles of scenic trails, and over 1,060 acres of parks and open space. From the forested paths around Lacamas Lake to the many playgrounds throughout the city, the natural beauty of Camas is a defining part of community life.

Camas' diversifying community is comprised of just over 27,000 people and expected to grow to over 37,000 by 2045. While most people who live in Camas commute to nearby cities for employment, in 2025, there are approximately 9,550 jobs within the city with the largest employment sectors being education and

healthcare, followed by professional services. The Georgia Pacific Mill remains a significant part of the city's economic history and a symbol of Camas' working roots.

The majority of housing in Camas is single family detached homes. Most residents own their home, with renters making up 20% of residents. There are approximately 10,000 housing units in Camas in 2025. By 2045, the city needs to add 4,226 new units to support the growing population. Camas also needs a greater variety of housing types at a range of price points to meet residents' diverse needs. By 2045, new multifamily and mixed-use buildings near transit, in Downtown, North Shore, and along NW Parker Street and Pacific Rim Boulevard will expand options for existing and new residents. These future developments will complement the strong sense of place already present in Camas' established neighborhoods like Prune Hill, Crown Park, and Evergreen Terrace.

Access to public art and community events is an important priority to define and enhance the identity of Camas. Beloved local traditions like Camas Days, the Camas Farmers Markets, and seasonal parades and festivals foster a deep sense of connection and pride. New development will include and support inclusive public gathering spaces to host events, ensuring that the community spirit thrives as the city grows.

Key community resources to preserve and enhance include the existing built infrastructure, high quality schools, access to living wage jobs, parks, open space and recreational amenities, and the distinctive Downtown area, where historic storefronts, local restaurants, and venues like the Liberty Theatre draw residents and visitors alike.

The community will connect with city government and processes through accessible engagement and neighborhood leadership. Ongoing collaboration will help ensure that Camas remains a place where people feel heard, welcomed, and at home.

Community Character Goals and Policies

Goal CC-1 Art, Culture, and Heritage

Camas is a city where history, art, and culture are celebrated and accessible to all. Camas events and activities will instill a sense of belonging among residents of all ages, making Camas an ideal place to live and work.

Policy CC-1.1 Encourage and promote a wide range of artistic and cultural activities by reducing barriers and increasing access to hosting and attending community events that define and enhance Camas' community identity.

Policy CC-1.2 Incentivize development sites to create spaces conducive to the provision of art and other cultural activities and amenities. Encourage murals, sculptures, interactive art installations, and

interpretive displays that celebrate the history, culture, and creativity of Camas.

Policy CC-1.3 Develop a process to memorialize historic sites and create and maintain an official inventory of Camas' historic and cultural resources.

Policy CC-1.4 Support the formation of a local arts commission that provides funding and support for local artists and artistic events in Camas.

Policy CC-1.5 Require a percentage of capital project budgets to be allocated for public art and design enhancements.

Policy CC-1.6 Prioritize naming streets, parks, and public facilities after historically significant people, events, geographic features, or native flora and fauna. Consider allowing naming rights in recognition of significant donations.

Goal CC-2 Sustainable Growth and Distinct Identity

Camas' unique identity is enhanced by high-quality urban design that respects the natural landscape, fosters a connection to nature, and integrates sustainable development.

Policy CC-2.1 Establish and enforce clear and objective design standards to ensure that new development respects and enhances Camas' architectural, historical, and natural character.

Policy CC-2.2 Regulate land use and development to protect natural topographic, geologic, vegetative, and hydrologic features, and natural contours of undeveloped properties.

Policy CC-2.3 Promote and provide educational resources for tree-lined streets, rain gardens, and preservation and use of native landscaping to reinforce Camas' connection to nature.

Policy CC-2.4 Align development regulations and design guidelines with dark sky standards to encourage the preservation of the night sky.

Policy CC-2.5 Establish distinctive gateway features at major points of entry into Camas, including attractive signage, landscaping, and public art that reflect Camas' distinct identity.

Policy CC-2.6 Ensure that street signage, lighting, landscaping, and street furniture are designed and maintained with a cohesive aesthetic that enhances community identity.

Policy CC-2.7 Revise the City's sign standards to ensure that all permanent and temporary signage is attractive and well-maintained, with clear regulations and enforcement mechanisms.

Policy CC-2.8 Provide educational and volunteer programs related to climate science, the connections between habitat conditions and native species, and effective ways to mitigate the impacts of climate change.

Goal CC-3 Community Engagement

Camas will have a strong sense of community through open communication, inclusive and meaningful outreach efforts, and enduring partnerships throughout the community.

Policy CC-3.1 Increase access to public engagement by ensuring materials and procedures are accessible for all community members, especially vulnerable groups such as low-income, Limited English Proficiency (LEP) individuals, youth, elderly, and differently abled.

Policy CC-3.2 Utilize outreach strategies such as focus groups and listening posts that accommodate the needs of everyone and account for the broad spectrum of community members.

Policy CC-3.3 Develop and implement strategies to support neighborhood leadership and associations to increase community involvement and provide opportunities to participate in the development processes.

Policy CC-3.4 Regularly inform the community of activities and events through a range of outreach methods including traditional and social media, partnerships with schools, and information at fairs and events.

Policy CC-3.5 Develop a City education program to inform the community on the inner workings of their local government, city functions, and an opportunity to engage with staff.

ourCamas 2045



Land Use

04

Land Use Element

The land use element is designed to support development that adheres to the City's vision to ensure Camas' future is as bright as its past.

04. Land Use

Vision

Camas embraces its small-town feel while responsibly managing growth, ensuring a prosperous and livable future for all. Camas provides a variety of housing options that meet the needs of all residents, while ensuring the town's charm and livability are sustained. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities and access to high wage jobs. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity.

Land Use Overview

The City of Camas is home to great schools, family-wage jobs, high quality neighborhoods, and an abundance of open space and recreational amenities. Camas has grown into a dynamic, vibrant city with diversified employment opportunities and services that cater to its residents' various needs. In 2025, Camas maintains its small town charm and character, and downtown remains the heart of the City with a mix of restaurants, shops, professional offices, and residential development. The Grass Valley area is home to several national and international technology and manufacturing firms. Newer residential development has occurred recently in the Green Mountain area, and planned transportation improvements in the North Shore area will improve connectivity and provide better transportation options throughout the City.

The land use element is designed to support development that adheres to the City's vision to ensure Camas' future is as bright as its past. The GMA identifies the land use element as the foundation of the comprehensive plan. GMA outlines the framework by which the plan will be implemented and establishes land use designations to accommodate the City's population and employment projections. The development of land in accordance with the goals and policies included in the land use element will ensure the achievement of an appropriate balance of public facilities, housing, employment, services, and recreational uses throughout the City.

Population Projections

GMA requires that each jurisdiction accommodate its share of the region's growth. The City of Camas is expected to have a population of 37,080 by 2045 (based on the County adopted growth rate of 1.2 percent per year), a 7,729-person increase from the 2023 population of 29,352. During the same period, Camas is expected to add 13,658 jobs.

Land Use Designations

In order to ensure the City's vision and land use goals are achieved, land use designations are used to assign a variety of development uses and building densities to land throughout the City. The plan identifies areas for residential, commercial, mixed use, mixed employment and industrial development. The plan also identifies areas for parks and open space to support recreation and enhance natural areas, including habitat and wildlife corridors.

Table 1 Land Use Designations

Comprehensive Plan Designation	Corresponding Zones	Total (Acres)[1]
Residential Low	Residential 15,000 (R-15)	407
	Residential 12,000 (R-12)	27
	Residential 10,000 (R-10)	280
	Residential 7,500 (R-7.5)	151
	Residential 6,000 (R-6)	19
	North Shore Lower Density (LD-NS)	145
	Downtown Residential (R-DT)	68
Residential Medium	Multi-Family 10 (MF-10)	37
Residential High	Multi-Family 18 (MF-18)	41
	Multi-Family 26 (MF-26)	33
	Multi-Family 34 (MF-34)	6
	North Shore Higher Density (HD-NS)	109
Mixed Use	Mixed Use (MX)	141
	North Shore Mixed-Use (MX-NS)	85
	Downtown Mixed-Use Low Rise (MX-LR)	41
	Downtown Mixed-Use Mid Rise (MX-MR)	55
Mixed Employment	Mixed Employment (ME)	235
	North Shore Mixed Employment (ME-NS)	99
Commercial	Neighborhood Commercial (NC)	2
	Community Commercial (CC)	63
	North Shore Commercial (C-NS)	54
	Regional Commercial (RC)	298

	Historic Main Street Core (HMSC)	17
Industrial	Heavy Industrial	545
Parks and Open Space	Neighborhood Park (NP) Special Use Park (SU) Open Space (OS)	1,343

[1]Total acres within each zoning designation are gross acres and inclusive of rights-of-way and infrastructure.

Overlays

In addition to the land use designations listed in Table 1, land use overlays further define appropriate uses and development standards for particular areas within the City. Overlays in Camas include an Airport Overlay and a Design Overlay. Development within all overlay areas must comply with the goals and policies of the underlying land use designation and the specific standards included in the overlay.

The Airport Overlay area applies to land adjacent to Grove Field, an airport owned and operated by the Port of Camas-Washougal and located northeast of Lacamas Lake. Grove Field adjoins the City's UGA and is proposed to be included in the UGA with this update. The Airport Overlay is designated to ensure land uses adjacent to the airport are compatible with air traffic and do not interfere with safe air navigation. For example, the comprehensive plan designation of lands adjacent to the airport is generally Mixed Employment, rather than residential, and the Airport Overlay area restricts uses tending to have higher concentrations of people, such as schools or hospitals.

The Design Overlay is a new overlay with the 2025 update and replaces the Gateways and Corridors Overlay included in the prior plan. The Design Overlay generally applies to the following locations. The specific extents of the overlay are included on the Camas Zoning Map.

- 6th Avenue
- 3rd Avenue
- Everett Street
- 38th Avenue
- Lake Road
- Green Mountain - Goodwin
- Brady Road
- Union Street
- Parker Street

The Design Overlay is intended to enhance the walkability, pedestrian experience, and design of the corridors it covers. Development/redevelopment within a designated Design Overlay must adhere to the Design Overlay goals and policies included in this element. See Goal LU-6 and Policies LU-6.1 – 6.7.

Figure 2 Comprehensive Plan Map

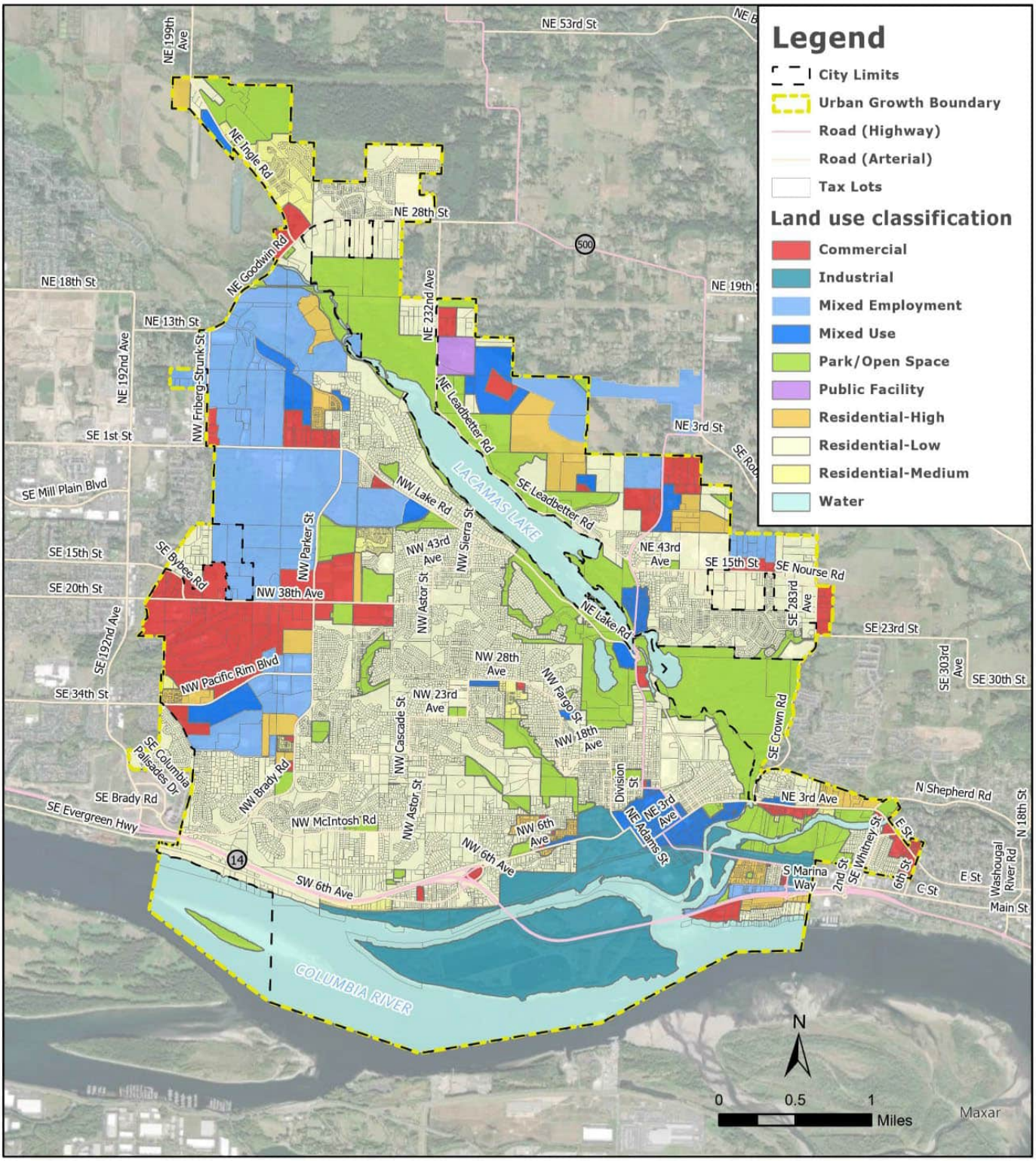
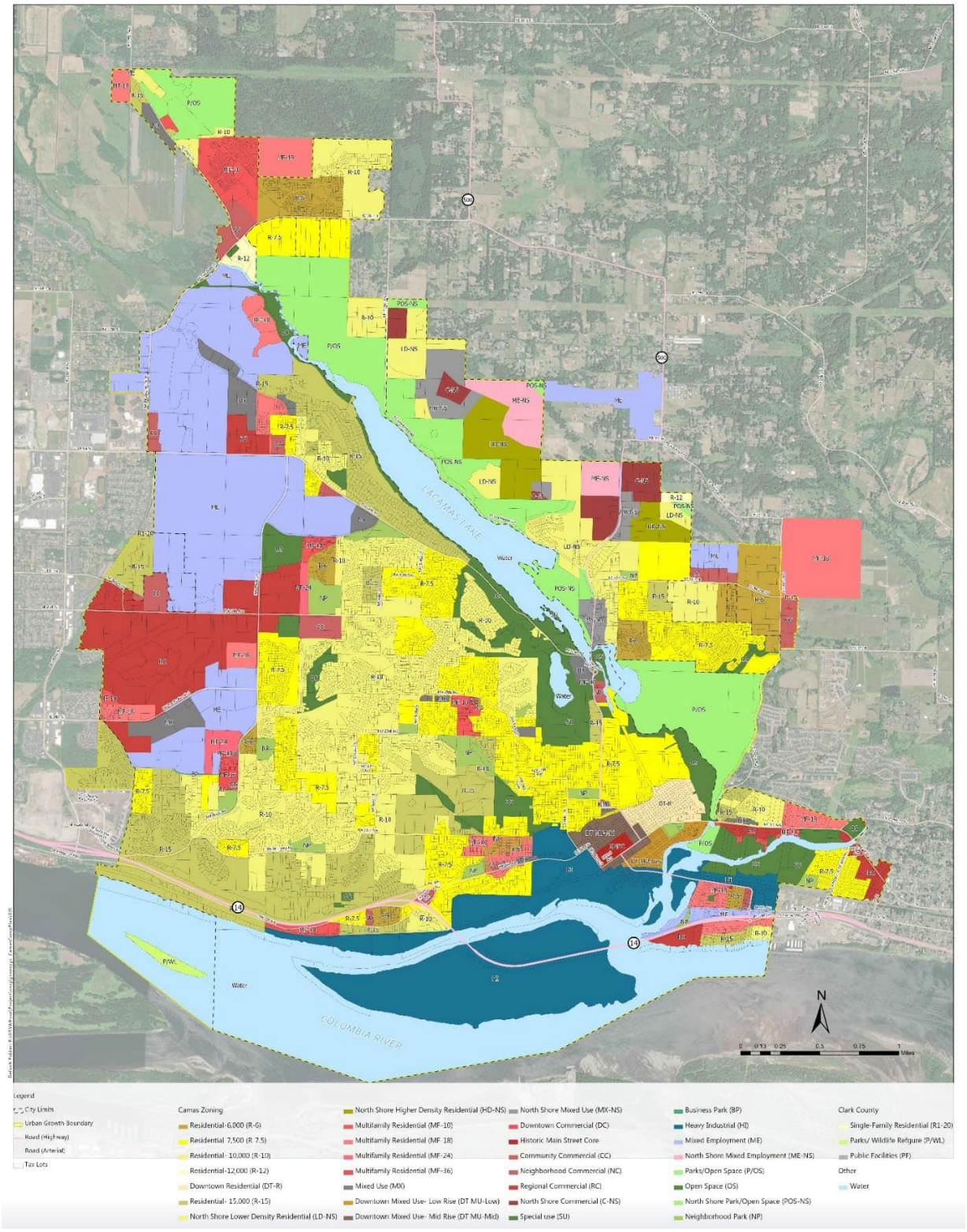


Figure 3 Zoning Map



Land Use Goals and Policies

Goal LU-1 Citywide Land Use

Maintain a land use pattern that respects the natural environment and existing uses while accommodating a mix of housing and employment opportunities to meet the City's growth projections in coordination with the capital improvement plan.

Policy LU-1.1 Ensure the appropriate mix of commercial, residential, and industrial zoned land accommodates the City's share of the regional population and employment projections for the 20-year planning horizon.

Policy LU-1.2 Coordinate with Clark County, the state, and special districts to identify future needs for essential public facilities such as airports, state education facilities, state and regional transportation facilities, state and local correctional facilities, solid waste handling facilities, regional parks and others as identified in RCW 36.70A.200. (See policies ED-3.1, 3.2, and 3.3 regarding Grove Field airport, policy TR-2.1 regarding transportation, and policy PFS-4.27 regarding solid waste.)

Policy LU-1.3 Implement design standards for new development, redevelopment, and infill that consider the surrounding built and natural environments and support a natural transition between uses.

Policy LU-1.4 Ensure that park and recreation land is distributed equitably throughout the City and work to achieve park and continuous trail corridors from Green Mountain to the Columbia River. (See policies PFS-2.1 and 2.4 regarding increasing connectivity to natural areas and continuous trail around Lacamas Lake.)

Policy LU-1.5 Ensure adequate public facilities, including roads, emergency services, utilities, and schools, exist to serve new development, and mitigate potential impacts to current residents. Establish and maintain policies for impact fees for new development.

Policy LU-1.6 Ensure consistency with County-wide planning policies.

Policy LU-1.7 Evaluate and improve design and building standards for new and redeveloped sites in high-risk natural hazard areas.

Policy LU-1.8 Incorporate sustainable and low climate impact design into development codes and standards.

Policy LU-1.9 Encourage high density concentrations of housing, commercial, and other uses needed in daily life along major transportation corridors to support the reduction in vehicle miles traveled and opportunities to increase physical activity.

Policy LU-1.10 Protect the viability of the airport as a significant economic resource to the community by encouraging compatible land uses and densities, and reducing hazards that may endanger the lives and property of the public and aviation users consistent with state laws RCW 36.701A.510 and RCW 36.70547.

Goal LU-2 Employment Land

Create a diversified economy and serve Camas residents, businesses, and tourists by providing sufficient land throughout the City to support a variety of business types and employment opportunities.

Policy LU-2.1 Protect employment land to ensure an adequate supply of commercial and industrial land to meet 20-year employment projections. Encourage a balance of new and existing commercial, light industrial, knowledge-based business, medical, and high-tech uses.

Policy LU-2.2 Encourage mixed-use developments (residential and commercial) that support adjacent uses, reduce vehicle miles traveled, and balance job creation.

Policy LU-2.3 Implement development and landscaping standards to ensure industrial development and other employment lands integrate with the surrounding neighborhoods.

Goal LU-3 Neighborhoods

Create vibrant, stable, and livable neighborhoods with a variety of housing choices that meet all stages in the life cycle and the range of affordability.

Policy LU-3.1 Encourage connectivity between neighborhoods and adjoining natural areas and trails to increase access to recreation amenities. (See policies PFS-2.1 and 2.2)

Policy LU-3.2 Discourage exclusive neighborhoods, privacy walls, and gated communities.

Policy LU-3.3 Provide commercial zoning within a half mile of residential areas for the development of food retailers (grocery stores and farmers' markets) to improve food access.

Goal LU-4 Natural Environment

Develop an interconnected network of parks, trails, and open space to enhance the quality of life for Camas residents and visitors and support and preserve wildlife corridors and natural resources.

Policy LU-4.1 Maintain development regulations that encourage the preservation of trees and natural areas, including the use of density bonuses and other tools to protect sensitive areas and encourage tree replacement. (See policy NE-4.1)

Policy LU-4.2 Support the purchase and preservation of open space by the City and private owners. Encourage careful consideration and integration of the natural environment in planning activities to maintain the park-like setting of Camas.

Policy LU-4.3 Encourage connectivity and increase access to regional trails throughout the City to support multi-modal transportation and physical activity. (See policies PFS-2.1)

Policy LU-4.4 Protect the quality and quantity of groundwater used for public water supplies through conservation of water usage and treatment of runoff.

Goal LU-5 Mixed-Use Areas

Foster economically and socially diverse mixed-use neighborhoods that meet the multi-modal transportation, housing, employment, education, recreation, and health needs of the community.

Policy LU-5.1 Mixed-use developments should be unique to the area in which they are located, encourage small business development, provide a mix of housing types to ensure affordability, increase pedestrian and transit connections, and include design that is sensitive to the natural environment.

Policy LU-5.2 Develop mixed-use areas that are oriented to the public street and scaled and designed to integrate with surrounding land uses.

Policy LU-5.3 Create a mixed-use zone that requires developments to include a minimum percentage of commercial space in both vertical and horizontal mixed-use settings.

Goal LU-6 Design Overlay Areas

Create attractive and welcoming areas in the City and distinguish Camas from adjacent jurisdictions through the development of design overlays.

Policy LU-6.1 Encourage development and redevelopment along the design overlay corridors that respects the historic character of the areas, improves pedestrian mobility/safety, and supports small-scale retail and commercial services.

Policy LU-6.2 Encourage development of commercial uses and multi-family residential within the NE 6th Avenue and NE 3rd Avenue design overlay corridors to support downtown businesses (such as through the Downtown subarea plan). Consider rezoning low-density residential land to support the downtown area. Consider rezoning low-density residential land to support the downtown area.

Policy LU-6.3 Orient building entrances toward the street and provide pedestrian connections from building entrances to the sidewalk. Encourage landscaping, rather than parking, between the building and the street to create a welcoming streetscape.

Policy LU-6.4 Collaborate with partners to support community events, public art, and infrastructure investments that celebrate cultural heritage, provide community amenities, and strengthen community branding. Develop area identities through events, festivals,

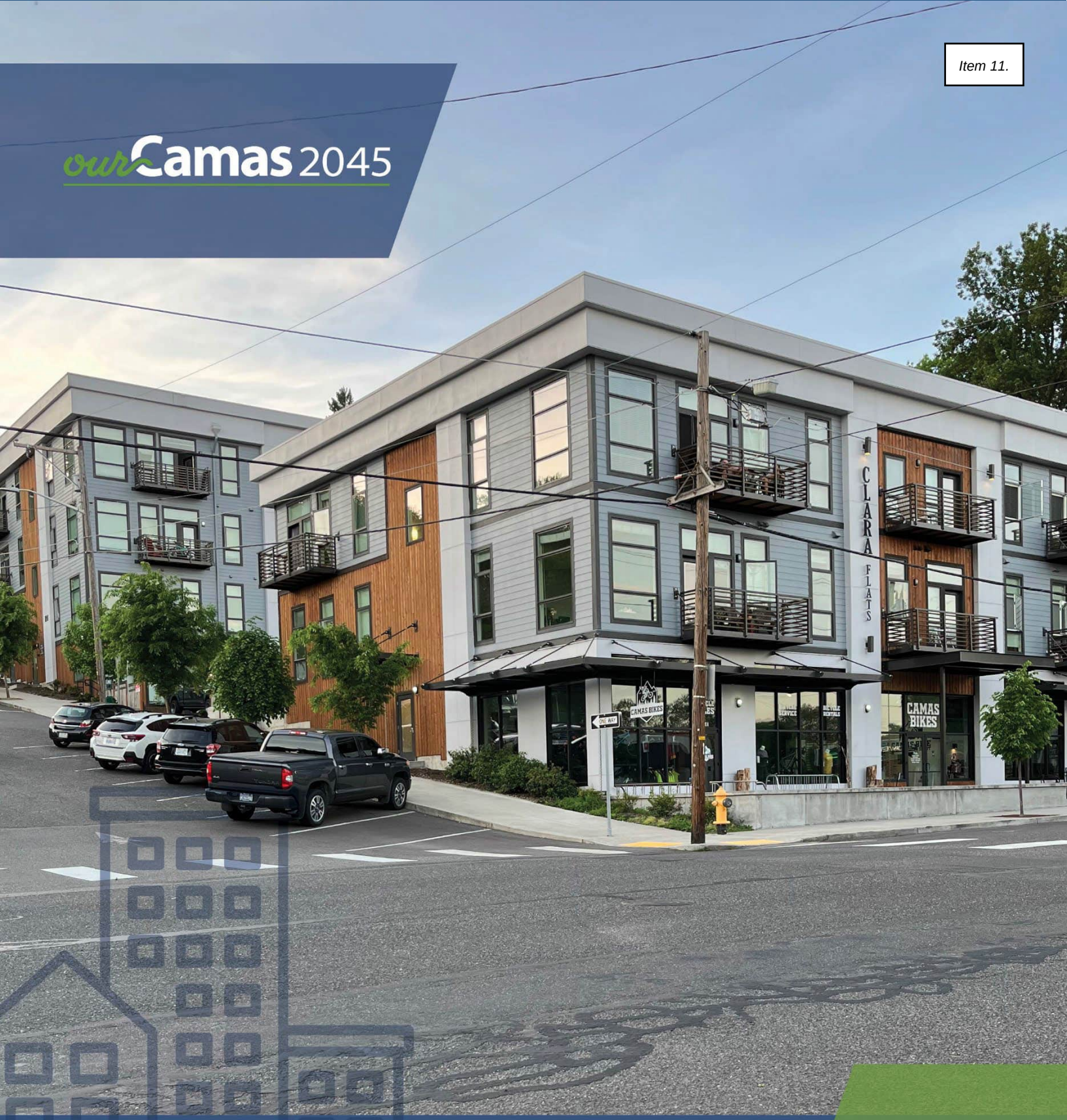
signage, and other improvements that help establish or enhance existing character within the overlay areas.

Policy LU-6.5 Encourage the designation and development of design overlay features in strategic areas to create a distinct pedestrian scale identity and attract visitors.

Policy LU-6.6 Identify streets in the design overlay areas as public places to encourage pedestrian and bicycle mobility and to reinforce the connection between the corridors and the surrounding neighborhoods.

Policy LU-6.7 Improve and increase wayfinding signage in design overlay areas to nearby recreational and other amenities.

ourCamas 2045



Housing

05

05. Housing

Vision

In the year 2045, residents of Camas continue to appreciate their safe, diverse, and welcoming community. Those raised in Camas will return for living-wage jobs and to ultimately retire here. Camas is a well-planned and connected city where residents enjoy pedestrian and bicycle paths between neighborhoods and to downtown. Camas provides a wide variety of housing options that meets the needs of all residents and provides a range of housing for all ages, abilities, needs, preferences, and income levels.

Background

This element of the comprehensive plan sets out the vision, goals, and policies to address current and projected housing needs for the next 20 years (2025 to 2045), inclusive of the diverse needs of the whole community across the income spectrum. Camas is facing housing challenges that could benefit from improved access to more housing options including more housing for seniors and young adults, smaller housing, more rental units, and affordable homeownership opportunities, all of which the City can have a role in supporting.

The housing element is supported by a housing needs assessment (provided below) that quantifies existing housing stock and projected housing needed to accommodate projected growth. Housing analysis is an important exercise as the housing needs in Camas tend to continually evolve based on changes in the broader economy, local demographics, and the regulatory environment. In addition to an assessment of housing needs based on the best available existing data, the housing element goals and policies reflect community input, state legislative requirements, and City of Camas' priorities.

The following section provides background on the planning framework and highlights the analytical findings associated with current and projected housing including details on Camas' community demographics, housing stock, housing market dynamics, expected housing demand, and special housing needs. The insights from this analysis help to build a factual basis for the housing policy updates.

Housing Challenges

Camas is facing housing challenges that could benefit from improved access to more housing options including more housing for seniors and young adults, smaller housing, more rental units, and affordable homeownership opportunities, all of which the City can have a role in supporting.

Planning Framework

In Clark County, RCW 36.70A.040 requires all cities to "fully plan" for the Elements of a Comprehensive Plan, including land use, housing, capital facilities, utilities, transportation, and climate change.[1] The current update process is part of a periodic update also required by the Growth Management Act (GMA), as part of an established schedule by the County.

At the state level, the GMA requires local jurisdictions to adopt Housing Elements that are consistent with statewide goals and objectives. The Housing Element must include an inventory and analysis of existing and projected housing needs that identifies the number of housing units by income level necessary to manage projected growth including permanent supportive and emergency housing.

Recent state legislation calls for cities to expand middle housing allowances in single family residential zones (HB 1110) and support Accessory Dwelling Unit development (HB 1337). These changes require cities to allow up to two Accessory Dwelling Units (ADUs) on all lots zoned to allow single-family homes. Lots with critical areas or their buffers are exempt from the requirements of both HB 1110 and HB 1337. In addition, via HB 1220, the Washington State Department of Commerce instructed local governments to "plan for and accommodate" housing affordable to all income levels.

MIDDLE HOUSING POLICY IN WA

'Middle housing' refers to moderate-density housing types between single-family detached homes and larger multifamily housing. HB 1110 became effective in July 2023 and requires that designated Growth Management Act (GMA) planning cities in Washington must allow certain minimum densities for middle housing within 6 months after their periodic update due date.

Camas is counted as a Tier 2 city under this policy, which must allow for 2 dwelling units per lot or higher in predominantly residential zones, as well as 4 dwelling units per lot within a quarter mile of major transit stops and for affordable housing (ESHB 1110, Sec. 3(1)(c)).

The Clark County Countywide Planning Policies provide helpful guidance on the Comprehensive Plan update. Clark County is currently in the process of updating its Comprehensive Plan and its Countywide Planning Policies. The existing 20-year growth plan spans 2015-2035 and includes a Housing Element with relevant policies for jurisdictions within the County. Please see Appendix X for a summary of the existing relevant Clark County Countywide Planning Policies.

Lastly, the City of Camas completed its Housing Action Plan (HAP) in 2021, including a housing needs assessment and a thorough community engagement process focused on learning about housing experiences and identifying ways to meet housing needs and overcome core challenges. The engagement included two virtual public meetings, seven focus groups and

[1] The GMA includes other optional Elements for economic development, parks and recreation, conservation, energy, sub areas, and ports.

interviews, a housing survey with over 300 responses, a project website, and written public comments. Key findings helped to shape the updates to the Camas Housing Element.

Community Engagement

The project team held interactive open houses and interviewed stakeholders to learn about housing challenges, opportunities, and actions. Engagement activities identified the following themes that could contribute to future decision-making related to housing in Camas.

Housing Insights

- **North Shore:** Need infill development.
- **General:** Are there model cities Camas would strive to look like? (Lake Oswego, Bend, etc.) Compare plans with cities that have experienced similar growth? What did they do well?
- **Housing:** Allow work/live housing along and around UGA/schools and major transportation corridors. Ensure workforce housing is available for current and future workers. Having diverse housing options will lead to a more diverse city.
- **Barriers to development and safety issues for pedestrians:** Height restrictions and fees are challenging, since rents are lower it is harder to make a project pencil, and need for safer crossings on 3rd Ave and difficult to cross 5th in some areas.

Public Engagement Findings Regarding Housing Strategies

- Citywide: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community. This goal seems very wide and difficult to achieve. More focused on affordability?
- More moderate density in and near Downtown with good connectivity (Safe, lit, easy).
- Be intentional- positive in messaging about adding middle housing and moderate density so community gets accustomed to why it is so important for our community and culture to include all. Show that it's not scary.
- Consider incentivizing housing developers through zoning, taxes and fees, and partnerships.
- Partnerships: Partner with Vancouver Housing Authority and other organizations to develop affordable housing. Partner with habitat for humanity and housing authority. Proud ground for moderate- and low-income housing.
- Attract a large senior housing project.
- More 4-5 story multi-family units, especially Downtown.
- Builder incentives to focus on mixed use/ apartments.
- Don't forget the bike paths.
- Make it easy to build ADUs in backyards.
- Support yes in my backyard policies.

- Incentivize small developers (housing & economic development combined!).

Housing Action Plan

The City of Camas completed its Housing Action Plan (HAP) in 2021, including a housing needs assessment and a thorough community engagement process focused on learning about housing experiences and identifying ways to meet housing needs and overcome core challenges. The engagement included two virtual public meetings, seven focus groups and interviews, a housing survey with over 300 responses, a project website, and written public comments. Key findings about community priorities and HAP goals and strategies are summarized below.

HAP Goals

- **Develop Housing to Accommodate Growth.** Thoughtful changes to Camas' zoning and development regulations can allow the City to better accommodate projected growth.
- **Diversify the Mix.** A greater variety of housing types can better serve young families, small households, seniors, people with disabilities, and people with diverse incomes.
- **Increase Housing Affordability.** Young families, seniors, and people who work in Camas may have difficulty finding affordable housing in Camas.
- **Preserve Existing Affordable Housing.** Camas should adopt strategies to preserve its existing affordable housing and prevent the displacement of residents. Community members noted concern for preserving existing affordable housing, particularly smaller single-family properties, in older neighborhoods near Downtown.

STRATEGY	GOALS			
	DEVELOP HOUSING	DIVERSIFY HOUSING MIX	INCREASE HOUSING AFFORDABILITY	PRESERVE AFFORDABLE HOUSING
Strategy 1: Expand housing opportunity in mixed use and downtown commercial districts.	♦	♦		
Strategy 2: Consider making targeted reasons during Comprehensive Plan updates.	♦			
Strategy 3: Diversify allowed housing types and update related lot and dimensional standards.	♦	♦	♦	
Strategy 4: Focus on key areas with residential development or redevelopment potential. Expand more mixed-use areas throughout the city.	♦	♦		
Strategy 5: Continue community conversations around housing and housing for all.	♦	♦	♦	♦
Strategy 6: Communicate available affordable housing resources.			♦	
Strategy 7: Build partnerships to develop and preserve affordable housing for individuals, families, and seniors. Explore expansion of the MFTE program.			♦	♦
Strategy 8: Explore funding source and cost reduction options for affordable housing.	♦	♦	♦	♦

Housing Targets

Planning for future housing demand is critical to ensure that the City can meet demand driven by population growth. This section summarizes projected future housing demand for Camas to provide context for the City's housing policies.

Population and Housing Allocations

Table 2 below demonstrates the City of Camas and Clark County's anticipated population forecast between 2023 and 2045. Since 2000, Camas has grown at a faster rate than the County overall with an Average Annual Growth Rate (AAGR) of 5.2% in the City (including annexations), compared to the County's AAGR of 2.4% (Housing Appendix). However, the County's estimates assume a slower growth scenario for the City in the next 22 years. With this assumption, new population growth in Camas is estimated to comprise 4.05% of growth in Clark County overall.

The population growth forecast indicates that the City of Camas will make up 4.05 percent of new growth population in Clark County between 2023 and 2045 with an AAGR of 1.2% in the City. The County's methodology also acknowledges Washington State Department of Commerce's HAPT estimates for current housing supply in Camas and allocates a number of net new units for the Urban Growth Area(s).

Table 2 Population Growth Forecast, Camas and Clark County, 2023 to 2045

Source: Clark County Interim Population Allocations and Clark County Comprehensive Plan 2025 Update, 2025 Population, Housing, and Employment Allocation – Issue Paper 5.

Jurisdiction	2023 Est. Population	Vacant Buildable Land Model Percent Capacity	2023-2045 Growth	2045 Estimate	Change (percent)	AAGR
City of Camas	**29,352**	**4.26%**	**7,729** ***(4.05% of total growth)***	**37,080**	**26%**	**1.2%**
Clark County	527,400	100%	190,754 *(100% of total growth)*	718,154	36%	1.6%

In May 2024, Clark County adopted housing allocations for jurisdictions located within county boundaries. In total, this shows an estimated 4,226 housing units needed by 2045 in the City of Camas and UGA(s).[2] The City would add about 311 new units to meet the new permanent

[2] The Washington State Department of Commerce Housing for All Planning Tool (HAPT) provides two allocation methods for determining the share of a County's housing supply to be met by jurisdictions. Method A assumes all housing needs will be accommodated through new housing production. Method B assumes all jurisdictions will accommodate equivalent shares of the total countywide housing need at each income level, proportional to their size, in the projection year. Clark County elected to use a hybrid method of 75/25 for Camas.

supportive housing target and 1,766 units affordable to low-income households below 80% of AMI by 2045. Camas currently has 143 units of housing affordable for households at or below 30% of AMI that are not Permanently Supportive Housing (PSH)[3] and 14 emergency units[4] according to the HAPT estimate. With this allocation, the City will need to accommodate 172 new units of temporary emergency housing by 2045.[5]

HOUSING ALLOCATIONS

In 2021, HB 1220 created a new way that communities in the state are required to plan for housing needs. This legislation requires that jurisdictions plan for sufficient land capacity for housing needs, including all economic segments of the population (moderate, low, very low and extremely low income, as well as emergency housing and permanent supportive housing).

- **Since 2000, the City of Camas had an average annual growth rate of 221 new housing units per year.**
- **Comparatively, the City will need to add an average of 195 new housing units per year between 2024 and 2045 to reach its allocation of net new units.**

[3] Permanent Supportive Housing is defined as: "subsidized, leased housing with no limit on length of stay that prioritizes people who need comprehensive support services to retain tenancy and utilizes admissions practices designed to use lower barriers to entry than would be typical for other subsidized or unsubsidized rental housing, especially related to rental history, criminal history, and personal behaviors" Washington RCW 36.70A.030(31).

[4] Temporary emergency housing is defined as: "temporary indoor accommodations for individuals or families who are homeless or at imminent risk of becoming homeless that is intended to address the basic health, food, clothing, and personal hygiene needs of individuals or families. Emergency housing may or may not require occupants to enter into a lease or an occupancy agreement." – Washington RCW 36.70A.030(14).

[5] Clark County's interim allocations do not include designated temporary emergency housing units at the City level. Estimates in this section for the City of Camas are derived directly from the Department of Commerce HAPT tool.

Figure 4 Housing Unit Allocations by Income, Camas and its UGA, 2024-2045

Source: Washington State Department of Commerce HAPT, Clark County Interim Housing Allocations, City of Camas
Note: Current supply includes both the estimate from the HAPT with the addition of 599 additional units since its calibration in 2020.



4,226 new homes will be needed over the next 20 years in the City of Camas

In addition, there will also need to be:
172 Emergency housing beds (temporary housing)

	0-30% AMI		>30-50% AMI	>50-80% AMI	>80-100% AMI	>100-120% AMI	>120% AMI	Total	Emergency housing beds
	Non-PSH	PSH							
2024: Current Housing Supply Estimate	143	0	458	1,874	1,182	1,965	4,201	**9,832**	14
2024-2045: New Housing Unit Needed for the Allocation	**564**	**331**	**811**	**955**	**516**	**249**	**799**	**4,226**	172
2045: Total Target Supply	707	331	1,269	2,811	1,627	2,214	4,499	**13,459**	186

Residential Capacity

Residential capacity is generally defined as the amount of existing housing units plus new housing a city can accommodate based on city zoning regulations (e.g., residential density requirements in the zoning code) and land available for new development. Residential capacity relates to residential growth allocations in a number of ways. Evaluating residential growth capacity is necessary to determine whether the housing growth allocation (determined by the

county) can be accommodated within the City of Camas and its UGA. Sufficient capacity is available if residential growth capacity is equal to or greater than the City's allocation. If sufficient capacity is not available, the shortfall must be addressed by rezoning, or revising allowable density, or by modifying or creating a new UGA or annexed area to provide additional area for residential growth capacity. The Vacant Buildable Lands Model (VBLM) for Clark County provided a basis for the available housing capacity in the City of Camas based on available buildable land (including both vacant and underutilized land) and current zoning. The existing zoning and UGA showed insufficient housing capacity.

The City of Camas is proposing zoning modifications that would allow for more residential capacity. Consequently, another analysis was completed to consider future modifications to select zones. According to the housing capacity estimates, Camas would have capacity for 5,329 housing units which would result in a surplus over the 2045 housing target of 4,226 housing units. Results (summarized below) from the updated capacity analysis show sufficient residential growth capacity to meet the 2045 housing target. The estimates depend on the final preferred alternative which could be refined further.

Summary of Housing Analysis Findings

A summary of key findings from the housing data analysis is provided below to help describe key insights to inform Comprehensive Plan policy updates (Technical Appendix provides the full findings).

Community Demographic Trends

- **Since 2000, Camas has grown at a faster rate than Clark County or Washington State overall, more than doubling in size by 2023 from 12,462 to 27,420 persons.** As population increases, the demand for housing also rises and affects planning.
- **In terms of land, Camas has expanded incrementally over time through annexations.** In the 2000's and early 2010's, the City added large new areas on the north side of Lacamas Lake, with a large portion of this area zoned for multifamily housing alongside employment and commercial areas.
- **Camas is becoming a more diverse community.** The share of people of color increased from 13% in 2012 to 24% in 2022 and is slightly more diverse than the county (21% were people of color in 2022).
- **Camas is seeing a larger share of couples and families with children (39%) and has a higher share of both groups than the County or State (24%, 22%, respectively).** The City also had a larger median household size (almost 3 persons) compared to the county (2.65 persons).
- **Median household income in Camas is higher than both Clark County and the state at $133,000 in 2022.** Adjusting for inflation, median income in the City still increased by 31 percentage

points since 2012 which is primarily due to growth in high-income households earning over $100,000 per year.[6]

- **Four out of five households in Camas owned their homes in 2018-2022, at a higher rate than either Clark County or Washington.** The share of renter households stayed the same in Camas since 2012, showing less than a 1% increase over this time period.
- **County-level trends indicate that homeownership disparities exist for some groups by race and ethnicity in Clark County,** with households who are Black or African American, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Hispanic or Latino, or mixed/other races having lower rates of homeownership.
- **At the County level, income levels also vary by race and ethnicity.** Households who were Black or African American, Native Hawaiian or Pacific Islander, Hispanic or Latino, two or more races, or another race had lower median household incomes than the overall average.
- **Overall levels of housing cost burden are decreasing, but more renters and low-income households experience higher rates.** Around 24% of all Camas households experienced cost burden (2022) with a higher share of renter households experienced cost burden compared to homeowners and with 100% of households earning less than $20,000 experienced severe cost burden (paying at least half of their monthly income towards housing). Although cost burden is generally lower for homeowners, more people of color in Camas who own their homes experience cost burden compared to white, non-Hispanic homeowners.

Existing Housing Inventory

- **Camas has seen growth in their number of housing units in the past two decades,** with a 108% change between 2000 and 2023 (annually this equates with an average of 221 new homes). The City of Camas' growth in housing units was lower than its population change (120%), indicating that the City has not been keeping pace by adding to its supply to meet the rising demand.
- **Camas has steadily low vacancy rates for all housing units in total** (4% in 2022 with little change over the last decade). This level of vacancy is indicative of a healthy housing market with natural rates of turnover; however, the slight decrease could begin to indicate constrained supply of housing.
- **For two-bedroom multifamily units, Camas has seen spikes in vacancy, but these align with new construction trends** which can temporarily raise vacancy rates for newly delivered units but do not indicate long-term vacancy. In 2023, the City saw over 200 new housing units delivered, likely accounting for the fluctuation in vacancies, as well as deliveries in 2017 and 2020.
- **Since 2015, the City has permitted 2,763 new housing units.** Single detached homes have accounted for the largest share (70%) of new permits in the City of Camas, and another 8 percent

[6] The median income in Camas is above the area median income (AMI) for 2023. HUD determined the AMI to be $114,400 for a family of four in the Portland-Vancouver-Hillsboro, OR-WA MSA (including Camas). This is lower than median income in Camas itself which was $133,000 in 2022 (Exhibit 14) and has been consistently lower than the City over time.

were made up of attached townhomes. While apartments, condos, and units in mixed-use buildings made up 20 percent of new permits between 2015-2024, middle housing types like duplexes, triplexes, quadplexes, and accessory dwelling units (ADUs) were only 2 percent of all permits.

- **Median home sale prices in Camas has increased over the last ten years,** with Camas' average prices generally remaining higher than the County. In 2023, the average home sale price in the City was **$704,000,** increasing by 119% since 2013 which is more expensive than the average home in the City of Portland (by $196,000) or Clark County (by $173,000).
- **Prices are also increasing quickly in Camas and Clark County for the average 2-bedroom multifamily rental.** The average 2-bedroom apartment rent was over $1,800 in the City and over $1,700 in Clark County (2024 year-to-date), indicating a 35% increase since 2010. Average 2-bedroom multifamily rents in Portland tracked closely with Camas in the 2010's, while rents in Vancouver remained lower (generally following countywide trends).
- **Compared with home sale price and rent increases in Camas, only households earning over 150% or more of AMI would be able to afford the average home in the City as of 2023.** However, the average 2-bedroom apartment is still affordable to households between 50 and 80% AMI in Camas.
- **The City of Camas had 98 units of regulated affordable housing in 6 buildings** according to data from Oregon Metro and the City. Approximately half of these units are affordable respectively for residents between 30-50% of AMI and 50-80% of AMI. The City also has several long-term care residential facilities for older adults providing 135 units.

Future Housing Demand

- **Since 2000, Camas has grown at a faster rate than Clark County overall but is expected to slow based on County estimates for 2045.** The County's projections assume that new population growth in Camas is estimated to grow at an annual rate of 1.2% to account for 4.05% of county growth.
- **County allocations show the need for 4,226 new housing units in Camas by 2045, adding around 211 new housing units per year.**
- **The City would add about 331 new units to meet the new permanent supportive housing target and 1,766 units affordable to low-income households below 80% of AMI by 2045.**
- **Camas residents with disabilities may require additional housing features for accessibility.** Around 8% of residents in Camas had at least one disability (2022), with the most common being cognitive difficulties, followed by ambulatory and vision difficulties. These disabilities can require housing accommodations such as zero-step entryways, ramps, lifts, or other accessibility features.

Housing Goals and Policies

Goal H-1 Citywide Housing

Promote safe, attractive, and vibrant neighborhoods with access to housing, jobs, services, schools, amenities, and healthy active living that meet the needs of all members of the community.

Policy H-1.1 Provide a range of housing choices and options to support all ages and income levels. Provide an adequate supply of land to accommodate the City's housing growth target.

Policy H-1.2 Support low impact development (LID) in residential development that minimizes both impervious areas and site grading to retain the natural contours of the land. LID strategies include conserving native vegetation, narrower streets, stormwater gardens, and other landscape practices that store and filter runoff.

Policy H-1.3 Promote the use of flexible development options (e.g., planned residential developments and development agreements) to create a variety of accessible housing types within new developments.

Policy H-1.4 Require new residential developments to demonstrate how proposed lot, street, and utility layouts can accommodate development of single-story dwellings, duplexes, and attached or detached accessory dwelling units.

Policy H-1.5 Ensure housing in mixed-use buildings (or developments) will complement the commercial and retail portion of the development and increase local living-wage jobs. Amend the municipal code to support mixed-use and middle housing development in the Downtown Subarea and near other community hubs.

Policy H-1.6 Support in-fill housing development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services. Ensure development compatibility with the surrounding neighborhood.

Policy H-1.7 Require all new housing developments to provide a range of housing types and sizes that are evaluated through the land use approval process and stipulated on the final plat.

Policy H-1.8 Support the maintenance, repair, and rehabilitation of Camas' existing housing stock by promoting resources that provide financial and other assistance to community members to maintain or repair health and safety features of their home.

Policy H-1.9 Support investment in existing neighborhoods to enhance livability, safety, and accessibility in a way that preserves unique physical character.

Policy H-1.10 Develop objective design standards to ensure new development is compatible in scale, architectural style, and landscape composition with existing and planned neighborhoods.

Policy H-1.11 Provide ongoing education and community engagement regarding Camas' housing needs, including available programs and incentives. Provide permit process support to affordable housing developers.

Policy H-1.12 Achieve and sustain the housing targets by income group allocation for Camas as adopted by the Clark County Council. Monitor and assess the City's progress in meeting housing needs at least every five years.

Policy H-1.13 Support and encourage housing legislation at the county, state, and federal levels that promotes and supports the City's housing goals and policies.

Goal H-2 Housing Choice and Affordability

Create a diversified housing stock that meets the needs of all lifestyles and economic segments of the community through new developments, preservation, and collaborative partnerships.

Policy H-2.1 Support and encourage a wide variety of housing types throughout the City to provide choice, diversity, and affordability and promote homeownership.

Policy H-2.2 Promote the preservation and rehabilitation of the City's existing affordable housing stock of all types, including low-cost rentals and

affordable owner-occupied single-family homes. Support measures that preserve affordable housing, such as home repair programs with partners to rehabilitate existing housing that serve low to moderate-income households.

Policy H-2.3 Create opportunities for ownership housing in a variety of settings, styles, sizes, and affordability levels throughout Camas.

Policy H-2.4 Provide incentives and bonuses for the development of affordable housing and middle housing. Ensure that any affordable housing built with the support of city incentives or bonuses (including, but not limited to, public funds, through development agreements, incentives, or by regulation) remains affordable for the longest possible term.

Policy H-2.5 Participate in collaborative partnerships with local and regional public and non-profit housing groups to ensure that affordable housing and supportive services are provided throughout the City.

Policy H-2.6 Encourage and support collaborations between for-profit and non-profit developers to expand affordable housing options.

Policy H-2.7 Evaluate the existing Multifamily Tax Exemption (MFTE) program provisions and participation. Consider changes and expansions to program options and associated costs and benefits that support housing production and affordable housing targets.

Policy H-2.8 Review and update the Camas Municipal Code to be consistent with State guidelines for housing and residential use.

Policy H-2.9 Plan for and accommodate Camas' allocated share of countywide future housing needs for moderate-, low-, very low-, and extremely low-income households as well as manufactured housing, multifamily housing, group homes, foster care facilities, emergency housing, emergency shelters, and permanent supportive housing.

Goal H-3 Housing Accessibility and Livability

Encourage and support a variety of housing opportunities for those with special needs, particularly those with challenges relating to age, health, or disability.

Policy H-3.1 Encourage and incentivize special needs and senior housing to be dispersed throughout the community and close to public transportation, shopping, medical clinics, and other essential services.

Policy H-3.2 Encourage, support, and work with partners, such as the Clark County Health District, that support social and health service organizations and offer programs and facilities to help persons with special needs remain in the community.

Policy H-3.3 Treat residential structures occupied by persons with disabilities the same as residential structures occupied by a family or by non-disabled unrelated individuals.

Policy H-3.4 Encourage the creation and retrofitting of senior housing and accessible housing types that allow residents to "age in place" to support aging populations and allow residents to continue living in Camas.

Policy H-3.5 Develop and implement a strategy or action plan to work with partners to secure grants and loans by agencies, private developers, and nonprofit organizations that are tied to the provision of permanent supportive housing, emergency shelter beds, transitional housing, and other housing serving at-risk populations.

Policy H-3.6 Work with other jurisdictions and health and social service organizations to develop a coordinated, regional approach to address the impacts of displacement and people at risk of becoming homeless.

Policy H-3.7 Promote the use of universal design principles for new development or redevelopment housing projects to ensure housing is designed for all people and abilities.

Goal H-4 Streamlining Permitting for Housing

Support the development of quality and sustainable housing in Camas with streamlined regulations and permitting processes.

Policy H-4.1 Periodically review and update the City's residential zoning regulations, design standards, and permitting procedures to promote quality development with timely and predictable outcomes.

Policy H-4.2 Create regulations and procedures that balance clarity and objectivity with flexibility for design innovation.

Policy H-4.3 Study the impacts of land use policy decisions and zoning code amendments and minimize the negative impacts to housing supply and affordability.

Policy H-4.4 Classify the development of middle housing and accessory dwelling units as permitted uses in lower density residential zones, consistent with the Growth Management Act.

Policy H-4.5 Review and update policies, codes, and ordinances to allow for a mix of housing types and variable lot and unit sizes in new subdivisions and development projects to promote housing choice diversity and affordability.

Policy H-4.6 Annually review the number and type of housing units built in Camas and permit timelines associated with new housing developments to inform additional changes to permitting, incentives, and housing programs.

ourCamas 2045



06 Natural Environment

06. Natural Environment

Nature in Camas

Camas has an abundance of natural areas that make it an ideal place to live. This element balances Camas' natural environment with the demands of a growing city.

Vision

Camas embraces its connection to nature and enjoys a wealth of outdoor recreational opportunities. Access to forests, clean water, parks, and trails is foundational to Camas' quality of life. The community shares a deep reverence for Camas' beauty, scenery, and tranquility, and is committed to preserving and enhancing its natural resources and tree canopy. Through proactive planning, the City mitigates the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come.

Natural Setting

Camas is blessed with an abundance of natural areas and physical features, making it a highly attractive place for people to call home. Residents and businesses who seek an exceptional quality of life are buoyed by the natural surroundings of Camas and enjoy such amenities as Lacamas, Round and Fallen Leaf Lakes, Lacamas Creek, and the Washougal River greenway. Residents also enjoy the beauty and quiet of the open space and greenbelt network throughout the community, stitched together by the City through many decades of planning and implementation.

As envisioned decades ago and to be held in perpetuity as natural, legacy lands along Lacamas Lake, Fallen Leaf Lake, and near Green Mountain are treasured for their mature stands of evergreen and deciduous trees and offer a respite for many in the community. When people think of Camas, they think of a place that values the natural environment on par with other facets of the community. Camas is a place where stewardship of greenbelts, natural areas, and open space is an essential fiber in the fabric of the community.

Overview

The natural environment element of the comprehensive plan provides a policy framework for the identification, protection, and improvement of Camas' natural environment. Goals and policies include those for environmental stewardship, the protection of

environmentally sensitive lands (critical areas), natural areas and open space, shorelines, and landscaping and tree enhancement.

Environmental stewardship refers to the City's role as chief steward of the environment for the Camas community. A chief steward in this context means how the City, on behalf of the residents, establishes a responsible relationship between the people and the land they inhabit.

Stewardship has three prongs for the benefit of all community members. The first prong relates to compliance with the Growth Management Act (GMA) and the identification, designation, and protection of certain environmentally sensitive lands, which, in GMA, are known as critical areas. The second prong relates to the community and its steadfast approach to keeping Camas a place that balances growth with preservation of a natural areas and open space network. Camas has longed placed a premium on its open space network of environmentally sensitive lands, with or without GMA requirements. The third prong is an ethic of volunteerism and stewardship from the community's citizenry, which manifests in many ways including active volunteer groups, active boards and committees, and public involvement on issues related to the environment.

The City of Camas has preserved over 700 acres of open space across 31 sites, including forests, wetlands, riparian corridors, and steep slopes, with nearly half of this land concentrated around Lacamas Lake. These natural areas, distinct from developed parks, are managed to protect ecosystem functions, water quality, native vegetation, and wildlife habitats, while allowing for limited public access through trails and modest amenities. The City prioritizes conservation and restoration of high-value landscapes such as waterfronts, forested hillsides, and sensitive wetlands, balancing environmental stewardship with recreational use. Key efforts include protecting watercourses within three major watersheds, regulating development on steep slopes and wetlands, and maintaining resilient forest lands to support biodiversity and ecological health.

Environmental Stewardship

One of the most demanding roles the City of Camas must fulfill is that of chief steward of the community's environment while also accommodating growth. The City has the duty to implement land use policies via development regulations and the responsibility to comply with federal and state statutes related to the environment.

Facing federal and state mandates, the City strives to ensure that its environment is managed in compliance with applicable laws and does so in a wise manner. While simultaneously accommodating growth, the City encourages the preservation, restoration, and improvement of the natural environment in all development.

Goal NE-1 Environmental Stewardship

Preserve Camas' natural environment citywide by developing a sustainable urban environment and protecting natural areas and open space, including critical areas.

Policy NE-1.1 Support a cleanup of the Camas Mill and other contaminated sites to protect natural resources and the city's water supply.

Policy NE-1.2 Support programs and regulations that monitor, maintain, conserve and protect water quality in Camas, including watersheds, Lacamas Lake Basin, Columbia River Basin, and Washougal River Basin.

Policy NE-1.3 Encourage restoration and protection of natural areas through the removal of invasive species.

Policy NE-1.4 Support and implement actions identified in adopted plans, including adaptive management of natural resources that is consistent with best available science and climate guidance to improve climate resiliency.

Policy NE-1.5 Protect and restore natural resources, valuable historic and cultural areas, climate refugia, habitat areas and corridors to provide biological and hydrological connectivity that fosters resilience to climate impacts.

Policy NE-1.6 Create and support natural resource management plans that consider climate change impacts and guide adaptive management.

Policy NE-1.7 Include immediate and long-term environmental impacts in the policy and regulatory decision-making process. Identify and quantify the ecosystem services benefits of natural systems and include these natural capital assets in cost-benefit assessments for community and development planning.

Policy NE-1.8 Promote and incentivize public and private landowners to restore and create local habitats and corridors to increase the availability throughout the city.

Policy NE-1.9 Regulate land use and development to protect natural topographic, geologic, vegetative, and hydrologic features of undeveloped properties.

Policy NE-1.10 Promote soil stability and minimize and control soil erosion using best management practices, best available science, ecologically sustainable site design, natural drainage systems and protection of existing native vegetation.

Critical Areas

The natural environment includes specific environmentally sensitive areas that the GMA requires the City to identify, designate, and protect. Referred to in statute (RCW 36.70A) as *critical areas.* Under GMA, critical areas include wetlands, critical aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas. Each of these critical areas is present in the City. The law further requires that the City use best available science (BAS) when developing policies and regulations to designate and protect critical areas. GMA also recognizes that salmonids (salmon and trout) play an important role in the ecosystem and are vital cultural and economic resources, which require jurisdictions to give 'special consideration to conservation and protection measures necessary to preserve or enhance anadromous fisheries'.

Functions of Critical Areas

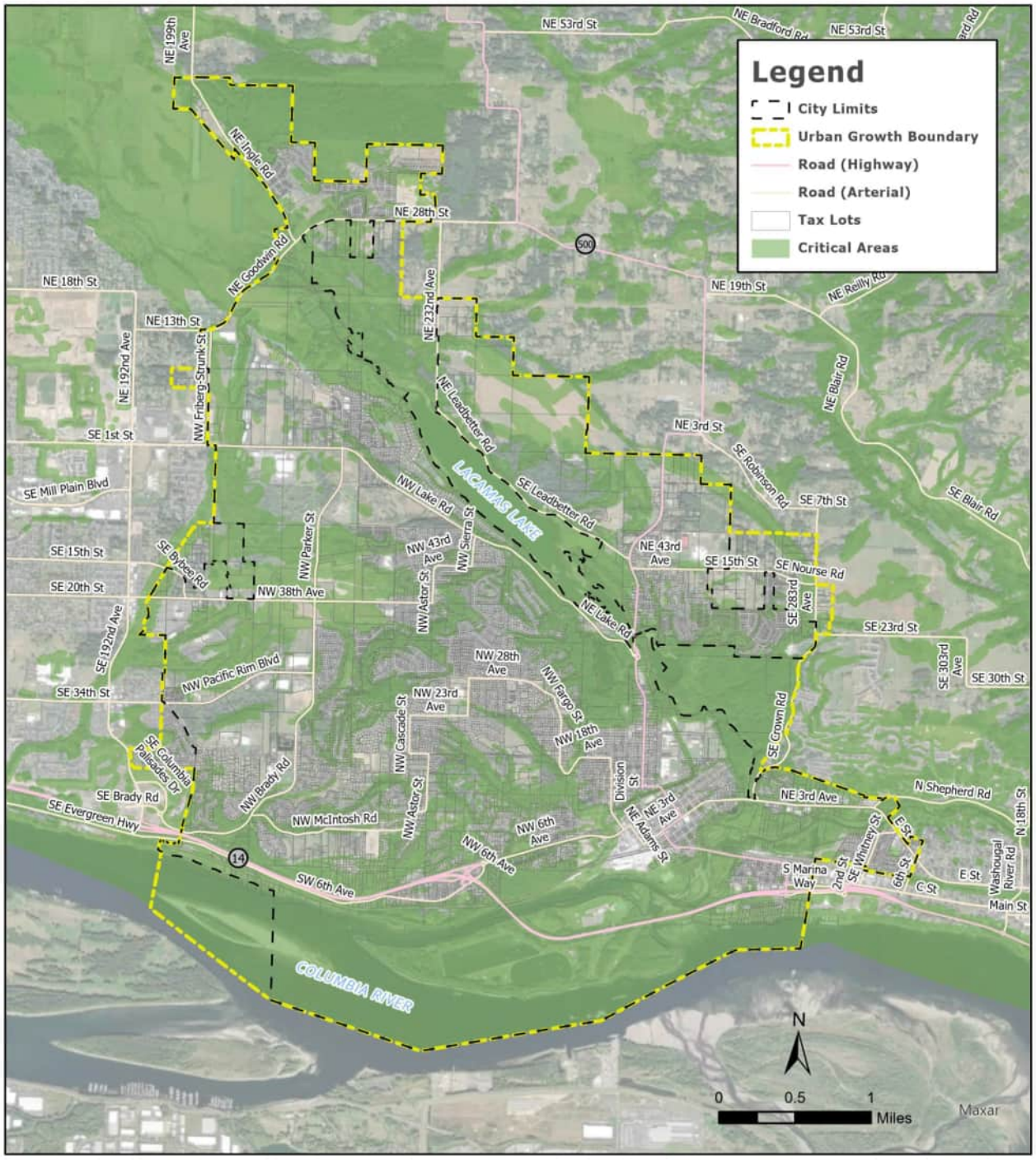
Critical areas perform key functions that enhance the environment and protect us from natural hazards. The beneficial functions and values that critical areas provide include, but are not limited to, water quality protection and enhancement; fish and wildlife habitat; food chain support; flood storage, conveyance, and attenuation of flood waters; groundwater recharge and discharge; drinking water quality and quantity; erosion control; protection from natural hazards; historical, cultural, archaeological, and aesthetic value; and recreation. Identifying the functions and values of local critical areas is essential to defining the purpose of a critical areas protection program.

Each type of critical area performs different functions and each community assesses the values of the critical areas in its environment differently. Therefore, the purpose of protecting critical areas is unique for each community. Critical areas protection is necessary to protect the public's health and safety and is essential to comply with state laws in Washington. It may also provide compliance with federal laws for such things as water quality and endangered species. There are also economic reasons to protect critical areas. For example, protection of drinking water quality and quantity supports sustainable growth, and critical areas support resource industries, such as salmon and other fisheries.

Critical areas are environmentally sensitive and hazardous areas that the State and City have identified for certain development considerations or restrictions to protect their functions and values, while allowing for reasonable use of property. Critical areas protection is regulated through the Camas Municipal Code (CMC) Title 16, which identifies five types of critical areas: wetlands, fish and wildlife habitat conservation areas, geologically hazardous areas (steep

slopes, erosion hazard areas, and seismic hazard areas), critical aquifer recharge areas (CARAs), and frequently flooded areas.

Figure 5 6Critical Areas



Wetlands

Wetlands are defined as those areas, designated in accordance with the approved federal wetland delineation manual and applicable regional supplements, which are inundated or

saturated by surface or ground water at a frequency and duration, and under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands in the community are generally located in and around the Grass Valley area in west Camas, Lacamas Lake, Lacamas Creek, and the Washougal River greenway. The largest mapped wetland is located around the south end of Lacamas Lake, identified as lake habitat. NWI does not identify mapped wetlands in downtown Camas.

Critical Aquifer Recharge Areas

Critical aquifer recharge areas (CARAs) are those areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge. The quality and quantity of groundwater in an aquifer is inextricably linked to its recharge area. To determine the threat to groundwater quality, existing land use activities and their potential to lead to contamination should be evaluated.

The goal of establishing CARAs is to protect the functions and values of the community's drinking water supply by preventing pollution and/or contamination of the supply directly or recharge areas indirectly.

Frequently Flooded Areas

Floodplains and other areas subject to flooding perform important hydrologic functions and may present a risk to persons and property. Classifications of frequently flooded areas should include, at a minimum, the 100-year floodplain designations of the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP), known as the 'special flood hazard area', which is defined further as having a special flood, mudflow, or flood-related erosion hazards and shown on Flood Insurance Rate Maps (FIRM), which also includes the regulatory floodway.

Geologically Hazardous Areas

In the physical context of Camas, geologically hazardous areas include areas susceptible to erosion hazard, seismic hazard, mine hazard, and other geological events. Geologically hazardous areas in Camas include severe erosion hazard areas adjacent to Lacamas Lake, north of the Columbia River, and to the east along the Washougal River.

Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas (FWHCAs) are critical ecological zones that support essential habitats and species necessary for maintaining ecosystem integrity and biodiversity. These areas may include rare ecosystems, high-density wildlife zones, breeding and migration corridors, and habitats for endangered or sensitive species. Their designation plays a key role in guiding land use planning, urban growth boundaries, and conservation strategies. FWHCAs must be identified using the best available science, considering factors such as habitat connectivity, human activity levels, riparian and salmonid protection, and the impact of

surrounding land uses. Buffer zones are also recommended to minimize conflicts between development and habitat preservation.

Aquatic and Riparian Habitat

Fish and wildlife habitat conservation areas in Camas include habitats for state or federally listed endangered, threatened, or sensitive species, as well as areas associated with state priority species identified by the Washington Department of Fish and Wildlife. These areas encompass naturally occurring ponds under twenty acres, classified state waters, and water bodies stocked with game fish by governmental or tribal entities. Key aquatic habitats in Camas include the Columbia and Washougal Rivers, Lacamas Creek, Camas Slough, Lacamas Lake, and various streams, ponds, and wetlands, all often bordered by riparian zones. Lacamas Lake is the largest aquatic habitat in the city aside from the Columbia River system.

Terrestrial Habitat

Terrestrial habitats in Camas, like aquatic ones, include areas supporting state or federally listed endangered, threatened, or sensitive species, as well as state priority species identified by the Washington Department of Fish and Wildlife (WDFW), State Natural Area Preserves, and locally important habitats. Locally designated habitats include Oregon white oak trees and stands, and Camas lily fields of specific sizes. While much of the city is mapped as "cave rich" by WDFW, actual cave presence is limited, though caves are considered a priority habitat feature. The Camas biodiversity corridor, which includes mature timber and sightings of Vaux swifts, runs through parts of the city. Oak woodland habitat is primarily found near Lacamas Lake, and the northern part of Camas including the Lacamas Prairie Natural Area Preserve, which protects rare Willamette Valley wet prairie habitat and several endangered plant species, including Bradshaw's lomatium.

Critical Areas Goals & Policies

Preserve, maintain, and restore the City's critical areas to protect their function and value.

Policy NE-2.1 Use best management practices and best available science to preserve, protect, and restore the biological health and diversity of Camas' critical areas.

Policy NE-2.2 Preserve and restore aquatic and riparian habitats consistent with applicable regulations.

Policy NE-2.3 Preserve and avoid development of areas with endangered, threatened, and sensitive species and species of local importance as required by local, state, and federal laws.

Policy NE-2.4 Ensure that development throughout the City meets or exceeds standards and practices for long-term wetland protection and mitigation.

Shorelines

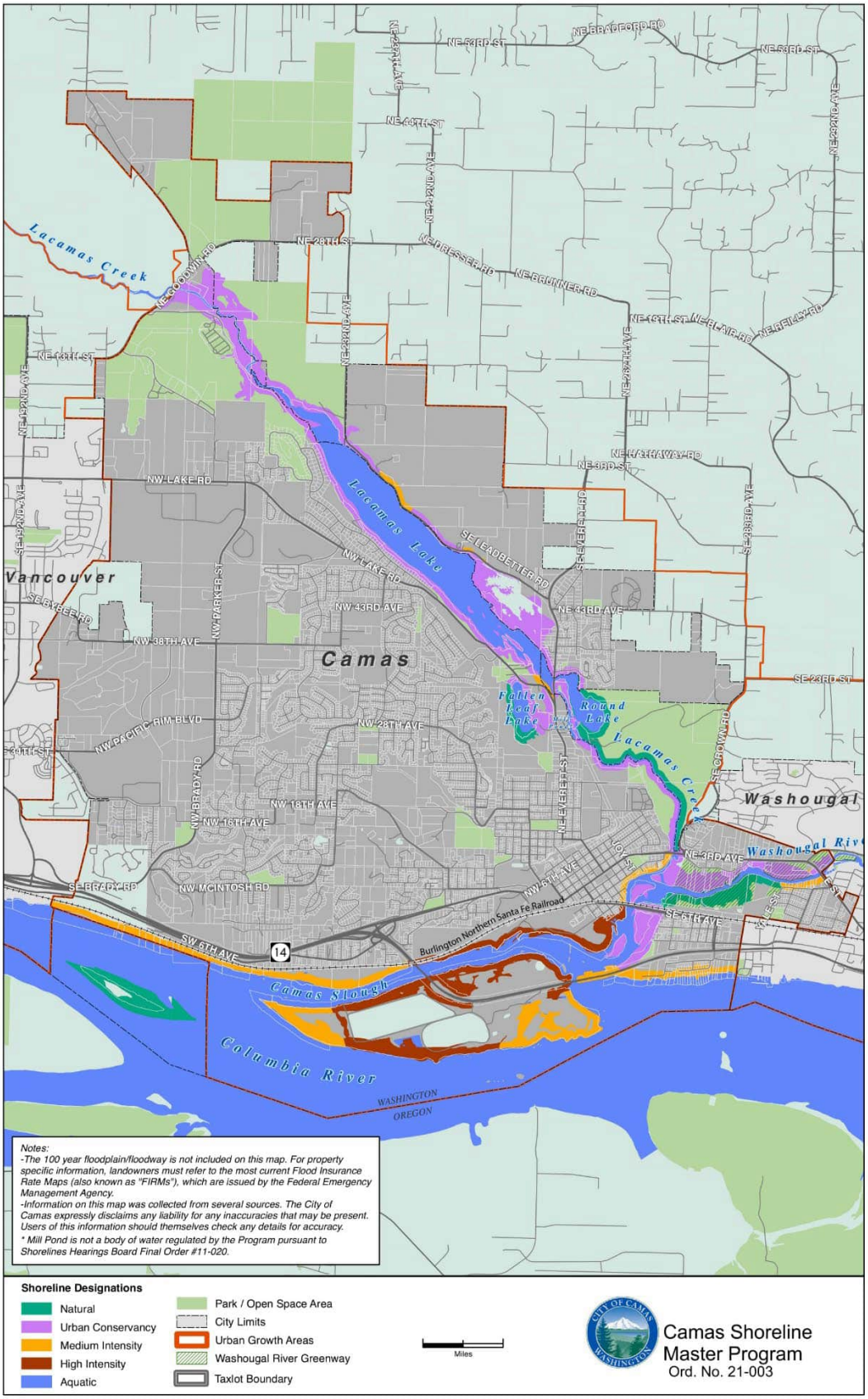
Overview

The Shoreline Management Act, enacted in 1972, created a collaborative framework between Washington State and local governments to manage and protect shorelines. Under this law, local jurisdictions are required to develop Shoreline Master Programs (SMPs) tailored to their specific needs.

Camas encompasses 946 acres of shoreline across 26 miles, including areas along Lacamas Creek, several lakes, and the Columbia and Washougal Rivers. The SMP outlines strategies to minimize flood risks, enhance recreational opportunities, and ensure sustainable shoreline use through voluntary programs and regulatory measures.

To guide development and conservation, Camas assigns specific shoreline designations based on land use, ecological characteristics, and community vision. These designations—Aquatic, Natural, Urban Conservancy, Medium Intensity, and High Intensity—are aligned with state guidelines and the city's comprehensive plan. Each designation comes with tailored policies and development regulations, such as height and setback limits. For example, High Intensity areas support industrial use, while Natural areas prioritize ecological preservation. These designations help ensure that shoreline development aligns with environmental protection and long-term community goals.

Figure 7 Shoreline Map



Shoreline Goals and Policies

Goal NE-3 Shorelines

Use the full potential of shoreline in accordance with the opportunities presented by their relationship to the surrounding area their natural resource values, and their unique aesthetic qualities offered by water, topography, and views. Develop a physical environment that is both ordered and diversified, and which integrates water and shoreline uses while achieving a net gain of ecological function.

Policy NE-3.1 Adopt the goals and policies as outlined in the current Camas Shoreline Master Program.

Landscape Enhancement and Tree Preservation

The natural landscape and existing tree cover are important aspects of Camas' natural environment. Native, mature landscaping and trees contribute to the City's ecological health, supply valuable animal habitat, and enhance the community's natural beauty.

Goal NE-4 Landscape Enhancement and Tree Preservation

Preserve existing natural landscapes and tree canopy. Support opportunities for increasing native and climate resilient landscaping and tree canopy.

Policy NE-4.1 Develop and implement a program to prioritize retention of existing trees and planting of new trees within development sites to maximize cooling and energy savings. Encourage planting of hardy and climate resilient native trees.

Policy NE-4.2 Develop an urban forestry program that articulates a long-term strategy for future-proofing the City's tree canopy, including actions for tree protection, management, education, and collecting and maintaining data on citywide tree canopy.

Policy NE-4.3 Require the use of native and climate resilient plants in residential, commercial, and industrial landscapes to support the implementation of low impact development.

Policy NE-4.4 Develop and implement a program to mitigate and compensate for tree canopy loss when retention of mature trees within development sites is impractical.

Policy NE-4.5 Develop and implement a program to prioritize retention of existing trees and planting of new trees within development sites to maximize cooling and energy savings. Encourage planting of hardy and climate resilient native trees.

Policy NE-4.6 Develop an urban forestry program that articulates a long-term strategy for future-proofing the City's tree canopy, including actions for tree protection, management, education, and collection and maintaining data on citywide tree canopy.

Policy NE-4.7 Require the use of native and climate resilient plants in residential, commercial, and industrial landscapes to support the implementation of low impact development.

Policy NE-4.8 Develop and implement a program to mitigate and compensate for tree canopy loss when retention of mature trees within development sites is impractical.

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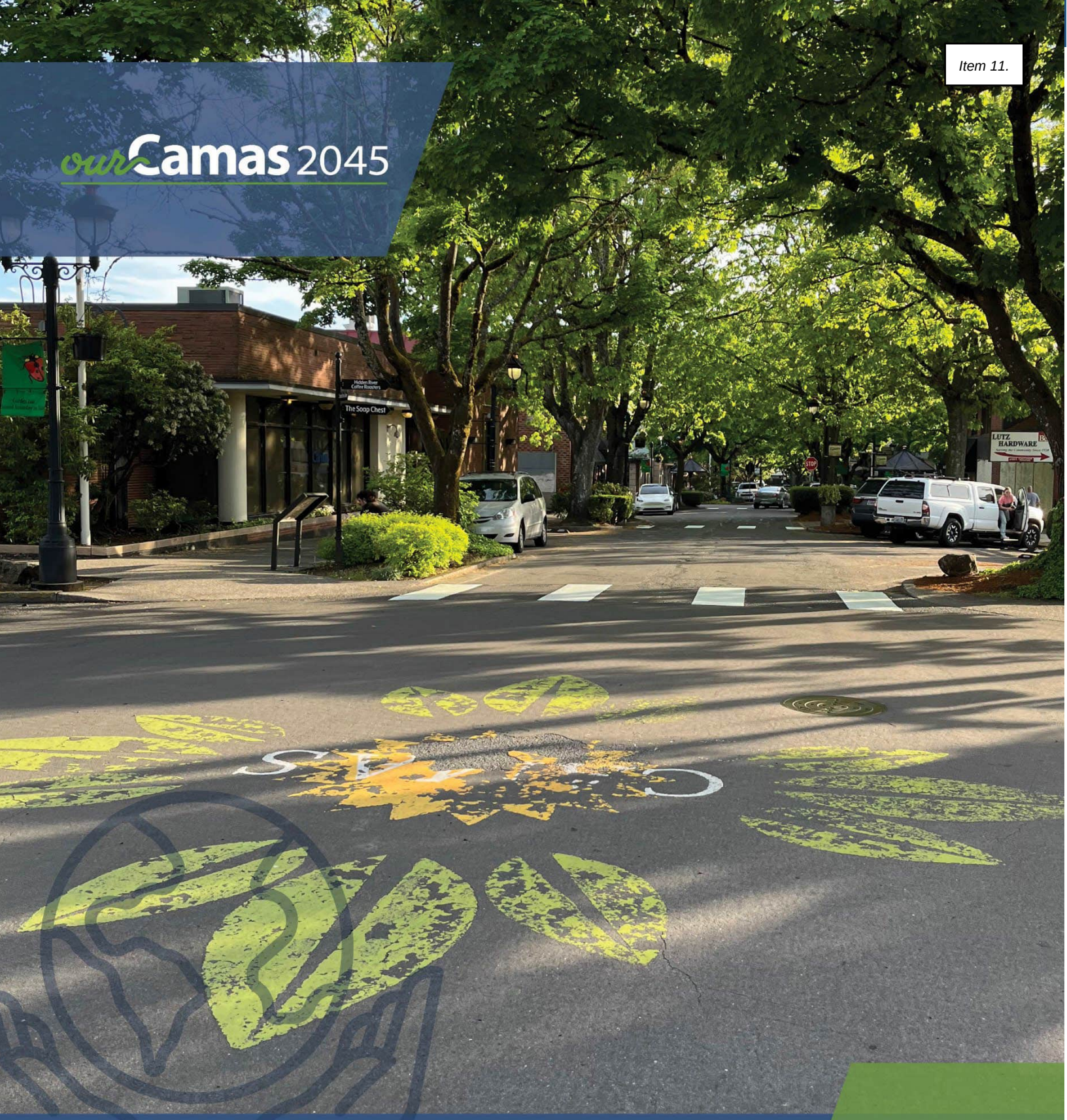


Climate Change & Resliency

07

07. Climate Change & Resiliency

Community Impacts from Climate Change

Climate hazards (i.e., natural hazards exacerbated by climate change) of the highest concern and priority are extreme heat and precipitation. Camas can address anticipated impacts by reducing GHG emissions and building community resiliency.

Vision

In 2045, Camas has proactive plans to reduce greenhouse gas (GHG) emissions and mitigate the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come. The most vulnerable communities are protected, and climate planning contributes to improvements in community health and well-being.

Introduction

The City developed this climate change and resiliency element consistent with House Bill 1181, signed into law in 2023. This new state law integrates climate planning into Washington's GMA and requires cities and counties to include a climate element in their comprehensive plans.

Climate change refers to long-term shifts in temperatures and weather patterns. The burning of fossil fuels and other human activities are increasing emissions of greenhouse gases (GHGs) that trap heat in the atmosphere and contribute to global and local climate change. Negative effects include impacts on the community caused by natural hazards that are exacerbated by climate change (e.g., the increased frequency and severity of drought conditions). Natural hazards are also referred to as "climate hazards" in this element as climate change is anticipated to affect the frequency and intensity of natural hazards.

The purpose of this climate element is twofold: to reduce contributions to climate change (i.e., GHG emissions) and to build community resilience to climate change.

To support these two overarching goals, the City formed a Climate Policy Advisory Group (CPAT) to advise on the creation of this new element. The 17 CPAT members included community members, City staff, City Council and Planning Commission liaisons, and representatives from the Port of Camas-Washougal, Clark Public Utilities, NW Natural, and the Camas School District. CPAT members held five meetings between early 2024 and early 2025.

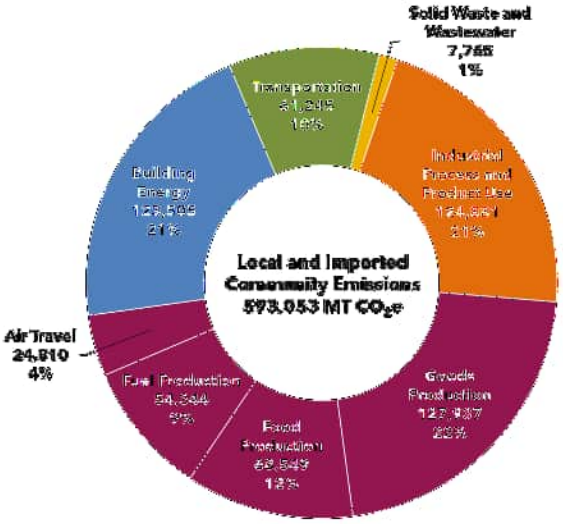
The CPAT was instrumental in the identification and development of climate goals and policies.

Climate Overview

Greenhouse Gas Emissions

The GHG reduction subelement identifies actions to reduce GHG emissions and decrease per capita vehicle miles traveled (VMT). One of the requirements of the GHG reduction subelement is to meet the GHG reduction requirements in RCW 36.70a.070(9)(d), including reducing per capita VMT within Camas but without increasing GHG emissions elsewhere in the state. To identify actions for VMT reduction, Clark County worked with local cities to prepare a VMT study and travel market assessment to understand baseline travel patterns and strategies for VMT reduction. According to the VMT study, data from the Highway Performance Monitoring System shows that the city's estimated per capita VMT, which represents the average weekday VMT within Camas divided by the city's population, is 11.1. The travel market assessment identified key travel destinations in the city for short trips (i.e., trips 3 miles or less), showing that areas near Lacamas Lake, Camas high school, and Downtown Camas are popular destinations. Both assessments will help inform a regional target for VMT, which will be established outside the climate element/comprehensive plan framework. In addition to VMT reduction, Clark County's Countywide Planning Policies establish requirements for cities to reach net-zero emissions by 2050 (14.1.2) in alignment with statewide GHG emission reductions (RCW 70A.45.020(1)) and set interim (5-year) objectives or targets (14.1.4). A GHG inventory for Camas was also prepared to inform GHG reduction strategies. The inventory provides an estimate of the city's carbon footprint from local emissions (building energy, transportation, solid waste and wastewater, and industrial process and product use) and imported emissions (consumption of goods). Figure 8 Camas Emissions, 2022 shows the combined and per capita emissions for the city.

Figure 8 Camas Emissions, 2022



With a population of 27,250, all 2022 GHG emissions combined (local and imported) for City of Camas totaled

593,035 MT CO_2e

21.8 MT CO_2e Per Capita

Local emissions include sector-based emissions that are generated within Camas. Imported emissions are generated outside of Camas to produce and provide the goods, food, services, air travel, and production of transport of fuels consumed by households. Additionally, wildfires have become one of the largest sources of carbon emissions in Washington state. From 2014 to 2018, wildfires in the state generated 39,200,000 MT CO_2e.

Figure 9 Local and Imported Emissions in Camas

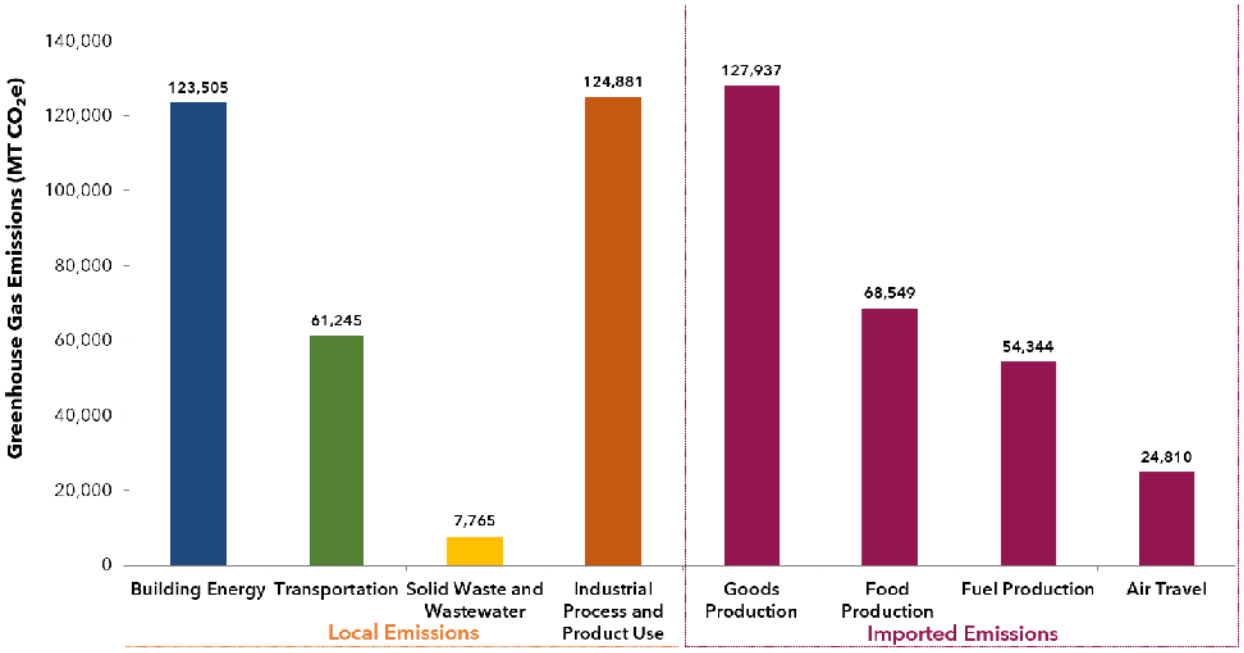


Figure 9 shows a breakdown of the sources of local and imported emissions in Camas. Most sources of local emissions include **industrial process and product use** and **building energy**, which accounts for **78%** of local emissions. Emissions from the industrial process and product use sector generally involve facilities with silicon semiconductor manufacturing. While emissions from these facilities contribute to a large share of local emissions, demand for these goods is global and not specific to Camas. Therefore, goals and policies target reducing local emissions and support existing GHG reduction strategies or targets that are being implemented by businesses and industries in Camas.

Climate Resiliency

Community resiliency is the ongoing process of preparing for, anticipating, and responding to natural hazards created or aggravated by climate change.

Natural hazards relevant to Camas are identified in the 2023 Clark County Natural Hazard Mitigation Plan (NHMP) (CRESA 2023). Table 3 Natural Hazards in Camas lists hazards of concern in order of ranking and their priority, which were evaluated as part of the risk assessment in the NHMP. The risk rating reflects the probability of a hazard weighted against its potential impact on people, property, and the economy. The table also shows the projected climate impacts for each hazard and how hazards have affected the community in the past.

Table 3 Natural Hazards in Camas

Natural Hazard (NHMP Rating[7])	Projected Changes by 2050[8]	Effects on the Community[9]
Extreme Heat (High)	40+ days per year that feel hotter than 90 degrees.	Increased demand for air conditioning, higher utility bills, heat-related illness for sensitive populations and youth at school playgrounds and sports fields, disruption of outdoor activities.
Extreme Precipitation (High)	12% increase in total annual precipitation	Overflowing of streams or rivers, unsafe driving and walking conditions.
Landslide (Medium)	13% increase in heavy rain events	Physical damage to residential and commercial property, energy infrastructure, communication infrastructure, and transportation infrastructure.
Flood (Medium)	17% increase in peak streamflow in Washougal River	Property damage, particularly for older buildings and low-income housing near the floodplain, and temporary or permanent displacement. Temporary closures of businesses and other services.
Wildfire (Medium)	9+ days per year that have high fire danger	Wildfire smoke can impact human health, particularly people with respiratory illnesses or diseases. Increased health risks and property damage for communities near the wildland-urban interface[10].

[7] 2023 CRESA Regional Natural Hazard Mitigation Plan Volume 2 – Planning Partner Annexes
[8] University of Washington's Climate Mapping for a Resilient Washington webtool. Projections are based on a "business as usual" emissions scenario.
[9] Includes effects identified by the Camas community in a 2025 survey.
[10] Clark County Code (15.13.030) defines the wildland-urban interface as areas with elevation in excess of 500 feet and one or more of the following conditions: (a) slope equal to or greater than 25%, (b) forest type vegetation, and (c) outside of an organized fire protection district.

Drought (Low)	14% decrease in summer rains	Impacts to water quality and quantity, decrease in habitat quality and quantity for salmon and other aquatic species.

Vulnerability

Vulnerable Communities

Climate change can impact certain groups of people (vulnerable populations) and areas of the city (overburdened communities) differently. Vulnerable populations are groups of people who are more vulnerable to environmental harms due to socioeconomic factors and other health risk factors (RCW 70A.02.010(14)). Overburdened communities are areas where vulnerable populations experience environmental harms and health impacts (RCW 70A.02.010(11)). Together, vulnerable and overburdened communities are disproportionately impacted by climate change due to the concentration of environmental harms (e.g., air pollution near major roadways) and socioeconomic characteristics (e.g., low income, youth and children). People and communities in Camas who are vulnerable to climate hazards are generally described in the *Our Camas 2045* Equity Framework (see **Introduction** for a description of Equity Communities in Camas).

In addition to communities described in the Equity Framework, CPAT members identified additional communities that could be more vulnerable to climate hazards. These communities include areas that are located near floodplains (such as Lacamas Lake and the Columbia River), near mobile sources of air pollution (such as major roadways), near steep slopes and steep road grades, and/or near the wildland urban interface (e.g., homes adjacent to forested areas).

Vulnerable Assets

In Camas, the impact of climate hazards can depend on the proximity of people and buildings to each hazard. The approximate location of these hazards is shown in Figure 10 Wildfire Hazard Areas and Figure 11 Flood and Landslide Hazard Areas. Climate hazard locations are based on data from publicly available sources such as Clark County's Open Data Hub and include approximate areas of increased risk. While this information provides a visualization of higher risk areas, data may not include all potential risks and data gaps may exist depending on when data was published. Therefore, these figures provide a conceptual understanding of the location of climate hazards and potential effects on the community.

Figure 10 Wildfire Hazard Areas

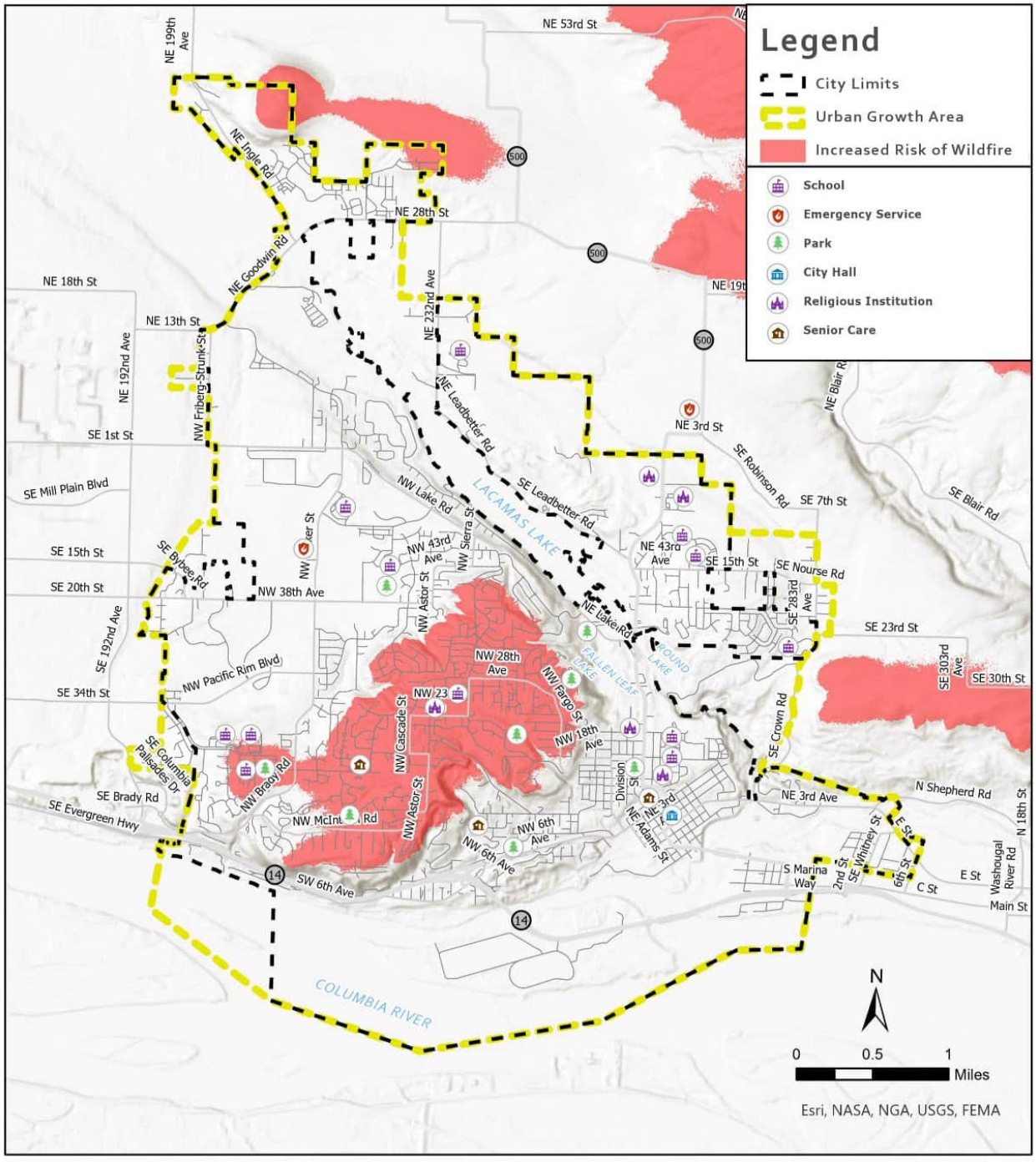
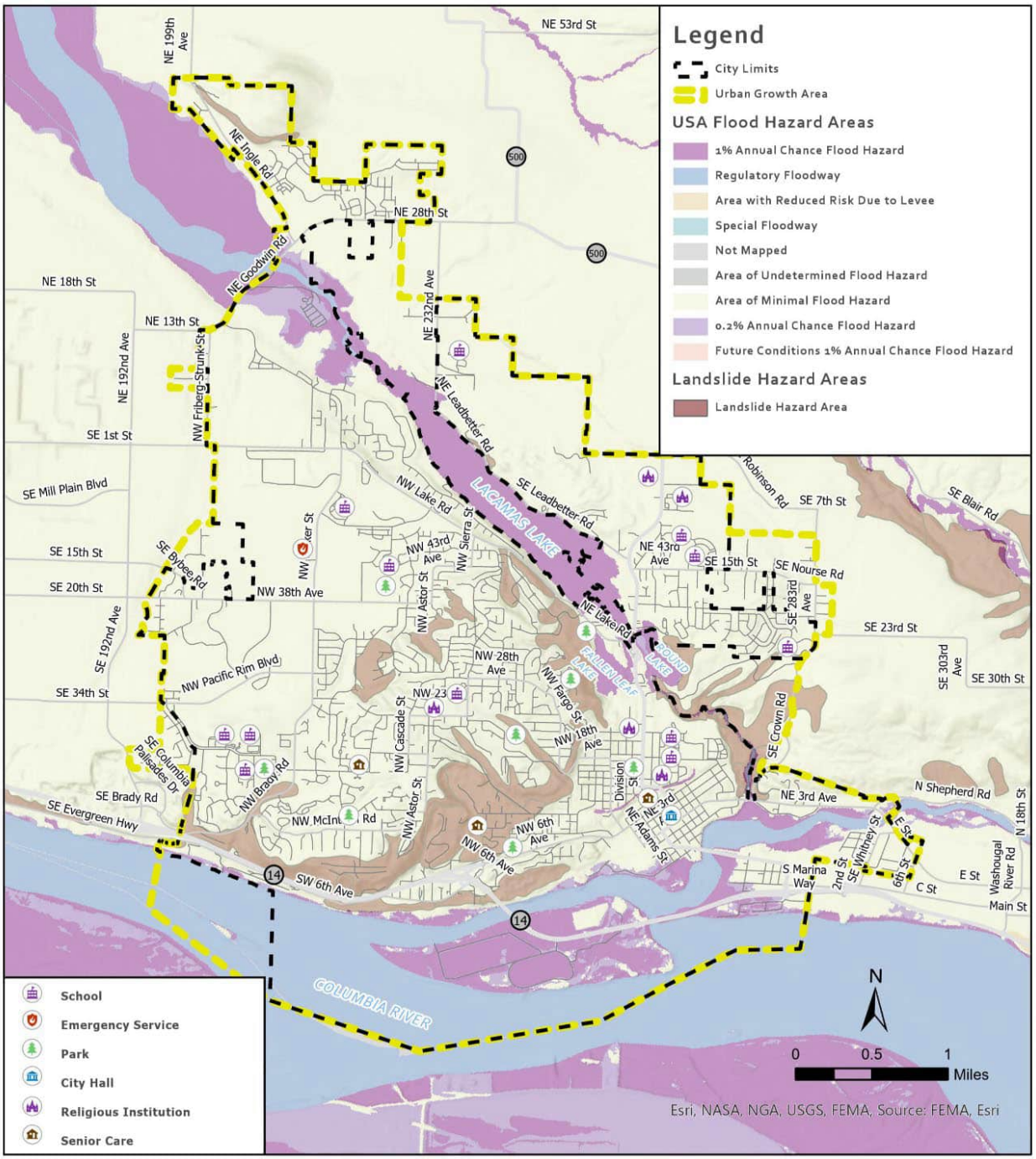


Figure 11 Flood and Landslide Hazard Areas



In Camas, buildings and infrastructure that could be vulnerable to climate hazards include aging water and sewer lines, buildings constructed before adopted seismic codes (e.g., city hall, public works operations center), and high-pressure natural gas lines. High tension power lines may also be vulnerable to severe storms (i.e., wind and ice), homes along the Washougal and Columbia Rivers, including the Georgia Pacific paper mill, may be susceptible to flooding, and the dam at Lacamas Lake could be impacted by an earthquake or flooding.

Extreme heat is one of the highest rated hazards for Camas. Buildings and impervious surfaces such as streets are factors in the urban heat island effect, where urban areas are warmer than surrounding rural or less developed areas. The County's department of public health collected heat data on one day in July 2024 and prepared a heat watch summary report describing how urban heat varies across neighborhoods in the county and how landscape features affect temperature and humidity. Across the county, areas with more buildings and paved surfaces tend to be hotter during the afternoon and evening. In Camas, the hottest areas of the city during the afternoon and evening are near Downtown Camas while cooler areas with more vegetation and shade are in west Camas, northeast of downtown, and near Lacamas Lake.

Vulnerability Assessment

A vulnerability and risk assessment prepared for Camas evaluated the risk of extreme heat on outdoor recreation sites, including (1) Lakes, (2) Parks & Trails, (3) School Playgrounds & Sport Fields, and (4) Downtown Camas. Both vulnerability (sensitivity and adaptive capacity) and risk (probability and magnitude) were evaluated.

The assessment produced composite scores for vulnerability and risk. For the lakes, Lacamas Lake and Round Lake scored high and Fallen Leaf Lake scored low. Under parks and trails, seven scored low, two scored medium, and 11 scored high. School playgrounds and sports fields scored medium (6) and high (6). Lastly, Downtown Camas scored high as it features the hottest area of the city.

To reduce vulnerability and risk, this element includes policies to mitigate the impacts of extreme heat.

Climate Change and Resiliency Goals and Policies

Climate goals and policies are established to meet the State's vision to reduce greenhouse gas emissions, plan for resilience, and support environmental justice. While these goals and policies directly focus on emissions and resiliency, additional policies in other elements of the plan tangentially support these goals. Those policies are noted with a leaf symbol.

Goal CL-1 Energy

Ensure that development and redevelopment projects, including buildings and energy infrastructure (generation, storage, and transmission) are designed to accommodate and use renewable energy, conservation, and efficiency technologies and practices to reduce GHG emissions and increase resiliency to natural hazards.

Policy CL-1.1 Support residents' efforts to improve energy efficiency and resiliency in existing and new residences.

Policy CL-1.2 Encourage renewable energy sources for new and existing buildings.

Policy CL-1.3 Provide commercial buildings, particularly restaurants and food services, with incentives to retrofit buildings for energy efficiency (e.g., grant programs, reduce permit fees, etc.).

Policy CL-1.4 Incentivize and streamline the review process for renewable resource projects.

Goal CL-2 Transportation

Improve the efficiency and resiliency of the transportation system to achieve GHG reduction goals and better withstand natural hazards.

Policy CL-2.1 Promote and complement state and utility incentives to provide electric vehicle charging infrastructure throughout the city, particularly at existing and new multi-family buildings and large employers.

Policy CL-2.2 Provide homeowners and renters information on state and federal tax credits/rebates for electric vehicles, renewable resources and energy efficiency.

Policy CL-2.3 Incorporate projected hydrologic climate impacts into the design and maintenance of water-crossing structures (e.g., climate-smart culverts and bridges).

Goal CL-3 Local Agency Sustainability and Preparedness

Support agencies, districts, and businesses in establishing and achieving their own sustainability goals, initiatives, and programs.

Policy CL-3.1 Support the sustainability initiatives of local agencies, districts, and businesses.

Policy CL-3.2 Support local businesses efforts to bolster climate preparedness and continuity of operations (e.g., develop on-site electricity storage to reduce energy demand during peak hours, incentives to install backup power, building retrofits).

Policy CL-3.3 Support the local economy's resilience to climate disruptions by providing information and resources on how to prepare for extreme heat, flooding, and wildfire.

Policy CL-3.4 Support economic opportunities for green jobs in Camas, including businesses that produce goods or services that benefit the environment and jobs that support business production processes to be more environmentally friendly or use fewer natural resources.

Policy CL-3.5 Develop a sustainable purchasing policy and sustainable construction standards for the City of Camas.

Goal CL-4 Community Health

Protect community health and well-being from the impacts of climate-exacerbated hazards and ensure that the most vulnerable residents do not bear disproportionate health impacts.

Policy CL-4.1 Promote the use of health impact assessments and other tools to identify and address the impacts on health and equity from climate change.

Policy CL-4.2 Develop and implement an urban heat resilience strategy that addresses land use, urban design, urban greening, and waste heat reduction actions.

Goal CL-5 Emergency Preparedness

Enhance emergency preparedness, response, and recovery efforts to mitigate risks and impacts associated with natural hazards.

Policy CL-5.1 Create accessible evacuation plans and outreach materials to help residents plan and practice actions that make evacuation and reunification quicker and safer during a natural hazard event (e.g., notification alerts).

Policy CL-5.2 Develop a comprehensive, communitywide wildfire resilience strategy to improve emergency response capabilities, create fire-resilient landscapes, promote fire-adapted communities, and support the development of community wildfire protection plans.

Policy CL-5.3 Support enhanced data collection for hazard events of all magnitudes to provide a fuller understanding of the community's hazard characteristics.

Policy CL-5.4 Develop resiliency hubs, such as community-serving facilities that support residents, coordinate communication, distribute resources, and enhance quality of life.

Policy CL-5.5 Prepare, plan, and provide ongoing training for those responding to adverse environmental events.

Goal CL-6 Water Resources

Protect and preserve the long-term quality and quantity of Camas' water, and natural and cultural resources from climate change hazards such asdrought and extreme participation.

Policy CL-6.1 Develop and implement a comprehensive drought resilience strategy that factors in projected climate impacts and sets action levels for different drought stages.

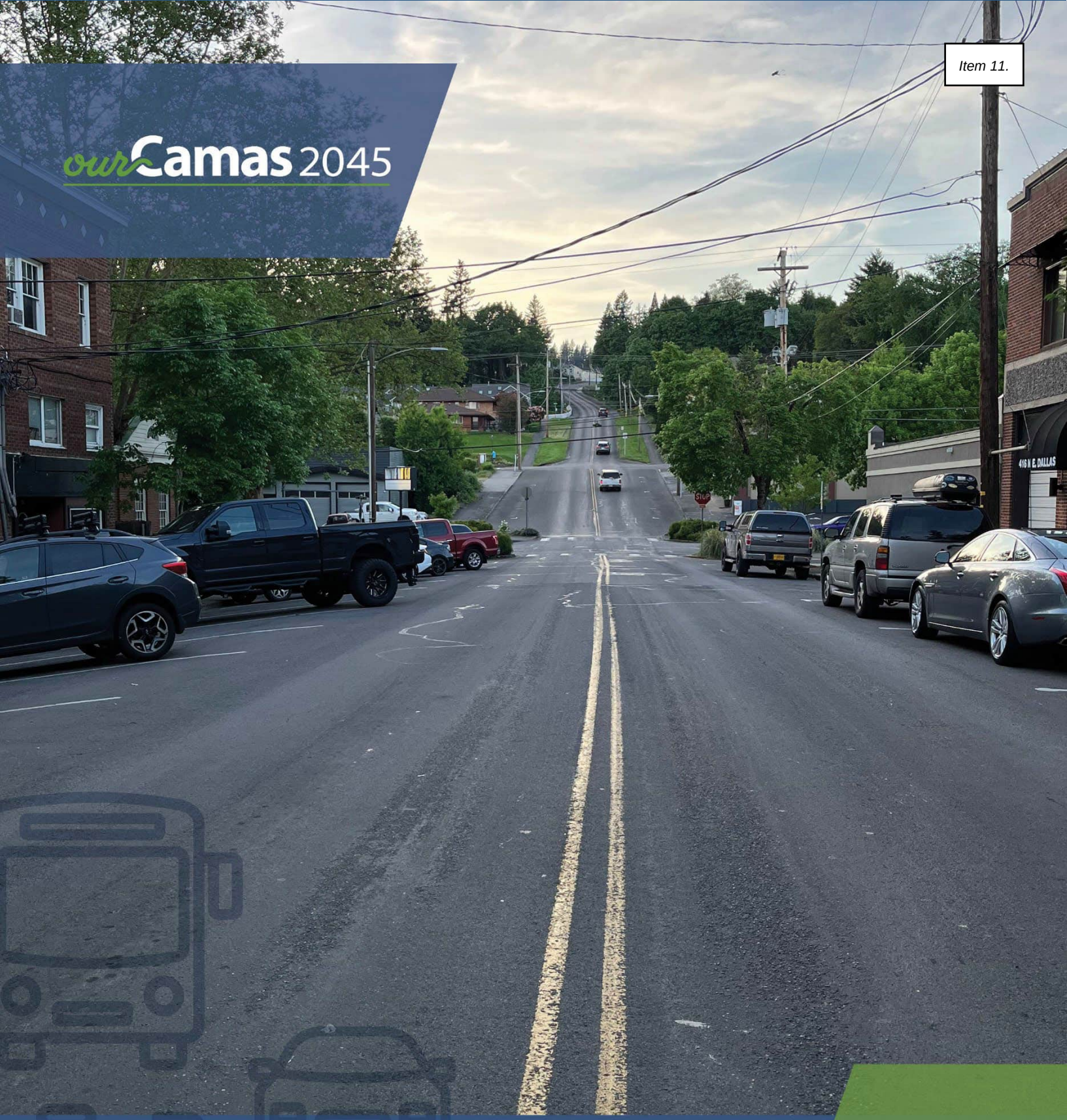
Policy CL-6.2 Evaluate the long-term adequacy of water delivery and storage infrastructure to ensure projected changes in hydrological conditions can be anticipated and managed effectively.

Policy CL-6.3 Implement actions recommended by the Lacamas, Round, and Fallen Leaf Lakes Management Plan to reduce the frequency of harmful algae blooms in lakes due to water pollution and projected changes in climate conditions, including higher temperatures.

Policy CL-6.4 Identify funding mechanisms for mitigation measures recommended by the Lake Management Plan to address the impacts of climate hazards on Lacamas, Round, and Fallen Leaf Lakes.

Policy CL-6.5 Introduce adaptive cooling features at local parks and school playgrounds and sports fields to help mitigate the effects of extreme heat on vulnerable park users and young children.

ourCamas 2045



Transportation

08

08. Transportation

GMA Planning Goal

Encourage efficient multimodal transportation systems that will reduce greenhouse gas emissions and per capita vehicle miles traveled, and are based on regional priorities and coordinated with county and city comprehensive plans.

Vision

In 2045, residents of Camas continue to appreciate their safe transportation infrastructure that equitably serves all users.

Introduction

As part of the comprehensive plan periodic update, the City of Camas reviewed and updated its Transportation System Plan (TSP). The TSP is adopted by reference and included as Appendix X. The TSP is a long-range plan to guide transportation investments for Camas and its UGA for the planning horizon to 2045. The TSP provides the following:

- Inventory of the current transportation system for all modes of travel
- Summary of land use assumptions used for estimating travel demands
- Summary of level of service (LOS) standards
- List of actions to address deficiencies
- Forecast of traffic demand for twenty years
- System needs to meet the current and forecasted demand
- Six-year Transportation Improvement Plan (TIP)

These items are foundational to a comprehensive plan and integral to implementing the Land Use plan.

The transportation element is one of the main parts of the comprehensive plan and is an effective tool for shaping the city's future development patterns. Growth and development patterns have a major influence on the fiscal health of local governments and on the economic performance of the community. The nature of public streets can shape the level of traffic congestion, the use of multiple modes, and the character of neighborhoods. Related requirements, such as parking and loading, will influence the cost to develop in a community and can present both opportunities and barriers to how people can access homes, schools, recreational opportunities, and businesses within the community and in the region.

Ownership, control, development, and the operation and maintenance of streets and public rights-of-way are primary functions of local governments. A transportation system is one of the most expensive facilities a community will construct, operate and maintain. Each new facility adds an asset to the city's portfolio, but it also must be managed, resulting in an incremental increase in operating costs and a new set of maintenance, preservation, and rehabilitation obligations.

Decisions about transportation facilities greatly influence the safety and security of the community. How the streets, roads and other transportation facilities are designed, built and maintained will influence safety in multiple ways for all users.

Federal, state, county and city transportation systems are interrelated, so coordination with other units of government is essential. Responsibility for transportation systems spans all levels of government. The Camas transportation network connects to state highways, neighboring city streets and adjacent county roads and indirectly to federal and interstate highways. It also interacts with transportation facilities operated by other special purpose districts like C-TRAN and for-profit businesses. Moreover, the public does not experience the transportation system as a series of separate systems, but as a single, unified system, and it expects all the parts to function in an integrated fashion.

The GMA requires the transportation element to implement and be consistent with the land use element. Counties and cities should use consistent land use assumptions, population forecasts, and planning periods for both elements. Coordination of the land use and transportation elements must be dynamic and iterative with an ongoing feedback loop coordinating land use and transportation in the plan development and in local implementation. The transportation element is also required to be consistent with state and regional plans. The transportation element is certified by the regional transportation organization, which is the Southwest Washington Regional Transportation Council (RTC), to ensure consistency with the regional transportation plan (RTP).

Performance Standards

Level of Service (LOS)

The TSP includes level of service as a measure of performance standards for motor vehicles. A LOS "D" and a vehicle to capacity (v/c) ratio not higher than 0.85 is the minimum performance standard during the highest one-hour period of the day for signalized, all-way stop and roundabout controlled intersections under City jurisdiction. These standards shall be applied to the intersection as a whole.

A LOS "E" and a v/c ratio not higher than 0.90 is the minimum performance standard during the highest one-hour period of the day for two-way stop and yield controlled intersections under City jurisdiction. These standards shall be applied to all intersection approaches serving more than 20 vehicles. Mobility standards do not apply to approaches at intersections serving 20 vehicles or fewer during the highest one-hour period of the day8. This mobility standard allows

more flexibility in the tension between larger intersection and street designs that are sometimes needed to accommodate peak vehicle demands, and the desire to maintain smaller designs that encourage slower vehicle speeds and tend to be more accommodating to pedestrian and bicycle users.

Level of Service for Highways of Statewide Significance is set by the State. In Clark County, the standard is set as LOS "D" for urban areas, including SR 14. Level of Service for regional state highway facilities (not part of the HSS), including SR 500 in Camas, is set through the Southwest Washington RTC. The Southwest Washington RTC Board adopted LOS 'E' or better for non-HSS urban state highway facilities.

As part of the City's TSP update, forecasted 2045 motor vehicle volumes for peak hour conditions were utilized to determine areas on the baseline roadway network that will be congested and may require future investments to accommodate forecasted growth. The corridors recommended to prioritize for improvements include:

- SR 500-NE Everett Street between NE 23rd Avenue and SE Leadbetter Road
- NW 6th Avenue between Norwood Street and Adams Street
- NE 3rd Avenue between NE Dallas Street and SE Lechner Street

Level of Traffic Stress (LTS)

The TSP includes Level of Traffic Stress (LTS) to measure the comfort of those who are walking, biking or rolling on streets shared with vehicles. The best way to make these facilities comfortable to use while walking, biking and rolling is with space, separation, and visibility. The specific application depends on the conditions of each street. LTS is measured on a scale of one to four. A road with an LTS of 1 is best and is suitable for all users. A road with an LTS of 4 has the highest level of stress for a user and is typically used by those with a high level of confidence or those who don't have an alternative option. The TSP indicates LTS 2 is the standard, meaning streets should be comfortable for most adults, including most adults experiencing disabilities. There may be some separation between pedestrians and vehicles, though no physical barrier.

Travel Demands and Characteristics

The number of people who choose to walk, bike, ride transit, or drive alone with the distances they travel is important for assessing how well existing transportation facilities serve the needs of users. Available data on travel demand, travel mode choice, and trip length are used to better understand travel behavior in the community and inform the needs analysis for the transportation system. This data is largely derived from the US Census Bureau on employment-based trips; however, no other travel data is available from this source. The following sections provide a summary of travel demands and characteristics in the City's planning area.

Commuter Trips

Much of the traffic in the Camas planning area, especially during the more congested weekday peak periods, is related to employment. In other words, how do people get to and from work

from their place of residence. People who live in Camas and who are employed overwhelmingly commute to work outside of the planning area (87 percent), while jobs in the planning area are overwhelmingly filled by people who live outside of the planning area (83 percent).[11]

In terms of the predominant travel mode, on average, almost 75 percent of employed residents in the Camas planning area commute to work using single-occupant motor vehicles. About 8 percent of residents carpool to work and the remaining 17 percent work from home, walk, bike, take transit, or use some other means of travel[12].

About 11 percent of employed residents in the Camas planning area worked from home pre-COVID, and that figure likely increased due to COVID-19. It seems likely that a higher percentage of workers will continue a hybrid work schedule that includes teleworking, at least part time. Any increase in the hybrid work week (e.g. 2-3 days in an office with the balance at home or some other remote location) will change the demand on the transportation network, including when and how people travel.

Transportation Demand by Mode

Pedestrian, bicycle, and motor vehicle traffic counts were conducted at key intersections throughout Camas on typical weekdays[13]. This information indicates where and when travel demand is highest for each mode of travel. It also provides a basis for assessing how well existing transportation facilities are able to meet the needs of users during peak demand periods.

- Pedestrian volumes during the PM peak hour are generally highest near downtown Camas, including along NE 3rd Avenue and NE Adams Street (the traffic count summary is included in the appendix). The highest hourly pedestrian activity during the evening peak occurred at the NW Sierra Drive intersection with NW 28th Avenue, near Dorothy Fox Elementary school, with 30 pedestrian crossings in the one-hour period. Other study intersections with more than 15 pedestrian crossings during the one-hour period included many downtown locations such as NE 6th Avenue at NE Adams Street, NE 3rd Avenue at NE Dallas Street, NE 3rd Avenue at NE 4th Street, and Weir Road at NE 3rd Avenue, near the border of Camas and Washougal.
- Bicycle volumes indicate limited biking, with the highest volumes along NW Lake Road, and NW Sierra Street (the traffic count summary is included in the appendix). During the evening peak hour, 20 of the 50 study intersections had no observed bicyclists during the one-hour period. The NE Lake Road at SR 500, NW Lake Road at NW Sierra Street, NW Lake Road at NW Leadbetter Drive, NW Sierra Street at NW 45th Avenue, and NE 6th Avenue at NE Garfield Street intersections had the highest observed bicycle volumes, with 4 or more bicyclists counted during the single hour at each of the intersections.

[11] US Census Bureau, OnTheMap. Home/Work Distance/Direction Analysis, 2015.
[12] US Census Bureau, 2012-2016 American Community Survey
[13] Based on counts conducted in April of 2018.

- Motor vehicle volumes on the roadways in Camas (the traffic count summary is included in the appendix) most commonly peak during weekday evenings between 4:50 and 5:50 p.m. The highest hourly motor vehicle volumes during the evening peak occurred along the NW 6th Avenue corridor between the SR 14 ramps and NE Adams Street, with more than 1,300 trips during the one-hour period. This corridor is the primary entrance into Camas from eastbound travel. The NE Lake Road at NE Everett Street, and NW 6th Avenue at SR 14 Ramps intersections had the highest observed volumes, with more than 1,800 entering vehicle trips during the single hour at each of the intersections.

Active Transportation Networks

Camas is a community with an active citizenry and, therefore, requires a fairly robust active transportation system that includes pedestrian and biking facilities. The TSP inventoried the pedestrian and biking facilities, listed gaps in the systems, and assessed the facilities for how a pedestrian and bicyclist experiences them.

Multimodal Network Design

The design of the streets in the City's planning area is based on the network classifications and area designation. All streets in the planning area are multimodal and include travel lanes and on-street parking for vehicles, sidewalks for pedestrians, and on-street or separated facilities for bicyclists. Accommodating these modes varies by the functional classification and area designations. For a typical street cross-section, the functional classification determines the minimum design requirements for the number of vehicle travel way lanes and on-street parking, and the minimum acceptable bike facility, and the area designation is used to determine the minimum acceptable design for pedestrian facilities, and the minimum travel lane and median/turn lane width. Together, these cross-section standards identify the design characteristics needed to meet the function and demand for each facility type for streets in the City's planning area. Since the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, this system allows standardization of key characteristics to provide consistency.

The typical designs are intended to be implemented in newly developing or redeveloping areas of the City's planning area, where constrained conditions do not limit the ability to construct the typical cross-section. A variety of physical and natural constraints may prevent adherence to the multimodal network design requirements. A deviation to the street standards may be requested from the City Engineer or City Engineer's designee with justification of constraints to consider a constrained cross-section or other adjustments.

Pedestrian Network

Walking supports healthy lifestyles, is an easy and economical way to travel, and is well-suited for people of all ages and abilities. In this plan, "walking" and "pedestrian" are terms that include people who walk independently or use canes, wheelchairs, or other walking aids, or strollers. Approximately two percent of commuters in the city walk to work, with three percent

utilizing public transportation, which often includes walking at the beginning or end of the trip.[14] In addition to the work commute trips, walking trips are made to and from recreational areas, shopping areas, schools, and other key destinations in the community. Continuous and direct sidewalk connections to all key destinations and along all streets, in addition to safe crossing opportunities along major roadways, are essential to encourage walking and transit use.

A pedestrian network assessment of streets, showing the extent to which the walking network on collector and arterial streets provides a level of comfort and safety for users, was completed throughout the city. About 30 percent of the collector and arterial street miles in Camas were rated "good (i.e., level of traffic stress (LTS) 2)" or "excellent (i.e., LTS 1)" for pedestrians. However, over 35 percent of the collector and arterial street miles rate poorly (i.e., LTS 4). Most of the street miles rated "poor" are located in high growth areas, be that housing or business growth. The pedestrian network in these areas is largely unimproved due to the once rural nature of the surrounding land use. As future urban development occurs, pedestrian facilities will improve in those areas. Overall, the pedestrian network rates relatively high near downtown, and generally poorer towards the edges of the city. See Figure 13 for an inventory of the pedestrian network.

Bicycle Network

Cycling is important for both transportation and recreation in the Camas planning area. This includes people who bike to work and school, bike for recreation or running errands. Approximately one percent of commuters in the city bicycle to work[15]. Riding bicycles also plays a key role in the transportation system's ability to support healthy and active lifestyles and provide a viable alternative to the automobile. Continuous bicycle connections between all activity generators and arterial/collector roadways are desirable to allow for safe and attractive non-motorized travel options.

The bicycle network in the City's planning area, shown in

Figure 12, is composed of bike lanes, roadway shoulders, shared roadways, and shared-use paths.

- Bike lanes are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. Bike lanes are most appropriate for arterials and collectors, where high traffic volumes and speeds warrant greater separation of the travel modes. Significant segments of continuous bicycle lanes exist along portions of NW Lake Road, NW 38th Avenue, NW Parker Street, NW Friberg-Strunk Street, and SR 500.
- Shoulder bikeways are paved with striped shoulders wide enough for bicycle travel. A six-foot paved shoulder is desired to adequately provide for bicyclists, with a four-foot minimum width in constrained areas. Roadways with shoulders less than four feet are

[14] US Census Bureau, 2012-2016 American Community Survey
[15] US Census Bureau, 2012-2016 American Community Survey

considered shared roadways. Some shoulder bikeways are signed to alert motorists to expect bicycle travel along the roadway

- Shared roadways include those on which bicyclists and motorists share the same travel lane. The most suitable roadways for shared bicycle use are those with low speeds (25 mph or less) and low traffic volumes (3,000 vehicles or fewer per day). Shared roadways, often signed as bicycle routes, serve to provide continuity to other bicycle facilities (e.g., bicycle lanes) or can be designated as a preferred route through the community. Shared roadways can have signs that highlight a special route or provide directional information in bicycling minutes or distance. Most local roadways in the city are considered shared roadways, but do not have signs or pavement markings, although some are planned to be improved in the TSP.
- Shared-use paths provide off-street travel for bicyclists and pedestrians, and are wider than an average sidewalk (e.g., 10 – 14 feet). Shared-use paths are typically paved (asphalt or concrete) but may also consist of an unpaved smooth surface, such as compacted gravel, as long as it meets Americans with Disabilities Act (ADA) standards. Paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout the residential neighborhoods.

A bicycle network assessment of streets in Camas shows the extent to which the bicycle network on collector and arterial streets provides a level of comfort and safety for users. About 20 percent of the collector and arterial street miles' in Camas rate "good (i.e., LTS 2)" or "excellent (i.e., LTS1)" for bicyclists. However, about 65 percent of the collector and arterial street miles' rate poorly (i.e., LTS 4) for bicyclists.

Overall, the bicycle network rates relatively high on the northwest side of the city and poor on the south and east side. The streets with the lowest ratings are the streets important for local and regional through travel (e.g. portions of NW 6th Avenue, NE 3rd Avenue, and SR 500), where many businesses and services are located. These streets rate low due to the relatively high motor vehicle traffic volumes and speeds and lack of separated bicycle facilities.

Transition Plan for Transportation

Title II of the Americans with Disabilities Act requires cities to establish a transition plan for transportation. The plan shall, at a minimum:

1. Identify physical obstacles in Camas' facilities that limit the accessibility of its programs or activities to individuals with disabilities;
2. Describe in detail the methods that will be used to make the facilities accessible;
3. Specify the schedule for taking the steps necessary to achieve compliance and, if the time period of the transition plan is longer than one year, identify steps that will be taken during each year of the transition period; and
4. Indicate the official responsible for implementation of the plan.

Camas has a relatively well-developed pedestrian network that is also potentially suitable for those who use mobility devices. The network is composed of sidewalks, shared-use paths and pedestrian trails, and other accessways. A large part of downtown Camas was developed prior to 1950, a time in which sidewalks were incorporated into the design of neighborhoods and streets. Although most areas incorporated into Camas over the following decades have sidewalk coverage, a few areas have noticeable gaps that do not make for a complete sidewalk network. These gaps are most significant in southwest, southeast, and northeast Camas, and on roadway segments outside city limits. Paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout residential neighborhoods. Unpaved pedestrian only trails are scattered throughout the city.

Many intersections in older parts of the city lack ADA-compliant ramps, which provide important connections between sidewalks, making it easier to cross streets and handle the vertical drop at curbs. Knowing these conditions, the city has been recently installing new curb ramps in many of these locations. The presence of curb ramps is fairly consistent along streets in downtown Camas, and in the newer neighborhoods in the city. Additional work is required by the City to ensure all existing and future sidewalks have curb ramps.

About 38 percent of street miles (including City arterial, collector and local streets) lack sidewalk coverage along one or both sides (see Figure 13). These gaps are more common along arterial streets than collector streets, at 40 and 23 percent, respectively, of the street miles with no sidewalk on either side. These numbers do not incorporate off-street shared-use paths that may run alongside some roadways. Any future streets constructed in association with development projects will be required to construct sidewalks with curb ramps, increasing the overall sidewalk supply.

Transportation Projects and Priorities

This section describes the transportation system improvement projects- multimodal street improvement, intersection improvement, pedestrian/bike improvement, transit enhancement, and demand/system management – to address the system needs identified in earlier text.

The list of projects was developed through three main sources including stakeholders, relying on previous plans (such as the North Shore Subarea Plan), and independent project team evaluation.

The full list of projects is identified to improve the transportation network along major streets in the City's planning area, regardless of their priority or their likelihood of being funded. The TSP focuses on streets in the planning area with a functional classification of Collector or higher. Additional improvements will occur with private development in the planning area, including the build-out of the local street network consistent with the applicable standards.

The planning process from the TSP screens candidate projects to set aside those that may not be feasible due to environmental or existing development limitations. The remaining projects

are a combination of new and previous ideas for the transportation system that seek to address the gaps and deficiencies in the city.

The full project list, included as Appendix X, includes 99 projects totaling over $180 million in total investments. For the purposes of cost estimates, project design elements are identified, however, the actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City, WSDOT, Clark County, and/or other partner agency approval. The projects were assigned to one of several categories:

- Multimodal Street Improvement - these projects will improve or construct new multimodal streets throughout the planning area, each with facilities for motorists, pedestrians, and bicyclists. A total of 29 projects have been identified that, as of 2024, will cost an estimated $72 million to complete.
- Intersection Improvement – these projects will improve safety and mobility at intersections throughout the planning area. A total of 19 projects were identified to construct new or improve existing intersections that, as of 2024, will cost an estimated $64 million to complete.
- Pedestrian/Bike Improvement – these projects include stand-alone sidewalk, path and roadway crossing improvements, and an integrated network of bicycle lanes, marked on-street routes and shared-use paths to facilitate safe and convenient travel citywide. A total of 39 pedestrian and bicycle projects were identified that, as of 2024, will cost an estimated $38 million to complete.
- Transit Enhancement – these projects will enhance the quality and convenience for transit passengers. One transit project was identified that, as of 2024, will cost an estimated $1 million.
- Demand/System Management – this will encourage more efficient usage of the transportation system. Two projects were identified that, as of 2024, will cost an estimated $450,000.

Transportation Facility Maps

Figure 12 Bicycle Facilities

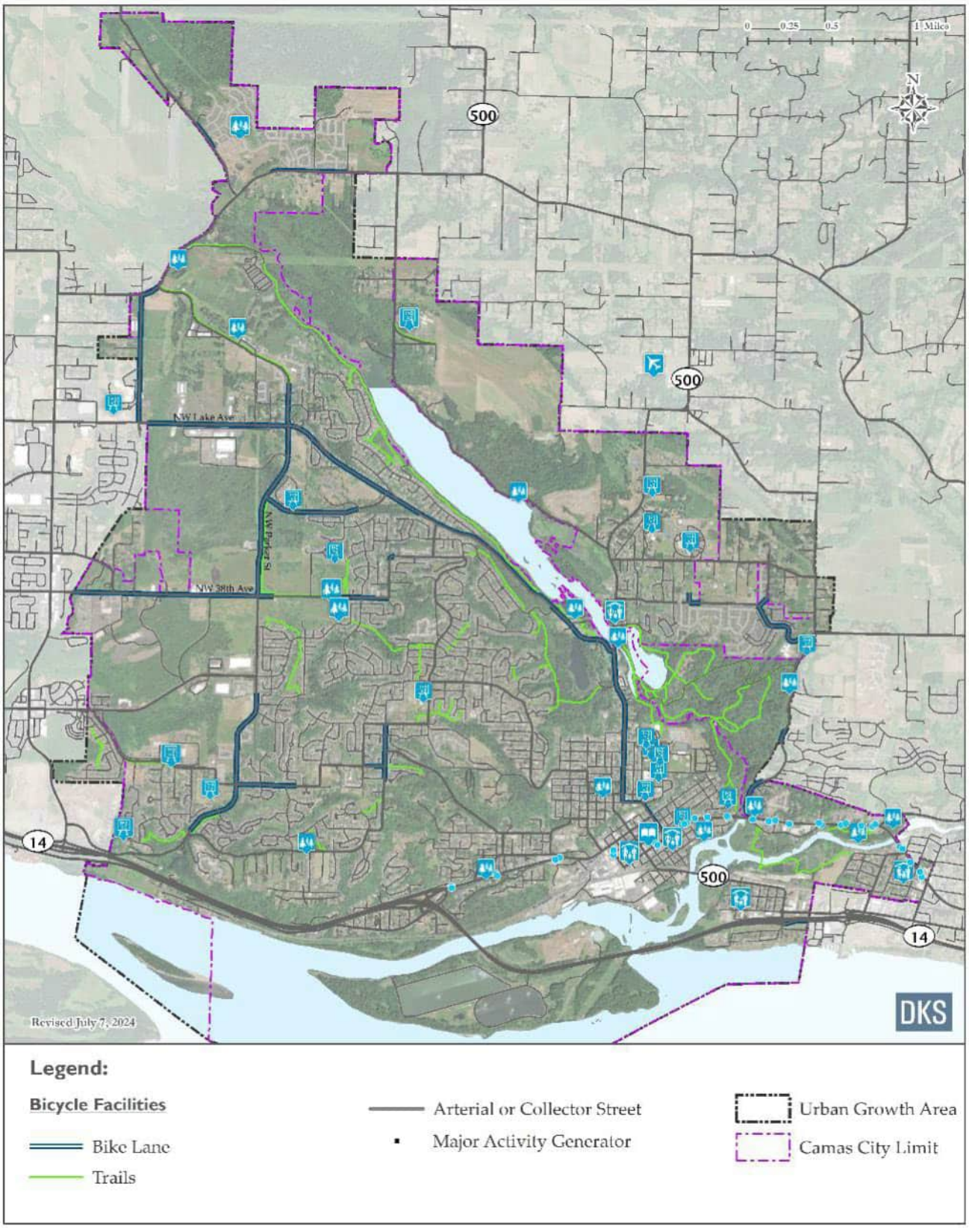


Figure 13 Pedestrian Facilities

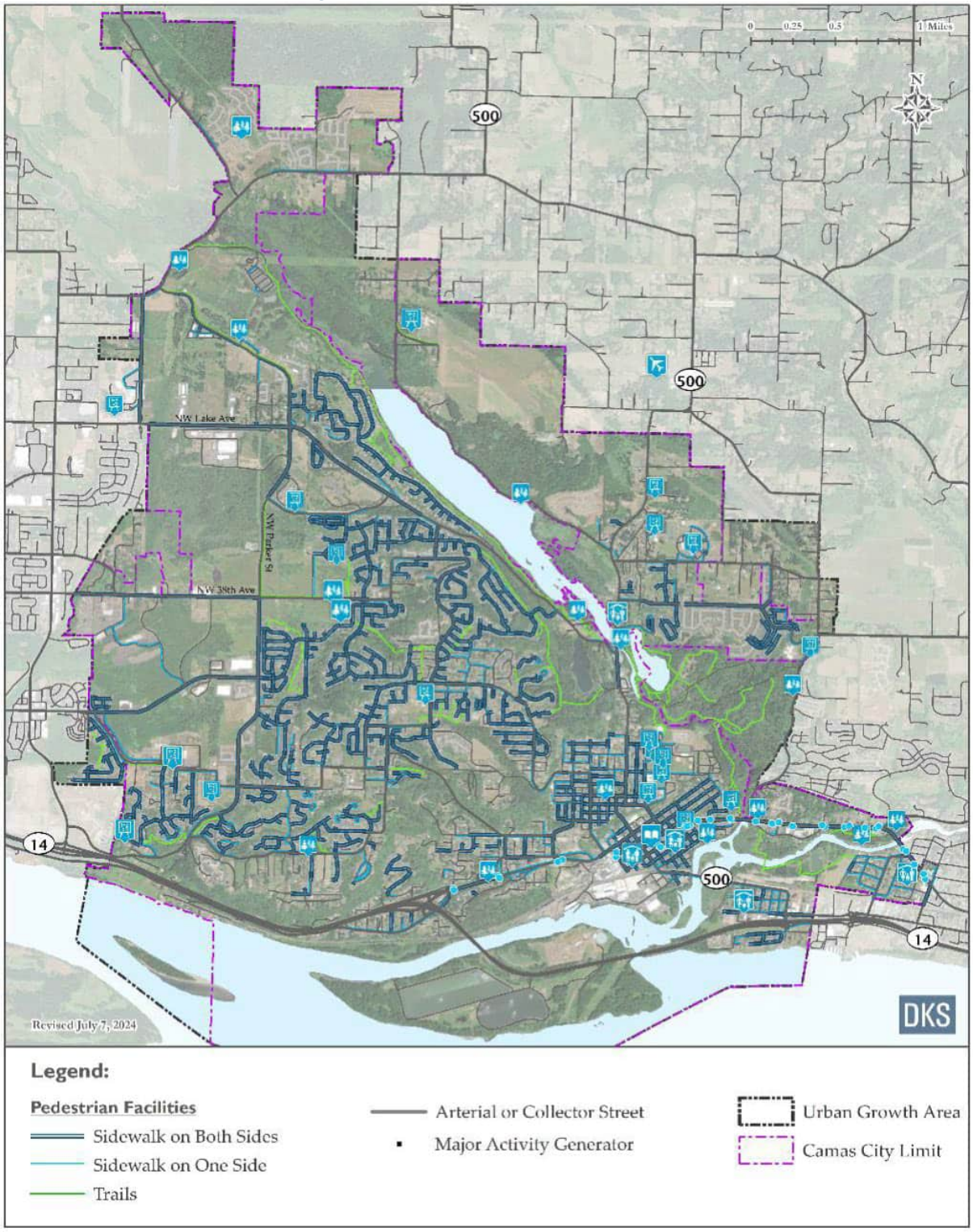


Figure 14 Street Network

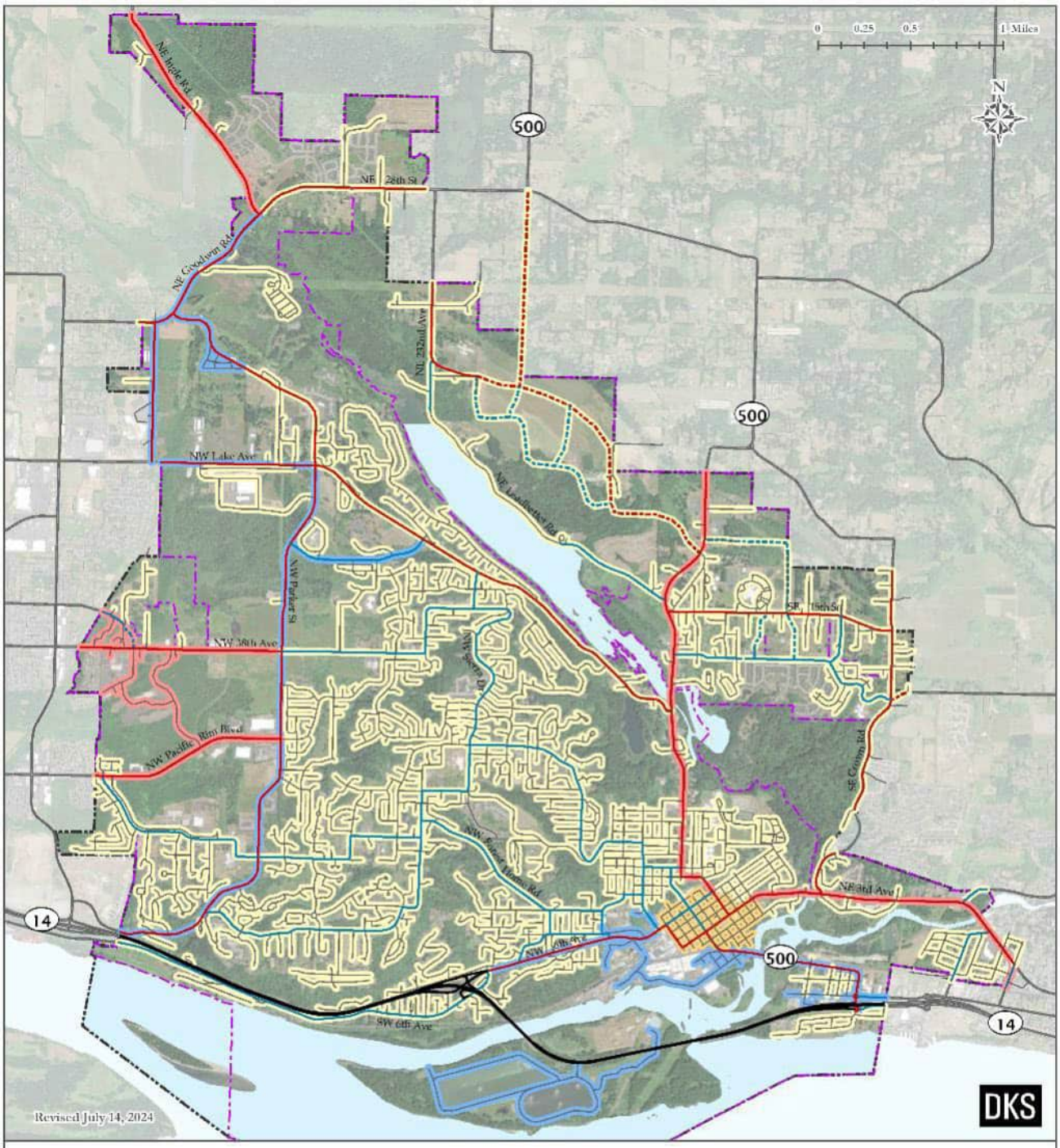
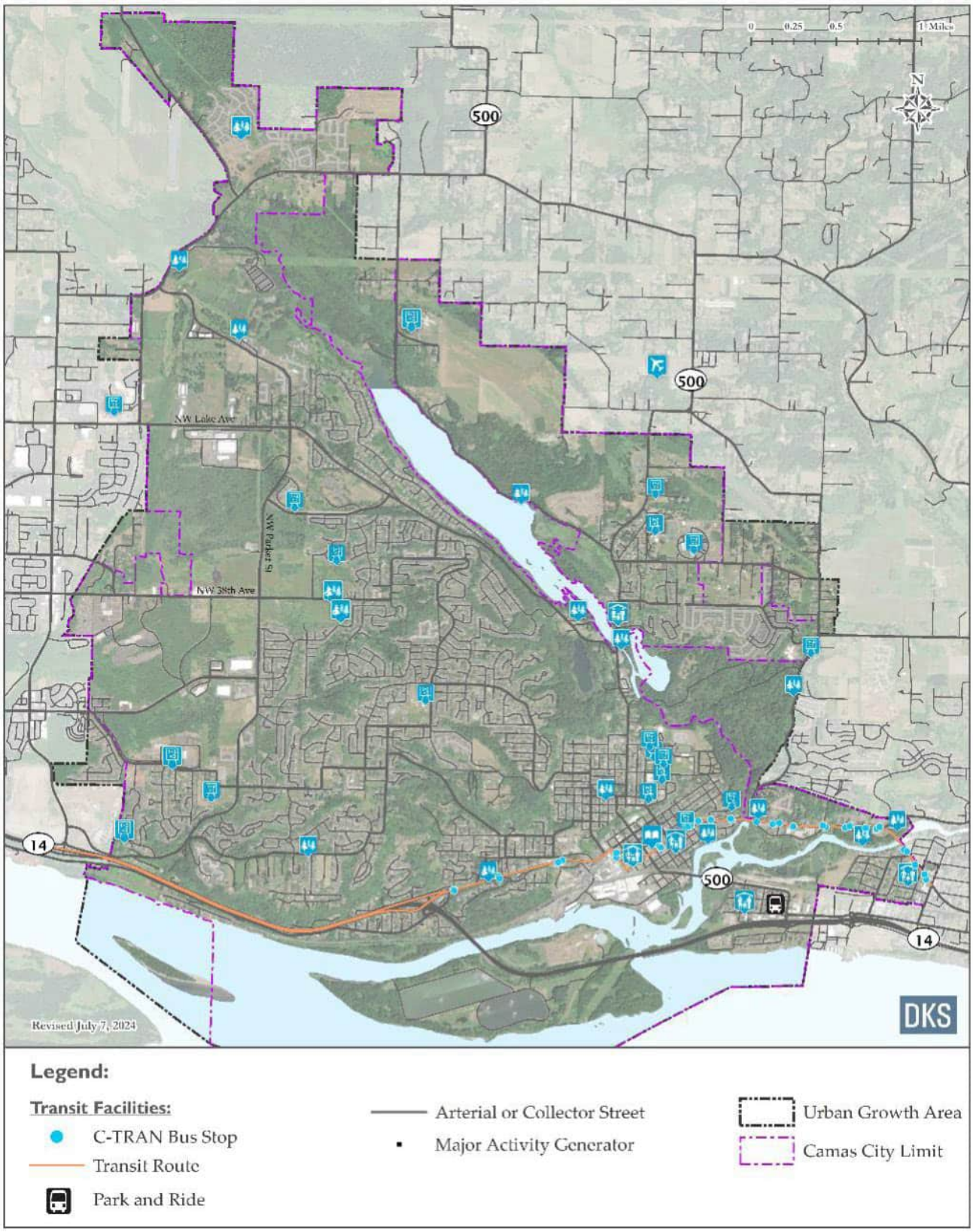


Figure 15 Transit Facilities



Transportation Goals and Policies

Goal TR-1 Complete Streets

Streets will function for all users of all abilities including bicyclists, pedestrians, transit users, and motorists.

Policy TR-1.1 Implement the Transportation System Plan (TSP) to maintain the livability of Camas and guide decision-making for transportation-related projects, policies, and design. Ensure consistency between the TSP, the Parks, Recreation and Open Space Plan and the 6-year street plan.

Policy TR-1.2 Maintain the transportation system to enhance safety and efficiency for all users, facility aesthetics, access management measures and the overall integrity of the system.

Policy TR-1.3 Construct streets that are interconnected and avoid long cul-de-sacs or dead ends. Block lengths should be less than 1,000 feet. Include pedestrian and bicycle linkages in the construction of cul-de-sacs and other forms of dead-end streets. Existing dead-end streets should be retrofitted to provide bicycle and pedestrian linkages as practicable.

Policy TR-1.4 Develop and implement design standards that provide attractive streetscapes, encourage appropriate traffic volumes and speeds, and support multi-modal safety. Include enhanced roadway features such as roundabouts, decorative lighting, and landscaping in gateways and design overlay areas.

Policy TR-1.5 Minimize access to new development and redevelopment along City arterials and consolidate access points when spacing is insufficient.

Policy TR-1.6 Provide routes designed for active transportation to encourage mode shift for short trips. Route planning should seek shortcuts and other opportunities that provide advantages to active transportation users. Public investments should support active transportation routes such as street lighting, safe crosswalks, and protected bike lanes.

Policy TR-1.7 Coordinate with Camas School District to implement a safe routes to school program to encourage the use of alternative and active transportation.

Policy TR-1.8 Develop and implement Complete Streets design in all new and retrofit street projects to support the use of alternative travel modes. Adopt engineering design standards consistent with Complete Streets goals.

Policy TR-1.9 Increase wayfinding signage for outdoor destinations throughout the City.

Policy TR-1.10 Inventory current bicycle and pedestrian networks to identify gaps in route coverage. Support filling in network gaps as new development and redevelopment occurs to create a bicycle and pedestrian network that is safe, comfortable, and accessible to people of all ages and abilities.

Policy TR-1.11 Minimize cut and fill roadway design and, where feasible, minimize restructuring the natural contours of the land.

Policy TR-1.12 Encourage the inclusion of low impact development (LID) design features (e.g. rain gardens, grass pavers, pervious pavement) in the design of road surfaces.

Policy TR-1.13 Require LED lights in new development and replace existing inventory that lack LED features.

Goal TR-2 Local and Regional Transit

Regional transit will provide safe, efficient, and dependable service to the Camas community for a variety of trips within and outside of the city.

Policy TR-2.1 Coordinate with local municipalities, Washington Department of Transportation, adjacent counties, and C-TRAN to ensure that minimum roadway and multi-modal design standards are consistent.

Policy TR-2.2 Partner with C-Tran to advocate for and develop transit options that are safe, convenient, frequent, and accessible for Camas residents.

Goal TR-3 Traffic Safety

Design and construct safe transportation facilities that meet applicable requirements.

Policy TR-3.1 Encourage traffic safety through education, enforcement, and engineering. Use traffic calming, traffic diversion, and other available tools such as landscaping, trees, and art to ensure a comfortable and safe environment for all users.

Policy TR-3.2 Provide adequate access for emergency vehicles throughout the city.

Policy TR-3.3 Develop safe pedestrian and bicycle routes between residential areas, schools, and public facilities.

Policy TR-3.4 Require new development to implement designs standards using the Neighborhood Traffic Management Plan.

Policy TR-3.5 Identify high accident areas and implement specific measures to reduce accident occurrences.

Goal TR-4 Transportation Demand Management

Transportation planning will achieve the efficient use of transportation infrastructure, increase its person carrying capacity, and accommodate and facilitate future growth consistent with land use objectives.

Policy TR-4.1 Require large employers to implement a commute trip reduction program for employees, as mandated by state law.

Policy TR-4.2 Support intergovernmental development review.

Policy TR-4.3 Support the Regional Transportation Council (RTC) with funding and staff participation to the extent possible.

Goal TR-5 Concurrency and Level of Service

The City will maintain the adopted LOS standards for all arterial streets and transit routes.

Policy TR-5.1 Encourage growth in areas with existing or planned infrastructure capacity.

Policy TR-5.2 Require new development to demonstrate that adequate person trips are available, or that multi-modal improvements to the transportation system will be made to accommodate the impacts concurrent with the development.

Policy TR-5.3 Utilize traffic impact fee studies, development traffic impact analyses, and corridor studies to identify deficiencies and plan improvements to maintain or improve LOS standards.

Policy TR-5.4 Take the following actions (in no priority order) if the probable funding falls short of meeting identified needs: 1) delay development until programs, facilities, or services can be funded; 2) obtain the revenue needed or revise the transportation plan to reflect known financial resources; or 3) change the transportation LOS standard, which is a last resort measure.

Goal TR-6 Transportation Revenue

Maximize the use of state and federal funds for transportation capital, operating, service, and demand improvements.

Policy TR-6.1 Maintain a capital improvement plan (CIP) that identifies construction and improvement priorities and funding.

Policy TR-6.2 Ensure that the transportation impact fee program responds to land use changes, supports connectivity, and requires new development to pay its proportionate share of needed capacity.

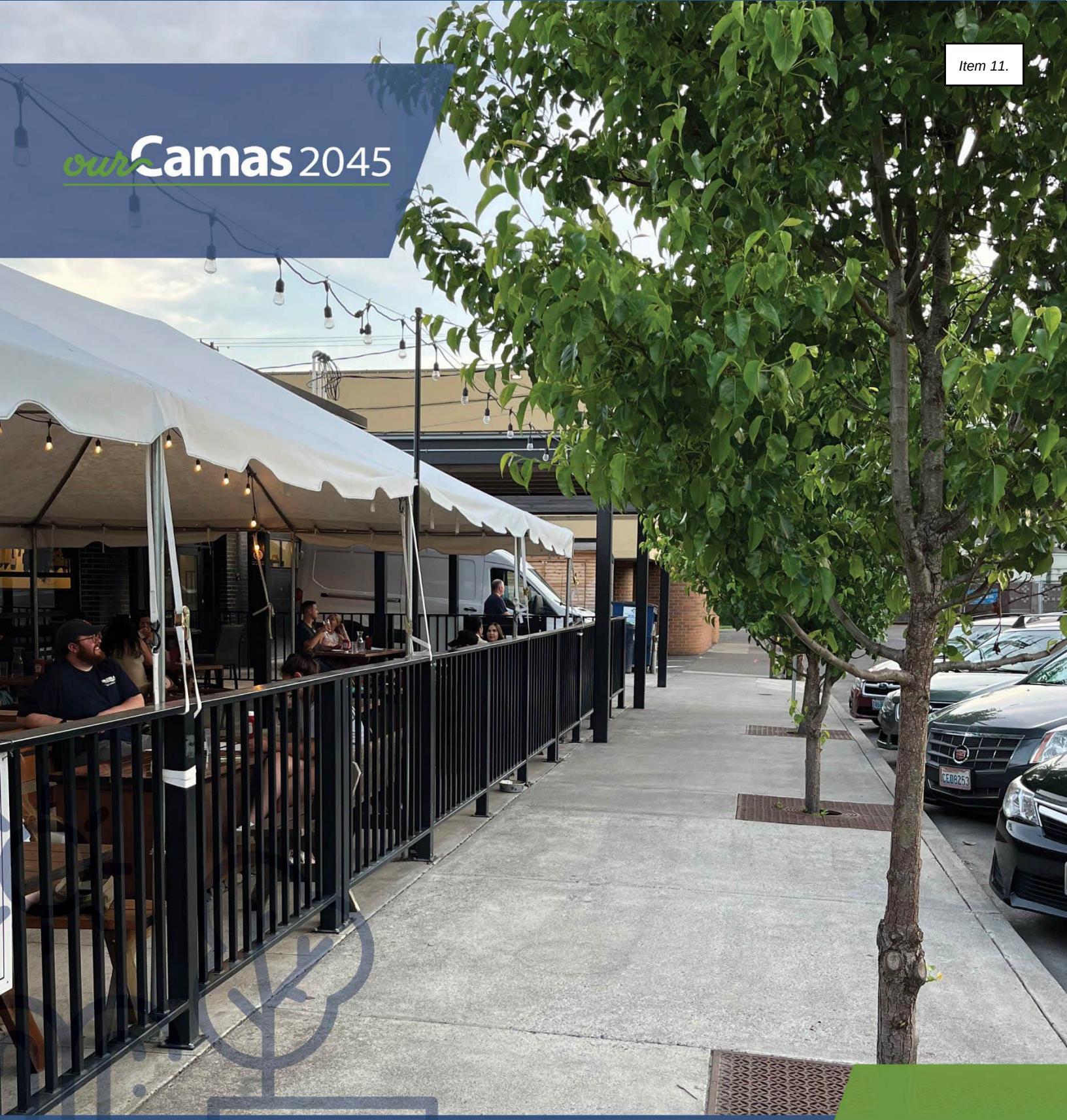
Policy TR-6.3 Support the Pavement Asset Management System and other maintenance programs to ensure cost-effective maintenance of transportation facilities and efficient use of public funds.

Policy TR-6.4 Develop equitable transportation impact fees to assess developers a fair-share contributions for any transportation improvements.

Policy TR-6.5 Prioritize transportation funding for multi-modal improvements that will enhance safety and access between infill areas, schools, and employment centers.

Policy TR-6.6 Focus transportation projects in economic development areas to act as catalysts for job growth.

ourCamas 2045



Public Facilities & Services

09

09. Public Facilities & Services

Purpose

Plan for adequate facilities that are consistent with the other elements, goals and policies of Our Camas 2045, can accommodate the projected population and employment growth and land use plan, and based on sound fiscal policies for the City.

Vision

In 2045, Camas residents enjoy the city's parks, trails, community centers, and other recreational opportunities. The school district draws families to the community and the library continues its vital role as a place of learning. Residents value accessible police, fire, and emergency response services. Proficient government agencies maintain existing City assets and coordinate future development.

Introduction

The City of Camas is a full-service community that offers a breadth of public facilities, services, and utilities. Public facilities include such things as City Hall, the Camas Public Library, the Public Works Operation Center, Lacamas Lodge, the Community Center, the Camas Police Department headquarters, and Fire Stations 41 and 42. The majority of the City's functions and services are carried out from these facilities.

General government services include such departments as Administration and Human Resources, Community Development, Finance, Information Technology, and the Camas Public Library. General services include but are not limited to utility billing, human resources, city clerk functions, building and engineering permits and inspection, and activities of the City Council and city boards and commissions.

Other city services include Fire and Emergency Medical Services (EMS), Police, and Parks and Recreation. Fire and EMS services are provided in Camas and, via intergovernmental agreements, beyond Camas city limits. The Camas Police Station dispatches law enforcement services throughout the community. Parks and Recreation services are housed in several facilities including Lacamas Lodge, the Community Center, and through a myriad of parks, trails, open spaces, and special use buildings.

Public utilities, administered by the Public Works Department, includes the city's sewer system, water system, and municipal stormwater system. These systems have a variety of assets that support them and are scattered throughout the city.

Public Works also operates solid waste service. Garbage trucks are dispatched from the Operations Center, the hub of Public Works' activities, and the solid waste is transported to an off-site transfer station and then to a landfill in eastern Washington. The City budgets money for capital equipment, however, the solid waste system does not require the same kinds of investments that the sewer, water, and stormwater systems require.

The public facilities and services element is divided into four sections:

- Public Facilities and Services including fire, emergency medical and police services, parks and open space, and City owned facilities
- Public and Franchise Utilities including water, sewer, stormwater, solid waste, electricity, natural gas, and telecommunications
- Capital Improvement Plan
- School Districts

Related to this element is the City's Capital Facilities Plan (CFP) (Appendix X), which provides a comprehensive project list and schedule guiding the investment of city resources in facilities and infrastructure. These resources are made up of local revenues as well as State, Federal and other sources. The CFP identifies those projects which have secured funding as well as a list of projects which have not yet been funded. The projects included in the overall CFP have largely been identified through other planning documents and efforts which are all incorporated into the City's comprehensive plan.

Level of Service (LOS) Standards

Under the GMA, adequate provisions for urban governmental services must be provided in the UGA. The goals and policies in this element are provided to address anticipated growth and maintain adopted LOS standards.

Public Facilities and Services

Many of the public facilities and services listed in this element have strategic plans and actions that guide maintenance and service improvements. The identified goals and policies were given consideration based on a framework of budgetary and operational guidelines as well as these strategic plans.

Fire Protection, Emergency Medical Services, and Police Protection

The city is served by the Camas-Washougal Fire Department (CWFD), which covers 20 square miles and 33,000 residents for fire protection and 80 square miles and 65,000 residents for emergency medical services. The Camas and Washougal fire departments consolidated in 2011 through a joint contract for service to improve efficiency and lower costs. CWFD averages approximately 5,000 fire and medical calls annually. The CWFD is the only fire department in

Clark County to provide ambulance transport services, which requires additional training for the firefighters in addition to fire suppression techniques.

Camas Fire and EMS operates out of two stations – Station 41 located in City Hall on NE Fourth Avenue and Station 42 located off NW Parker Street. Station 42 is relatively new, while Station 41 is many decades old.

Voters approved a capital construction bond in August of 2024 for a new downtown station and headquarters to replace Station 41. It will be located on the property occupied by the City Hall Annex building just west of City Hall on NE Fourth Avenue. When the new Station 41 is completed, there will be vacated space in the City Hall building. Future uses for the vacated space have not been determined.

A Facility Conditions Assessment (Appendix X) was completed in 2021 and lists some deficiencies in Station 42 in the form of HVAC, plumbing, electrical, and interior finishes that will be addressed with funding from a general obligation bond.

The Camas Police Department operates a full-service police department from one location near the downtown core. This 15,000 square-foot facility was built in 1998 and includes a 1,500 square-foot community/training room. Services include police response, community engagement, school resource officers, investigative follow-up, parking enforcement, code enforcement, and records services.

The City is currently investing over $400,000 in upgrades to the Camas Police Station by replacing end-of-life mechanical equipment. This investment will make it more cost-effective and environmentally resilient.

Parks, Trails, and Open Space

Camas' Comprehensive Parks, Recreation, and Open Space (PROS) plan , updated in March 2022, outlines a community vision for Camas that includes a high-quality park and recreation system, with a comprehensive open space and trail system linking all recreational sites to the regional trail network. The PROS plan is adopted by reference and included as Appendix X.

Parks and recreational opportunities in Camas include neighborhood parks that serve individual neighborhoods, natural open space areas that preserve resources throughout the community, and special use areas for specific recreation needs. Supplementing these are public and private sites and facilities, such as school sites, regional parks, and privately-owned recreation facilities.

In response to the community's feedback on the PROS plan, the City is currently working on a Parks and Open Space Management Plan (POSMP). The purpose of the POSMP is to maintain the existing facilities, fill gaps and improve trail connections, and develop and improve existing parks. The POSMP will outline a strategic vision for the thoughtful management of parks and open spaces within the city, ensuring that they continue to serve as resources for all users. The City will need to coordinate the POSMP with the comprehensive plan to ensure consistency.

During the City's review of land use designations, the PROS plan was reviewed to ensure that sufficient land is designated as Park, Open Space/Green Space, and NS-Parks/Open Space. Because the North Shore Subarea Plan was adopted after the last comprehensive plan update, this update includes revisions that incorporate the new NS-Parks/Open Space designation.

Camas receives impact fees paid by new development for park, trail, and open space improvements that increase the capacity of the system. The expenditure of the collected fees will be applied to the total costs of implementing projects that are identified in the PROS Plan project list, and as further refined by the City's Capital Improvements Plan.

City Facilities

The comprehensive FCA reviewed 17 publicly owned buildings located at 11 different sites. The total square footage of the surveyed buildings is just under 276,000 square feet.

The FCA report notes the total replacement value of all facilities at $61 million in 2022 dollars. The reported deficiencies for the years 2022-2027 total $17 million with the priority needs (life safety and code issue deficiencies) at $6.3 million. Long-term needs would require $18 million for major maintenance projects.

Recently, the City appropriated funding, through limited general obligation bonds, to pay for many of the items listed as priority needs in the FCA. This approximately $7 million has allowed the City to attend to some of the high priority deficiencies.

Noteworthy on the list is Station 41 and the City Hall Annex. With passage of a voter approved bond in 2024 specifically to replace Station 41, the City Hall Annex building will be demolished, and the site will house the new Station 41, which will also serve as the Fire Department's headquarters.

The Camas Public Library, located across the street from City Hall on NE Fourth Avenue, provides library services to the community at-large. According to the FCA, the library is in need of priority improvements to address immediate deficiencies. Since the date of the report, the City is funding a number of deficiencies through a general obligation bond.

City and Franchise Utilities

Water

The City owns and operates a multi-source municipal water system which includes supply, treatment, storage, and distribution of potable water to residential and commercial customers. The City currently obtains its water from ten groundwater wells and two surface water sources that are treated to provide high quality water to customers. The City owns over 143 miles of pipelines in its water transmission and distribution system. Service is provided to customers across five major pressure zones and 18 subzones. Eight booster pumping stations are used to move water between pressure zones. Seven storage facilities, with a combined total of 8.45 million gallons (MG), provide storage for normal and emergency conditions, such as fire

suppression. Additionally, distribution system includes numerous meters, isolation valves, and hydrants. Additional information regarding Camas Water Service, including capacity analysis, is available in Appendix X, Water System Plan (2019).

Sewer

The majority of the 7,700-acre UGA and the sewage collecting infrastructure inside the city limits is owned and operated by the City of Camas. The collecting system consists of traditional gravity sewers, pump stations, force mains, and septic tank effluent systems. The system includes 38,260 linear feet of force main, 29 lift stations, and 236,200 linear feet of gravity mains. Approximately half of the city is served by septic tank effluent systems and the other half by a traditional collection system. The City gathers, treats, and discharges wastewater into the Columbia River at the Camas Wastewater Treatment Plant (WWTP).

The City of Camas Sewer Division serves residences and commercial buildings, with approximately 8,500 customers, comprised of industrial, commercial, and residential users.

A collection system flow metering and projection was conducted in 2018/2019 to evaluate the collection system using the City's hydraulic model. The results of this analysis are available in Appendix X, General Sewer Plan (2022), which develops a management plan for the system over the next 20 years.

Stormwater

The stormwater runoff generated from approximately 7,500 acres across the city of Camas is managed through 75 miles of stormwater conveyance pipe and 1,800 stormwater inlets and catch basins. The stormwater conveyance system is owned and maintained by the City. The City also owns and maintains stormwater facilities, including underground treatment vaults, detention ponds, biofiltration swales, wet ponds, drainage ditches, and culverts. These have been geolocated on the City's Stormwater Management Action Plan (SMAP) Public Input Map. The SMAP identifies actions to protect and improve receiving waters' water quality. Commercial and residential stormwater facilities are privately owned and maintained per stormwater code CMC 14.02.200 Ownership and Maintenance. These privately owned facilities within the city are geolocated on the SMAP Public Input Map. Additional details on stormwater management in Camas can be found in Appendix X, Stormwater Management Program (2024).

Solid Waste

The City owns and operates its own solid waste utility which provides for the collection and transfer of solid waste refuse to the Clark County-owned Washougal Transfer Station. The City is responsible for managing garbage collection within the Camas boundaries. The City has established universal compulsory solid waste collection, requiring all residents and businesses to maintain solid waste service. The City contracts with Waste Connections of Washington to provide recycling and yard debris management, collection, and disposal. The City also contracts with Waste Connections to provide large container service (larger than 2 cubic yards) to those with greater solid waste handling needs.

All cities and towns in Clark County have delegated responsibility for solid waste transfer and disposal planning to the County, including Camas. The currently adopted Clark County Solid Waste Management Plan (CSWMP) of 2015 is undergoing updates and anticipated to be adopted by the end of 2025. Agreements between Clark County and its cities commit each to the plan and to the plan's waste disposal system.

Franchise Utilities

There are several other utilities, some of which are provided by public entities and others by private entities, that contribute to the functionality and prosperity of the community. The main utilities include electricity, natural gas, and telecommunications. Electricity is provided by Clark Public Utilities (CPU), a customer-owned public utility; natural gas is provided by Northwest Natural; and telecommunications, including high-speed internet, are provided by a variety of companies (e.g. Comcast, Verizon, Frontier, etc.). No detailed inventory regarding the capacity of these utilities is available.

Electrical

Clark Public Utilities (CPU) (https://www.clarkpublicutilities.com/) provides electricity to Camas and throughout Clark County. CPU balances strategic planning for the future with present rate and service stability in compliance with changing requirements at the local, state, and federal levels. CPU is led by an elected board to plan for integration of new technologies and has indicated there is ample capacity to meet existing demand for areas within both the incorporated City limits and the UGA. Power supplies are provided through a combination of power supply contracts and purchases from the generating system.

Natural Gas

Delivery of natural gas to Camas and its UGA is provided by Northwest Natural (https://www.nwnatural.com/). The delivery of natural gas is governed by the Federal Energy Regulatory Commission, the National Office of Pipeline Safety, and the Washington Utilities and Transportation Commission (WUTC). The City's regulations include safety and emergency provisions, LOS standards, and rate limitations. Northwest Natural provides natural gas service to all of Clark County. The alignment of the main pipeline crosses the Columbia River at the area of the Port of Camas-Washougal. Additionally, Northwest Natural is improving its backbone through the City with the installation of a large-diameter high-pressure gas main connecting Lake Road and Pacific Rim Boulevard.

Telecommunications

Verizon provides local telephone service to the City and its UGA. Many of the telecommunication facilities, including aerial and underground, are co-located with those of the electrical power provider. Frontier Communications also provides telecommunications to a large number of customers in the Camas area. Contact information for telecommunication utility providers is available on the City of Camas website (https://www.cityofcamas.us/utilities/page/new-resident-information).

Capital Improvement Plan

The 6-year Capital Improvement Plan (CIP) is a significant component of the financing plan and is adopted as part of the biennial budget. It includes a list of projects, project start dates, estimated cost, and funding. The CIP is a shorter term funding plan that directs available resources to specific projects including street preservation and improvements, fire and EMS, parks and recreation, stormwater, water, and sewer projects. The 2025-2026 CIP is included as Appendix X.

The first two years of the capital facilities plan are typically consistent with the adopted City budget. However, since capital expenditures often impact multiple years after funding has been committed, it is prudent to plan ahead for the expenditure of funds for at least four years or longer. Additionally, some of the City's adopted plans include longer term expenditure plans in which resources are actively being pursued when opportunities arise.

School Districts

Public schools are recognized as one of the largest public services within the community. Education serves one of the most important roles in community health as the quality of education today impacts the skill levels, employment rates, labor supply, and wages of tomorrow.

The Camas School District has the most, and some of largest, public facilities in the Camas Urban Growth Area. The UGA spans two school districts. Camas and Evergreen School Districts are responsible for facility planning and service levels of the districts and coordination with the city's overall development. Both school districts are currently evaluating school facilities and overall needs to serve the community.

The Camas School District has prepared a 2022 Capital Facilities Plan (CFP) to provide the County and the Cities with a schedule and financing program for capital improvement needs over a six year period (2022-2028) to ensure that adequate facilities are available to serve new growth and development.

The collection of school impact fees generates partial funding for construction of public facilities needed to accommodate new development. School impact fees are collected by the cities and County on behalf of the District at the time plats are approved or building permits are issued. Impact fees are calculated based on a formula, which includes the portion of District construction resulting in increased capacity in schools. The districts submit their capital facilities plans every other year, accompanied by impact fee calculations. The plans describe the existing and planned school facilities and services.

Anticipated property acquisition and new construction is based on the enrollment forecast, capacity, the District's educational standards and the community's support of finance tools to fund improvements.

Public Facilities and Services Goals and Policies

Goal PFS-1 Fire Protection, Emergency Medical Services, Police Protection

Provide fire protection, emergency medical services, and police protection to Camas and accommodate growth in the community.

Policy PFS-1.1 Plan for fire and emergency medical services to include adequate land, building, and equipment to effectively serve the geographic area of the city north of Lacamas Lake (North Shore).

Policy PFS-1.2 Assess the level of service needs and provide fire, advanced life support emergency medical, and police services that meet the community demand. Maintain service levels as growth occurs.Ensure

Policy PFS-1.3 Ensure the installation of commercial fire sprinklers where required by code and strongly encourage their use when installation is optional.Require

Policy PFS-1.4 Pursue funding to maintain fire facilities, including all fire apparatus at levels that best serve the community. Fire apparatus includes fire suppression equipment such as engine, water tenders, brush trucks and command officer vehicles.

Policy PFS-1.5 Require all new residences to install fire sprinkler systems.

Policy PFS-1.6 Plan police annex facilities at strategic locations throughout the City.

Goal PFS-2 Parks, Trails and Open Space

A network of parks, trails, and open space will connect neighborhoods, wildlife corridors, and natural resources and enhance the quality of life for residents and visitors. Refer to the Camas PROS plan for additional goals and policies.

Policy PFS-2.1 Provide and maintain an active transportation network to increase connectivity to natural areas, wildlife corridors, and other natural resources in Camas.

Policy PFS-2.2 Ensure every neighborhood has access to a park within a 15-minute walk or roll.

Policy PFS-2.3 Provide safe and maintained parks, natural areas, and other recreational spaces that are accessible for all ages and abilities.

Policy PFS-2.4 Provide a continuous trail network around Lacamas Lake with ample access points, prioritizing active transportation users. Consider new public access points through dedications, easements, and acquisitions. Partner with transit agencies to plan and implement transit service to Lacamas and Round Lake.X

Policy PFS-2.5 Explore the development of dog parks within special use park areas to balance the needs of pet owners and other park users.

Policy PFS-2.6 Encourage the development of parks and playgrounds that have ample facilities for all users.

Policy PFS-2.7 Work with the Camas Parks & Recreation Department to acquire land for parks, trails, recreational uses, and habitat conservation.

Policy PFS-2.8 Enhance water conservation methods and technologies in development of irrigation infrastructure within parks and recreation areas.

Goal PFS-3 City Facilities and Services

Provide facilities and services to support the functions of City government and the community, including cemetery, animal control, and the public library.

Policy PFS-3.1 Develop an expansion plan (e.g., new municipal facility, meeting space) to accommodate additional personnel.

Policy PFS-3.2 Ensure that the municipal building and primary services remain downtown.

Policy PFS-3.3 Incorporate sustainable and low climate impact design into city buildings. Promote LEED certification (or similar) for all publicly owned facilities.

Policy PFS-3.4 Utilize the City's capital improvement program to develop alternative transportation facilities and electric vehicle charging infrastructure for public facilities.

Policy PFS-3.5 Maximize the developed and undeveloped property for cemetery use to meet future burial needs and trends and meet residents' service expectations.

Policy PFS-3.6 Provide economic stability to the cemetery fund by reducing dependency on the general fund.

Policy PFS-3.7 Develop a strong volunteer and donation program for the cemetery.

Policy PFS-3.8 Continue animal control partnership with the City of Washougal.

Policy PFS-3.9 Maintain funding and support for library services that meet the demands of current and future residents.

Policy PFS-3.10 Assess need and solutions for additional library services throughout the growing City.

Goal PFS-4 City and Franchise Utilities

Provide utility services, including energy and communication facilities and their services, to all businesses, residents, and properties in the City limits.

General Utilities Policy

Policy PFS-4.1 Maintain and improve City utility systems through preventative maintenance and regular assessments and improvements to meet regulatory standards.

Policy PFS-4.2 Where service is available, require connection to public water for domestic and irrigation needs and connection to sewer systems. Promote connection to sewer and water before system failure of private well or septic.

Policy PFS-4.3 The City should be the sole provider of urban services, including water and sewer, within the UGA for sewer service and the Water Service Area for water. Require all new construction connect to city systems. Prohibit construction of new private wells and subsurface sewage disposal systems in new developments.

Policy PFS-4.4 Do not extend utilities without annexation or commitments for annexation. Exceptions may be made in cases where human

health is threatened. In areas where utilities presently extend beyond City limits, but are within UGAs, plan development jointly with the County. A joint development must be consistent with City standards.

Policy PFS-4.5 Coordinate plans for providing public utility services in UGAs and rural areas with plans for transitioning undeveloped land to urban uses.

Policy PFS-4.6 Plan public utility services so that service provision maximizes efficiency and cost effectiveness and ensures concurrency. Coordinate with other entities to provide services within the urban area.

Water Service Policy

Policy PFS-4.7 Extend adequate public water service throughout the City's urban areas that meets state requirements and provides minimum fire flow as required by the Fire Marshal.

Policy PFS-4.8 Conserve and protect groundwater resources to provide safe, clean, high quality drinking water to residents.

Policy PFS-4.9 Ensure water infrastructure is designed to City standards and is in place prior to land development.

Policy PFS-4.10 Coordinate with Clark County and other purveyors to eliminate private systems in accordance with the Clark County Coordinated Water System Plan.

Policy PFS-4.11 Coordinate with the County and the cities of Vancouver and Washougal to protect groundwater from contamination.

Policy PFS-4.12 Expand municipal reclaimed water systems and allow onsite non-potable water systems to reduce water demand in private-sector commercial and residential buildings.

Policy PFS-4.13 Eliminate the introduction of groundwater and surface water into the sewer system.

Sewer Services Policy

Policy PFS-4.14 Extend public sanitary sewer service, as required, throughout urban areas. Service may be provided outside urban areas to serve areas where imminent health hazards exist.

Policy PFS-4.15 Use traditional gravity sewer systems (in lieu of STEP systems) to serve future customers and reduce maintenance and power costs.

Policy PFS-4.16 Coordinate with Clark County to eliminate septic systems.

Stormwater Policy

Policy PFS-4.17 Provide a stable funding source to meet National Pollutant Discharge Elimination Systems (NPDES) Phase II requirements to manage and control stormwater runoff.

Policy PFS-4.18 Inspect homeowner association and other private facilities and provide directions and standards for repair.

Policy PFS-4.19 Meet water quality standards by providing best management practices for development activities.

Policy PFS-4.20 Establish baseline flows on each drainage basin or sub-basin for the analysis of deficiencies.

Policy PFS-4.21 Consider stormwater impacts during land use review processes and develop standards that would reduce the amount of impervious surface on existing and new development, including the creation and adoption of low-impact development standards and the use of green infrastructure, to address increased storm intensities and stormwater runoff.

Policy PFS-4.22 Require new development or redevelopment to comply with the Camas Stormwater Design Standards Manual and design criteria.

Policy PFS-4.23 Protect natural stream courses for water quality.

Policy PFS-4.24 Manage stormwater to safely pass surface water and maintain water quality of lakes, streams, and rivers.

Solid Waste Policy

Policy PFS-4.25 Provide for solid waste service throughout the City through continuance of self-collection of solid waste and contracting with private waste management companies to provide recycling and yard debris collection options.

Policy PFS-4.26 Continue a system of universal compulsory solid waste collection.

Policy PFS-4.27 Coordinate with the County to implement the Clark County Solid Waste Management Plan (CSWMP). Reduce the total production of waste, increase the recycling rate of waste that is produced, and properly manage and dispose of waste that is not recycled. Provide education and outreach to businesses and the public on benefits and opportunities for waste reduction and recycling. Focus on residential recycling rates to improve participation rates similar to the rest of the County.

Policy PFS-4.28 Work with solid waste utility companies to determine if household food waste/compost can be accommodated in yard waste bins.

Franchise Utility Policy

Policy PFS-4.29 Minimize the effects on adjacent properties, the environment, and the visual quality of the community of siting, developing, operating, and maintaining facilities.

Policy PFS-4.30 Coordinate to provide reliable service through partnerships and agreements with utility companies.

Policy PFS-4.31 Promote the conservation of energy resources through the adoption of appropriate energy codes and efficient land use and transportation systems.

Policy PFS-4.32 Work with energy utilities to improve the safety and reliability of infrastructure vulnerable to climate change (e.g., undergrounding transmission lines).

Goal PFS-5 Capital Improvement Plan

Maintain and implement the Capital Improvement Plan in coordination with the biennial budget.

Policy PFS-5.1 Update the capital improvement plan biannually and include a statement of projected costs and sources of revenue.

Policy PFS-5.2 Ensure capital improvements enhance the community and add physical value to the City.

Policy PFS-5.3 Apply earnings from bond proceeds toward the debt service fund reserved for the future repayment of debt directly for enhancement of the project.

Policy PFS-5.4 Dedicate all or a portion of the first year of property taxes generated from newly incorporated areas to the Capital Fund.

Policy PFS-5.5 Dedicated funds and bonds may be used to fund essential capital improvement projects such as police, fire, and general municipal structures.

Policy PFS-5.6 Use voted, general obligation debt for discretionary projects such as recreation and library facilities.

Policy PFS-5.7 Prioritize projects that support the core services provided by the City.

Policy PFS-5.8 Ensure consistency of capital improvement plans with the adopted comprehensive plan map and evaluate if funding is adequate to provide necessary public facilities and services to implement the plan.

Goal PFS-6 School Districts

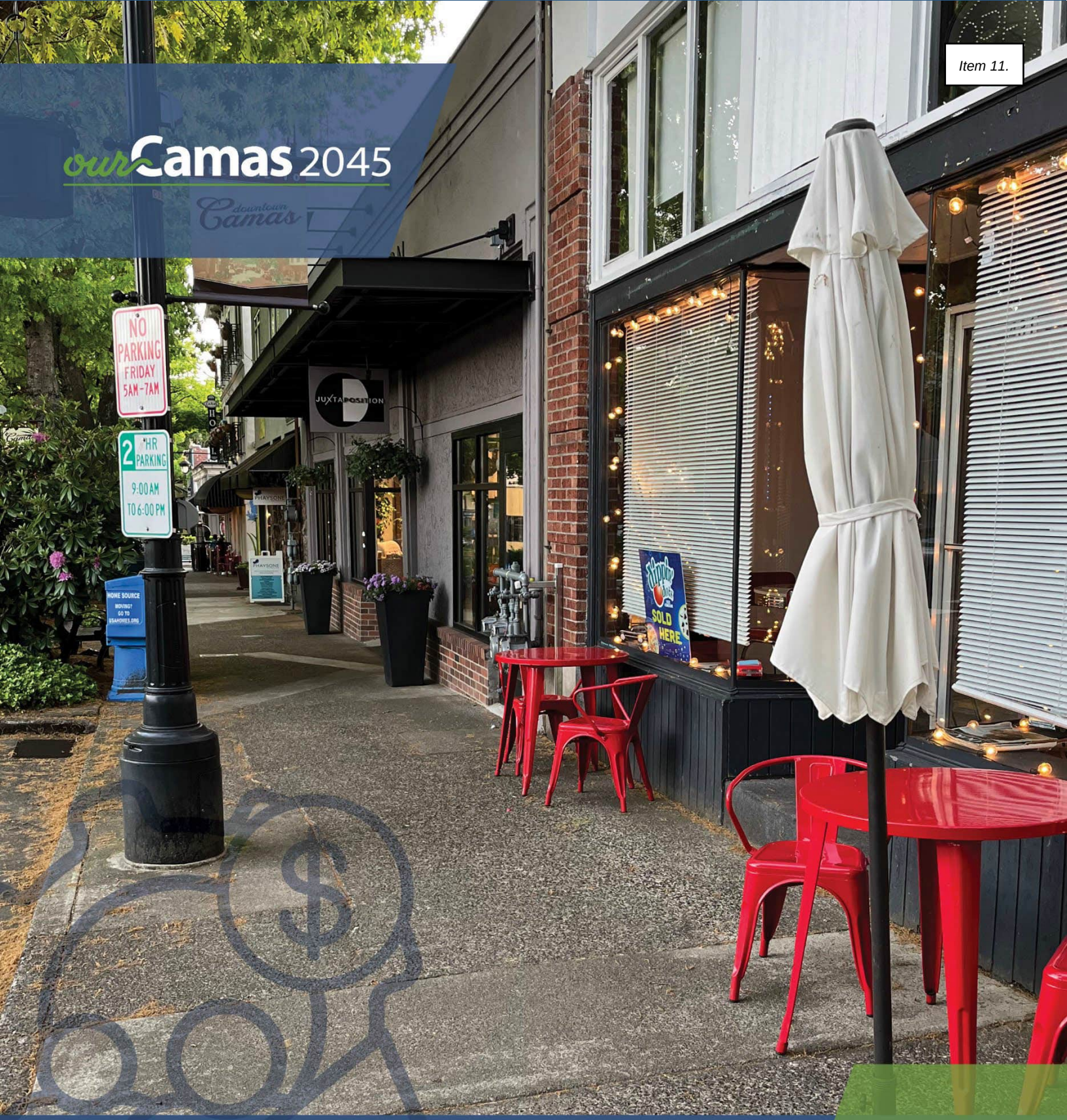
Support access to quality education and public schools through partnerships and investments.

Policy PFS-6.1 Encourage the Camas School District, Clark County, and the City of Camas to invest in mutual use facilities that support intergenerational and intercultural use.

Policy PFS-6.2 Coordinate planning between the Camas School District and the City of Camas to reflect school facility needs in response to growth forecasts.

Policy PFS-6.3 Ensure equitable access to schools and educational programs, specifically considering those in underserved areas, where needs and abilities may differ.

ourCamas 2045



Economic Development

10

10. Economic Development

Boosting the Local Economy

The economic health and well-being of the City of Camas is supported by providing a wide range of employment opportunities throughout the community and a setting and quality of life that is attractive to businesses and residents.

Vision

In 2045, Camas has cultivated a diverse and thriving economy with stable employment opportunities and living-wage jobs across various sectors, including technology, healthcare, manufacturing, retail, recreation, and professional services. Camas residents have access to a wide range of services and amenities in their community, while benefiting from excellent regional connectivity and the city's proximity to Portland International Airport. Camas is a gateway to nature and recreational opportunities, supporting regional tourism in the area. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity. Professional office, medical, and industrial uses typify western Camas, with retail businesses supporting these firms and nearby residents. The North Shore area will fulfill the employment and retail needs of the growing population on the northeast side, and reduce trips outside the city. Downtown Camas anchors the community with a dynamic economic landscape and retains its historic atmosphere as a walkable, attractive place to shop, dine, and gather. Inclusive housing options within the city's core contributes to a town center that supports local businesses.

Approach for Updating this Element

The approach for updating the economic development element for the 2025 to 2045 planning horizon was informed by community input (outlined below), state legislation requirements, priorities, and a comprehensive economic profile. This profile integrated the best available information from public and private data sources to assess the city's economic trajectory, opportunities, challenges, and economic conditions and competitiveness. These insights help build a factual basis for the updates.

Community Engagement Insights

Interactive open houses and interviews with stakeholders provided information about economic development strengths,

challenges, opportunities, and actions in Downtown Camas and other areas in the City. Engagement activities identified the following themes that could contribute to future decision-making related to economic development in Camas.

Economic Development

- **North Shore:** Need infill development.
- **Grass Valley:** Needs mixed/light industrial park with athlete fields/parks. Why no Grass Valley Subarea Plan? Be clear on what kinds of businesses would be most beneficial to Camas in Grass Valley to build awareness when talking with prospective businesses.
- **General:** Need more commercial space, more manufacturing jobs, and a dedicated economic development director or staff person (apply for grant), and plan. Focus on tourism and bring in money. Are there model cities Camas would strive to look like? (Lake Oswego, Bend, etc.) Compare plans with cities that have experienced similar growth? What did they do well?
- **Housing:** Allow work/live housing along and around UGA/schools and major transportation corridors. Ensure workforce housing is available for current and future workers. Having diverse housing options will lead to a more diverse city.

Downtown Strengths

- **Strong sense of place:** Downtown stakeholders feel supported by Camas community. They discussed the quaint, small-town character, with unique features attracting visitors and services and how the mix of new and old/established businesses contributes to vitality of Downtown.
- **Positive support for businesses**: Good interactions with the DCA, overall good experience working with the City and business owners cultivate a collaborative environment.
- **Increases in housing density seen as a positive direction:** New housing is opportunity for more amenities to support the growth and expansion of amenities can make Downtown more walkable.

Downtown Opportunities

- **Improvements to public realm** to increase / improve street lighting, address issues with street trees (some interfere with sidewalks, other infrastructure), improve the civic area of Fire Dept. plan, add connectivity to adjacent residential neighborhoods, and open spaces, and provide outdoor dining spilling out onto sidewalk.
- **Community gathering spaces**: Need more meeting places indoor/outdoor and outdoor spaces for children/families, should expand Downtown Core beyond 4th Ave, support redevelopment of underutilized land on 3rd and 5th Ave, and should create more spaces for retail that extends walkability of Downtown, cohesiveness.
- **Development potential:** Explore more ways to activate ground floors and embrace walkability / modern parking standards.

Downtown Challenges

- **Parking is a concern for some:** Two-hour duration (especially difficult for employees) and Mill property / parking lot.
- **Pace of development:** Concern over what new development will mean for current businesses and need for balance between new development and preserving historic structures in Downtown.
- **Growth opportunities are limited:** Need to expand the definition of Downtown (beyond just 4th Ave) to expand and provide more amenities. There is limited space on 4th Ave where businesses would like to locate.
- **Barriers to development and safety issues for pedestrians:** Height restrictions and fees are challenging, since rents are lower it is harder to make a project pencil, and need for safer crossings on 3rd Ave and difficult to cross 5th in some areas.

Public Engagement Findings Regarding Strategies

- **Need more responsive permitting and ongoing maintenance to the public realm** since this supports the success of Downtown.
- **More partnerships between City and Downtown businesses:** City can increase interaction and build relationships with business / property owners.
- **Identify ways to keep local presence and restore historic structures:** Some expressed concern over losing historic structures and asked for ways to balance preservation with new development. The City could provide incentives for existing business owners who would like to expand or stay in Downtown Camas as new development continues.
- **Explore ways to address underutilized property**: For example, opportunities at GP parking lot.
- **Pedestrian Safety and Connectivity:** Address 3rd and 5th Avenue pedestrian safety and improve connections to and from Downtown. Focus on pedestrian activation through plazas and public spaces. Address accessibility needs both with ADA and beyond.
- **Improvements:** Expand character of Downtown to the broader boundary defined in the plan. Accommodate a flexibility of spaces and variety of uses through use of public space (sidewalks, parking, etc.). Define the historic character of 4th Avenue through specific streetscape elements.

City of Camas Competitive Position

The city's competitive position can be summarized in terms of strengths, weaknesses, opportunities, and threats. These represent internal and external factors that can have positive or negative impacts on economic outcomes in Camas. Several ideas added to the summary below are based on feedback received through community engagement activities. Table 4 below outlines key findings associated with economic growth and development.

Table 4 Strengths, Weaknesses, Opportunities, and Threats Summary Analysis

STRENGTHS

- High quality of life amenities like parks and recreation opportunities including new City investments in capital projects.
- Downtown experiencing high visitation and high demand for retail spaces (increasing rents, low vacancy).
- Responsive permitting, ongoing maintenance of the public realm.
- No Washington State income tax.
- Proximity to Portland International Airport.
- Well regarded public schools.
- The Downtown Camas Association is completing a comprehensive Downtown lighting plan with a state grant to support safety.

WEAKNESSES

- Rising housing costs, purchasing a home is unaffordable for those under 120% AMI.
- High industrial rents and very low industrial real estate vacancies.
- Development standards related to height was cited as a barrier by stakeholders.
- Need Downtown development to be feasible to build (pencil).
- Highly constrained lands may be difficult to develop for commercial or industrial land uses (such as in Washougal).

OPPORTUNITIES

- Attract highly skilled workers with locational flexibility.
- Develop pathways for youth to gain skills and seek jobs in Camas.
- Identify target industries for managing land capacity and expected growth.
- Incentives for existing business owners, wishing to expand their operations.
- Opportunities for Downtown redevelopment and partnerships with Downtown businesses and nonprofits (such as Downtown Camas Association, the Port, Chamber, Farmers Market, and more).
- Develop mill ditch into a compelling, easy, and beautiful trail system that is clear to connect with from Downtown and improve the trails to encourage local resident activity and to attract visitors.
- Need more hotels and conference space.
- City should partner more with the Downtown Camas Association on incentive programs.
- Improve pedestrian safety throughout downtown.

THREATS

- Unequal rates of homeownership by race and ethnicity indicating unequal economic opportunities.
- Disparities between remote and non-remote workers.
- Anchor employer changes.
- Safety threats that could be supported by better lighting, street tree improvements, safer crossings for pedestrians in the Downtown.
- Need to balance preserving historic features with new development in Downtown.

Broad Planning Context

Comprehensive planning in Washington is guided by the Growth Management Act (GMA), a series of statutes first adopted in 1990 which requires cities and towns within the state's most populous counties to fully plan for future growth (RCW 36.70A) and develop mandatory comprehensive plan elements. State provisions set limits on what actions cities and counties can take to support economic development. Article 8, Section 7 of the state constitution specifies that "No county, city, town or other municipal corporation shall hereafter give any money, property, or loan its money, or credit to or in aid of any individual, association, company or corporation, except for the necessary support of the poor and infirm."[16] Given this limitation, cities generally cannot directly use public funds to attract private development and instead target policies that facilitate economic growth through land use, infrastructure, tourism, marketing, and partnerships with nonprofit community-based organizations.

Cities in Washington also coordinate with county-level Associate Development Organizations (ADOs) that represent each of Washington's counties, funded in part by the state Department of Commerce. The Columbia River Economic Development Council (CREDC) represents Clark County and presents a baseline of goals and objectives for the region. Their former 2018-2023 Comprehensive Economic Development Plan outlined goals and actions based on a vision and set of values and guiding principles identified through extensive engagement with local partners, which have carried through and expanded with the more recent 2024 Comprehensive Economic Development Plan with new supplemental actions to encourage economic development for communities within Clark County.

New objectives in CREDC's regional economic development plan expand on support for entrepreneurship, placemaking investments, fostering development and redevelopment projects, and expanding equitable employment opportunities. The Plan also recognizes the growing role of smaller cities like Camas outside of Vancouver which are seeing fast population growth and opportunities to develop their own employment bases.

[16] RCW 35.21.703 does allow cities to contract with nonprofit corporations to advance economic development.

Table 5 Goals and Objectives from 2018-2023 CREDC Comprehensive Economic Development Plan

Source: CREDC

	2018 Plan Objectives	2024 Update Objectives
Expand the Existing Base	• Become Industry Experts • Strategically Market Industry Clusters • Build a Start-Up Ecosystem	• Reduce Site Infrastructure Hurdles • Grow Start-Up Ecosystem • Support Permitting Consistency • Explore Commercial Code Flexibility • Foster Small Business Networking
Support People	• Foster Skills Development • Prepare Youth for Economic Opportunity • Launch a Brain Gain Initiative	• Align Workforce with Employer Needs • Enhance Access to Career Pathways • Support Talent Retention
Create Place	• Each Community Creates a Placemaking Strategy • Embrace Economic Opportunity in Urban Center • CREDC Tells the Story of Place • Make Areas Desired by Industry Clusters Shovel-Ready • Determine All Transportation Needs on a Regional Level	• Leverage Placemaking Investments • Encourage Infrastructure Investments That Cross Municipal Boundaries

The Clark Countywide Planning Policies provide guidance on economic development across incorporated and unincorporated areas of the County (the County also distinguishes policies specifically for unincorporated areas, but not for jurisdictions and their UGAs). These policies (adopted in 2015) are currently being updated. The updated version will be reviewed as a part of the policy and goal development stage of the Comprehensive Plan update.

Buildable Land Capacity and Employment Capacity

Cities fully planning for adequate land capacity to meet the needs of the community must understand their current employment base, development trends, workforce housing availability, income segments of the population, and future projections. To fully plan for growth and meet community needs in compliance with state provisions, more suburban cities like Camas that are

growing in terms of employment must understand the dynamics of the local and regional economy, consider where employment is concentrated and how residents and workers access employment opportunities, what industries are growing or declining, and whether there is sufficient space to fulfill anticipated employment land needs alongside other uses.

Washington's Review and Evaluation Program (the Buildable Lands Program, RCW 36.70A.215) requires certain counties, including Clark County, to establish their own buildable lands programs and review past development and density patterns to see if local policies are effective and prepare to plan for the next 20 years of growth, through a "Buildable Lands Report" released before a Comprehensive Plan update.

Clark County has updated its Vacant Buildable Lands Model (VBLM) as a part of their 2025 periodic update of their Comprehensive Plan. This VBLM provides a basis for the available employment capacity in the City of Camas based on available buildable land (including both vacant and underutilized land), current zoning, and market and employment density assumptions. Table 6 below shows the County's current allocation of jobs for the City of Camas and the Camas Urban Growth Area (UGA) and the 2023 Vacant Buildable Lands Model (VBLM) capacity and yield calculations.[17]

This analysis shows that the City of Camas has a job target of 13,658 jobs, with a preliminary estimated capacity showing availability for 11,363 jobs, as well as additional assumptions for work from home, construction, and government jobs which have specific land need considerations documented in Clark County's 2025 Population, Housing and Employment Allocation memorandum.[18]

Evaluating employment capacity is necessary to determine whether the job growth allocation (determined by the county) can be accommodated within the City of Camas and Camas UGA(s). Sufficient capacity is available if employment growth capacity is equal to or greater than the City's allocation. If sufficient capacity is not available, the shortfall must be addressed by rezoning, or revising allowable density, or by modifying or creating a new UGA or annexed area to provide additional area for employment growth capacity. To help provide geographic context for this analysis, a map of the City of Camas and its existing and proposed Urban Growth Areas was created see Figure 16.

[17] This has been modified since the County's 2020 Buildable Lands Report, which identified 963 net buildable acres (296 on commercial land, 667 on industrial land) in the Camas UGA (Clark County Buildable Lands Report, 2023).

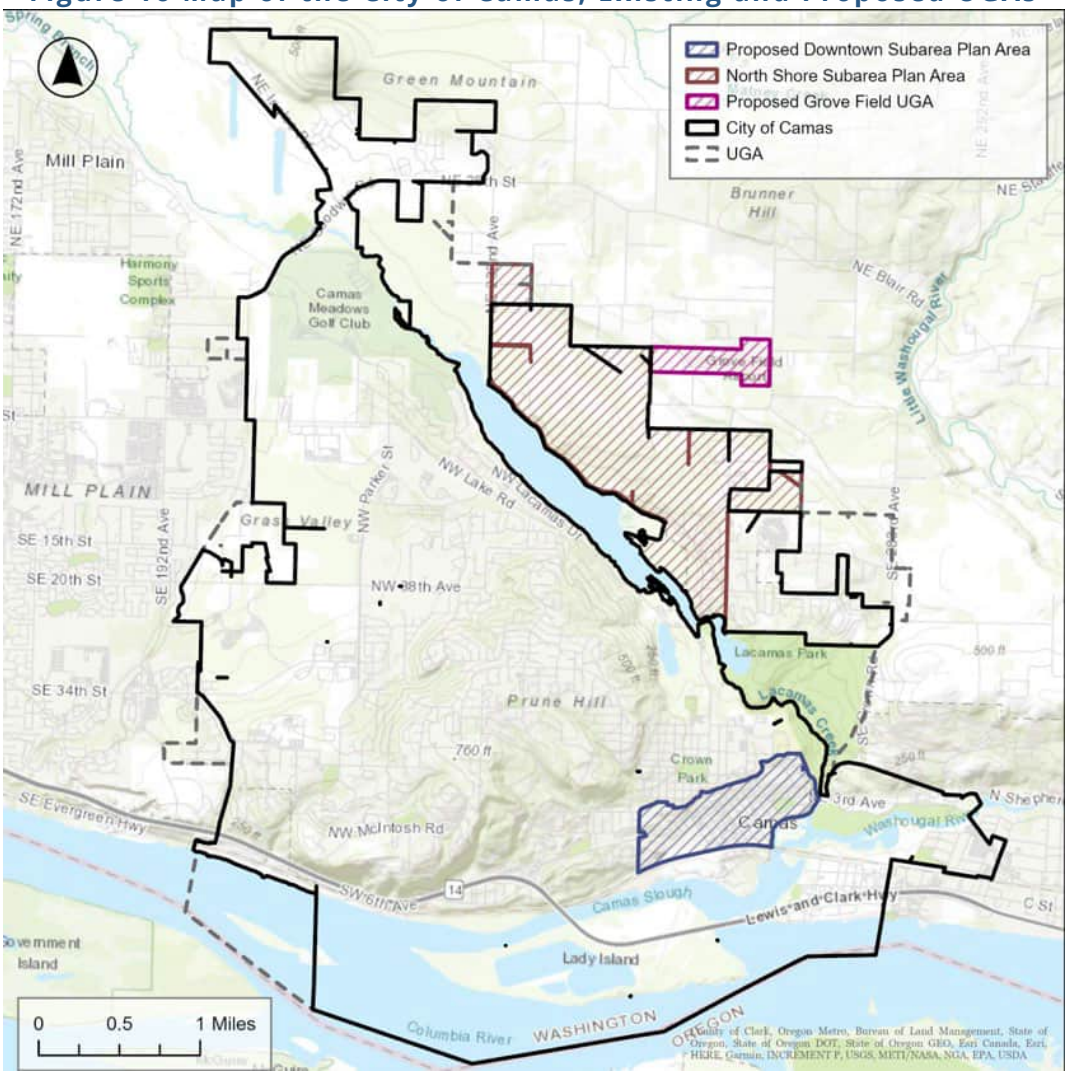
[18] Clark County Community Planning, 'Clark County Comprehensive Plan 2025 Update 2025 Population, Housing and Employment Allocation – Issue Paper 5,' April 2024, https://clark.wa.gov/sites/default/files/media/document/2024-04/issue_paper_5_pop-emp_alloc_4_17_24.pdf.

Table 6 Employment Capacity and Allocation by UGA, Clark County

Source: VBLM 2023, Capacity and Yield by Jurisdiction. Note: The County total estimate is 88,100 jobs accounting for government, construction, rural, and work from home jobs.

Jurisdiction	2023-2045 Employment Allocation	2023 VBLM Capacity	Assumptions		
			Work from Home	Construction	Government
City of Camas and Camas UGA	**13,658 jobs**	**11,363 jobs**	615 jobs	879 jobs	549 jobs
Total Clark County UGAs and Cities	**83,695 jobs**	65,091 jobs	3,524 jobs	5,038 jobs	8,600 jobs

Figure 16 Map of the City of Camas, Existing and Proposed UGAs



Additional analysis refining the employment capacity is underway that is based on key City of Camas zoning and UGA modifications. The City of Camas is proposing zoning modifications and the addition of a new UGA that would allow for additional employment capacity. According to these refined employment capacity estimates, Camas would have capacity for 12,273 jobs which would almost meet the 2045 employment target of 13,658 jobs. The finalized estimates will depend on the final preferred alternative.

CLARK COUNTY'S BUILDABLE LANDS REPORT, 2023, KEY FINDINGS

Clark County's Buildable Lands Report was adopted in June 2022 to update the methodology and Vacant Buildable Lands Model (VBLM) and updated with 2023 data.

- The Clark County Buildable Lands Report and employment allocations and City of Camas estimates indicate that there is sufficient employment capacity for employment growth in the county through 2045.
- Camas has the second largest share of total projected jobs in Clark County (17.5%) after the City of Vancouver and the Vancouver Unincorporated Urban Area (U). The City of Camas is expected to have capacity to accommodate 11,363 jobs, with about half (55%) of new employment on commercial land and half on industrial (45%).

City of Camas Profile

More than 10,000 years ago, Native Americans occupied the Columbia River Valley in the area where Camas is now situated. Before Camas was incorporated, a paper mill owned by the LaCamas Colony Company was established in 1883 to help supply newsprint for The Oregonian. Shortly thereafter, the City of Camas became an incorporated city in 1906. The City is named after the camas lily, a deep blue flowered plant with edible onion-like bulbs valued by various Columbia river Native American Tribes.[19] The paper mill expanded in the early 20th Century playing an important role in the local economy and grew to become Clark County's largest manufacturing company with 2,700 employees by 1971.[20] Located in the western edge of Downtown Camas along the Columbia River, the mill then experienced a downturn beginning in the 1980s that continued into the 21st Century, resulting in a reduced workforce. More recently, in 2018, the mill now owned by Georgia-Pacific, shut down several facilities and all but one of its paper machines and downsized its workforce to roughly 150 workers. In 2024, the mill continues to operate with a reduced workforce.

[19] City of Camas history: https://www.cityofcamas.us/community/page/camas-history
[20] Source: https://www.camaspostrecord.com/news/2023/sep/07/camas-mill-celebrates-its-140th-birthday/#:~:text=An%20entire%20wall%20of%20photos,built%20the%20mill%20to%20produce

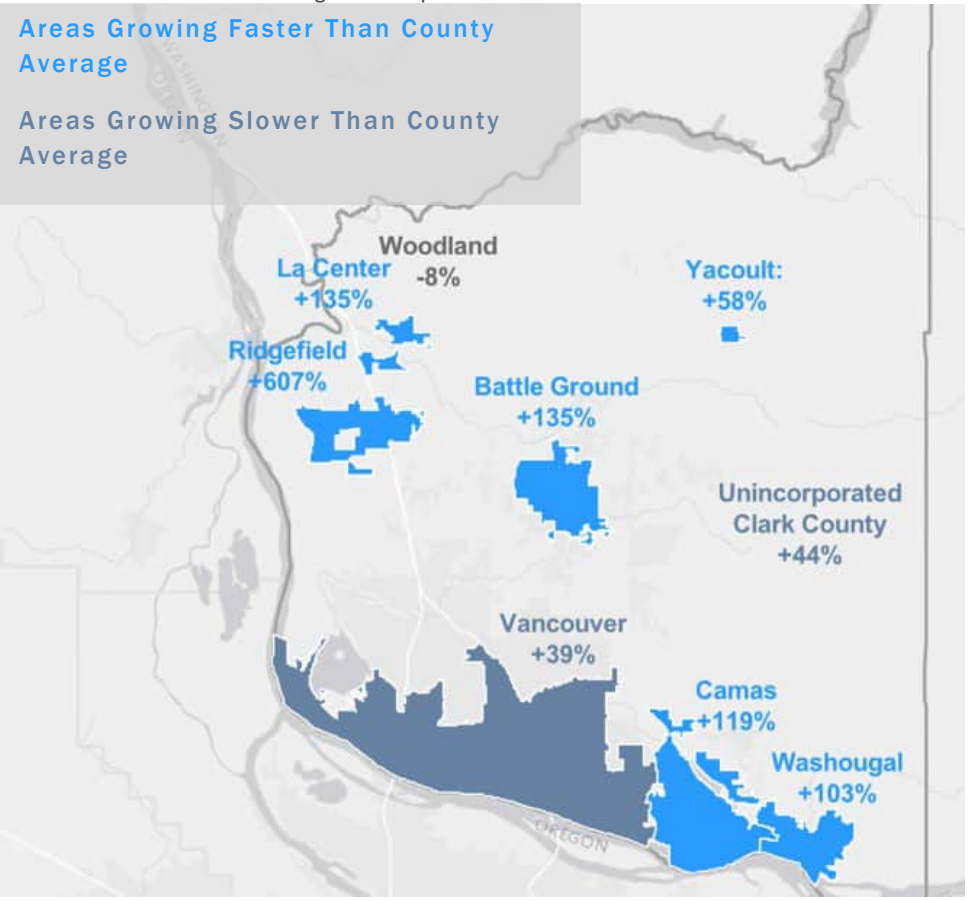
The early economy in Camas was at first dominated by manufacturing but has shifted and diversified over time. The 2015 Comp Plan describes a transition where the City's past economic health was closely tied to the paper mill and then shifted to become more diversified supporting many technology and manufacturing firms, as well as a growing school system and professional offices. In the last four decades, the family-friendly City with close ties to the Portland Metropolitan Region has continued to attract more residents especially from 1990 to 2000 by almost doubling in size to almost 13,000 people, increasing to a little over 19,000 people in 2010, and then reaching 27,420 people by 2023. Similar to the City of Vancouver, Camas has experienced high population growth over the last two decades, with an average annual growth rate of 5.2% which is double the rate in Clark County and Washington State.

Today, the City of Camas is a highly desirable place to live, offering a prime location nearby the growing cities and employment centers of Vancouver and Portland, and the smaller cities of Washougal and Battle Ground in south Clark County. The City of Camas is sandwiched between the City of Vancouver (sharing a border on the west side of Camas) to the west and the City of Washougal to the east. At a regional level, the City is interconnected to the Portland Metropolitan region, located northeast of Portland (see map below).

Camas has been working to advance its economic development goals in recent years while investing in quality-of-life amenities that make it as competitive location for attracting workers and residents. Recently, the City adopted a North Shore subarea plan (2022) to support community vibrancy and economic development strategies and the City is working to adopt a new Downtown subarea plan as a part of the 2025 Comprehensive Plan periodic update project. The City has also been expanding its inventory of parks space by leveraging the County's Legacy Lands program to expand its offerings of natural areas and recreation facilities. As larger economic trends increase locational flexibility (especially for professional services and traditionally office-based jobs), these types of investments will be critical for cities in the region to continue drawing in and retaining a residential base and workforce. The Port of Camas-Washougal manages an airport that is outside City limits, but most of the developable land in the North Shore area is within the airport influence area.

Figure 17 Camas Compared to Clark County Cities

Source: Office of Financial Management Population Estimates



Economic Development Overview

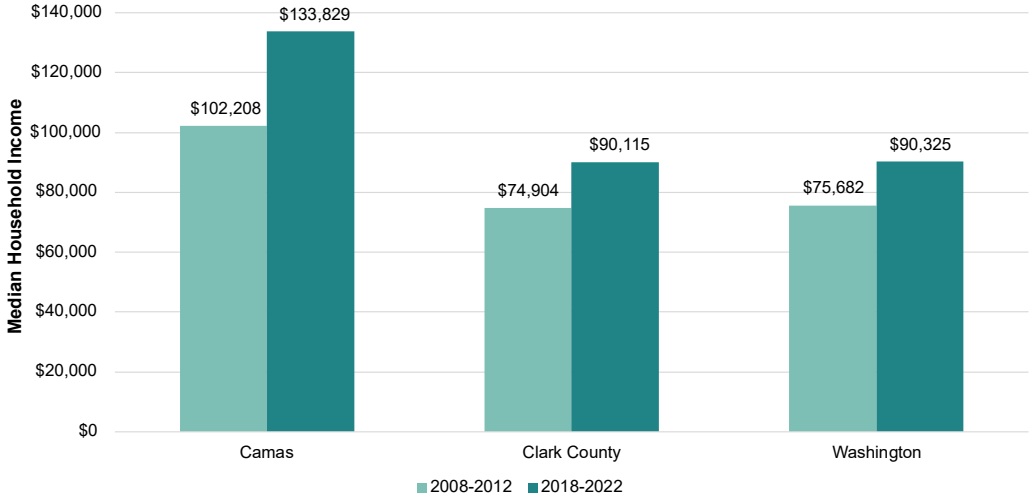
Economic development for the City of Camas is the creation and sustenance of a diverse array of employment opportunities, ensuring the tax base currently enjoyed by the City endures and is strengthened. The economic health and well-being of the City are tied to commitments to promote a wide range of employment opportunities for the citizens of the community and to provide a setting and quality of life that attract businesses and residents.

Planning a diverse and vibrant economy must start by understanding current economic conditions in the City and Clark County. While the City's past economic health was closely tied to the paper mill, in more recent years, the City's economy has diversified and now supports many technology and manufacturing firms, as well as a growing school system and professional offices. The figures below compare the median household income for Camas, Clark County, and Washington as well as employment and related trends over time.

As illustrated in Figure 18 when compared with Clark County, wages in Camas are higher and have grown over the last decade. Higher wages can have positive impacts on other aspects of the economy, and community members have expressed their desire to support living-wage jobs, particularly in healthcare and high technology.

Figure 18 Median Household Income, Camas, Clark County, and Washington

Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates
Note: 2008-2012 values are adjusted for inflation. Median household incomes are shown in 2022 $.



Growth in employment, population, and housing are interconnected. In general, communities with a high ratio of population to jobs can be characterized as "bedroom" or commuter communities, where there are fewer jobs than residents in the city. In Camas, there are roughly three residents for every one employee, indicating a continued trend from the past decade.

The ratio of jobs to housing has slightly increased from 0.9 to 1.0, indicating a healthy balance of housing units in comparison with employment and meeting the jobs-to-housing ratio of 1:1 adopted by Clark County (Resolution 2016-03-01). As the City grows, maintaining this trend can help to ensure there is adequate housing for those who work in Camas.

Table 7 Population, Employment, and Jobs Comparison Ratios, Camas, 2010-2021

Source: OFM, LEHD-LODES. Note: Employment data is currently only available at the City level through 2021.

	Trends			Ratios	
	Population	Employment	Housing Units	Population : Jobs	Jobs : Housing
2010	19,355	6,508	7,072	3.0	0.9
2021	26,870	9,558	9,586	2.8	**1.0**

Overall, Clark County has seen fluctuations in employment since 2000, with the most notable decline in employment in the wake of the 2008 recession and at the onset of the COVID-19 in 2020. However, the County has also seen a rapid rebound from pandemic trends, with sharp employment growth after 2020. The City has generally seen positive growth in employment over the last two decades. The City saw less of a decrease during 2020 compared to Clark County overall, which may reflect Camas' growth in remote workers during this period (Figure 19).

Figure 19 Total Covered Employment Change YOY, Clark County (2001-2022)

Source: Washington Employment Security Department

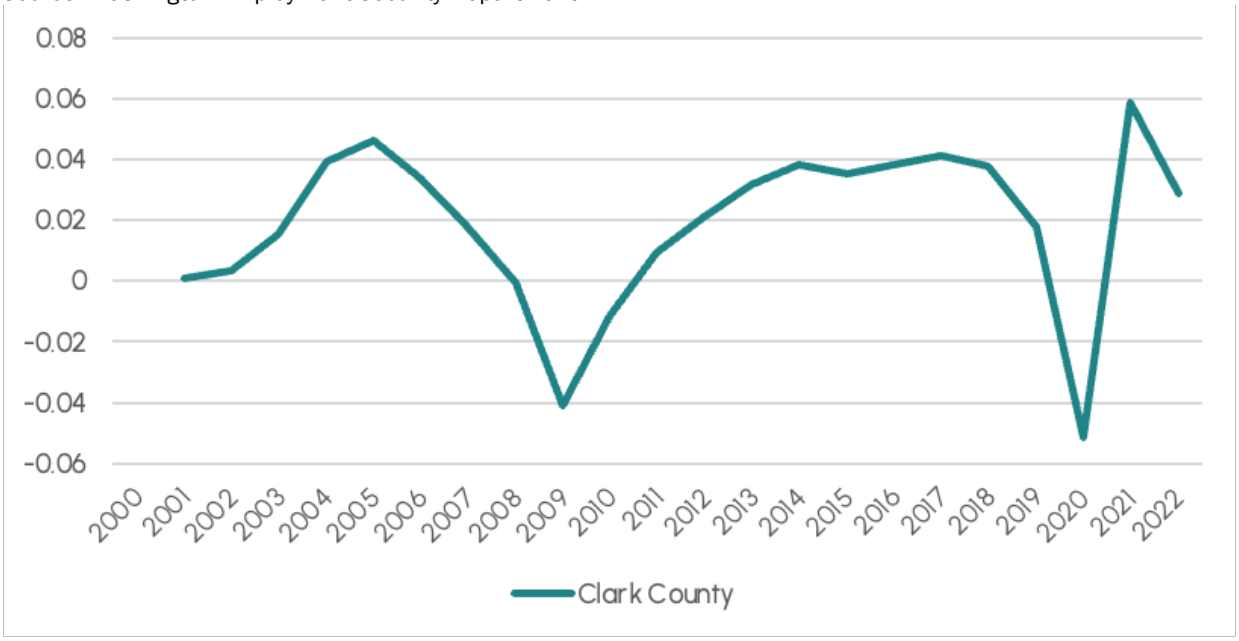
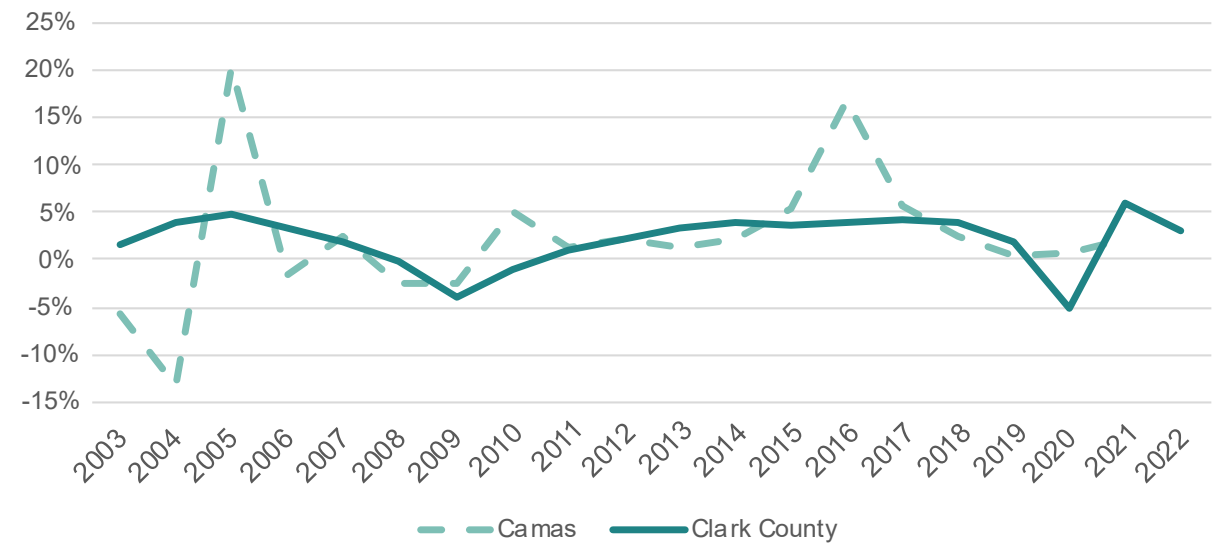


Figure 20 Total Employment Change YOY (Primary Jobs), Camas and Clark County

Source: Washington Employment Security Department, LEHD-LODES. Note: LEHD-LODES data for the City of Camas only available through 2021



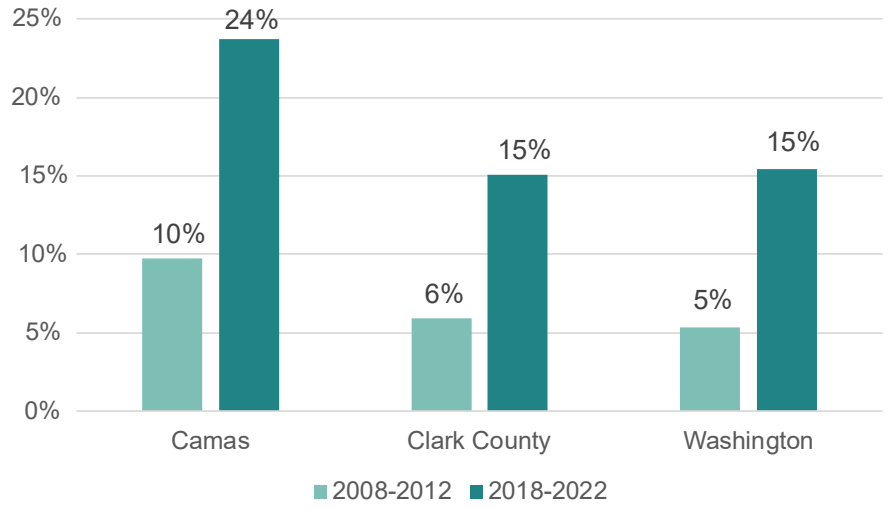
The Economic Development Element establishes goals and policies that seek to maintain the diversification of employment opportunities and support the continued growth of the Camas economy and attainment of the jobs target by 2045.

The City is targeting businesses that provide a greater proportion of living-wage jobs. Increasing retail services in support of residential, industrial, and professional business growth

is highly desirable. Camas is also seeing an increasing share of remote workers at a higher rate than the County or State, with nearly a quarter of workers falling into this category in 2022.

Figure 21 Share of Remote Workers, Camas, Clark County, and Washington, 2012-2022

Source: ACS, 2008-2012, 2018-2022



Summary of Demographic and Economic Trends

A summary of key findings from this Economic Development Element analysis is provided below to help describe key insights regarding the economic context, economic opportunities and challenges informing plan updates (Technical Appendix provides the full findings).

- **Camas has an aging population with a median age of 40 years in 2022 and a growing share of residents aged 60 years and over.** This group typically represents late-career workers or retirees. Median age in Camas is higher than Clark County overall and quickly growing since 2012, likely indicating a combination of natural growth and in-migration of older adults.
- **Camas has a higher share of residents 25 or older with at least a college level bachelor degree compared to Clark County or Washington State**, with 79% of residents holding these degrees in 2022. This share of residents rose quickly from only 37% in 2012.
- **Median household income for all households in Camas was nearly $134,000 in 2022, higher than Clark County or Washington State.** Since 2012, median income for residents of Camas increased by about 30% (in nominal dollars, not adjusted for inflation), more than either the County or State.
- **The City of Camas has seen generally positive trends in employment growth over the last two decades,** with notable increases in the number of workers in 2005, 2010, and 2016. The City of Camas employment grew from approximately 6,584 to 9,558 between 2011 and 2021.

- **The current employment to housing ratio in Camas was 1.0 in 2021, meaning that there is about one employee working in the City for every housing unit.** This ratio indicates that Camas has a well-balanced housing stock to accommodate workers in the City.
- **In 2021, the top five industries by employment in Camas were Finance and Insurance; Manufacturing; Educational Services; Professional, Scientific, and Technical Services; and Wholesale Trade.** Four of these five top industries paid above average wages (all except Educational Services paid below average wages). Finance and Insurance was the City's fastest growing industry (with an average annual growth rate of about 33%).
- **Top employers also reflect many of the County's largest industries, including professional services like finance and insurance, technology, manufacturing, and health care. Four of the City's top ten employers were in the manufacturing industry as of 2020.** Within Camas, employment has concentrated at two nodes, including the Downtown area to the southeast and corporate campuses in the Grass Valley near the border with the City of Vancouver.
- **Camas is part of an interconnected region, with more residents commuting out of Camas for work (8,159) than employees commuting in (6,982) as of 2021. Approximately 9,102 people are employed in Camas and among this total nearly 90% live in Camas (8,159) but work outside of the city and the remaining 10% live and work in Camas (943 people).** Top commuting destinations for Camas residents are primarily nearby, larger cities with employment hubs like Vancouver and Portland, while only 10% remained in the City. Nearly 59% commute less than 10 miles. The fourth most common destination for residents was Seattle, likely indicating remote workers at companies based in the Puget Sound area. Workers commuting to Camas originated from similar destinations, with one quarter coming from Vancouver.
- **Washington State Employment Security Department projections for future employment growth estimated that the Southwest Washington region will grow by about 19% overall by 2031.** The sectors expected to see the greatest increase in their share of employment are Professional/ Business Services, Leisure/ Hospitality, Education/ Health Services, Information, and Other Services.
- **Camas has a larger share of remote workers compared with Clark County and Washington State.** In 2022 one in four workers in Camas was a remote employee, compared to 15% in both the County and State overall. The share of remote workers in Camas has grown since 2012.
- **Since 2020, the City has issued 8,652 new business permits, with the largest volume of new permits in 2020 and a decreasing amount annually after 2020.** General business establishments accounted for the largest portion of these permits (74%), followed by home occupations (25%), and nonprofits (1%).
- **Camas' taxable retail sales were higher than those in most comparable jurisdictions in Clark County over the past decade**, competing primarily with the City of Battle

Ground for the highest annual sales. In 2022, total taxable retail sales reached an all-time high of over $600 million.

- **Retail rents in Camas had slight upward growth since 2014 while vacancies trended downward, indicating increasing demand for retail. Industrial real estate in the City of Camas is also performing well compared to Clark County in 2024.** The City is home to only about 3.9% of Clark County's industrial real estate in square footage but saw a sharp increase of industrial rents PSF in 2022, growing by over 200% year-over-year (YOY) to $23. Vacancy rates for industrial real estate were also extremely low in Camas in 2024 YTD at 1.7%, indicating high demand in the industrial market.

Implementation Tools and Strategies

Realizing the City of Camas economic development goals requires building on the City's potential while overcoming existing constraints. The following implementation strategies will generate positive momentum toward creating a more balanced and healthy economy.

Programmatic Strategies

- **Economic Development Committee:** Establish a mayor-appointed committee to help refine and implement Camas' economic development goals and strategies. The committee will:
  - Convene government, private sector, and nonprofit partners to leverage resources or secure financial support for economic development initiatives that benefit Camas and the broader region. In addition, this committee would help provide input on the Economic Development Strategy.
- **Economic Development Strategy**: Create an Economic Development Strategic Plan involving the Economic Development Committee, local businesses, community groups, school districts, and city leadership that further identifies priorities for job creation in targeted industries, infrastructure needs, reducing regulatory barriers, and incentives to attract needed and desired businesses.
  - Promote the development of an economic development strategy that will capitalize on the creation and retention of industries that provide living-wage jobs.
  - Future economic development strategy planning should capitalize on existing facilities and infrastructure and include a mix of uses that are trail- and transit-oriented and designed with high-quality streetscape appeal.
  - Lead an economic development strategy update every 1 to 3 years.

Financial Strategies

- **Leverage Grant Dollars**: Utilize federal, state, and county grants to support the establishment and expansion of small local businesses and infrastructure improvements benefiting economic development areas.
- **Incentives**: Explore incentives to encourage mixed-use development and provide affordable housing options (such as TIF, LID, MFTE changes).

- **Partnership**: Coordinate with the Columbia River Economic Development Council (CREDC) or other relevant organizations, to explore collaborative opportunities in promoting regional workforce development.
- **Opportunity Site Inventory**: Identify sites where the city can participate in cost-sharing mechanisms for infrastructure development.
    - Establish a policy that prioritizes capital investments to or on opportunities sites or other capital projects that better connect commercial nodes. This could include sidewalks, trails, bike paths, etc.

Regulatory Strategies

- **Code Audit**: Ensure the zoning code supports/incentivizes a broad range of needed and desired businesses in various zones.
    - **Study Allowed Uses:** Ensure needed and desired businesses are allowed in certain zones, including accessory uses which can support home-based businesses.
    - **Design standards**: Consider revisiting existing design standards to ensure they adequately support efforts to maintain and enhance existing character without compromising development feasibility.
    - **Flexible parking standards:** Develop flexible parking standards that can respond to site conditions.
    - **Revised Gateway Corridor Design Standards:** Update the design standards and allowed uses for gateway corridors to enhance its natural beauty but deemphasize its auto-oriented environment.

Procedural Strategies

- **Capacity Building**: Leverage increased tax revenue from population growth to support Camas' economic development strategy.
- **Clear and Objective Development Standards**: Establish clear and objective development standards for all development types, reducing the need for conditional use processes or other discretionary review processes.
- **Monitoring**: Monitor the performance of economic development such as with business retention and attrition, changes in tax revenues, and permitting of employment facilities. Monitor the financial impact of new programs, policies, and regulatory requirements on development feasibility by providing a report update every 1-3 years describing key metrics such as development changes and infrastructure projects.

Economic Development Goals and Policies

Goal ED-1 Citywide Economic Development

Maintain a diverse range of employment opportunities to support all residents, provide sufficient land supporting employment needs, and provide a setting and quality of life that attract and retain living-wage jobs[21] throughout the community.

Policy ED-1.1 Work with partners to identify strategies to proactively recruit businesses and ensure that tools and incentives are in place to attract sustainable and innovative industries to expand and provide stable living-wage employment.

Policy ED-1.2 Work with partners (such as the Chamber of Commerce, education programs, Workforce SW WA, CREDC) to provide apprenticeships, internships, vocational training schools, entrepreneurship programs, equitable opportunities, and on-the-job training in targeted industry sectors.

Policy ED-1.3 Encourage appropriate reuse, environmental cleanup, and redevelopment of older and deteriorating commercial areas and industrial brownfield sites. Identify opportunities to support place-based economic development, provide connections to the waterfront, diversify the economy, and support mixed-use development.

Policy ED-1.4 Foster and expand year-round recreational services, lodging, conference spaces, dining, and retail options to support tourism, benefit residents and employers, leverage Camas' strong parks and open space assets, and connect to the waterfront.

Policy ED-1.5 Participate in regional recruitment organizations to ensure the availability of an adequate supply of commercial and industrial employment land to support the City's economic development goals. Evaluate city resources to support economic development

[21] A living-wage job is one that pays an income sufficient to cover basic living expenses without financial hardship, allowing an individual or family to afford essential needs such as housing, food, healthcare, transportation, childcare, and other necessities without relying on public assistance. MIT Living wage calculation (2024): https://livingwage.mit.edu/counties/53053.

planning and implementation by designating a point-of-contact for economic development programs and serving as a liaison to the business community.

Policy ED-1.6 Support and encourage employees to use the Commute Trip Reduction Program. Encourage businesses to support remote work to reduce trips and implement a trip reduction program with incentives for carpooling, transit ridership, and other options beyond single-occupancy vehicles.

Policy ED-1.7 Encourage mixed-use development and complementary businesses throughout the City to support industry clusters and leverage resources.

Policy ED-1.8 Review regulatory design standards and planning procedures for industrial and commercial facilities and provide economic incentives to promote private investment in start-ups, incubator businesses, and businesses relocating to Camas.

Policy ED-1.9 Coordinate with Clark County and evaluate adding a Grove Field Urban Growth Area (UGA) for employment purposes to support employment targets.

Policy ED-1.10 Explore ways to support remote workers such as community hubs and third places and code revisions for co-working spaces.

Policy ED-1.11 Implement the Downtown Camas subarea plan and the associated goals and actions (see downtown subarea element).

Policy ED-1.12 Promote the growth of residential development in the North Shore as described in the Camas North Shore Subarea Plan.

Goal ED-2 Local Business Development

Promote business creation, expansion, retention, and diversification throughout the community to create a consistent and reliable tax base and a healthy, diversified local economy.

Policy ED-2.1 Identify and plan for infrastructure (such as the capital facilities plan) to nurture and incubate new businesses. Explore financing tools such as tax increment financing to fund infrastructure to support development and investment in targeted areas.

Policy ED-2.2 Support retention, expansion, and recruitment of local businesses in Camas.

Policy ED-2.3 Support development standards that promote high-quality building and site design, encourage businesses to operate in a sustainable and environmentally responsible manner and integrate energy efficient design features.

Policy ED-2.4 Collaborate with partners and agencies (such as CREDC and the Port of Camas Washougal) to develop economic strategies that promote diversification of business and industry in the city and facilitate opportunities for entrepreneurship.

Policy ED-2.5 Work with partners to proactively recruit and promote the growth of businesses and industries that provide, at a minimum, cost-of-living wages and economic diversity in alignment with the CREDC regional economic development plan.

Policy ED-2.6 Explore the creation of an economic development grant program for local businesses in connection with local partners.

Policy ED-2.7 Facilitate an environment for the success and growth of small businesses to maintain a strong, diverse, and resilient local economy.

Policy ED-2.8 Encourage investments and programs that provide resources and support to minority-owned and woman-owned businesses.

Policy ED-2.9 Increase the number of neighborhood business districts to expand local access to goods and services. Consider expanding mixed-use zoning options with ground floor commercial uses that allow residents to walk or roll from home.

Policy ED-2.10 Encourage shopping local to support Camas businesses.

Goal ED-3 Mixed Use and Commercial Areas

Encourage efficient and innovative development that thoughtfully mixes commercial and residential land uses that are pedestrian-friendly and consider the context of the surrounding area.

Policy ED-3.1 Develop commercial and mixed-use areas that are safe, comfortable, and attractive to pedestrians.

Policy ED-3.2 Encourage efficient land use in the mixed-use land use designation by facilitating compact, high-density development and minimizing the amount of land that is needed for surface parking.

Policy ED-3.3 Promote the growth of businesses such as grocery stores, medical offices, and restaurants that meet the retail and service needs of the community.

Policy ED-3.4 Encourage new developments to provide neighborhood parks and shared use paths to encourage greater physical activity and connect residential areas to commercial centers, public transit, and community facilities.

Goal ED-4 Mixed Employment and Industrial Areas

Providing a mix of traditional industrial and non-industrial land uses to maximize opportunities and partnerships and facilitate employers to remain, expand, or locate in Camas.

Policy ED-4.1 Evaluate the costs and benefits associated with adding the Grove Field Urban Growth Area to the North Shore Subarea Plan.

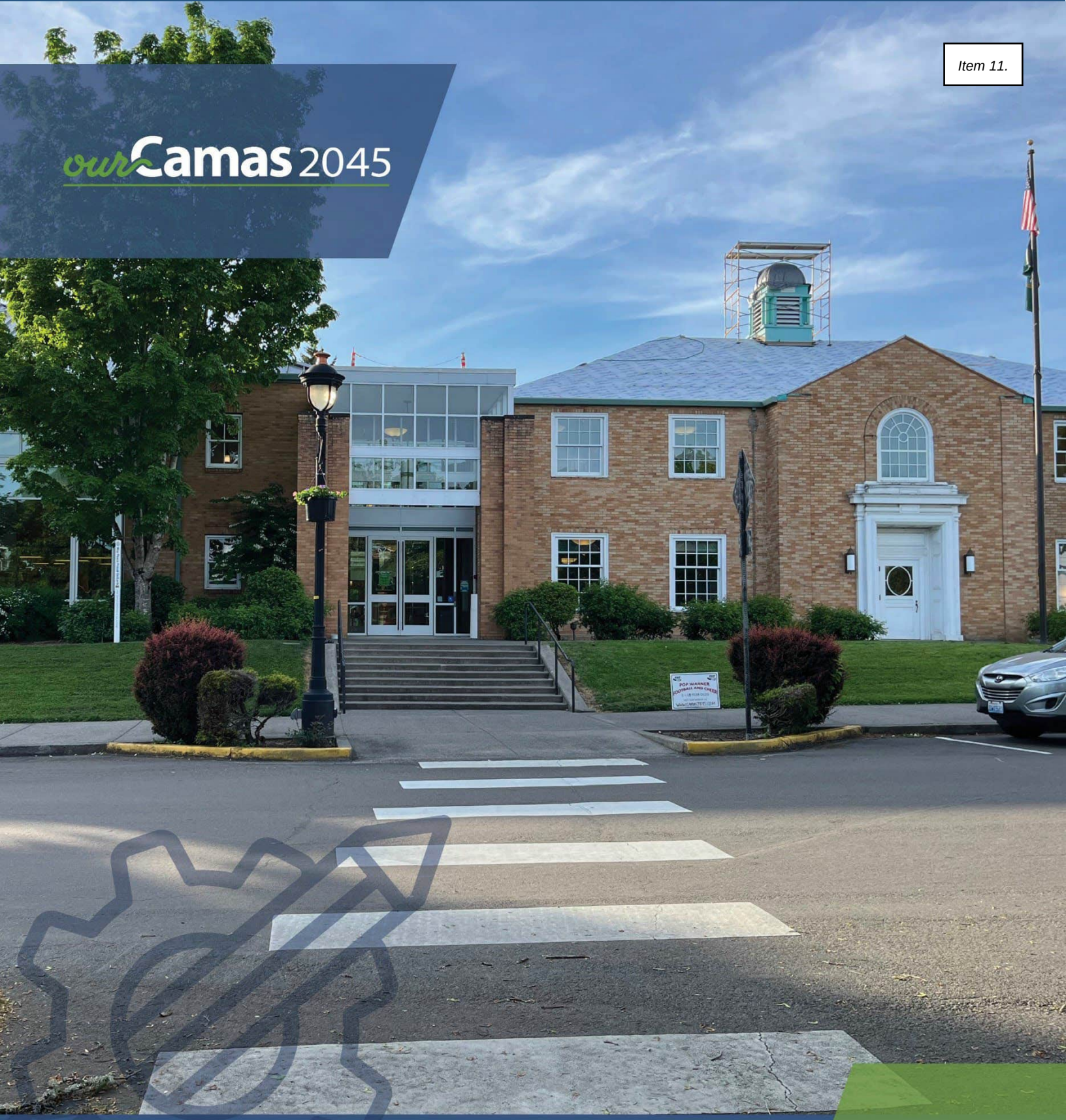
Policy ED-4.2 Preserve large tracts of land for large industry and master-planned commercial development within mixed employment land use areas.

Policy ED-4.3 Support a mix of light industrial, research and development, manufacturing, and office spaces through flexible zoning that allows for evolving business needs.

Policy ED-4.4 Support the development of business parks, incubators, and innovation hubs that integrate industrial and high-tech employment uses.

Policy ED-4.5 Ensure zoning and development regulations support both large-scale employers and small businesses, including start-ups and maker spaces.

ourCamas 2045



Technical Appendices

11

11. Technical Appendices

[Appendices to be included in future draft]

2025-2026 Capital Improvement Project List

6-Year Street Plan

Camas General Sewer Plan (2022)

Camas School District Capital Facilities Plan (2022)

Camas Stormwater Management Plan (2024)

Camas Water System Plan (2019)

Capital Facilities Plan

Clark County Comprehensive Plan (2025)

Economic Opportunity Analysis (2024)

Engagement Summary

Facility Conditions Assessment, Volumes 1 and 2

Housing Action Plan (2021)

Housing Needs Assessment (2024)

Parks and Open Space Management Plan (POSMP) (2025)

Parks, Recreation & Open Space Plan (2022)

Transportation System Plan (2025)

APPENDIX D

CAMAS FLOW MONITORING REPORT 2025

Camas Flow Monitoring 2025

Final Report Submitted to **Carollo Engineers** May 28, 2025



ADS ENVIRONMENTAL SERVICES

846 Industry Dr.
Tukwila, WA 98188

800-633-7246
www.adsenv.com

May 28, 2025

Max Mozer

Carollo Engineers

1200 5th Avenue Suite 900

Seattle, WA 98101

SUBJECT: Camas Flow Monitoring 2025

Dear Mr. Mozer,

ADS is pleased to submit the report for the project referenced above completed on behalf of Carollo Engineers. The metering was conducted at four (4) flow monitoring locations and one (1) rain monitoring location. The study was conducted during the period of Wednesday, 15 January 2025 to Tuesday, 29 April 2025.

The report contains depth, velocity, and quantity hydrographs as well as daily long tables for the metering period. An Excel file containing depth, quantity, and velocity entities for the monitoring location in 15-minute format was provided previously.

In addition, we would be happy to further explain any details about the report that may seem unclear. Should you have any questions or comments, you may contact the Project Manager, Cody Mahaffey at (425) 620-6412.

It has been our pleasure to be of service to you in the performance of this project. Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

Justin Hatch
Hydraulic Data Analyst

Camas Flow Monitoring 2025

Prepared For:

Max Mozer
Carollo Engineers
1200 5th Avenue Suite 900
Seattle, WA 98101

Prepared By:

ADS, LLC
846 Industry Dr.
Tukwila, WA 98188

Scope and Methodology

Introduction

Carollo Engineers entered into an agreement with ADS Environmental Services to conduct flow monitoring at (4) four flow locations and (1) one rainfall gauging location in Camas, Washington. The study was scheduled for a period of (105) one-hundred and five days. Once in place, the flow monitoring equipment was to be used to measure depth, velocity, and to quantify flows. Data obtained from the study will be used for inflow and infiltration analysis.

Project Scope

The scope of this study involved using a flow monitor to quantify wastewater flow at the designated locations for the study period. Specifically, the study included the following key components.

- Investigate the proposed flow-monitoring site for adequate hydraulic conditions
- Flow monitor installation
- Flow monitor confirmations and data collections
- Flow data analysis

Additionally, temporary rain gauge monitors were used to measure and record rainfall at the designated locations. Specifically, the study involved the following key components.

- Investigate the proposed rain gauge sites for sufficient exposure and security
- Rain Gauge installations
- Manually confirming rain gauge tipping bucket operation and date collections
- Rain data analysis

Equipment installation was completed on January 14, 2025. The monitoring period began on January 15, 2025 and was completed on April 29, 2025. Upon completion of the study, equipment was removed from the system.

Flow Monitoring Equipment



The ***ADS Triton+*** monitor was selected for this project. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS Triton+ monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals.

The Triton+ monitor features cross-checking using multiple technologies in each sensor for continuous running of comparisons and tolerances. The Triton+ monitor can support two (2) sets of sensors. The sensor option used for this project was:

The Peak Combo Sensor installed at the bottom of the pipe includes three types of data acquisition technologies

The ***up looking ultrasonic depth*** uses sound waves from two independent transceivers to measure the distance from the sensor upward toward the flow surface; applying the speed of sound in the water and the temperature measured by sensor to calculate depth.

The ***pressure depth*** is calculated by using a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube.

To obtain ***peak velocity*****,** the sensor sends an ultrasonic signal at an angle upward through the widest cross-section of the oncoming flow. The signal is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity.

Installation

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed.

In pipes up to 42 inches in diameter, the sensors were mounted on expandable stainless-steel rings, inserted at least a foot upstream into influent pipes and tightened against the inside walls of the pipes. Influent pipe installations reduce the influences of turbulence and backwater often caused by changes in channel geometry in manholes.





Data Collection, Confirmation, and Quality Assurance

Data collects were done remotely via wireless connect on a weekly basis. As needed, during the monitoring period, field crews visit each monitoring location to verify proper monitor operation and document field conditions. The following quality assurance steps are taken to assure the integrity of the collected data:

Measure power supplies: monitors were powered by dry cell battery packs. Voltages were recorded and battery packs replaced, as necessary. Separate batteries provided back-up power to memory allowing primary batteries to be replaced without loss of data.

Clock synchronization: Field crews synchronized monitor clocks to master clocks.

Confirm depth and velocity readings: Field crews descended into meter manholes to manually measure depths and velocities and compare the meter readings to confirm that they agreed. The site met the criteria for confirmation for depth and velocity unless noted otherwise in the site commentary section. They also measured silt levels, if any, in the inverts of the pipes. Silt areas were subtracted from flow areas to compute true areas of flow.

Confirm average velocities through cross-sectional velocity profiles: Since ADS velocity sensors measure peak velocity, field crews collected cross-sectional velocity profiles in order to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

Upload and Review Data: Data collected from the monitors were uploaded and reviewed by a Data Analyst for completeness, outliers and deviations in the flow patterns, which indicate system anomalies or equipment failure.

Rainfall Logging Equipment



The ***ADS RainAlert III*** monitor was selected for this project. This monitor provides rainfall data acquisition and intelligent alarming to support wastewater capital improvement.

The ADS RainAlert III monitor measures rainfall using a tipping bucket containing a funnel and a small tipping mechanism that can collect a specific amount of rainfall. Once the tipping mechanism is full it empties and records that a tip has occurred. Typically, each tip is equivalent to 0.01 inches (or 0.2mm) of rainfall. The monitor records the number of tips that occur over each 5-minute interval to calculate discrete rainfall amounts for each of those 5-minute intervals.

Installation

Installation of rainfall logging equipment typically proceeds in five steps. First, investigating and selecting the appropriate location to install the tipping bucket and monitor. Second, installing the Sun Shield involves properly placing the sun shield and securing it to an appropriate structure or surface, or mounting it to a pole, as applicable. Third, involves mounting the tipping bucket on the sun shield at the designated rainfall collection location and connecting the wires from the monitor to the tipping bucket. Fourth, involves testing and adjusting the tipping bucket and internal tipping mechanism to ensure it accurately measures rainfall amounts. The final step involves installing the monitor at the appropriate location.

Flow Quantification Methods

There are two main equations used to measure open channel flow: the ***Continuity Equation*** and the ***Manning Equation.*** The Continuity Equation, which is considered the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

Continuity Equation

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow.

Data Analysis and Presentation

Data Analysis

A flow monitor is typically programmed to collect data at 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the ultrasonic depth, (2) the peak velocity and (3) the pressure depth. The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. The data analyst selects which depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Occasionally the velocity sensor's performance may be compromised resulting in invalid readings sporadically during the monitoring period. This is generally caused by excessive debris (silt) blocking the sensor's crystals, shallow flows (~< 1") that may drop below the top of the sensor or very clear flows lacking the particles needed to measure rate. In order to use the Continuity equation to quantify the flow during these periods, a Data Analyst and/or Engineer will use the site's historical pipe curve (depth vs. velocity) data along with valid field confirmations to reconstitute and replace the false velocity recordings with expected velocity readings for a given historical depth along the curve.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs.
Hydrographs are based on 15-minute data. Tables are provided in daily average format. These tables show the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the flow data table and hydrograph.

DFINAL - Final calculated depth measurement (in inches)

QFINAL - Final calculated flow rate (in MGD)

VFINAL - Final calculated flow velocity (in feet per second)

RAIN – Final calculated rainfall (in inches)

REPORT TOTAL - Total volume of flow recorded for the indicated time period (in MG)

CAM_100290

Site Commentary

SITE INFORMATION

Pipe	Elliptical (19 in H x 19.5 in W)
Silt	0.00 (in)

OBSERVATIONS

Surcharge conditions were not experienced. Review of the scattergraph shows that free-flow conditions were maintained throughout the study.

This site was located upstream of site CAM_51123. A review of flow balancing indicated no problems

Average flow depth, velocity, and quantity data observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025**, along with observed minimum and maximum data, are provided in the following table.

Observed Flow Conditions			
Item	**DFINAL (in)**	**VFINAL (ft/s)**	**QFINAL (MGD - Total MG)**
Average	3.24	2.00	0.326
Minimum	1.34	1.05	0.049
Maximum	9.57	3.56	1.941
Min Time	04/29/2025 02:10:00	04/23/2025 00:55:00	04/29/2025 02:10:00
Max Time	02/23/2025 16:40:00	01/31/2025 09:25:00	02/23/2025 15:50:00

Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Values in the graphical reports are based on the fifteen minutes average and values in the Observed Flow Conditions and tabular report are based on the five-minute average.

DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
DFINAL (in)	100
VFINAL (ft/s)	100
QFINAL (MGD - Total MG)	100

Camas.Carollo.TFM.WA24		Site Name
Flow Monitoring Site Report		CAM_100290

Site Address /Location:	1724 NE Franklin St, Camas, WA 98607			Monitor Series	Location Type
				TRITON+	Temporary
Site Access Details:	On Road	Latitude:	45.5919803	Pipe Size (H x W)	Pipe Shape
		Longitude:	-122.4042885	19.00 x 19.50	Circular



Manhole #	System Characteristics
100290	Residential
Access	Traffic
Drive	None







Installation Information

Installation Date:	Installation Type:
Tuesday, January 14, 2025	Doppler Special Installation
Monitoring Location (Sensors):	Monitor Location:
Upstream 0-5 FT	Manhole
Sensors / Devices:	Pressure Sensor Range (psi)
Peak Combo (CS4)	0 - 5 psi

Installation Confirmation:

Time	
12:14:00 PM	
Depth of Flow (Wet DOF) (in)	
2.50	
CS58 Physical Offset (in)	Measurement Confidence (in)
N/A	0.25"
Peak Velocity (fps)	Velocity Sensor Offset (in)
2.23	N/A
Silt (in)	Silt Type
0	

Manhole / Pipe Information:

Manhole Depth (Approx. FT):	Manhole Configuration
13'	Single
Manhole Material:	Manhole Condition:
Concrete	Good
Manhole Opening Diameter (in)	Manhole Diameter (Approx.):
24	26
Manhole Cover	Manhole Frame
Steel	Normal
Active Connections	Air Quality:
No	Normal
Pipe Material	Pipe Condition:
PVC	Good

Communication Information:

Communication Type	Antenna Location
Wireless	Manhole Pick / Vent Hole

Additional Site Info. / Comments:

ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23116.11.325

Additional Photos

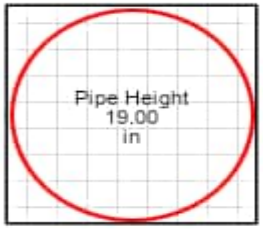
Monitoring Point Inlet	Outlet	
		
Top Down	**Location**	**Map**
		
	KEY	
	Flow Direction Monitoring Point	

Hydrograph Report

CAM_100290

Flow Monitor

CAM_100290



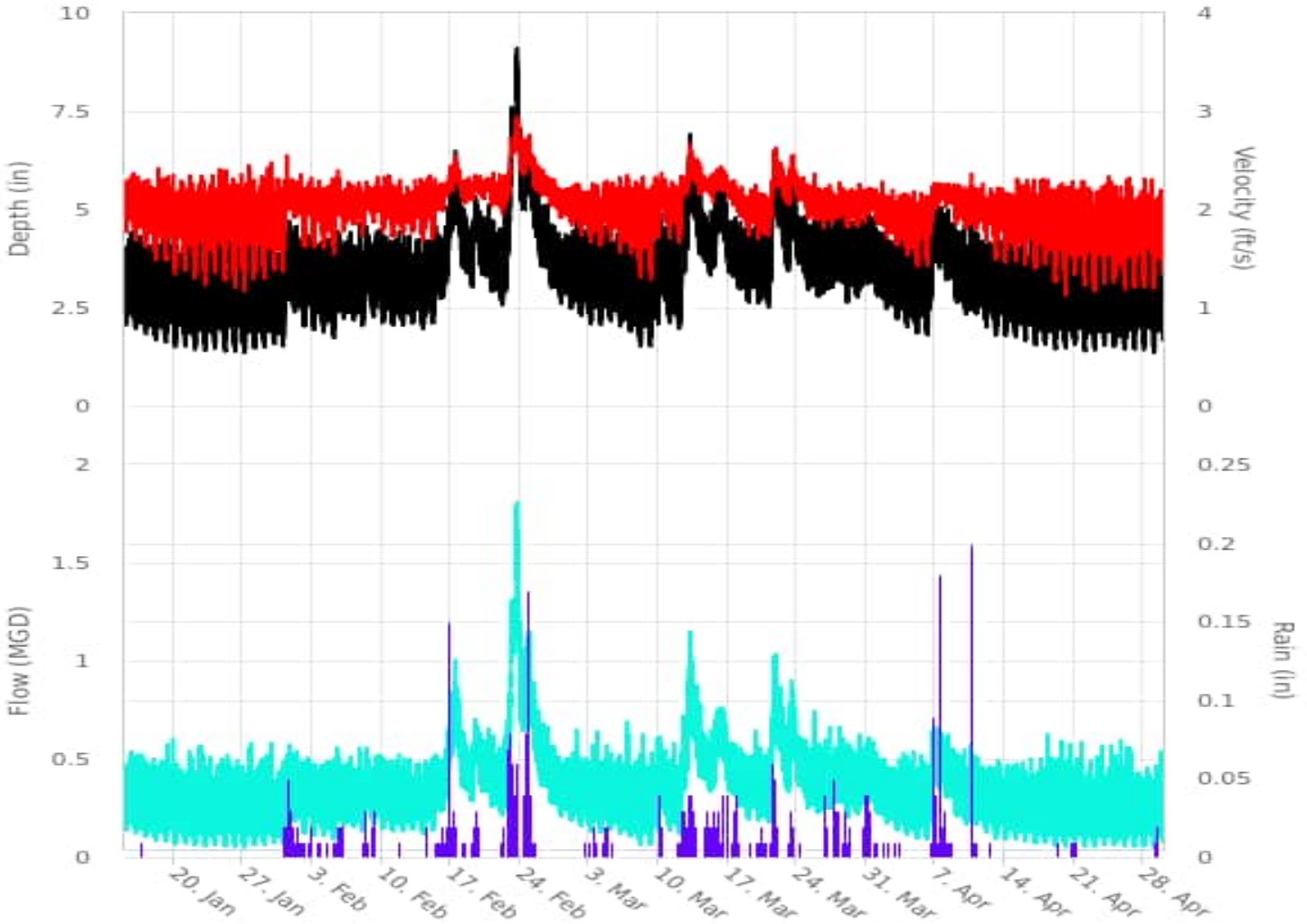
Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL





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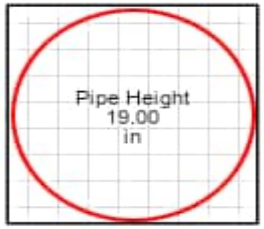
Scattergraph Report

CAM_100290

Flow Monitor

CAM_100290



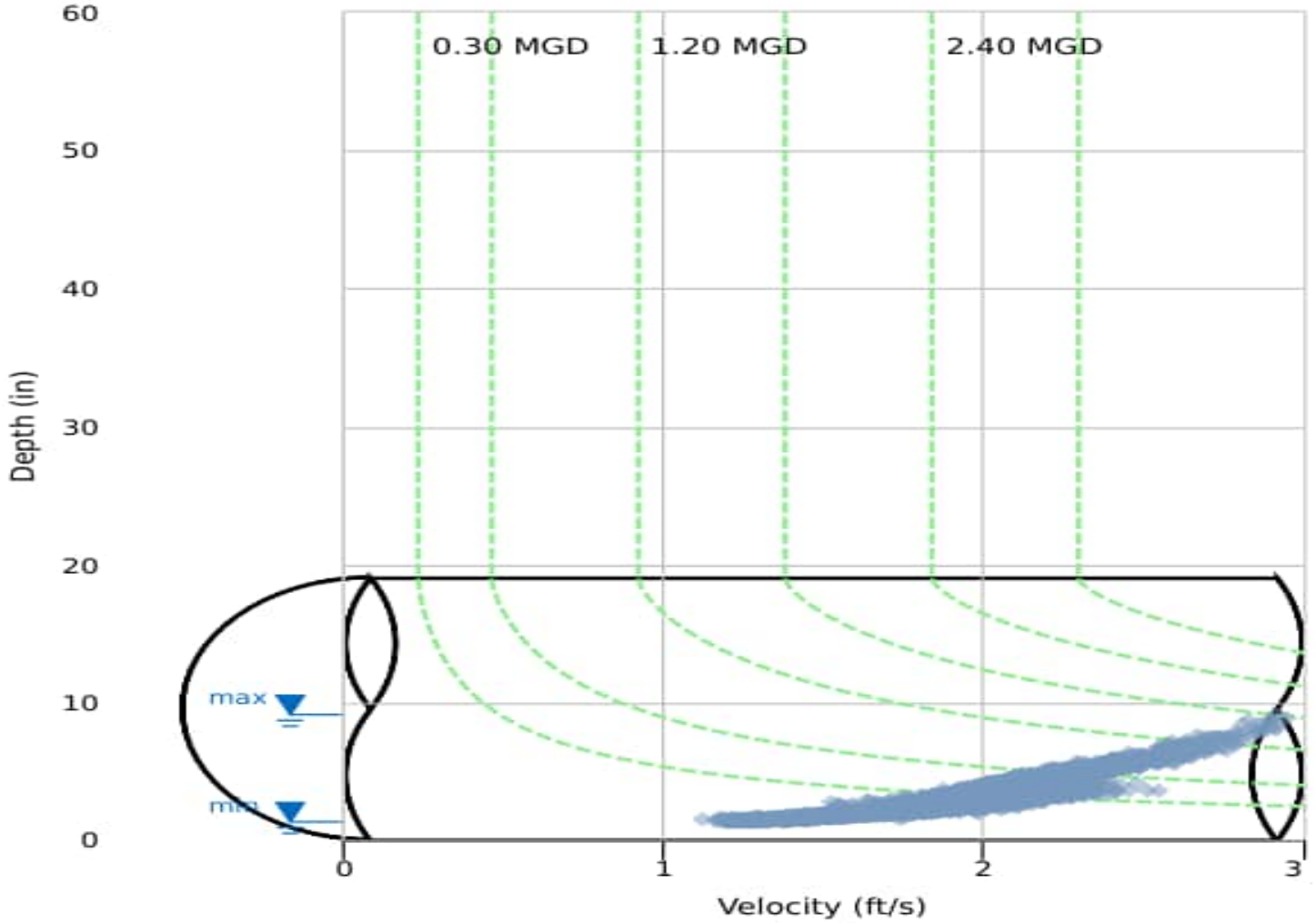
Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL - VFINAL
Iso-Q™
Min-Max Depth





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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_100290 Pipe: Elliptical (19 in H x 19.5 in W), Silt0.00 in

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/15/2025	04:00	2.05	17:35	5.79	2.91	04:00	1.72	12:50	2.64	2.05	04:00	0.131	17:35	0.777	0.274	0.274	-
01/16/2025	03:45	1.95	17:20	5.64	2.78	03:30	1.67	14:35	2.65	2.01	03:30	0.118	17:20	0.766	0.256	0.256	0.01
01/17/2025	04:50	1.82	08:55	5.72	2.66	03:50	1.60	09:35	2.65	1.94	03:50	0.104	08:55	0.823	0.235	0.235	-
01/18/2025	03:35	1.66	15:10	5.61	2.61	04:05	1.38	21:50	2.67	1.90	04:05	0.078	15:10	0.752	0.228	0.228	-
01/19/2025	05:50	1.61	21:45	5.69	2.60	03:00	1.46	10:10	2.67	1.88	05:50	0.080	21:45	0.792	0.226	0.226	-
01/20/2025	03:10	1.48	08:50	5.26	2.58	03:00	1.32	19:10	2.65	1.87	03:10	0.063	15:55	0.700	0.222	0.222	-
01/21/2025	04:10	1.50	07:40	5.55	2.49	02:40	1.34	14:05	2.65	1.83	04:10	0.067	07:40	0.757	0.208	0.208	-
01/22/2025	03:15	1.42	10:40	5.50	2.46	05:05	1.28	19:00	2.61	1.81	03:30	0.058	17:15	0.705	0.203	0.203	-
01/23/2025	03:10	1.40	11:55	5.55	2.41	03:15	1.20	21:45	2.60	1.80	03:15	0.052	11:55	0.717	0.197	0.197	-
01/24/2025	03:40	1.44	21:35	5.46	2.48	03:05	1.33	13:30	2.67	1.83	03:50	0.062	21:35	0.802	0.207	0.207	-
01/25/2025	05:10	1.37	09:30	5.59	2.47	04:50	1.25	06:30	2.75	1.80	04:50	0.053	09:30	0.746	0.207	0.207	-
01/26/2025	04:05	1.37	18:40	5.56	2.48	04:05	1.18	16:35	2.58	1.79	04:05	0.050	18:40	0.741	0.207	0.207	-
01/27/2025	03:05	1.34	10:10	5.32	2.44	02:35	1.15	10:15	2.88	1.81	03:10	0.049	09:25	0.712	0.203	0.203	-
01/28/2025	05:20	1.45	13:35	5.60	2.48	02:40	1.17	20:45	2.80	1.81	02:40	0.055	20:45	0.790	0.206	0.206	-
01/29/2025	04:05	1.49	08:25	5.63	2.50	03:55	1.25	19:20	2.99	1.82	03:55	0.060	19:20	0.884	0.211	0.211	-
01/30/2025	05:00	1.56	20:55	5.05	2.46	05:15	1.37	10:00	2.95	1.83	05:15	0.070	10:00	0.682	0.202	0.202	-
01/31/2025	02:00	1.50	16:35	5.68	3.25	00:45	1.34	09:25	3.56	2.05	01:50	0.065	09:25	1.079	0.328	0.328	0.60
02/01/2025	06:40	2.37	10:00	5.76	3.09	03:45	1.90	20:15	2.55	2.08	06:40	0.180	10:00	0.736	0.296	0.296	0.12
02/02/2025	03:50	2.02	20:45	5.43	2.96	03:35	1.56	15:20	2.60	1.98	03:35	0.117	15:20	0.791	0.273	0.273	0.07
02/03/2025	03:05	1.91	07:20	5.57	2.82	04:25	1.60	18:10	2.66	1.97	04:25	0.111	07:20	0.704	0.253	0.253	0.02
02/04/2025	03:45	1.86	07:55	5.46	2.75	04:30	1.60	14:20	2.57	1.96	04:30	0.107	07:55	0.718	0.245	0.245	0.01
02/05/2025	04:30	1.71	12:15	5.74	2.93	04:10	1.52	12:10	2.55	1.99	04:10	0.090	12:15	0.824	0.273	0.273	0.19
02/06/2025	04:30	2.21	21:30	5.44	3.02	03:40	1.70	15:20	2.55	2.03	03:40	0.150	20:30	0.679	0.282	0.282	-
02/07/2025	04:55	2.16	07:10	5.58	2.89	04:55	1.80	00:35	2.51	2.01	04:55	0.148	07:10	0.722	0.264	0.264	-
02/08/2025	01:55	2.02	11:05	5.93	3.17	01:45	1.73	11:05	2.33	2.06	01:55	0.129	11:05	0.812	0.309	0.309	0.25
02/09/2025	04:40	2.25	20:30	5.60	3.14	17:30	1.83	14:20	2.45	2.07	04:25	0.162	20:30	0.709	0.303	0.303	0.05
02/10/2025	03:10	2.10	07:40	5.61	2.98	02:50	1.76	07:35	2.71	2.04	04:00	0.141	07:40	0.778	0.279	0.279	-
02/11/2025	05:00	2.04	07:40	5.65	2.90	02:40	1.70	15:20	2.57	2.00	04:35	0.131	07:40	0.738	0.265	0.265	0.01
02/12/2025	03:55	2.05	07:05	5.48	2.90	00:20	1.69	13:50	2.52	2.00	03:30	0.131	07:05	0.690	0.264	0.264	-
02/13/2025	03:50	2.09	06:40	5.37	2.95	03:20	1.74	15:05	2.49	2.02	03:20	0.137	06:40	0.678	0.272	0.272	-
02/14/2025	05:10	1.95	08:55	5.54	2.87	05:00	1.66	08:50	2.56	1.98	05:00	0.117	08:55	0.770	0.261	0.261	0.07
02/15/2025	06:10	2.10	11:30	5.53	3.08	03:35	1.65	00:25	2.58	2.02	03:35	0.130	08:40	0.734	0.291	0.291	0.09
02/16/2025	01:45	2.76	21:35	6.26	3.77	04:55	1.90	20:30	2.43	2.18	04:55	0.229	21:35	0.902	0.412	0.412	0.77
02/17/2025	23:35	3.96	11:45	6.94	5.05	02:20	2.17	12:20	2.65	2.34	23:35	0.429	11:45	1.090	0.657	0.657	0.39
02/18/2025	23:30	3.21	06:40	6.08	4.00	14:05	2.02	20:45	2.42	2.20	23:30	0.309	06:40	0.852	0.445	0.445	0.02
02/19/2025	05:00	3.01	08:55	6.23	4.25	07:05	2.06	08:55	2.43	2.23	05:00	0.281	08:55	0.904	0.495	0.495	0.40
02/20/2025	23:55	3.15	02:50	5.75	3.82	07:55	2.08	18:05	2.40	2.21	23:55	0.307	09:40	0.788	0.420	0.420	-
02/21/2025	23:15	2.78	23:20	5.80	3.45	16:05	2.01	08:05	2.54	2.16	23:15	0.245	08:10	0.793	0.357	0.357	0.04
02/22/2025	05:40	2.55	23:30	6.71	3.69	06:45	1.91	23:00	2.49	2.16	06:45	0.207	23:30	0.988	0.402	0.402	0.84
02/23/2025	00:00	5.10	16:40	9.57	7.24	00:00	2.35	15:55	3.00	2.71	00:00	0.663	15:50	1.941	1.246	1.246	1.07
02/24/2025	10:35	4.91	23:25	7.52	5.85	05:45	2.34	15:35	2.86	2.54	10:35	0.633	19:35	1.324	0.874	0.874	0.87
02/25/2025	23:40	3.80	00:40	6.97	5.08	11:05	2.14	00:00	2.77	2.40	23:40	0.409	00:40	1.145	0.682	0.682	0.03
02/26/2025	23:55	3.25	06:45	6.02	3.98	15:30	2.11	06:45	2.49	2.22	23:55	0.314	06:45	0.886	0.448	0.448	-
02/27/2025	23:55	2.81	19:55	5.67	3.54	16:45	1.97	06:20	2.46	2.14	23:55	0.240	19:55	0.766	0.367	0.367	-
02/28/2025	03:25	2.59	14:55	5.80	3.32	13:50	1.88	14:55	2.37	2.05	03:20	0.202	14:55	0.799	0.323	0.323	-
03/01/2025	03:20	2.45	19:55	5.73	3.23	04:15	1.82	23:00	2.35	2.02	04:15	0.185	14:25	0.770	0.310	0.310	-
03/02/2025	06:20	2.29	14:00	5.53	3.17	04:00	1.73	08:25	2.29	1.97	04:00	0.155	20:10	0.709	0.295	0.295	0.05
03/03/2025	03:55	2.07	19:00	5.90	3.04	04:05	1.66	21:10	2.30	1.93	04:00	0.128	19:00	0.793	0.277	0.277	0.07
03/04/2025	04:20	2.05	16:25	5.79	3.09	03:20	1.62	16:20	2.39	1.97	03:55	0.124	16:25	0.801	0.290	0.290	0.12
03/05/2025	04:10	2.14	20:15	5.47	3.03	03:30	1.65	22:25	2.42	1.97	03:35	0.137	20:50	0.701	0.279	0.279	0.01
03/06/2025	03:20	2.02	22:15	5.72	2.85	02:55	1.55	13:25	2.50	1.90	03:15	0.116	22:15	0.785	0.250	0.250	-
03/07/2025	23:55	1.85	16:35	5.47	2.68	03:40	1.51	21:30	2.45	1.87	03:40	0.101	16:35	0.729	0.230	0.230	-
03/08/2025	04:20	1.50	17:25	5.66	2.60	04:05	1.29	10:35	2.41	1.81	04:05	0.062	17:25	0.767	0.220	0.220	-
03/09/2025	04:20	1.51	07:45	5.47	2.73	05:00	1.27	15:00	2.49	1.85	05:05	0.062	07:45	0.742	0.240	0.240	0.20
03/10/2025	23:05	2.29	06:20	5.91	3.41	00:00	1.81	07:35	2.58	2.11	00:00	0.164	06:20	0.811	0.344	0.344	0.22
03/11/2025	23:30	2.06	06:40	5.64	2.92	01:55	1.62	19:10	2.53	2.01	01:55	0.133	16:25	0.766	0.270	0.270	0.02
03/12/2025	03:25	1.96	23:15	6.33	3.68	02:15	1.64	23:15	2.41	2.10	03:10	0.117	23:15	0.917	0.398	0.398	0.83
03/13/2025	23:50	4.25	03:05	7.64	5.44	22:35	2.20	05:00	2.73	2.40	23:50	0.484	05:00	1.283	0.749	0.749	0.49
03/14/2025	23:40	3.51	01:00	6.11	4.27	04:20	2.15	01:00	2.55	2.26	23:40	0.369	01:00	0.924	0.502	0.502	0.16
03/15/2025	06:25	3.30	20:15	6.13	4.13	13:15	2.04	20:15	2.46	2.25	06:20	0.327	20:15	0.895	0.479	0.479	0.60
03/16/2025	23:35	3.62	04:50	6.35	4.73	21:10	2.11	07:10	2.60	2.28	23:35	0.378	07:10	0.995	0.584	0.584	0.16
03/17/2025	23:40	3.11	02:55	5.79	3.87	14:45	2.01	15:20	2.60	2.18	23:40	0.284	02:55	0.808	0.421	0.421	0.19
03/18/2025	23:05	2.71	06:40	5.83	3.51	23:55	1.77	12:40	2.35	2.04	23:55	0.203	06:40	0.776	0.348	0.348	0.02
03/19/2025	04:25	2.60	20:55	5.97	3.47	04:40	1.68	18:45	2.39	1.97	01:45	0.190	18:45	0.832	0.334	0.334	0.07
03/20/2025	03:25	2.60	06:45	5.86	3.38	01:30	1.67	03:50	2.27	1.93	01:30	0.182	06:45	0.774	0.316	0.316	0.11
03/21/2025	03:20	2.49	15:25	7.29	4.60	02:45	1.73	15:55	2.76	2.19	03:20	0.176	15:25	1.249	0.577	0.577	1.12
03/22/2025	23:00	3.51	05:40	6.54	4.75	23:00	2.07	04:10	2.62	2.28	23:00	0.344	05:40	1.031	0.590	0.590	-
03/23/2025	02:40	3.42	09:50	6.72	4.53	03:15	2.03	09:50	2.74	2.26	04:05	0.329	09:50	1.132	0.551	0.551	0.44
03/24/2025	23:55	3.16	06:10	6.03	3.99	23:10	2.00	15:55	2.44	2.17	23:55	0.288	15:55	0.855	0.439	0.439	0.01

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/25/2025	04:25	2.94	20:10	5.99	3.58	16:25	1.85	18:45	2.42	2.07	02:40	0.241	18:45	0.851	0.363	0.363	-
03/26/2025	04:25	2.76	06:25	5.96	3.53	17:00	1.77	06:25	2.38	2.05	04:20	0.224	06:25	0.834	0.354	0.354	0.20
03/27/2025	03:50	2.95	06:45	5.94	3.62	01:45	1.76	06:45	2.33	2.01	01:45	0.238	06:45	0.812	0.357	0.357	0.24
03/28/2025	23:55	2.79	03:25	6.14	3.78	23:10	1.87	06:30	2.37	2.06	23:55	0.225	06:30	0.862	0.388	0.388	0.17
03/29/2025	01:45	2.62	15:55	5.90	3.59	03:25	1.78	06:05	2.36	2.01	01:30	0.198	06:05	0.797	0.355	0.355	0.12
03/30/2025	02:00	2.74	08:55	5.83	3.57	04:05	1.81	09:30	2.34	2.02	04:05	0.216	09:30	0.793	0.354	0.354	0.23
03/31/2025	23:50	2.91	12:40	6.05	3.74	23:50	1.87	12:40	2.38	2.07	23:50	0.237	12:40	0.852	0.384	0.384	0.10
04/01/2025	23:55	2.49	01:35	5.59	3.34	23:55	1.72	14:00	2.39	1.99	23:55	0.174	01:35	0.751	0.318	0.318	0.03
04/02/2025	23:25	2.33	16:55	5.70	3.15	23:05	1.60	00:25	2.32	1.92	23:25	0.152	16:55	0.749	0.283	0.283	0.05
04/03/2025	23:25	2.18	00:55	5.66	2.98	23:25	1.55	19:15	2.26	1.86	23:25	0.129	19:15	0.726	0.259	0.259	0.02
04/04/2025	02:40	2.00	14:05	5.65	2.85	04:20	1.51	23:25	2.30	1.83	02:10	0.112	14:05	0.741	0.241	0.241	-
04/05/2025	03:15	1.84	14:15	5.67	2.75	05:10	1.40	22:20	2.38	1.80	05:10	0.092	14:15	0.748	0.229	0.229	-
04/06/2025	04:35	1.80	22:35	6.10	3.29	03:10	1.39	12:10	2.36	1.91	04:40	0.091	21:00	0.840	0.319	0.319	0.71
04/07/2025	23:45	3.31	00:40	6.20	4.18	01:25	1.92	23:50	2.32	2.15	10:35	0.314	00:40	0.850	0.464	0.464	0.37
04/08/2025	23:50	2.80	06:45	6.01	3.74	00:20	1.94	07:20	2.39	2.13	23:50	0.233	06:45	0.819	0.394	0.394	0.07
04/09/2025	23:10	2.49	15:20	5.69	3.30	15:10	1.79	07:40	2.46	2.04	23:10	0.187	07:40	0.759	0.319	0.319	-
04/10/2025	02:15	2.32	06:10	5.60	3.18	04:10	1.73	05:05	2.45	2.04	02:25	0.164	06:10	0.699	0.305	0.305	0.27
04/11/2025	23:10	2.28	06:05	5.51	3.07	23:55	1.76	19:15	2.34	2.00	23:55	0.157	06:05	0.732	0.284	0.284	0.01
04/12/2025	23:55	1.94	06:05	5.40	2.95	23:50	1.59	06:05	2.34	1.93	23:50	0.113	06:05	0.716	0.266	0.266	0.01
04/13/2025	03:05	1.78	08:30	5.37	2.89	04:40	1.47	08:30	2.53	1.90	02:50	0.092	08:30	0.769	0.258	0.258	-
04/14/2025	03:15	1.77	06:40	5.62	2.77	02:20	1.40	06:40	2.42	1.87	02:20	0.088	06:40	0.782	0.240	0.240	-
04/15/2025	02:50	1.74	18:50	5.27	2.73	02:30	1.47	05:45	2.43	1.86	02:25	0.088	18:50	0.669	0.233	0.233	-
04/16/2025	23:55	1.63	15:15	5.54	2.60	01:35	1.43	07:00	2.45	1.84	23:55	0.079	15:15	0.719	0.217	0.217	-
04/17/2025	01:40	1.53	06:20	5.34	2.59	01:35	1.33	00:00	2.67	1.83	01:35	0.067	06:20	0.679	0.218	0.218	-
04/18/2025	02:45	1.56	15:10	5.61	2.53	03:00	1.42	00:10	2.45	1.80	02:25	0.073	12:50	0.764	0.209	0.209	-
04/19/2025	02:55	1.43	15:10	5.55	2.51	00:35	1.24	16:10	2.46	1.76	02:55	0.056	13:10	0.726	0.206	0.206	0.01
04/20/2025	03:50	1.46	10:55	5.52	2.59	03:30	1.09	10:50	2.49	1.76	03:30	0.051	10:55	0.765	0.215	0.215	0.05
04/21/2025	03:00	1.54	17:10	5.56	2.56	00:15	1.33	20:30	2.53	1.80	02:25	0.068	10:45	0.718	0.212	0.212	0.02
04/22/2025	02:45	1.38	19:10	5.57	2.49	02:55	1.21	14:35	2.34	1.75	02:55	0.052	19:10	0.740	0.202	0.202	-
04/23/2025	03:35	1.41	07:00	5.56	2.52	00:55	1.05	09:30	2.33	1.76	00:55	0.050	07:00	0.705	0.206	0.206	-
04/24/2025	03:35	1.53	19:30	5.64	2.49	03:00	1.22	12:30	2.62	1.77	03:00	0.063	19:30	0.756	0.201	0.201	-
04/25/2025	01:30	1.46	15:20	5.44	2.49	00:55	1.24	15:20	2.35	1.73	01:30	0.057	15:20	0.724	0.200	0.200	-
04/26/2025	02:30	1.42	14:20	5.51	2.50	05:25	1.17	18:25	2.54	1.75	02:30	0.055	14:20	0.747	0.205	0.205	-
04/27/2025	04:00	1.42	07:20	5.24	2.58	02:55	1.18	20:20	2.47	1.75	04:00	0.053	07:20	0.667	0.212	0.212	-
04/28/2025	01:40	1.41	08:35	5.40	2.51	01:50	1.19	12:40	2.56	1.76	01:40	0.052	08:35	0.688	0.204	0.204	-
04/29/2025	02:10	1.34	10:55	5.61	2.52	02:00	1.19	21:10	2.47	1.74	02:10	0.049	10:55	0.759	0.205	0.205	0.13

01/15/2025 00:00 - 04/29/2025 23:59

	DFINAL (in)	VFINAL (ft/s)	QFINAL (MGD - Total MG)	RAIN FINAL (in)
Total			34.250	13.62
Average	3.24	2.00	0.326	

CAM_51123

Site Commentary

SITE INFORMATION

Pipe	Elliptical (20 in H x 20.13 in W)
Silt	0.00 (in)

OBSERVATIONS

Surcharge conditions were not experienced. Review of the scattergraph shows that free-flow conditions were maintained throughout the study.

This site was located downstream of site CAM_100290. A review of flow balancing indicated no problems.

Average flow depth, velocity, and quantity data observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025**, along with observed minimum and maximum data, are provided in the following table.

Observed Flow Conditions			
Item	**DFINAL (in)**	**VFINAL (ft/s)**	**QFINAL (MGD - Total MG)**
Average	7.07	2.37	1.132
Minimum	3.27	1.07	0.162
Maximum	19.05	3.74	5.203
Min Time	04/28/2025 03:45:00	04/28/2025 03:45:00	04/28/2025 03:45:00
Max Time	02/23/2025 16:05:00	02/23/2025 15:45:00	02/23/2025 16:30:00

Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Values in the graphical reports are based on the fifteen minutes average and values in the Observed Flow Conditions and tabular report are based on the five-minute average.

DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
DFINAL (in)	99.653
VFINAL (ft/s)	99.653
QFINAL (MGD - Total MG)	99.653

Camas.Carollo.TFM.WA24		Site Name
Flow Monitoring Site Report		CAM_51123

Site Address /Location:	SE Cedar St and SE 3rd Ave, Camas, WA 98607			Monitor Series	Location Type
				TRITON+	Temporary
Site Access Details:	On Road	Latitude:	45.5829094	Pipe Size (H x W)	Pipe Shape
		Longitude:	-122.4010296	20.00 X 20.13	Circular



Manhole #	System Characteristics
51123	Industrial
Access	Traffic
Drive	None







Installation Information	
Installation Date:	Installation Type:
Wednesday, January 15, 2025	Doppler Standard Ring and Crank
Monitoring Location (Sensors):	Monitor Location:
Upstream 0-5 FT	Manhole
Sensors / Devices:	Pressure Sensor Range (psi)
Peak Combo (CS4)	0 - 5 psi
Installation Confirmation:	
Time	
8:23:00 AM	
Depth of Flow (Wet DOF) (in)	
7.75	
CS58 Physical Offset (in)	Measurement Confidence (in)
N/A	0.38"
Peak Velocity (fps)	Velocity Sensor Offset (in)
2.77	N/A
Silt (in)	Silt Type
0	

Manhole / Pipe Information:	
Manhole Depth (Approx. FT):	Manhole Configuration
16'	Single
Manhole Material:	Manhole Condition:
Concrete	Good
Manhole Opening Diameter (in)	Manhole Diameter (Approx.):
24	26
Manhole Cover	Manhole Frame
Steel	Normal
Active Connections	Air Quality:
Yes, Inside	Normal
Pipe Material	Pipe Condition:
Concrete	Good
Communication Information:	
Communication Type	Antenna Location
Wireless	Manhole Pick / Vent Hole
Additional Site Info. / Comments:	

ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23116.11.325

Additional Photos

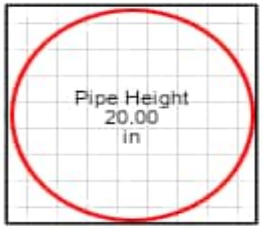
Monitoring Point Inlet	Outlet	
		
Top Down	**Location**	**Map**
		
	KEY	
	Flow Direction Monitoring Point	

Hydrograph Report

CAM_51123

Flow Monitor

CAM_51123



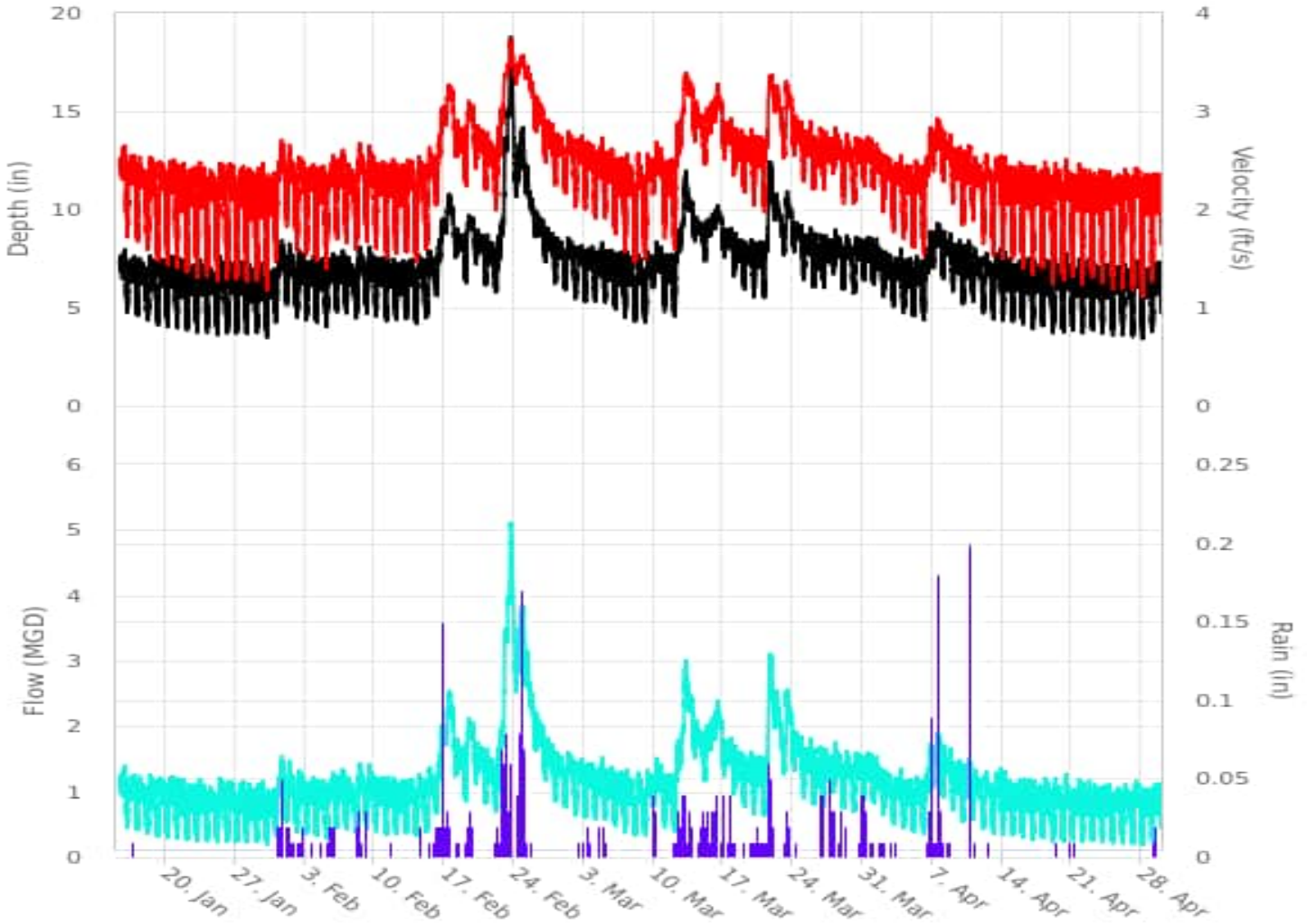
Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL





846 Industry Dr.
Tukwila, WA 98188

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Scattergraph Report

CAM_51123

Flow Monitor

CAM_51123

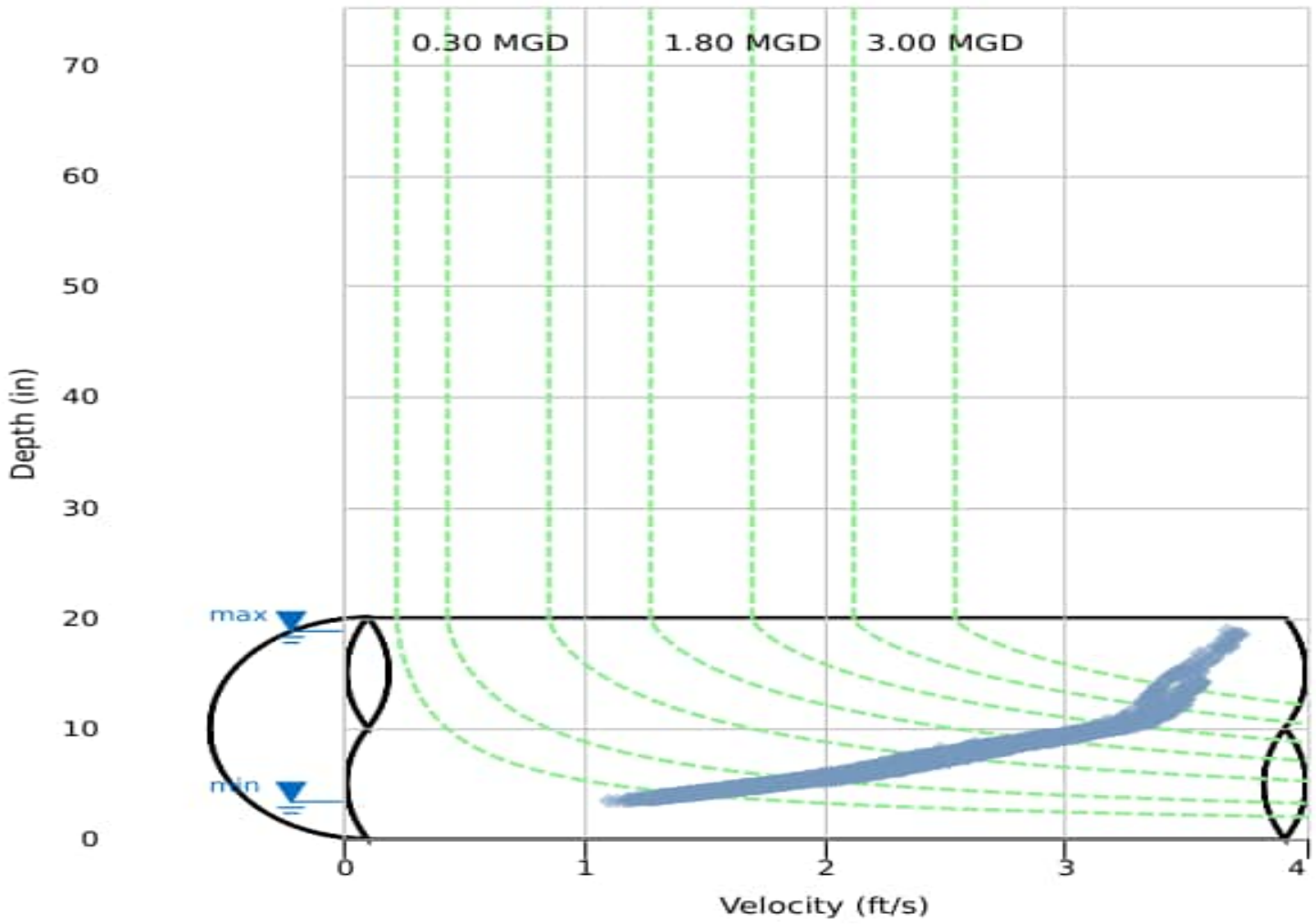
Pipe Height
20.00
in

Report Period

01/15/2025
To
04/29/2025

Legend

- DFINAL - VFINAL
- Iso-Q™
- Min-Max Depth



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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_51123 Pipe: Elliptical (20 in H x 20.13 in W), Silt0.00 in

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/15/2025	23:50	5.80	21:30	8.39	7.16	23:50	2.17	21:30	2.69	2.45	23:50	0.742	21:30	1.522	1.123	0.710	-
01/16/2025	03:30	4.69	17:40	8.36	6.47	03:30	1.70	17:40	2.60	2.26	03:30	0.431	17:40	1.464	0.914	0.914	0.01
01/17/2025	04:30	4.46	09:15	7.96	6.27	04:30	1.62	09:15	2.59	2.21	04:30	0.383	09:15	1.367	0.858	0.858	-
01/18/2025	03:35	4.21	09:55	7.89	6.14	03:35	1.52	19:00	2.59	2.16	03:35	0.330	19:00	1.330	0.825	0.825	-
01/19/2025	05:05	4.01	10:00	7.93	6.07	05:05	1.44	10:00	2.57	2.12	05:05	0.292	10:00	1.348	0.802	0.802	-
01/20/2025	04:35	3.95	17:50	8.08	6.12	04:35	1.41	19:35	2.57	2.13	04:35	0.280	10:00	1.363	0.812	0.812	-
01/21/2025	05:25	3.91	20:45	8.03	5.89	05:25	1.39	20:45	2.54	2.07	05:25	0.271	20:45	1.352	0.749	0.749	-
01/22/2025	04:00	3.72	08:15	7.89	5.84	03:10	1.31	20:55	2.51	2.05	04:00	0.240	20:55	1.285	0.738	0.738	-
01/23/2025	04:05	3.64	21:00	7.78	5.80	04:05	1.27	12:20	2.50	2.05	04:05	0.224	21:00	1.257	0.728	0.728	-
01/24/2025	04:10	3.64	11:05	7.86	5.75	04:10	1.28	11:05	2.52	2.04	04:10	0.226	11:05	1.303	0.715	0.715	-
01/25/2025	04:35	3.55	09:50	8.22	5.72	03:45	1.24	11:10	2.56	2.02	04:35	0.211	09:50	1.396	0.712	0.712	-
01/26/2025	05:00	3.58	10:40	7.91	5.81	05:00	1.24	11:15	2.57	2.04	05:00	0.214	10:40	1.323	0.739	0.739	-
01/27/2025	02:40	3.65	18:55	8.00	5.77	02:40	1.26	18:55	2.56	2.03	02:40	0.223	18:55	1.359	0.719	0.719	-
01/28/2025	02:45	3.53	08:45	7.64	5.62	02:45	1.24	08:50	2.45	1.98	02:45	0.209	08:45	1.215	0.679	0.679	-
01/29/2025	04:00	3.61	19:45	7.87	5.65	02:30	1.23	19:45	2.54	1.98	02:30	0.216	19:45	1.321	0.681	0.681	-
01/30/2025	03:40	3.44	09:10	7.52	5.58	03:35	1.17	08:10	2.44	1.96	03:40	0.191	09:10	1.175	0.665	0.665	-
01/31/2025	00:55	4.02	18:35	8.72	6.76	00:55	1.39	16:20	2.74	2.29	00:55	0.283	18:35	1.618	1.008	1.008	0.60
02/01/2025	04:10	5.01	10:20	8.59	6.63	04:05	1.79	10:20	2.74	2.28	04:05	0.499	10:20	1.599	0.952	0.952	0.12
02/02/2025	05:45	4.47	12:50	8.36	6.47	05:45	1.55	10:45	2.61	2.20	05:45	0.367	12:50	1.442	0.906	0.906	0.07
02/03/2025	03:15	4.30	19:40	8.08	6.25	04:15	1.50	21:30	2.64	2.15	04:15	0.338	19:40	1.372	0.838	0.838	0.02
02/04/2025	04:40	4.08	08:20	8.08	6.03	03:55	1.43	08:20	2.54	2.09	04:40	0.298	08:20	1.361	0.779	0.779	0.01
02/05/2025	03:55	3.97	20:15	7.96	6.28	04:55	1.38	20:45	2.58	2.15	03:55	0.278	20:15	1.356	0.857	0.857	0.19
02/06/2025	04:05	4.70	19:15	8.20	6.49	04:50	1.67	19:55	2.71	2.24	04:50	0.426	19:15	1.436	0.912	0.912	-
02/07/2025	04:20	4.62	18:05	8.12	6.18	03:30	1.64	18:05	2.56	2.17	04:20	0.408	18:05	1.382	0.825	0.825	-
02/08/2025	03:25	4.41	10:25	8.28	6.59	03:25	1.54	11:25	2.70	2.26	03:25	0.358	10:25	1.482	0.955	0.955	0.25
02/09/2025	04:10	4.62	11:35	8.31	6.60	04:10	1.63	11:00	2.69	2.27	04:10	0.405	11:05	1.478	0.953	0.953	0.05
02/10/2025	03:45	4.52	22:30	8.01	6.33	04:10	1.59	19:40	2.51	2.18	03:40	0.385	22:30	1.329	0.861	0.861	-
02/11/2025	04:25	4.23	19:40	7.90	6.18	04:25	1.48	20:45	2.56	2.14	04:25	0.323	19:40	1.333	0.822	0.822	0.01
02/12/2025	04:10	4.27	07:30	7.92	6.12	04:55	1.50	07:25	2.58	2.13	04:10	0.338	07:25	1.350	0.806	0.806	-
02/13/2025	04:20	4.32	19:55	7.86	6.20	04:20	1.52	09:20	2.54	2.16	04:20	0.342	19:55	1.303	0.835	0.835	-
02/14/2025	05:15	4.09	10:10	8.06	6.15	05:15	1.43	11:05	2.58	2.14	05:15	0.297	11:05	1.310	0.825	0.825	0.07
02/15/2025	04:15	4.40	10:50	8.30	6.46	04:15	1.58	12:00	2.69	2.24	04:15	0.366	12:00	1.485	0.921	0.921	0.09
02/16/2025	03:30	5.49	20:45	9.65	7.62	05:25	2.00	19:50	3.09	2.56	03:30	0.637	20:45	2.066	1.317	1.317	0.77
02/17/2025	23:15	8.39	10:25	11.12	9.70	23:15	2.79	16:55	3.31	3.09	23:15	1.578	10:25	2.661	2.116	2.116	0.39
02/18/2025	23:40	7.27	08:10	9.37	8.28	23:50	2.46	08:40	2.94	2.71	23:40	1.152	08:10	1.918	1.507	1.507	0.02
02/19/2025	04:45	6.10	09:45	9.95	8.58	04:45	2.21	10:20	3.14	2.80	04:45	0.810	09:45	2.192	1.658	1.658	0.40
02/20/2025	03:55	7.11	08:20	9.14	8.13	12:45	2.32	19:05	2.91	2.65	03:55	1.089	08:20	1.821	1.442	1.442	-
02/21/2025	05:15	6.03	08:30	9.07	7.41	05:15	2.17	08:30	2.84	2.49	05:15	0.783	08:30	1.779	1.199	1.199	0.04
02/22/2025	04:00	5.59	23:55	11.23	7.72	03:45	1.99	23:50	3.26	2.59	04:00	0.646	23:50	2.678	1.351	1.351	0.84
02/23/2025	00:05	10.43	16:05	19.05	15.02	00:05	3.26	15:45	3.74	3.50	00:05	2.439	16:30	5.203	3.978	3.978	1.07
02/24/2025	04:05	10.51	19:25	14.53	12.43	05:20	3.25	19:50	3.59	3.44	05:20	2.464	19:25	3.923	3.191	3.191	0.87
02/25/2025	23:55	9.12	00:20	12.77	10.78	23:40	2.97	00:30	3.50	3.33	23:40	1.874	00:20	3.349	2.601	2.601	0.03
02/26/2025	23:55	7.91	03:10	10.25	9.11	23:20	2.66	03:15	3.21	2.96	23:55	1.400	03:10	2.346	1.864	1.864	-
02/27/2025	04:25	6.91	08:10	9.35	8.19	04:25	2.39	08:40	2.95	2.70	04:25	1.041	08:10	1.914	1.481	1.481	-
02/28/2025	02:40	5.95	08:10	9.19	7.57	03:35	2.20	08:10	2.85	2.55	02:40	0.786	08:10	1.812	1.266	1.266	-
03/01/2025	04:20	5.79	09:20	8.95	7.36	05:25	2.14	11:30	2.83	2.51	03:15	0.733	09:20	1.729	1.206	1.206	-
03/02/2025	04:10	5.27	20:00	8.28	7.13	05:25	1.95	19:35	2.78	2.47	05:25	0.584	19:35	1.538	1.137	1.137	0.05
03/03/2025	03:25	5.12	19:25	8.40	6.91	03:25	1.95	08:10	2.75	2.41	03:25	0.559	19:25	1.547	1.066	1.066	0.07
03/04/2025	03:55	5.13	19:45	8.46	6.94	04:40	1.88	19:45	2.76	2.38	03:55	0.541	19:45	1.574	1.059	1.059	0.12
03/05/2025	04:30	5.15	20:05	8.27	6.77	04:30	1.87	20:10	2.66	2.34	04:30	0.540	20:05	1.470	1.004	1.004	0.01
03/06/2025	03:55	4.82	20:55	8.32	6.57	03:55	1.72	20:55	2.61	2.25	03:55	0.452	20:55	1.460	0.931	0.931	-
03/07/2025	03:30	4.38	08:30	8.15	6.34	03:30	1.53	08:35	2.58	2.17	03:30	0.351	08:30	1.402	0.857	0.857	-
03/08/2025	04:00	4.11	17:45	7.86	6.17	04:00	1.39	11:30	2.59	2.14	04:00	0.291	11:30	1.335	0.822	0.822	-
03/09/2025	04:15	3.93	11:05	8.22	6.30	04:15	1.37	11:05	2.64	2.18	04:15	0.269	11:05	1.451	0.869	0.869	0.20
03/10/2025	23:55	5.43	09:00	8.53	7.24	23:55	1.98	07:20	2.72	2.44	23:55	0.617	07:20	1.563	1.138	1.138	0.22
03/11/2025	02:55	4.69	16:45	8.03	6.51	03:00	1.68	20:40	2.59	2.24	03:00	0.425	20:40	1.369	0.915	0.915	0.02
03/12/2025	03:50	4.50	23:00	9.76	7.62	03:50	1.57	23:00	3.08	2.51	03:50	0.376	23:00	2.116	1.312	1.312	0.83
03/13/2025	23:25	8.95	07:05	12.07	10.44	23:25	2.91	07:10	3.40	3.24	23:25	1.788	07:05	3.041	2.437	2.437	0.49
03/14/2025	23:40	7.92	07:40	9.77	9.01	23:40	2.58	07:20	3.16	2.89	23:40	1.352	07:20	2.169	1.795	1.795	0.16
03/15/2025	04:40	7.19	22:05	10.06	8.76	03:25	2.39	22:10	3.15	2.81	04:40	1.113	22:05	2.245	1.695	1.695	0.60
03/16/2025	23:55	7.87	09:40	10.53	9.47	23:55	2.58	10:35	3.32	3.04	23:55	1.336	10:35	2.505	2.018	2.018	0.16
03/17/2025	23:35	7.19	07:15	9.24	8.40	04:05	2.46	18:50	2.96	2.75	23:35	1.131	07:15	1.878	1.560	1.560	0.19
03/18/2025	23:50	6.16	07:10	8.86	7.77	23:50	2.22	07:10	2.84	2.61	23:50	0.825	07:10	1.725	1.335	1.335	0.02
03/19/2025	02:40	5.74	19:05	8.73	7.39	01:45	2.15	19:45	2.84	2.54	02:40	0.725	19:05	1.677	1.221	1.221	0.07
03/20/2025	03:30	5.47	19:45	8.61	7.24	02:20	2.01	18:45	2.78	2.47	02:20	0.635	19:45	1.622	1.161	1.161	0.11
03/21/2025	03:05	5.41	15:45	12.74	9.27	03:05	1.95	19:10	3.38	2.86	03:05	0.602	15:40	3.207	1.943	1.943	1.12
03/22/2025	23:55	8.30	09:00	11.00	9.75	23:55	2.69	11:10	3.29	3.07	23:55	1.498	09:00	2.618	2.112	2.112	-
03/23/2025	02:30	7.45	10:05	11.31	9.37	02:55	2.50	08:30	3.36	2.96	02:30	1.203	10:05	2.708	1.955	1.955	0.44
03/24/2025	23:20	7.24	07:40	9.54	8.59	23:55	2.46	07:40	2.99	2.75	23:20	1.142	07:40	1.995	1.606	1.606	0.01

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/25/2025	23:40	6.19	18:00	9.34	7.88	01:05	2.22	19:10	2.95	2.60	23:40	0.850	18:00	1.900	1.362	1.362	-
03/26/2025	02:45	5.80	06:45	9.16	7.56	00:35	2.14	20:30	2.88	2.55	02:45	0.730	20:25	1.776	1.266	1.266	0.20
03/27/2025	03:25	5.93	07:05	9.04	7.56	03:25	2.17	07:05	2.86	2.54	03:25	0.765	07:05	1.781	1.256	1.256	0.24
03/28/2025	23:55	6.20	06:50	9.39	7.83	23:55	2.26	06:50	2.92	2.59	23:55	0.848	06:50	1.909	1.340	1.340	0.17
03/29/2025	01:25	5.73	09:45	8.88	7.46	02:10	2.05	09:45	2.83	2.49	01:25	0.699	09:45	1.724	1.220	1.220	0.12
03/30/2025	02:25	5.57	17:20	8.76	7.39	04:10	2.02	17:25	2.77	2.47	02:25	0.654	17:20	1.649	1.195	1.195	0.23
03/31/2025	03:00	6.05	13:00	8.93	7.68	03:55	2.19	13:00	2.80	2.54	03:00	0.795	13:00	1.720	1.283	1.283	0.10
04/01/2025	23:55	5.76	10:30	8.75	7.25	23:30	2.07	10:35	2.71	2.43	23:55	0.705	10:35	1.614	1.137	1.137	0.03
04/02/2025	01:35	5.43	08:25	8.27	6.87	01:30	1.88	07:50	2.59	2.34	01:30	0.588	08:30	1.422	1.019	1.019	0.05
04/03/2025	02:55	4.97	19:35	8.09	6.56	02:50	1.76	19:35	2.60	2.26	02:55	0.484	19:35	1.399	0.925	0.925	0.02
04/04/2025	04:05	4.69	18:35	8.36	6.32	04:05	1.69	10:20	2.49	2.19	04:05	0.428	18:35	1.371	0.858	0.858	-
04/05/2025	03:45	4.41	08:10	8.43	6.22	03:45	1.54	08:15	2.61	2.15	03:45	0.356	08:10	1.479	0.833	0.833	-
04/06/2025	05:00	4.27	19:20	9.00	6.97	02:25	1.48	19:25	2.88	2.33	02:30	0.331	19:25	1.780	1.081	1.081	0.71
04/07/2025	03:35	6.81	11:15	9.59	8.28	03:35	2.37	11:15	2.99	2.67	03:35	1.010	11:15	2.010	1.488	1.488	0.37
04/08/2025	23:55	6.16	07:05	9.12	7.75	23:55	2.20	07:05	2.84	2.53	23:55	0.817	07:05	1.793	1.293	1.293	0.07
04/09/2025	02:30	5.66	17:30	8.69	7.15	23:15	2.01	19:50	2.67	2.39	23:15	0.666	17:35	1.539	1.101	1.101	-
04/10/2025	02:30	5.06	06:30	8.55	7.01	01:40	1.81	20:15	2.69	2.35	02:30	0.516	19:40	1.528	1.061	1.061	0.27
04/11/2025	02:30	5.10	07:05	8.11	6.76	02:30	1.82	07:40	2.57	2.29	02:30	0.519	07:05	1.370	0.978	0.978	0.01
04/12/2025	04:00	4.62	09:40	8.21	6.51	04:00	1.63	09:55	2.65	2.22	04:00	0.403	09:40	1.409	0.912	0.912	0.01
04/13/2025	03:30	4.34	20:15	8.25	6.44	03:30	1.50	19:20	2.61	2.20	03:30	0.341	19:20	1.428	0.898	0.898	-
04/14/2025	03:15	4.26	07:50	8.82	6.25	03:15	1.46	07:50	2.74	2.15	03:15	0.323	07:50	1.654	0.839	0.839	-
04/15/2025	02:30	4.12	06:10	7.98	6.10	02:30	1.44	19:45	2.52	2.11	02:30	0.303	06:10	1.293	0.796	0.796	-
04/16/2025	02:20	4.01	18:40	7.96	6.06	03:10	1.36	06:55	2.50	2.10	02:20	0.279	18:40	1.293	0.786	0.786	-
04/17/2025	03:50	3.81	06:45	7.84	5.98	03:45	1.31	06:45	2.46	2.07	03:45	0.248	06:45	1.271	0.764	0.764	-
04/18/2025	02:00	3.84	07:40	8.08	5.88	02:00	1.31	09:40	2.57	2.05	02:00	0.250	07:45	1.368	0.737	0.737	-
04/19/2025	02:50	3.60	11:25	7.81	5.85	02:50	1.21	09:50	2.49	2.03	02:50	0.210	11:25	1.253	0.733	0.733	0.01
04/20/2025	04:50	3.71	11:20	7.89	5.96	04:50	1.27	11:25	2.53	2.06	04:50	0.230	11:20	1.316	0.769	0.769	0.05
04/21/2025	03:00	3.64	17:30	7.90	5.82	03:00	1.24	17:30	2.50	2.03	03:00	0.219	17:30	1.301	0.724	0.724	0.02
04/22/2025	02:55	3.56	10:55	7.73	5.75	02:55	1.18	20:45	2.45	2.01	02:55	0.202	10:55	1.241	0.707	0.707	-
04/23/2025	02:15	3.58	19:55	7.83	5.71	02:15	1.21	20:00	2.49	1.99	02:15	0.208	20:00	1.279	0.693	0.693	-
04/24/2025	02:15	3.44	19:50	7.87	5.69	02:15	1.15	19:50	2.47	1.99	02:15	0.186	19:50	1.279	0.690	0.690	-
04/25/2025	03:25	3.51	18:25	7.41	5.68	03:25	1.16	07:45	2.41	1.99	03:25	0.195	17:05	1.137	0.686	0.686	-
04/26/2025	02:40	3.49	08:05	7.89	5.72	02:40	1.16	10:00	2.44	1.99	02:40	0.193	08:10	1.240	0.701	0.701	-
04/27/2025	03:40	3.41	11:00	7.70	5.83	03:40	1.13	09:35	2.47	2.01	03:40	0.182	11:00	1.230	0.732	0.732	-
04/28/2025	03:45	3.27	08:55	7.48	5.68	03:45	1.07	08:55	2.38	1.97	03:45	0.162	08:55	1.156	0.686	0.686	-
04/29/2025	01:50	3.54	18:50	8.02	5.78	01:50	1.17	18:55	2.49	2.00	01:50	0.199	18:55	1.314	0.706	0.706	0.13

01/15/2025 00:00 - 04/29/2025 23:59

	DFINAL (in)	VFINAL (ft/s)	QFINAL (MGD - Total MG)	RAIN FINAL (in)
Total			118.475	13.62
Average	7.07	2.37	1.132	

CAM_52167

Site Commentary

SITE INFORMATION

Pipe	Elliptical (18.13 in H x 18.13 in W)
Silt	0.00 (in)

OBSERVATIONS

Surcharge conditions were not experienced. Review of the scattergraph shows that free-flow conditions were maintained throughout the study.

Average flow depth, velocity, and quantity data observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025**, along with observed minimum and maximum data, are provided in the following table.

Observed Flow Conditions			
Item	**DFINAL (in)**	**VFINAL (ft/s)**	**QFINAL (MGD - Total MG)**
Average	1.63	3.33	0.221
Minimum	0.54	0.43	0.006
Maximum	5.26	5.50	1.536
Min Time	01/22/2025 04:45:00	04/22/2025 03:30:00	01/22/2025 04:45:00
Max Time	02/18/2025 09:55:00	02/18/2025 09:55:00	02/18/2025 09:55:00

Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Values in the graphical reports are based on the fifteen minutes average and values in the Observed Flow Conditions and tabular report are based on the five-minute average.

DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
DFINAL (in)	100
VFINAL (ft/s)	100
QFINAL (MGD - Total MG)	100

Camas.Carollo.TFM.WA24		Site Name
Flow Monitoring Site Report		CAM_52167

Site Address /Location:	SE Dallas St and SE 3rd Ave, Camas, WA 98607			Monitor Series	Location Type
				TRITON+	Temporary
Site Access Details:	On Road	Latitude:	45.5833078	Pipe Size (H x W)	Pipe Shape
		Longitude:	-122.4001589	18.13 X 18.13	Circular



Manhole #	System Characteristics
52167	Industrial
Access	Traffic
Drive	None







Installation Information	
Installation Date:	Installation Type:
Tuesday, January 14, 2025	Doppler Standard Ring and Crank
Monitoring Location (Sensors):	Monitor Location:
Upstream 0-5 FT	Manhole
Sensors / Devices:	Pressure Sensor Range (psi)
Peak Combo (CS4), Smart Depth (CS5)	0 - 5 psi
Installation Confirmation:	
Time	
2:43:00 PM	
Depth of Flow (Wet DOF) (in)	
1.25	
CS58 Physical Offset (in)	Measurement Confidence (in)
1.38	0.25"
Peak Velocity (fps)	Velocity Sensor Offset (in)
2.82	N/A
Silt (in)	Silt Type
0	

Manhole / Pipe Information:	
Manhole Depth (Approx. FT):	Manhole Configuration
17.5'	Single
Manhole Material:	Manhole Condition:
Concrete	Good
Manhole Opening Diameter (in)	Manhole Diameter (Approx.):
24	26
Manhole Cover	Manhole Frame
Steel	Normal
Active Connections	Air Quality:
No	Normal
Pipe Material	Pipe Condition:
Hollow Tile	Good
Communication Information:	
Communication Type	Antenna Location
Wireless	Manhole Pick / Vent Hole
Additional Site Info. / Comments:	

ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23116.11.325

Additional Photos

Monitoring Point Inlet	Outlet	NW inlet connection
		
Top Down	**Location**	**Map**
		
	KEY	
	Flow Direction Monitoring Point	

Hydrograph Report

CAM_52167

Flow Monitor

CAM_52167

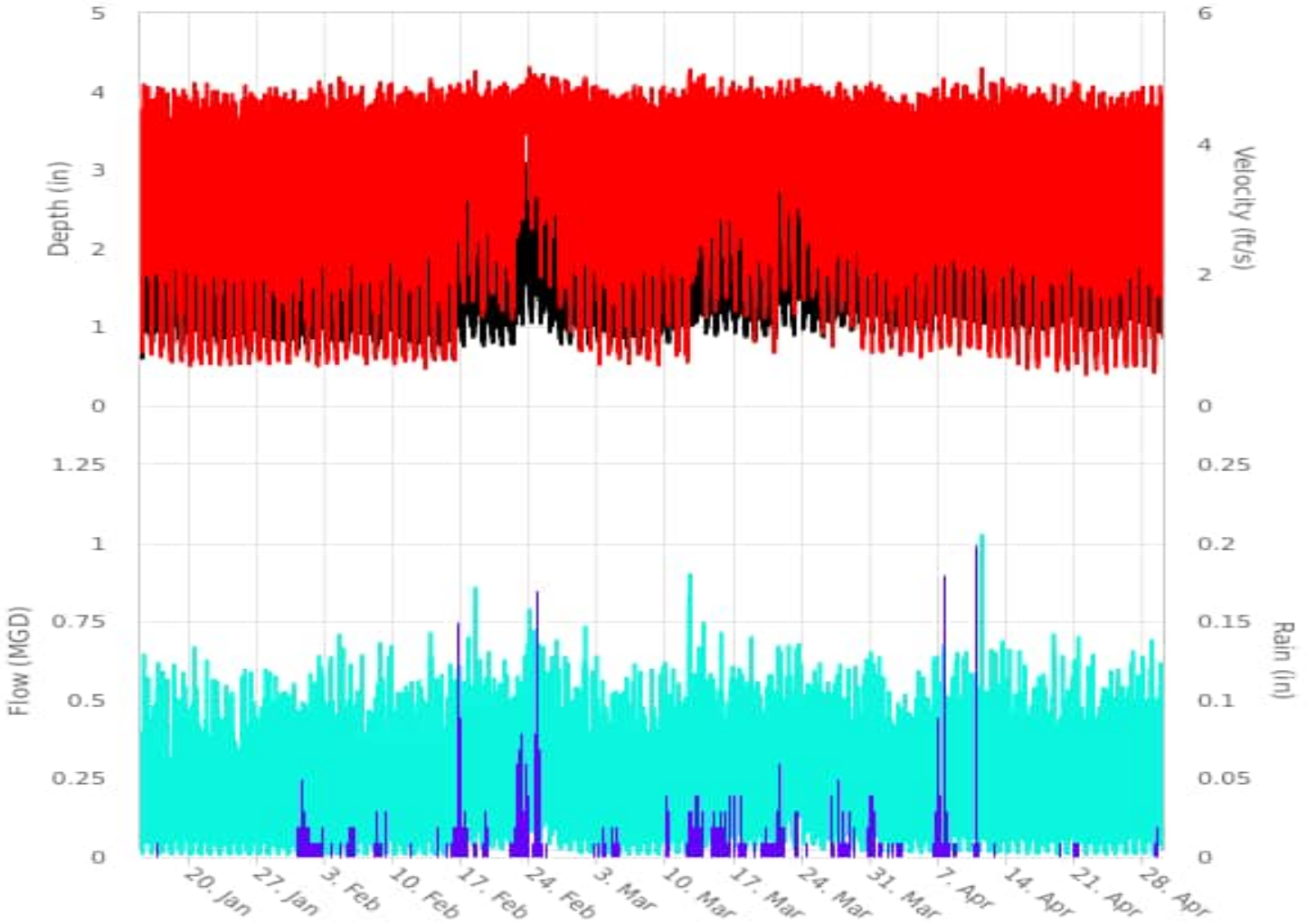
Pipe Height
18.13
in

Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL



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Scattergraph Report

CAM_52167

Flow Monitor

CAM_52167

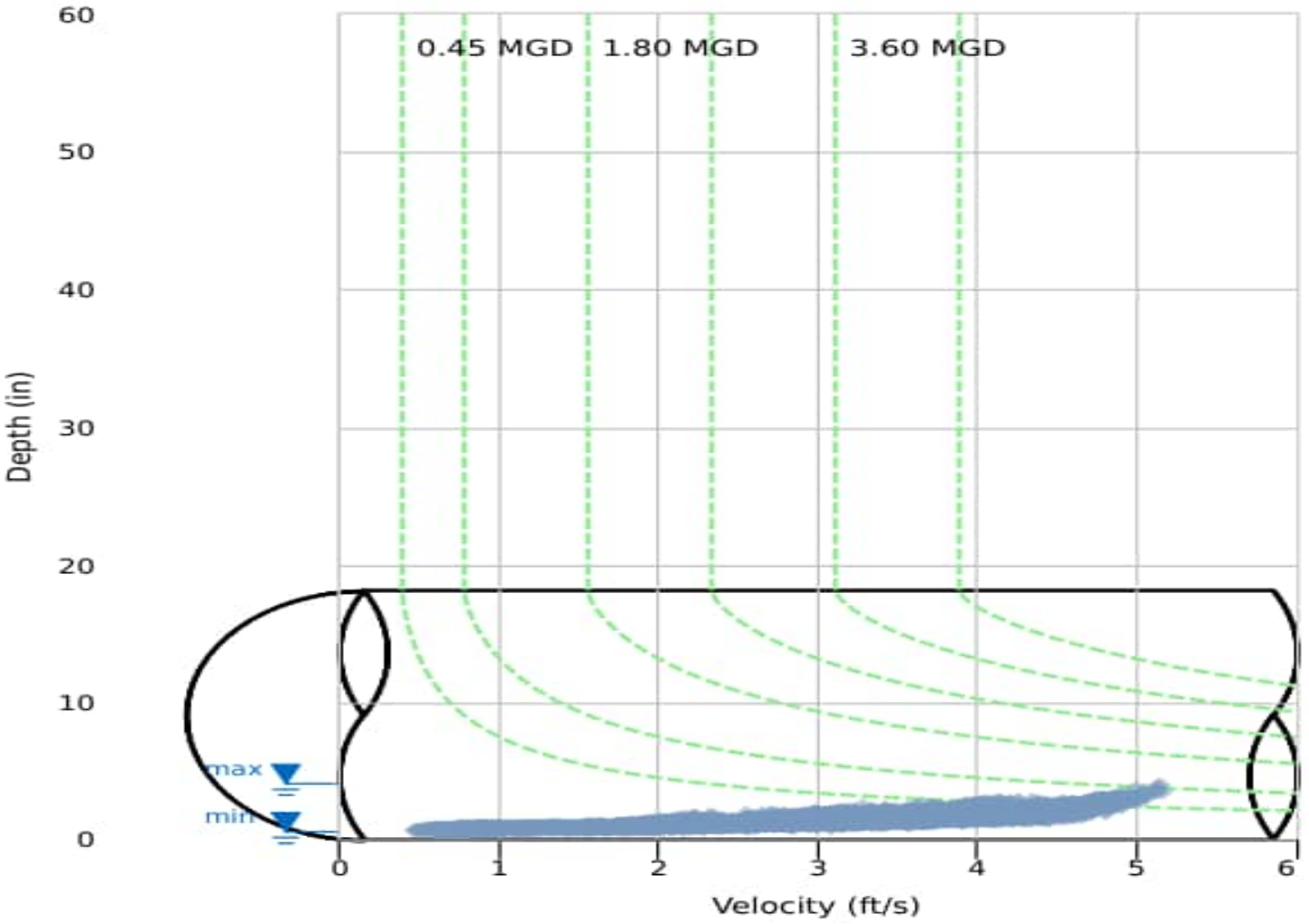
Pipe Height
18.13
in

Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL - VFINAL
Iso-Q™
Min-Max Depth



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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_52167 Pipe: Elliptical (18.13 in H x 18.13 in W), Silt0.00 in

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/15/2025	04:55	0.55	08:30	3.97	1.60	05:45	0.66	08:30	5.21	3.36	04:55	0.008	08:30	0.981	0.214	0.214	-
01/16/2025	03:55	0.63	08:05	4.32	1.59	04:50	0.74	20:00	5.28	3.33	03:55	0.009	08:05	1.118	0.213	0.213	0.01
01/17/2025	06:00	0.68	20:05	4.16	1.51	03:45	0.73	20:05	5.28	3.15	06:00	0.011	20:05	1.057	0.189	0.189	-
01/18/2025	04:30	0.65	10:15	4.26	1.53	06:50	0.63	10:15	5.28	3.13	04:30	0.009	10:15	1.096	0.197	0.197	-
01/19/2025	04:15	0.70	09:25	4.17	1.56	06:40	0.64	16:40	5.26	3.20	04:15	0.010	11:30	1.046	0.203	0.203	-
01/20/2025	03:55	0.59	13:00	4.22	1.53	04:00	0.58	13:00	5.30	3.15	03:55	0.007	13:00	1.084	0.198	0.198	-
01/21/2025	02:50	0.54	18:10	4.14	1.47	05:25	0.61	18:10	5.24	3.09	05:25	0.007	18:10	1.044	0.182	0.182	-
01/22/2025	04:45	0.54	23:35	3.98	1.48	04:45	0.58	12:00	5.15	3.13	04:45	0.006	23:35	0.965	0.186	0.186	-
01/23/2025	05:00	0.55	21:25	4.33	1.45	05:00	0.59	21:25	5.31	3.04	05:00	0.006	21:25	1.129	0.179	0.179	-
01/24/2025	03:45	0.61	08:55	3.95	1.45	05:30	0.60	08:55	5.10	3.09	05:30	0.008	08:55	0.951	0.179	0.179	-
01/25/2025	05:45	0.66	10:20	4.19	1.48	03:30	0.62	10:20	5.31	3.08	04:55	0.009	10:20	1.076	0.189	0.189	-
01/26/2025	05:05	0.63	14:25	4.18	1.46	03:45	0.60	10:35	5.29	3.09	05:15	0.008	14:25	1.064	0.184	0.184	-
01/27/2025	01:25	0.65	21:20	4.06	1.49	04:40	0.66	21:20	5.33	3.08	01:30	0.010	21:20	1.033	0.191	0.191	-
01/28/2025	02:00	0.65	08:00	4.06	1.44	05:35	0.63	08:00	5.26	2.96	03:25	0.009	08:00	1.018	0.178	0.178	-
01/29/2025	04:15	0.65	10:05	4.15	1.41	04:00	0.66	10:05	5.26	2.92	04:10	0.009	10:05	1.051	0.171	0.171	-
01/30/2025	03:55	0.57	20:25	3.97	1.41	05:40	0.57	20:25	5.19	2.94	04:00	0.007	20:25	0.976	0.171	0.171	-
01/31/2025	01:35	0.68	19:40	4.05	1.52	02:40	0.76	19:40	5.22	3.25	02:40	0.013	19:40	1.010	0.197	0.197	0.60
02/01/2025	06:45	0.68	21:45	3.97	1.49	05:45	0.63	19:35	5.18	3.04	05:45	0.010	21:45	0.971	0.187	0.187	0.12
02/02/2025	02:55	0.61	12:05	3.95	1.57	05:45	0.55	10:00	5.25	3.18	05:45	0.007	10:00	0.972	0.211	0.211	0.07
02/03/2025	05:30	0.62	13:20	4.03	1.46	04:00	0.59	13:20	5.14	3.03	04:00	0.008	13:20	0.988	0.181	0.181	0.02
02/04/2025	03:55	0.67	19:30	4.00	1.51	03:55	0.61	19:30	5.20	3.09	03:55	0.008	19:30	0.988	0.194	0.194	0.01
02/05/2025	04:50	0.60	14:05	3.61	1.48	04:35	0.69	17:55	5.09	3.09	05:00	0.008	14:05	0.831	0.188	0.188	0.19
02/06/2025	04:35	0.62	17:25	3.99	1.51	04:35	0.72	19:35	5.16	3.15	04:35	0.009	19:35	0.972	0.194	0.194	-
02/07/2025	03:25	0.59	12:25	3.81	1.44	04:55	0.60	09:55	5.13	2.99	04:55	0.008	12:25	0.906	0.175	0.175	-
02/08/2025	02:10	0.62	22:45	4.02	1.49	05:05	0.68	16:20	5.18	3.07	05:15	0.010	22:45	0.986	0.192	0.192	0.25
02/09/2025	02:30	0.66	18:15	4.05	1.58	05:20	0.62	18:15	5.29	3.27	05:20	0.009	18:15	1.023	0.210	0.210	0.05
02/10/2025	05:50	0.61	16:10	3.93	1.50	03:05	0.62	16:10	5.26	3.17	03:05	0.008	16:10	0.974	0.193	0.193	-
02/11/2025	02:20	0.62	19:55	3.94	1.48	05:10	0.65	19:55	5.20	3.13	02:45	0.009	19:55	0.964	0.188	0.188	0.01
02/12/2025	05:45	0.61	19:05	4.18	1.45	02:50	0.67	19:05	5.29	3.06	02:50	0.009	19:05	1.068	0.184	0.184	-
02/13/2025	06:00	0.64	19:50	4.14	1.48	05:50	0.55	19:50	5.29	3.17	06:00	0.007	19:50	1.054	0.191	0.191	-
02/14/2025	02:00	0.59	19:55	4.18	1.41	04:55	0.64	19:55	5.26	3.00	04:55	0.008	19:55	1.063	0.180	0.180	0.07
02/15/2025	03:25	0.58	19:55	4.17	1.41	05:05	0.56	19:55	5.28	3.11	05:05	0.007	19:55	1.064	0.178	0.178	0.09
02/16/2025	03:40	0.58	20:15	4.10	1.55	06:45	0.66	18:25	5.27	3.39	06:45	0.008	20:15	1.009	0.219	0.219	0.77
02/17/2025	04:40	0.70	07:50	4.25	1.74	04:00	1.03	07:50	5.35	3.80	04:00	0.016	07:50	1.108	0.262	0.262	0.39
02/18/2025	03:35	0.79	09:55	5.26	1.80	04:45	1.22	09:55	5.50	3.78	04:45	0.022	09:55	1.536	0.281	0.281	0.02
02/19/2025	05:25	0.70	19:45	4.44	1.75	04:10	0.93	19:45	5.40	3.84	05:25	0.015	19:45	1.190	0.271	0.271	0.40
02/20/2025	03:30	0.70	16:55	4.22	1.69	04:45	1.02	08:05	5.36	3.72	04:45	0.016	16:55	1.073	0.252	0.252	-
02/21/2025	05:15	0.69	08:40	4.15	1.65	04:35	0.91	15:35	5.36	3.59	04:35	0.013	08:40	1.017	0.239	0.239	0.04
02/22/2025	04:20	0.65	16:55	3.98	1.66	05:05	0.78	19:35	5.13	3.65	05:05	0.011	16:55	0.956	0.241	0.241	0.84
02/23/2025	05:25	0.92	15:55	4.46	2.16	02:35	1.93	10:50	5.39	4.46	04:55	0.047	15:55	1.157	0.385	0.385	1.07
02/24/2025	06:05	0.90	19:45	4.29	2.03	05:40	1.71	08:35	5.42	4.30	05:40	0.039	08:35	1.122	0.344	0.344	0.87
02/25/2025	03:45	0.90	13:10	4.31	1.91	03:45	1.64	13:10	5.44	4.17	03:45	0.035	13:10	1.146	0.304	0.304	0.03
02/26/2025	05:45	0.80	21:05	4.18	1.82	00:55	1.61	06:55	5.25	3.95	00:55	0.031	21:05	1.041	0.282	0.282	-
02/27/2025	05:45	0.70	23:15	3.98	1.69	03:50	0.85	22:00	5.23	3.69	03:50	0.014	22:00	0.977	0.244	0.244	-
02/28/2025	04:05	0.70	15:40	3.43	1.62	03:25	0.86	15:40	5.07	3.61	03:25	0.014	15:40	0.773	0.222	0.222	-
03/01/2025	05:40	0.69	11:25	4.47	1.60	05:40	0.73	11:25	5.37	3.52	05:40	0.010	11:25	1.191	0.221	0.221	-
03/02/2025	05:40	0.71	19:45	4.32	1.64	04:50	0.70	11:00	5.22	3.50	04:50	0.011	19:45	1.098	0.230	0.230	0.05
03/03/2025	04:00	0.67	11:45	4.11	1.59	03:55	0.57	11:45	5.24	3.46	03:55	0.008	11:45	1.035	0.213	0.213	0.07
03/04/2025	05:20	0.68	21:05	4.23	1.55	02:15	0.70	21:05	5.30	3.35	02:15	0.011	21:05	1.088	0.207	0.207	0.12
03/05/2025	03:55	0.65	08:10	4.05	1.54	03:55	0.67	19:50	5.31	3.29	03:55	0.009	08:10	1.019	0.207	0.207	0.01
03/06/2025	04:25	0.62	22:10	4.19	1.52	04:20	0.63	18:15	5.28	3.23	04:25	0.008	22:10	1.067	0.201	0.201	-
03/07/2025	04:00	0.64	08:30	4.09	1.47	01:50	0.69	08:30	5.20	3.10	01:50	0.009	08:30	1.020	0.185	0.185	-
03/08/2025	04:10	0.64	12:00	3.85	1.48	03:00	0.62	09:10	5.21	3.12	03:00	0.009	12:00	0.920	0.185	0.185	-
03/09/2025	04:25	0.65	18:00	4.24	1.58	03:00	0.59	20:35	5.34	3.20	03:00	0.008	10:50	1.090	0.211	0.211	0.20
03/10/2025	05:15	0.79	17:15	4.14	1.59	06:10	1.01	17:15	5.26	3.29	06:10	0.018	17:15	1.046	0.209	0.209	0.22
03/11/2025	02:10	0.71	07:10	3.79	1.54	02:10	0.75	20:45	5.14	3.22	02:10	0.011	19:20	0.877	0.196	0.196	0.02
03/12/2025	03:55	0.70	09:45	4.33	1.82	03:55	0.65	09:45	5.43	3.58	03:55	0.010	09:45	1.154	0.281	0.281	0.83
03/13/2025	04:50	0.92	14:35	4.42	1.83	04:45	1.41	14:35	5.41	3.83	04:50	0.032	14:35	1.183	0.279	0.279	0.49
03/14/2025	01:20	0.80	21:05	4.19	1.80	01:20	0.90	21:05	5.33	3.71	01:20	0.016	21:05	1.080	0.270	0.270	0.16
03/15/2025	04:45	0.85	15:50	4.19	1.78	04:45	0.86	15:50	5.27	3.70	04:45	0.017	15:50	1.070	0.264	0.264	0.60
03/16/2025	06:20	0.81	18:35	4.35	1.85	04:05	0.98	18:35	5.37	3.79	04:05	0.018	18:35	1.148	0.284	0.284	0.16
03/17/2025	02:00	0.83	19:20	4.36	1.77	02:00	0.99	19:20	5.33	3.67	02:00	0.019	19:20	1.144	0.261	0.261	0.19
03/18/2025	03:40	0.77	18:30	4.20	1.72	03:05	0.90	18:30	5.28	3.58	03:40	0.017	18:30	1.074	0.246	0.246	0.02
03/19/2025	03:20	0.79	13:10	4.17	1.67	01:55	0.82	13:10	5.37	3.50	01:55	0.016	13:10	1.083	0.232	0.232	0.07
03/20/2025	02:50	0.79	19:15	4.12	1.65	02:50	0.70	13:20	5.32	3.47	02:50	0.012	19:15	1.029	0.228	0.228	0.11
03/21/2025	02:15	0.78	15:45	4.33	1.82	04:05	0.77	15:45	5.35	3.76	04:05	0.014	15:45	1.137	0.277	0.277	1.12
03/22/2025	23:20	0.94	13:30	4.22	1.89	03:40	1.44	20:55	5.32	3.92	03:40	0.035	13:30	1.072	0.295	0.295	-
03/23/2025	02:10	0.83	15:15	4.36	1.88	02:10	0.96	15:15	5.39	3.92	02:10	0.018	15:15	1.156	0.295	0.295	0.44
03/24/2025	00:40	0.89	13:50	4.13	1.80	01:45	1.32	04:30	5.18	3.77	01:45	0.029	13:50	1.010	0.268	0.268	0.01

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/25/2025	03:55	0.86	19:00	4.30	1.76	23:50	1.09	19:00	5.26	3.67	23:50	0.023	19:00	1.105	0.254	0.254	-
03/26/2025	01:10	0.83	06:55	4.34	1.73	03:10	0.80	10:05	5.28	3.58	03:10	0.016	06:55	1.111	0.245	0.245	0.20
03/27/2025	00:30	0.85	23:40	3.85	1.73	01:55	0.79	06:35	5.27	3.54	01:55	0.016	12:15	0.929	0.242	0.242	0.24
03/28/2025	03:05	0.91	12:25	4.30	1.74	01:40	1.09	15:10	5.34	3.55	05:05	0.025	12:25	1.117	0.247	0.247	0.17
03/29/2025	01:45	0.89	19:25	4.06	1.74	01:45	0.87	19:25	5.18	3.50	01:45	0.018	19:25	1.003	0.243	0.243	0.12
03/30/2025	01:00	0.88	11:45	4.29	1.73	02:30	0.76	11:45	5.26	3.43	02:30	0.016	11:45	1.104	0.240	0.240	0.23
03/31/2025	04:30	0.87	07:15	4.01	1.71	04:30	0.75	07:15	5.24	3.35	04:30	0.015	07:15	0.997	0.231	0.231	0.10
04/01/2025	04:35	0.87	21:05	4.20	1.63	03:40	0.79	21:05	5.20	3.25	01:10	0.016	21:05	1.056	0.212	0.212	0.03
04/02/2025	03:45	0.85	20:50	4.04	1.59	03:45	0.84	20:50	5.15	3.17	03:45	0.017	20:50	0.991	0.199	0.199	0.05
04/03/2025	03:00	0.82	13:05	3.65	1.58	05:00	0.71	18:15	5.02	3.09	01:55	0.014	13:05	0.831	0.194	0.194	0.02
04/04/2025	03:35	0.75	21:30	4.15	1.55	03:35	0.68	23:10	5.20	3.07	03:35	0.011	21:30	1.041	0.189	0.189	-
04/05/2025	04:35	0.79	16:25	4.20	1.58	04:35	0.67	16:25	5.24	3.09	04:35	0.012	16:25	1.066	0.196	0.196	-
04/06/2025	03:15	0.85	10:45	4.21	1.73	04:15	0.82	16:20	5.30	3.44	03:15	0.016	16:20	1.079	0.238	0.238	0.71
04/07/2025	04:25	0.88	06:35	4.34	1.78	03:30	0.77	06:35	5.32	3.47	03:30	0.017	06:35	1.131	0.249	0.249	0.37
04/08/2025	05:00	0.91	16:40	4.40	1.74	03:30	0.76	16:40	5.36	3.44	03:30	0.017	16:40	1.163	0.241	0.241	0.07
04/09/2025	02:25	0.92	06:35	4.02	1.76	02:20	0.72	14:00	5.23	3.39	02:25	0.017	14:00	0.997	0.242	0.242	-
04/10/2025	01:35	0.87	12:00	4.13	1.71	04:05	0.72	12:00	5.24	3.35	03:15	0.016	12:00	1.039	0.228	0.228	0.27
04/11/2025	05:10	0.88	09:35	5.07	1.82	02:45	0.73	09:35	5.34	3.41	02:45	0.015	09:35	1.416	0.266	0.266	0.01
04/12/2025	03:40	0.85	08:05	4.30	1.67	05:40	0.73	18:45	5.31	3.33	02:45	0.015	08:05	1.109	0.224	0.224	0.01
04/13/2025	04:30	0.78	19:05	4.31	1.66	04:30	0.64	19:05	5.31	3.28	04:30	0.011	19:05	1.122	0.227	0.227	-
04/14/2025	02:25	0.78	19:10	4.26	1.63	02:25	0.71	19:10	5.27	3.28	02:25	0.012	19:10	1.093	0.217	0.217	-
04/15/2025	03:00	0.73	09:20	4.06	1.64	03:00	0.52	09:20	5.20	3.18	03:00	0.008	09:20	1.009	0.216	0.216	-
04/16/2025	02:55	0.72	18:45	3.92	1.58	02:55	0.55	18:45	5.10	3.08	02:55	0.008	18:45	0.942	0.196	0.196	-
04/17/2025	03:10	0.75	18:45	4.03	1.59	03:10	0.54	18:45	5.22	3.00	03:10	0.009	18:45	1.003	0.201	0.201	-
04/18/2025	04:55	0.87	21:45	4.25	1.61	01:50	0.75	21:45	5.29	3.03	01:50	0.015	21:45	1.093	0.199	0.199	-
04/19/2025	04:10	0.79	16:30	4.10	1.60	04:10	0.52	16:30	5.19	2.92	04:10	0.009	16:30	1.019	0.196	0.196	0.01
04/20/2025	05:10	0.73	21:20	4.29	1.65	05:10	0.53	21:20	5.27	3.07	05:10	0.008	21:20	1.102	0.214	0.214	0.05
04/21/2025	02:35	0.73	07:30	4.17	1.58	02:35	0.58	07:30	5.29	2.94	02:35	0.009	07:30	1.064	0.196	0.196	0.02
04/22/2025	03:30	0.68	20:20	4.40	1.60	03:30	0.43	20:20	5.26	2.99	03:30	0.006	20:20	1.141	0.201	0.201	-
04/23/2025	03:55	0.76	20:55	4.05	1.57	03:55	0.53	20:55	5.18	2.92	03:55	0.009	20:55	1.001	0.187	0.187	-
04/24/2025	03:35	0.65	06:20	4.10	1.61	03:35	0.47	06:20	5.18	2.93	03:35	0.006	06:20	1.017	0.200	0.200	-
04/25/2025	03:40	0.67	10:50	4.33	1.57	03:40	0.58	10:50	5.27	2.88	03:40	0.008	10:50	1.121	0.189	0.189	-
04/26/2025	05:10	0.78	21:15	4.33	1.62	05:10	0.57	21:15	5.27	2.98	05:10	0.010	21:15	1.120	0.202	0.202	-
04/27/2025	05:15	0.71	18:10	3.91	1.63	05:15	0.58	18:10	5.22	2.97	05:15	0.009	18:10	0.958	0.210	0.210	-
04/28/2025	03:05	0.75	20:15	4.35	1.57	03:05	0.55	20:15	5.31	2.97	03:05	0.009	20:15	1.136	0.194	0.194	-
04/29/2025	02:50	0.67	15:10	3.95	1.55	02:25	0.49	15:10	5.20	2.95	02:50	0.007	15:10	0.968	0.190	0.190	0.13

01/15/2025 00:00 - 04/29/2025 23:59

	DFINAL (in)	VFINAL (ft/s)	QFINAL (MGD - Total MG)	RAIN FINAL (in)
Total			23.166	13.62
Average	1.63	3.33	0.221	

CAM_81189

Site Commentary

SITE INFORMATION

Pipe	Elliptical (12.13 in H x 12.13 in W)
Silt	0.00 (in)

OBSERVATIONS

Surcharge conditions were not experienced. Review of the scattergraph shows that free-flow conditions were experienced during the study. Backwater conditions were observed.

Average flow depth, velocity, and quantity data observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025**, along with observed minimum and maximum data, are provided in the following table.

Observed Flow Conditions			
Item	**DFINAL (in)**	**VFINAL (ft/s)**	**QFINAL (MGD - Total MG)**
Average	2.07	1.91	0.117
Minimum	0.98	0.37	0.017
Maximum	4.16	2.85	0.295
Min Time	04/11/2025 02:50:00	02/21/2025 04:30:00	04/22/2025 02:20:00
Max Time	04/23/2025 08:25:00	04/01/2025 10:45:00	02/06/2025 15:30:00

Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Values in the graphical reports are based on the fifteen minutes average and values in the Observed Flow Conditions and tabular report are based on the five-minute average.

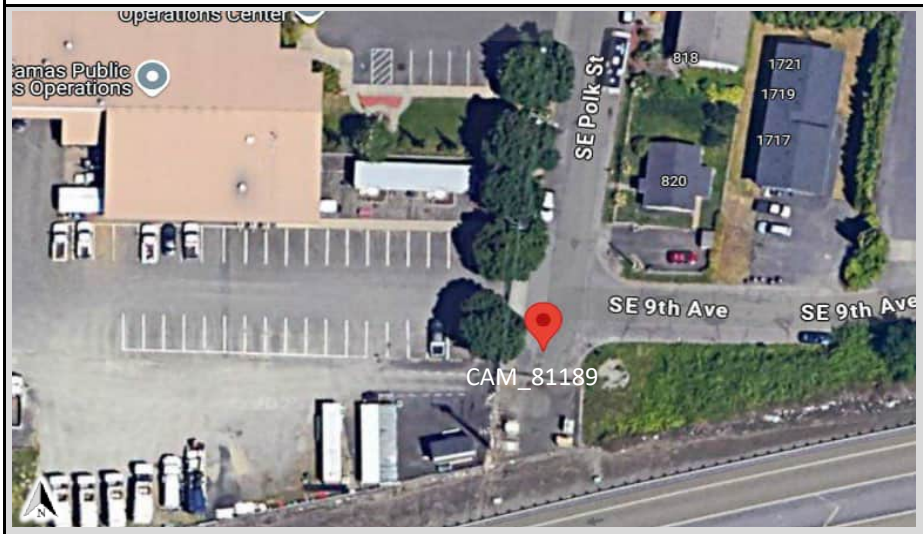
DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
DFINAL (in)	100
VFINAL (ft/s)	100
QFINAL (MGD - Total MG)	100

Camas.Carollo.TFM.WA24		Site Name
Flow Monitoring Site Report		CAM_81189

Site Address /Location:	820 SE Polk St, Camas, WA 98607			Monitor Series	Location Type
				TRITON+	Temporary
Site Access Details:	On Road	Latitude:	45.580146	Pipe Size (H x W)	Pipe Shape
		Longitude:	-122.39157	12.13 x 12.13	Circular



Manhole #	System Characteristics
81189	Residential
Access	Traffic
Drive	None







ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23116.11.325

Installation Information

Installation Date:	Installation Type:
Tuesday, January 14, 2025	Doppler Standard Ring and Crank
Monitoring Location (Sensors):	Monitor Location:
Upstream 0-5 FT	Manhole
Sensors / Devices:	Pressure Sensor Range (psi)
Peak Combo (CS4)	0 - 5 psi

Installation Confirmation:

Time	
10:17:00 AM	
Depth of Flow (Wet DOF) (in)	
2.50	
CS58 Physical Offset (in)	Measurement Confidence (in)
N/A	0.25"
Peak Velocity (fps)	Velocity Sensor Offset (in)
2.57	N/A
Silt (in)	Silt Type
0	

Manhole / Pipe Information:

Manhole Depth (Approx. FT):	Manhole Configuration
7.5	Single
Manhole Material:	Manhole Condition:
Concrete	Good
Manhole Opening Diameter (in)	Manhole Diameter (Approx.):
24	26
Manhole Cover	Manhole Frame
Steel	Normal
Active Connections	Air Quality:
Yes, Inside	Normal
Pipe Material	Pipe Condition:
Concrete	Good

Communication Information:

Communication Type	Antenna Location
Wireless	Manhole Pick / Vent Hole

Additional Site Info. / Comments:

Additional Photos

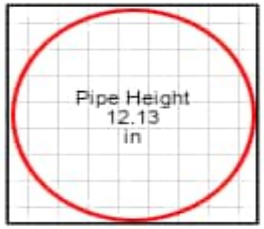
Monitoring Point Inlet	Outlet	West connection
		
Top Down	**Location**	**Map**
		
East Connection	**KEY**	
	Flow Direction Monitoring Point	

Hydrograph Report

CAM_81189

Flow Monitor

CAM_81189



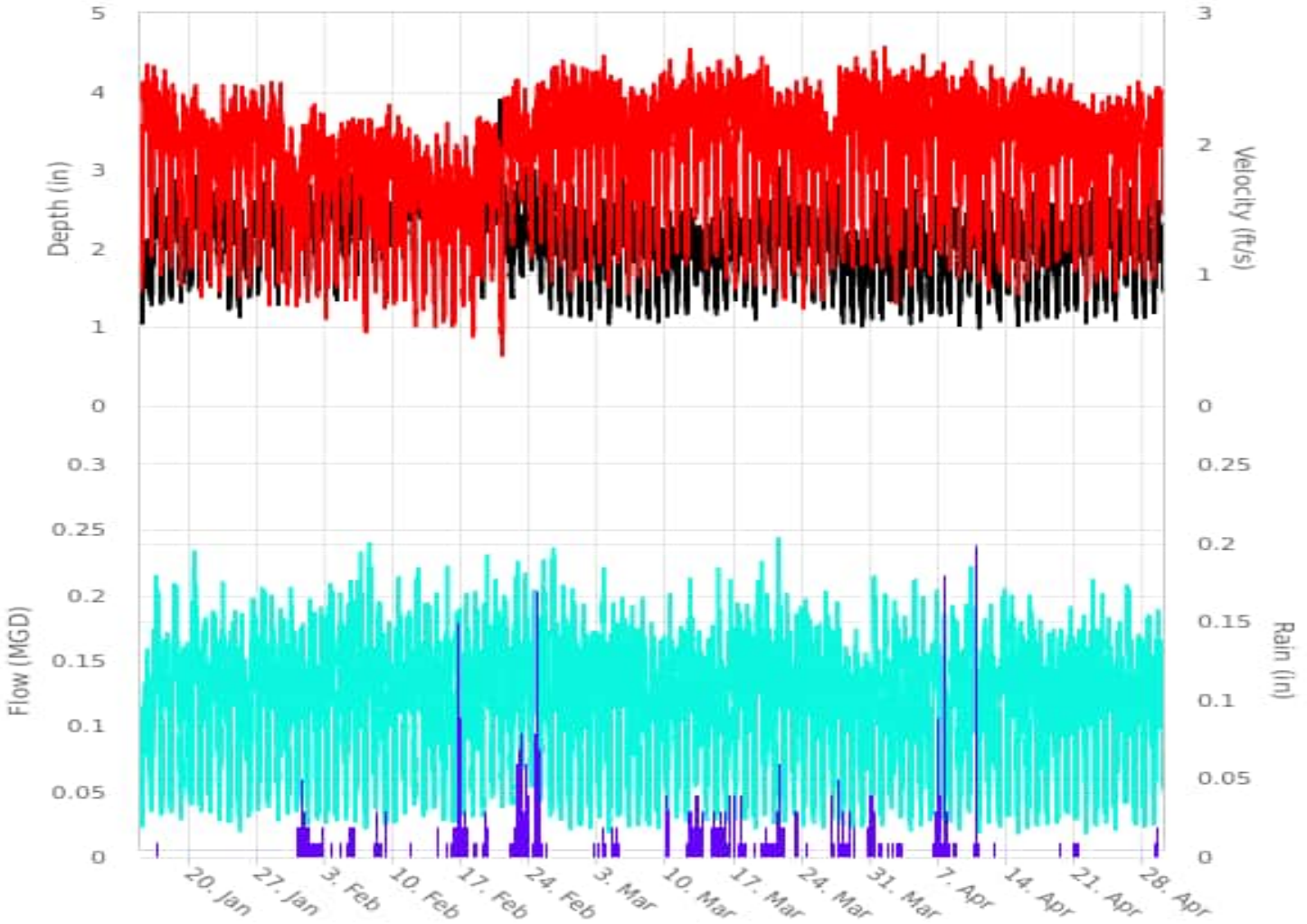
Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL

ADS ENVIRONMENTAL SERVICES



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Scattergraph Report

CAM_81189

Flow Monitor

CAM_81189

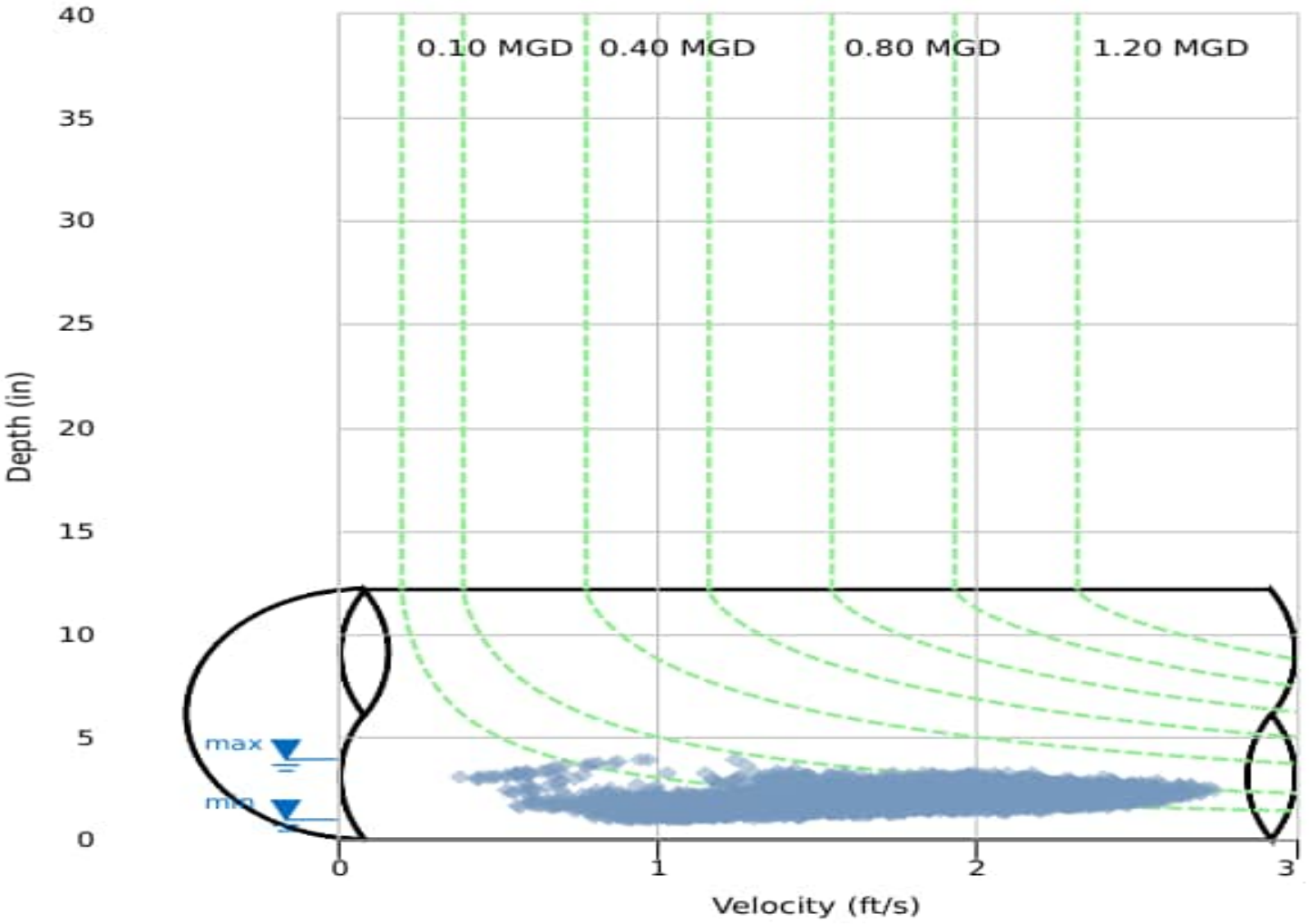
Pipe Height
12.13
in

Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL - VFINAL
Iso-Q™
Min-Max Depth



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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_81189 Pipe: Elliptical (12.13 in H x 12.13 in W), Silt0.00 in

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/15/2025	04:55	1.03	09:30	2.34	1.63	02:55	0.86	15:35	2.71	2.08	04:55	0.022	15:35	0.168	0.090	0.090	-
01/16/2025	04:20	1.26	18:25	2.91	2.11	04:35	0.89	09:15	2.65	2.09	04:35	0.026	14:20	0.217	0.133	0.133	0.01
01/17/2025	05:05	1.26	13:55	2.70	1.97	03:45	0.95	11:30	2.66	2.03	05:05	0.030	12:20	0.203	0.115	0.115	-
01/18/2025	04:20	1.31	12:00	2.93	2.19	04:20	1.03	04:25	2.50	1.92	04:20	0.031	12:00	0.226	0.129	0.129	-
01/19/2025	03:05	1.30	16:40	2.70	1.92	06:20	0.87	16:40	2.60	1.82	05:15	0.028	16:40	0.224	0.101	0.101	-
01/20/2025	04:15	1.49	13:45	3.00	2.27	06:15	0.92	11:35	2.63	1.94	06:15	0.037	11:35	0.253	0.137	0.137	-
01/21/2025	03:50	1.41	14:55	2.97	2.09	06:00	0.77	08:20	2.35	1.82	04:25	0.031	15:30	0.196	0.112	0.112	-
01/22/2025	03:55	1.48	15:05	3.08	2.22	05:15	0.74	11:25	2.30	1.78	03:55	0.032	12:05	0.203	0.121	0.121	-
01/23/2025	03:20	1.37	12:55	3.26	2.17	04:15	0.86	11:30	2.60	1.84	04:15	0.028	11:30	0.234	0.121	0.121	-
01/24/2025	02:50	1.22	14:20	2.77	2.05	04:40	0.90	14:15	2.61	1.91	04:40	0.025	14:15	0.222	0.118	0.118	-
01/25/2025	04:45	1.09	11:05	2.53	1.85	04:45	0.80	18:05	2.50	1.91	04:45	0.019	11:05	0.194	0.101	0.101	-
01/26/2025	05:10	1.37	19:55	2.69	2.10	02:30	0.90	08:10	2.51	1.94	02:45	0.030	13:50	0.205	0.123	0.123	-
01/27/2025	03:25	1.39	20:20	2.89	2.21	03:25	1.02	11:30	2.51	1.86	03:25	0.034	11:35	0.224	0.125	0.125	-
01/28/2025	06:25	1.52	18:20	2.94	2.10	05:35	0.63	11:45	2.50	1.91	03:25	0.037	11:50	0.206	0.117	0.117	-
01/29/2025	03:05	1.22	20:50	3.16	2.18	22:25	0.80	10:10	2.52	1.72	03:05	0.024	10:10	0.204	0.113	0.113	-
01/30/2025	05:10	1.47	09:25	3.13	2.34	03:15	0.73	06:10	2.19	1.55	05:10	0.029	10:45	0.209	0.114	0.114	-
01/31/2025	02:20	1.72	15:20	3.07	2.38	04:30	0.70	19:55	2.30	1.57	02:20	0.034	15:55	0.207	0.116	0.116	0.60
02/01/2025	05:00	1.30	09:50	2.89	2.13	05:05	0.78	14:05	2.39	1.80	05:05	0.024	14:05	0.206	0.116	0.116	0.12
02/02/2025	03:55	1.42	19:10	2.99	2.18	05:15	0.79	18:55	2.60	1.74	05:20	0.028	12:00	0.215	0.117	0.117	0.07
02/03/2025	03:45	1.50	16:05	3.30	2.41	02:40	0.64	18:55	2.27	1.66	02:40	0.024	14:35	0.236	0.128	0.128	0.02
02/04/2025	03:45	1.31	13:10	3.19	2.15	01:20	0.88	17:25	2.59	1.73	03:40	0.028	13:15	0.249	0.114	0.114	0.01
02/05/2025	04:10	1.39	15:35	3.41	2.24	02:55	0.75	20:00	2.27	1.77	02:55	0.028	15:35	0.233	0.124	0.124	0.19
02/06/2025	02:55	1.38	15:30	3.78	2.30	02:55	0.78	19:40	2.33	1.76	02:55	0.025	15:30	0.295	0.127	0.127	-
02/07/2025	05:45	1.49	15:10	3.53	2.40	05:05	0.55	08:05	2.44	1.60	02:30	0.022	13:25	0.252	0.125	0.125	-
02/08/2025	02:05	1.55	17:45	3.26	2.44	04:55	0.74	20:10	2.33	1.58	04:55	0.033	20:10	0.228	0.121	0.121	0.25
02/09/2025	05:00	1.27	23:05	2.81	2.02	03:20	0.71	09:20	2.51	1.70	05:00	0.021	13:25	0.196	0.104	0.104	0.05
02/10/2025	02:50	1.36	15:20	3.24	2.32	02:15	0.77	12:10	2.27	1.71	04:00	0.025	10:45	0.229	0.126	0.126	-
02/11/2025	02:45	1.57	18:20	2.95	2.38	04:45	0.72	13:05	2.24	1.61	04:45	0.029	13:10	0.207	0.121	0.121	0.01
02/12/2025	03:05	1.75	12:40	3.28	2.55	05:55	0.60	07:00	2.15	1.55	03:05	0.034	12:00	0.230	0.129	0.129	-
02/13/2025	04:10	1.58	13:40	3.20	2.43	02:40	0.72	07:45	2.01	1.50	02:40	0.030	07:45	0.207	0.116	0.116	-
02/14/2025	04:30	1.61	13:35	3.65	2.38	06:55	0.55	10:30	2.11	1.48	02:50	0.028	10:25	0.207	0.111	0.111	0.07
02/15/2025	06:20	1.62	12:05	3.12	2.38	02:05	0.61	12:05	2.20	1.45	06:20	0.026	12:05	0.232	0.109	0.109	0.09
02/16/2025	03:00	1.60	15:45	3.32	2.40	01:30	0.54	10:30	2.12	1.45	06:10	0.025	10:30	0.207	0.113	0.113	0.77
02/17/2025	03:25	1.62	12:30	3.15	2.46	03:25	0.70	09:05	2.20	1.46	03:25	0.029	09:05	0.215	0.116	0.116	0.39
02/18/2025	23:15	1.81	14:20	3.31	2.40	04:50	0.48	16:10	2.29	1.53	03:35	0.028	10:35	0.219	0.112	0.112	0.02
02/19/2025	04:05	1.35	15:15	3.34	2.22	04:05	0.82	17:45	2.27	1.75	04:05	0.026	15:20	0.238	0.121	0.121	0.40
02/20/2025	04:35	1.74	21:45	3.99	2.55	22:55	0.63	09:15	2.25	1.60	05:50	0.040	12:05	0.221	0.127	0.127	-
02/21/2025	23:40	1.63	00:00	3.38	2.45	04:30	0.37	10:00	2.53	1.64	04:30	0.036	12:45	0.224	0.112	0.112	0.04
02/22/2025	04:45	1.33	19:35	3.08	2.08	05:25	1.15	08:25	2.56	1.99	04:45	0.036	17:15	0.235	0.124	0.124	0.84
02/23/2025	06:20	1.59	14:00	3.11	2.25	23:15	1.35	11:10	2.43	1.94	06:20	0.057	11:40	0.226	0.131	0.131	1.07
02/24/2025	04:50	1.66	12:45	3.09	2.19	05:30	1.06	20:25	2.52	1.95	04:50	0.046	12:40	0.215	0.128	0.128	0.87
02/25/2025	04:20	1.39	11:55	3.24	2.08	23:05	1.11	08:25	2.55	2.00	04:20	0.037	11:55	0.251	0.124	0.124	0.03
02/26/2025	03:50	1.21	10:05	2.96	2.08	04:55	0.91	17:50	2.72	2.11	03:50	0.030	10:05	0.264	0.132	0.132	-
02/27/2025	03:25	1.14	12:40	2.87	2.01	04:35	0.98	08:30	2.68	2.10	03:25	0.026	11:05	0.225	0.125	0.125	-
02/28/2025	05:00	1.11	09:35	3.31	1.96	03:30	0.86	10:10	2.71	2.04	05:00	0.021	11:25	0.215	0.118	0.118	-
03/01/2025	03:55	1.12	22:00	2.89	1.91	05:15	0.83	09:35	2.67	2.07	05:15	0.020	12:00	0.202	0.115	0.115	-
03/02/2025	04:30	1.08	19:50	2.40	1.88	04:30	0.93	11:10	2.65	2.08	04:30	0.021	12:15	0.185	0.114	0.114	0.05
03/03/2025	04:30	1.21	13:50	2.77	1.95	01:50	1.03	13:05	2.73	2.13	04:30	0.028	13:50	0.237	0.121	0.121	0.07
03/04/2025	03:50	1.02	08:45	3.19	1.95	03:40	0.89	13:20	2.70	2.02	03:40	0.019	21:55	0.214	0.115	0.115	0.12
03/05/2025	02:25	1.25	12:25	3.34	2.09	02:15	1.05	07:15	2.65	1.94	02:15	0.031	12:50	0.219	0.121	0.121	0.01
03/06/2025	04:40	1.20	12:15	2.75	2.07	04:35	0.85	10:45	2.53	1.90	04:35	0.023	12:10	0.198	0.117	0.117	-
03/07/2025	02:35	1.10	14:55	2.65	1.96	23:30	0.71	11:50	2.57	1.91	02:35	0.023	14:35	0.203	0.110	0.110	-
03/08/2025	05:00	1.09	13:15	2.72	1.89	04:45	0.86	13:40	2.53	1.99	04:45	0.021	13:10	0.198	0.109	0.109	-
03/09/2025	04:20	1.06	12:25	2.40	1.83	04:20	0.98	12:25	2.59	2.05	04:20	0.022	12:25	0.188	0.107	0.107	0.20
03/10/2025	03:45	1.12	10:15	2.52	1.91	03:40	0.99	10:15	2.71	2.09	03:40	0.024	10:15	0.211	0.115	0.115	0.22
03/11/2025	01:45	1.16	14:05	2.55	1.95	01:45	1.00	09:50	2.62	2.08	01:45	0.025	10:20	0.189	0.117	0.117	0.02
03/12/2025	02:40	1.16	10:00	2.63	1.94	02:35	1.07	09:50	2.80	2.15	02:35	0.027	10:00	0.230	0.122	0.122	0.83
03/13/2025	23:50	1.30	18:15	2.34	1.89	23:50	1.25	19:20	2.62	2.12	23:50	0.037	10:50	0.180	0.112	0.112	0.49
03/14/2025	04:05	1.20	11:00	2.52	1.89	04:05	0.98	08:05	2.76	2.04	04:05	0.026	18:15	0.203	0.111	0.111	0.16
03/15/2025	03:20	1.16	08:35	2.68	1.89	00:45	1.08	11:15	2.71	2.12	03:25	0.028	08:30	0.225	0.116	0.116	0.60
03/16/2025	04:20	1.21	13:15	2.88	1.93	04:45	0.89	15:20	2.63	2.06	04:45	0.025	13:15	0.238	0.116	0.116	0.16
03/17/2025	03:30	1.33	08:25	2.63	2.00	02:00	0.80	13:40	2.79	2.12	03:30	0.026	13:45	0.206	0.124	0.124	0.19
03/18/2025	02:30	1.25	08:20	2.61	1.95	03:30	0.91	10:10	2.79	2.05	02:30	0.028	08:20	0.199	0.116	0.116	0.02
03/19/2025	03:40	1.09	08:20	2.76	2.06	03:20	0.85	18:45	2.79	2.02	03:20	0.021	18:45	0.236	0.126	0.126	0.07
03/20/2025	02:15	1.40	12:30	2.67	2.04	02:00	0.90	08:15	2.71	1.96	02:00	0.030	08:15	0.214	0.117	0.117	0.11
03/21/2025	01:25	1.24	13:50	3.12	2.15	02:35	0.81	12:20	2.52	1.93	02:35	0.024	13:45	0.256	0.127	0.127	1.12
03/22/2025	02:40	1.38	08:40	2.72	2.09	03:35	0.69	09:30	2.53	1.93	03:35	0.024	08:35	0.205	0.121	0.121	-
03/23/2025	02:20	1.28	11:15	2.61	2.07	02:20	0.97	09:10	2.49	1.96	02:20	0.028	11:15	0.197	0.121	0.121	0.44
03/24/2025	03:35	1.31	16:15	2.64	2.10	02:00	0.71	09:00	2.60	1.96	03:35	0.022	18:10	0.202	0.124	0.124	0.01

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/25/2025	03:15	1.30	08:15	2.67	1.98	03:35	0.84	09:05	2.65	1.98	03:35	0.025	10:40	0.205	0.115	0.115	-
03/26/2025	02:40	1.22	07:40	3.02	2.15	02:35	0.77	07:40	2.37	1.81	02:35	0.021	07:40	0.239	0.120	0.120	0.20
03/27/2025	01:50	1.22	12:05	2.90	2.08	01:50	1.00	18:55	2.65	1.89	01:50	0.027	12:10	0.209	0.117	0.117	0.24
03/28/2025	03:35	1.03	19:55	2.55	1.78	03:35	1.04	13:05	2.71	2.11	03:35	0.022	09:00	0.169	0.105	0.105	0.17
03/29/2025	02:10	1.04	11:00	2.38	1.75	03:30	1.04	09:55	2.70	2.14	03:30	0.023	12:25	0.178	0.105	0.105	0.12
03/30/2025	02:55	0.99	11:00	2.42	1.65	04:35	1.01	18:30	2.66	2.08	04:35	0.021	11:00	0.181	0.093	0.093	0.23
03/31/2025	03:40	1.09	13:30	2.79	1.91	02:05	0.99	07:50	2.77	2.10	03:45	0.023	08:50	0.218	0.116	0.116	0.10
04/01/2025	03:25	1.08	13:50	2.88	1.80	03:25	1.02	10:45	2.85	2.06	03:25	0.023	10:45	0.225	0.105	0.105	0.03
04/02/2025	02:50	1.29	14:05	3.92	2.03	14:20	0.69	16:20	2.72	1.99	02:50	0.035	11:15	0.211	0.115	0.115	0.05
04/03/2025	03:55	1.14	10:45	2.65	1.87	02:25	1.18	17:25	2.65	2.08	02:25	0.030	08:05	0.200	0.110	0.110	0.02
04/04/2025	02:55	1.02	10:20	2.89	1.91	02:55	0.91	23:00	2.71	2.02	02:55	0.019	10:20	0.235	0.113	0.113	-
04/05/2025	03:55	1.06	09:05	2.49	1.77	02:45	1.00	08:45	2.73	2.09	03:55	0.023	09:05	0.207	0.103	0.103	-
04/06/2025	01:05	1.13	19:10	2.83	1.95	03:35	0.94	19:45	2.64	2.10	03:35	0.024	19:45	0.219	0.120	0.120	0.71
04/07/2025	04:15	1.15	14:00	2.99	1.73	13:30	0.91	11:15	2.65	2.10	04:25	0.024	13:55	0.199	0.098	0.098	0.37
04/08/2025	03:45	1.17	14:55	2.57	2.02	02:35	0.97	04:25	2.61	2.03	02:35	0.025	09:20	0.199	0.122	0.122	0.07
04/09/2025	02:45	1.01	18:15	2.50	1.86	02:15	0.96	18:15	2.68	2.03	02:50	0.021	18:15	0.206	0.108	0.108	-
04/10/2025	03:25	1.38	09:25	2.89	2.11	03:25	1.02	11:45	2.77	2.06	03:25	0.033	08:30	0.236	0.130	0.130	0.27
04/11/2025	02:50	0.98	13:55	2.71	1.96	02:45	0.95	06:30	2.47	1.97	02:50	0.019	17:50	0.193	0.114	0.114	0.01
04/12/2025	23:55	1.19	09:05	2.52	1.83	02:10	0.88	09:00	2.66	2.02	02:25	0.026	09:00	0.207	0.104	0.104	0.01
04/13/2025	05:40	1.07	20:05	2.79	2.06	05:20	0.99	10:20	2.58	1.99	05:20	0.023	20:00	0.215	0.124	0.124	-
04/14/2025	01:50	1.38	12:55	2.68	2.02	03:30	0.86	19:25	2.58	2.01	03:30	0.029	14:15	0.207	0.119	0.119	-
04/15/2025	02:35	1.01	10:50	2.55	1.87	02:35	0.83	13:30	2.70	1.98	02:35	0.017	10:50	0.195	0.108	0.108	-
04/16/2025	01:55	1.05	14:05	2.85	1.99	01:55	0.90	08:30	2.56	1.98	01:55	0.020	08:30	0.206	0.116	0.116	-
04/17/2025	02:50	1.04	14:00	2.61	1.88	02:45	0.96	07:45	2.57	1.98	02:50	0.021	09:00	0.188	0.106	0.106	-
04/18/2025	02:20	1.10	13:45	2.79	1.88	02:15	0.92	06:40	2.68	2.04	02:15	0.021	13:40	0.193	0.110	0.110	-
04/19/2025	03:40	1.10	15:15	2.41	1.91	05:35	1.08	10:55	2.59	2.05	02:20	0.026	10:55	0.180	0.113	0.113	0.01
04/20/2025	04:25	1.16	13:05	2.74	2.00	02:35	0.94	07:10	2.50	2.01	02:35	0.026	13:05	0.211	0.118	0.118	0.05
04/21/2025	02:15	1.16	07:20	2.90	2.08	01:05	0.99	06:55	2.44	1.94	02:15	0.025	10:40	0.197	0.120	0.120	0.02
04/22/2025	02:35	1.05	18:35	2.87	2.07	02:20	0.73	11:05	2.45	1.88	02:20	0.017	18:35	0.226	0.117	0.117	-
04/23/2025	00:40	1.13	08:25	4.16	2.16	12:25	0.65	19:30	2.35	1.78	03:40	0.019	19:35	0.210	0.117	0.117	-
04/24/2025	03:30	1.18	08:55	2.97	2.01	01:30	0.93	09:55	2.57	1.91	03:30	0.025	08:55	0.210	0.113	0.113	-
04/25/2025	02:45	1.08	11:15	2.58	1.98	02:40	0.82	08:20	2.50	1.92	02:40	0.019	08:25	0.191	0.112	0.112	-
04/26/2025	04:05	1.40	10:35	3.07	2.16	02:40	0.87	11:20	2.53	1.95	04:05	0.031	10:35	0.231	0.126	0.126	-
04/27/2025	02:15	1.11	20:15	2.51	1.92	02:20	0.88	09:30	2.51	2.00	02:20	0.021	12:30	0.182	0.112	0.112	-
04/28/2025	01:30	1.07	10:55	2.93	2.03	03:15	0.92	12:50	2.50	1.92	01:30	0.021	12:50	0.216	0.116	0.116	-
04/29/2025	01:00	1.15	11:35	2.83	2.00	02:25	0.96	10:45	2.50	2.04	02:25	0.025	11:35	0.218	0.119	0.119	0.13

01/15/2025 00:00 - 04/29/2025 23:59

	DFINAL (in)	VFINAL (ft/s)	QFINAL (MGD - Total MG)	RAIN FINAL (in)
Total			12.250	13.62
Average	2.07	1.91	0.117	

CAM_RG

Site Commentary

SITE INFORMATION

Rain Collector Dimensions	8”

OBSERVATIONS

A review of the hydrograph indicates CAM_RG functioned under normal conditions during the study.

The total rainfall recorded during the monitoring period was 13.62 inches.

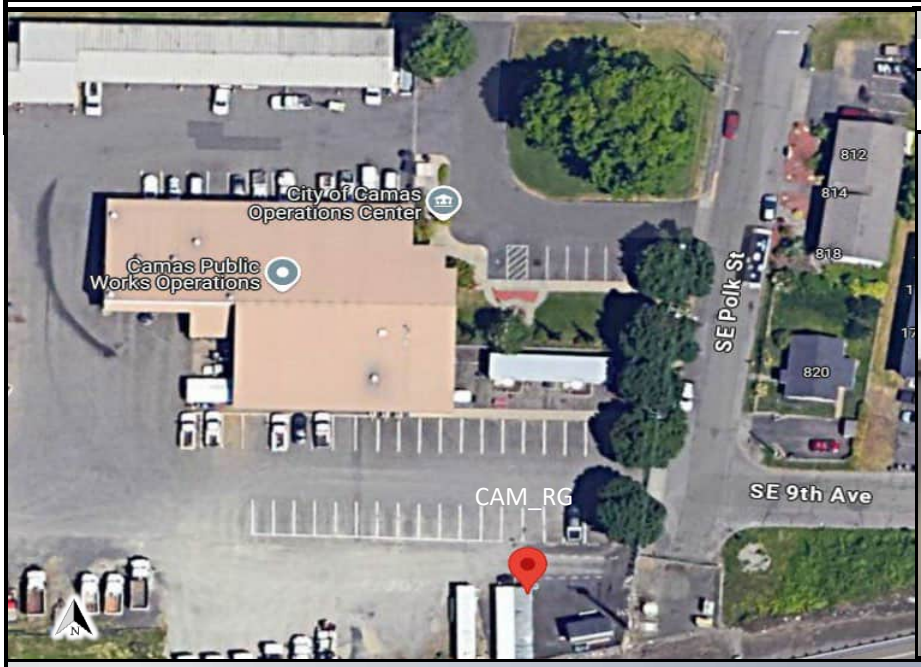
DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
Rain	100

Camas.Carollo.TFM.WA24		Site Name
Rainfall Monitoring Site Report		**CAM_RG**

				Monitor Series	Location Type
Site Address /Location:	1620 SE 8th Ave, Camas, WA 98607			Rain Alert III	Temporary
Site Access Details:	On Roof	Latitude:	45.5800529	Installation Date	
		Longitude:	-122.3918594	1.14.2025	



Location	
On Roof	
Access	Traffic
Drive	None





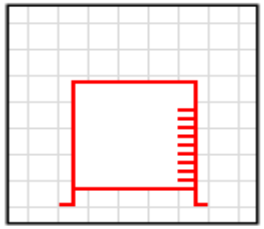
ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23081.11.325

Hydrograph Report

CAM_RG

Rain Gauge

CAM_RG

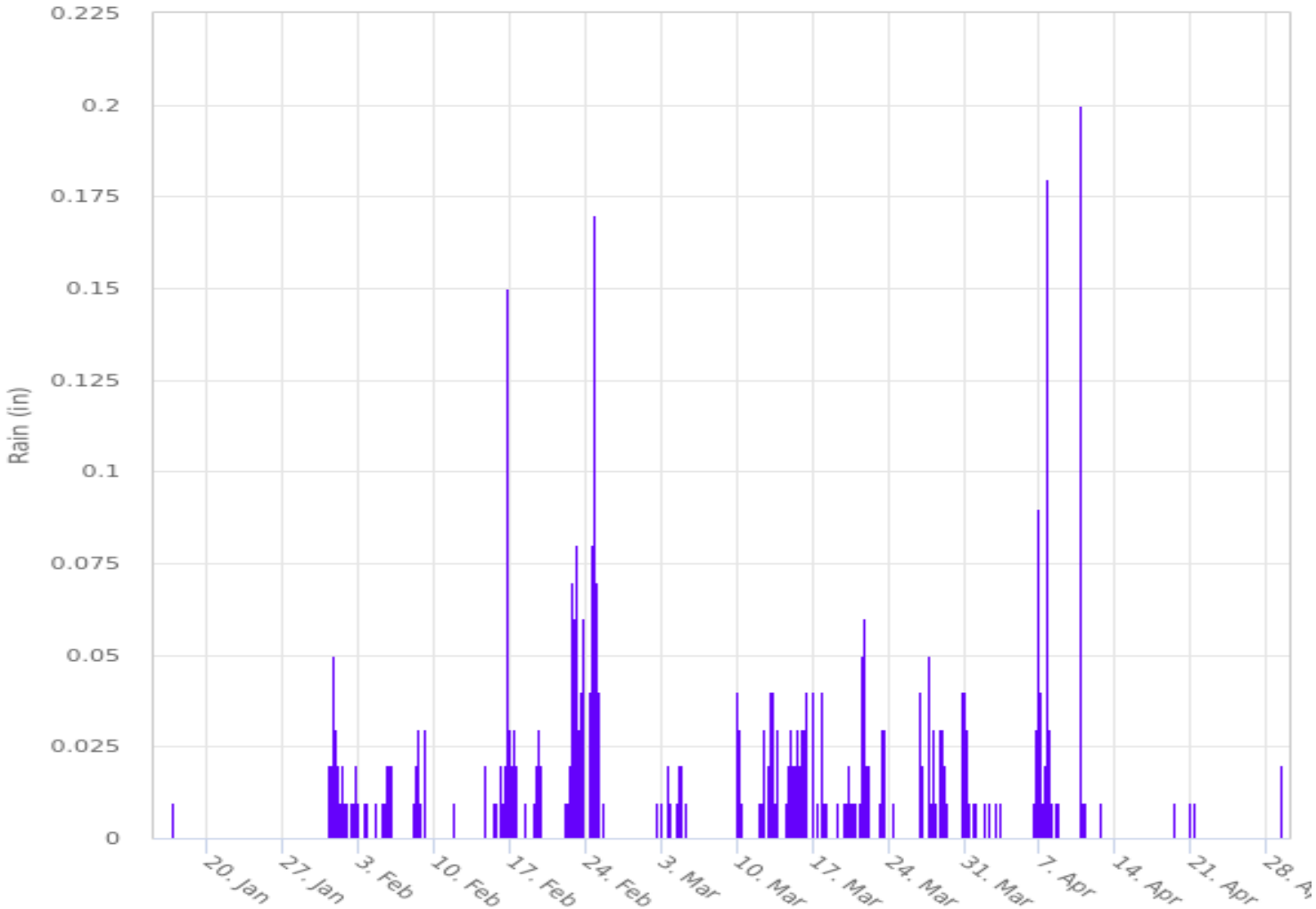


Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL



846 Industry Dr.
Tukwila, WA 98188

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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_RG

Date	RAIN FINAL (in) Total
01/15/2025	-
01/16/2025	0.01
01/17/2025	-
01/18/2025	-
01/19/2025	-
01/20/2025	-
01/21/2025	-
01/22/2025	-
01/23/2025	-
01/24/2025	-
01/25/2025	-
01/26/2025	-
01/27/2025	-
01/28/2025	-
01/29/2025	-
01/30/2025	-
01/31/2025	0.60
02/01/2025	0.12
02/02/2025	0.07
02/03/2025	0.02
02/04/2025	0.01
02/05/2025	0.19
02/06/2025	-
02/07/2025	-
02/08/2025	0.25
02/09/2025	0.05
02/10/2025	-
02/11/2025	0.01
02/12/2025	-
02/13/2025	-
02/14/2025	0.07
02/15/2025	0.09
02/16/2025	0.77
02/17/2025	0.39
02/18/2025	0.02
02/19/2025	0.40
02/20/2025	-
02/21/2025	0.04
02/22/2025	0.84
02/23/2025	1.07
02/24/2025	0.87
02/25/2025	0.03
02/26/2025	-
02/27/2025	-
02/28/2025	-
03/01/2025	-
03/02/2025	0.05
03/03/2025	0.07
03/04/2025	0.12
03/05/2025	0.01
03/06/2025	-
03/07/2025	-
03/08/2025	-
03/09/2025	0.20
03/10/2025	0.22
03/11/2025	0.02
03/12/2025	0.83
03/13/2025	0.49
03/14/2025	0.16
03/15/2025	0.60
03/16/2025	0.16
03/17/2025	0.19
03/18/2025	0.02
03/19/2025	0.07
03/20/2025	0.11
03/21/2025	1.12
03/22/2025	-
03/23/2025	0.44
03/24/2025	0.01
03/25/2025	-

01/15/2025 00:00 - 04/29/2025 23:59

	RAIN FINAL (in)
Date	Total
03/26/2025	0.20
03/27/2025	0.24
03/28/2025	0.17
03/29/2025	0.12
03/30/2025	0.23
03/31/2025	0.10
04/01/2025	0.03
04/02/2025	0.05
04/03/2025	0.02
04/04/2025	-
04/05/2025	-
04/06/2025	0.71
04/07/2025	0.37
04/08/2025	0.07
04/09/2025	-
04/10/2025	0.27
04/11/2025	0.01
04/12/2025	0.01
04/13/2025	-
04/14/2025	-
04/15/2025	-
04/16/2025	-
04/17/2025	-
04/18/2025	-
04/19/2025	0.01
04/20/2025	0.05
04/21/2025	0.02
04/22/2025	-
04/23/2025	-
04/24/2025	-
04/25/2025	-
04/26/2025	-
04/27/2025	-
04/28/2025	-
04/29/2025	0.13

	RAIN FINAL (in)
Total	13.62
Average	

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TECHNICAL MEMORANDUM

Subject: Camas, WA Flow Monitoring Wet Weather Analysis

Prepared For: Carollo

Prepared By: Paul Mitchell, Regional Engineer

Date: May 23, 2025

Background

In addition to sewer flow monitoring and data delivery conducted as part of this temporary deployment of 4 flow monitors, ADS also conducted a wet weather analysis which also takes into account rain data collected from the single deployed temporary rain gauge. This wet weather analysis was conducted to assess Rainfall Dependent Infiltration and Inflow (RDII) attributed to each of the 4 monitored tributaries which could then be used to assist in relative prioritization of those tributary areas (or basins) based on computed and normalized RDII volume per inch rain per acre (converted to % rainfall ingress).

Methodology

The methodology used for this evaluation includes the following primary tasks:

- Evaluate the available data using ADS' Sliicer™ application for evaluating RDII. This includes determination of typical net average dry day flow (ADF).
- Determine RDII for each storm event meeting minimum criteria discussed herein and compute RDII volume associated with each rain event.
- Generate an RDII volume vs. rainfall volume chart (called a Q-vs-i chart) from each storm event data point for each evaluated site/basin and fit a regression line through the data on the Q-vs-i chart.
- Normalize the RDII using the Q-vs-i chart by dividing the slope of the regression line (Gallons RDII per inch rain) by acreage to generate values of % ingress attributed to each site/basin. Use this result to rank relative RDII performance of the site/basins.

Wet Weather Analysis

This section describes an evaluation of wet weather impacts on system flows, defined as Rainfall Dependent Infiltration and Inflow (RDII). This evaluation was based on available flow data provided during the approximate 3 month duration of the flow study. This is done by evaluating excess flow volumes from the studied sewer shed areas (basins) associated with each flow monitoring site during rain events that occurred during the available data periods at each of the 4 locations. This section also describes an evaluation of dry weather flow data for purposes of determining base wastewater flows (to compare wet weather flows against).

Each flow monitoring site represents a defined tributary area (or basin) and each was identified with a simple alpha-numeric ID – CAM_100290, CAM_51123, etc. The Sliicer™ application recognizes basins as having the same name as the monitors used to determine tributary flows (i.e. sites and basins have the same ID). One of the flow sites, CAM_51123, relied upon subtracting flow from a flow monitor upstream (CAM_100290) to define net flow for basin CAM_51123. Table 1 provides a summary of site/basins, site schematic defining each evaluated basin, and size of each basin (acres).

Dry Weather Flow

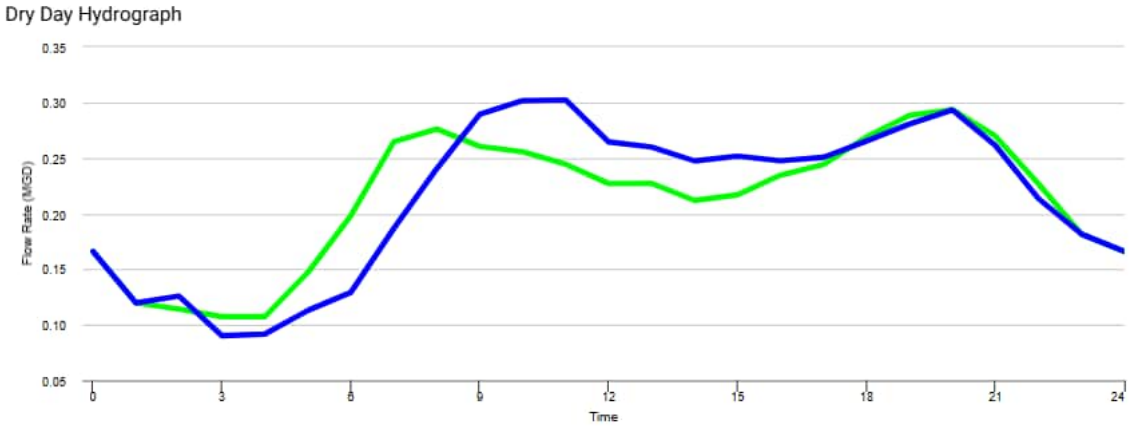
Prior to conducting a wet weather analysis, dry weather flow patterns must first be determined by reviewing data obtained during dry weather conditions at each location. For this analysis, a *dry day* is defined as any day in which there was less than 0.10 in. of rain in the previous day, less than 0.50 in. of rain in the previous three days, and less than 1.00 in. of rain in the previous five days. This process automatically eliminates the selection of most wet weather events and the periods associated with recovery from these events. Once the initial dry days are selected, they are compared to one another to make sure that the flow pattern for each day is repeatable. Any days that have an inconsistent flow pattern are removed from consideration. The resulting dry days are then averaged to establish an average diurnal flow pattern from the site, called an Average Dry day (ADF) pattern. The dry weather analysis evaluates the weekday pattern separate from the weekend pattern to account for differences often observed.

Dry weather flows were evaluated for each flow monitor location from the available data provided. Recorded flow rates from the sanitary sewer monitoring location for each dry day are overlaid on a hydrograph, enabling a hydrograph of the Average Dry day Flow (ADF) to be determined for Weekdays (green curve) and Weekends (blue curve) as depicted in Figure 1 for site/basin CAM_100290. ADF hydrographs for each site are included in Appendix A. Table 1 summarizes the ADF values (weekdays) for each site/basin.

Table 1
Basin Summary Data

Site/ Basin	Pipe Diameter (in)	Added or Upstream Subtracted FM Sites to Determine Net Basin Flow	Basin Size (Acres)	Gross ADDF Weekday (mgd)	Net ADDF Weekday (mgd)
CAM_100290	19	+(CAM_100290)	476	0.22	0.22
CAM_51123	20	+(CAM_51123) - (CAM_100290)	1159	0.77	0.55
CAM_52167	18	+(CAM_52167)	299	0.19	0.19
CAM_81189	12	+(CAM_81189)	136	0.12	0.12
		Total	2071		1.08

Figure 1
Average Dry Day Flow (ADF) Hydrograph – Site/Basin CAM_100290



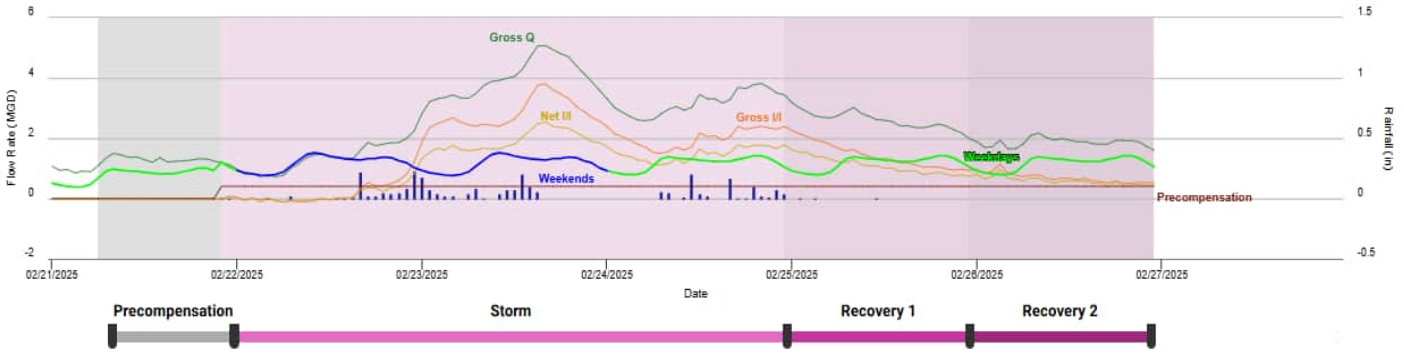
Wet Weather RDII Analysis

A wet weather RDII analysis is performed by comparing specific wet weather events to average dry weather flows (ADF). Based on criteria for a “storm” as being a rain event with at least 0.8 inch of rain with no rain interruption of more than 12 hours, there were 5 rain “storm” events captured during the flow study period. Captured storm volumes ranged from 1.15 inches (April 6, 2025) to 2.84 inches (February 21, 2025). Based on the concurrent periods of flow and rain “storm” data available at each site, an RDII analysis was conducted to characterize the impact of wet weather on flow measured in the basins.

Recorded flow rates for a specific storm event are plotted against average dry weather conditions. The difference observed represents the rain-dependent inflow and infiltration

(RDII or I/I) entering the sanitary sewer system upstream from each monitoring location and is called a storm hydrograph. Figure 2 depicts a storm hydrograph for site/basin CAM_51123 during the largest captured storm event period (from February 21 to 26, 2025).

Figure 2
Storm Hydrograph – Site/Basin CAM_51123



RDII calculations are made for each storm event (the ~5 day period depicted by purple colored bands above for the storm event starting February 21). The first period (shown as a 3 day duration in Figure 2) following the onset of rain is referred to as the Storm Period. The darker purple period following the Storm Period is referred to as Recovery 1, and the next period is referred to as Recovery 2. For purposes of this evaluation, the entire "Event" was used for this analysis which covers the Storm and both Recovery periods. Figure 2 also depicts precompensation which is an upward adjustment made to the ADF pattern so that pattern and the actual flow on storm onset were the same. This effectively compensates for flow that is already elevated leading into a given storm event; enabling a more accurate RDII response to be quantified only from the indicated storm under evaluation.

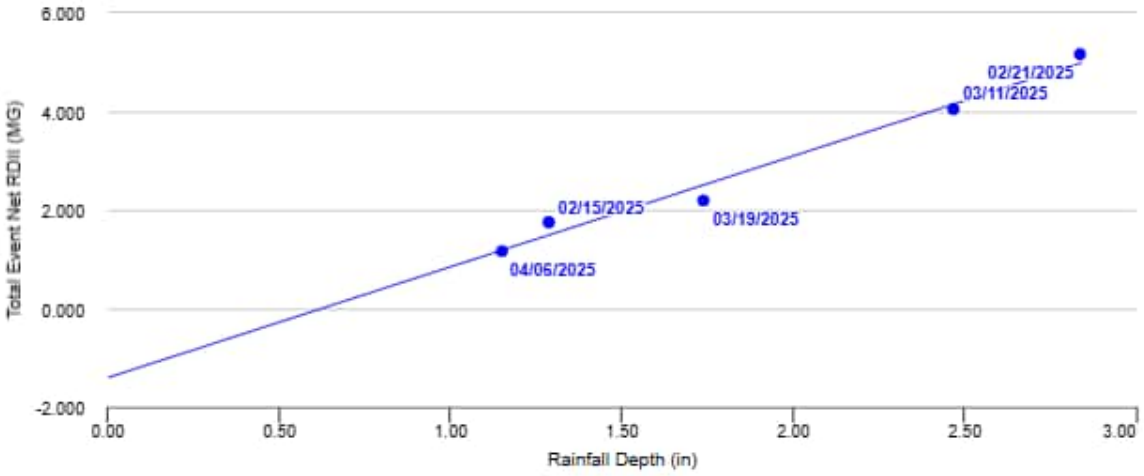
The storm hydrographs for this location showed excess flow responses (shown as "Gross I/I" in the above hydrograph) follow closely with a slight delay to the rainfall pattern. The Gross I/I is the difference between the actual recorded flow (shown as "Gross Q") minus the ADF weekend and weekday pattern. For cases where the net RDII for a basin is determined by subtraction of an upstream flow site (see Table 1), the hydrographs also show a "Net I/I" component as is the case for site/basin CAM_51123 above.

Also, in the case of CAM_51123, the delayed and significant yet muted or delayed response to rainfall may be indicative of predominantly indirect storm drainage pathways (i.e., the infiltration component of RDII). Storm hydrographs of the 5 selected storms for all locations are included in Appendix A.

Once the calculations were complete for each storm event, excess wet weather flow volumes were plotted as a function of rainfall volume on graphs commonly referred to as

Q-vs-i graphs; each with best fit regression lines drawn. The rain volume vs. excess flow volume Q-vs-i chart is shown in Figure 3 for site/basin CAM_51123. These charts for all other locations are included in Appendix A.

Figure 3
Q-vs-i graph for CAM_51123



These volume-based Q-vs-i graphs for the basins generally show a good visual (regression line) correlation between excess wastewater volume and rainfall. The Q-vs-i graph for CAM_51123 projects about 2 million gallons of I/I would be generated from about 1.5 inches of rain. However, there is an apparent threshold (X-intercept) of about 0.5 or 0.6 inches of rain in the above Q-vs-i graph; below which there is little to no RDII response. This means projected RDII vs rainfall volumes based on regression line slope will be greater than individual storm values. These graphs are included for all the site/basins in Appendix A. Caution is warranted in attempting to extrapolate higher rainfall responses from these Q-vs-i graphs since the linear extrapolation may not remain fully intact during significantly stronger storm events. A summary of individual RDII response data points (MG/inch) per storm is provided in Table 2.

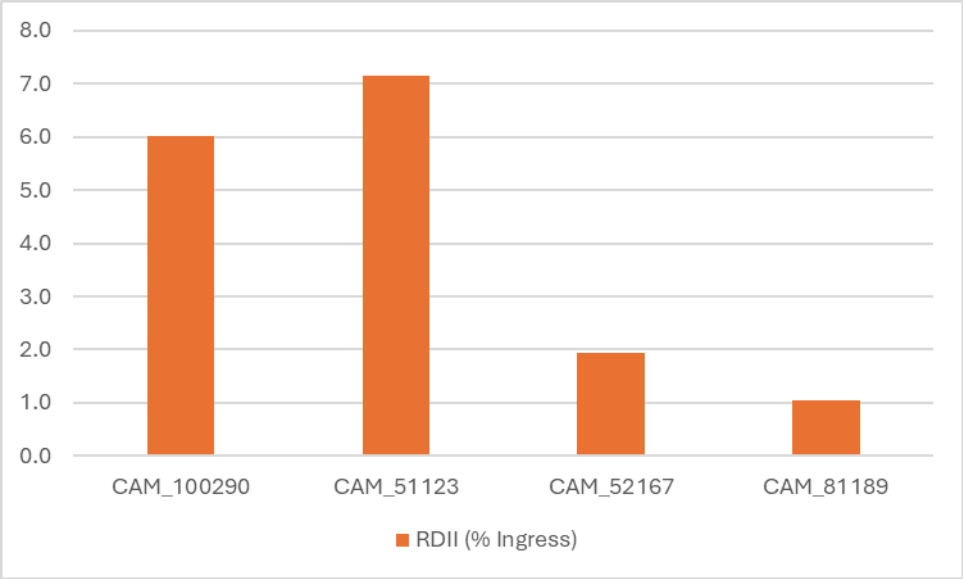
Table 2
Basin RDII Storm Response Summary

	Storm RDII (MG/inch)				
Site/ Basin	2/15/2025 (1.29")	2/21/2025 (2.84")	3/11/2025 (2.47")	3/19/2025 (1.74")	4/6/2025 (1.15")
CAM_100290	0.57	0.68	0.64	0.48	0.52
CAM_51123	1.36	1.82	1.64	1.26	1.01
CAM_52167	0.16	0.14	0.20	0.12	0.17
CAM_81189	0.01	0.03	0.01	0.03	0.00

To properly characterize relative I/I performance among the sites/basins evaluated, the wet weather I/I responses must also be normalized according to basin size. This is done by taking the slope of the Q-vs-i responses described above (gallons RDII / inch rain) and dividing by basin area (acres – see Table 1) to yield normalized values of RDII response in terms of projected % rainfall ingress. These rain and size normalized % ingress values based on Q-vs-i projected slopes are summarized in Figure 4.

As a general rule, basins may be considered to yield excessive RDII if such normalized values are much greater than 5. Two of the 4 site/basins evaluated slightly exceeded this value.

Figure 4
Projected RDII (% Rainfall Ingress)



The computed values for ADF and rain & area normalized projected RDII volumes (including % Ingress) are summarized in Table 3. Hydrographs of the flow monitoring period, dry day hydrographs, storm hydrographs, and volume-based Q vs i graphs are included in Appendix A.

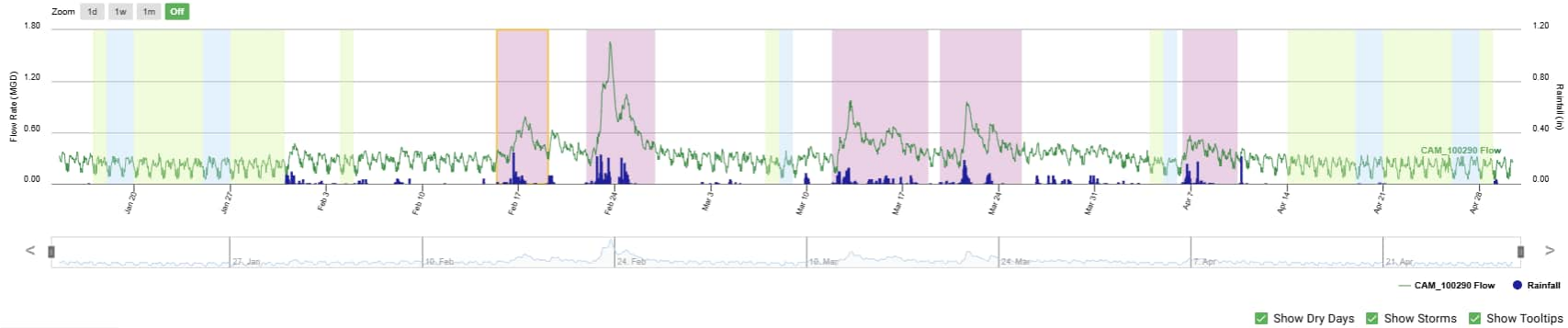
Table 3
Basin Dry and Wet Weather Performance Summary

Site/ Basin	Pipe Diameter (in)	Basin Size (Acres)	Net ADDF Weekday (mgd)	Projected Net RDII (MG/in)	Projected Net RDII (%rain ingress)
CAM_100290	19	476	0.22	0.78	6.0
CAM_51123	20	1159	0.55	2.25	7.1
CAM_52167	18	299	0.19	0.16	1.9
CAM_81189	12	136	0.12	0.04	1.0

Appendix A

Study period Hydrographs, ADF hydrographs, Storm hydrographs, and Q vs i graphs

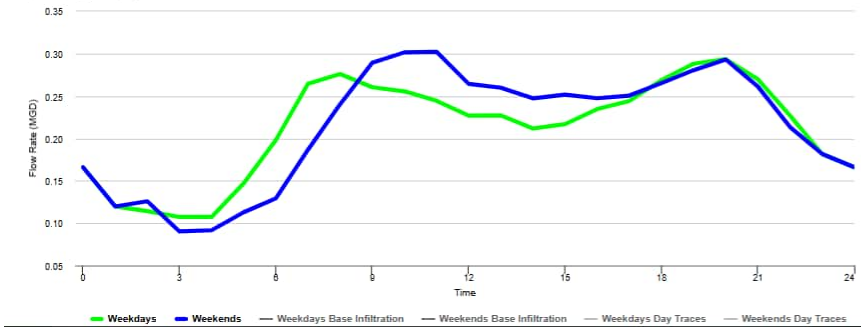
Hydrograph with Basin Rainfall: 01/14/2025 - 04/30/2025 | Basin CAM_100290 | Edit Dry Days

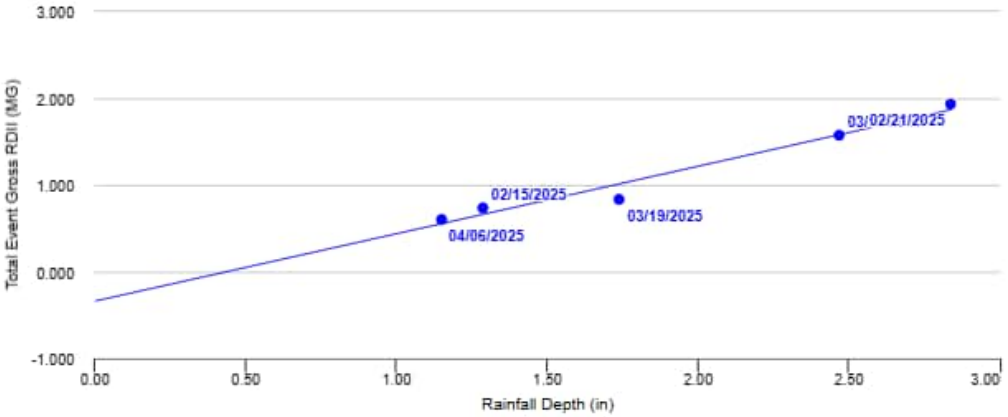


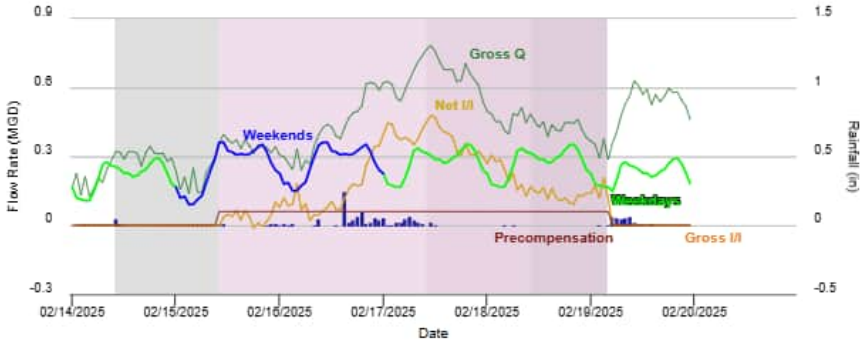
Show Dry Days | Show Storms | Show Tooltips

DRY DAYS | STORM EVENTS | STATISTICS

Dry Day Hydrograph



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Flow Rate (MGD)
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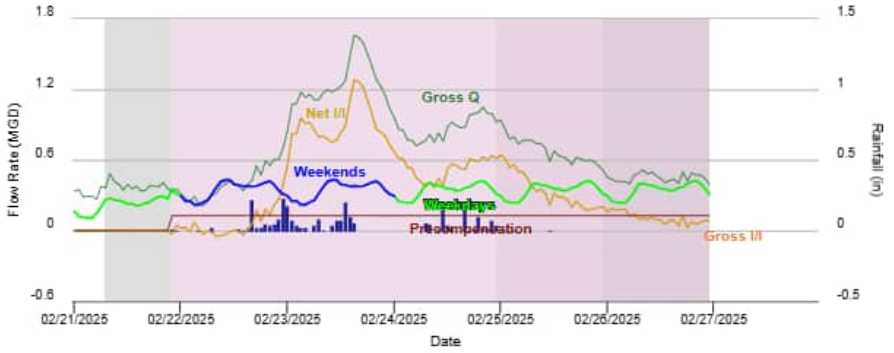
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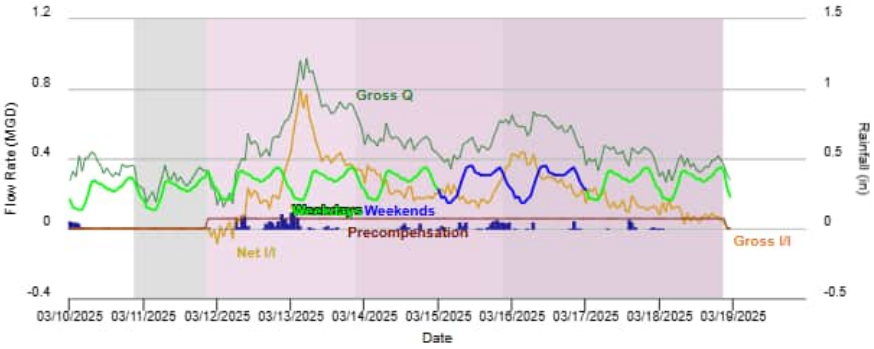
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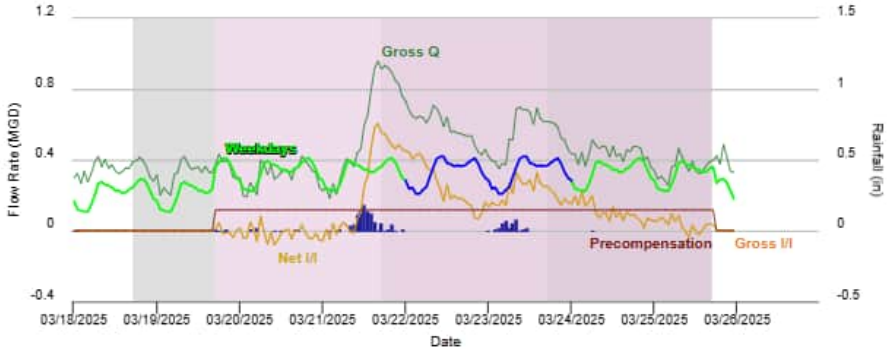
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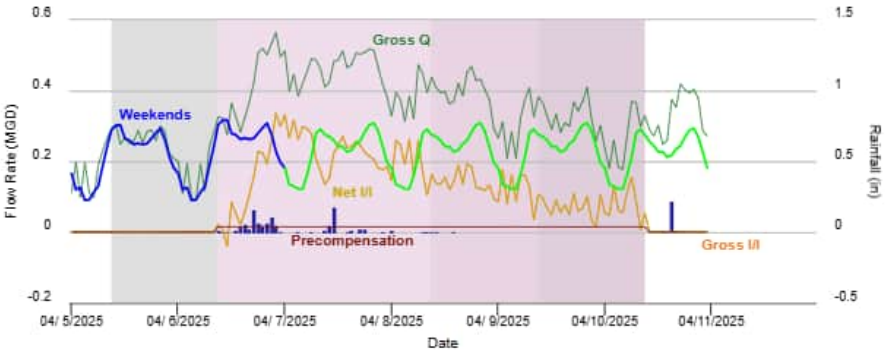
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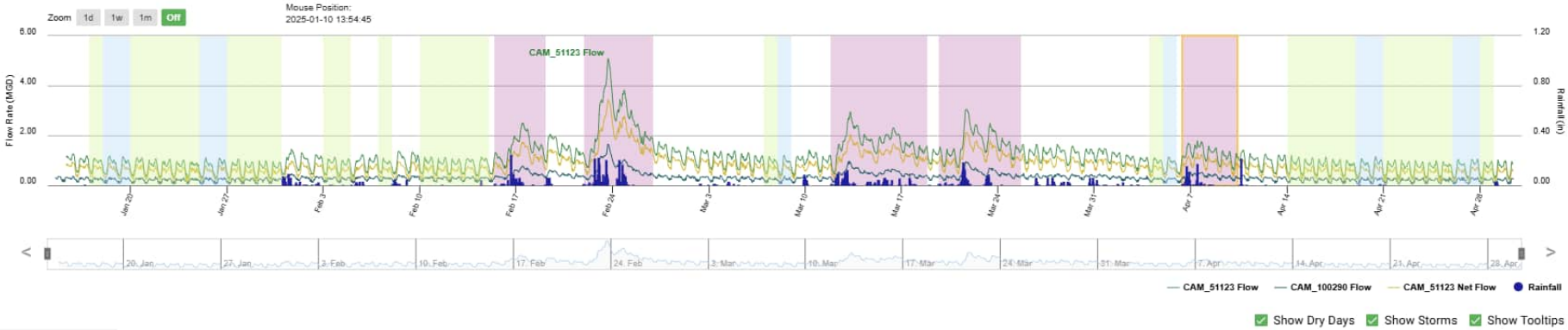
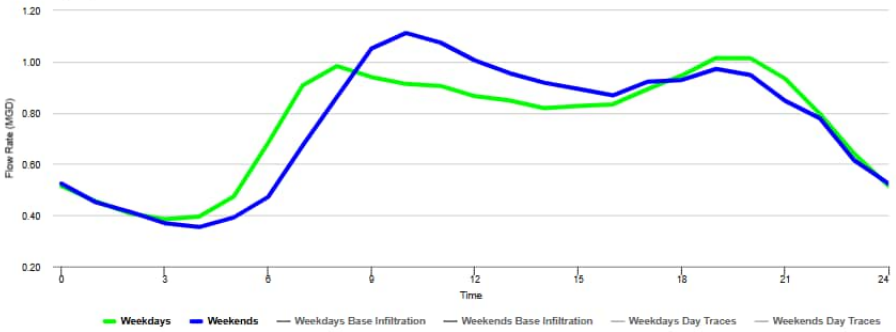
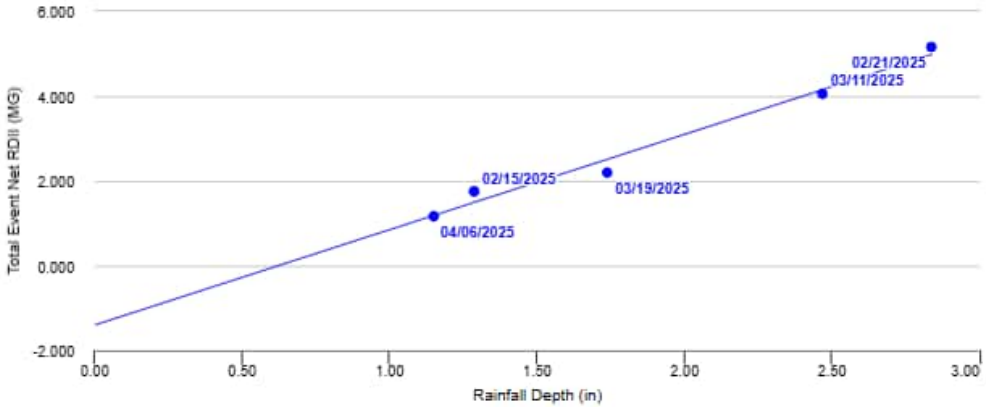
Hydrograph with Basin Rainfall: 01/14/2025 - 04/30/2025 | Basin CAM_51123 | Edit Dry Days

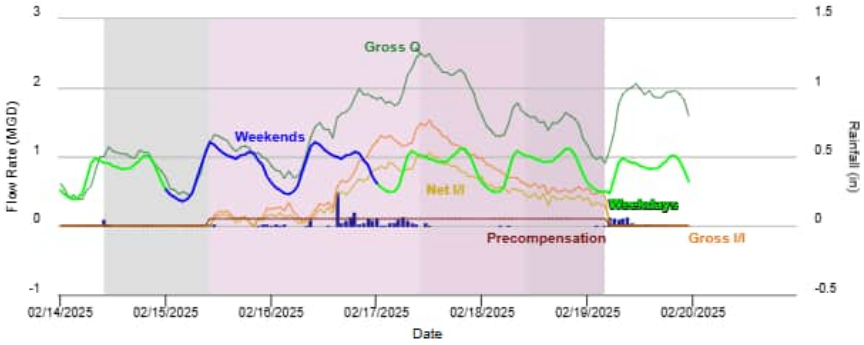


DRY DAYS | STORM EVENTS | STATISTICS

Dry Day Hydrograph



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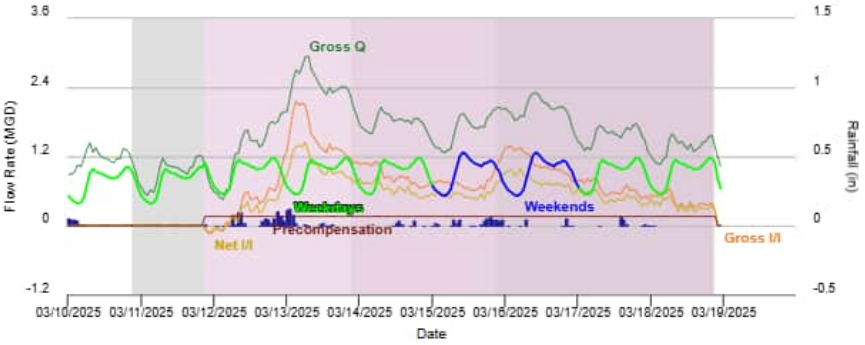
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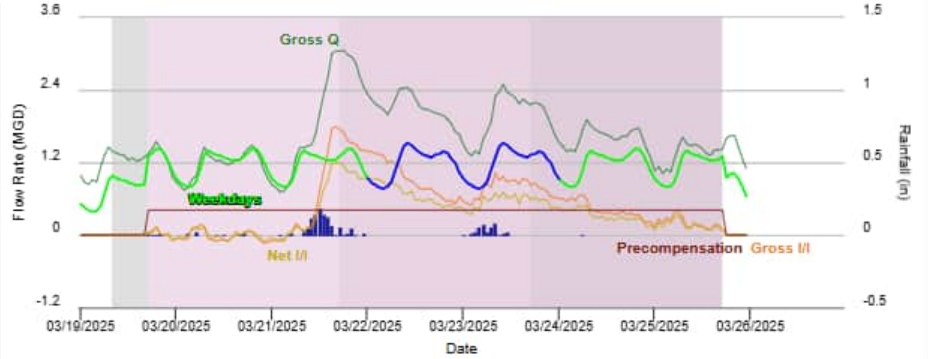
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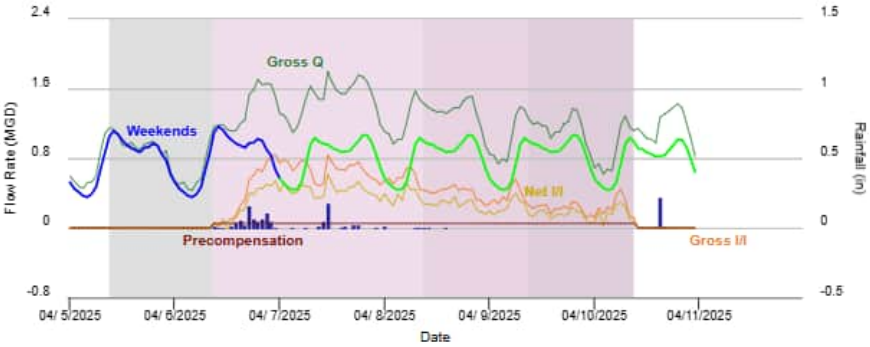
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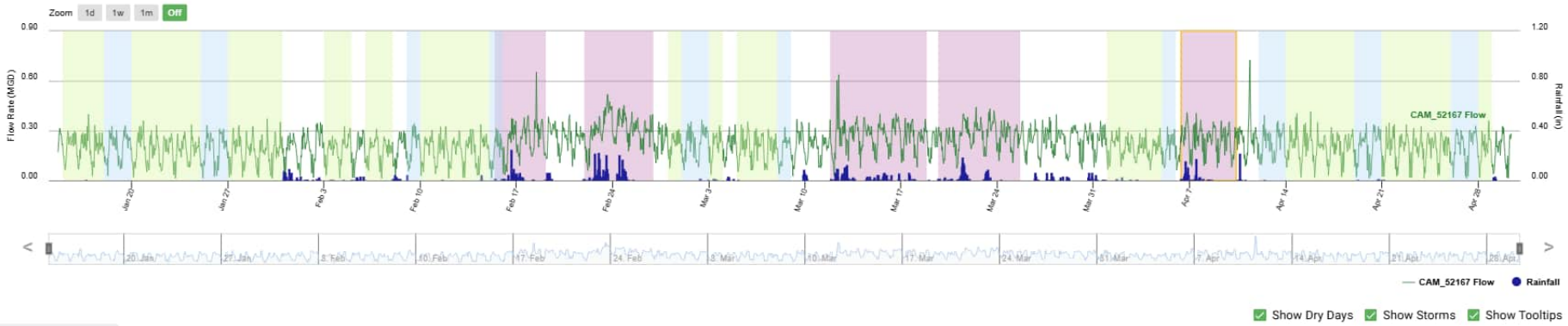
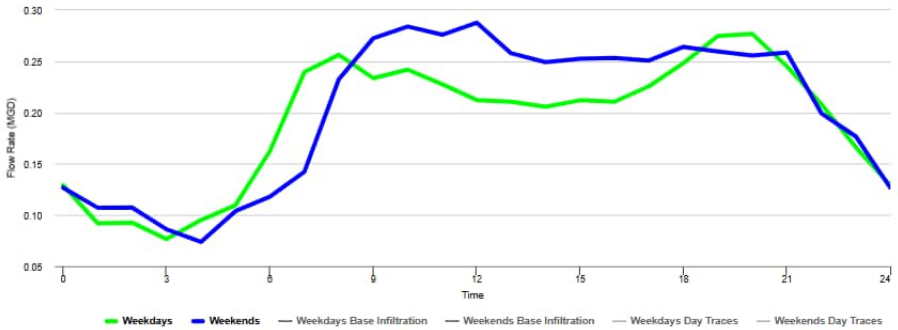
Hydrograph with Basin Rainfall: 01/14/2025 - 04/30/2025 | Basin CAM_52167 | Edit Dry Days

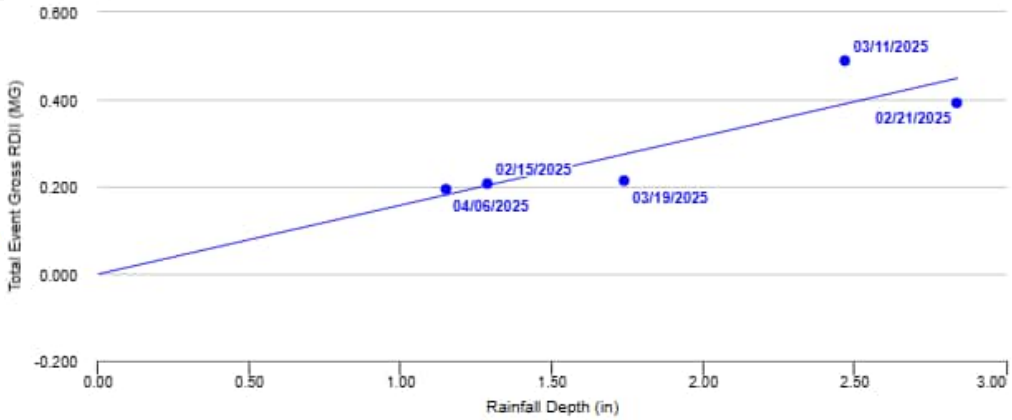


Show Dry Days Show Storms Show Tooltips

DRY DAYS | STORM EVENTS | STATISTICS

Dry Day Hydrograph



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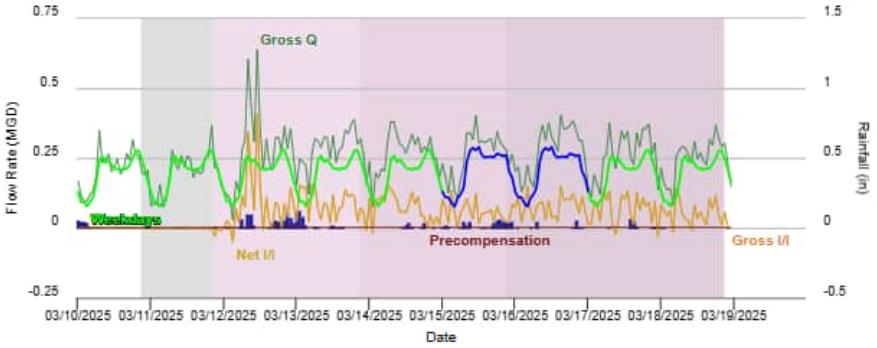
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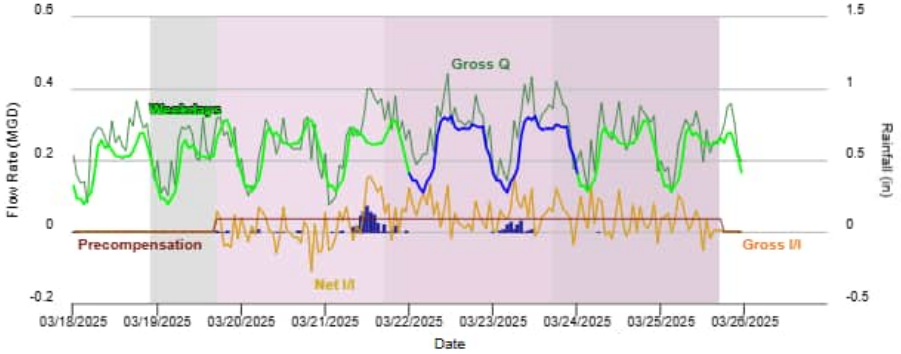
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Gross Q
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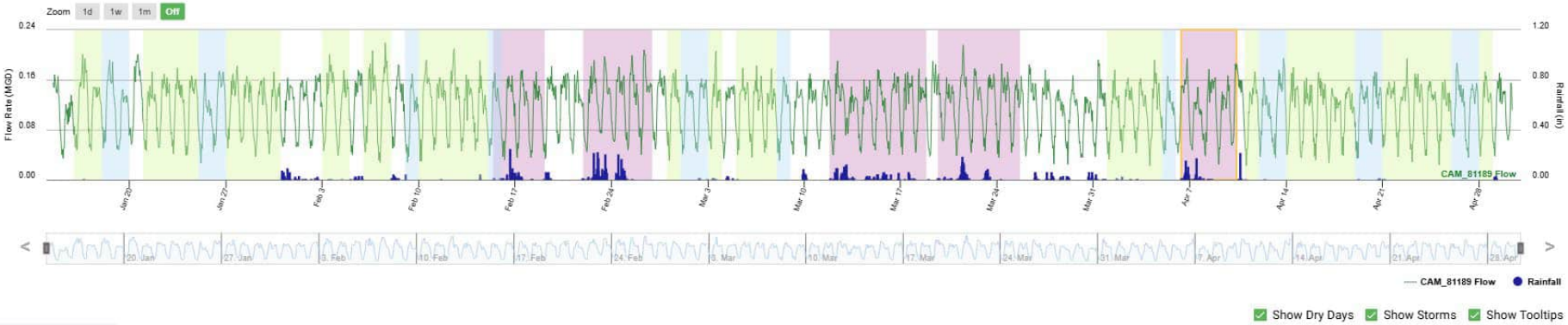
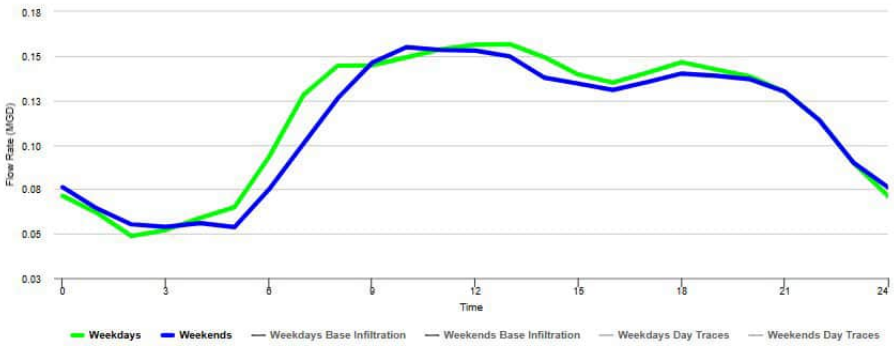
Date

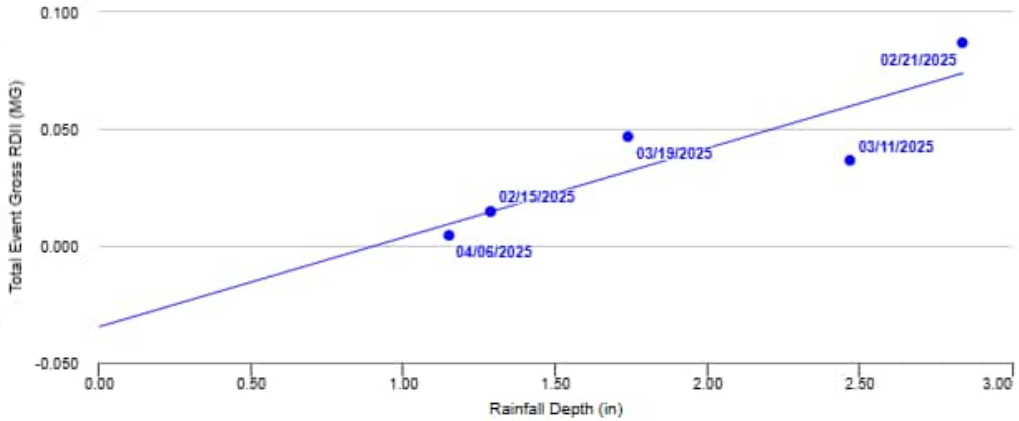
Hydrograph with Basin Rainfall: 01/14/2025 - 04/30/2025 | Basin CAM_81189 | Edit Dry Days

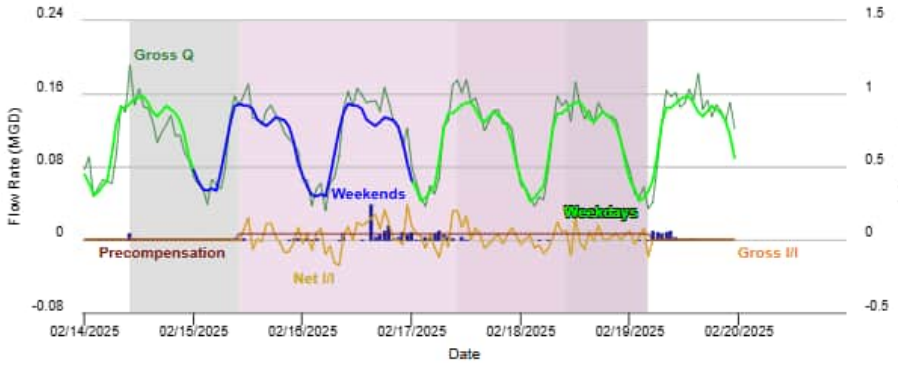


DRY DAYS | STORM EVENTS | STATISTICS

Dry Day Hydrograph



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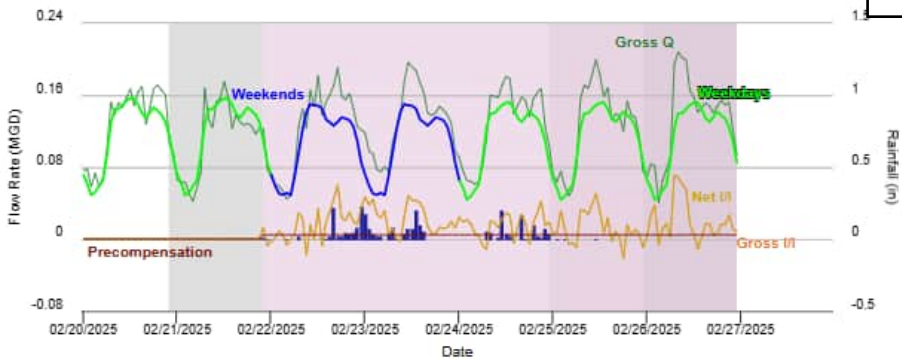
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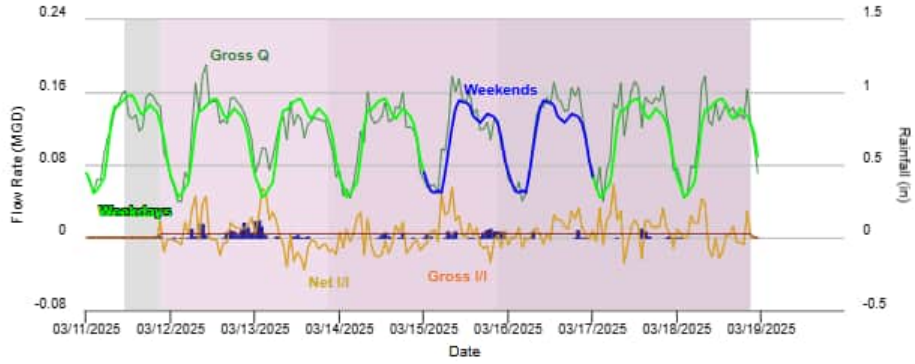
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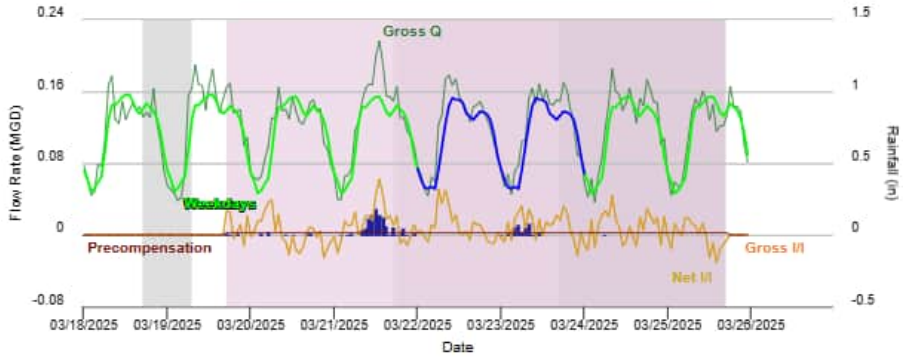
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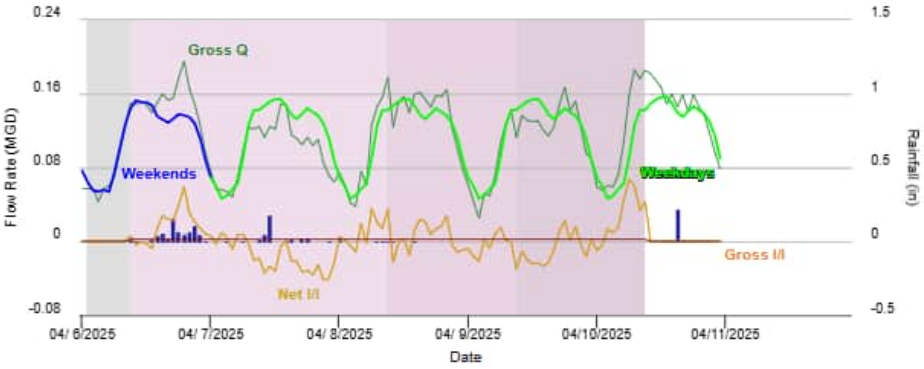
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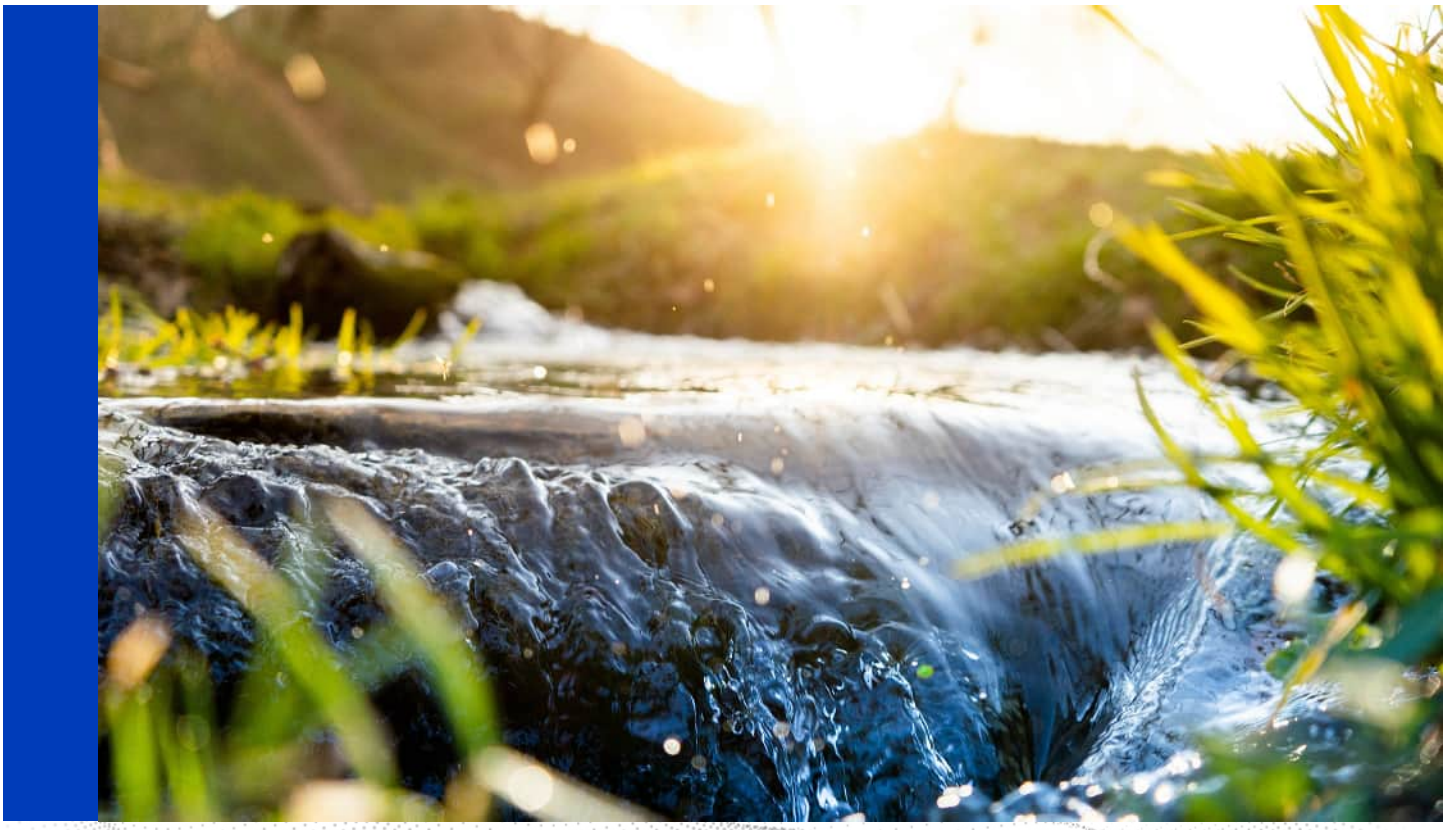
APPENDIX E

HYDRAULIC MODEL UPDATE TECHNICAL MEMORANDUM

City of Camas WASHINGTON

General Sewer Plan



Hydraulic Model Update

August 2026 / DRAFT

carollo

General Sewer Plan

Hydraulic Model Update

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Abbreviations

ADWF	average dry weather flow
BWF	base wastewater flow
Carollo	Carollo Engineers
City	City of Camas
CIWEM	Chartered Institution of Water and Environmental Management
DWF	dry weather flows
FRC	fast response curve
GIS	geographic information system
gpad	gallons per acre per day
gpm	gallons per minute
GSP	General Sewer Plan
GWI	groundwater infiltration
LS	lift station
mgd	million gallons per day
RDI	rainfall dependent infiltration
RDII	rainfall derived inflows and infiltration
SCADA	supervisory control and data acquisition
SRC	slow response curve
STEP	septic tank effluent pumping
UDG	Urban Drainage Group
UGA	urban growth area
WWF	wet weather flow
WWTF	wastewater treatment facility

SECTION 1 INTRODUCTION

Sanitary sewer collection system models are valuable tools used to assess the performance of collection systems during dry and wet weather conditions, and to support planning for future improvements. These models provide a means to simulate the impact of different sized storms on the collection system and determine where system deficiencies are likely to occur. In addition, a well-calibrated model provides an easy way to test alternative improvement scenarios.

The previous iteration of the City of Camas (City) sewer collection system model was updated in 2019 for the 2024 General Sewer Plan (GSP) using MIKE URBAN software and represented the gravity sewer system. In 2023, the septic tank effluent pumping (STEP) system was developed as a separate model, in MIKE URBAN. For the 2025 GSP update, the gravity and STEP models were combined into a single model and converted to MIKE+ software, with additional system pipes added to reflect new infrastructure and updates since the original model development.

This report summarizes the City's sewer collection system hydraulic model update and calibration for use in the City's sewer system conveyance planning.

SECTION 2 STUDY AREA

The City's service area is shown in Figure 1. The service area is approximately 7,600 acres. The current service area includes the City limits, and the future service area extends to the urban growth area (UGA) which totals to 9,300 acres.

The modeled collection system consists of the gravity system and the STEP that is upstream of the gravity system. Table 1 shows a summary of the City's pipe infrastructure by type.

Table 1 Summary of Pipe Infrastructure by Type

Sewer Type	Modeled Pipe Length (feet)	Pipe Length (feet)	Percent of Modeled System (%)
Gravity Main	113,809	405,499	28.1
Force Main(1)(2)	51,677	65,218	79.2
STEP Main	44,531	290,019	15.4
Total	**210,016**	**760,736**	**27.6**

Notes:
(1) Force main pipe length was determined by using both existing GIS data and newly mapped force main segments in the North Shore area.
(2) The total force main length includes the dual force main installed in the North Shore area.
(3) This Includes STEP Transmission, STEP Main, STEF Main, and STEG Main.
GIS - geographic information system.

Figure 1 shows the current service area outlined by a dashed black line. The service area for the 2045 and buildout scenarios is outlined by a dotted purple line. Figure 2 shows the extent of the hydraulic model for the existing, 2045, and buildout systems.

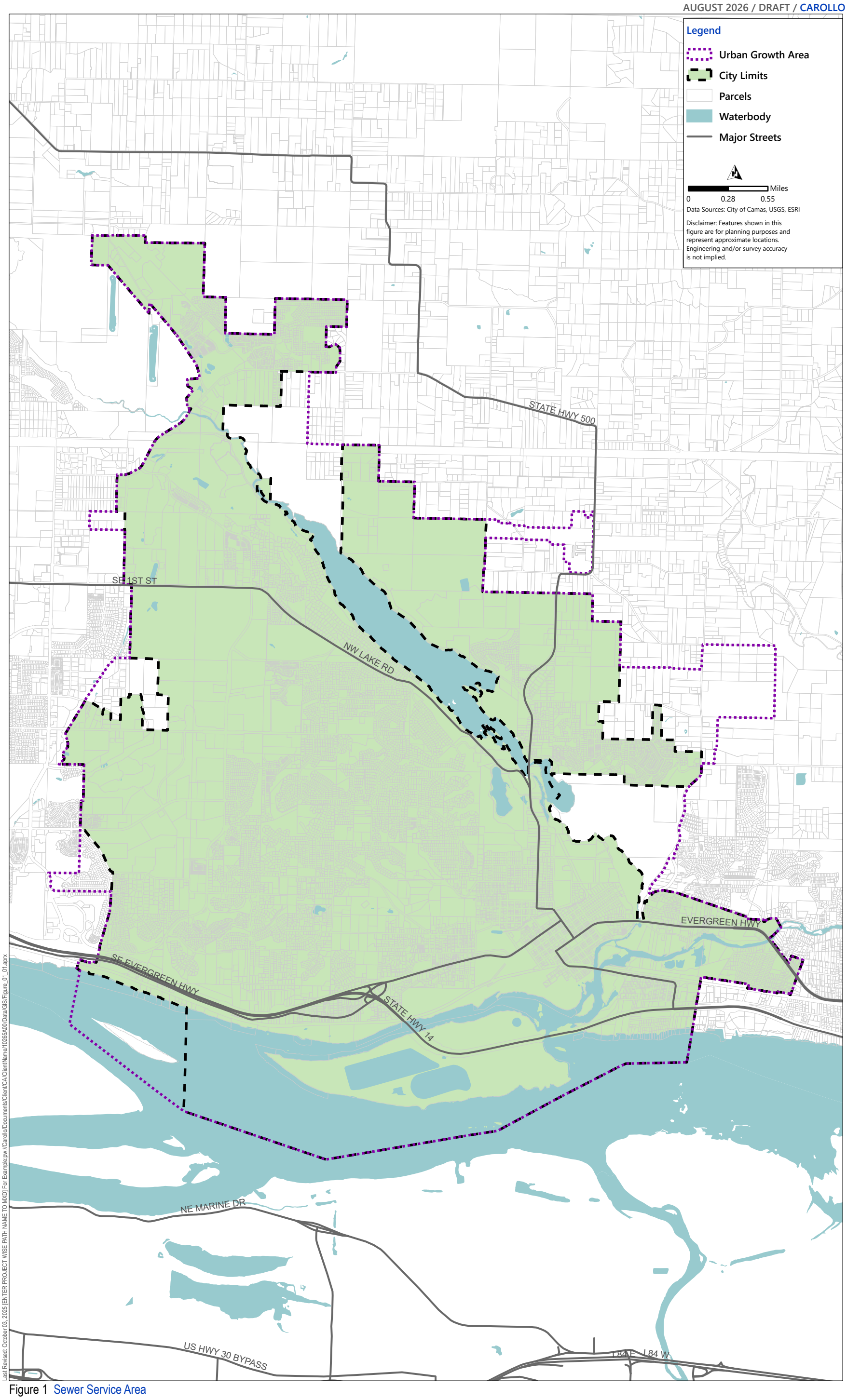


Figure 1 Sewer Service Area

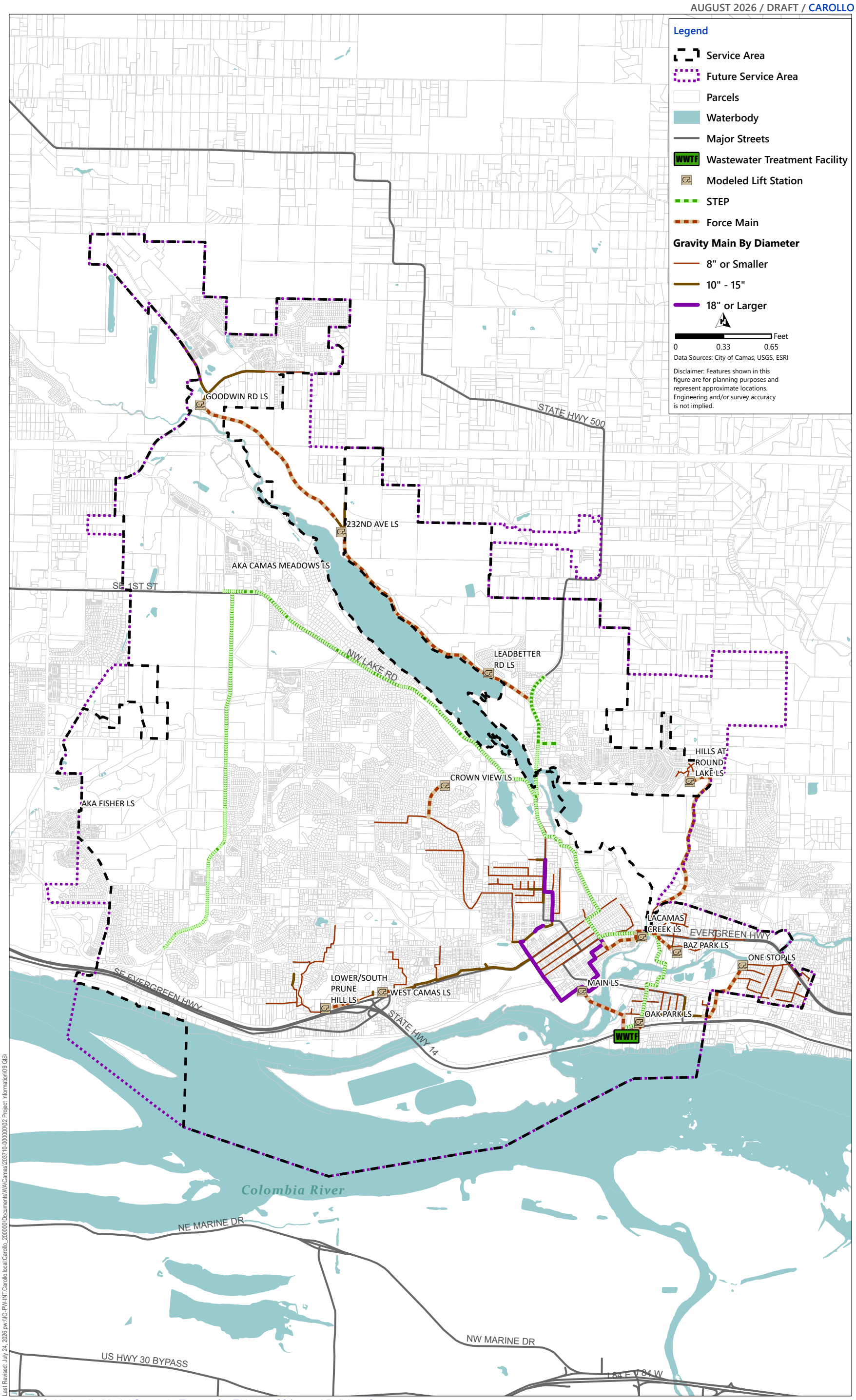


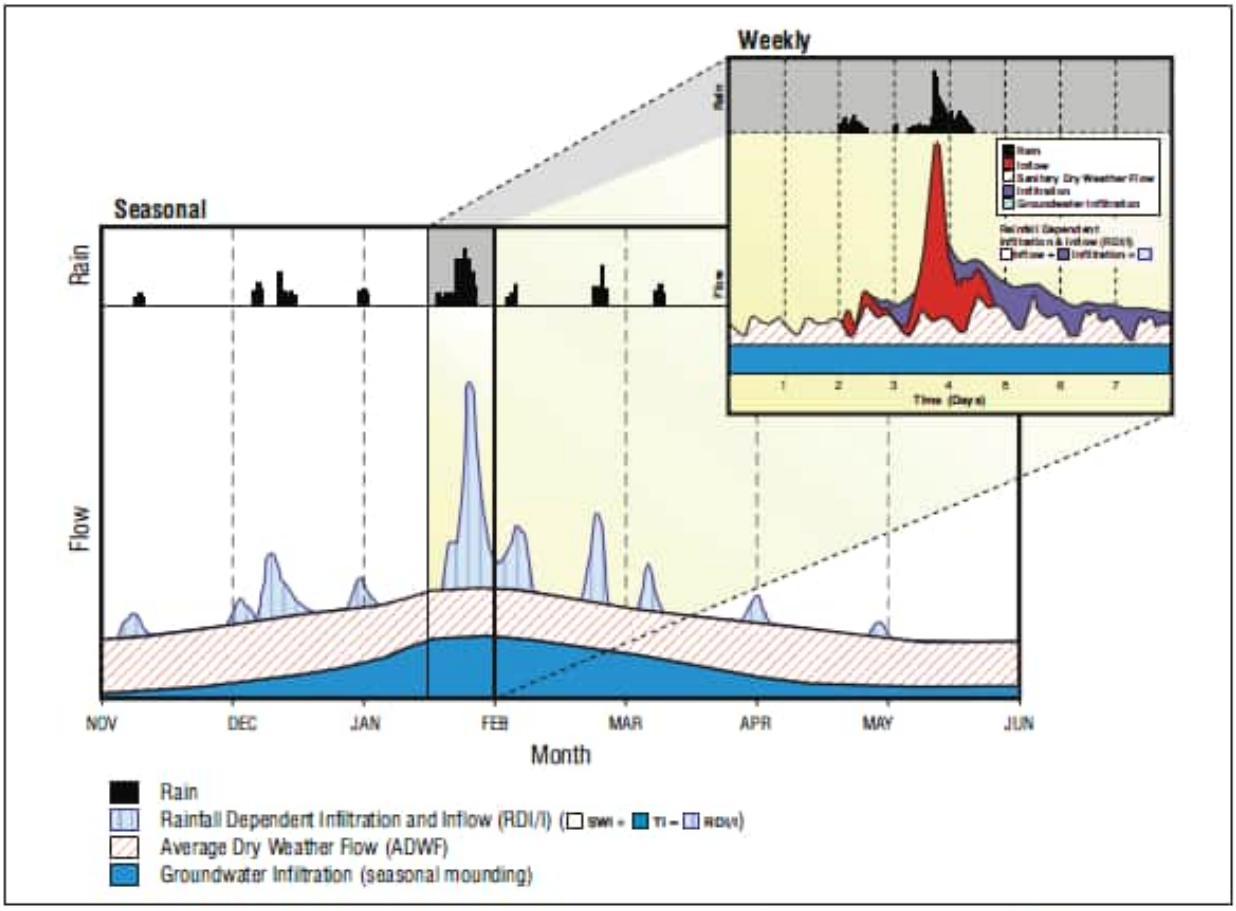
Figure 2 Hydraulic Model Scenario Extents for Existing, 2045, and Buildout Systems

SECTION 3 SEWER COLLECTION FLOWS

Sewer collection systems are intended to convey sanitary flows but frequently have additional flows from other sources. The different flow components are described in the section below and illustrated in Figure 3.

3.1 Dry Weather Flow Components

Average dry weather flow (ADWF) is the flow that is entering the collection system on a daily basis. There are two primary components of ADWF, base wastewater flow and dry weather groundwater infiltration (GWI). ADWF was estimated from an average of dry weather flow (DWF) data at each flow meter from January 15, 2025, to April 30, 2025. Section 4 describes the flow monitoring efforts performed by ADS, which went into determining the ADWF. The ADWF serves as the baseline flow in the hydraulic model.



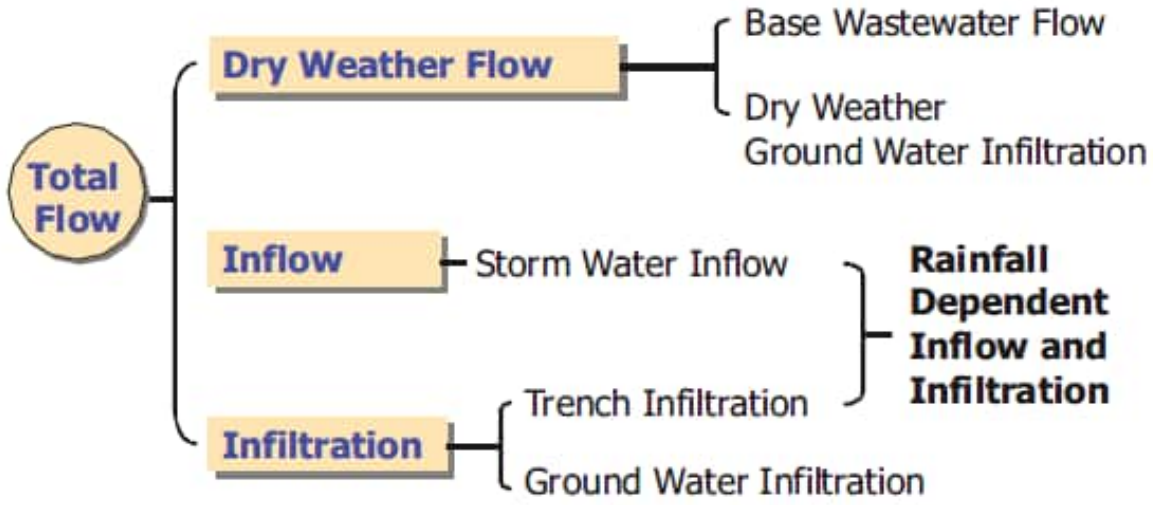


Figure 3 Typical Wastewater Flow Components

Note: This figure is not based on flow data specific to the City.

3.1.1 Base Wastewater Flow

The base wastewater flow (BWF) is the sanitary flow generated by routine water usage of the City's residential, commercial, and industrial customers. Conveying this flow is the primary function of the

collection system. The flow has a diurnal pattern that varies by individual customer's water use patterns. Typically, a residential diurnal pattern has two peaks with the more pronounced peak following the wake-up hours of the day, and a less pronounced peak occurring in the evening. Commercial and industrial patterns, though they vary depending on the type of use, typically have more consistent, higher flow patterns during business hours, and lower flows at night. Furthermore, the diurnal flow pattern of a weekend may vary from the diurnal flow experienced during a weekday. Diurnal (24-hour) patterns for both weekdays and weekends are applied to ADWF and cumulatively make up the flows experienced in the wastewater collection system. The diurnal patterns utilized for the City's collection system basins are developed in Section 4.2.1.

3.1.2 Dry Weather Groundwater Infiltration

Dry weather GWI will enter the sewer system when the relative depth of the groundwater table is higher than the depth of the pipeline and the sanitary sewer pipe allow infiltration through defects such as cracks, misaligned joints, and broken pipelines. Dry weather GWI (or base infiltration) cannot easily be separated from BWF by flow measurement techniques. Therefore, dry weather GWI is typically grouped with BWF.

3.2 Wet Weather Flow

Wet weather flow (WWF) includes two components:

1. Rainfall derived inflow and infiltration (RDII): The stormwater RDII response in the sewer system to rainfall is seen immediately (inflow) or within hours after the storm (infiltration).
2. GWI: Wet weather GWI is not specific to a single rainfall event, but rather to the effects on the sewer system over the entire wet weather season. The depth of the groundwater table rising above the pipe invert elevation causes GWI. Sewer pipes within close proximity to a body of water can be greatly influenced by groundwater effects.

3.2.1 Inflow and Infiltration

Inflow and infiltration are rainfall derived flows in the collection system from specific storm events. Inflow is stormwater that enters the sewer system via a direct connection to the system, such as roof drain and downspout connections, leaky manhole covers, and inappropriate storm drain connections. Infiltration is stormwater that enters the sewer system by percolating through the soil and enters through foundation drains, defects in pipelines, manholes, and joints. Some of the most common sources of RDII are shown in Figure 4. The adverse effect of RDII entering the sewer system is that it increases both the flow volume and peak flows such that the sewer system could be operating at or above its capacity, as illustrated in Figure 5. If too much RDII enter the sewer system, sanitary sewer overflows could occur.

3.2.2 Groundwater Infiltration

GWI, one of the components of RDII, is associated with extraneous water entering the sewer system through defects in pipes and manholes while the ground is saturated during the wet weather season. GWI is related to the condition of the sewer pipes, manholes, and groundwater levels. GWI may occur throughout the year, although rates are typically higher in the late winter and early spring in the Pacific Northwest.

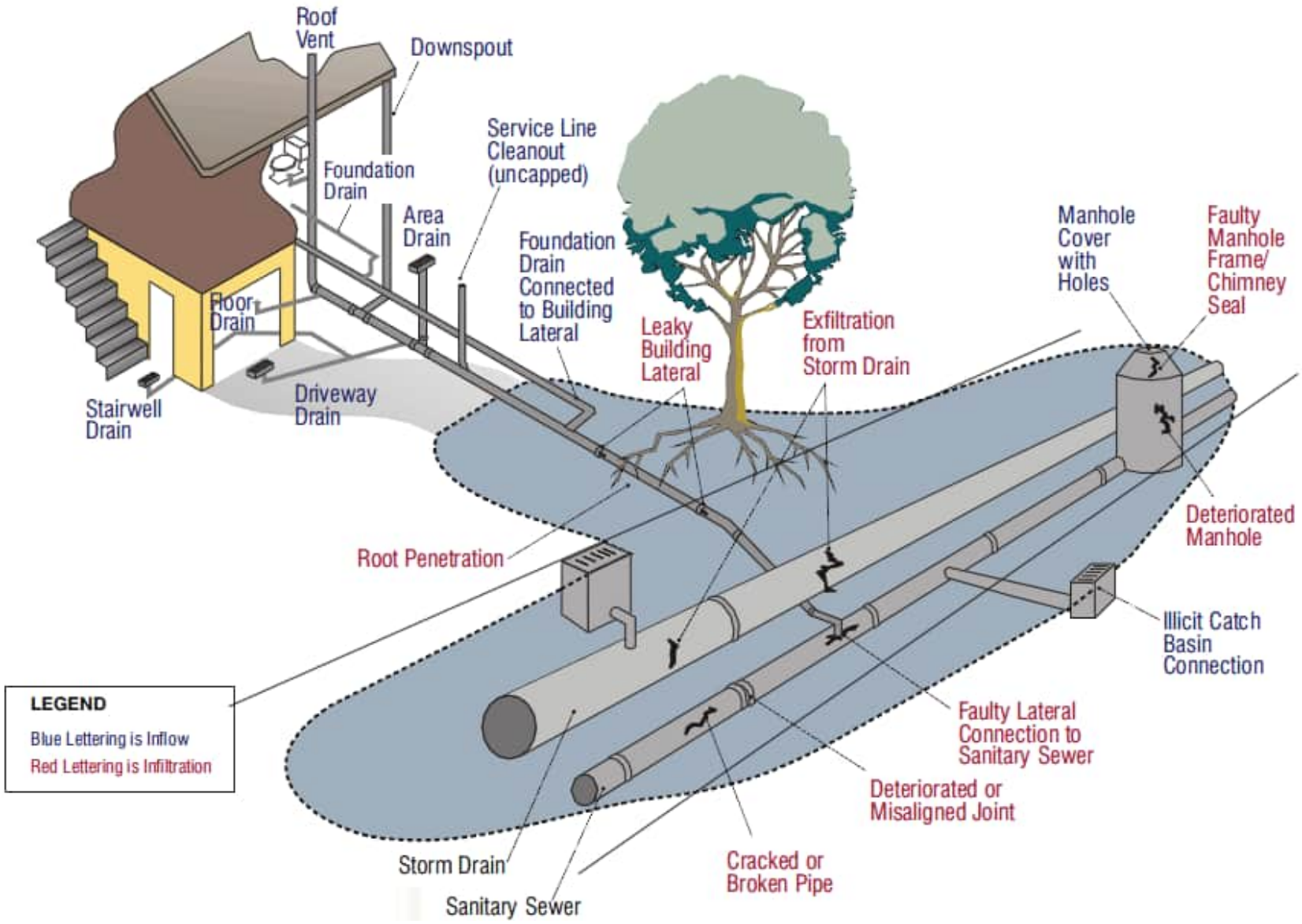


Figure 4 Typical Sources of Inflow and Infiltration

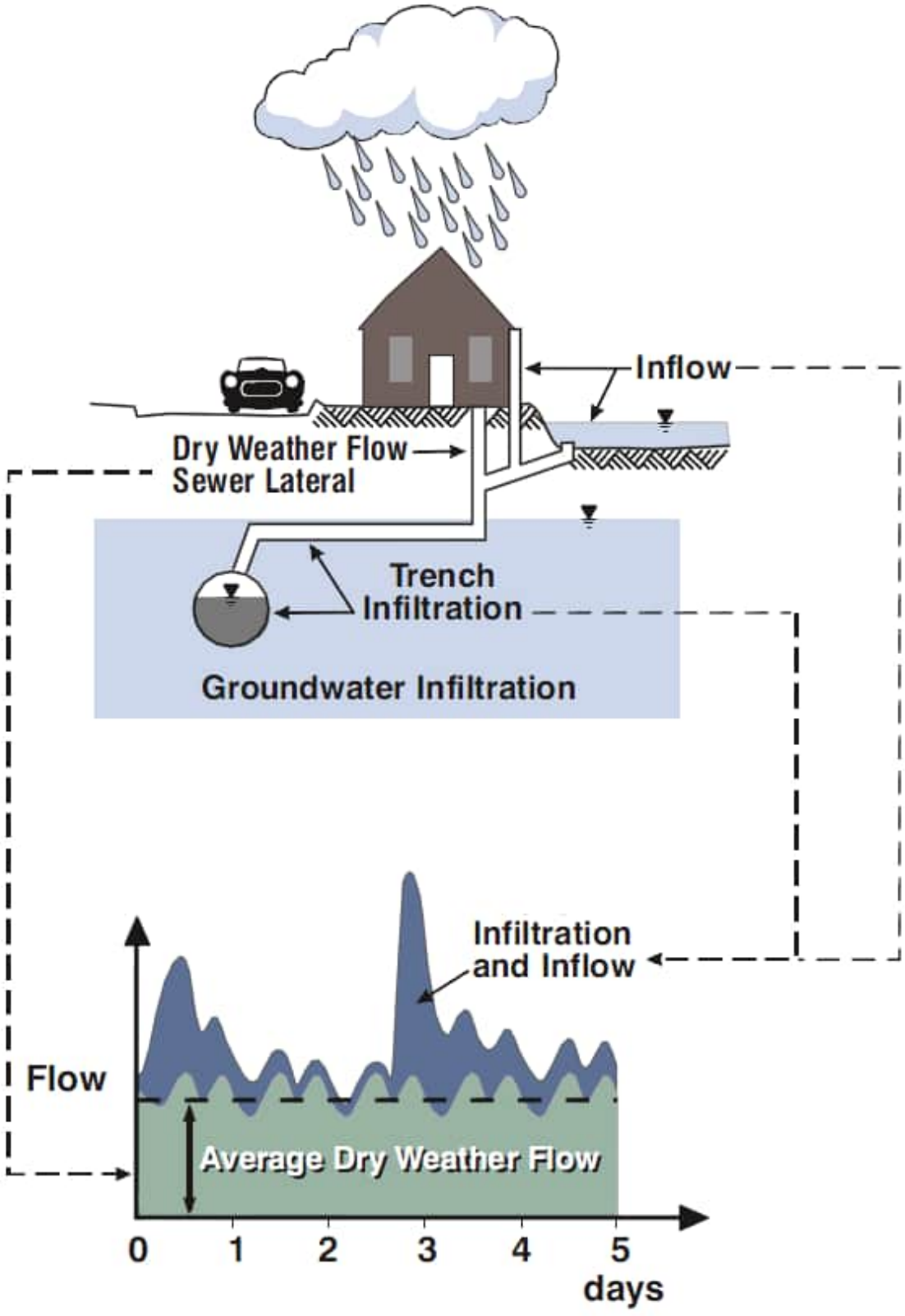


Figure 5 Typical Effects of Inflow and Infiltration

SECTION 4 FLOW MONITORING PROGRAM

As part of the Scope of Services for this GSP Update, Carollo Engineers (Carollo) contracted with ADS to conduct a temporary flow monitoring program within the City's sanitary sewer collection system. The purposes of the flow monitoring program were to correlate actual collection system flows to the hydraulic model predicted flows, evaluate the system's capacity, and estimate basin inflow and infiltration. The temporary flow monitoring data was collected for a period of approximately 105 days from January 15, 2025 to April 30, 2025. The *Camas Flow Monitoring Report 2025* prepared by ADS summarizes the flow monitoring program and was submitted to the City as a stand-alone report. A copy of the report is included in Attachment A.

4.1 Program Description

4.1.1 Flow Monitoring Sites and Tributary Areas

Four sewer basins were monitored during the flow monitoring period. The meter sites were selected to best isolate and model the critical areas and subareas within the sewer system. In addition to these meter basins, three other sewer basins were evaluated using the City's supervisory control and data acquisition (SCADA) data. One of these basins represents the City's STEP system, because this area was not directly monitored by ADS nor the City, flow from the STEP system was estimated using a mass-balance approach based on influent data from the wastewater treatment facility (WWTF). Two additional basins in the North Shore area located upstream in Basin 4-1-3 were also analyzed. These include the basin upstream of the Goodwin Road Lift Station (LS) and the Leadbetter Road LS basin which is located downstream of the Goodwin Road LS but still upstream of Basin 4-1-3.

These seven flow monitoring locations, as well as the area tributary to each site, are shown on Figure 6. Table 2 lists the flow monitoring locations and the diameters for the sewers where the meters were installed. Figure 7 provides a schematic illustrating the flow monitoring locations to help understand how the basins connect. Meter data quality was reviewed at all sites and deemed acceptable to use for model calibration. The quality of meter data and other trends in the flow can be determined from scattergraphs. Which plot the depth versus velocity as compared to the manning's curve for the pipe segment. Scattergraphs for each metered site can be found in the ADS Flow Monitoring Report, Attachment A.

Table 2 Flow Monitoring Locations

Basin ID	ADS Meter ID	Upstream Pipe ID	Upstream Basin Type	Upstream Pipe Slope (%)	Upstream Pipe Diameter (inch)
8-1-2	CAM_81189	SEWER-GMAIN-100313	Gravity	0.18	12
4-1-3	CAM_100290	SEWER-GMAIN-100740	Gravity	0.38	12
5-2-1	CAM_52167	SEWER-GMAIN-101019	Gravity	2.74	18
5-1-2	CAM_51123	SEWER-GMAIN-100236	Gravity	0.23	21
Goodwin Road(1)	-	SEWER-GMAIN-102279	Gravity	2.0	18
Leadbetter Road(1)	-	SEWER-FMAIN-100127	Gravity	0.29	18
STEP(2)	-	N/A	STEP	-	-
WWTF(3)		N/A	Gravity/STEP	-	-

Notes:
(1) Flow information was based on historical wet well flows provided by the City from February 1, 2025 to April 30, 2025.
(2) No upstream pipe ID information was available for the STEP basin. Flow for this area was therefore estimated using GIS-derived upstream drainage data and a mass balance approach using influent flow meter data at the WWTF.
(3) Flow meter information was provided from the City's SCADA system.

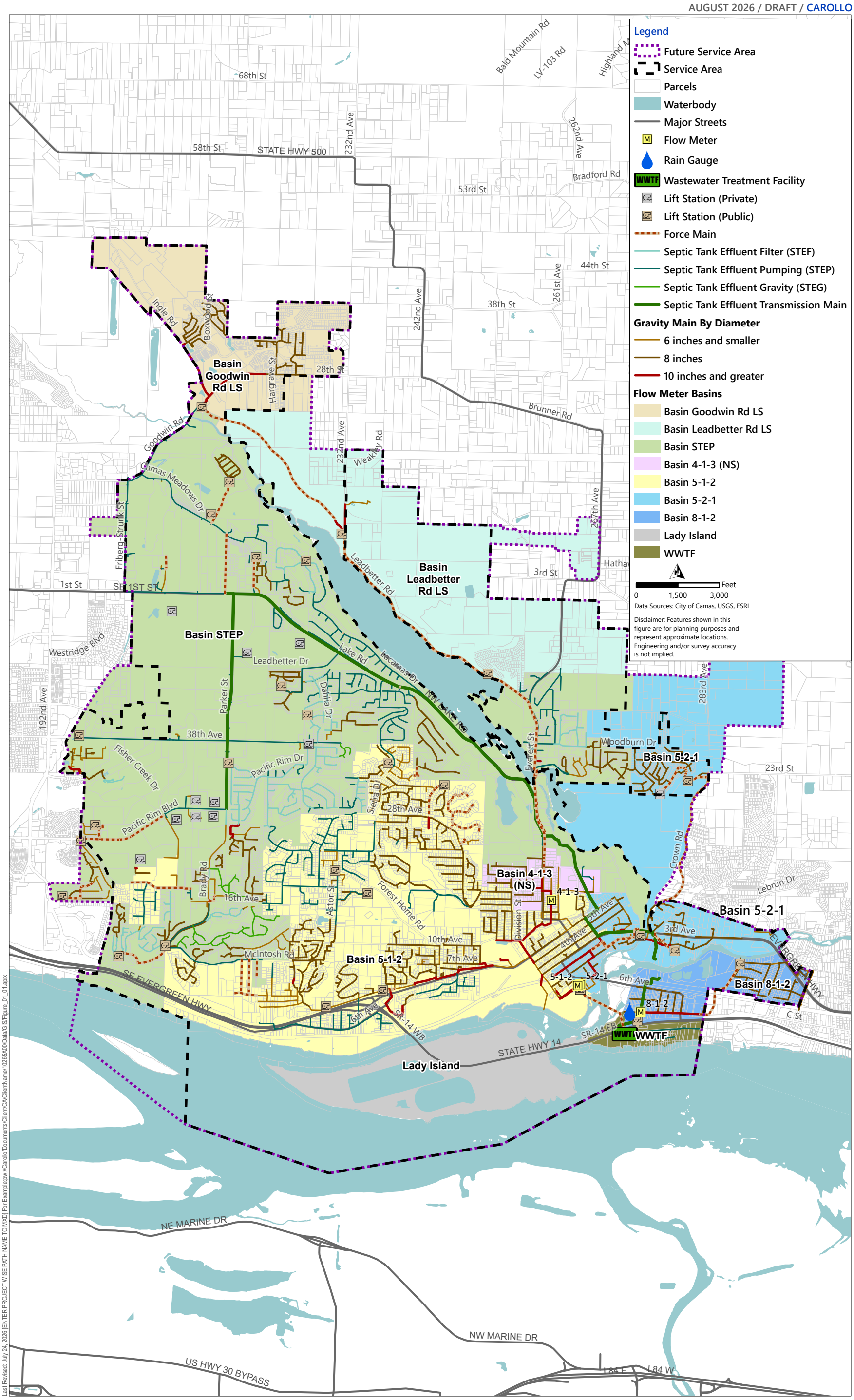


Figure 6 Flow Monitoring Locations

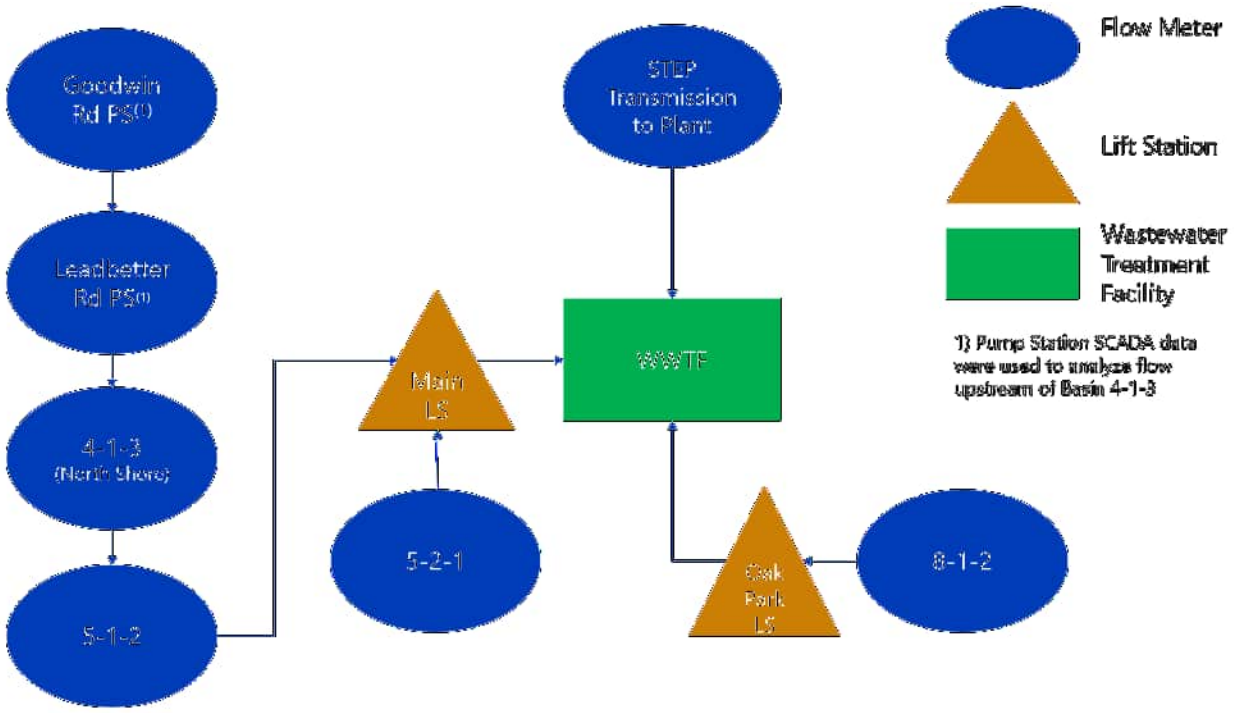


Figure 7 Flow Monitoring Schematic

4.1.2 Flow Meter Installation and Flow Calculation

The flow monitoring equipment used ADS Triton+ monitor. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow. The monitor includes data acquisition sensors and a battery-powered microcomputer with a processor, data storage, and an internal clock to synchronize readings. It was programmed to record flow depth and velocity every 5 minutes.

The Triton+ monitor also provides cross-checking between multiple sensor technologies to improve reliability and can support up to two sets of sensors.

For this project, the Peak Combo Sensor was installed at the bottom of the pipe. This sensor measures flow using three technologies:

- Ultrasonic depth which is measured by using sound waves,
- Pressure depth is determined from hydrostatic pressure, and
- Peak velocity is calculated from reflected ultrasonic signals using digital spectrum analysis.

ADS conducted an analysis of the data retrieved from each flow meter and made adjustments as needed for calibration based on the field measurements. The flow at each meter was then calculated at 15-minute intervals based on the continuity equation:

$$Q = V \times A$$

Where:

- Q = Pipeline flow rate, cubic feet per second.
- V = Average velocity, feet per second.
- A = Cross sectional flow area, square feet.

4.1.3 Rain Gauges

One rain gauge was installed by ADS to record rainfall that occurred throughout the flow monitoring program. The location of the rain gauge is shown in Figure 6.

4.2 Flow Monitoring Results

The flow monitoring program data were evaluated by components including DWF, rainfall, and WWF. Data collected from flow meter Basin 8-1-2 is presented throughout this report as an example of the type of data and the results from the flow monitoring program.

4.2.1 Dry Weather Flow Data

Base flow can be estimated for a wastewater collection system by comparing DWF and WWF at the flow monitoring locations. To estimate ADWF for more specific areas, such as individual wastewater basins, DWFs are typically estimated based on the area contributing to flows and flow coefficients developed for each land use type. This method is based on the assumption that areas with similar land uses, such as low-density residential parcels, produce equivalent quantities of wastewater flow on a per area basis. System-wide flows can be compared to known flows at flow monitors, or at the treatment plant to verify accuracy. This method of estimating base flows is an industry standard for planning and provides sufficiently accurate data for planning purposes. Table 3 shows the ADWF development summary for each flow meters.

Existing ADWFs for each basin were estimated using data from the Flow Monitoring Program for each of the flow monitoring basins. ADWF was developed using the driest days from the flow monitoring period based on the following set of minimum criteria:

- Less than 0.1 inches of rain in the previous day.
- Less than 0.4 inches of rain in the previous three days.
- Less than 1.0 inch of rain in the previous five days.
- In addition, those dry days that exhibited unusual flow patterns were not used to generate net dry day flow values for a basin.

Characteristic dry weather 24-hour diurnal flow patterns for each site were developed from hourly data. The hourly flow data were also used to calibrate the hydraulic model for the observed DWFs during the flow monitoring period. Hourly patterns for weekday and weekend flows vary and were separated to

better define DWF. An example of the DWF patterns from Flow Meter Basin 8-1-2, are shown in Figure 8. Additional patterns for all DWF development for all flow monitoring basins can be found in Attachment B.



Figure 8 Typical Weekday vs Weekend Dry Weather Flows (Meter 5-1-2)

Carollo used the average weekday and weekend dry weather levels and velocities at each site from the data provided by ADS for use in the model calibration process.

Table 3 ADWF Development Summary

Meter ID	Weekday ADWF (mgd)	Weekend ADWF (mgd)	Weekday/Weekend Ratio	Gross ADWF (mgd)	Net ADWF (mgd)
Meter 8-1-2	0.12	0.11	1.09	0.12	0.12
Meter 4-1-3	0.24	0.24	1.00	0.24	0.11
Meter 5-2-1	0.20	0.21	0.95	0.20	0.20
Meter 5-1-2	0.86	0.84	1.02	0.85	0.61
Leadbetter Road	0.13	0.14	0.91	0.13	0.04
Goodwin Road	0.09	0.10	0.93	0.09	0.09
STEP(1)	-	-	1.00	1.63	1.63
WWTF	2.81	2.79	1.00	2.80	1.63

Notes:
(1) STEP flow was derived using the City's SCADA Data by subtracting the upstream metered flows from the total WWTF's influent flow.
mgd - million gallons per day.

4.2.2 Rainfall Data

An important part of the flow monitoring program is the collection and analysis of rainfall data. Three significant rainfall events occurred during the course of the flow monitoring period, as well as a few other relatively minor events. The storms recorded during the Temporary Flow Monitoring Program caused an RDII response in the collection system and were appropriate for RDII analysis and model calibration purposes. The rainfall data recorded over the course of the flow monitoring program is illustrated in Figure 9. Figure 10 illustrates the total accumulation of rainfall over the course of the flow monitoring period for the ADS tipping bucket type rain gauge. Table 4 summarizes a range of events that occurred during the course of the flow monitoring period available and recorded at the ADS rain gauge for calibration.

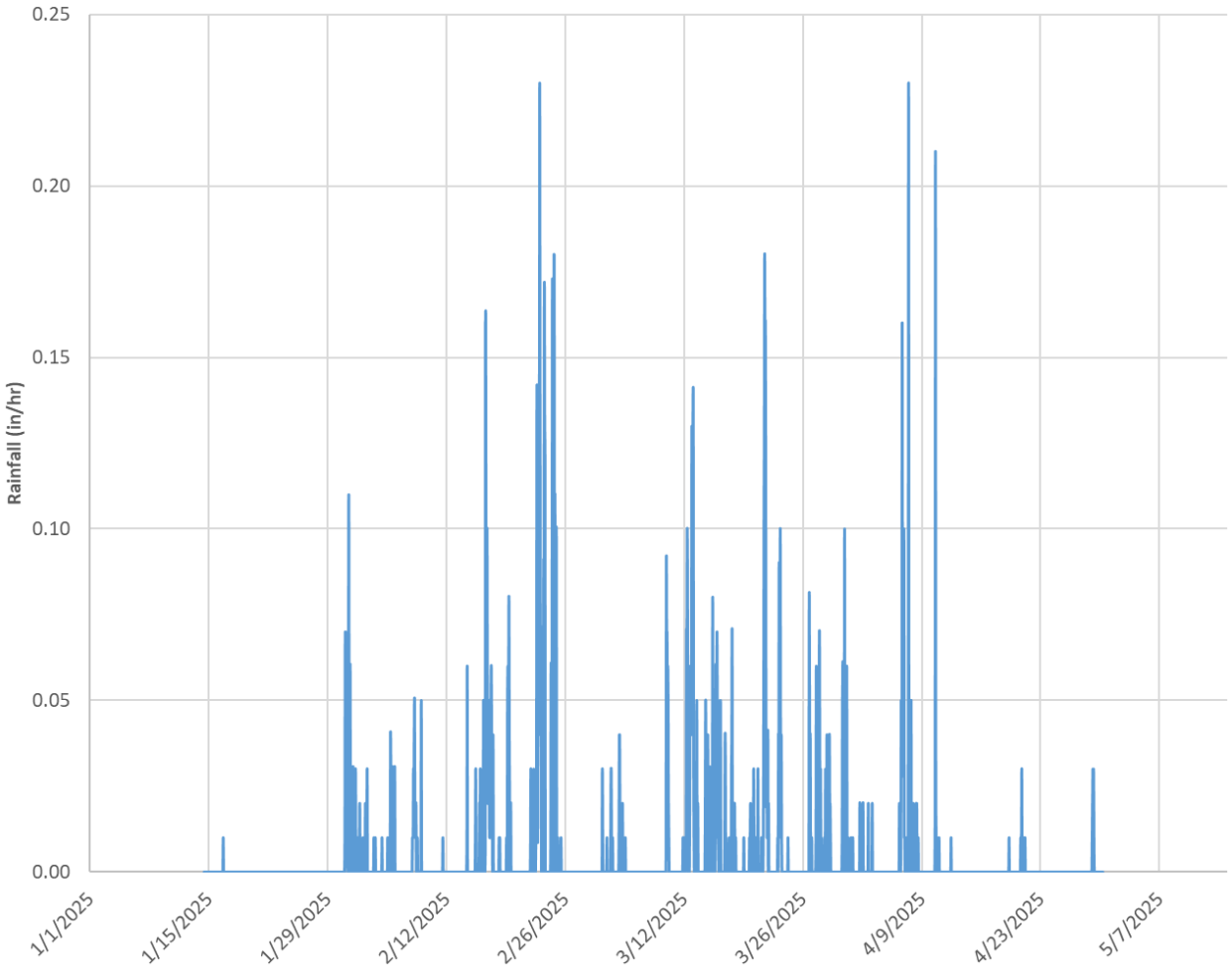


Figure 9 Rainfall Intensity

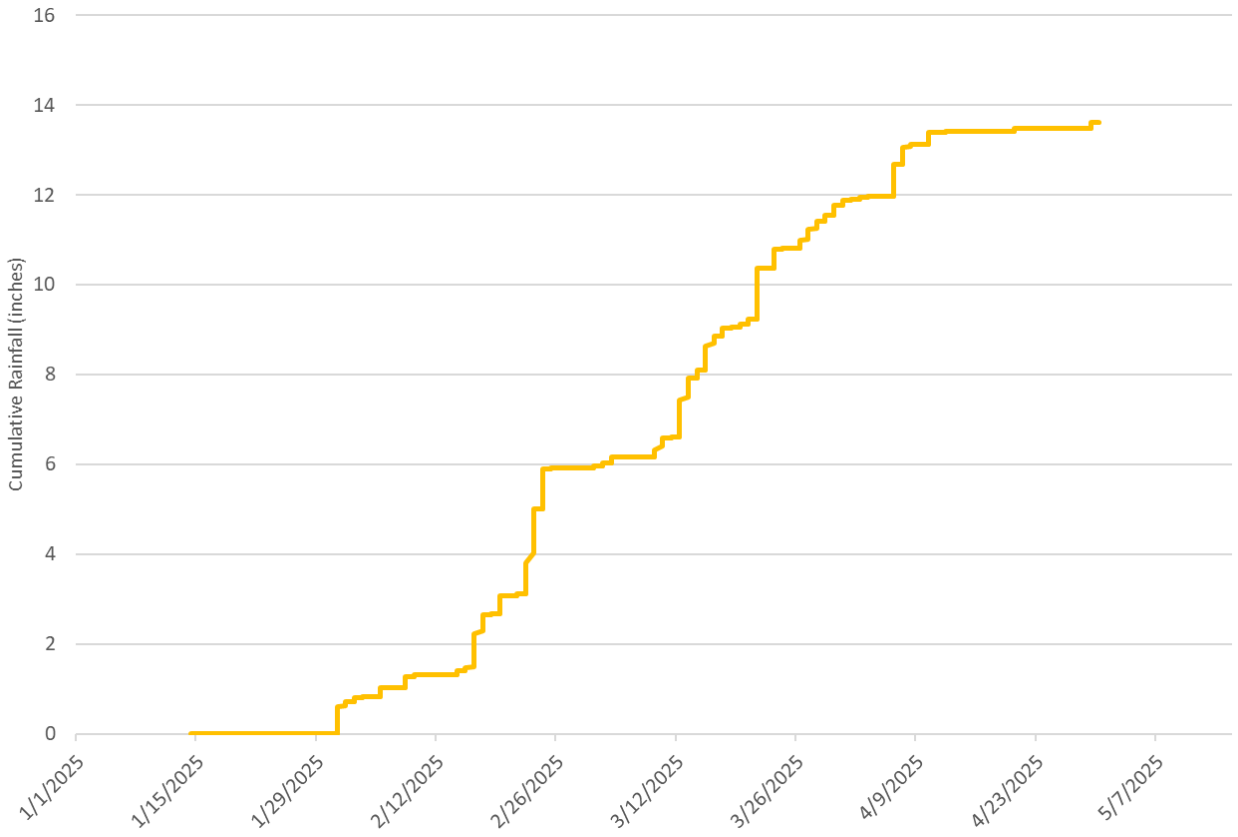


Figure 10 Cumulative Rainfall

Table 4 Identified Storm Events

Storm Event	Start Date	End Date	Total Event Rainfall (inch)	Total 24-hour Volume (inch)	Maximum Peak Intensity (inch/hour)
1	1/31/2025	2/5/2025	0.82	0.63	0.11
2	2/14/2025	2/19/2025	1.34	1.04	0.16
3	2/21/2025	2/25/2025	2.82	1.82	0.23
4	3/2/2025	3/5/2025	0.24	0.13	0.04
5	3/12/2025	3/19/2025	2.45	1.18	0.14
6	3/20/2025	4/1/2025	2.74	1.12	0.18
7	4/5/2025	4/9/2025	1.15	0.94	0.23

4.2.3 Wet Weather Flow Data

The flow monitoring data were also evaluated to determine how the collection system responds to wet weather events. As mentioned above, the flow monitoring program captured three main rainfall events. The rainfall event that occurred on February 23, 2025 was associated with the largest RDII response during the flow monitoring period and is the most appropriate to be used for RDII analysis.

Figure 11 shows an example of the wet weather response at Meter 5-1-2 during the February 23, 2025 rainfall event. This figure also illustrates the volume of RDII that entered the system from the collection system upstream of Meter 5-1-2. The blue line is the base sanitary flow while the yellow line shows the recorded rainfall during the storm event. As can be seen in the figure, the flow increased by 4 to 8 times ADWF due to RDII entering the system during wet weather events.

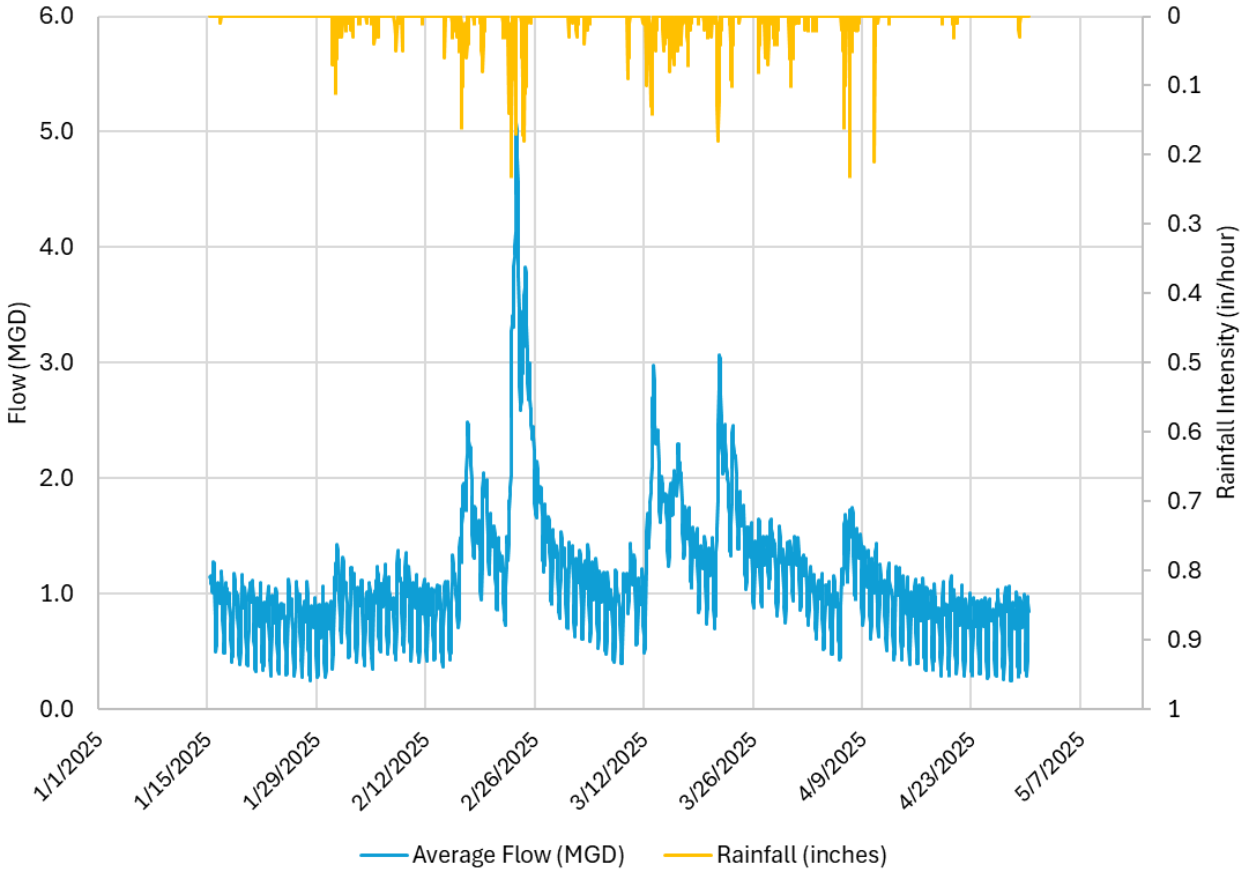


Figure 11 Example of Wet Weather Response (Meter 5-1-2)

SECTION 5 ZONING AND LAND USE DATA

Land use designations and regulations are important when evaluating existing sewer system capacity because they indicate the types and intensity of development that may occur in an area. These uses may include single family and multi-family residential development, as well as commercial and industrial development.

Land use is also an important factor in estimating wastewater flows. The type and intensity of development directly affect the volume of wastewater generated. The service area generally includes both sewered and unsewered areas. Sewered areas contribute flow to the collection system, while unsewered areas such as vacant, undeveloped parcels, or development such as parking facilities without a wastewater connections and do not currently contribute flow to the collection system. The following sections summarize the land use assumptions used for the existing sewer service area and the Study Area. For additional information on zoning and land use data, see Chapter 3 - Basis of Planning of the GSP.

SECTION 6 WASTEWATER FLOW FACTORS

The wastewater flow factors were developed using flow monitoring data, City's SCADA data, land use information, and basin-specific calibration of ADWF. For hydraulic model calibration, basin-specific flow factors were developed for each monitored basin. These basin specific factors were used during DWF calibration and subsequently combined into weighted average flow factors for use in projecting future wastewater flows.

The development of wastewater flow factors, allocation of flows to the collection system for hydraulic model development, and methodology used to project existing and future flows are described in Chapter 3 Section 3.4.3 of the GSP.

SECTION 7 HYDRAULIC MODEL OVERVIEW

A wastewater collection system model is a simplified representation of the real sewer system. Wastewater system models can assess the conveyance capacity of the collection system. The model can be used to size new infrastructure. In addition, sewer system models can perform "what if" scenarios to assess the impacts of future developments and land use changes. The City's collection system hydraulic model was updated and expanded using a multi-step process utilizing data from a variety of sources. This section summarizes the hydraulic model development process, including a description of the modeled collection system, the hydraulic model elements, and the model creation process.

7.1 Selected Hydraulic Modeling Software

The City's previous collection system hydraulic model was developed in MIKE URBAN, a hydraulic modeling software developed by DHI. Since DHI announced it would discontinue support for MIKE URBAN, the model was converted to MIKE+, which is now the current modeling platform. MIKE+ has a 1D engine which is a widely adopted tool for planning, analysis, and design related to stormwater runoff, combined sewers, sanitary sewers, and other drainage systems.

The latest version (2024) of MIKE+ was used for the hydraulic model update. More information about the modeling software can be found in the MIKE+ Collection System User Guide (0F[1]).

7.2 Modeled Collection System and Skeletonization

The City previously had two separate sewer models: a skeletonized model developed during the previous GSP and a model of the STEP system. Carollo combined these two models and extended the system to the North Shore area. Carollo also added gravity pipes larger than 6 inches in diameter, where information from GIS or as-builts was available. The added portions of the gravity collection system includes the downtown area, north of Lacamas Lake Park, Oak Park area, and the neighborhood surrounding

[1] Collection System User Guide, MIKE+ 2024.

Goot Park. As additional data become available and as the City's GIS database is developed, additional gravity system pipes can be added to the model.

Additionally, key sewers 8-inches in diameter and smaller are included in the City's hydraulic model where needed for connectivity, or where it was determined that the pipes in question were considered as primary collectors.

7.3 Elements of a Hydraulic Model

The following provides a brief overview of the various elements of the hydraulic model and the required input parameters associated with each:

- **Nodes:** Sewer manholes, cleanouts, and other locations where pipes begin, pipe sizes change or pipelines intersect are represented by junctions in the hydraulic model. Required inputs for junctions include rim elevation, invert elevation, diameter, and surcharge depth (used to represent pressurized systems). Two different node types are used in the model:
  - **Junctions:** Volume free nodes that function as simple hydraulic connection points between two or more links. Junction nodes are used where flow combines, splits, or transitions through the system and do not provide storage volume or significantly impact hydraulic routing.
  - **Manhole:** Nodes with assigned storage volume that represent physical sewer manholes in the collection system. Manhole nodes incorporate structure geometry into the hydraulic calculations and can influence flow routing, surcharge conditions, and system storage.
- **Pipes:** Gravity sewers and force mains are represented as pipes in the hydraulic model. Input parameters for pipes include length, friction factor (e.g., Manning's n for gravity mains, Hazen Williams C for force mains), invert elevations, diameter, shape, and whether or not the pipe is a force main.
- **Basin:** For collection system modeling, storage nodes typically are used to represent pump station wet wells (although other storage basins, etc., can be modeled as storage nodes). Input parameters for storage nodes include invert elevation, wet well depth, and wet well cross section or a depth-area relationship.
- **Pumps:** Pumps are included in the hydraulic model as links. Input parameters for pumps include pump curves and operational controls.
- **Outlets:** Outlets represent areas where flow can leave the system. For sewer system modeling, an outlet typically represents an overflow point or the connection to the WWTF.
- **Rain Gauges:** Rain gauges are locations where rainfall is input to the hydraulic model for simulation of WWF. The rain can be historical, projected, or theoretical hourly rainfall events.
- **Subcatchments:** Subcatchments represent areas of land whose topography and drainage characteristics direct flow to a single discharge point into the sewer system. Subcatchments can be used to define sanitary flows or to route a portion of the rainfall runoff into the system. Inflow conditions for the subcatchments are defined model inputs.
- **Inflows:** There are two primary flow sources that enter into the collection system, which are input through individual junctions (and storage nodes) in the model:
  - **Dry Weather:** Dry weather inflows simulate base sanitary wastewater flows and represent the average flow. The DWFs can be multiplied by up to four patterns that vary the flow by month, day,

hour, and day of the week (e.g., weekday or weekend). The dry weather diurnal patterns are adjusted during the dry weather calibration process to match the known typical daily flow fluctuations. Two diurnal patterns were developed for each basin, respectively representing weekday and weekend days (see Section 2.9.1).

» **RDII:** RDII are flows into the collection system originating from rainfall. Several models are available in MIKE URBAN to capture these effects. The models have a number of parameters that are adjusted during the wet weather calibration process (see Section 9.3.1) to model the flows into the collection during different storm events.

SECTION 8 HYDRAULIC MODEL EXPANSION AND REFINEMENT

8.1 Flow Monitoring Basins

To identify capacity requirements for specific facilities throughout the system, flows were developed for each flow monitoring basin. These basins are based on the local topography and trunk sewers that drain them. The basins have been defined within the current system boundaries and generally delineate large areas of the conveyance system network that ultimately flow to interceptors that convey the flow to the WWTF.

8.2 Primary Collectors

The City's hydraulic model was expanded and refined to match the latest GIS, which was provided by the City in January 2025. As part of the GSP update, Carollo identified the primary collectors to add to the hydraulic model for improved spatial capture of the City's area. Figure 12 illustrates the additional collection system areas that were added to the model. Approximately, 39.8 miles of pipes ranging from 6- to 36-inches were added to the hydraulic model, 9.8 miles of which were force mains. The model update also added six LSs:

- Goodwin Road LS.
- 232nd Avenue LS.
- Leadbetter Road LS.
- Hills at Round Lake LS.
- Oak Park LS.
- Baz Park LS.

This model updates total is 39.8 miles of the total collection system to the model. The City provided all the as-built drawings of their collection system, which includes the areas in North Shore and the seven LSs mentioned above. Adjustments to inverts and pipe diameter were made as needed. Some field verification was performed at flow meters 5-1-2 to ensure the geometry manhole drop downs was correct. Figure 14 shows the pipelines that were included in the hydraulic model.

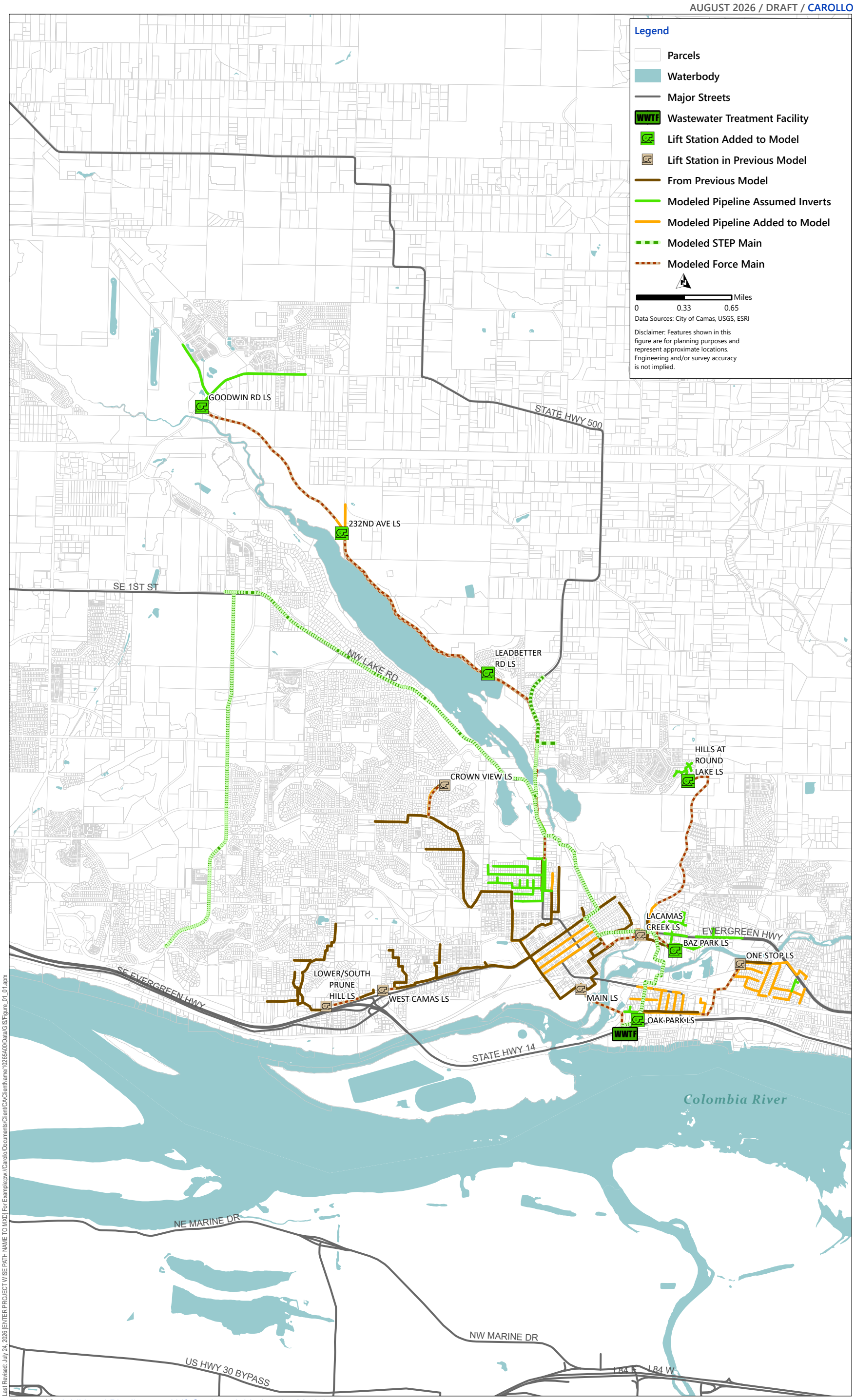


Figure 12 Additional Pipelines and Lift Stations Added to the Model

The modeled sewer system consists of approximately 8.4 miles of STEP pipelines ranging in diameter from 6-inches to 24-inches (or 13.7 percent of the total linear feet of pipes in the collection system) and approximately 21.6 miles gravity sewer pipelines ranging in 6-inches to 36-inches (or 28.1 percent of the total linear feet of pipes in the collection system). There are twelve pump stations in the hydraulic model, of which six were in the previous hydraulic model. The modeled pump station information is summarized Table 5. The pumps stations beyond the modeled system are implicitly included in the loading polygons where they are located. Neglecting the complete details of very small pump stations is common practice in skeletonized collection system models as their low flows are relatively small and steady. The force mains were not included in the model.

Table 6 summarizes the modeled sewer system by pipeline type, diameter, and length of pipe.

Table 5 Modeled Lift Stations

Name	No. of Pumps	Firm Capacity (gpm)	Total Capacity (gpm)	Pump 1 Start Level (feet)	Pump 2 Start Level (feet)	Pump 1 Stop Level (feet)	Pump 2 Stop Level (feet)
Crown View	2	222	444	520.0	516.0	521.0	516.0
Lacamas Creek	2	950	1,900	23.03	21.03	23.73	21.03
One Stop	2	231	462	19.97	16.97	20.97	16.97
South Prune Hills	2	600	1,200	134.53	130.53	135.53	130.53
West Camas	2	1,000	2,000	116.7	111.2	117.7	111.2
Goodwin Road(1)	2	340	680	179.08	177.08	179.58	177.08
232nd Avenue(1)	2	365	730	179.67	177.17	180.17	177.17
Leadbetter Road(1)	2	605	1,210	175.0	172.0	175.5	172.0
Main(2)	3	3,850	7,700	15.5	15.0	16.5	15.0
Hills at Round Lake	2	257	514	319.16	314.56	320.16	314.56
Oak Park	2	350	700	19.5	16.5	20	16.5
Baz Park	2	488	976	21.17	16.77	22.17	16.77

Notes:
(1) Lift Station designed with space for a third pump to be added in the future.
(2) Pump on/off level assumed.
gpm - gallons per minute.

Table 6 Modeled System Pipelines

Diameter (inches)	Gravity Modeled Pipe Length (feet)	STEP Modeled Pipe Length (feet)	Force Main Modeled Pipe Length (feet)	Total Pipe Lengths (feet)	Percent of Modeled System (%)
6	33	66	25,685	25,784	12.3%
8	80,974	3,254	17,752	101,979	48.6%
10	3,431	4,953	2,517	10,902	5.2%
12	17,201	343	3,375	20,919	10.0%
15	1,818	-	-	1,818	0.9%
18	5,913	-	2,348	8,261	3.9%
21	2,828	20,907	-	23,735	11.3%
24	1,238	15,008	-	16,246	7.7%
36	372	-	-	372	0.2%
Total	**113,809**	**44,531**	**51,677**	**210,016**	**100%**

8.3 Wastewater Flow Allocation

Defining the quantity of dry weather wastewater flows generated within a municipality and how the flows are distributed throughout the collection system is an important component of the hydraulic modeling process. Various techniques can be used to assign wastewater flows to individual model nodes, depending on the type of data that is available. Adequate estimates of the volume of sanitary wastewater flows are important in maintaining and sizing sewer system facilities, both for present and future conditions. Baseline wastewater flows were allocated (assigned to specific nodes) in the hydraulic model based on land use data provided by the City and wastewater flow coefficients developed previously in Section 6.

Sanitary sewer flows were developed based on analyses of the City's flow meter data described in Section 6. Measured ADWF for each meter basin was used to develop land use-specific flow factors (in gallons per acre per day [gpad]). The flow factors and land use data specific to each model basin were used to estimate an ADWF, as described below:

- **Step 1:** The City's seven basins were subdivided into 11,950 individual model subcatchments based on tax parcels excluding the right-of-way. Figure 13 shows the subcatchments developed to allocate flows within the hydraulic model. Each subcatchment represents the geographic area contributing flow to a single model node (i.e., trunk system manhole). Although the Camas wastewater model is a skeletonized model rather than an all-pipe model, tax parcels were still used as the basis for the model subcatchments to provide a more detailed distribution of loading throughout the system. In some cases, individual parcels were automatically split between adjacent loading polygons based on the model network layout and downstream assignment, resulting in portions of the same parcel contributing flow to different model nodes.
- **Step 2:** The ADWFs were calculated for each subcatchment using a GIS software program by multiplying the land use flow factors by the land use acreage.
- **Step 3:** The model used a base sewage flow of 2.10 mgd, with the remaining 0.75 mgd of the ADS-monitored flow assigned as groundwater infiltration and distributed among the basins based on pipe length. See Section 8.3.1 for additional details on the development and allocation of groundwater basin-specific infiltration.
- **Step 3:** The subcatchment DWF was allocated to the appropriate node in the sewer system model.
- **Step 4:** The allocated DWFs were adjusted along with the GWI as necessary during the DWF calibration process (see Section 9) to closely match the actual measured DWFs recorded during the flow monitoring period.

8.3.1 Systemwide Base Wastewater Flow and Groundwater Infiltration Allocation

During the 2025 winter flow monitoring period, ADS measured a systemwide ADWF of approximately 2.85 mgd. In comparison, the City's historical WWTF influent data indicated an average summer ADWF of 2.10 mgd. Because groundwater levels are typically higher during the winter, the 0.75 mgd difference was attributed to groundwater infiltration. Therefore, the model used 2.10 mgd as the base wastewater flow.

The estimated groundwater infiltration was allocated to each sewer basin based on its proportion of the system's total pipe length, assuming that basins with more pipes have greater potential for groundwater to enter through pipe defects, joints, and manholes. The infiltration assigned to each basin was then divided by the basin's contributing acreage to calculate a basin-specific infiltration rate in gpad. This rate was applied to the contributing area within each basin to distribute infiltration to the model loading locations. As a result, basins with a greater amount of sewer pipe relative to their contributing area received a higher infiltration rate.

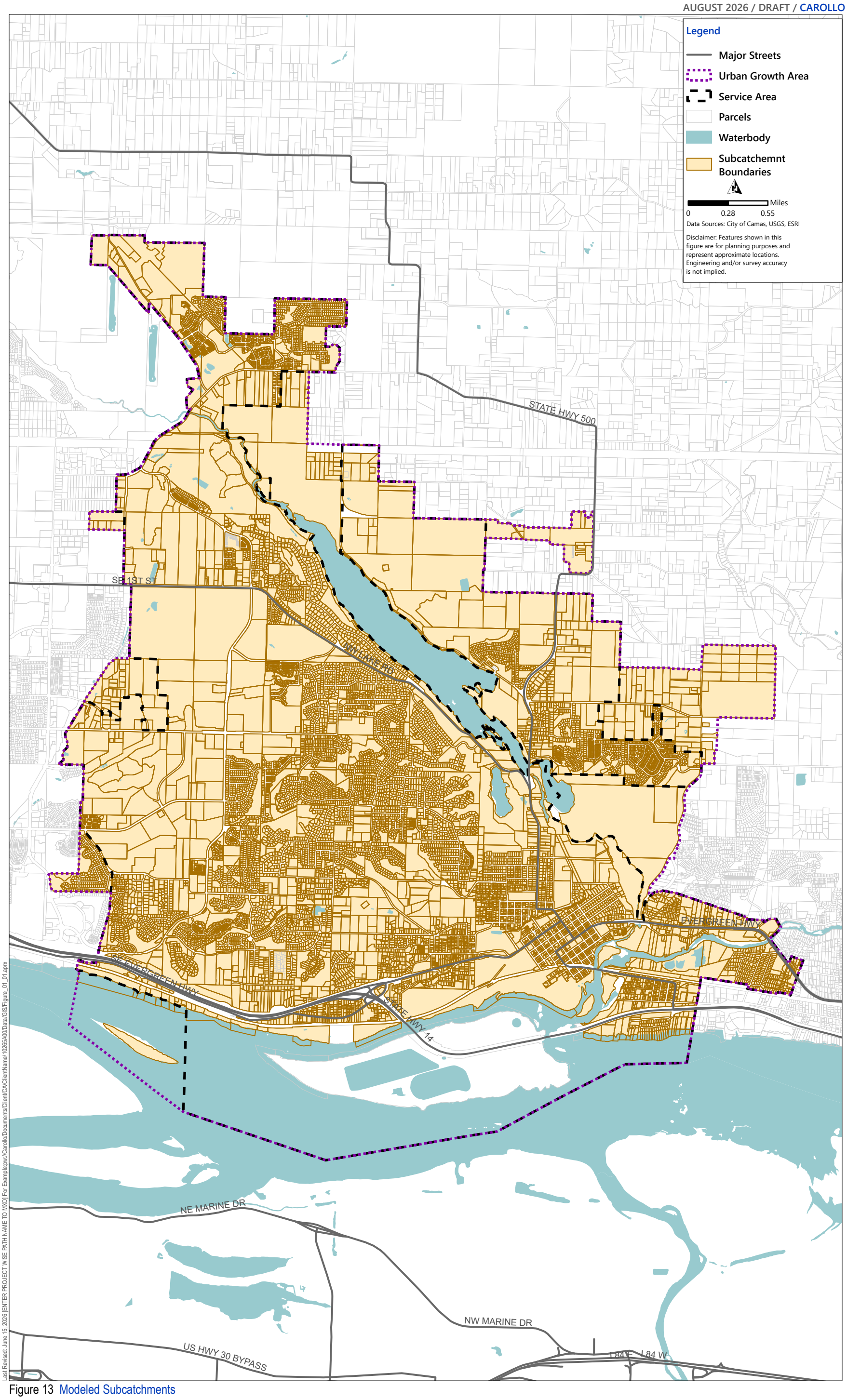


Figure 13 Modeled Subcatchments

8.4 Inflow and Infiltration: Time-Area A and RDI

MIKE+ has several modules to estimate the RDII in each basin. For this study, the Time-Area Model A (Inflow) and rainfall dependent infiltration (RDI) methods were chosen to model RDII, respectively. The Model A includes three primary factors including: time to concentration, a reduction factor representing flow losses, and an initial loss. The model also includes curves representing basin rain response. Basin rain response is essentially how fast flow from different parts of the catchment basin reaches the collection system.

The infiltration component of RDII flow comes from three sources, conceptually represented by different storage zones through the soil column. Figure 14 shows the conceptual RDI model, from DHI (2022). The three sources of flow that enter the collection system as RDI are Overland Flow that enters the system rapidly after a storm, Interflow with a medium response time, and Base Flow with a slower response, which is different than the sanitary Base Flow coming from wastewater customers. The volume of water stored in each zone, the response time, and how water moves between the zones are described by a series of related equations. The equations include 19 parameters that are not directly measurable and must be found through model calibration. An evapotranspiration term is included to simulate drying of the zones. Appendix D presents the resulting parameters after model calibration.

Two important RDII parameters are the areas of "connected pervious" and "connected impervious" land contributing flow to each basin's collection system. These areas represent the equivalent area of land accumulating rainfall to produce the WWF measured at the downstream flow meter. For example, if a flow meter measures a fast response to a storm event, there may be a lot of impervious land that is accumulating rainfall and contributing surface runoff to the collection system. Connected pervious land represents the equivalent amount of land absorbing rainfall and slowly contributing WWF to the collection system when the ground is saturated.

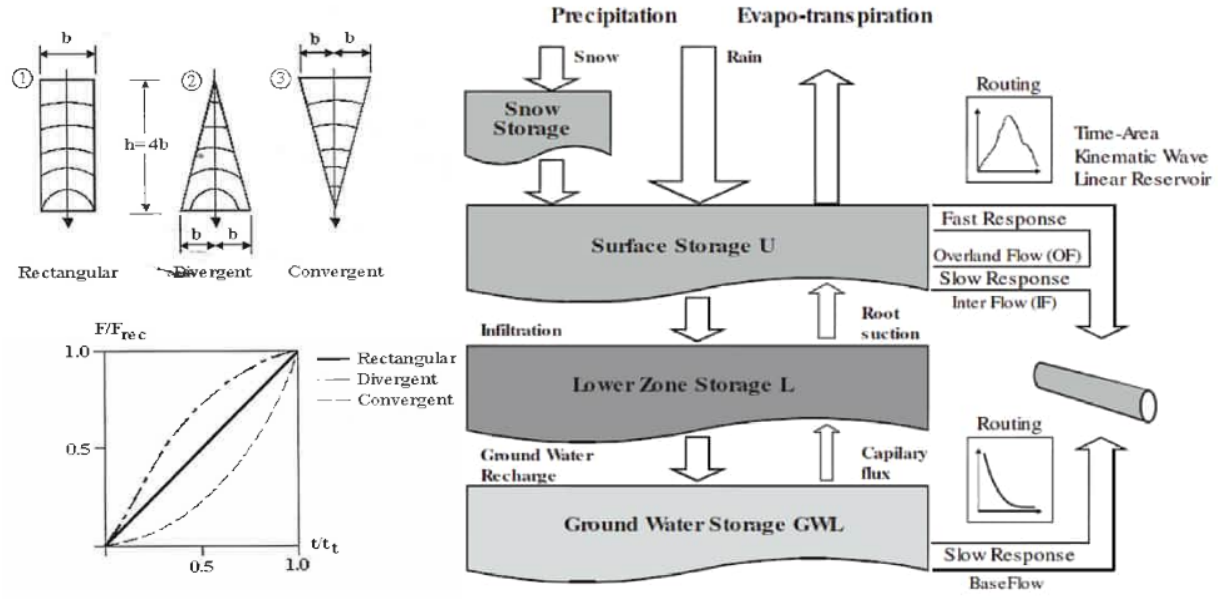


Figure 14 Model A and RDI

The RDI and Model A flow components combine to create a continuous hydrograph of RDII flow from each basin for each storm event. Often during wet periods, additional storms occur while tailing components of the preceding storm are still entering the system, creating complex hydrographs. The model is able to track subsurface groundwater storage through the wet season. Subsurface groundwater conditions are influenced by parameters affecting the interflow (horizontal leakage) and moisture interception by vegetation and root zone storage. Estimated evapotranspiration time series are also included in the model to further represent the physical processes that diminish the quantity of surface and sub-surface water.

8.5 Model Update Process

The City's hydraulic model combines information on the physical and operational characteristics of the wastewater collection system and performs calculations to solve a series of mathematical equations to simulate flows in pipes. The hydraulic model is a dynamic tool that can be changed and updated over time to represent the most recent data available to the City. The following steps outline the process used to update the hydraulic model:

- **Step 1:** The City's GIS shape files for the sewer collection system were obtained.
- **Step 2:** The GIS data were reviewed and deemed not accurate enough to rely on for model updates.
- **Step 3:** The collection system pipeline and facility data were updated based on available as-builts. Physical and operational data for the City's wastewater collection facilities were also updated and provided by the City.
  - Once all the relevant data was updated and input into the hydraulic model, the model was reviewed to verify that the model data was input correctly and that the flow direction and size of the modeled pipelines were logical. Additionally, the modeled pump stations were also checked to verify that they operated correctly.
- **Step 4:** Dry weather wastewater flows were then allocated to the appropriate model junctions. These flows were scaled up or down, as necessary, to match the ADWFs recorded during the flow monitoring period during the dry weather period.
- **Step 5:** The hydraulic model contains certain run parameters that need to be set by the user at the beginning of the project. These include run dates, time steps, reporting parameters, output units, and flow routing method. Once the run parameters were established, the model was debugged to ensure that it ran without errors or critical warnings.

SECTION 9 HYDRAULIC MODEL CALIBRATION

Hydraulic model calibration is a crucial component of the hydraulic modeling effort. Calibrating the model to match data collected during the flow monitoring program ensures the most accurate results possible. The calibration process consists of calibrating to both dry and wet weather conditions.

For this project, both dry and wet weather monitoring was conducted at the four metering sites presented and discussed in Section 4:

- DWF calibration ensures an accurate depiction of base wastewater flow generated within the study area, and diurnal fluctuations.
- WWF calibration consists of calibrating the hydraulic model to a specific storm event or events to accurately simulate the peak flow and volume of RDII into the sewer system. The amount of RDII is essentially the difference between the WWF and DWF components.

9.1 Calibration Standards

The hydraulic model was calibrated in accordance with international modeling recommendations. The Urban Drainage Group (UDG), formerly known as Wastewater Planning Users Group, a section of the Chartered Institution of Water and Environmental Management (CIWEM), has established generally agreed upon principles for model verification. The dry weather and wet weather calibration focused on meeting the recommendations on model verification contained in the "Code of Practice for the Hydraulic Modeling of Urban Drainage Systems," published by the CIWEM UDG[2], as summarized below.

9.1.1 Dry Weather Calibration Standards

Dry weather calibration should be carried out for two dry weather days, and the modeled flows and depths should be compared to the field-measured flows and depths. Both the modeled and field-measured flow hydrographs should closely follow each other in both shape and magnitude. In addition to the shape, the flow hydrographs should also meet the following criteria as a general guide:

- The timing of flow peaks and troughs should be within 1 hour.
- The peak flow rate should be within the range of ±10 percent.
- The volume of flow (or the average rate of flow) should be within the range of ±10 percent. If applicable, care should be taken to exclude periods of missing or inaccurate data.
- The unsurcharged depth should be within ±10 percent or ±4 inches, whichever is greater.

9.1.2 Wet Weather Calibration Standards

For each meter, three separate storms should be simulated with the model. For at least two storms out of the three events from the flow monitoring period, the model-simulated flows and depths should match the field-measured flows and depths within the accepted criteria. The modeled and field flow hydrographs for the calibration storms should closely follow each other in both shape and magnitude, until the flow has substantially returned to DWF rates.

In addition to the shape, the flow hydrographs should also meet the following criteria as a general guide:

- The timing of the peaks and troughs should be similar with regard to the duration of the events.
- The peak flow rates at significant peaks should be in the range of +25 percent to -15 percent and should be generally similar throughout.

[2] UDG, Code of Practice for the Hydraulic Modelling of Urban Drainage Systems, 1st Edition CIWEM 2017 www.ciwem.org.

- Modeled volume of flow should be within +20 percent to -10 percent of measured volume of flow.
- The depth of surcharge should be in the range of +20-inches to -4-inches.
- The difference between maximum unsurcharged depth should be within the range of ± 4-inches.

The Wet Weather calibration is focused more on the peak observed flows at the monitored location and generally overpredicted for the smaller storm events that generated a lesser peak and/or volume. In other words, if the flow monitoring program captured several back-to-back storms, it may be preferable to use the back-to-back storms events as the calibration storms, as opposed to calibrating to two separate storms that have occurred weeks or months apart. Model calibration simulations should be run for a duration long enough that the RDII response is no longer apparent in the measured data.

9.2 Dry Weather Flow Calibration

9.2.1 Dry Weather Calibration Process

The DWF calibration process consists of several elements, as outlined below:

- The first step in the calibration process was to divide the City into flow meter tributary areas. Seven tributary areas were created, one for each flow meter from the flow monitoring program, plus the treatment facility and the two pump stations in the North Shore area. A map showing the locations of each flow monitoring site and their associated tributary area is provided in Section 4 along with a schematic of the flow meters.
- The next step was to define the flow volumes within each area, which was accomplished in the flow allocation step.
- Create diurnal patterns to match the temporal distribution of flow. A diurnal curve is a pattern of hourly multipliers that are applied to the base flow to simulate the variation in flow that occurs throughout the day. Two diurnal curves were developed for each flow monitoring tributary area, one representing weekday flow and one representing weekend flow. The diurnal patterns were initially developed based on the flow monitoring data and adjusted as part of the calibration process until the model-simulated flows closely matched the field-measured flows. Figure 15 shows the calibrated weekday and weekend diurnal patterns for the area tributary to Meter 8-1-2. Similar diurnal curves were developed for each of the meters and its tributary area. These additional curves are available in Attachment E.

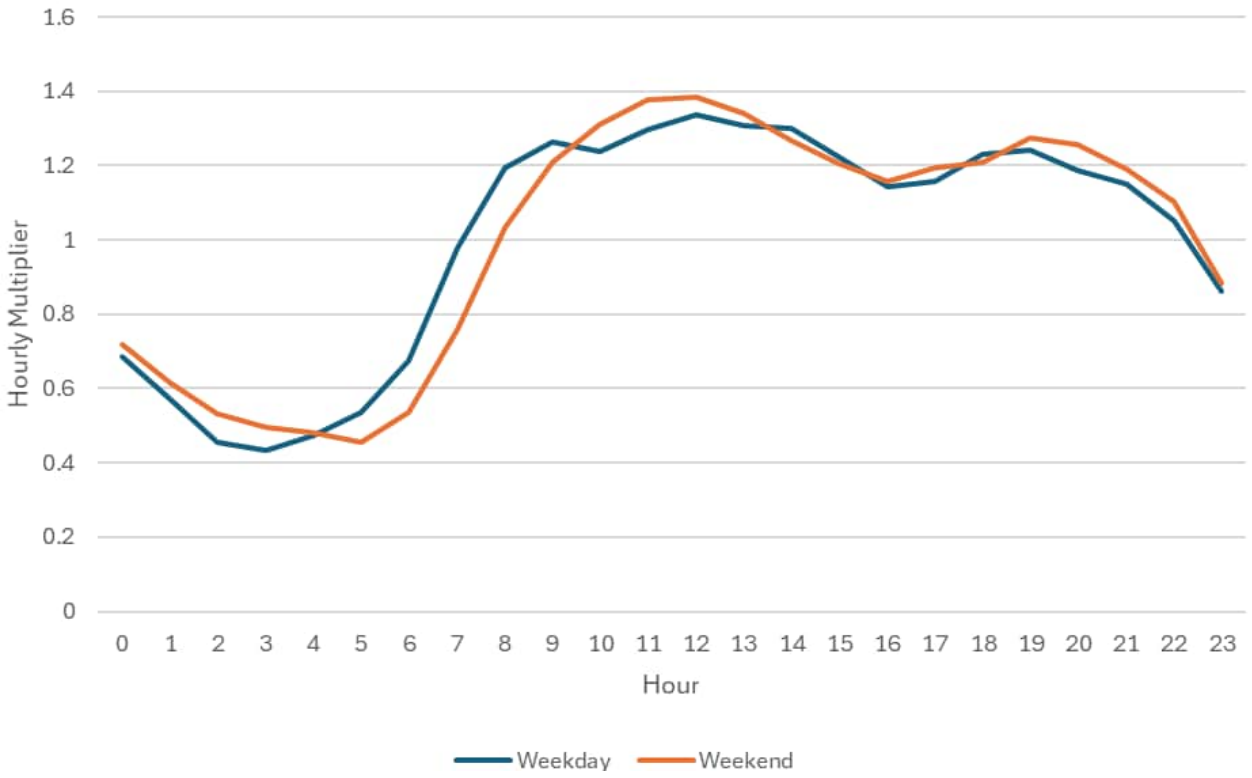


Figure 15 Example of Diurnal Pattern (Meter 8-1-2)

9.2.2 Dry Weather Calibration Discussion

Table 7 provides a summary of the DWF calibration using the average and daily peak flow results for both weekday and weekend conditions. As shown on Table 7, the model-simulated average and peak flows for both weekday and weekend DWF were all within 10 percent. In general, the percent difference between the overall modeled and measured DWF ranged between -2.2 and +7.7 percent, with most differences being less than 8 percent.

Attachment E contains a detailed DWF calibration summary sheet for each of the seven metering sites. Each calibration sheet provides plots that compare the model-simulated and field-measured flow data for both weekday and weekend conditions. An example of the dry weather calibration for Meter 8-1-2 is shown in Figure 16.

There is good overall correlation of the field-measured data to the model output results. All meters meet criteria for both level and velocity, indicating a well calibrated model for DWFs. Losses in the modeled manholes were minimized throughout the system to allow for minimal head loss and decrease in modeled levels to better match the measured data.

Table 7 DWF Calibration Results

Flow Meter ID	Weekday Average Flow Percent Error (%)	Weekday Peak Flow Percent Error (%)	Weekday Max Level Difference (inches)	Weekend Average Flow Percent Error (%)	Weekend Peak Flow Percent Error (%)	Weekday Max Level Difference (inches)	Percent Different (%)
Meter 4-1-3	-2.6%	0.7%	2.07	-1.1%	-0.4%	2.01	-2.2%
Meter 5-1-2	1.3%	-1.9%	1.35	0.9%	0.9%	1.32	1.2%
Meter 5-2-1	0.4%	-7.8%	0.21	-3.9%	3.0%	0.32	-0.9%
Meter 8-1-2	0.4%	-1.7%	0.37	4.1%	2.0%	0.30	1.4%
STEP/WWTF	2.2%	-0.4%		1.0%	-1.2%		1.8%
Leadbetter Road	10.0%	0.7%		-1.3%	-5.6%		6.5%
Goodwin Road	4.0%	2.8%		-3.3%	-4.2%		1.8%

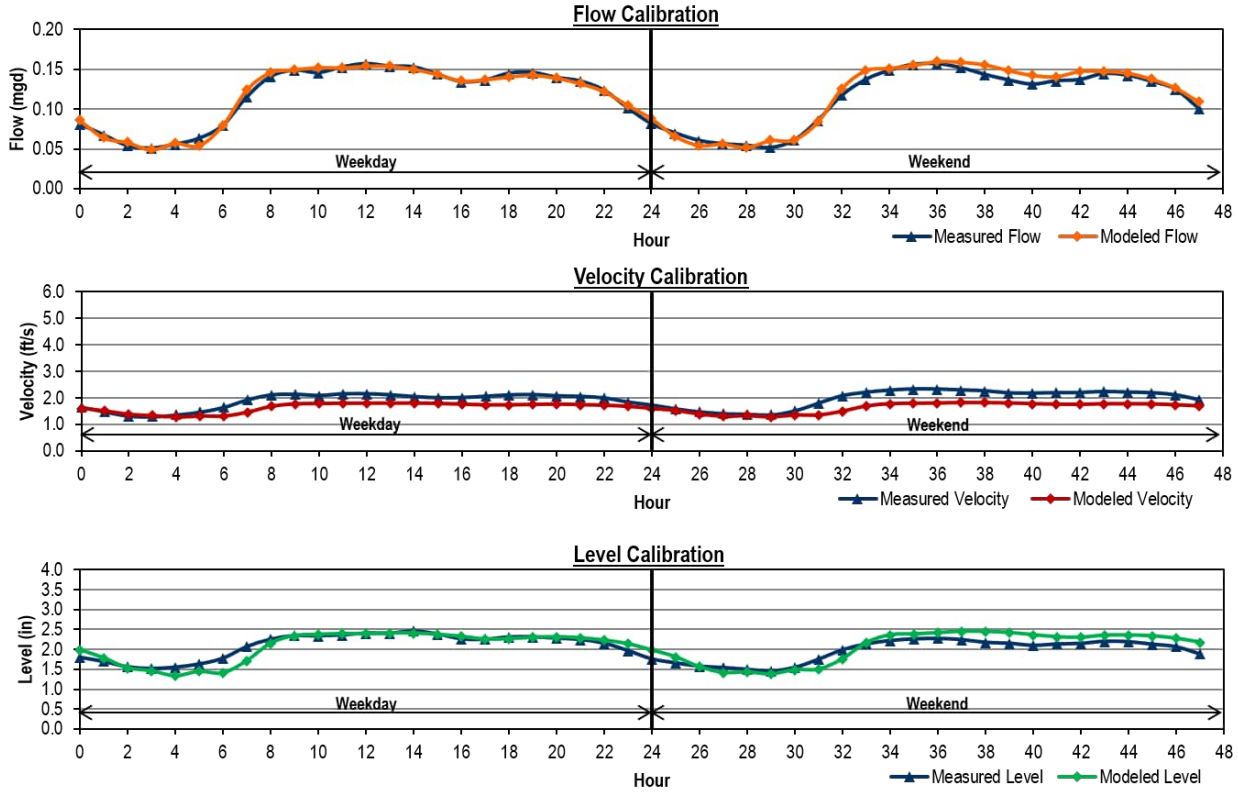


Figure 16 Example of DWF Calibration (Meter 8-1-2)

9.3 Wet Weather Flow Calibration

9.3.1 Wet Weather Flow Calibration Process

The WWF calibration enables the hydraulic model to accurately simulate RDII entering the collection system during storms. The WWF calibration process consists of running model simulations of historic

rainfall events based on data collected as part of a system flow monitoring program. The goal of any WWF monitoring program is to capture and characterize a system's response to a significant rainfall event, preferably during wet antecedent moisture conditions. As outlined below, the WWF calibration process consists of several elements:

- **Identify calibration rainfall events**. The WWF calibration process consists of running model simulations of historic rainfall events based on data collected as part of the flow monitoring program. The goal of any wet weather flow monitoring program is to capture and characterize a system's response to a significant rainfall event, preferably during wet antecedent moisture conditions.

  The selection of a particular calibration storm or group of storms is based on a review of the flow and rainfall data. There is a good range of different event types available for the different meters. Major rainfall events were identified as part of Section 4.2.2. For WWF calibration, the model was run from March 9 to April 13, 2025, because the rain events that occurred on these dates have shown the most response to the collection system. To run a model simulation for the period of these storms, minute rainfall data were input into the model for these events. Table 3 summarizes the three storms picked for calibration for each of the five sites. Figure 9 illustrates the storms used in the model calibration process.

- **Define RDII tributary areas**. For the WWF calibration, RDII flows are added on top of the DWF. The model calculates two types of response: a slow response corresponding mainly to infiltration, or slow response curve (SRC), and a fast response corresponding mainly to direct inflow, or fast response curve (FRC). Impervious area, which is the fraction of the catchment considered to contribute to FRC runoff, and RDI Area, which is the fraction of the total catchment area that contributes to the SRC RDI runoff component are two major model-specific data in the model calculation of WWFs. These values were initially set based on engineering judgment, as well as the previously used values, and then adjusted until the model-simulated flows (both peak flows and total volume) matched closely with the field-measured flows.

- **Create RDII parameter database and modify to match field-measured flows**. The main step in the WWF calibration process involves adjusting both Model A and RDI parameters for each flow monitoring tributary area. The most important parameters were described in Section 8.4 and Attachment D summarizes all calibrated parameters by flow monitoring site, for current conditions. As with the dry weather calibration, the wet weather calibration process compared the meter data with the model output. Comparisons were made of average and peak flows as well as the temporal distribution of flow until flows returned to their baseline levels. According to the CIWEM UDG, a hydraulic model is generally considered calibrated to WWF conditions if the modeled peak flows are within +25 percent to -15 percent of the field-measured data, and if the average modeled volumes are within +20 percent to -10 percent of the field-measured data. Calibration was performed for the depth of flow as well, this is considered calibrated when peak depths are with ± 4-inches when unsurcharged, and +20-inches to -4 inches when surcharged.

- **Adjust model variables to match field-measured velocity and flow depths**. Once the model-simulated flows matched the field-measured flows within the acceptable limits, the model-simulated velocity and flow depth were compared to the field-measured velocity and flow depth. Adjustments were made to various model parameters until the modeled and measured velocity and depth closely matched one another. The primary varied parameters for this process are node outlet head losses and pipeline roughness (Manning's n), although other parameters can also be

adjusted as calibration results are generated. Sediment buildup and movement in the pipe will also influence the level and depth, but these are very difficult to quantify and can change frequently, therefore they are not included in the calibration.

Manning's roughness coefficients, or n values, have industry accepted ranges based on a number of variables. Roughness coefficients increase over time depending on the construction methods, installation quality, system maintenance, and other environmental factors. There can be certain factors within the City's collection system that can result in roughness coefficients that differ from the typical range. These could include joint misalignment, cracks, and debris (e.g., root intrusion, etc.) that lead to increased turbulence in a pipe and an increase in the apparent Manning's n factor.

If the model is unable to reasonably match the field-measured flow depth and velocity using Manning's roughness coefficients within the range of 0.011 to 0.013, further investigation should be conducted to help determine the cause of the discrepancy. Some issues that could cause such a discrepancy can include errors in the slope or diameter of a pipeline, downstream blockages, pipeline sags, and, in some cases, influences from downstream pump station operations.

9.3.2 Wet Weather Calibration Results

Attachment F contains a detailed WWF calibration summary sheet for each of the seven-meter sites. The modeled outputs at each flow meter were compared to the data from three storms recorded during the flow monitoring period for calibration. Each calibration sheet provides plots that compare the model-simulated and field-measured flow, velocity, and level data for the calibration storms. An example of the wet weather calibration for Meter 5-1-2 is shown on Figure 17.

Table 8 provides a summary of the WWF calibration using the total volume and peak flow results. Of the seven meters, all had two or more storm event responses within calibration standards for volume and peak flows. As shown on Table 8, the model-simulated average and peak flows at all meter sites were within the acceptable tolerances for the calibration storms, and therefore the model was considered calibrated and ready to use for capacity analysis purposes.

As discussed in Section 9.1, it is critical that the hydraulic model is not only calibration to volume and peak flow, but also level data. This will ensure accuracy and trust in modeled results when evaluating capacity deficiencies, which are based on a hydraulic grade line criteria in the collection system.

Modeled data at all meters closely matched the recorded level information. Of the seven meters with level data, all seven met the level calibration standard with a maximum difference of 3.5 inches.

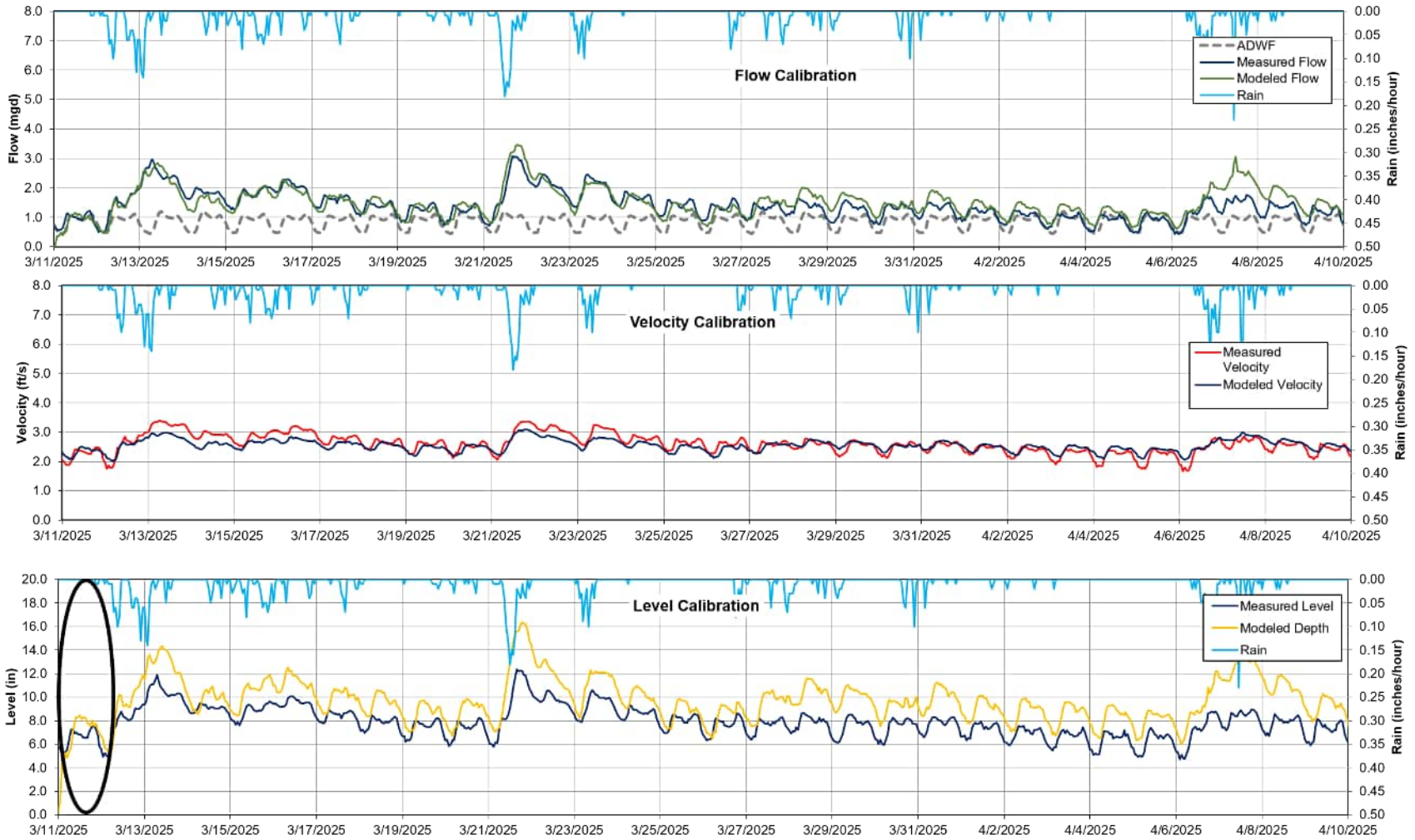


Figure 17 Example WWF Calibration (Meter 5-1-2)

Table 8 WWF Calibration Results

Flow Meter ID	Storm 1 Total Volume Percent Error (%)	Storm 1 Peak Flow Percent Error (%)	Storm 1 Max Level Difference (inches)	Storm 2 Total Volume Percent Error (%)	Storm 2 Peak Flow Percent Error (%)	Storm 2 Max Level Difference (inches)	Storm 3 Total Volume Percent Error (%)	Storm 3 Peak Flow Percent Error (%)	Storm 3 Max Level Difference (inches)
Meter 4-1-3	8.0%	13.0%	2.5	6.1%	12.0%	2.5	28.2%	81.1%	3.7
Meter 5-1-2	-4.2%	-4.6%	2.4	6.0%	12.8%	4.0	33.7%	74.8%	6.1
Meter 5-2-1	-18.9%	-49.3%	-0.3	-9.4%	-11.7%	1.3	1.9%	3.1%	1.1
Meter 8-1-2	6.5%	-1.8%	0.2	6.8%	3.3%	0.1	11.5%	13.4%	0.1
STEP	5.2%	0.8%		19.6%	13.0%		39.8%	53.5%	
Leadbetter Road	-8.2%	-28.3%		4.1%	-10.1%		6.2%	-4.6%	
Goodwin Road	-6.4%	-9.1%		3.2%	20.8%		7.1%	38.3%	

9.4 Hydraulic Model Calibration Summary

Calibration of the City's hydraulic model was a multi-step process that involved comparing model-simulated flow to the actual field-measured data for both dry and wet weather conditions. The model met all UDG standards for ADWF. Results showed the model met UDG standards for calculation of flows during peak wet weather flow. The UDG level standards were met at seven of the seven sites used for model calibration. These calibration results provide a high level of confidence in the model's accuracy such that the model can be considered calibrated and ready to use for subsequent capacity analysis.

ATTACHMENT A

CAMAS FLOW MONITORING REPORT 2025

Camas Flow Monitoring 2025

Final Report Submitted to **Carollo Engineers** May 28, 2025



ADS ENVIRONMENTAL SERVICES

846 Industry Dr.
Tukwila, WA 98188

800-633-7246
www.adsenv.com

May 28, 2025

Max Mozer

Carollo Engineers

1200 5th Avenue Suite 900

Seattle, WA 98101

SUBJECT: Camas Flow Monitoring 2025

Dear Mr. Mozer,

ADS is pleased to submit the report for the project referenced above completed on behalf of Carollo Engineers. The metering was conducted at four (4) flow monitoring locations and one (1) rain monitoring location. The study was conducted during the period of Wednesday, 15 January 2025 to Tuesday, 29 April 2025.

The report contains depth, velocity, and quantity hydrographs as well as daily long tables for the metering period. An Excel file containing depth, quantity, and velocity entities for the monitoring location in 15-minute format was provided previously.

In addition, we would be happy to further explain any details about the report that may seem unclear. Should you have any questions or comments, you may contact the Project Manager, Cody Mahaffey at (425) 620-6412.

It has been our pleasure to be of service to you in the performance of this project. Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

Justin Hatch
Hydraulic Data Analyst

Wednesday, 15 January 2025 to Tuesday, 29 April 2025

Camas Flow Monitoring 2025

Prepared For:

Max Mozer
Carollo Engineers
1200 5th Avenue Suite 900
Seattle, WA 98101

Prepared By:

ADS, LLC
846 Industry Dr.
Tukwila, WA 98188

Scope and Methodology

Introduction

Carollo Engineers entered into an agreement with ADS Environmental Services to conduct flow monitoring at (4) four flow locations and (1) one rainfall gauging location in Camas, Washington. The study was scheduled for a period of (105) one-hundred and five days. Once in place, the flow monitoring equipment was to be used to measure depth, velocity, and to quantify flows. Data obtained from the study will be used for inflow and infiltration analysis.

Project Scope

The scope of this study involved using a flow monitor to quantify wastewater flow at the designated locations for the study period. Specifically, the study included the following key components.

- Investigate the proposed flow-monitoring site for adequate hydraulic conditions
- Flow monitor installation
- Flow monitor confirmations and data collections
- Flow data analysis

Additionally, temporary rain gauge monitors were used to measure and record rainfall at the designated locations. Specifically, the study involved the following key components.

- Investigate the proposed rain gauge sites for sufficient exposure and security
- Rain Gauge installations
- Manually confirming rain gauge tipping bucket operation and date collections
- Rain data analysis

Equipment installation was completed on January 14, 2025. The monitoring period began on January 15, 2025 and was completed on April 29, 2025. Upon completion of the study, equipment was removed from the system.

Flow Monitoring Equipment



The ***ADS Triton+*** monitor was selected for this project. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS Triton+ monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals.

The Triton+ monitor features cross-checking using multiple technologies in each sensor for continuous running of comparisons and tolerances. The Triton+ monitor can support two (2) sets of sensors. The sensor option used for this project was:

The Peak Combo Sensor installed at the bottom of the pipe includes three types of data acquisition technologies

The ***up looking ultrasonic depth*** uses sound waves from two independent transceivers to measure the distance from the sensor upward toward the flow surface; applying the speed of sound in the water and the temperature measured by sensor to calculate depth.

The ***pressure depth*** is calculated by using a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube.

To obtain ***peak velocity*****,** the sensor sends an ultrasonic signal at an angle upward through the widest cross-section of the oncoming flow. The signal is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity.

Installation

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed.

In pipes up to 42 inches in diameter, the sensors were mounted on expandable stainless-steel rings, inserted at least a foot upstream into influent pipes and tightened against the inside walls of the pipes. Influent pipe installations reduce the influences of turbulence and backwater often caused by changes in channel geometry in manholes.





Data Collection, Confirmation, and Quality Assurance

Data collects were done remotely via wireless connect on a weekly basis. As needed, during the monitoring period, field crews visit each monitoring location to verify proper monitor operation and document field conditions. The following quality assurance steps are taken to assure the integrity of the collected data:

Measure power supplies: monitors were powered by dry cell battery packs. Voltages were recorded and battery packs replaced, as necessary. Separate batteries provided back-up power to memory allowing primary batteries to be replaced without loss of data.

Clock synchronization: Field crews synchronized monitor clocks to master clocks.

Confirm depth and velocity readings: Field crews descended into meter manholes to manually measure depths and velocities and compare the meter readings to confirm that they agreed. The site met the criteria for confirmation for depth and velocity unless noted otherwise in the site commentary section. They also measured silt levels, if any, in the inverts of the pipes. Silt areas were subtracted from flow areas to compute true areas of flow.

Confirm average velocities through cross-sectional velocity profiles: Since ADS velocity sensors measure peak velocity, field crews collected cross-sectional velocity profiles in order to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

Upload and Review Data: Data collected from the monitors were uploaded and reviewed by a Data Analyst for completeness, outliers and deviations in the flow patterns, which indicate system anomalies or equipment failure.

Rainfall Logging Equipment



The ***ADS RainAlert III*** monitor was selected for this project. This monitor provides rainfall data acquisition and intelligent alarming to support wastewater capital improvement.

The ADS RainAlert III monitor measures rainfall using a tipping bucket containing a funnel and a small tipping mechanism that can collect a specific amount of rainfall. Once the tipping mechanism is full it empties and records that a tip has occurred. Typically, each tip is equivalent to 0.01 inches (or 0.2mm) of rainfall. The monitor records the number of tips that occur over each 5-minute interval to calculate discrete rainfall amounts for each of those 5-minute intervals.

Installation

Installation of rainfall logging equipment typically proceeds in five steps. First, investigating and selecting the appropriate location to install the tipping bucket and monitor. Second, installing the Sun Shield involves properly placing the sun shield and securing it to an appropriate structure or surface, or mounting it to a pole, as applicable. Third, involves mounting the tipping bucket on the sun shield at the designated rainfall collection location and connecting the wires from the monitor to the tipping bucket. Fourth, involves testing and adjusting the tipping bucket and internal tipping mechanism to ensure it accurately measures rainfall amounts. The final step involves installing the monitor at the appropriate location.

Flow Quantification Methods

There are two main equations used to measure open channel flow: the ***Continuity Equation*** and the ***Manning Equation.*** The Continuity Equation, which is considered the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

Continuity Equation

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow.

Data Analysis and Presentation

Data Analysis

A flow monitor is typically programmed to collect data at 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the ultrasonic depth, (2) the peak velocity and (3) the pressure depth. The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. The data analyst selects which depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Occasionally the velocity sensor's performance may be compromised resulting in invalid readings sporadically during the monitoring period. This is generally caused by excessive debris (silt) blocking the sensor's crystals, shallow flows (~< 1") that may drop below the top of the sensor or very clear flows lacking the particles needed to measure rate. In order to use the Continuity equation to quantify the flow during these periods, a Data Analyst and/or Engineer will use the site's historical pipe curve (depth vs. velocity) data along with valid field confirmations to reconstitute and replace the false velocity recordings with expected velocity readings for a given historical depth along the curve.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs.
Hydrographs are based on 15-minute data. Tables are provided in daily average format. These tables show the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the flow data table and hydrograph.

DFINAL - Final calculated depth measurement (in inches)

QFINAL - Final calculated flow rate (in MGD)

VFINAL - Final calculated flow velocity (in feet per second)

RAIN – Final calculated rainfall (in inches)

REPORT TOTAL - Total volume of flow recorded for the indicated time period (in MG)

CAM_100290

Site Commentary

SITE INFORMATION

Pipe	Elliptical (19 in H x 19.5 in W)
Silt	0.00 (in)

OBSERVATIONS

Surcharge conditions were not experienced. Review of the scattergraph shows that free-flow conditions were maintained throughout the study.

This site was located upstream of site CAM_51123. A review of flow balancing indicated no problems

Average flow depth, velocity, and quantity data observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025**, along with observed minimum and maximum data, are provided in the following table.

Observed Flow Conditions			
Item	**DFINAL (in)**	**VFINAL (ft/s)**	**QFINAL (MGD - Total MG)**
Average	3.24	2.00	0.326
Minimum	1.34	1.05	0.049
Maximum	9.57	3.56	1.941
Min Time	04/29/2025 02:10:00	04/23/2025 00:55:00	04/29/2025 02:10:00
Max Time	02/23/2025 16:40:00	01/31/2025 09:25:00	02/23/2025 15:50:00

Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Values in the graphical reports are based on the fifteen minutes average and values in the Observed Flow Conditions and tabular report are based on the five-minute average.

DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
DFINAL (in)	100
VFINAL (ft/s)	100
QFINAL (MGD - Total MG)	100

Camas.Carollo.TFM.WA24		Site Name
Flow Monitoring Site Report		CAM_100290

Site Address /Location:	1724 NE Franklin St, Camas, WA 98607			Monitor Series	Location Type
				TRITON+	Temporary
Site Access Details:	On Road	Latitude:	45.5919803	Pipe Size (H x W)	Pipe Shape
		Longitude:	-122.4042885	19.00 x 19.50	Circular



Manhole #	System Characteristics
100290	Residential
Access	Traffic
Drive	None







Installation Information

Installation Date:	Installation Type:
Tuesday, January 14, 2025	Doppler Special Installation
Monitoring Location (Sensors):	Monitor Location:
Upstream 0-5 FT	Manhole
Sensors / Devices:	Pressure Sensor Range (psi)
Peak Combo (CS4)	0 - 5 psi

Installation Confirmation:

Time	
12:14:00 PM	
Depth of Flow (Wet DOF) (in)	
2.50	
CS58 Physical Offset (in)	Measurement Confidence (in)
N/A	0.25"
Peak Velocity (fps)	Velocity Sensor Offset (in)
2.23	N/A
Silt (in)	Silt Type
0	

Manhole / Pipe Information:

Manhole Depth (Approx. FT):	Manhole Configuration
13'	Single
Manhole Material:	Manhole Condition:
Concrete	Good
Manhole Opening Diameter (in)	Manhole Diameter (Approx.):
24	26
Manhole Cover	Manhole Frame
Steel	Normal
Active Connections	Air Quality:
No	Normal
Pipe Material	Pipe Condition:
PVC	Good

Communication Information:

Communication Type	Antenna Location
Wireless	Manhole Pick / Vent Hole

Additional Site Info. / Comments:

ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23116.11.325

Additional Photos

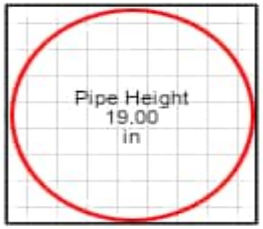
Monitoring Point Inlet	Outlet	
		
Top Down	**Location**	**Map**
		
	KEY	
	Flow Direction Monitoring Point	

Hydrograph Report

CAM_100290

Flow Monitor

CAM_100290



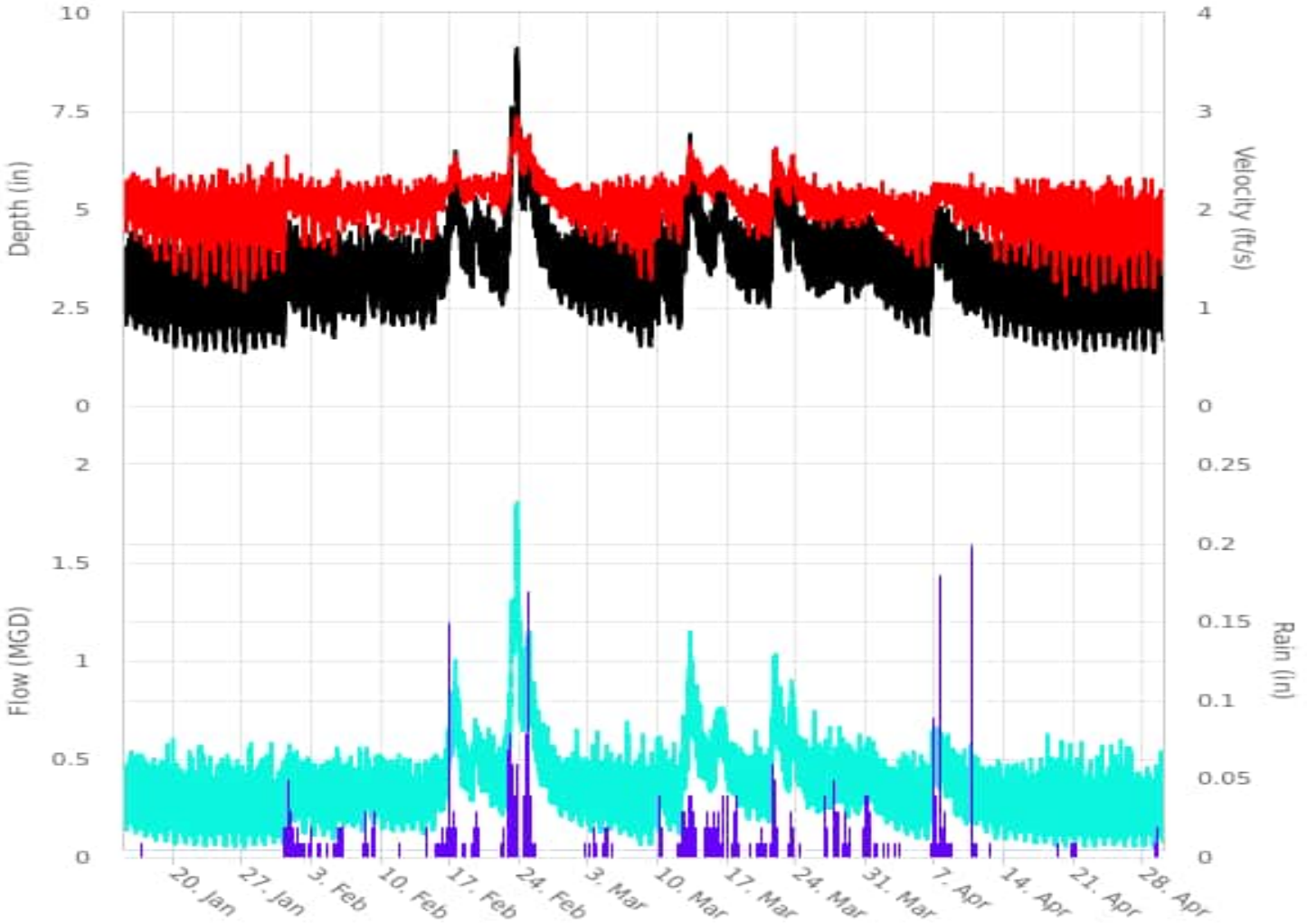
Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL





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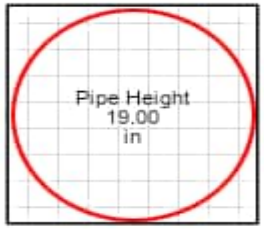
Scattergraph Report

CAM_100290

Flow Monitor

CAM_100290



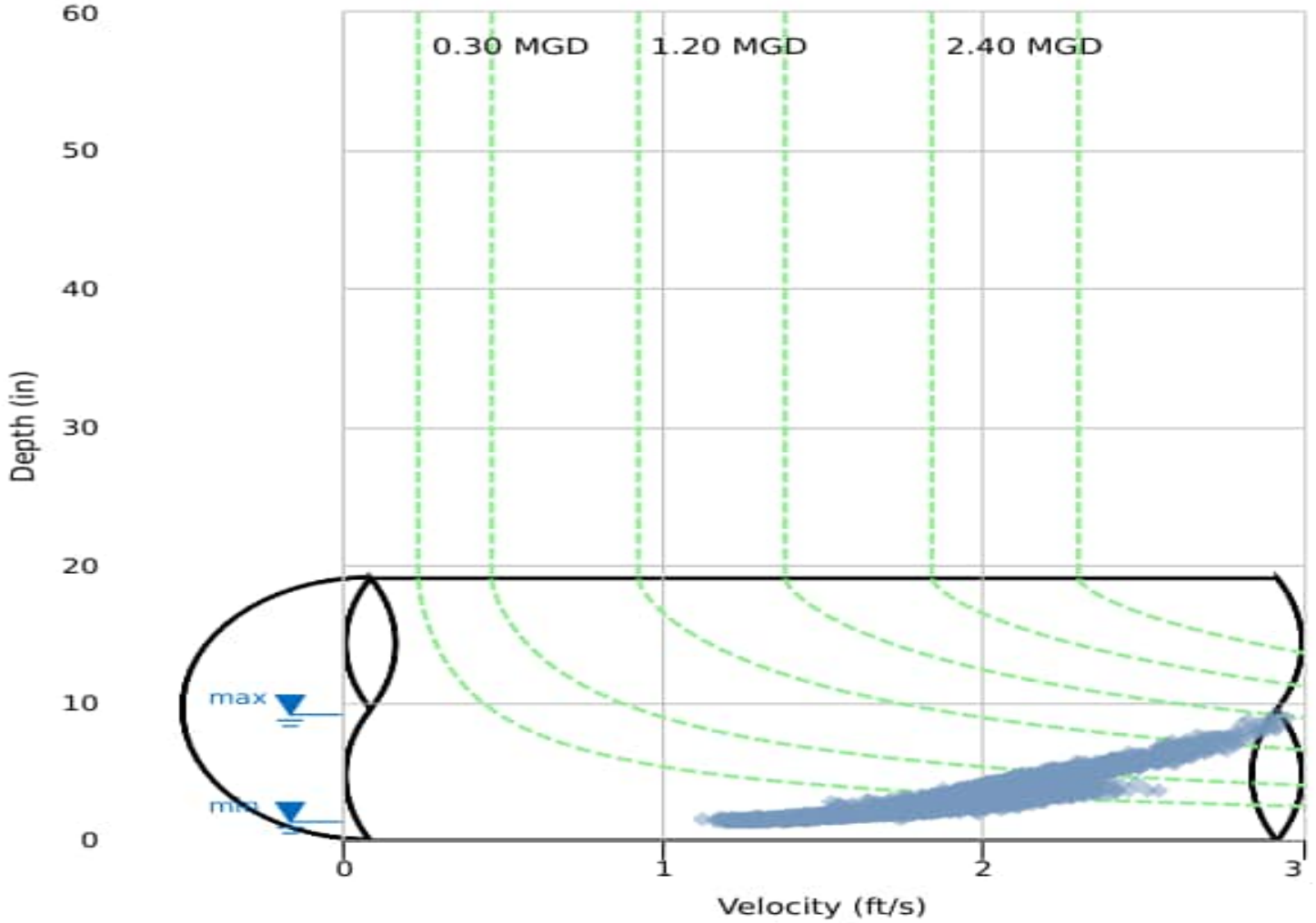
Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL - VFINAL
Iso-Q™
Min-Max Depth





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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_100290 Pipe: Elliptical (19 in H x 19.5 in W), Silt0.00 in

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/15/2025	04:00	2.05	17:35	5.79	2.91	04:00	1.72	12:50	2.64	2.05	04:00	0.131	17:35	0.777	0.274	0.274	-
01/16/2025	03:45	1.95	17:20	5.64	2.78	03:30	1.67	14:35	2.65	2.01	03:30	0.118	17:20	0.766	0.256	0.256	0.01
01/17/2025	04:50	1.82	08:55	5.72	2.66	03:50	1.60	09:35	2.65	1.94	03:50	0.104	08:55	0.823	0.235	0.235	-
01/18/2025	03:35	1.66	15:10	5.61	2.61	04:05	1.38	21:50	2.67	1.90	04:05	0.078	15:10	0.752	0.228	0.228	-
01/19/2025	05:50	1.61	21:45	5.69	2.60	03:00	1.46	10:10	2.67	1.88	05:50	0.080	21:45	0.792	0.226	0.226	-
01/20/2025	03:10	1.48	08:50	5.26	2.58	03:00	1.32	19:10	2.65	1.87	03:10	0.063	15:55	0.700	0.222	0.222	-
01/21/2025	04:10	1.50	07:40	5.55	2.49	02:40	1.34	14:05	2.65	1.83	04:10	0.067	07:40	0.757	0.208	0.208	-
01/22/2025	03:15	1.42	10:40	5.50	2.46	05:05	1.28	19:00	2.61	1.81	03:30	0.058	17:15	0.705	0.203	0.203	-
01/23/2025	03:10	1.40	11:55	5.55	2.41	03:15	1.20	21:45	2.60	1.80	03:15	0.052	11:55	0.717	0.197	0.197	-
01/24/2025	03:40	1.44	21:35	5.46	2.48	03:05	1.33	13:30	2.67	1.83	03:50	0.062	21:35	0.802	0.207	0.207	-
01/25/2025	05:10	1.37	09:30	5.59	2.47	04:50	1.25	06:30	2.75	1.80	04:50	0.053	09:30	0.746	0.207	0.207	-
01/26/2025	04:05	1.37	18:40	5.56	2.48	04:05	1.18	16:35	2.58	1.79	04:05	0.050	18:40	0.741	0.207	0.207	-
01/27/2025	03:05	1.34	10:10	5.32	2.44	02:35	1.15	10:15	2.88	1.81	03:10	0.049	09:25	0.712	0.203	0.203	-
01/28/2025	05:20	1.45	13:35	5.60	2.48	02:40	1.17	20:45	2.80	1.81	02:40	0.055	20:45	0.790	0.206	0.206	-
01/29/2025	04:05	1.49	08:25	5.63	2.50	03:55	1.25	19:20	2.99	1.82	03:55	0.060	19:20	0.884	0.211	0.211	-
01/30/2025	05:00	1.56	20:55	5.05	2.46	05:15	1.37	10:00	2.95	1.83	05:15	0.070	10:00	0.682	0.202	0.202	-
01/31/2025	02:00	1.50	16:35	5.68	3.25	00:45	1.34	09:25	3.56	2.05	01:50	0.065	09:25	1.079	0.328	0.328	0.60
02/01/2025	06:40	2.37	10:00	5.76	3.09	03:45	1.90	20:15	2.55	2.08	06:40	0.180	10:00	0.736	0.296	0.296	0.12
02/02/2025	03:50	2.02	20:45	5.43	2.96	03:35	1.56	15:20	2.60	1.98	03:35	0.117	15:20	0.791	0.273	0.273	0.07
02/03/2025	03:05	1.91	07:20	5.57	2.82	04:25	1.60	18:10	2.66	1.97	04:25	0.111	07:20	0.704	0.253	0.253	0.02
02/04/2025	03:45	1.86	07:55	5.46	2.75	04:30	1.60	14:20	2.57	1.96	04:30	0.107	07:55	0.718	0.245	0.245	0.01
02/05/2025	04:30	1.71	12:15	5.74	2.93	04:10	1.52	12:10	2.55	1.99	04:10	0.090	12:15	0.824	0.273	0.273	0.19
02/06/2025	04:30	2.21	21:30	5.44	3.02	03:40	1.70	15:20	2.55	2.03	03:40	0.150	20:30	0.679	0.282	0.282	-
02/07/2025	04:55	2.16	07:10	5.58	2.89	04:55	1.80	00:35	2.51	2.01	04:55	0.148	07:10	0.722	0.264	0.264	-
02/08/2025	01:55	2.02	11:05	5.93	3.17	01:45	1.73	11:05	2.33	2.06	01:55	0.129	11:05	0.812	0.309	0.309	0.25
02/09/2025	04:40	2.25	20:30	5.60	3.14	17:30	1.83	14:20	2.45	2.07	04:25	0.162	20:30	0.709	0.303	0.303	0.05
02/10/2025	03:10	2.10	07:40	5.61	2.98	02:50	1.76	07:35	2.71	2.04	04:00	0.141	07:40	0.778	0.279	0.279	-
02/11/2025	05:00	2.04	07:40	5.65	2.90	02:40	1.70	15:20	2.57	2.00	04:35	0.131	07:40	0.738	0.265	0.265	0.01
02/12/2025	03:55	2.05	07:05	5.48	2.90	00:20	1.69	13:50	2.52	2.00	03:30	0.131	07:05	0.690	0.264	0.264	-
02/13/2025	03:50	2.09	06:40	5.37	2.95	03:20	1.74	15:05	2.49	2.02	03:20	0.137	06:40	0.678	0.272	0.272	-
02/14/2025	05:10	1.95	08:55	5.54	2.87	05:00	1.66	08:50	2.56	1.98	05:00	0.117	08:55	0.770	0.261	0.261	0.07
02/15/2025	06:10	2.10	11:30	5.53	3.08	03:35	1.65	00:25	2.58	2.02	03:35	0.130	08:40	0.734	0.291	0.291	0.09
02/16/2025	01:45	2.76	21:35	6.26	3.77	04:55	1.90	20:30	2.43	2.18	04:55	0.229	21:35	0.902	0.412	0.412	0.77
02/17/2025	23:35	3.96	11:45	6.94	5.05	02:20	2.17	12:20	2.65	2.34	23:35	0.429	11:45	1.090	0.657	0.657	0.39
02/18/2025	23:30	3.21	06:40	6.08	4.00	14:05	2.02	20:45	2.42	2.20	23:30	0.309	06:40	0.852	0.445	0.445	0.02
02/19/2025	05:00	3.01	08:55	6.23	4.25	07:05	2.06	08:55	2.43	2.23	05:00	0.281	08:55	0.904	0.495	0.495	0.40
02/20/2025	23:55	3.15	02:50	5.75	3.82	07:55	2.08	18:05	2.40	2.21	23:55	0.307	09:40	0.788	0.420	0.420	-
02/21/2025	23:15	2.78	23:20	5.80	3.45	16:05	2.01	08:05	2.54	2.16	23:15	0.245	08:10	0.793	0.357	0.357	0.04
02/22/2025	05:40	2.55	23:30	6.71	3.69	06:45	1.91	23:00	2.49	2.16	06:45	0.207	23:30	0.988	0.402	0.402	0.84
02/23/2025	00:00	5.10	16:40	9.57	7.24	00:00	2.35	15:55	3.00	2.71	00:00	0.663	15:50	1.941	1.246	1.246	1.07
02/24/2025	10:35	4.91	23:25	7.52	5.85	05:45	2.34	15:35	2.86	2.54	10:35	0.633	19:35	1.324	0.874	0.874	0.87
02/25/2025	23:40	3.80	00:40	6.97	5.08	11:05	2.14	00:00	2.77	2.40	23:40	0.409	00:40	1.145	0.682	0.682	0.03
02/26/2025	23:55	3.25	06:45	6.02	3.98	15:30	2.11	06:45	2.49	2.22	23:55	0.314	06:45	0.886	0.448	0.448	-
02/27/2025	23:55	2.81	19:55	5.67	3.54	16:45	1.97	06:20	2.46	2.14	23:55	0.240	19:55	0.766	0.367	0.367	-
02/28/2025	03:25	2.59	14:55	5.80	3.32	13:50	1.88	14:55	2.37	2.05	03:20	0.202	14:55	0.799	0.323	0.323	-
03/01/2025	03:20	2.45	19:55	5.73	3.23	04:15	1.82	23:00	2.35	2.02	04:15	0.185	14:25	0.770	0.310	0.310	-
03/02/2025	06:20	2.29	14:00	5.53	3.17	04:00	1.73	08:25	2.29	1.97	04:00	0.155	20:10	0.709	0.295	0.295	0.05
03/03/2025	03:55	2.07	19:00	5.90	3.04	04:05	1.66	21:10	2.30	1.93	04:00	0.128	19:00	0.793	0.277	0.277	0.07
03/04/2025	04:20	2.05	16:25	5.79	3.09	03:20	1.62	16:20	2.39	1.97	03:55	0.124	16:25	0.801	0.290	0.290	0.12
03/05/2025	04:10	2.14	20:15	5.47	3.03	03:30	1.65	22:25	2.42	1.97	03:35	0.137	20:50	0.701	0.279	0.279	0.01
03/06/2025	03:20	2.02	22:15	5.72	2.85	02:55	1.55	13:25	2.50	1.90	03:15	0.116	22:15	0.785	0.250	0.250	-
03/07/2025	23:55	1.85	16:35	5.47	2.68	03:40	1.51	21:30	2.45	1.87	03:40	0.101	16:35	0.729	0.230	0.230	-
03/08/2025	04:20	1.50	17:25	5.66	2.60	04:05	1.29	10:35	2.41	1.81	04:05	0.062	17:25	0.767	0.220	0.220	-
03/09/2025	04:20	1.51	07:45	5.47	2.73	05:00	1.27	15:00	2.49	1.85	05:05	0.062	07:45	0.742	0.240	0.240	0.20
03/10/2025	23:05	2.29	06:20	5.91	3.41	00:00	1.81	07:35	2.58	2.11	00:00	0.164	06:20	0.811	0.344	0.344	0.22
03/11/2025	23:30	2.06	06:40	5.64	2.92	01:55	1.62	19:10	2.53	2.01	01:55	0.133	16:25	0.766	0.270	0.270	0.02
03/12/2025	03:25	1.96	23:15	6.33	3.68	02:15	1.64	23:15	2.41	2.10	03:10	0.117	23:15	0.917	0.398	0.398	0.83
03/13/2025	23:50	4.25	03:05	7.64	5.44	22:35	2.20	05:00	2.73	2.40	23:50	0.484	05:00	1.283	0.749	0.749	0.49
03/14/2025	23:40	3.51	01:00	6.11	4.27	04:20	2.15	01:00	2.55	2.26	23:40	0.369	01:00	0.924	0.502	0.502	0.16
03/15/2025	06:25	3.30	20:15	6.13	4.13	13:15	2.04	20:15	2.46	2.25	06:20	0.327	20:15	0.895	0.479	0.479	0.60
03/16/2025	23:35	3.62	04:50	6.35	4.73	21:10	2.11	07:10	2.60	2.28	23:35	0.378	07:10	0.995	0.584	0.584	0.16
03/17/2025	23:40	3.11	02:55	5.79	3.87	14:45	2.01	15:20	2.60	2.18	23:40	0.284	02:55	0.808	0.421	0.421	0.19
03/18/2025	23:05	2.71	06:40	5.83	3.51	23:55	1.77	12:40	2.35	2.04	23:55	0.203	06:40	0.776	0.348	0.348	0.02
03/19/2025	04:25	2.60	20:55	5.97	3.47	04:40	1.68	18:45	2.39	1.97	01:45	0.190	18:45	0.832	0.334	0.334	0.07
03/20/2025	03:25	2.60	06:45	5.86	3.38	01:30	1.67	03:50	2.27	1.93	01:30	0.182	06:45	0.774	0.316	0.316	0.11
03/21/2025	03:20	2.49	15:25	7.29	4.60	02:45	1.73	15:55	2.76	2.19	03:20	0.176	15:25	1.249	0.577	0.577	1.12
03/22/2025	23:00	3.51	05:40	6.54	4.75	23:00	2.07	04:10	2.62	2.28	23:00	0.344	05:40	1.031	0.590	0.590	-
03/23/2025	02:40	3.42	09:50	6.72	4.53	03:15	2.03	09:50	2.74	2.26	04:05	0.329	09:50	1.132	0.551	0.551	0.44
03/24/2025	23:55	3.16	06:10	6.03	3.99	23:10	2.00	15:55	2.44	2.17	23:55	0.288	15:55	0.855	0.439	0.439	0.01

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/25/2025	04:25	2.94	20:10	5.99	3.58	16:25	1.85	18:45	2.42	2.07	02:40	0.241	18:45	0.851	0.363	0.363	-
03/26/2025	04:25	2.76	06:25	5.96	3.53	17:00	1.77	06:25	2.38	2.05	04:20	0.224	06:25	0.834	0.354	0.354	0.20
03/27/2025	03:50	2.95	06:45	5.94	3.62	01:45	1.76	06:45	2.33	2.01	01:45	0.238	06:45	0.812	0.357	0.357	0.24
03/28/2025	23:55	2.79	03:25	6.14	3.78	23:10	1.87	06:30	2.37	2.06	23:55	0.225	06:30	0.862	0.388	0.388	0.17
03/29/2025	01:45	2.62	15:55	5.90	3.59	03:25	1.78	06:05	2.36	2.01	01:30	0.198	06:05	0.797	0.355	0.355	0.12
03/30/2025	02:00	2.74	08:55	5.83	3.57	04:05	1.81	09:30	2.34	2.02	04:05	0.216	09:30	0.793	0.354	0.354	0.23
03/31/2025	23:50	2.91	12:40	6.05	3.74	23:50	1.87	12:40	2.38	2.07	23:50	0.237	12:40	0.852	0.384	0.384	0.10
04/01/2025	23:55	2.49	01:35	5.59	3.34	23:55	1.72	14:00	2.39	1.99	23:55	0.174	01:35	0.751	0.318	0.318	0.03
04/02/2025	23:25	2.33	16:55	5.70	3.15	23:05	1.60	00:25	2.32	1.92	23:25	0.152	16:55	0.749	0.283	0.283	0.05
04/03/2025	23:25	2.18	00:55	5.66	2.98	23:25	1.55	19:15	2.26	1.86	23:25	0.129	19:15	0.726	0.259	0.259	0.02
04/04/2025	02:40	2.00	14:05	5.65	2.85	04:20	1.51	23:25	2.30	1.83	02:10	0.112	14:05	0.741	0.241	0.241	-
04/05/2025	03:15	1.84	14:15	5.67	2.75	05:10	1.40	22:20	2.38	1.80	05:10	0.092	14:15	0.748	0.229	0.229	-
04/06/2025	04:35	1.80	22:35	6.10	3.29	03:10	1.39	12:10	2.36	1.91	04:40	0.091	21:00	0.840	0.319	0.319	0.71
04/07/2025	23:45	3.31	00:40	6.20	4.18	01:25	1.92	23:50	2.32	2.15	10:35	0.314	00:40	0.850	0.464	0.464	0.37
04/08/2025	23:50	2.80	06:45	6.01	3.74	00:20	1.94	07:20	2.39	2.13	23:50	0.233	06:45	0.819	0.394	0.394	0.07
04/09/2025	23:10	2.49	15:20	5.69	3.30	15:10	1.79	07:40	2.46	2.04	23:10	0.187	07:40	0.759	0.319	0.319	-
04/10/2025	02:15	2.32	06:10	5.60	3.18	04:10	1.73	05:05	2.45	2.04	02:25	0.164	06:10	0.699	0.305	0.305	0.27
04/11/2025	23:10	2.28	06:05	5.51	3.07	23:55	1.76	19:15	2.34	2.00	23:55	0.157	06:05	0.732	0.284	0.284	0.01
04/12/2025	23:55	1.94	06:05	5.40	2.95	23:50	1.59	06:05	2.34	1.93	23:50	0.113	06:05	0.716	0.266	0.266	0.01
04/13/2025	03:05	1.78	08:30	5.37	2.89	04:40	1.47	08:30	2.53	1.90	02:50	0.092	08:30	0.769	0.258	0.258	-
04/14/2025	03:15	1.77	06:40	5.62	2.77	02:20	1.40	06:40	2.42	1.87	02:20	0.088	06:40	0.782	0.240	0.240	-
04/15/2025	02:50	1.74	18:50	5.27	2.73	02:30	1.47	05:45	2.43	1.86	02:25	0.088	18:50	0.669	0.233	0.233	-
04/16/2025	23:55	1.63	15:15	5.54	2.60	01:35	1.43	07:00	2.45	1.84	23:55	0.079	15:15	0.719	0.217	0.217	-
04/17/2025	01:40	1.53	06:20	5.34	2.59	01:35	1.33	00:00	2.67	1.83	01:35	0.067	06:20	0.679	0.218	0.218	-
04/18/2025	02:45	1.56	15:10	5.61	2.53	03:00	1.42	00:10	2.45	1.80	02:25	0.073	12:50	0.764	0.209	0.209	-
04/19/2025	02:55	1.43	15:10	5.55	2.51	00:35	1.24	16:10	2.46	1.76	02:55	0.056	13:10	0.726	0.206	0.206	0.01
04/20/2025	03:50	1.46	10:55	5.52	2.59	03:30	1.09	10:50	2.49	1.76	03:30	0.051	10:55	0.765	0.215	0.215	0.05
04/21/2025	03:00	1.54	17:10	5.56	2.56	00:15	1.33	20:30	2.53	1.80	02:25	0.068	10:45	0.718	0.212	0.212	0.02
04/22/2025	02:45	1.38	19:10	5.57	2.49	02:55	1.21	14:35	2.34	1.75	02:55	0.052	19:10	0.740	0.202	0.202	-
04/23/2025	03:35	1.41	07:00	5.56	2.52	00:55	1.05	09:30	2.33	1.76	00:55	0.050	07:00	0.705	0.206	0.206	-
04/24/2025	03:35	1.53	19:30	5.64	2.49	03:00	1.22	12:30	2.62	1.77	03:00	0.063	19:30	0.756	0.201	0.201	-
04/25/2025	01:30	1.46	15:20	5.44	2.49	00:55	1.24	15:20	2.35	1.73	01:30	0.057	15:20	0.724	0.200	0.200	-
04/26/2025	02:30	1.42	14:20	5.51	2.50	05:25	1.17	18:25	2.54	1.75	02:30	0.055	14:20	0.747	0.205	0.205	-
04/27/2025	04:00	1.42	07:20	5.24	2.58	02:55	1.18	20:20	2.47	1.75	04:00	0.053	07:20	0.667	0.212	0.212	-
04/28/2025	01:40	1.41	08:35	5.40	2.51	01:50	1.19	12:40	2.56	1.76	01:40	0.052	08:35	0.688	0.204	0.204	-
04/29/2025	02:10	1.34	10:55	5.61	2.52	02:00	1.19	21:10	2.47	1.74	02:10	0.049	10:55	0.759	0.205	0.205	0.13

01/15/2025 00:00 - 04/29/2025 23:59

	DFINAL (in)	VFINAL (ft/s)	QFINAL (MGD - Total MG)	RAIN FINAL (in)
Total			34.250	13.62
Average	3.24	2.00	0.326	

CAM_51123

Site Commentary

SITE INFORMATION

Pipe	Elliptical (20 in H x 20.13 in W)
Silt	0.00 (in)

OBSERVATIONS

Surcharge conditions were not experienced. Review of the scattergraph shows that free-flow conditions were maintained throughout the study.

This site was located downstream of site CAM_100290. A review of flow balancing indicated no problems.

Average flow depth, velocity, and quantity data observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025**, along with observed minimum and maximum data, are provided in the following table.

Observed Flow Conditions			
Item	**DFINAL (in)**	**VFINAL (ft/s)**	**QFINAL (MGD - Total MG)**
Average	7.07	2.37	1.132
Minimum	3.27	1.07	0.162
Maximum	19.05	3.74	5.203
Min Time	04/28/2025 03:45:00	04/28/2025 03:45:00	04/28/2025 03:45:00
Max Time	02/23/2025 16:05:00	02/23/2025 15:45:00	02/23/2025 16:30:00

Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Values in the graphical reports are based on the fifteen minutes average and values in the Observed Flow Conditions and tabular report are based on the five-minute average.

DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
DFINAL (in)	99.653
VFINAL (ft/s)	99.653
QFINAL (MGD - Total MG)	99.653

Camas.Carollo.TFM.WA24		Site Name
Flow Monitoring Site Report		CAM_51123

Site Address /Location:	SE Cedar St and SE 3rd Ave, Camas, WA 98607			Monitor Series	Location Type
				TRITON+	Temporary
Site Access Details:	On Road	Latitude:	45.5829094	Pipe Size (H x W)	Pipe Shape
		Longitude:	-122.4010296	20.00 X 20.13	Circular



Manhole #	System Characteristics
51123	Industrial
Access	Traffic
Drive	None







Installation Information	
Installation Date:	Installation Type:
Wednesday, January 15, 2025	Doppler Standard Ring and Crank
Monitoring Location (Sensors):	Monitor Location:
Upstream 0-5 FT	Manhole
Sensors / Devices:	Pressure Sensor Range (psi)
Peak Combo (CS4)	0 - 5 psi
Installation Confirmation:	
Time	
8:23:00 AM	
Depth of Flow (Wet DOF) (in)	
7.75	
CS58 Physical Offset (in)	Measurement Confidence (in)
N/A	0.38"
Peak Velocity (fps)	Velocity Sensor Offset (in)
2.77	N/A
Silt (in)	Silt Type
0	

Manhole / Pipe Information:	
Manhole Depth (Approx. FT):	Manhole Configuration
16'	Single
Manhole Material:	Manhole Condition:
Concrete	Good
Manhole Opening Diameter (in)	Manhole Diameter (Approx.):
24	26
Manhole Cover	Manhole Frame
Steel	Normal
Active Connections	Air Quality:
Yes, Inside	Normal
Pipe Material	Pipe Condition:
Concrete	Good
Communication Information:	
Communication Type	Antenna Location
Wireless	Manhole Pick / Vent Hole
Additional Site Info. / Comments:	

ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23116.11.325

Additional Photos

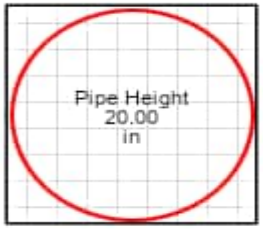
Monitoring Point Inlet	Outlet	
		
Top Down	**Location**	**Map**
		
	KEY	
	Flow Direction Monitoring Point	

Hydrograph Report

CAM_51123

Flow Monitor

CAM_51123



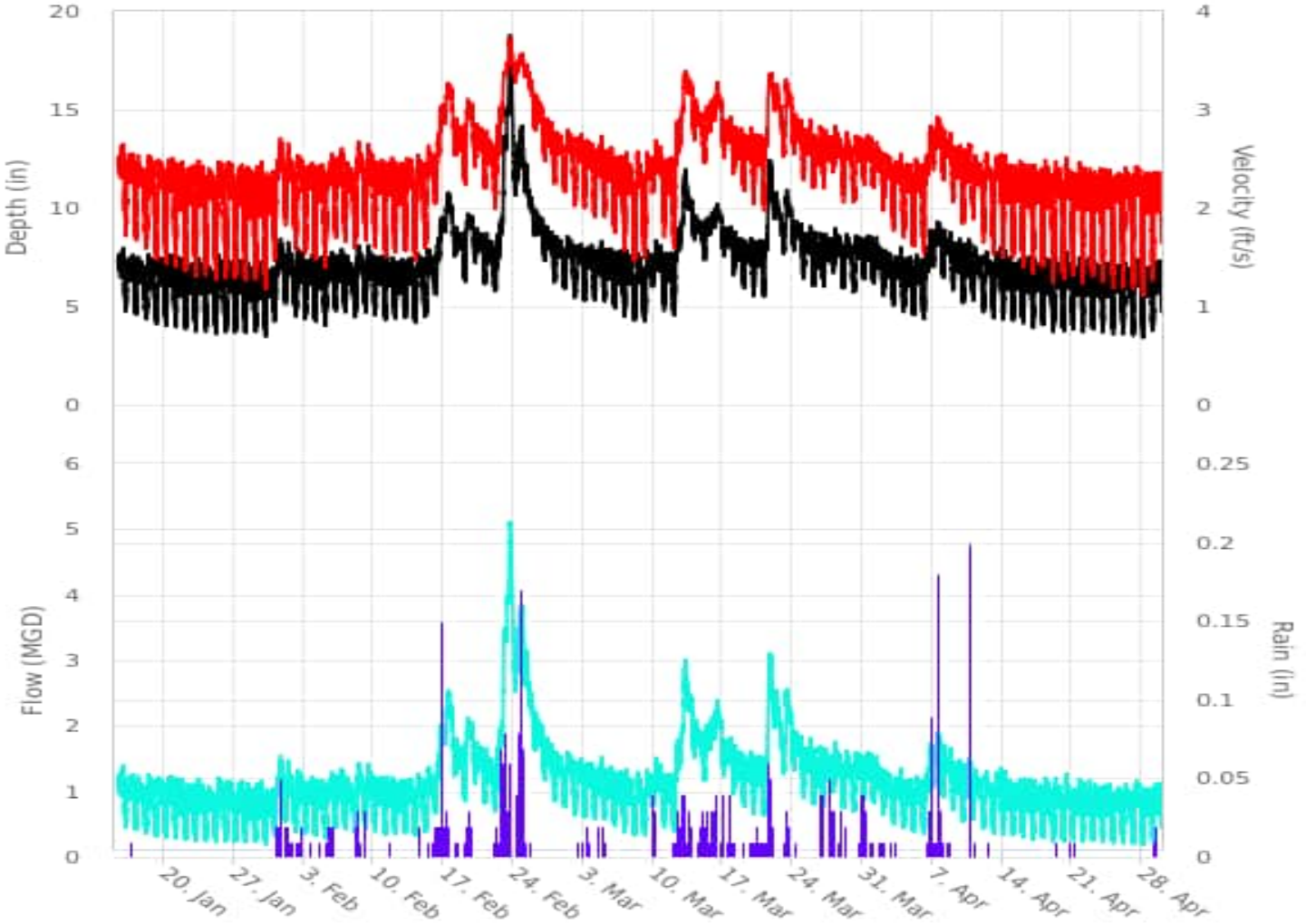
Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL





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Scattergraph Report

CAM_51123

Flow Monitor

CAM_51123

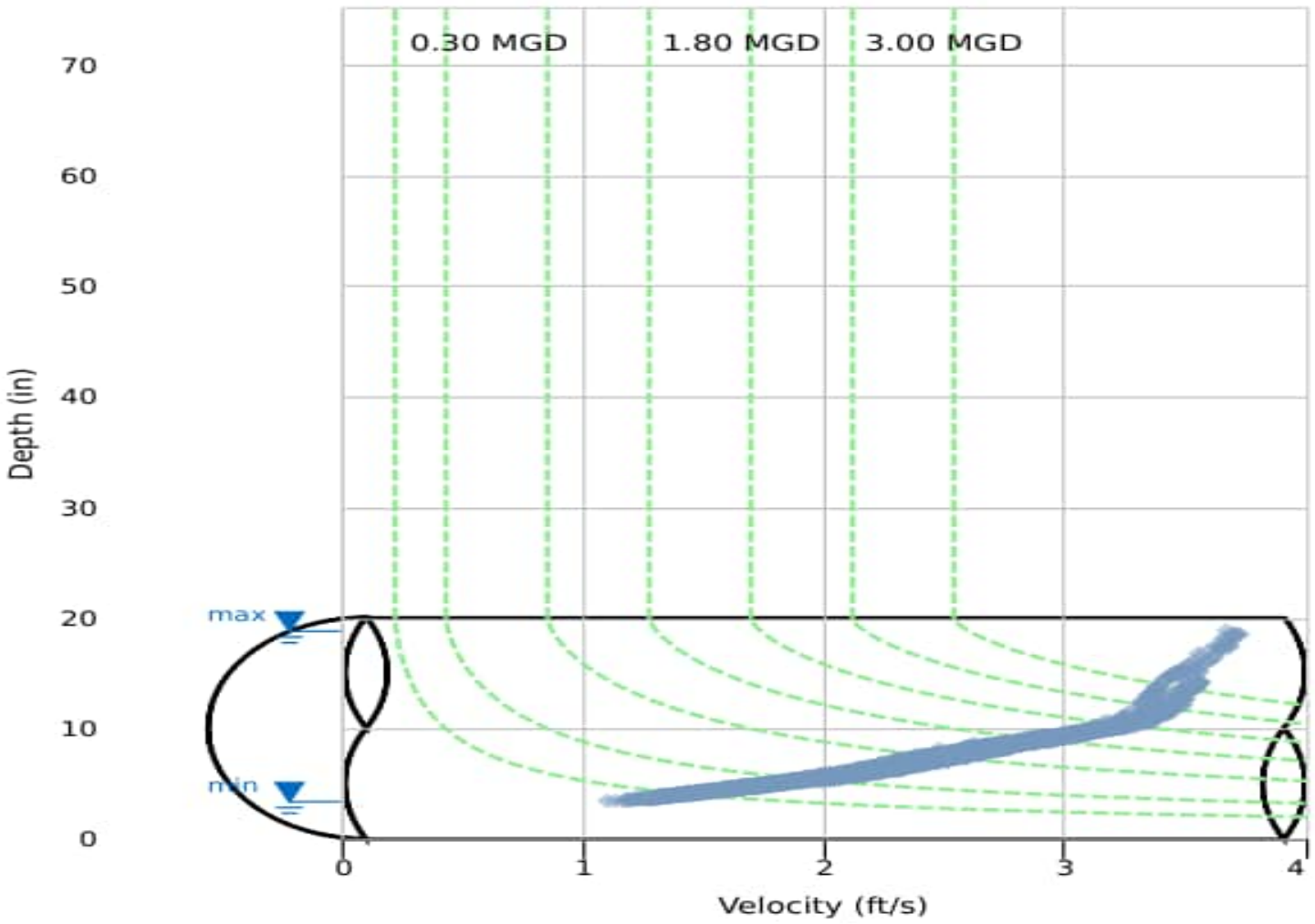
Pipe Height
20.00
in

Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL - VFINAL
Iso-Q™
Min-Max Depth



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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_51123 Pipe: Elliptical (20 in H x 20.13 in W), Silt0.00 in

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/15/2025	23:50	5.80	21:30	8.39	7.16	23:50	2.17	21:30	2.69	2.45	23:50	0.742	21:30	1.522	1.123	0.710	-
01/16/2025	03:30	4.69	17:40	8.36	6.47	03:30	1.70	17:40	2.60	2.26	03:30	0.431	17:40	1.464	0.914	0.914	0.01
01/17/2025	04:30	4.46	09:15	7.96	6.27	04:30	1.62	09:15	2.59	2.21	04:30	0.383	09:15	1.367	0.858	0.858	-
01/18/2025	03:35	4.21	09:55	7.89	6.14	03:35	1.52	19:00	2.59	2.16	03:35	0.330	19:00	1.330	0.825	0.825	-
01/19/2025	05:05	4.01	10:00	7.93	6.07	05:05	1.44	10:00	2.57	2.12	05:05	0.292	10:00	1.348	0.802	0.802	-
01/20/2025	04:35	3.95	17:50	8.08	6.12	04:35	1.41	19:35	2.57	2.13	04:35	0.280	10:00	1.363	0.812	0.812	-
01/21/2025	05:25	3.91	20:45	8.03	5.89	05:25	1.39	20:45	2.54	2.07	05:25	0.271	20:45	1.352	0.749	0.749	-
01/22/2025	04:00	3.72	08:15	7.89	5.84	03:10	1.31	20:55	2.51	2.05	04:00	0.240	20:55	1.285	0.738	0.738	-
01/23/2025	04:05	3.64	21:00	7.78	5.80	04:05	1.27	12:20	2.50	2.05	04:05	0.224	21:00	1.257	0.728	0.728	-
01/24/2025	04:10	3.64	11:05	7.86	5.75	04:10	1.28	11:05	2.52	2.04	04:10	0.226	11:05	1.303	0.715	0.715	-
01/25/2025	04:35	3.55	09:50	8.22	5.72	03:45	1.24	11:10	2.56	2.02	04:35	0.211	09:50	1.396	0.712	0.712	-
01/26/2025	05:00	3.58	10:40	7.91	5.81	05:00	1.24	11:15	2.57	2.04	05:00	0.214	10:40	1.323	0.739	0.739	-
01/27/2025	02:40	3.65	18:55	8.00	5.77	02:40	1.26	18:55	2.56	2.03	02:40	0.223	18:55	1.359	0.719	0.719	-
01/28/2025	02:45	3.53	08:45	7.64	5.62	02:45	1.24	08:50	2.45	1.98	02:45	0.209	08:45	1.215	0.679	0.679	-
01/29/2025	04:00	3.61	19:45	7.87	5.65	02:30	1.23	19:45	2.54	1.98	02:30	0.216	19:45	1.321	0.681	0.681	-
01/30/2025	03:40	3.44	09:10	7.52	5.58	03:35	1.17	08:10	2.44	1.96	03:40	0.191	09:10	1.175	0.665	0.665	-
01/31/2025	00:55	4.02	18:35	8.72	6.76	00:55	1.39	16:20	2.74	2.29	00:55	0.283	18:35	1.618	1.008	1.008	0.60
02/01/2025	04:10	5.01	10:20	8.59	6.63	04:05	1.79	10:20	2.74	2.28	04:05	0.499	10:20	1.599	0.952	0.952	0.12
02/02/2025	05:45	4.47	12:50	8.36	6.47	05:45	1.55	10:45	2.61	2.20	05:45	0.367	12:50	1.442	0.906	0.906	0.07
02/03/2025	03:15	4.30	19:40	8.08	6.25	04:15	1.50	21:30	2.64	2.15	04:15	0.338	19:40	1.372	0.838	0.838	0.02
02/04/2025	04:40	4.08	08:20	8.08	6.03	03:55	1.43	08:20	2.54	2.09	04:40	0.298	08:20	1.361	0.779	0.779	0.01
02/05/2025	03:55	3.97	20:15	7.96	6.28	04:55	1.38	20:45	2.58	2.15	03:55	0.278	20:15	1.356	0.857	0.857	0.19
02/06/2025	04:05	4.70	19:15	8.20	6.49	04:50	1.67	19:55	2.71	2.24	04:50	0.426	19:15	1.436	0.912	0.912	-
02/07/2025	04:20	4.62	18:05	8.12	6.18	03:30	1.64	18:05	2.56	2.17	04:20	0.408	18:05	1.382	0.825	0.825	-
02/08/2025	03:25	4.41	10:25	8.28	6.59	03:25	1.54	11:25	2.70	2.26	03:25	0.358	10:25	1.482	0.955	0.955	0.25
02/09/2025	04:10	4.62	11:35	8.31	6.60	04:10	1.63	11:00	2.69	2.27	04:10	0.405	11:05	1.478	0.953	0.953	0.05
02/10/2025	03:45	4.52	22:30	8.01	6.33	04:10	1.59	19:40	2.51	2.18	03:40	0.385	22:30	1.329	0.861	0.861	-
02/11/2025	04:25	4.23	19:40	7.90	6.18	04:25	1.48	20:45	2.56	2.14	04:25	0.323	19:40	1.333	0.822	0.822	0.01
02/12/2025	04:10	4.27	07:30	7.92	6.12	04:55	1.50	07:25	2.58	2.13	04:10	0.338	07:25	1.350	0.806	0.806	-
02/13/2025	04:20	4.32	19:55	7.86	6.20	04:20	1.52	09:20	2.54	2.16	04:20	0.342	19:55	1.303	0.835	0.835	-
02/14/2025	05:15	4.09	10:10	8.06	6.15	05:15	1.43	11:05	2.58	2.14	05:15	0.297	11:05	1.310	0.825	0.825	0.07
02/15/2025	04:15	4.40	10:50	8.30	6.46	04:15	1.58	12:00	2.69	2.24	04:15	0.366	12:00	1.485	0.921	0.921	0.09
02/16/2025	03:30	5.49	20:45	9.65	7.62	05:25	2.00	19:50	3.09	2.56	03:30	0.637	20:45	2.066	1.317	1.317	0.77
02/17/2025	23:15	8.39	10:25	11.12	9.70	23:15	2.79	16:55	3.31	3.09	23:15	1.578	10:25	2.661	2.116	2.116	0.39
02/18/2025	23:40	7.27	08:10	9.37	8.28	23:50	2.46	08:40	2.94	2.71	23:40	1.152	08:10	1.918	1.507	1.507	0.02
02/19/2025	04:45	6.10	09:45	9.95	8.58	04:45	2.21	10:20	3.14	2.80	04:45	0.810	09:45	2.192	1.658	1.658	0.40
02/20/2025	03:55	7.11	08:20	9.14	8.13	12:45	2.32	19:05	2.91	2.65	03:55	1.089	08:20	1.821	1.442	1.442	-
02/21/2025	05:15	6.03	08:30	9.07	7.41	05:15	2.17	08:30	2.84	2.49	05:15	0.783	08:30	1.779	1.199	1.199	0.04
02/22/2025	04:00	5.59	23:55	11.23	7.72	03:45	1.99	23:50	3.26	2.59	04:00	0.646	23:50	2.678	1.351	1.351	0.84
02/23/2025	00:05	10.43	16:05	19.05	15.02	00:05	3.26	15:45	3.74	3.50	00:05	2.439	16:30	5.203	3.978	3.978	1.07
02/24/2025	04:05	10.51	19:25	14.53	12.43	05:20	3.25	19:50	3.59	3.44	05:20	2.464	19:25	3.923	3.191	3.191	0.87
02/25/2025	23:55	9.12	00:20	12.77	10.78	23:40	2.97	00:30	3.50	3.33	23:40	1.874	00:20	3.349	2.601	2.601	0.03
02/26/2025	23:55	7.91	03:10	10.25	9.11	23:20	2.66	03:15	3.21	2.96	23:55	1.400	03:10	2.346	1.864	1.864	-
02/27/2025	04:25	6.91	08:10	9.35	8.19	04:25	2.39	08:40	2.95	2.70	04:25	1.041	08:10	1.914	1.481	1.481	-
02/28/2025	02:40	5.95	08:10	9.19	7.57	03:35	2.20	08:10	2.85	2.55	02:40	0.786	08:10	1.812	1.266	1.266	-
03/01/2025	04:20	5.79	09:20	8.95	7.36	05:25	2.14	11:30	2.83	2.51	03:15	0.733	09:20	1.729	1.206	1.206	-
03/02/2025	04:10	5.27	20:00	8.28	7.13	05:25	1.95	19:35	2.78	2.47	05:25	0.584	19:35	1.538	1.137	1.137	0.05
03/03/2025	03:25	5.12	19:25	8.40	6.91	03:25	1.95	08:10	2.75	2.41	03:25	0.559	19:25	1.547	1.066	1.066	0.07
03/04/2025	03:55	5.13	19:45	8.46	6.94	04:40	1.88	19:45	2.76	2.38	03:55	0.541	19:45	1.574	1.059	1.059	0.12
03/05/2025	04:30	5.15	20:05	8.27	6.77	04:30	1.87	20:10	2.66	2.34	04:30	0.540	20:05	1.470	1.004	1.004	0.01
03/06/2025	03:55	4.82	20:55	8.32	6.57	03:55	1.72	20:55	2.61	2.25	03:55	0.452	20:55	1.460	0.931	0.931	-
03/07/2025	03:30	4.38	08:30	8.15	6.34	03:30	1.53	08:35	2.58	2.17	03:30	0.351	08:30	1.402	0.857	0.857	-
03/08/2025	04:00	4.11	17:45	7.86	6.17	04:00	1.39	11:30	2.59	2.14	04:00	0.291	11:30	1.335	0.822	0.822	-
03/09/2025	04:15	3.93	11:05	8.22	6.30	04:15	1.37	11:05	2.64	2.18	04:15	0.269	11:05	1.451	0.869	0.869	0.20
03/10/2025	23:55	5.43	09:00	8.53	7.24	23:55	1.98	07:20	2.72	2.44	23:55	0.617	07:20	1.563	1.138	1.138	0.22
03/11/2025	02:55	4.69	16:45	8.03	6.51	03:00	1.68	20:40	2.59	2.24	03:00	0.425	20:40	1.369	0.915	0.915	0.02
03/12/2025	03:50	4.50	23:00	9.76	7.62	03:50	1.57	23:00	3.08	2.51	03:50	0.376	23:00	2.116	1.312	1.312	0.83
03/13/2025	23:25	8.95	07:05	12.07	10.44	23:25	2.91	07:10	3.40	3.24	23:25	1.788	07:05	3.041	2.437	2.437	0.49
03/14/2025	23:40	7.92	07:40	9.77	9.01	23:40	2.58	07:20	3.16	2.89	23:40	1.352	07:20	2.169	1.795	1.795	0.16
03/15/2025	04:40	7.19	22:05	10.06	8.76	03:25	2.39	22:10	3.15	2.81	04:40	1.113	22:05	2.245	1.695	1.695	0.60
03/16/2025	23:55	7.87	09:40	10.53	9.47	23:55	2.58	10:35	3.32	3.04	23:55	1.336	10:35	2.505	2.018	2.018	0.16
03/17/2025	23:35	7.19	07:15	9.24	8.40	04:05	2.46	18:50	2.96	2.75	23:35	1.131	07:15	1.878	1.560	1.560	0.19
03/18/2025	23:50	6.16	07:10	8.86	7.77	23:50	2.22	07:10	2.84	2.61	23:50	0.825	07:10	1.725	1.335	1.335	0.02
03/19/2025	02:40	5.74	19:05	8.73	7.39	01:45	2.15	19:45	2.84	2.54	02:40	0.725	19:05	1.677	1.221	1.221	0.07
03/20/2025	03:30	5.47	19:45	8.61	7.24	02:20	2.01	18:45	2.78	2.47	02:20	0.635	19:45	1.622	1.161	1.161	0.11
03/21/2025	03:05	5.41	15:45	12.74	9.27	03:05	1.95	19:10	3.38	2.86	03:05	0.602	15:40	3.207	1.943	1.943	1.12
03/22/2025	23:55	8.30	09:00	11.00	9.75	23:55	2.69	11:10	3.29	3.07	23:55	1.498	09:00	2.618	2.112	2.112	-
03/23/2025	02:30	7.45	10:05	11.31	9.37	02:55	2.50	08:30	3.36	2.96	02:30	1.203	10:05	2.708	1.955	1.955	0.44
03/24/2025	23:20	7.24	07:40	9.54	8.59	23:55	2.46	07:40	2.99	2.75	23:20	1.142	07:40	1.995	1.606	1.606	0.01

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/25/2025	23:40	6.19	18:00	9.34	7.88	01:05	2.22	19:10	2.95	2.60	23:40	0.850	18:00	1.900	1.362	1.362	-
03/26/2025	02:45	5.80	06:45	9.16	7.56	00:35	2.14	20:30	2.88	2.55	02:45	0.730	20:25	1.776	1.266	1.266	0.20
03/27/2025	03:25	5.93	07:05	9.04	7.56	03:25	2.17	07:05	2.86	2.54	03:25	0.765	07:05	1.781	1.256	1.256	0.24
03/28/2025	23:55	6.20	06:50	9.39	7.83	23:55	2.26	06:50	2.92	2.59	23:55	0.848	06:50	1.909	1.340	1.340	0.17
03/29/2025	01:25	5.73	09:45	8.88	7.46	02:10	2.05	09:45	2.83	2.49	01:25	0.699	09:45	1.724	1.220	1.220	0.12
03/30/2025	02:25	5.57	17:20	8.76	7.39	04:10	2.02	17:25	2.77	2.47	02:25	0.654	17:20	1.649	1.195	1.195	0.23
03/31/2025	03:00	6.05	13:00	8.93	7.68	03:55	2.19	13:00	2.80	2.54	03:00	0.795	13:00	1.720	1.283	1.283	0.10
04/01/2025	23:55	5.76	10:30	8.75	7.25	23:30	2.07	10:35	2.71	2.43	23:55	0.705	10:35	1.614	1.137	1.137	0.03
04/02/2025	01:35	5.43	08:25	8.27	6.87	01:30	1.88	07:50	2.59	2.34	01:30	0.588	08:30	1.422	1.019	1.019	0.05
04/03/2025	02:55	4.97	19:35	8.09	6.56	02:50	1.76	19:35	2.60	2.26	02:55	0.484	19:35	1.399	0.925	0.925	0.02
04/04/2025	04:05	4.69	18:35	8.36	6.32	04:05	1.69	10:20	2.49	2.19	04:05	0.428	18:35	1.371	0.858	0.858	-
04/05/2025	03:45	4.41	08:10	8.43	6.22	03:45	1.54	08:15	2.61	2.15	03:45	0.356	08:10	1.479	0.833	0.833	-
04/06/2025	05:00	4.27	19:20	9.00	6.97	02:25	1.48	19:25	2.88	2.33	02:30	0.331	19:25	1.780	1.081	1.081	0.71
04/07/2025	03:35	6.81	11:15	9.59	8.28	03:35	2.37	11:15	2.99	2.67	03:35	1.010	11:15	2.010	1.488	1.488	0.37
04/08/2025	23:55	6.16	07:05	9.12	7.75	23:55	2.20	07:05	2.84	2.53	23:55	0.817	07:05	1.793	1.293	1.293	0.07
04/09/2025	02:30	5.66	17:30	8.69	7.15	23:15	2.01	19:50	2.67	2.39	23:15	0.666	17:35	1.539	1.101	1.101	-
04/10/2025	02:30	5.06	06:30	8.55	7.01	01:40	1.81	20:15	2.69	2.35	02:30	0.516	19:40	1.528	1.061	1.061	0.27
04/11/2025	02:30	5.10	07:05	8.11	6.76	02:30	1.82	07:40	2.57	2.29	02:30	0.519	07:05	1.370	0.978	0.978	0.01
04/12/2025	04:00	4.62	09:40	8.21	6.51	04:00	1.63	09:55	2.65	2.22	04:00	0.403	09:40	1.409	0.912	0.912	0.01
04/13/2025	03:30	4.34	20:15	8.25	6.44	03:30	1.50	19:20	2.61	2.20	03:30	0.341	19:20	1.428	0.898	0.898	-
04/14/2025	03:15	4.26	07:50	8.82	6.25	03:15	1.46	07:50	2.74	2.15	03:15	0.323	07:50	1.654	0.839	0.839	-
04/15/2025	02:30	4.12	06:10	7.98	6.10	02:30	1.44	19:45	2.52	2.11	02:30	0.303	06:10	1.293	0.796	0.796	-
04/16/2025	02:20	4.01	18:40	7.96	6.06	03:10	1.36	06:55	2.50	2.10	02:20	0.279	18:40	1.293	0.786	0.786	-
04/17/2025	03:50	3.81	06:45	7.84	5.98	03:45	1.31	06:45	2.46	2.07	03:45	0.248	06:45	1.271	0.764	0.764	-
04/18/2025	02:00	3.84	07:40	8.08	5.88	02:00	1.31	09:40	2.57	2.05	02:00	0.250	07:45	1.368	0.737	0.737	-
04/19/2025	02:50	3.60	11:25	7.81	5.85	02:50	1.21	09:50	2.49	2.03	02:50	0.210	11:25	1.253	0.733	0.733	0.01
04/20/2025	04:50	3.71	11:20	7.89	5.96	04:50	1.27	11:25	2.53	2.06	04:50	0.230	11:20	1.316	0.769	0.769	0.05
04/21/2025	03:00	3.64	17:30	7.90	5.82	03:00	1.24	17:30	2.50	2.03	03:00	0.219	17:30	1.301	0.724	0.724	0.02
04/22/2025	02:55	3.56	10:55	7.73	5.75	02:55	1.18	20:45	2.45	2.01	02:55	0.202	10:55	1.241	0.707	0.707	-
04/23/2025	02:15	3.58	19:55	7.83	5.71	02:15	1.21	20:00	2.49	1.99	02:15	0.208	20:00	1.279	0.693	0.693	-
04/24/2025	02:15	3.44	19:50	7.87	5.69	02:15	1.15	19:50	2.47	1.99	02:15	0.186	19:50	1.279	0.690	0.690	-
04/25/2025	03:25	3.51	18:25	7.41	5.68	03:25	1.16	07:45	2.41	1.99	03:25	0.195	17:05	1.137	0.686	0.686	-
04/26/2025	02:40	3.49	08:05	7.89	5.72	02:40	1.16	10:00	2.44	1.99	02:40	0.193	08:10	1.240	0.701	0.701	-
04/27/2025	03:40	3.41	11:00	7.70	5.83	03:40	1.13	09:35	2.47	2.01	03:40	0.182	11:00	1.230	0.732	0.732	-
04/28/2025	03:45	3.27	08:55	7.48	5.68	03:45	1.07	08:55	2.38	1.97	03:45	0.162	08:55	1.156	0.686	0.686	-
04/29/2025	01:50	3.54	18:50	8.02	5.78	01:50	1.17	18:55	2.49	2.00	01:50	0.199	18:55	1.314	0.706	0.706	0.13

01/15/2025 00:00 - 04/29/2025 23:59

	DFINAL (in)	VFINAL (ft/s)	QFINAL (MGD - Total MG)	RAIN FINAL (in)
Total			118.475	13.62
Average	7.07	2.37	1.132	

CAM_52167

Site Commentary

SITE INFORMATION

Pipe	Elliptical (18.13 in H x 18.13 in W)
Silt	0.00 (in)

OBSERVATIONS

Surcharge conditions were not experienced. Review of the scattergraph shows that free-flow conditions were maintained throughout the study.

Average flow depth, velocity, and quantity data observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025**, along with observed minimum and maximum data, are provided in the following table.

Observed Flow Conditions			
Item	**DFINAL (in)**	**VFINAL (ft/s)**	**QFINAL (MGD - Total MG)**
Average	1.63	3.33	0.221
Minimum	0.54	0.43	0.006
Maximum	5.26	5.50	1.536
Min Time	01/22/2025 04:45:00	04/22/2025 03:30:00	01/22/2025 04:45:00
Max Time	02/18/2025 09:55:00	02/18/2025 09:55:00	02/18/2025 09:55:00

Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Values in the graphical reports are based on the fifteen minutes average and values in the Observed Flow Conditions and tabular report are based on the five-minute average.

DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
DFINAL (in)	100
VFINAL (ft/s)	100
QFINAL (MGD - Total MG)	100

Camas.Carollo.TFM.WA24		Site Name
Flow Monitoring Site Report		CAM_52167

Site Address /Location:	SE Dallas St and SE 3rd Ave, Camas, WA 98607			Monitor Series	Location Type
				TRITON+	Temporary
Site Access Details:	On Road	Latitude:	45.5833078	Pipe Size (H x W)	Pipe Shape
		Longitude:	-122.4001589	18.13 X 18.13	Circular



Manhole #	System Characteristics
52167	Industrial
Access	Traffic
Drive	None







ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23116.11.325

Installation Information

Installation Date:	Installation Type:
Tuesday, January 14, 2025	Doppler Standard Ring and Crank
Monitoring Location (Sensors):	Monitor Location:
Upstream 0-5 FT	Manhole
Sensors / Devices:	Pressure Sensor Range (psi)
Peak Combo (CS4), Smart Depth (CS5)	0 - 5 psi

Installation Confirmation:

Time	
2:43:00 PM	
Depth of Flow (Wet DOF) (in)	
1.25	
CS58 Physical Offset (in)	Measurement Confidence (in)
1.38	0.25"
Peak Velocity (fps)	Velocity Sensor Offset (in)
2.82	N/A
Silt (in)	Silt Type
0	

Manhole / Pipe Information:

Manhole Depth (Approx. FT):	Manhole Configuration
17.5'	Single
Manhole Material:	Manhole Condition:
Concrete	Good
Manhole Opening Diameter (in)	Manhole Diameter (Approx.):
24	26
Manhole Cover	Manhole Frame
Steel	Normal
Active Connections	Air Quality:
No	Normal
Pipe Material	Pipe Condition:
Hollow Tile	Good

Communication Information:

Communication Type	Antenna Location
Wireless	Manhole Pick / Vent Hole

Additional Site Info. / Comments:

Additional Photos

Monitoring Point Inlet	Outlet	NW inlet connection
		
Top Down	**Location**	**Map**
		
	KEY	
	Flow Direction Monitoring Point	

Hydrograph Report

CAM_52167

Flow Monitor

CAM_52167

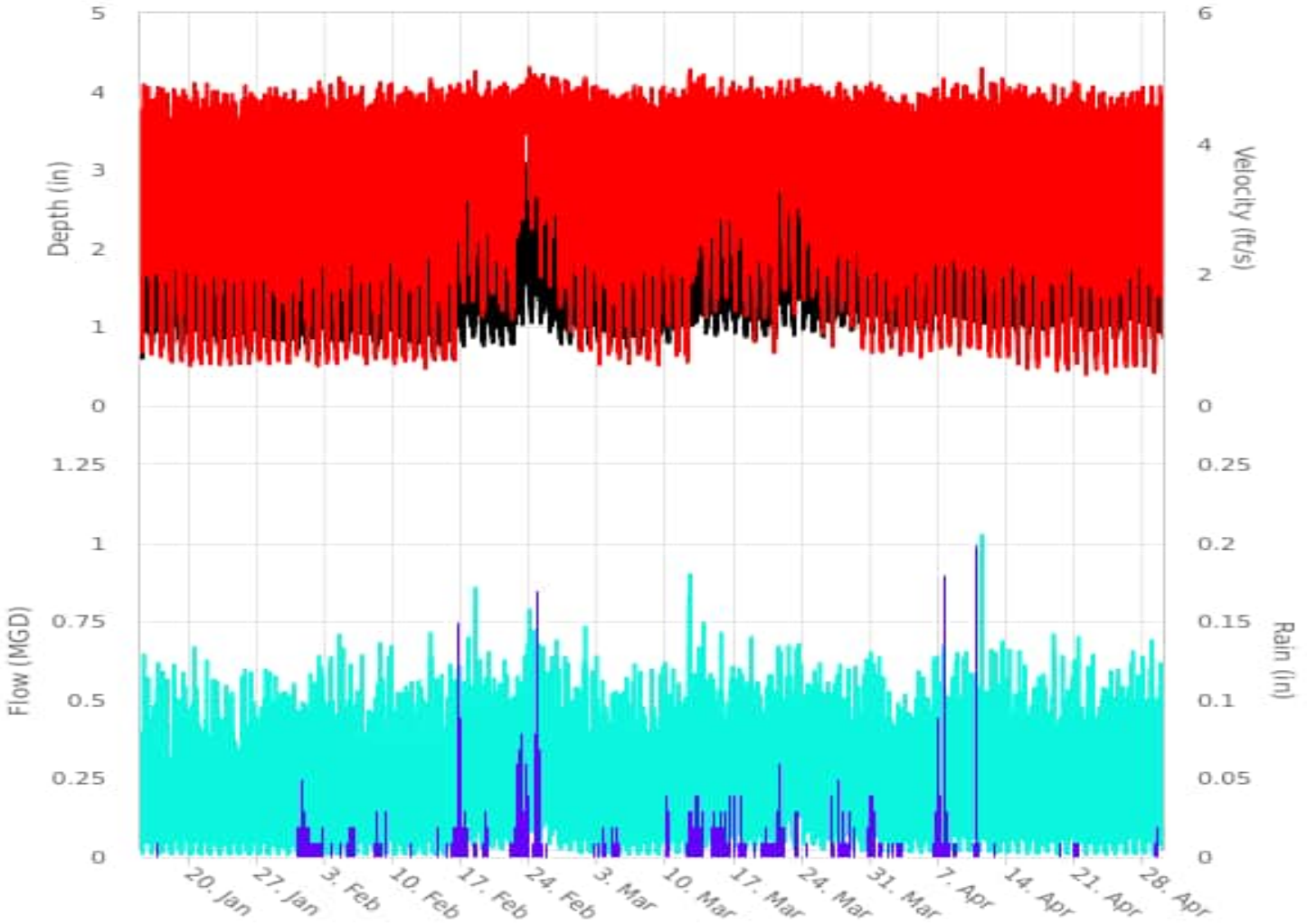
Pipe Height
18.13
in

Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL



846 Industry Dr.
Tukwila, WA 98188

800-633-7246
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Scattergraph Report

CAM_52167

Flow Monitor

CAM_52167

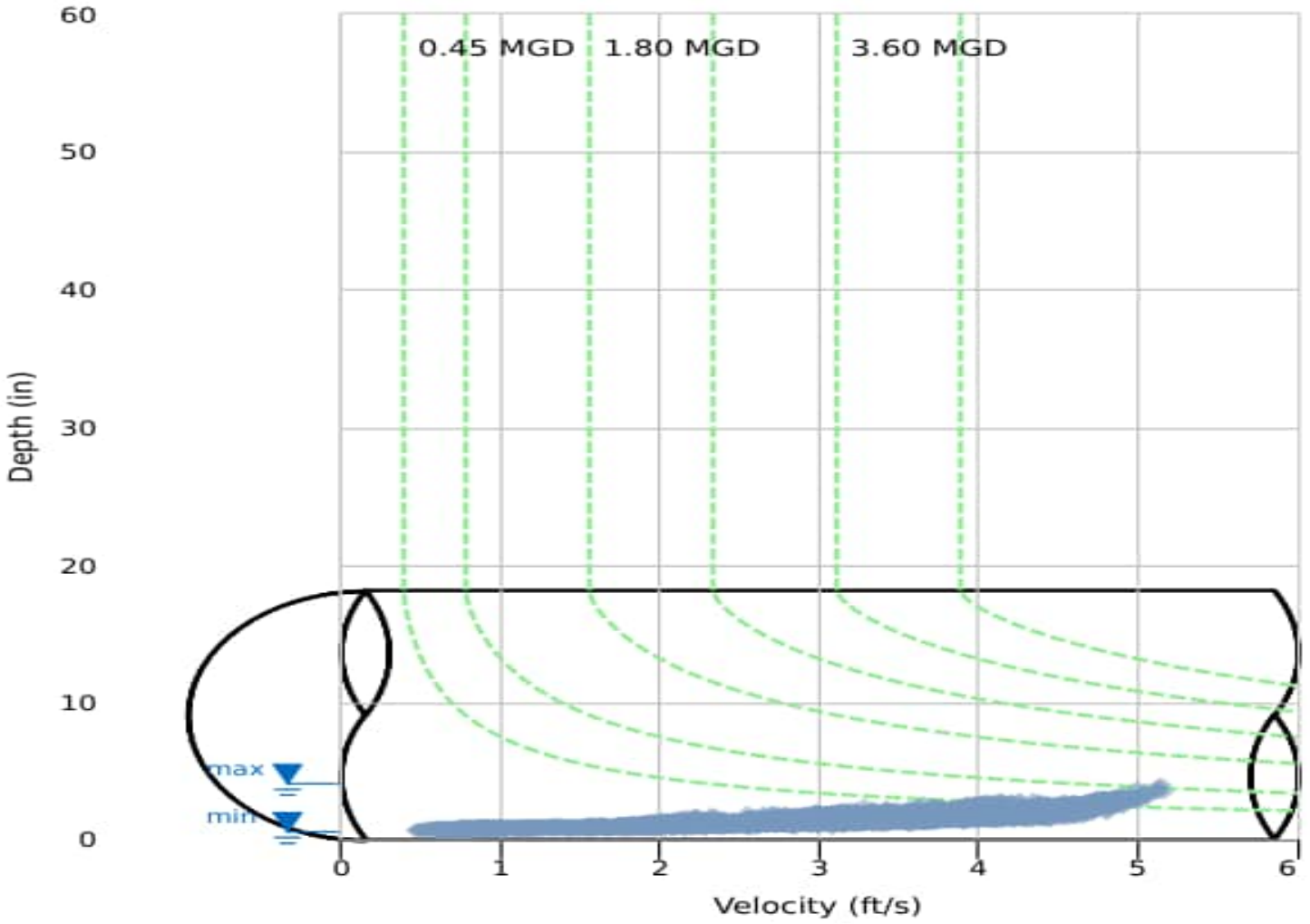
Pipe Height
18.13
in

Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL - VFINAL
Iso-Q™
Min-Max Depth



846 Industry Dr.
Tukwila, WA 98188

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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_52167 Pipe: Elliptical (18.13 in H x 18.13 in W), Silt0.00 in

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/15/2025	04:55	0.55	08:30	3.97	1.60	05:45	0.66	08:30	5.21	3.36	04:55	0.008	08:30	0.981	0.214	0.214	-
01/16/2025	03:55	0.63	08:05	4.32	1.59	04:50	0.74	20:00	5.28	3.33	03:55	0.009	08:05	1.118	0.213	0.213	0.01
01/17/2025	06:00	0.68	20:05	4.16	1.51	03:45	0.73	20:05	5.28	3.15	06:00	0.011	20:05	1.057	0.189	0.189	-
01/18/2025	04:30	0.65	10:15	4.26	1.53	06:50	0.63	10:15	5.28	3.13	04:30	0.009	10:15	1.096	0.197	0.197	-
01/19/2025	04:15	0.70	09:25	4.17	1.56	06:40	0.64	16:40	5.26	3.20	04:15	0.010	11:30	1.046	0.203	0.203	-
01/20/2025	03:55	0.59	13:00	4.22	1.53	04:00	0.58	13:00	5.30	3.15	03:55	0.007	13:00	1.084	0.198	0.198	-
01/21/2025	02:50	0.54	18:10	4.14	1.47	05:25	0.61	18:10	5.24	3.09	05:25	0.007	18:10	1.044	0.182	0.182	-
01/22/2025	04:45	0.54	23:35	3.98	1.48	04:45	0.58	12:00	5.15	3.13	04:45	0.006	23:35	0.965	0.186	0.186	-
01/23/2025	05:00	0.55	21:25	4.33	1.45	05:00	0.59	21:25	5.31	3.04	05:00	0.006	21:25	1.129	0.179	0.179	-
01/24/2025	03:45	0.61	08:55	3.95	1.45	05:30	0.60	08:55	5.10	3.09	05:30	0.008	08:55	0.951	0.179	0.179	-
01/25/2025	05:45	0.66	10:20	4.19	1.48	03:30	0.62	10:20	5.31	3.08	04:55	0.009	10:20	1.076	0.189	0.189	-
01/26/2025	05:05	0.63	14:25	4.18	1.46	03:45	0.60	10:35	5.29	3.09	05:15	0.008	14:25	1.064	0.184	0.184	-
01/27/2025	01:25	0.65	21:20	4.06	1.49	04:40	0.66	21:20	5.33	3.08	01:30	0.010	21:20	1.033	0.191	0.191	-
01/28/2025	02:00	0.65	08:00	4.06	1.44	05:35	0.63	08:00	5.26	2.96	03:25	0.009	08:00	1.018	0.178	0.178	-
01/29/2025	04:15	0.65	10:05	4.15	1.41	04:00	0.66	10:05	5.26	2.92	04:10	0.009	10:05	1.051	0.171	0.171	-
01/30/2025	03:55	0.57	20:25	3.97	1.41	05:40	0.57	20:25	5.19	2.94	04:00	0.007	20:25	0.976	0.171	0.171	-
01/31/2025	01:35	0.68	19:40	4.05	1.52	02:40	0.76	19:40	5.22	3.25	02:40	0.013	19:40	1.010	0.197	0.197	0.60
02/01/2025	06:45	0.68	21:45	3.97	1.49	05:45	0.63	19:35	5.18	3.04	05:45	0.010	21:45	0.971	0.187	0.187	0.12
02/02/2025	02:55	0.61	12:05	3.95	1.57	05:45	0.55	10:00	5.25	3.18	05:45	0.007	10:00	0.972	0.211	0.211	0.07
02/03/2025	05:30	0.62	13:20	4.03	1.46	04:00	0.59	13:20	5.14	3.03	04:00	0.008	13:20	0.988	0.181	0.181	0.02
02/04/2025	03:55	0.67	19:30	4.00	1.51	03:55	0.61	19:30	5.20	3.09	03:55	0.008	19:30	0.988	0.194	0.194	0.01
02/05/2025	04:50	0.60	14:05	3.61	1.48	04:35	0.69	17:55	5.09	3.09	05:00	0.008	14:05	0.831	0.188	0.188	0.19
02/06/2025	04:35	0.62	17:25	3.99	1.51	04:35	0.72	19:35	5.16	3.15	04:35	0.009	19:35	0.972	0.194	0.194	-
02/07/2025	03:25	0.59	12:25	3.81	1.44	04:55	0.60	09:55	5.13	2.99	04:55	0.008	12:25	0.906	0.175	0.175	-
02/08/2025	02:10	0.62	22:45	4.02	1.49	05:05	0.68	16:20	5.18	3.07	05:15	0.010	22:45	0.986	0.192	0.192	0.25
02/09/2025	02:30	0.66	18:15	4.05	1.58	05:20	0.62	18:15	5.29	3.27	05:20	0.009	18:15	1.023	0.210	0.210	0.05
02/10/2025	05:50	0.61	16:10	3.93	1.50	03:05	0.62	16:10	5.26	3.17	03:05	0.008	16:10	0.974	0.193	0.193	-
02/11/2025	02:20	0.62	19:55	3.94	1.48	05:10	0.65	19:55	5.20	3.13	02:45	0.009	19:55	0.964	0.188	0.188	0.01
02/12/2025	05:45	0.61	19:05	4.18	1.45	02:50	0.67	19:05	5.29	3.06	02:50	0.009	19:05	1.068	0.184	0.184	-
02/13/2025	06:00	0.64	19:50	4.14	1.48	05:50	0.55	19:50	5.29	3.17	06:00	0.007	19:50	1.054	0.191	0.191	-
02/14/2025	02:00	0.59	19:55	4.18	1.41	04:55	0.64	19:55	5.26	3.00	04:55	0.008	19:55	1.063	0.180	0.180	0.07
02/15/2025	03:25	0.58	19:55	4.17	1.41	05:05	0.56	19:55	5.28	3.11	05:05	0.007	19:55	1.064	0.178	0.178	0.09
02/16/2025	03:40	0.58	20:15	4.10	1.55	06:45	0.66	18:25	5.27	3.39	06:45	0.008	20:15	1.009	0.219	0.219	0.77
02/17/2025	04:40	0.70	07:50	4.25	1.74	04:00	1.03	07:50	5.35	3.80	04:00	0.016	07:50	1.108	0.262	0.262	0.39
02/18/2025	03:35	0.79	09:55	5.26	1.80	04:45	1.22	09:55	5.50	3.78	04:45	0.022	09:55	1.536	0.281	0.281	0.02
02/19/2025	05:25	0.70	19:45	4.44	1.75	04:10	0.93	19:45	5.40	3.84	05:25	0.015	19:45	1.190	0.271	0.271	0.40
02/20/2025	03:30	0.70	16:55	4.22	1.69	04:45	1.02	08:05	5.36	3.72	04:45	0.016	16:55	1.073	0.252	0.252	-
02/21/2025	05:15	0.69	08:40	4.15	1.65	04:35	0.91	15:35	5.36	3.59	04:35	0.013	08:40	1.017	0.239	0.239	0.04
02/22/2025	04:20	0.65	16:55	3.98	1.66	05:05	0.78	19:35	5.13	3.65	05:05	0.011	16:55	0.956	0.241	0.241	0.84
02/23/2025	05:25	0.92	15:55	4.46	2.16	02:35	1.93	10:50	5.39	4.46	04:55	0.047	15:55	1.157	0.385	0.385	1.07
02/24/2025	06:05	0.90	19:45	4.29	2.03	05:40	1.71	08:35	5.42	4.30	05:40	0.039	08:35	1.122	0.344	0.344	0.87
02/25/2025	03:45	0.90	13:10	4.31	1.91	03:45	1.64	13:10	5.44	4.17	03:45	0.035	13:10	1.146	0.304	0.304	0.03
02/26/2025	05:45	0.80	21:05	4.18	1.82	00:55	1.61	06:55	5.25	3.95	00:55	0.031	21:05	1.041	0.282	0.282	-
02/27/2025	05:45	0.70	23:15	3.98	1.69	03:50	0.85	22:00	5.23	3.69	03:50	0.014	22:00	0.977	0.244	0.244	-
02/28/2025	04:05	0.70	15:40	3.43	1.62	03:25	0.86	15:40	5.07	3.61	03:25	0.014	15:40	0.773	0.222	0.222	-
03/01/2025	05:40	0.69	11:25	4.47	1.60	05:40	0.73	11:25	5.37	3.52	05:40	0.010	11:25	1.191	0.221	0.221	-
03/02/2025	05:40	0.71	19:45	4.32	1.64	04:50	0.70	11:00	5.22	3.50	04:50	0.011	19:45	1.098	0.230	0.230	0.05
03/03/2025	04:00	0.67	11:45	4.11	1.59	03:55	0.57	11:45	5.24	3.46	03:55	0.008	11:45	1.035	0.213	0.213	0.07
03/04/2025	05:20	0.68	21:05	4.23	1.55	02:15	0.70	21:05	5.30	3.35	02:15	0.011	21:05	1.088	0.207	0.207	0.12
03/05/2025	03:55	0.65	08:10	4.05	1.54	03:55	0.67	19:50	5.31	3.29	03:55	0.009	08:10	1.019	0.207	0.207	0.01
03/06/2025	04:25	0.62	22:10	4.19	1.52	04:20	0.63	18:15	5.28	3.23	04:25	0.008	22:10	1.067	0.201	0.201	-
03/07/2025	04:00	0.64	08:30	4.09	1.47	01:50	0.69	08:30	5.20	3.10	01:50	0.009	08:30	1.020	0.185	0.185	-
03/08/2025	04:10	0.64	12:00	3.85	1.48	03:00	0.62	09:10	5.21	3.12	03:00	0.009	12:00	0.920	0.185	0.185	-
03/09/2025	04:25	0.65	18:00	4.24	1.58	03:00	0.59	20:35	5.34	3.20	03:00	0.008	10:50	1.090	0.211	0.211	0.20
03/10/2025	05:15	0.79	17:15	4.14	1.59	06:10	1.01	17:15	5.26	3.29	06:10	0.018	17:15	1.046	0.209	0.209	0.22
03/11/2025	02:10	0.71	07:10	3.79	1.54	02:10	0.75	20:45	5.14	3.22	02:10	0.011	19:20	0.877	0.196	0.196	0.02
03/12/2025	03:55	0.70	09:45	4.33	1.82	03:55	0.65	09:45	5.43	3.58	03:55	0.010	09:45	1.154	0.281	0.281	0.83
03/13/2025	04:50	0.92	14:35	4.42	1.83	04:45	1.41	14:35	5.41	3.83	04:50	0.032	14:35	1.183	0.279	0.279	0.49
03/14/2025	01:20	0.80	21:05	4.19	1.80	01:20	0.90	21:05	5.33	3.71	01:20	0.016	21:05	1.080	0.270	0.270	0.16
03/15/2025	04:45	0.85	15:50	4.19	1.78	04:45	0.86	15:50	5.27	3.70	04:45	0.017	15:50	1.070	0.264	0.264	0.60
03/16/2025	06:20	0.81	18:35	4.35	1.85	04:05	0.98	18:35	5.37	3.79	04:05	0.018	18:35	1.148	0.284	0.284	0.16
03/17/2025	02:00	0.83	19:20	4.36	1.77	02:00	0.99	19:20	5.33	3.67	02:00	0.019	19:20	1.144	0.261	0.261	0.19
03/18/2025	03:40	0.77	18:30	4.20	1.72	03:05	0.90	18:30	5.28	3.58	03:40	0.017	18:30	1.074	0.246	0.246	0.02
03/19/2025	03:20	0.79	13:10	4.17	1.67	01:55	0.82	13:10	5.37	3.50	01:55	0.016	13:10	1.083	0.232	0.232	0.07
03/20/2025	02:50	0.79	19:15	4.12	1.65	02:50	0.70	13:20	5.32	3.47	02:50	0.012	19:15	1.029	0.228	0.228	0.11
03/21/2025	02:15	0.78	15:45	4.33	1.82	04:05	0.77	15:45	5.35	3.76	04:05	0.014	15:45	1.137	0.277	0.277	1.12
03/22/2025	23:20	0.94	13:30	4.22	1.89	03:40	1.44	20:55	5.32	3.92	03:40	0.035	13:30	1.072	0.295	0.295	-
03/23/2025	02:10	0.83	15:15	4.36	1.88	02:10	0.96	15:15	5.39	3.92	02:10	0.018	15:15	1.156	0.295	0.295	0.44
03/24/2025	00:40	0.89	13:50	4.13	1.80	01:45	1.32	04:30	5.18	3.77	01:45	0.029	13:50	1.010	0.268	0.268	0.01

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/25/2025	03:55	0.86	19:00	4.30	1.76	23:50	1.09	19:00	5.26	3.67	23:50	0.023	19:00	1.105	0.254	0.254	-
03/26/2025	01:10	0.83	06:55	4.34	1.73	03:10	0.80	10:05	5.28	3.58	03:10	0.016	06:55	1.111	0.245	0.245	0.20
03/27/2025	00:30	0.85	23:40	3.85	1.73	01:55	0.79	06:35	5.27	3.54	01:55	0.016	12:15	0.929	0.242	0.242	0.24
03/28/2025	03:05	0.91	12:25	4.30	1.74	01:40	1.09	15:10	5.34	3.55	05:05	0.025	12:25	1.117	0.247	0.247	0.17
03/29/2025	01:45	0.89	19:25	4.06	1.74	01:45	0.87	19:25	5.18	3.50	01:45	0.018	19:25	1.003	0.243	0.243	0.12
03/30/2025	01:00	0.88	11:45	4.29	1.73	02:30	0.76	11:45	5.26	3.43	02:30	0.016	11:45	1.104	0.240	0.240	0.23
03/31/2025	04:30	0.87	07:15	4.01	1.71	04:30	0.75	07:15	5.24	3.35	04:30	0.015	07:15	0.997	0.231	0.231	0.10
04/01/2025	04:35	0.87	21:05	4.20	1.63	03:40	0.79	21:05	5.20	3.25	01:10	0.016	21:05	1.056	0.212	0.212	0.03
04/02/2025	03:45	0.85	20:50	4.04	1.59	03:45	0.84	20:50	5.15	3.17	03:45	0.017	20:50	0.991	0.199	0.199	0.05
04/03/2025	03:00	0.82	13:05	3.65	1.58	05:00	0.71	18:15	5.02	3.09	01:55	0.014	13:05	0.831	0.194	0.194	0.02
04/04/2025	03:35	0.75	21:30	4.15	1.55	03:35	0.68	23:10	5.20	3.07	03:35	0.011	21:30	1.041	0.189	0.189	-
04/05/2025	04:35	0.79	16:25	4.20	1.58	04:35	0.67	16:25	5.24	3.09	04:35	0.012	16:25	1.066	0.196	0.196	-
04/06/2025	03:15	0.85	10:45	4.21	1.73	04:15	0.82	16:20	5.30	3.44	03:15	0.016	16:20	1.079	0.238	0.238	0.71
04/07/2025	04:25	0.88	06:35	4.34	1.78	03:30	0.77	06:35	5.32	3.47	03:30	0.017	06:35	1.131	0.249	0.249	0.37
04/08/2025	05:00	0.91	16:40	4.40	1.74	03:30	0.76	16:40	5.36	3.44	03:30	0.017	16:40	1.163	0.241	0.241	0.07
04/09/2025	02:25	0.92	06:35	4.02	1.76	02:20	0.72	14:00	5.23	3.39	02:25	0.017	14:00	0.997	0.242	0.242	-
04/10/2025	01:35	0.87	12:00	4.13	1.71	04:05	0.72	12:00	5.24	3.35	03:15	0.016	12:00	1.039	0.228	0.228	0.27
04/11/2025	05:10	0.88	09:35	5.07	1.82	02:45	0.73	09:35	5.34	3.41	02:45	0.015	09:35	1.416	0.266	0.266	0.01
04/12/2025	03:40	0.85	08:05	4.30	1.67	05:40	0.73	18:45	5.31	3.33	02:45	0.015	08:05	1.109	0.224	0.224	0.01
04/13/2025	04:30	0.78	19:05	4.31	1.66	04:30	0.64	19:05	5.31	3.28	04:30	0.011	19:05	1.122	0.227	0.227	-
04/14/2025	02:25	0.78	19:10	4.26	1.63	02:25	0.71	19:10	5.27	3.28	02:25	0.012	19:10	1.093	0.217	0.217	-
04/15/2025	03:00	0.73	09:20	4.06	1.64	03:00	0.52	09:20	5.20	3.18	03:00	0.008	09:20	1.009	0.216	0.216	-
04/16/2025	02:55	0.72	18:45	3.92	1.58	02:55	0.55	18:45	5.10	3.08	02:55	0.008	18:45	0.942	0.196	0.196	-
04/17/2025	03:10	0.75	18:45	4.03	1.59	03:10	0.54	18:45	5.22	3.00	03:10	0.009	18:45	1.003	0.201	0.201	-
04/18/2025	04:55	0.87	21:45	4.25	1.61	01:50	0.75	21:45	5.29	3.03	01:50	0.015	21:45	1.093	0.199	0.199	-
04/19/2025	04:10	0.79	16:30	4.10	1.60	04:10	0.52	16:30	5.19	2.92	04:10	0.009	16:30	1.019	0.196	0.196	0.01
04/20/2025	05:10	0.73	21:20	4.29	1.65	05:10	0.53	21:20	5.27	3.07	05:10	0.008	21:20	1.102	0.214	0.214	0.05
04/21/2025	02:35	0.73	07:30	4.17	1.58	02:35	0.58	07:30	5.29	2.94	02:35	0.009	07:30	1.064	0.196	0.196	0.02
04/22/2025	03:30	0.68	20:20	4.40	1.60	03:30	0.43	20:20	5.26	2.99	03:30	0.006	20:20	1.141	0.201	0.201	-
04/23/2025	03:55	0.76	20:55	4.05	1.57	03:55	0.53	20:55	5.18	2.92	03:55	0.009	20:55	1.001	0.187	0.187	-
04/24/2025	03:35	0.65	06:20	4.10	1.61	03:35	0.47	06:20	5.18	2.93	03:35	0.006	06:20	1.017	0.200	0.200	-
04/25/2025	03:40	0.67	10:50	4.33	1.57	03:40	0.58	10:50	5.27	2.88	03:40	0.008	10:50	1.121	0.189	0.189	-
04/26/2025	05:10	0.78	21:15	4.33	1.62	05:10	0.57	21:15	5.27	2.98	05:10	0.010	21:15	1.120	0.202	0.202	-
04/27/2025	05:15	0.71	18:10	3.91	1.63	05:15	0.58	18:10	5.22	2.97	05:15	0.009	18:10	0.958	0.210	0.210	-
04/28/2025	03:05	0.75	20:15	4.35	1.57	03:05	0.55	20:15	5.31	2.97	03:05	0.009	20:15	1.136	0.194	0.194	-
04/29/2025	02:50	0.67	15:10	3.95	1.55	02:25	0.49	15:10	5.20	2.95	02:50	0.007	15:10	0.968	0.190	0.190	0.13

01/15/2025 00:00 - 04/29/2025 23:59

	DFINAL (in)	VFINAL (ft/s)	QFINAL (MGD - Total MG)	RAIN FINAL (in)
Total			23.166	13.62
Average	1.63	3.33	0.221	

CAM_81189

Site Commentary

SITE INFORMATION

Pipe	Elliptical (12.13 in H x 12.13 in W)
Silt	0.00 (in)

OBSERVATIONS

Surcharge conditions were not experienced. Review of the scattergraph shows that free-flow conditions were experienced during the study. Backwater conditions were observed.

Average flow depth, velocity, and quantity data observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025**, along with observed minimum and maximum data, are provided in the following table.

Observed Flow Conditions			
Item	**DFINAL (in)**	**VFINAL (ft/s)**	**QFINAL (MGD - Total MG)**
Average	2.07	1.91	0.117
Minimum	0.98	0.37	0.017
Maximum	4.16	2.85	0.295
Min Time	04/11/2025 02:50:00	02/21/2025 04:30:00	04/22/2025 02:20:00
Max Time	04/23/2025 08:25:00	04/01/2025 10:45:00	02/06/2025 15:30:00

Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Values in the graphical reports are based on the fifteen minutes average and values in the Observed Flow Conditions and tabular report are based on the five-minute average.

DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
DFINAL (in)	100
VFINAL (ft/s)	100
QFINAL (MGD - Total MG)	100

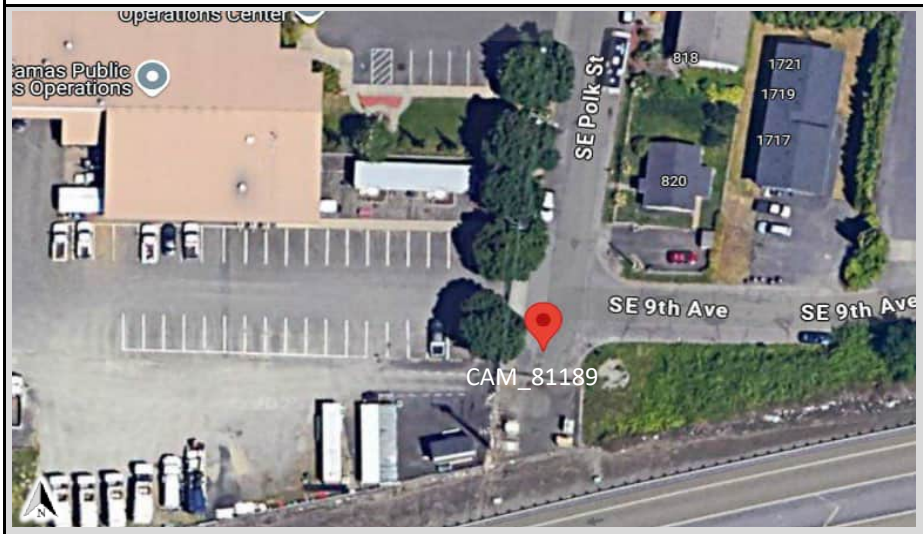
Camas.Carollo.TFM.WA24

Flow Monitoring Site Report

Site Name

CAM_81189

Site Address /Location:	820 SE Polk St, Camas, WA 98607			Monitor Series	Location Type
				TRITON+	Temporary
Site Access Details:	On Road	Latitude:	45.580146	Pipe Size (H x W)	Pipe Shape
		Longitude:	-122.39157	12.13 x 12.13	Circular



Manhole #	System Characteristics
81189	Residential
Access	Traffic
Drive	None







ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23116.11.325

Installation Information

Installation Date:	Installation Type:
Tuesday, January 14, 2025	Doppler Standard Ring and Crank
Monitoring Location (Sensors):	Monitor Location:
Upstream 0-5 FT	Manhole
Sensors / Devices:	Pressure Sensor Range (psi)
Peak Combo (CS4)	0 - 5 psi

Installation Confirmation:

Time	
10:17:00 AM	
Depth of Flow (Wet DOF) (in)	
2.50	
CS58 Physical Offset (in)	Measurement Confidence (in)
N/A	0.25"
Peak Velocity (fps)	Velocity Sensor Offset (in)
2.57	N/A
Silt (in)	Silt Type
0	

Manhole / Pipe Information:

Manhole Depth (Approx. FT):	Manhole Configuration
7.5	Single
Manhole Material:	Manhole Condition:
Concrete	Good
Manhole Opening Diameter (in)	Manhole Diameter (Approx.):
24	26
Manhole Cover	Manhole Frame
Steel	Normal
Active Connections	Air Quality:
Yes, Inside	Normal
Pipe Material	Pipe Condition:
Concrete	Good

Communication Information:

Communication Type	Antenna Location
Wireless	Manhole Pick / Vent Hole

Additional Site Info. / Comments:

Additional Photos

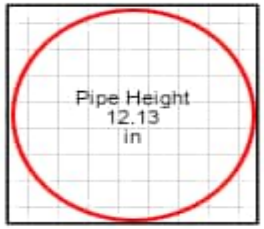
Monitoring Point Inlet	Outlet	West connection
		
Top Down	**Location**	**Map**
		
East Connection	**KEY**	
	Flow Direction Monitoring Point	

Hydrograph Report

CAM_81189

Flow Monitor

CAM_81189



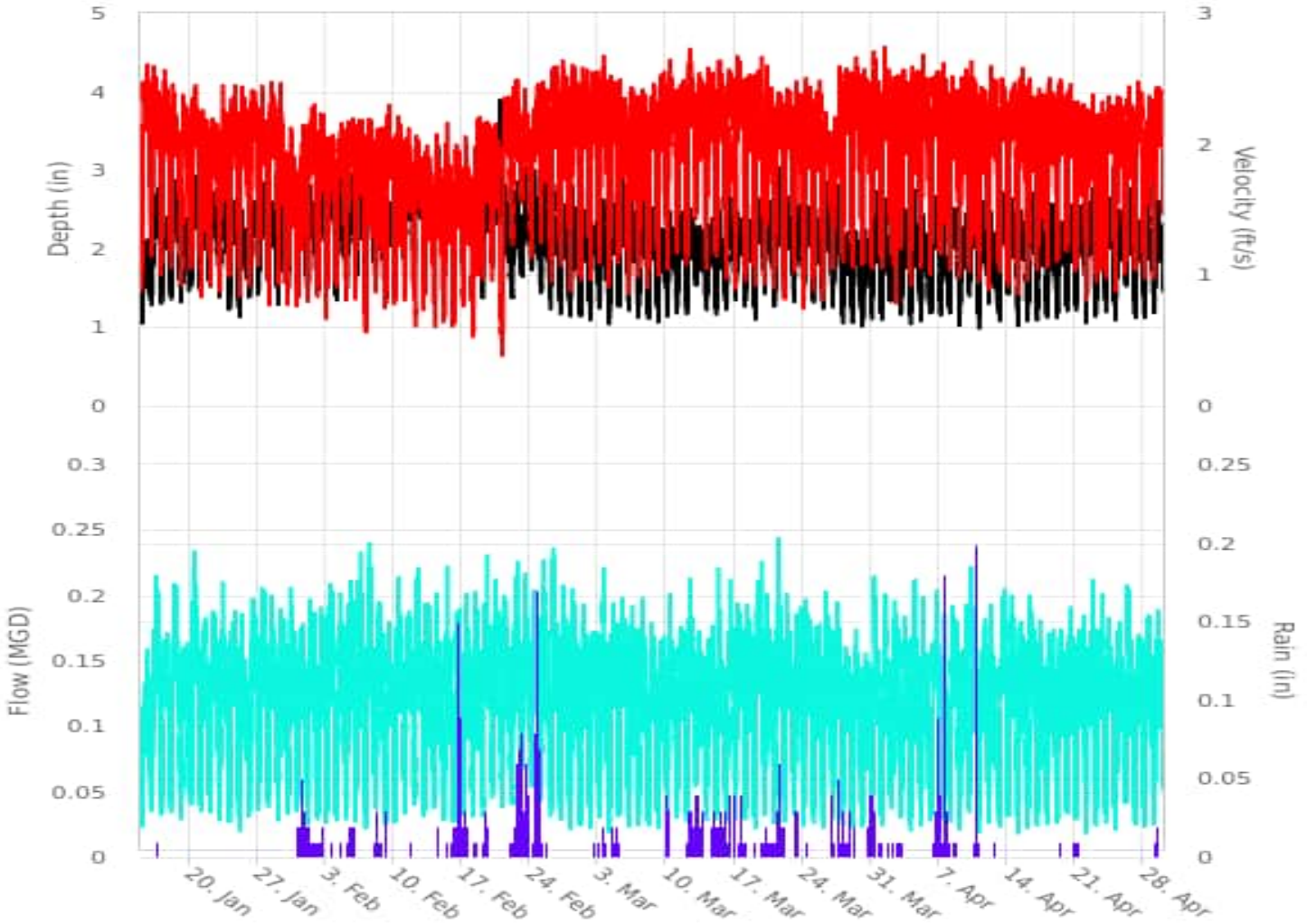
Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL

ADS ENVIRONMENTAL SERVICES



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Scattergraph Report

CAM_81189

Flow Monitor

CAM_81189

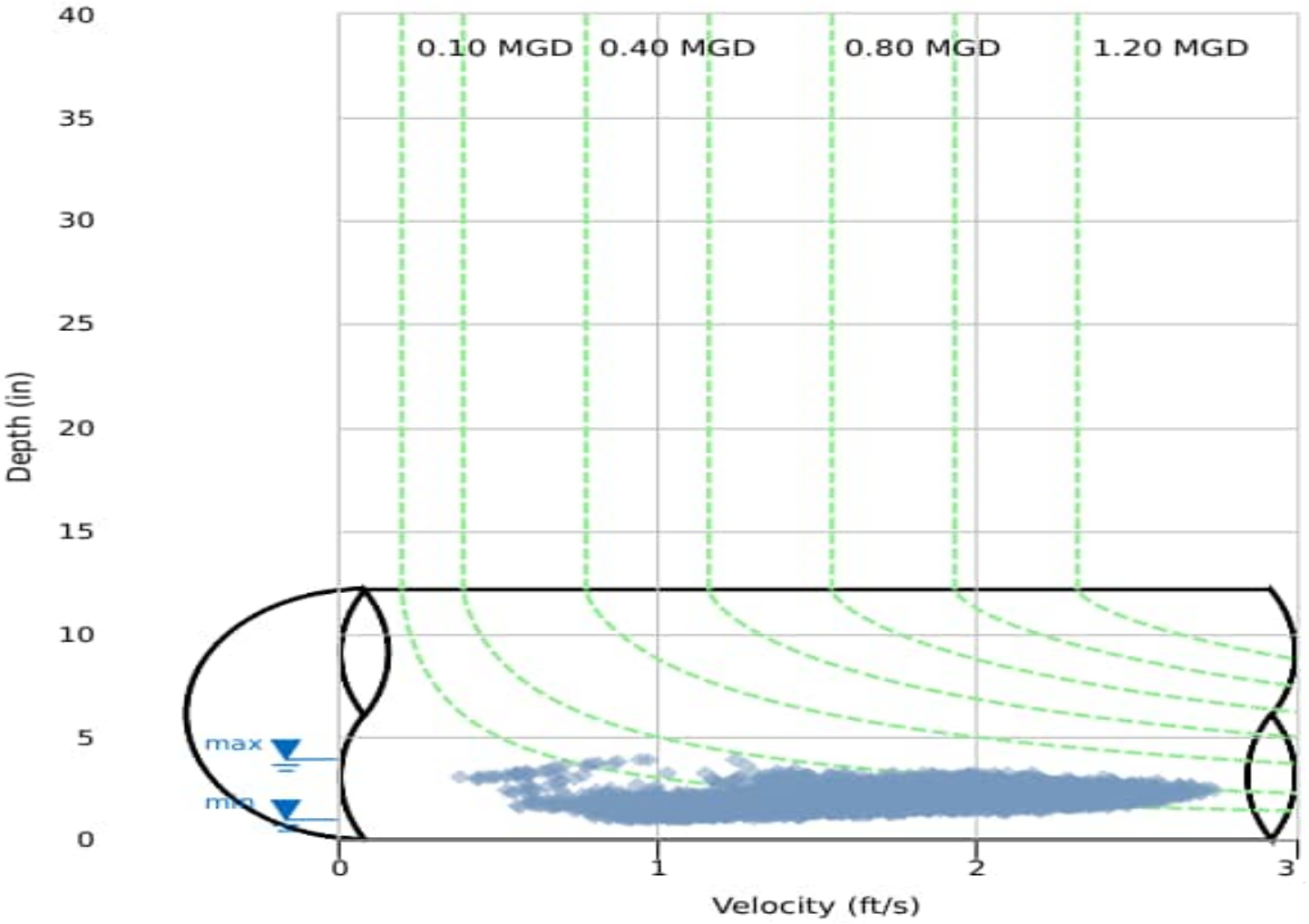
Pipe Height
12.13
in

Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL - VFINAL
Iso-Q™
Min-Max Depth



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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_81189 Pipe: Elliptical (12.13 in H x 12.13 in W), Silt0.00 in

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
01/15/2025	04:55	1.03	09:30	2.34	1.63	02:55	0.86	15:35	2.71	2.08	04:55	0.022	15:35	0.168	0.090	0.090	-
01/16/2025	04:20	1.26	18:25	2.91	2.11	04:35	0.89	09:15	2.65	2.09	04:35	0.026	14:20	0.217	0.133	0.133	0.01
01/17/2025	05:05	1.26	13:55	2.70	1.97	03:45	0.95	11:30	2.66	2.03	05:05	0.030	12:20	0.203	0.115	0.115	-
01/18/2025	04:20	1.31	12:00	2.93	2.19	04:20	1.03	04:25	2.50	1.92	04:20	0.031	12:00	0.226	0.129	0.129	-
01/19/2025	03:05	1.30	16:40	2.70	1.92	06:20	0.87	16:40	2.60	1.82	05:15	0.028	16:40	0.224	0.101	0.101	-
01/20/2025	04:15	1.49	13:45	3.00	2.27	06:15	0.92	11:35	2.63	1.94	06:15	0.037	11:35	0.253	0.137	0.137	-
01/21/2025	03:50	1.41	14:55	2.97	2.09	06:00	0.77	08:20	2.35	1.82	04:25	0.031	15:30	0.196	0.112	0.112	-
01/22/2025	03:55	1.48	15:05	3.08	2.22	05:15	0.74	11:25	2.30	1.78	03:55	0.032	12:05	0.203	0.121	0.121	-
01/23/2025	03:20	1.37	12:55	3.26	2.17	04:15	0.86	11:30	2.60	1.84	04:15	0.028	11:30	0.234	0.121	0.121	-
01/24/2025	02:50	1.22	14:20	2.77	2.05	04:40	0.90	14:15	2.61	1.91	04:40	0.025	14:15	0.222	0.118	0.118	-
01/25/2025	04:45	1.09	11:05	2.53	1.85	04:45	0.80	18:05	2.50	1.91	04:45	0.019	11:05	0.194	0.101	0.101	-
01/26/2025	05:10	1.37	19:55	2.69	2.10	02:30	0.90	08:10	2.51	1.94	02:45	0.030	13:50	0.205	0.123	0.123	-
01/27/2025	03:25	1.39	20:20	2.89	2.21	03:25	1.02	11:30	2.51	1.86	03:25	0.034	11:35	0.224	0.125	0.125	-
01/28/2025	06:25	1.52	18:20	2.94	2.10	05:35	0.63	11:45	2.50	1.91	03:25	0.037	11:50	0.206	0.117	0.117	-
01/29/2025	03:05	1.22	20:50	3.16	2.18	22:25	0.80	10:10	2.52	1.72	03:05	0.024	10:10	0.204	0.113	0.113	-
01/30/2025	05:10	1.47	09:25	3.13	2.34	03:15	0.73	06:10	2.19	1.55	05:10	0.029	10:45	0.209	0.114	0.114	-
01/31/2025	02:20	1.72	15:20	3.07	2.38	04:30	0.70	19:55	2.30	1.57	02:20	0.034	15:55	0.207	0.116	0.116	0.60
02/01/2025	05:00	1.30	09:50	2.89	2.13	05:05	0.78	14:05	2.39	1.80	05:05	0.024	14:05	0.206	0.116	0.116	0.12
02/02/2025	03:55	1.42	19:10	2.99	2.18	05:15	0.79	18:55	2.60	1.74	05:20	0.028	12:00	0.215	0.117	0.117	0.07
02/03/2025	03:45	1.50	16:05	3.30	2.41	02:40	0.64	18:55	2.27	1.66	02:40	0.024	14:35	0.236	0.128	0.128	0.02
02/04/2025	03:45	1.31	13:10	3.19	2.15	01:20	0.88	17:25	2.59	1.73	03:40	0.028	13:15	0.249	0.114	0.114	0.01
02/05/2025	04:10	1.39	15:35	3.41	2.24	02:55	0.75	20:00	2.27	1.77	02:55	0.028	15:35	0.233	0.124	0.124	0.19
02/06/2025	02:55	1.38	15:30	3.78	2.30	02:55	0.78	19:40	2.33	1.76	02:55	0.025	15:30	0.295	0.127	0.127	-
02/07/2025	05:45	1.49	15:10	3.53	2.40	05:05	0.55	08:05	2.44	1.60	02:30	0.022	13:25	0.252	0.125	0.125	-
02/08/2025	02:05	1.55	17:45	3.26	2.44	04:55	0.74	20:10	2.33	1.58	04:55	0.033	20:10	0.228	0.121	0.121	0.25
02/09/2025	05:00	1.27	23:05	2.81	2.02	03:20	0.71	09:20	2.51	1.70	05:00	0.021	13:25	0.196	0.104	0.104	0.05
02/10/2025	02:50	1.36	15:20	3.24	2.32	02:15	0.77	12:10	2.27	1.71	04:00	0.025	10:45	0.229	0.126	0.126	-
02/11/2025	02:45	1.57	18:20	2.95	2.38	04:45	0.72	13:05	2.24	1.61	04:45	0.029	13:10	0.207	0.121	0.121	0.01
02/12/2025	03:05	1.75	12:40	3.28	2.55	05:55	0.60	07:00	2.15	1.55	03:05	0.034	12:00	0.230	0.129	0.129	-
02/13/2025	04:10	1.58	13:40	3.20	2.43	02:40	0.72	07:45	2.01	1.50	02:40	0.030	07:45	0.207	0.116	0.116	-
02/14/2025	04:30	1.61	13:35	3.65	2.38	06:55	0.55	10:30	2.11	1.48	02:50	0.028	10:25	0.207	0.111	0.111	0.07
02/15/2025	06:20	1.62	12:05	3.12	2.38	02:05	0.61	12:05	2.20	1.45	06:20	0.026	12:05	0.232	0.109	0.109	0.09
02/16/2025	03:00	1.60	15:45	3.32	2.40	01:30	0.54	10:30	2.12	1.45	06:10	0.025	10:30	0.207	0.113	0.113	0.77
02/17/2025	03:25	1.62	12:30	3.15	2.46	03:25	0.70	09:05	2.20	1.46	03:25	0.029	09:05	0.215	0.116	0.116	0.39
02/18/2025	23:15	1.81	14:20	3.31	2.40	04:50	0.48	16:10	2.29	1.53	03:35	0.028	10:35	0.219	0.112	0.112	0.02
02/19/2025	04:05	1.35	15:15	3.34	2.22	04:05	0.82	17:45	2.27	1.75	04:05	0.026	15:20	0.238	0.121	0.121	0.40
02/20/2025	04:35	1.74	21:45	3.99	2.55	22:55	0.63	09:15	2.25	1.60	05:50	0.040	12:05	0.221	0.127	0.127	-
02/21/2025	23:40	1.63	00:00	3.38	2.45	04:30	0.37	10:00	2.53	1.64	04:30	0.036	12:45	0.224	0.112	0.112	0.04
02/22/2025	04:45	1.33	19:35	3.08	2.08	05:25	1.15	08:25	2.56	1.99	04:45	0.036	17:15	0.235	0.124	0.124	0.84
02/23/2025	06:20	1.59	14:00	3.11	2.25	23:15	1.35	11:10	2.43	1.94	06:20	0.057	11:40	0.226	0.131	0.131	1.07
02/24/2025	04:50	1.66	12:45	3.09	2.19	05:30	1.06	20:25	2.52	1.95	04:50	0.046	12:40	0.215	0.128	0.128	0.87
02/25/2025	04:20	1.39	11:55	3.24	2.08	23:05	1.11	08:25	2.55	2.00	04:20	0.037	11:55	0.251	0.124	0.124	0.03
02/26/2025	03:50	1.21	10:05	2.96	2.08	04:55	0.91	17:50	2.72	2.11	03:50	0.030	10:05	0.264	0.132	0.132	-
02/27/2025	03:25	1.14	12:40	2.87	2.01	04:35	0.98	08:30	2.68	2.10	03:25	0.026	11:05	0.225	0.125	0.125	-
02/28/2025	05:00	1.11	09:35	3.31	1.96	03:30	0.86	10:10	2.71	2.04	05:00	0.021	11:25	0.215	0.118	0.118	-
03/01/2025	03:55	1.12	22:00	2.89	1.91	05:15	0.83	09:35	2.67	2.07	05:15	0.020	12:00	0.202	0.115	0.115	-
03/02/2025	04:30	1.08	19:50	2.40	1.88	04:30	0.93	11:10	2.65	2.08	04:30	0.021	12:15	0.185	0.114	0.114	0.05
03/03/2025	04:30	1.21	13:50	2.77	1.95	01:50	1.03	13:05	2.73	2.13	04:30	0.028	13:50	0.237	0.121	0.121	0.07
03/04/2025	03:50	1.02	08:45	3.19	1.95	03:40	0.89	13:20	2.70	2.02	03:40	0.019	21:55	0.214	0.115	0.115	0.12
03/05/2025	02:25	1.25	12:25	3.34	2.09	02:15	1.05	07:15	2.65	1.94	02:15	0.031	12:50	0.219	0.121	0.121	0.01
03/06/2025	04:40	1.20	12:15	2.75	2.07	04:35	0.85	10:45	2.53	1.90	04:35	0.023	12:10	0.198	0.117	0.117	-
03/07/2025	02:35	1.10	14:55	2.65	1.96	23:30	0.71	11:50	2.57	1.91	02:35	0.023	14:35	0.203	0.110	0.110	-
03/08/2025	05:00	1.09	13:15	2.72	1.89	04:45	0.86	13:40	2.53	1.99	04:45	0.021	13:10	0.198	0.109	0.109	-
03/09/2025	04:20	1.06	12:25	2.40	1.83	04:20	0.98	12:25	2.59	2.05	04:20	0.022	12:25	0.188	0.107	0.107	0.20
03/10/2025	03:45	1.12	10:15	2.52	1.91	03:40	0.99	10:15	2.71	2.09	03:40	0.024	10:15	0.211	0.115	0.115	0.22
03/11/2025	01:45	1.16	14:05	2.55	1.95	01:45	1.00	09:50	2.62	2.08	01:45	0.025	10:20	0.189	0.117	0.117	0.02
03/12/2025	02:40	1.16	10:00	2.63	1.94	02:35	1.07	09:50	2.80	2.15	02:35	0.027	10:00	0.230	0.122	0.122	0.83
03/13/2025	23:50	1.30	18:15	2.34	1.89	23:50	1.25	19:20	2.62	2.12	23:50	0.037	10:50	0.180	0.112	0.112	0.49
03/14/2025	04:05	1.20	11:00	2.52	1.89	04:05	0.98	08:05	2.76	2.04	04:05	0.026	18:15	0.203	0.111	0.111	0.16
03/15/2025	03:20	1.16	08:35	2.68	1.89	00:45	1.08	11:15	2.71	2.12	03:25	0.028	08:30	0.225	0.116	0.116	0.60
03/16/2025	04:20	1.21	13:15	2.88	1.93	04:45	0.89	15:20	2.63	2.06	04:45	0.025	13:15	0.238	0.116	0.116	0.16
03/17/2025	03:30	1.33	08:25	2.63	2.00	02:00	0.80	13:40	2.79	2.12	03:30	0.026	13:45	0.206	0.124	0.124	0.19
03/18/2025	02:30	1.25	08:20	2.61	1.95	03:30	0.91	10:10	2.79	2.05	02:30	0.028	08:20	0.199	0.116	0.116	0.02
03/19/2025	03:40	1.09	08:20	2.76	2.06	03:20	0.85	18:45	2.79	2.02	03:20	0.021	18:45	0.236	0.126	0.126	0.07
03/20/2025	02:15	1.40	12:30	2.67	2.04	02:00	0.90	08:15	2.71	1.96	02:00	0.030	08:15	0.214	0.117	0.117	0.11
03/21/2025	01:25	1.24	13:50	3.12	2.15	02:35	0.81	12:20	2.52	1.93	02:35	0.024	13:45	0.256	0.127	0.127	1.12
03/22/2025	02:40	1.38	08:40	2.72	2.09	03:35	0.69	09:30	2.53	1.93	03:35	0.024	08:35	0.205	0.121	0.121	-
03/23/2025	02:20	1.28	11:15	2.61	2.07	02:20	0.97	09:10	2.49	1.96	02:20	0.028	11:15	0.197	0.121	0.121	0.44
03/24/2025	03:35	1.31	16:15	2.64	2.10	02:00	0.71	09:00	2.60	1.96	03:35	0.022	18:10	0.202	0.124	0.124	0.01

	DFINAL (in)					VFINAL (ft/s)					QFINAL (MGD - Total MG)						RAIN FINAL (in)
Date	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
03/25/2025	03:15	1.30	08:15	2.67	1.98	03:35	0.84	09:05	2.65	1.98	03:35	0.025	10:40	0.205	0.115	0.115	-
03/26/2025	02:40	1.22	07:40	3.02	2.15	02:35	0.77	07:40	2.37	1.81	02:35	0.021	07:40	0.239	0.120	0.120	0.20
03/27/2025	01:50	1.22	12:05	2.90	2.08	01:50	1.00	18:55	2.65	1.89	01:50	0.027	12:10	0.209	0.117	0.117	0.24
03/28/2025	03:35	1.03	19:55	2.55	1.78	03:35	1.04	13:05	2.71	2.11	03:35	0.022	09:00	0.169	0.105	0.105	0.17
03/29/2025	02:10	1.04	11:00	2.38	1.75	03:30	1.04	09:55	2.70	2.14	03:30	0.023	12:25	0.178	0.105	0.105	0.12
03/30/2025	02:55	0.99	11:00	2.42	1.65	04:35	1.01	18:30	2.66	2.08	04:35	0.021	11:00	0.181	0.093	0.093	0.23
03/31/2025	03:40	1.09	13:30	2.79	1.91	02:05	0.99	07:50	2.77	2.10	03:45	0.023	08:50	0.218	0.116	0.116	0.10
04/01/2025	03:25	1.08	13:50	2.88	1.80	03:25	1.02	10:45	2.85	2.06	03:25	0.023	10:45	0.225	0.105	0.105	0.03
04/02/2025	02:50	1.29	14:05	3.92	2.03	14:20	0.69	16:20	2.72	1.99	02:50	0.035	11:15	0.211	0.115	0.115	0.05
04/03/2025	03:55	1.14	10:45	2.65	1.87	02:25	1.18	17:25	2.65	2.08	02:25	0.030	08:05	0.200	0.110	0.110	0.02
04/04/2025	02:55	1.02	10:20	2.89	1.91	02:55	0.91	23:00	2.71	2.02	02:55	0.019	10:20	0.235	0.113	0.113	-
04/05/2025	03:55	1.06	09:05	2.49	1.77	02:45	1.00	08:45	2.73	2.09	03:55	0.023	09:05	0.207	0.103	0.103	-
04/06/2025	01:05	1.13	19:10	2.83	1.95	03:35	0.94	19:45	2.64	2.10	03:35	0.024	19:45	0.219	0.120	0.120	0.71
04/07/2025	04:15	1.15	14:00	2.99	1.73	13:30	0.91	11:15	2.65	2.10	04:25	0.024	13:55	0.199	0.098	0.098	0.37
04/08/2025	03:45	1.17	14:55	2.57	2.02	02:35	0.97	04:25	2.61	2.03	02:35	0.025	09:20	0.199	0.122	0.122	0.07
04/09/2025	02:45	1.01	18:15	2.50	1.86	02:15	0.96	18:15	2.68	2.03	02:50	0.021	18:15	0.206	0.108	0.108	-
04/10/2025	03:25	1.38	09:25	2.89	2.11	03:25	1.02	11:45	2.77	2.06	03:25	0.033	08:30	0.236	0.130	0.130	0.27
04/11/2025	02:50	0.98	13:55	2.71	1.96	02:45	0.95	06:30	2.47	1.97	02:50	0.019	17:50	0.193	0.114	0.114	0.01
04/12/2025	23:55	1.19	09:05	2.52	1.83	02:10	0.88	09:00	2.66	2.02	02:25	0.026	09:00	0.207	0.104	0.104	0.01
04/13/2025	05:40	1.07	20:05	2.79	2.06	05:20	0.99	10:20	2.58	1.99	05:20	0.023	20:00	0.215	0.124	0.124	-
04/14/2025	01:50	1.38	12:55	2.68	2.02	03:30	0.86	19:25	2.58	2.01	03:30	0.029	14:15	0.207	0.119	0.119	-
04/15/2025	02:35	1.01	10:50	2.55	1.87	02:35	0.83	13:30	2.70	1.98	02:35	0.017	10:50	0.195	0.108	0.108	-
04/16/2025	01:55	1.05	14:05	2.85	1.99	01:55	0.90	08:30	2.56	1.98	01:55	0.020	08:30	0.206	0.116	0.116	-
04/17/2025	02:50	1.04	14:00	2.61	1.88	02:45	0.96	07:45	2.57	1.98	02:50	0.021	09:00	0.188	0.106	0.106	-
04/18/2025	02:20	1.10	13:45	2.79	1.88	02:15	0.92	06:40	2.68	2.04	02:15	0.021	13:40	0.193	0.110	0.110	-
04/19/2025	03:40	1.10	15:15	2.41	1.91	05:35	1.08	10:55	2.59	2.05	02:20	0.026	10:55	0.180	0.113	0.113	0.01
04/20/2025	04:25	1.16	13:05	2.74	2.00	02:35	0.94	07:10	2.50	2.01	02:35	0.026	13:05	0.211	0.118	0.118	0.05
04/21/2025	02:15	1.16	07:20	2.90	2.08	01:05	0.99	06:55	2.44	1.94	02:15	0.025	10:40	0.197	0.120	0.120	0.02
04/22/2025	02:35	1.05	18:35	2.87	2.07	02:20	0.73	11:05	2.45	1.88	02:20	0.017	18:35	0.226	0.117	0.117	-
04/23/2025	00:40	1.13	08:25	4.16	2.16	12:25	0.65	19:30	2.35	1.78	03:40	0.019	19:35	0.210	0.117	0.117	-
04/24/2025	03:30	1.18	08:55	2.97	2.01	01:30	0.93	09:55	2.57	1.91	03:30	0.025	08:55	0.210	0.113	0.113	-
04/25/2025	02:45	1.08	11:15	2.58	1.98	02:40	0.82	08:20	2.50	1.92	02:40	0.019	08:25	0.191	0.112	0.112	-
04/26/2025	04:05	1.40	10:35	3.07	2.16	02:40	0.87	11:20	2.53	1.95	04:05	0.031	10:35	0.231	0.126	0.126	-
04/27/2025	02:15	1.11	20:15	2.51	1.92	02:20	0.88	09:30	2.51	2.00	02:20	0.021	12:30	0.182	0.112	0.112	-
04/28/2025	01:30	1.07	10:55	2.93	2.03	03:15	0.92	12:50	2.50	1.92	01:30	0.021	12:50	0.216	0.116	0.116	-
04/29/2025	01:00	1.15	11:35	2.83	2.00	02:25	0.96	10:45	2.50	2.04	02:25	0.025	11:35	0.218	0.119	0.119	0.13

01/15/2025 00:00 - 04/29/2025 23:59

	DFINAL (in)	VFINAL (ft/s)	QFINAL (MGD - Total MG)	RAIN FINAL (in)
Total			12.250	13.62
Average	2.07	1.91	0.117	

CAM_RG

Site Commentary

SITE INFORMATION

Rain Collector Dimensions	8”

OBSERVATIONS

A review of the hydrograph indicates CAM_RG functioned under normal conditions during the study.

The total rainfall recorded during the monitoring period was 13.62 inches.

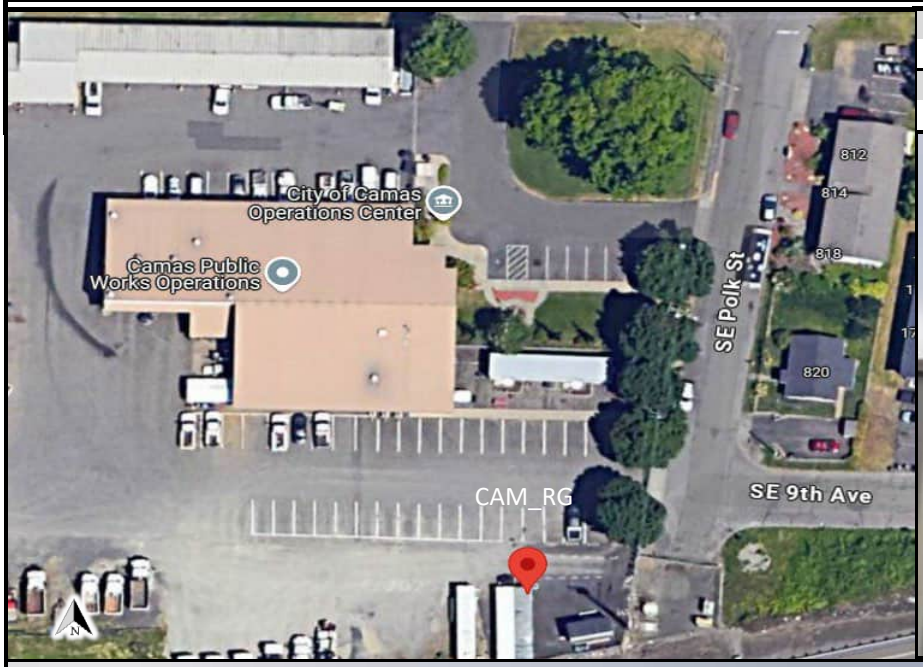
DATA UPTIME

Data uptime observed during **Wednesday, 15 January 2025 to Tuesday, 29 April 2025** is provided in the following table:

Percent Uptime	
Rain	100

Camas.Carollo.TFM.WA24		Site Name
Rainfall Monitoring Site Report		**CAM_RG**

				Monitor Series	Location Type
Site Address /Location:	1620 SE 8th Ave, Camas, WA 98607			Rain Alert III	Temporary
Site Access Details:	On Roof	Latitude:	45.5800529	Installation Date	
		Longitude:	-122.3918594	1.14.2025	



Location	
On Roof	
Access	Traffic
Drive	None





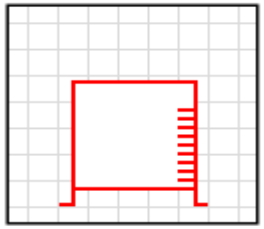
ADS Project Name:	Camas.Carollo.TFM.WA24
ADS Project Number:	23081.11.325

Hydrograph Report

CAM_RG

Rain Gauge

CAM_RG

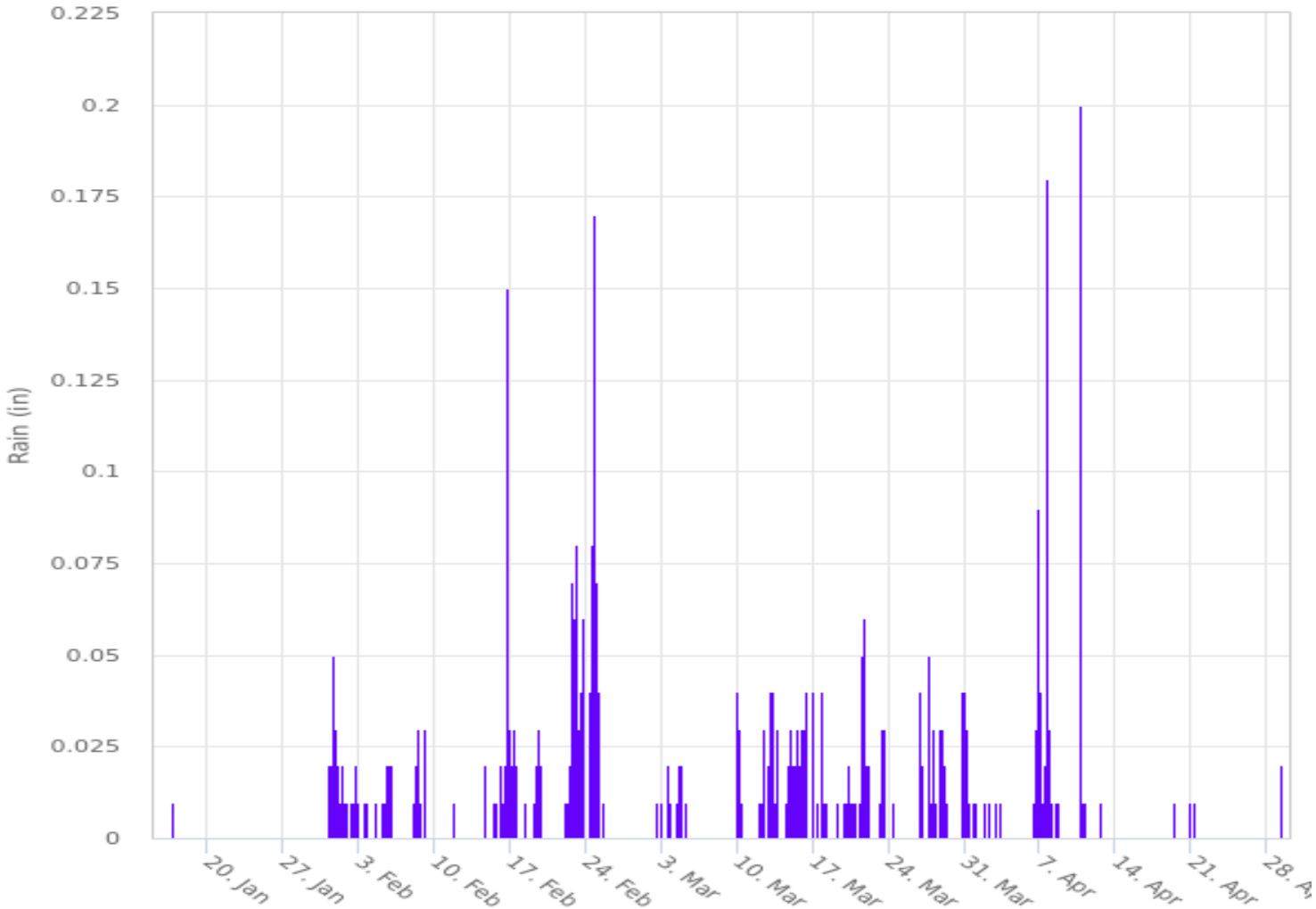


Report Period

01/15/2025
To
04/29/2025

Legend

DFINAL
VFINAL
QFINAL
RAIN FINAL



846 Industry Dr.
Tukwila, WA 98188

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Daily Tabular Report

01/15/2025 00:00 - 04/29/2025 23:59
CAM_RG

Date	RAIN FINAL (in) Total
01/15/2025	-
01/16/2025	0.01
01/17/2025	-
01/18/2025	-
01/19/2025	-
01/20/2025	-
01/21/2025	-
01/22/2025	-
01/23/2025	-
01/24/2025	-
01/25/2025	-
01/26/2025	-
01/27/2025	-
01/28/2025	-
01/29/2025	-
01/30/2025	-
01/31/2025	0.60
02/01/2025	0.12
02/02/2025	0.07
02/03/2025	0.02
02/04/2025	0.01
02/05/2025	0.19
02/06/2025	-
02/07/2025	-
02/08/2025	0.25
02/09/2025	0.05
02/10/2025	-
02/11/2025	0.01
02/12/2025	-
02/13/2025	-
02/14/2025	0.07
02/15/2025	0.09
02/16/2025	0.77
02/17/2025	0.39
02/18/2025	0.02
02/19/2025	0.40
02/20/2025	-
02/21/2025	0.04
02/22/2025	0.84
02/23/2025	1.07
02/24/2025	0.87
02/25/2025	0.03
02/26/2025	-
02/27/2025	-
02/28/2025	-
03/01/2025	-
03/02/2025	0.05
03/03/2025	0.07
03/04/2025	0.12
03/05/2025	0.01
03/06/2025	-
03/07/2025	-
03/08/2025	-
03/09/2025	0.20
03/10/2025	0.22
03/11/2025	0.02
03/12/2025	0.83
03/13/2025	0.49
03/14/2025	0.16
03/15/2025	0.60
03/16/2025	0.16
03/17/2025	0.19
03/18/2025	0.02
03/19/2025	0.07
03/20/2025	0.11
03/21/2025	1.12
03/22/2025	-
03/23/2025	0.44
03/24/2025	0.01
03/25/2025	-

01/15/2025 00:00 - 04/29/2025 23:59

	RAIN FINAL (in)
Date	Total
03/26/2025	0.20
03/27/2025	0.24
03/28/2025	0.17
03/29/2025	0.12
03/30/2025	0.23
03/31/2025	0.10
04/01/2025	0.03
04/02/2025	0.05
04/03/2025	0.02
04/04/2025	-
04/05/2025	-
04/06/2025	0.71
04/07/2025	0.37
04/08/2025	0.07
04/09/2025	-
04/10/2025	0.27
04/11/2025	0.01
04/12/2025	0.01
04/13/2025	-
04/14/2025	-
04/15/2025	-
04/16/2025	-
04/17/2025	-
04/18/2025	-
04/19/2025	0.01
04/20/2025	0.05
04/21/2025	0.02
04/22/2025	-
04/23/2025	-
04/24/2025	-
04/25/2025	-
04/26/2025	-
04/27/2025	-
04/28/2025	-
04/29/2025	0.13

	RAIN FINAL (in)
Total	13.62
Average	

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TECHNICAL MEMORANDUM

Subject: Camas, WA Flow Monitoring Wet Weather Analysis

Prepared For: Carollo

Prepared By: Paul Mitchell, Regional Engineer

Date: May 23, 2025

Background

In addition to sewer flow monitoring and data delivery conducted as part of this temporary deployment of 4 flow monitors, ADS also conducted a wet weather analysis which also takes into account rain data collected from the single deployed temporary rain gauge. This wet weather analysis was conducted to assess Rainfall Dependent Infiltration and Inflow (RDII) attributed to each of the 4 monitored tributaries which could then be used to assist in relative prioritization of those tributary areas (or basins) based on computed and normalized RDII volume per inch rain per acre (converted to % rainfall ingress).

Methodology

The methodology used for this evaluation includes the following primary tasks:

- Evaluate the available data using ADS' Sliicer™ application for evaluating RDII. This includes determination of typical net average dry day flow (ADF).
- Determine RDII for each storm event meeting minimum criteria discussed herein and compute RDII volume associated with each rain event.
- Generate an RDII volume vs. rainfall volume chart (called a Q-vs-i chart) from each storm event data point for each evaluated site/basin and fit a regression line through the data on the Q-vs-i chart.
- Normalize the RDII using the Q-vs-i chart by dividing the slope of the regression line (Gallons RDII per inch rain) by acreage to generate values of % ingress attributed to each site/basin. Use this result to rank relative RDII performance of the site/basins.

Wet Weather Analysis

This section describes an evaluation of wet weather impacts on system flows, defined as Rainfall Dependent Infiltration and Inflow (RDII). This evaluation was based on available flow data provided during the approximate 3 month duration of the flow study. This is done by evaluating excess flow volumes from the studied sewer shed areas (basins) associated with each flow monitoring site during rain events that occurred during the available data periods at each of the 4 locations. This section also describes an evaluation of dry weather flow data for purposes of determining base wastewater flows (to compare wet weather flows against).

Each flow monitoring site represents a defined tributary area (or basin) and each was identified with a simple alpha-numeric ID – CAM_100290, CAM_51123, etc. The Sliicer™ application recognizes basins as having the same name as the monitors used to determine tributary flows (i.e. sites and basins have the same ID). One of the flow sites, CAM_51123, relied upon subtracting flow from a flow monitor upstream (CAM_100290) to define net flow for basin CAM_51123. Table 1 provides a summary of site/basins, site schematic defining each evaluated basin, and size of each basin (acres).

Dry Weather Flow

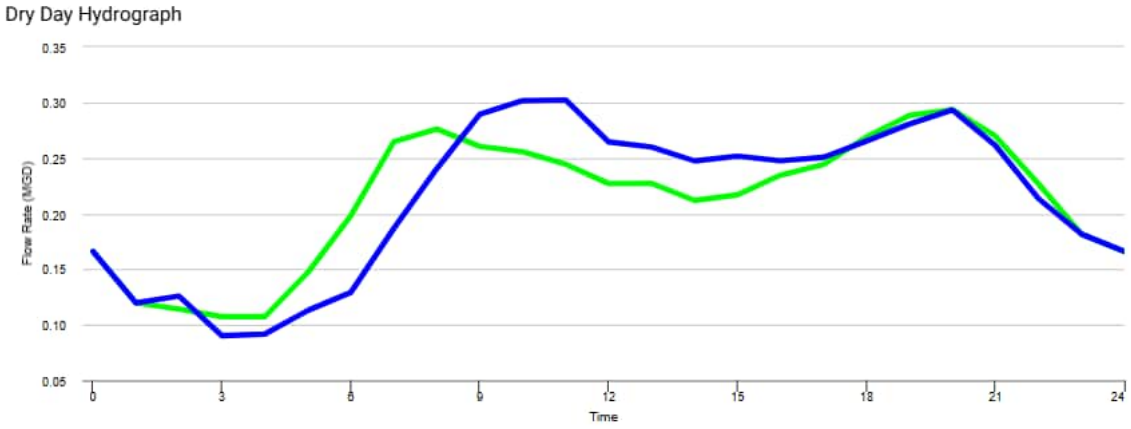
Prior to conducting a wet weather analysis, dry weather flow patterns must first be determined by reviewing data obtained during dry weather conditions at each location. For this analysis, a *dry day* is defined as any day in which there was less than 0.10 in. of rain in the previous day, less than 0.50 in. of rain in the previous three days, and less than 1.00 in. of rain in the previous five days. This process automatically eliminates the selection of most wet weather events and the periods associated with recovery from these events. Once the initial dry days are selected, they are compared to one another to make sure that the flow pattern for each day is repeatable. Any days that have an inconsistent flow pattern are removed from consideration. The resulting dry days are then averaged to establish an average diurnal flow pattern from the site, called an Average Dry day (ADF) pattern. The dry weather analysis evaluates the weekday pattern separate from the weekend pattern to account for differences often observed.

Dry weather flows were evaluated for each flow monitor location from the available data provided. Recorded flow rates from the sanitary sewer monitoring location for each dry day are overlaid on a hydrograph, enabling a hydrograph of the Average Dry day Flow (ADF) to be determined for Weekdays (green curve) and Weekends (blue curve) as depicted in Figure 1 for site/basin CAM_100290. ADF hydrographs for each site are included in Appendix A. Table 1 summarizes the ADF values (weekdays) for each site/basin.

Table 1
Basin Summary Data

Site/ Basin	Pipe Diameter (in)	Added or Upstream Subtracted FM Sites to Determine Net Basin Flow	Basin Size (Acres)	Gross ADDF Weekday (mgd)	Net ADDF Weekday (mgd)
CAM_100290	19	+(CAM_100290)	476	0.22	0.22
CAM_51123	20	+(CAM_51123) - (CAM_100290)	1159	0.77	0.55
CAM_52167	18	+(CAM_52167)	299	0.19	0.19
CAM_81189	12	+(CAM_81189)	136	0.12	0.12
		Total	2071		1.08

Figure 1
Average Dry Day Flow (ADF) Hydrograph – Site/Basin CAM_100290



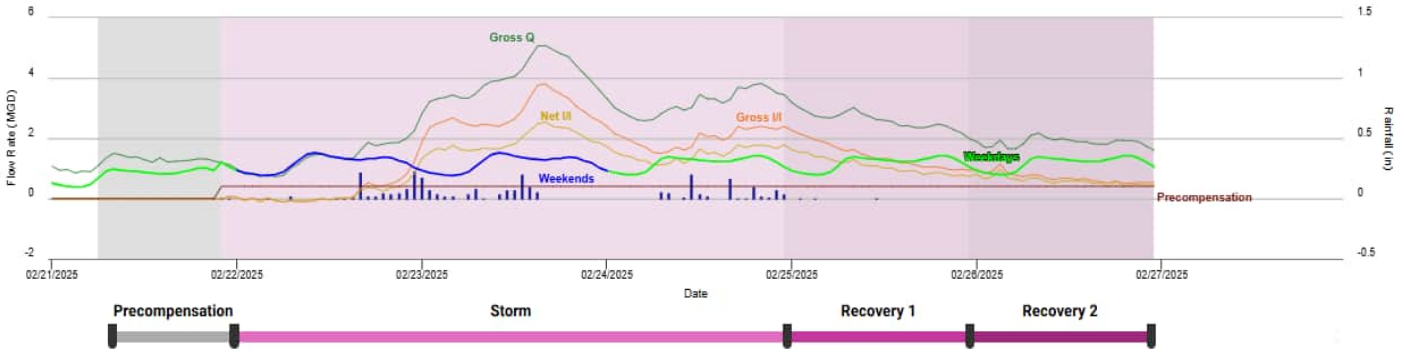
Wet Weather RDII Analysis

A wet weather RDII analysis is performed by comparing specific wet weather events to average dry weather flows (ADF). Based on criteria for a “storm” as being a rain event with at least 0.8 inch of rain with no rain interruption of more than 12 hours, there were 5 rain “storm” events captured during the flow study period. Captured storm volumes ranged from 1.15 inches (April 6, 2025) to 2.84 inches (February 21, 2025). Based on the concurrent periods of flow and rain “storm” data available at each site, an RDII analysis was conducted to characterize the impact of wet weather on flow measured in the basins.

Recorded flow rates for a specific storm event are plotted against average dry weather conditions. The difference observed represents the rain-dependent inflow and infiltration

(RDII or I/I) entering the sanitary sewer system upstream from each monitoring location and is called a storm hydrograph. Figure 2 depicts a storm hydrograph for site/basin CAM_51123 during the largest captured storm event period (from February 21 to 26, 2025).

Figure 2
Storm Hydrograph – Site/Basin CAM_51123



RDII calculations are made for each storm event (the ~5 day period depicted by purple colored bands above for the storm event starting February 21). The first period (shown as a 3 day duration in Figure 2) following the onset of rain is referred to as the Storm Period. The darker purple period following the Storm Period is referred to as Recovery 1, and the next period is referred to as Recovery 2. For purposes of this evaluation, the entire "Event" was used for this analysis which covers the Storm and both Recovery periods. Figure 2 also depicts precompensation which is an upward adjustment made to the ADF pattern so that pattern and the actual flow on storm onset were the same. This effectively compensates for flow that is already elevated leading into a given storm event; enabling a more accurate RDII response to be quantified only from the indicated storm under evaluation.

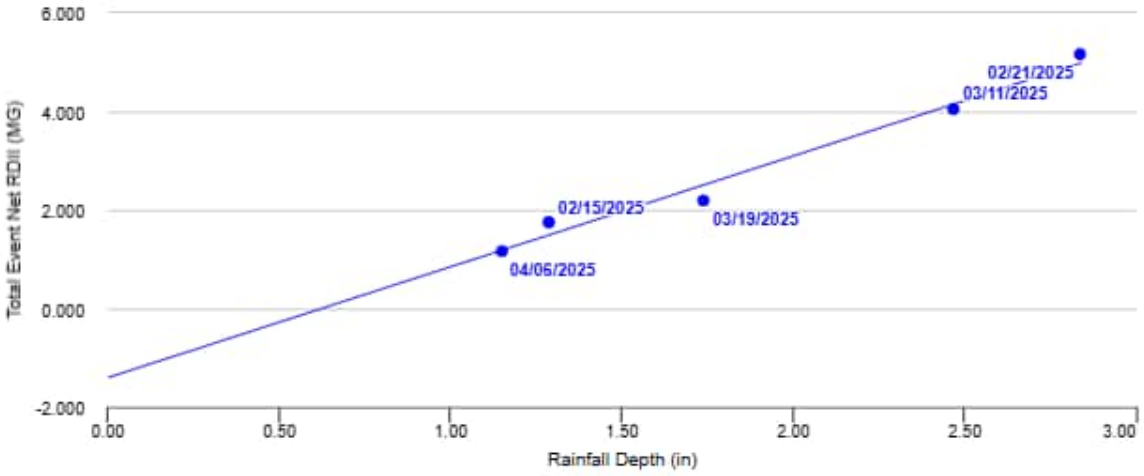
The storm hydrographs for this location showed excess flow responses (shown as "Gross I/I" in the above hydrograph) follow closely with a slight delay to the rainfall pattern. The Gross I/I is the difference between the actual recorded flow (shown as "Gross Q") minus the ADF weekend and weekday pattern. For cases where the net RDII for a basin is determined by subtraction of an upstream flow site (see Table 1), the hydrographs also show a "Net I/I" component as is the case for site/basin CAM_51123 above.

Also, in the case of CAM_51123, the delayed and significant yet muted or delayed response to rainfall may be indicative of predominantly indirect storm drainage pathways (i.e., the infiltration component of RDII). Storm hydrographs of the 5 selected storms for all locations are included in Appendix A.

Once the calculations were complete for each storm event, excess wet weather flow volumes were plotted as a function of rainfall volume on graphs commonly referred to as

Q-vs-i graphs; each with best fit regression lines drawn. The rain volume vs. excess flow volume Q-vs-i chart is shown in Figure 3 for site/basin CAM_51123. These charts for all other locations are included in Appendix A.

Figure 3
Q-vs-i graph for CAM_51123



These volume-based Q-vs-i graphs for the basins generally show a good visual (regression line) correlation between excess wastewater volume and rainfall. The Q-vs-i graph for CAM_51123 projects about 2 million gallons of I/I would be generated from about 1.5 inches of rain. However, there is an apparent threshold (X-intercept) of about 0.5 or 0.6 inches of rain in the above Q-vs-i graph; below which there is little to no RDII response. This means projected RDII vs rainfall volumes based on regression line slope will be greater than individual storm values. These graphs are included for all the site/basins in Appendix A. Caution is warranted in attempting to extrapolate higher rainfall responses from these Q-vs-i graphs since the linear extrapolation may not remain fully intact during significantly stronger storm events. A summary of individual RDII response data points (MG/inch) per storm is provided in Table 2.

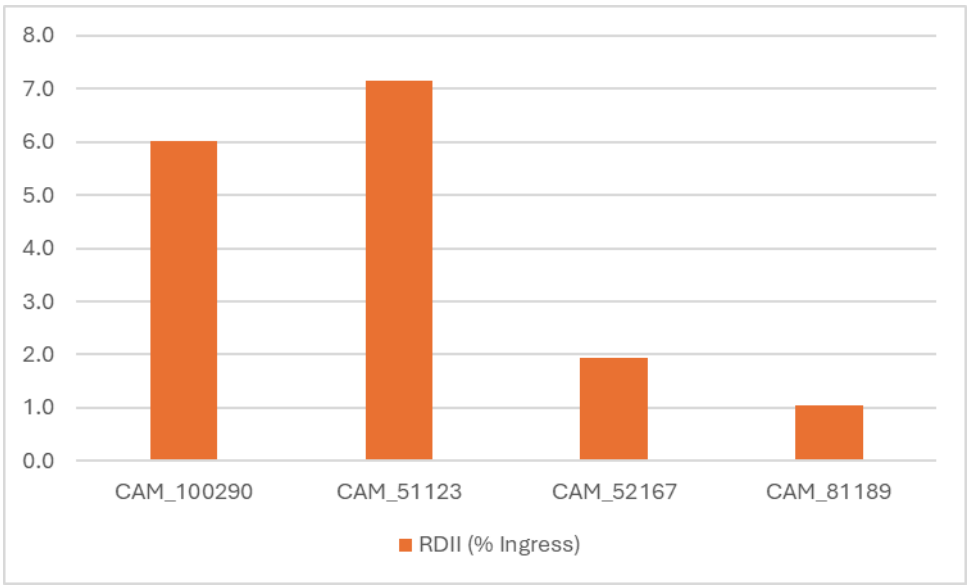
Table 2
Basin RDII Storm Response Summary

	Storm RDII (MG/inch)				
Site/ Basin	2/15/2025 (1.29")	2/21/2025 (2.84")	3/11/2025 (2.47")	3/19/2025 (1.74")	4/6/2025 (1.15")
CAM_100290	0.57	0.68	0.64	0.48	0.52
CAM_51123	1.36	1.82	1.64	1.26	1.01
CAM_52167	0.16	0.14	0.20	0.12	0.17
CAM_81189	0.01	0.03	0.01	0.03	0.00

To properly characterize relative I/I performance among the sites/basins evaluated, the wet weather I/I responses must also be normalized according to basin size. This is done by taking the slope of the Q-vs-i responses described above (gallons RDII / inch rain) and dividing by basin area (acres – see Table 1) to yield normalized values of RDII response in terms of projected % rainfall ingress. These rain and size normalized % ingress values based on Q-vs-i projected slopes are summarized in Figure 4.

As a general rule, basins may be considered to yield excessive RDII if such normalized values are much greater than 5. Two of the 4 site/basins evaluated slightly exceeded this value.

Figure 4
Projected RDII (% Rainfall Ingress)



The computed values for ADF and rain & area normalized projected RDII volumes (including % Ingress) are summarized in Table 3. Hydrographs of the flow monitoring period, dry day hydrographs, storm hydrographs, and volume-based Q vs i graphs are included in Appendix A.

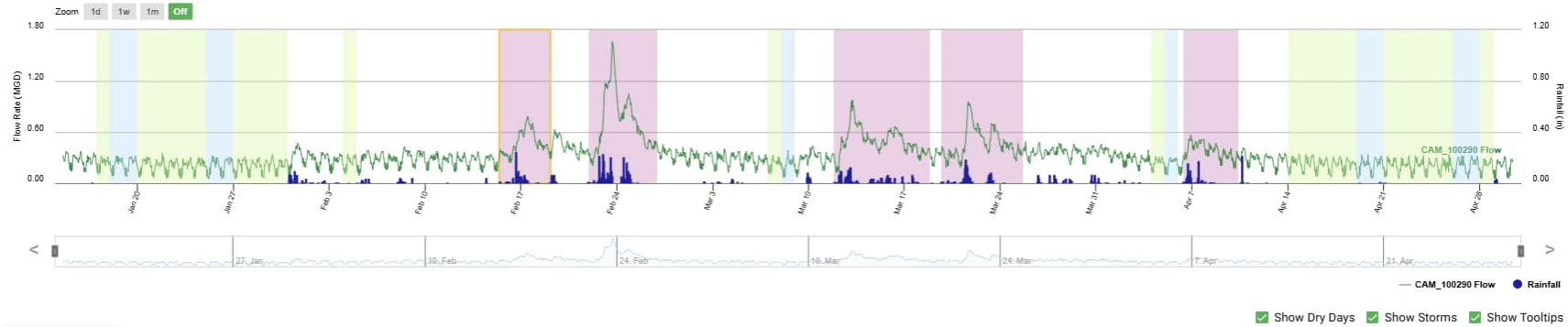
Table 3
Basin Dry and Wet Weather Performance Summary

Site/ Basin	Pipe Diameter (in)	Basin Size (Acres)	Net ADDF Weekday (mgd)	Projected Net RDII (MG/in)	Projected Net RDII (%rain ingress)
CAM_100290	19	476	0.22	0.78	6.0
CAM_51123	20	1159	0.55	2.25	7.1
CAM_52167	18	299	0.19	0.16	1.9
CAM_81189	12	136	0.12	0.04	1.0

Appendix A

Study period Hydrographs, ADF hydrographs, Storm hydrographs, and Q vs i graphs

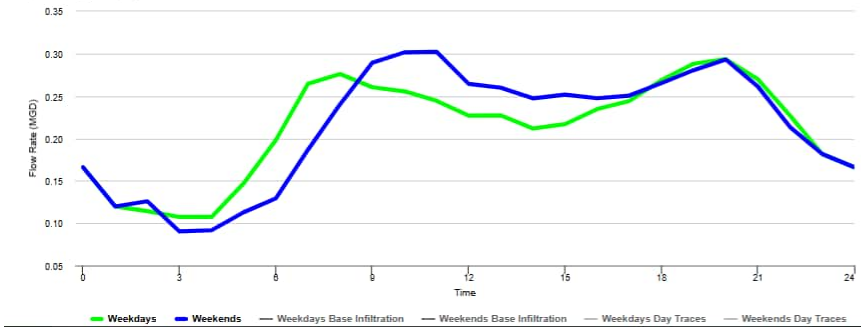
Hydrograph with Basin Rainfall: 01/14/2025 - 04/30/2025 | Basin CAM_100290 | Edit Dry Days

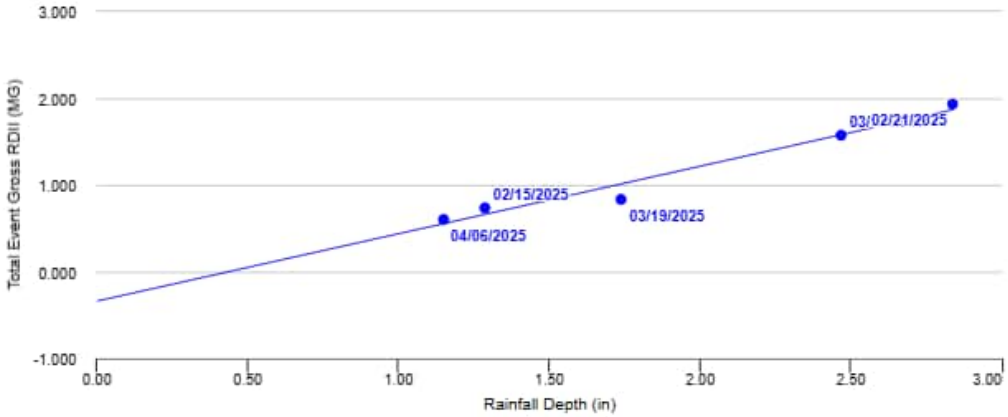


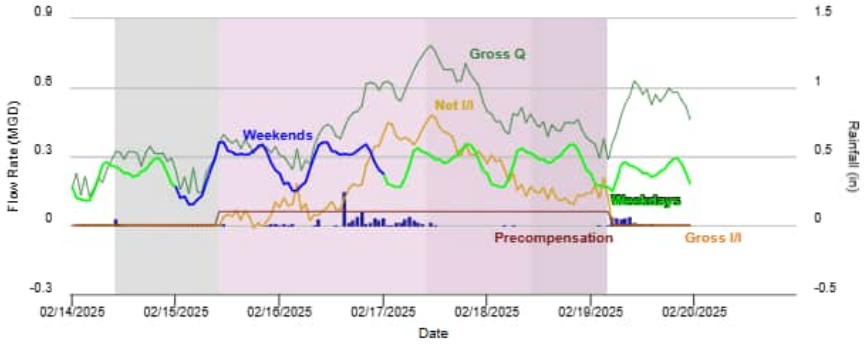
Show Dry Days | Show Storms | Show Tooltips

DRY DAYS | STORM EVENTS | STATISTICS

Dry Day Hydrograph



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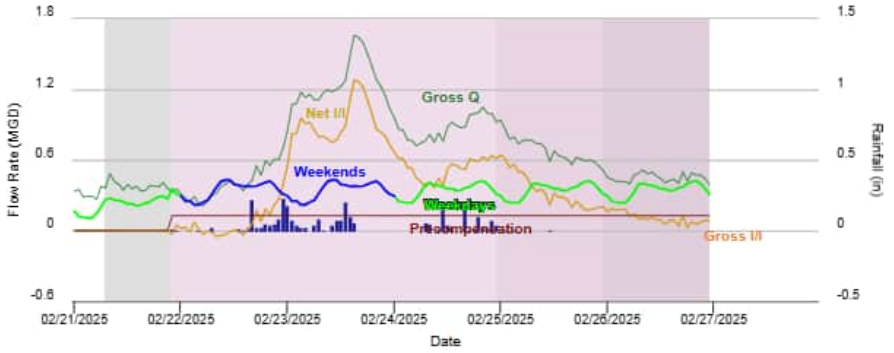
Weekdays
Precompensation
Gross I/I
Flow Rate (MGD)
Rainfall (in)
Date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Rainfall (in)
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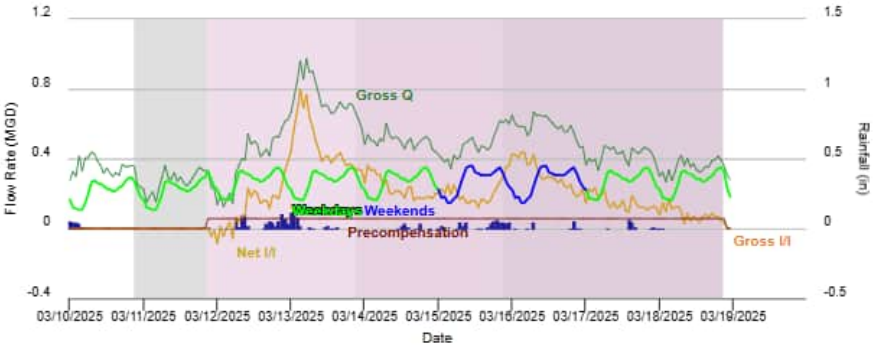
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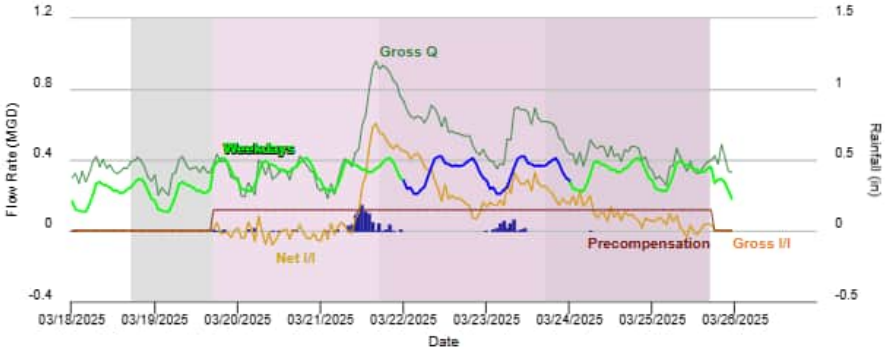
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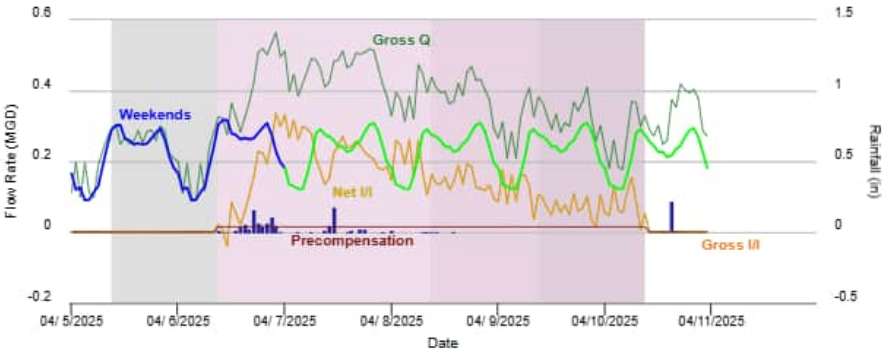
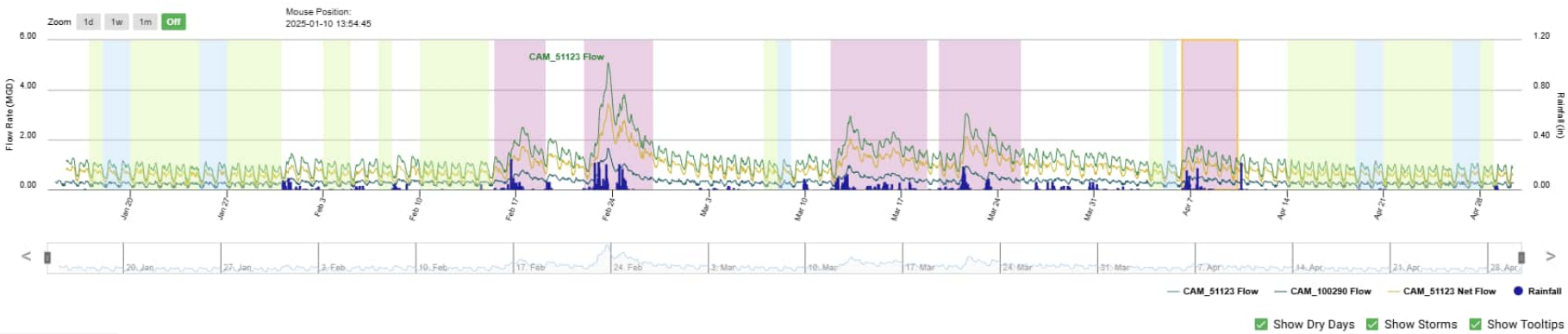
Rainfall (in)
Date

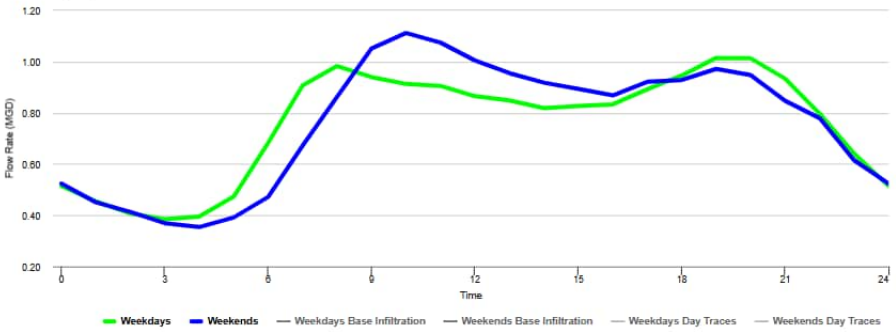

Gross Q
Weekends
Net I/I
Precompensation
Gross I/I
Flow Rate (MGD)
Rainfall (in)
Date

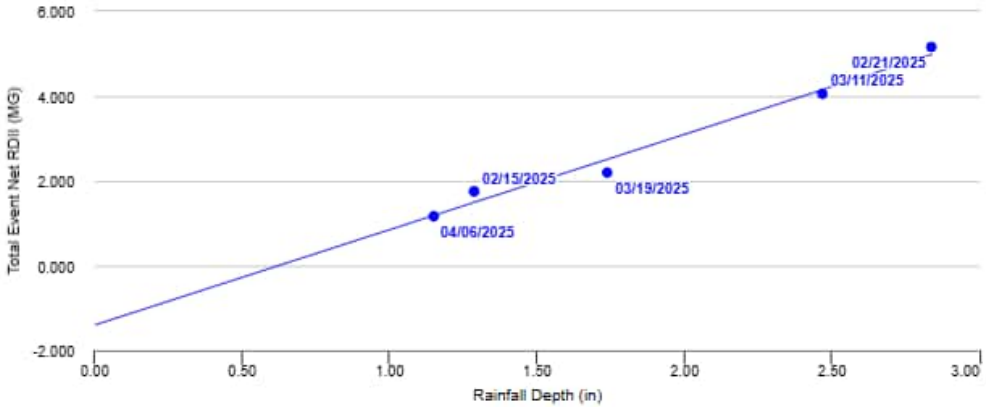
Hydrograph with Basin Rainfall: 01/14/2025 - 04/30/2025 | Basin CAM_51123 | Edit Dry Days

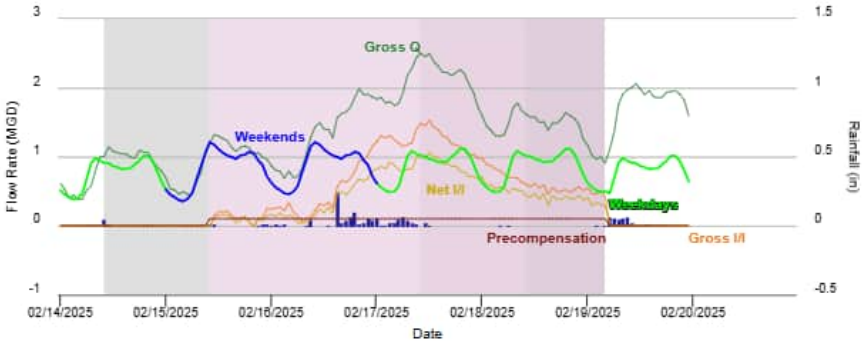


DRY DAYS | STORM EVENTS | STATISTICS

Dry Day Hydrograph



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Gross I/I
Flow Rate (MGD)
Rainfall (in)
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Gross Q
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Flow Rate (MGD)
Rainfall (in)
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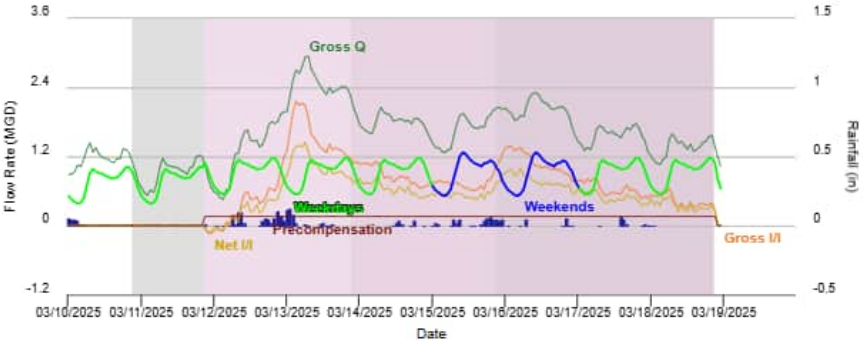
02/27/2025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Precompensation
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Flow Rate (MGD)
Rainfall (in)
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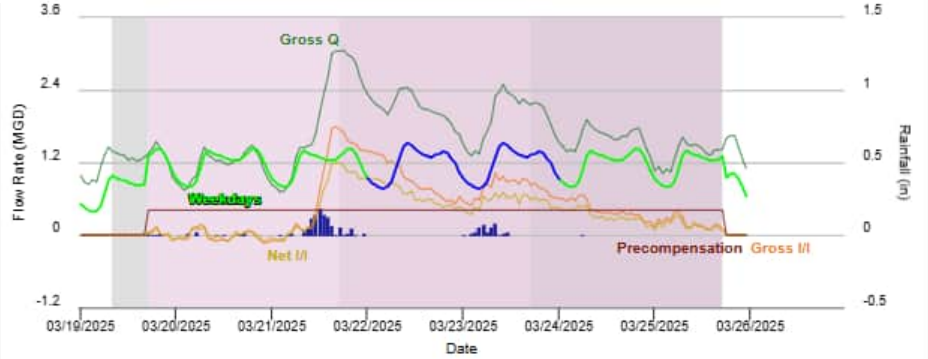
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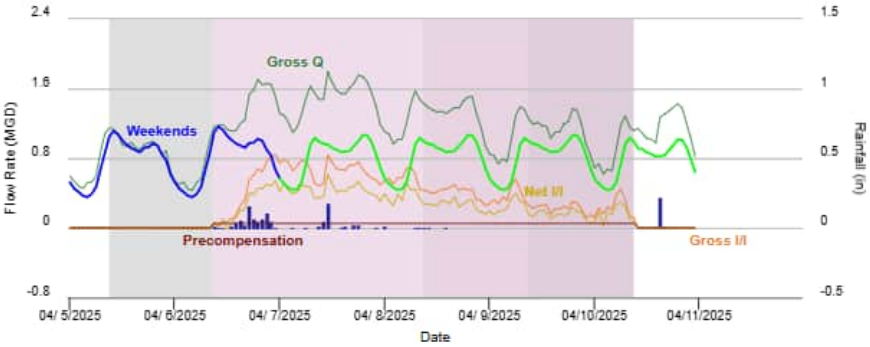
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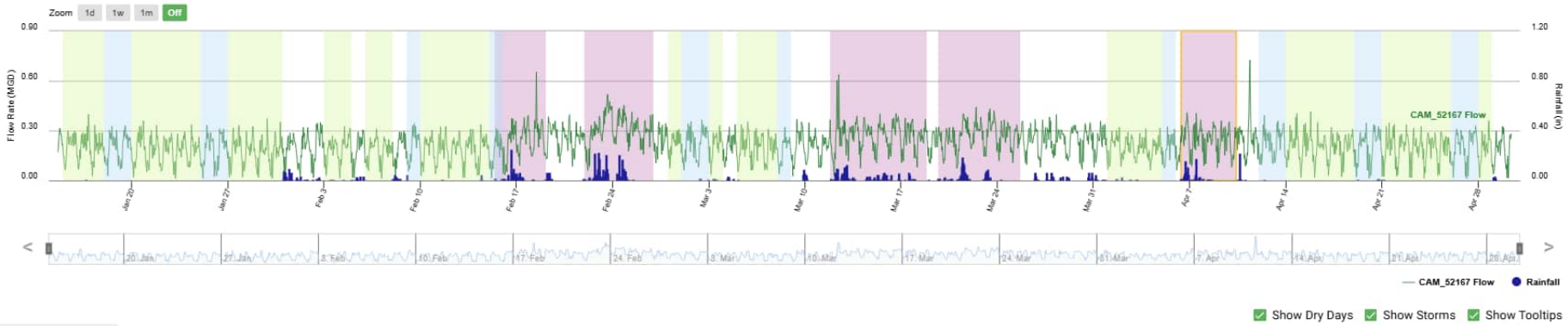
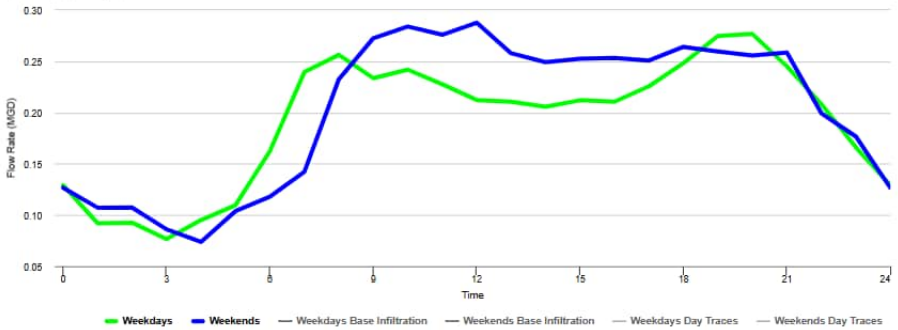
Hydrograph with Basin Rainfall: 01/14/2025 - 04/30/2025 | Basin CAM_52167 | Edit Dry Days

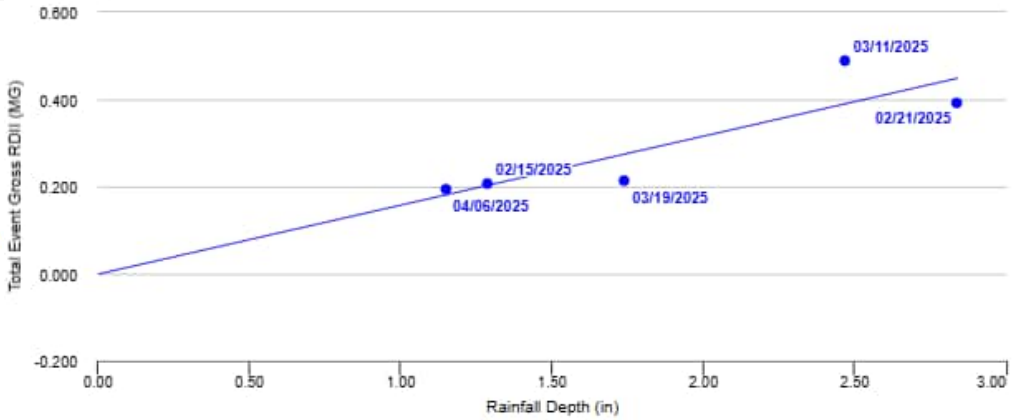


Show Dry Days Show Storms Show Tooltips

DRY DAYS | STORM EVENTS | STATISTICS

Dry Day Hydrograph






Gross Q
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Flow Rate (MGD)
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Gross Q
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Rainfall (in)
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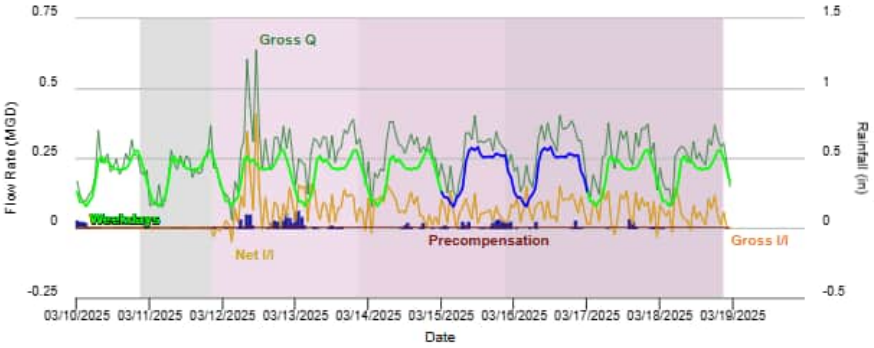
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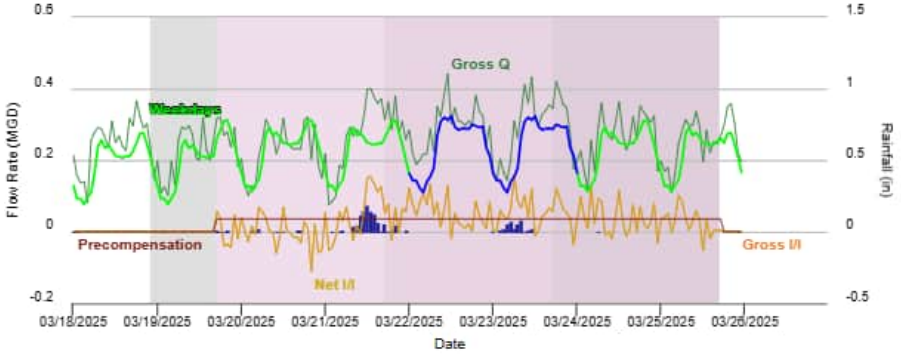
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Flow Rate (MGD)
Rainfall (in)
Date


Gross Q
Weekends
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Precompensation
Net I/I
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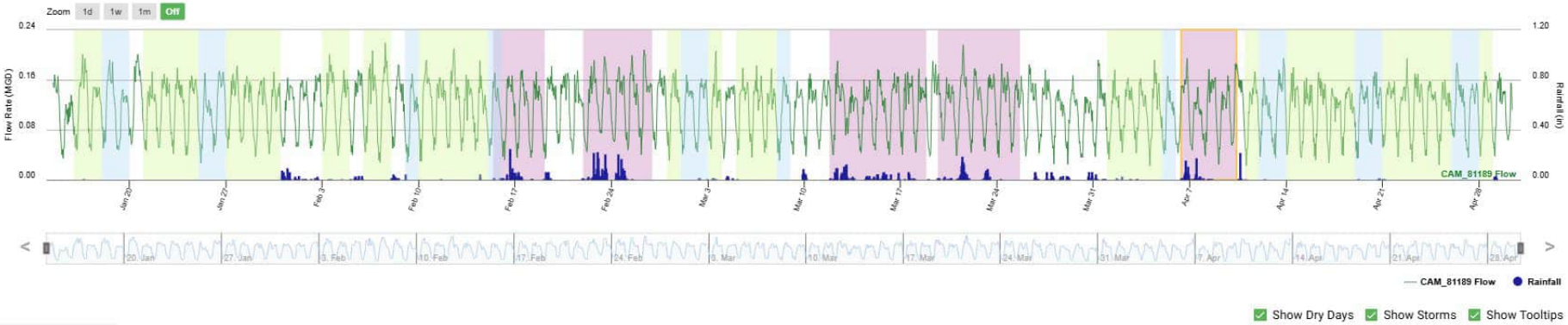
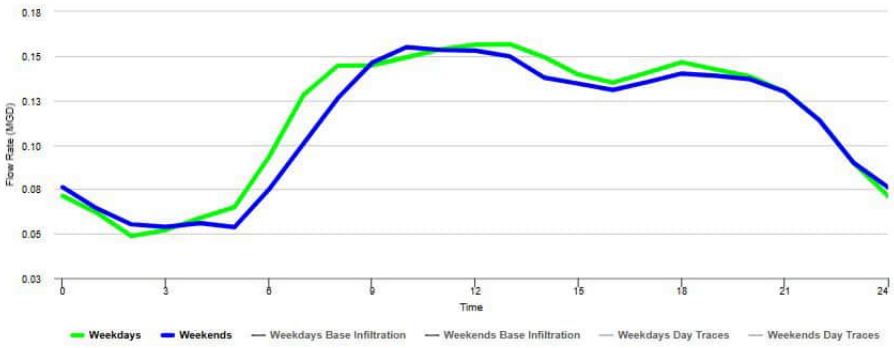
Flow Rate (MGD)
Rainfall (in)
Date

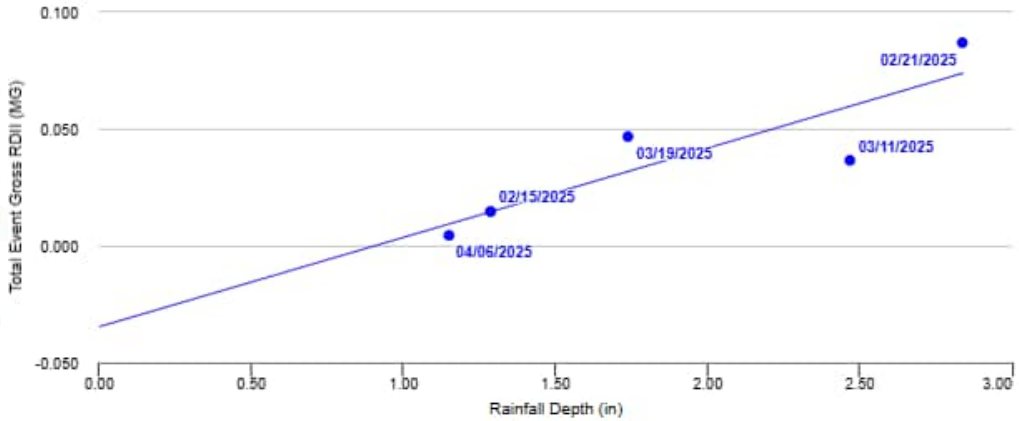
Hydrograph with Basin Rainfall: 01/14/2025 - 04/30/2025 | Basin CAM_81189 | Edit Dry Days

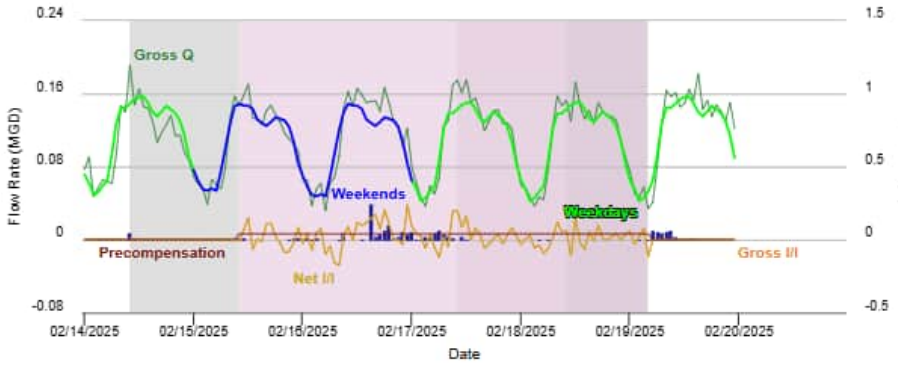


DRY DAYS | STORM EVENTS | STATISTICS

Dry Day Hydrograph



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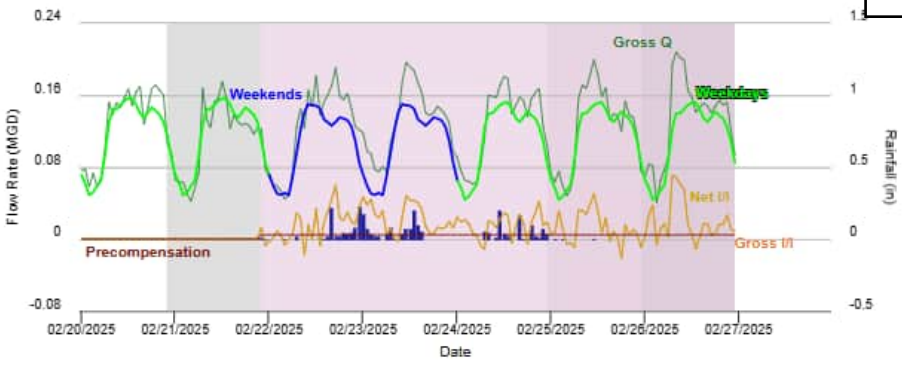
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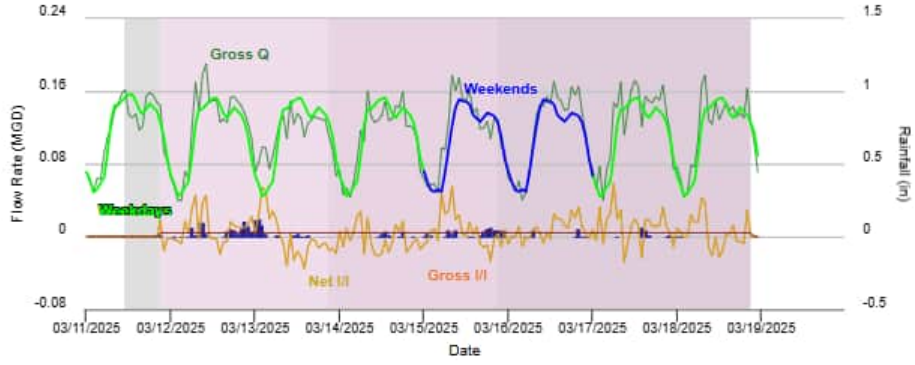
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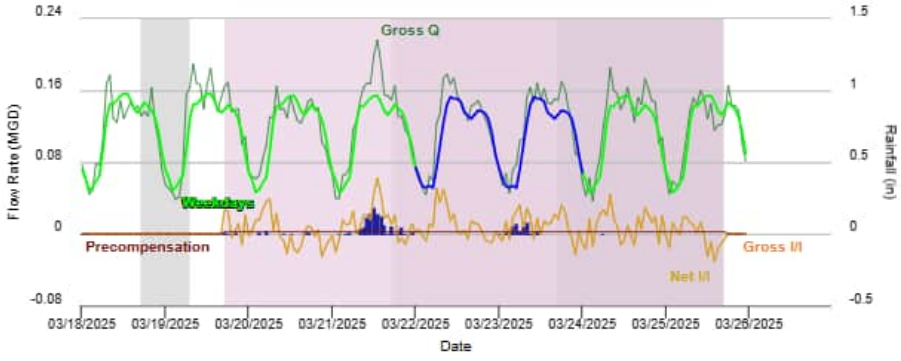
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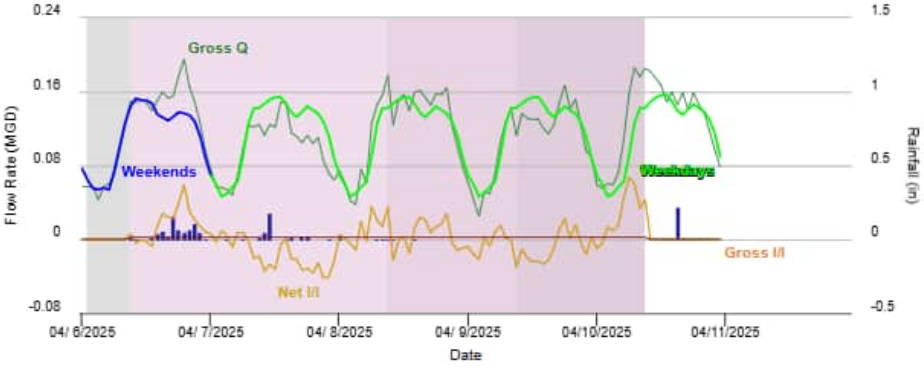
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ATTACHMENT B

ADWF DEVELOPMENT REVIEW PACKET

ADWF DEVELOPMENT REVIEW PACKET

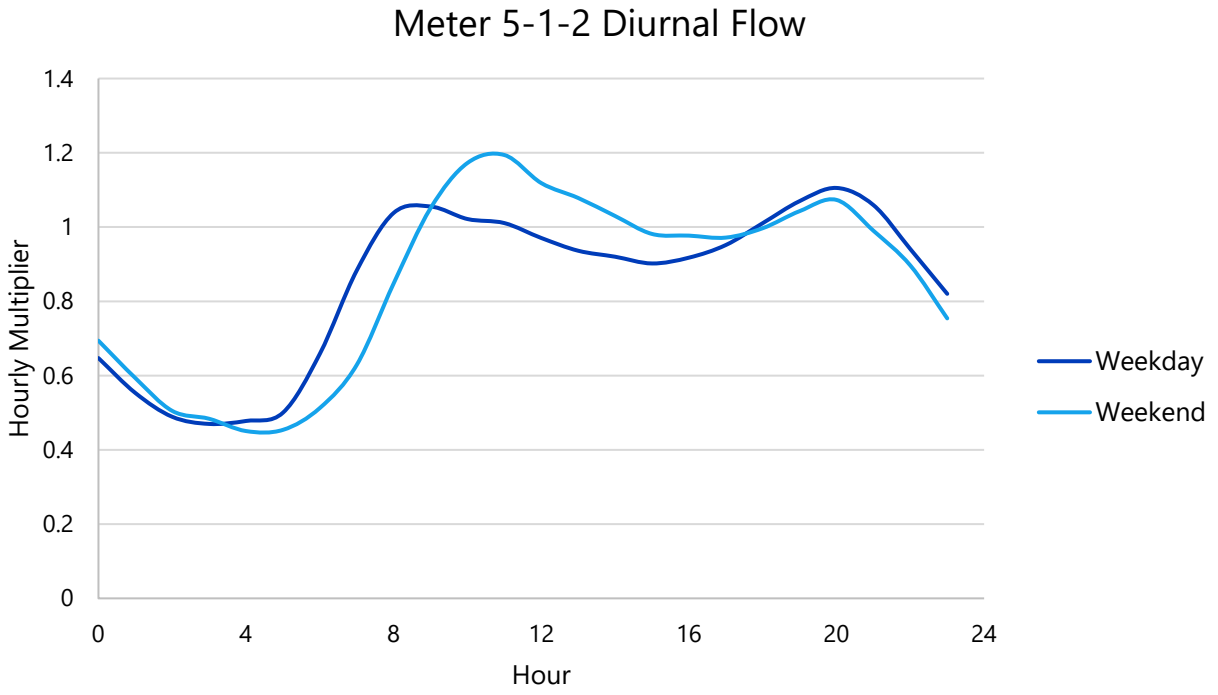

Figure B.1 Meter 5-1-2 Diurnal Flow

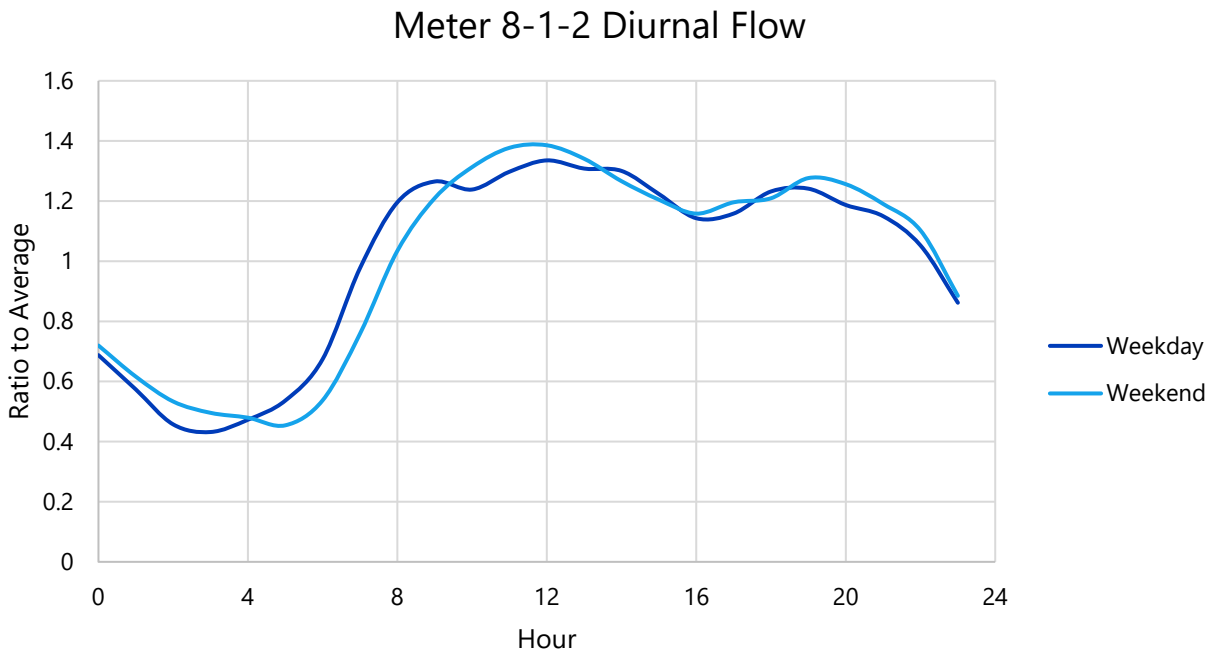

Figure B.2 Meter 8-1-2 Diurnal Flow

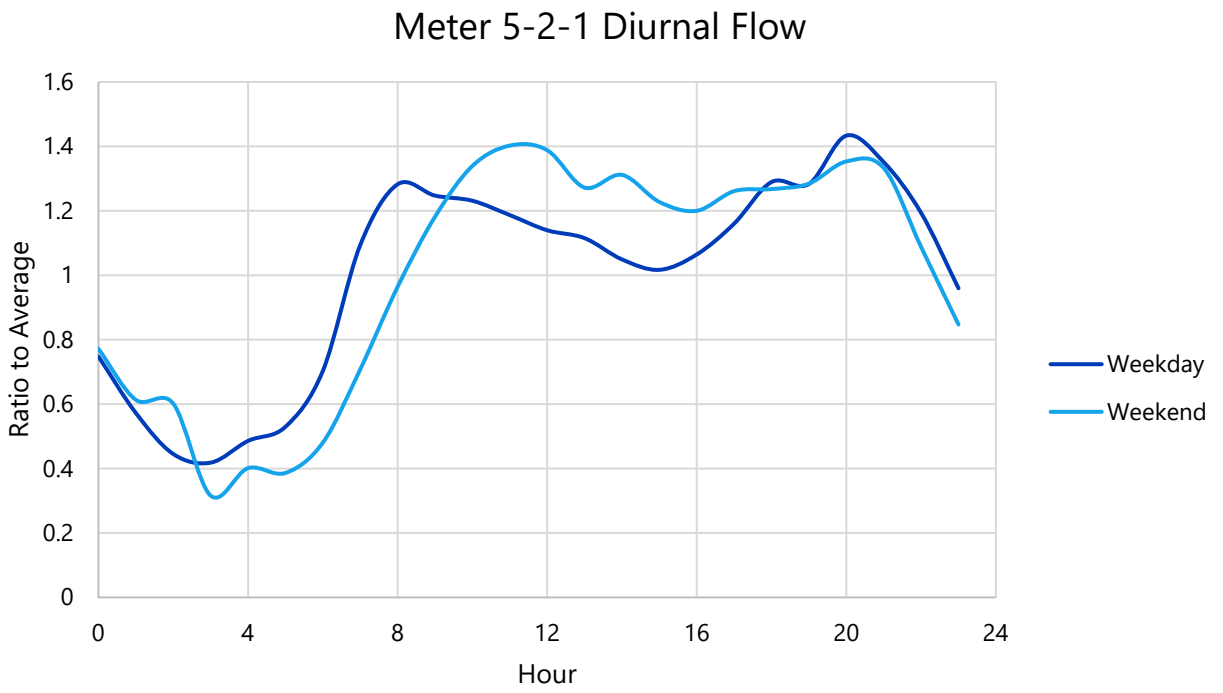

Figure B.3 Meter 5-2-1 Dry Weather Flow

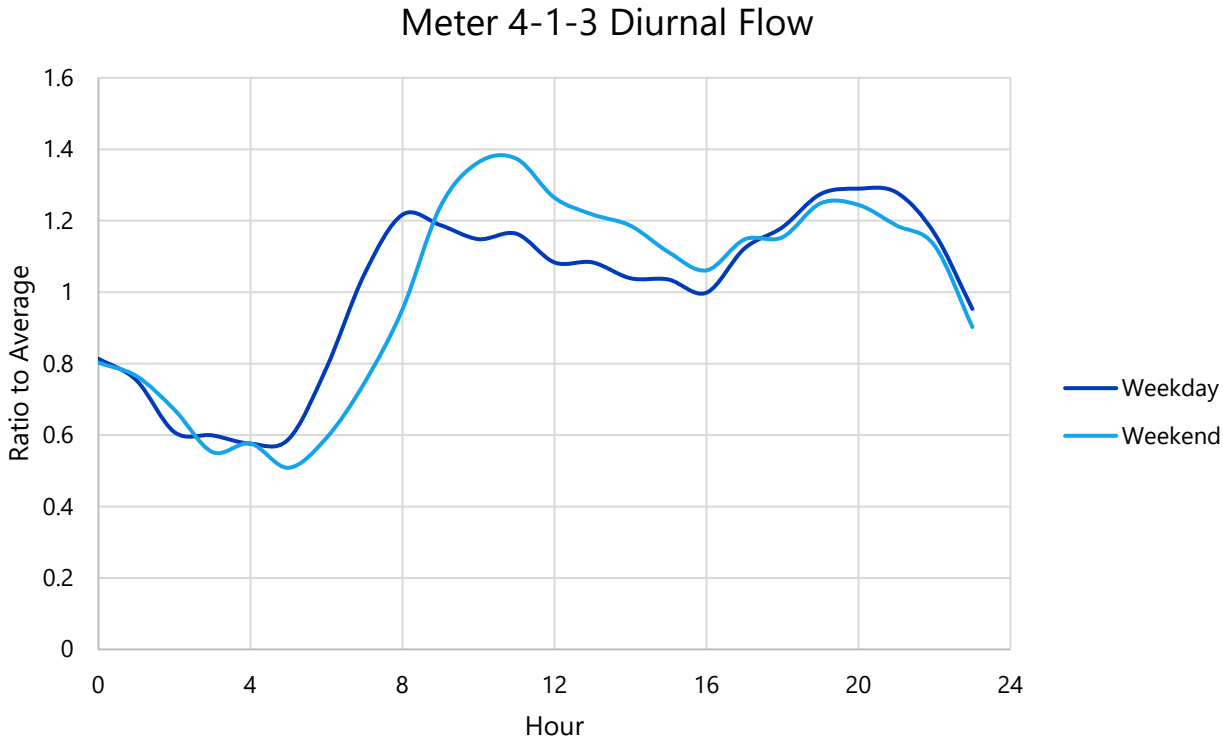

Figure B.4 Meter 4-1-3 Diurnal Flow

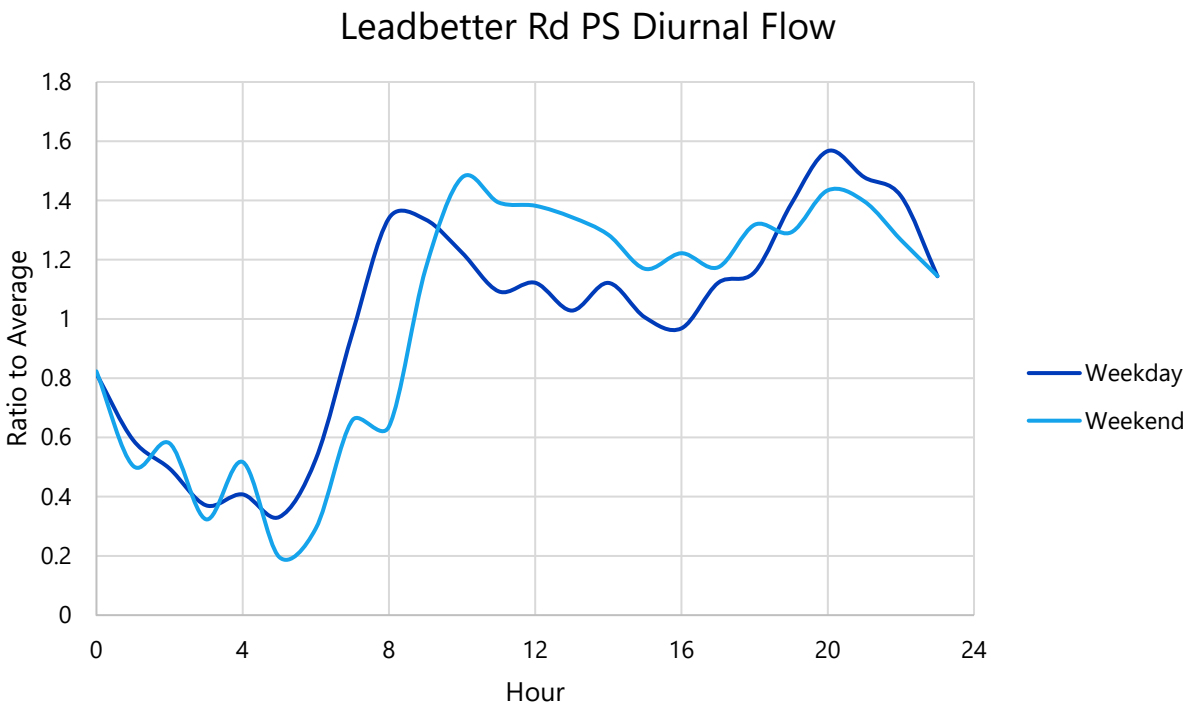

Figure B.5 Leadbetter Rd PS Diurnal Flow

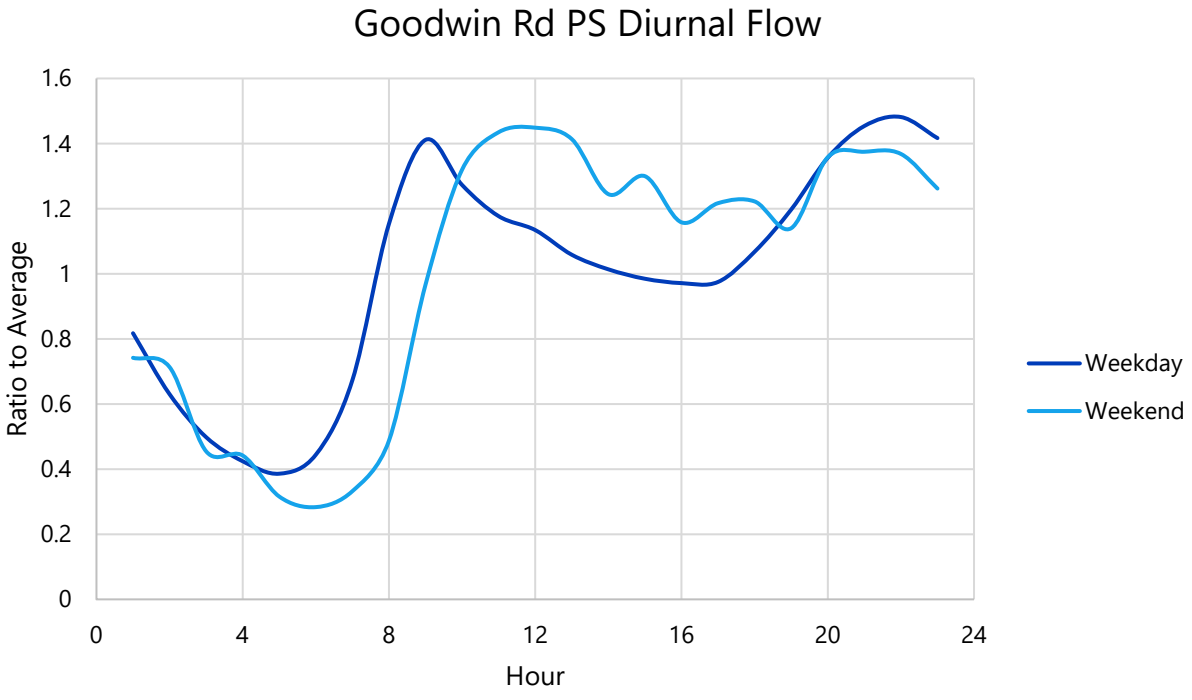

Figure B.6 Goodwin Rd PS Diurnal Flow

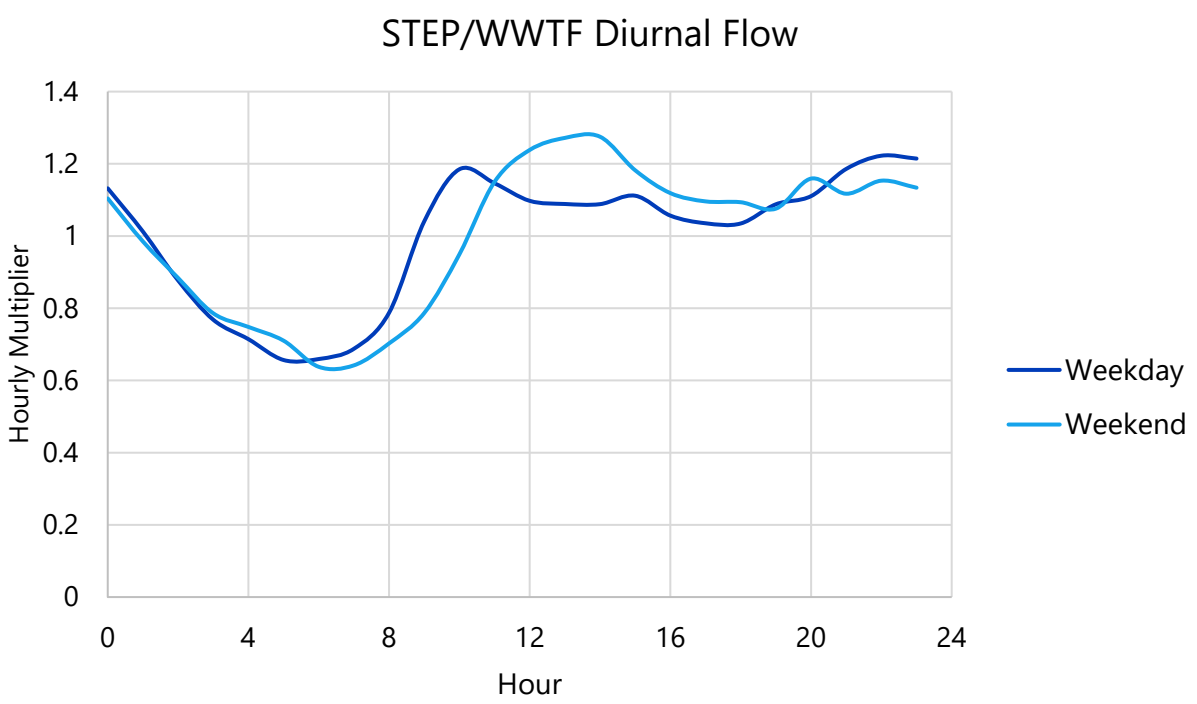

Figure B.7 STEP/WWTF Diurnal Flow

ATTACHMENT C

DRAFT 2045 COMPREHENSIVE PLAN



ourCamas 2045

DRAFT - *Last Updated July 2025*

Comprehensive Plan

ourCamas 2045

Acknowledgements

Thank you to the members of the Camas community for sharing your time and insights in the development of Our Camas 2045.

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Jennifer Senescu
John Svilarich

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Geoerl Nile, Vice Chair
Marlo Maroon
Joe Walsh
Shawn High
Mahsa Eshghi
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Betty Peng
Jason Irving
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Carrie Schulstad
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Bryan Rachal, Communications Director
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3J Consulting, Inc.
DKS Associates
ECOnorthwest
SERA Architects

ourCamas 2045

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ourCamas 2045



Vision

01

01. Vision

Our Camas Vision Statement

This vision is written in the present tense, as if describing the city as it exists in 2045. Some aspects of the vision can be found in Camas today, while others represent aspirations. The vision provides a framework for the goals and policies of every element of Our Camas 2045.

Our Community



Camas is an inclusive community where residents experience a sense of belonging and connection. Community-wide events foster civic pride, strong bonds among neighbors and a welcoming atmosphere for new residents. Community amenities and recreation facilities throughout Camas promote active lifestyles and social interaction. Camas is recognized for excellent schools and its commitment to lifelong learning. The City promotes a strong culture of public safety, transparent communication, and good governance, allowing residents to thrive in their neighborhoods and engage in decision-making that shapes their community.

Our Environment



Camas embraces its connection to nature and enjoys a wealth of outdoor recreational opportunities. Access to forests, clean water, parks, and trails is foundational to Camas' quality of life. The community shares a deep reverence for Camas' beauty, scenery, and tranquility, and is committed to preserving and enhancing its natural resources and tree canopy. Through proactive planning, the City mitigates the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come.

Our Neighborhoods



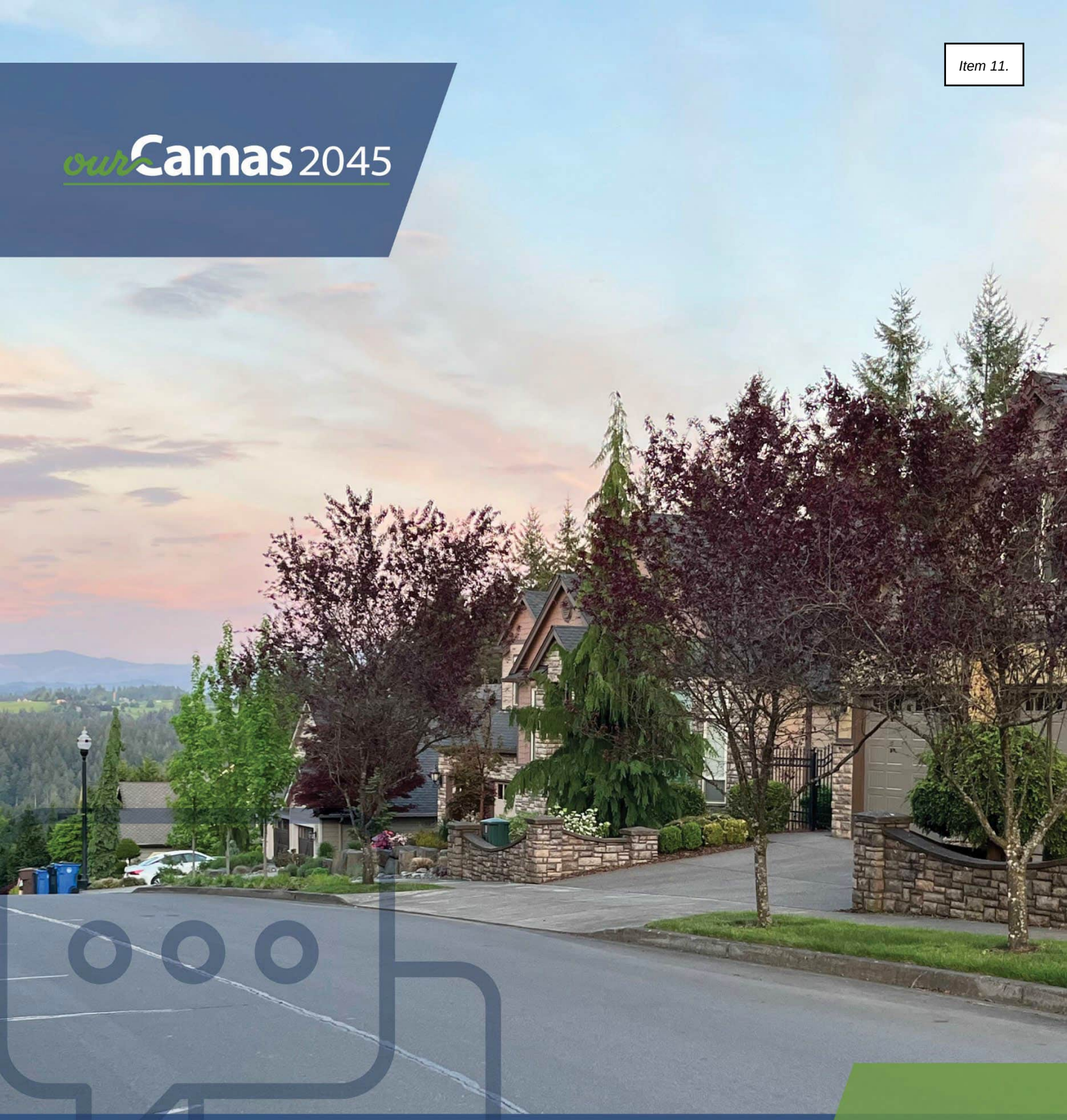
Camas embraces its small-town feel while responsibly managing growth, ensuring a prosperous and livable future for all. Camas provides a variety of housing options that meet the needs of all residents, while ensuring the town's charm and livability are sustained. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities and access to high wage jobs. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity.

Our Downtown



Charming, vibrant, and walkable, Downtown Camas is the city's living room. Downtown's history is complemented by new businesses and inclusive housing options. Expansion, resiliency and a dynamic economic landscape are critical to its success. Downtown Camas anchors the community while fostering a culture of pride, support, and connection.

ourCamas 2045



02 Introduction

02. Introduction

Our Camas 2045

Our Camas 2045 is a roadmap for the future of the city and guides land use development and public facility investment decisions between now and 2045.

Camas has a long and rich history. More than 10,000 years ago, Native Americans occupied the Columbia River Valley. The Lewis and Clark Corps of Discovery camped by the river in 1806. In the late 1800s, the La Camas Colony Company of Portland purchased 2,600 acres and began planning the construction of a paper mill to supply newsprint for The Oregonian. The construction of the mill brought the platting of the town and the City of Camas was incorporated in 1906. Today, Camas is a vibrant and diverse community that occupies approximately 16 square miles and is home to over 27,000 people.

Our Camas 2045 is an update to the prior City of Camas comprehensive plan, Camas 2035. This update incorporates new state legislation to support additional housing and climate planning and establishes a new vision for the community's future.

The history of Camas comprehensive planning dates back to 1963 when the first plan was prepared. In 1990, the state adopted the Growth Management Act (GMA) with the goal of managing the growth of cities that had previously grown in an uncoordinated fashion. GMA requires municipalities to update their comprehensive plans every 10 years to ensure future growth can be accommodated with housing and jobs, and public services and facilities are available to serve new residential, commercial, and employment areas.

The last major update to the City's comprehensive plan was in 2016. Since that time, the city has grown by over 5,000 people, added new residential areas in Grass Valley and Green Mountain, and completed the North Shore Subarea Plan, which established a new vision and zoning for the North Shore of Lacamas Lake and sets the stage for future residential, mixed use, and employment development. In conjunction with Our Camas 2045, the city prepared a downtown subarea plan. Our Downtown 2045 establishes a detailed vision and action plan to catalyze public and private investment in the historic downtown. Both plans work together to guide future development and ensure Camas' future remains as vibrant as its past.

What is a Comprehensive Plan?

Our Camas 2045 guides land use development and public facility investment decisions between now and 2045. Our Camas 2045 has eight elements that work together to achieve the community's vision and ensure long-term economic vitality:

- Community Character
- Land Use
- Housing
- Natural Environment
- Climate Change & Resiliency
- Transportation
- Public Facilities & Services
- Economic Development

Each element sets goals that will implement the vision and expresses policies that will guide land use and infrastructure decisions for the 20-year planning horizon. The elements are supported by the comprehensive plan map, which identifies land use designations throughout the City and within its urban growth area.1

Why Plan?

Planning is choosing what to do and how and when to do it. Planning is part of our everyday lives. We plan our vacations, our budgets, and even our trips to the grocery store. The detailed planning of our daily lives derives from a set of goals that we want to accomplish – in a day, in the next six months, or the next two years.

In the same way and for the same purpose, the City's plan is the basis of coordinated action – it enables public and private interests to undertake projects with a clear understanding of community goals and policies.

Our Camas 2045 helps the City identify deficiencies and take steps to remedy them. Planning can find desirable and reasonable solutions before the problem is beyond the community's economic capabilities. The plan is crucial to avoiding uncoordinated activities as the City adapts to changing conditions and experiences the population growth that is anticipated.

The plan is not intended as a rigid system of goals and development policies; rather, it is:

- Long range – looks ahead 20 years to anticipate growth and resulting community needs.
- Comprehensive – relates and integrates all types of uses and necessary public facilities.
- General – establishes general locations and areas for the elements and indicates their relationships to each other and the population they serve.
- Responsive – through regular updates, adjusts to changing conditions, unforeseen circumstances, and local and regional trends.

How is a Comprehensive Plan Related to Other Plans?

Our Camas 2045 is part of a family of state, regional, and local plans. Some, like statewide GMA and Clark County's Comprehensive Growth Management Plan, set the overall planning framework and guide the content of the Camas comprehensive plan.

Others, like plans that are specific to particular subareas, supply more detailed information about individual topics or smaller parts of the City.

Growth Management Act

The GMA establishes state goals, sets deadlines for compliance, and offers direction on how to prepare comprehensive plans and development regulations. GMA also establishes requirements for early and continuous public participation. GMA requires state and local governments to manage growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, and preparing comprehensive plans and implementing them through capital investments and development regulations.

The GMA legislation, which is Chapter 36.70A of the Revised Code of Washington (RCW), contains 15 goals.

For a community's plan to be valid, it must meet the requirements of the GMA through consistency with state statutory goals, countywide policies, and the plans of adjacent jurisdictions.

The fifteen statutory goals identified in the GMA (RCW 36.70A) are:

1. **Urban growth**. Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner.
2. **Reduce sprawl.** Reduce the inappropriate conversion of undeveloped land into sprawling, low-density development.
3. **Transportation.** Encourage efficient multimodal transportation systems that will reduce greenhouse gas emissions and per capita vehicle miles traveled, and are based on regional priorities and coordinated with county and city comprehensive plans.
4. **Housing.** Plan for and accommodate housing affordable to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage preservation of existing housing stock.
5. **Economic development.** Encourage economic development throughout the state that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons, promote the retention and expansion of existing businesses and recruitment of new businesses, recognize regional differences impacting economic development opportunities, and encourage growth in areas experiencing insufficient economic growth, all within the capacities of the state's natural resources, public services, and public facilities.
6. **Property rights.** Private property shall not be taken for public use without just compensation having been made. The property rights of landowners shall be protected from arbitrary and discriminatory actions.
7. **Permits.** Applications for both state and local government permits should be processed in a timely and fair manner to ensure predictability.

8. **Natural resource industries.** Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forestlands and productive agricultural lands, and discourage incompatible uses.
9. **Open space and recreation.** Retain open space and green space, enhance recreational opportunities, enhance fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities.
10. **Environment.** Protect and enhance the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
11. **Citizen participation and coordination.** Encourage the involvement of citizens in the planning process, including the participation of vulnerable populations and overburdened communities, and ensure coordination between communities and jurisdictions to reconcile conflicts.
12. **Public facilities and services.** Ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.
13. **Historic preservation.** Identify and encourage the preservation of lands, sites, and structures, that have historical or archaeological significance.
14. **Climate change and resiliency.** Ensure that comprehensive plans, development regulations, and regional policies, plans, and strategies under RCW 36.70A.210 and chapter 47.80 RCW adapt to and mitigate the effects of a changing climate; support reductions in greenhouse gas emissions and per capita vehicle miles traveled; prepare for climate impact scenarios; foster resiliency to climate impacts and natural hazards; protect and enhance environmental, economic, and human health and safety; and advance environmental justice.
15. **Shorelines of the state.** For shorelines of the state, the goals and policies of the shoreline management act as set forth in RCW 90.58.020 shall be considered an element of the county's or city's comprehensive plan.

Urban Growth Areas

An urban growth area is a defined area of land adjacent to city limits within which urban growth is encouraged and beyond which growth can occur only if it is not urban in nature.

Each county that adopts a comprehensive plan under the GMA must designate urban growth areas. The City of Camas has 11,848 acres of land within the urban growth areas. This land, combined with the vacant land available within the City limits, must accommodate the City's population and employment projections as established by the state's Office of Financial Management. The population and employment projections for the City for the year 2045 are 37,080 people and 11,615 jobs. The City is proposing urban growth area expansion to accommodate increased job capacity (see the Land Use Element for additional details).

County Planning Goals and Policies

The Comprehensive Growth Management Plan, adopted by Clark County and its cities and last updated in 2016, guides local jurisdictions as they work to decide questions of regional land use and services.

Clark County is in the final stages of fully updating this plan for 2025 through 2045. As County and city plans were developed, representatives of the City of Camas met on a regular basis over the span of two years with officials of the County and its cities to coordinate efforts. This level of communication helps ensure that the plans and capital projects of these jurisdictions are consistent when adopted. Our Camas 2045 is consistent with the concepts put forward in the County's Comprehensive Growth Management Plan, and the initial drafts of its pending comprehensive plan, and the countywide planning policies as required by RCW 36.70A.100 and 210, WAC 365-196-305; 400(2)(c); 510 and 520.

Local Plans

The goals and policies included in Our Camas 2045 are implemented through development regulations established in the Camas Zoning Code (Title 18 of the Camas Municipal Codes) as well as the standards set forth in existing plans and policy documents.

Our Camas 2045 has been developed to ensure consistency with all other relevant local plans as listed below:

- Strategic Plan (updated annually)
- Legacy Lands Master Plan (in development)
- Lake Management Plan (2024)
- North Shore Subarea Plan (October 2022)
- Camas Water System Plan (October 2019)
- Camas General Sewer Plan (June 2022)
- Camas General Sewer/Wastewater Facility Plan (November 2011)
- City of Camas Parks, Recreation, and Open Space Comprehensive Plan (March 2022)
- Camas Design Standards Manual–Engineering (adopted October 20, 2014, Res. 1308, updated annually)
- Camas Design Review Manual (May 2, 2016)
- Camas Shoreline Master Program (spring 2021)
- Downtown Design Manual (revision in process, to be adopted with Our Downtown Camas 2045, the Downtown Subarea Plan)
- Camas Stormwater Design Standards Manual (June 2022)
- Six-Year Street Plan (Updated annually)
- 2025–2030 Capital Facilities Plan Project List (to be updated with Our Camas 2045)
- Transportation Impact Fee Update (May 2012)

Amending a Comprehensive Plan

The City is required to review its comprehensive plan at least every ten years. However, the City's comprehensive plan and development regulations are reviewed and evaluated regularly.

Our Camas 2045 is based on the best available information. As years go by, new information or changing circumstances – for instance, a revised sewer or water plan – may prompt changes to this plan. By state law, amending a comprehensive plan can occur only once a year and must follow the procedures that are set forth in RCW 36.70A.130.

Amendments to a comprehensive plan require legislative action, which entails the adoption of a resolution or ordinance following notice and public hearing indicating, at a minimum, a finding that a review and evaluation has occurred and identifying the revisions made, or that a revision was not needed and the reasons.

The review and evaluation must include the consideration of critical area ordinances, population projections, and other plans and policies in effect.

Under certain circumstances, amendments can occur more frequently:

- The initial adoption of a subarea plan. Subareas must clarify, supplement, or implement jurisdiction-wide comprehensive plan policies, and may only be adopted if the cumulative impacts of the proposed plan are addressed by appropriate environmental review under chapter 43.21C RCW.
- The development of an initial subarea plan for economic development located outside of the 100 year floodplain in a county that has completed a state-funded pilot project that is based on watershed characterization and local habitat assessment
- The adoption or amendment of a shoreline master program under the procedures set forth in Chapter 90.58 RCW.
- The amendment of the capital facilities element of a comprehensive plan that occurs concurrently with the adoption or amendment of a county or city budget.
- The adoption of comprehensive plan amendments necessary to enact a planned action under RCW 43.21C.440, provided that amendments are considered in accordance with the public participation program established by the county or city under this subsection (2)(a) and all persons who have requested notice of a comprehensive plan update are given notice of the amendments and an opportunity to comment.

Developing Our Camas 2045

Our Camas 2045 began with a citywide outreach process to better understand the community's vision and priorities related to Camas' future. The Our Camas Visioning process reached over 1,000 community members through community conversations, community events, an online survey, online mapping tools, and the project website.

The City hosted two Community Summits. The first, held in June 2024, was an open house event where members of the public could provide feedback on the draft vision statement and goals, as well as provide ideas to achieve the vision and goals. The second Community Summit was held in October 2024 and provided a forum for community members to provide feedback on the draft land use alternatives, development scales, review development concepts for downtown, and learn about the County's climate planning efforts and greenhouse gas inventory.

There were several advisory committees that participated in the development of the plan.

- Project Advisory Committee (PAC) – technical stakeholders, agency partners, service providers
- Community Advisory Community (CAC) – broad cross-section of community interests

- Climate Policy Advisory Team (CPAT) – community members advising on climate goals and policies
- Existing advisory bodies that consulted on the vision, goals, policies, and plan:
    - Downtown Camas Association (DCA)
    - City Council
    - Planning Commission

Following preparation of the draft plan, the City hosted pop-up events throughout the summer and fall of 2025 to seek input on the preferred alternative map and draft goals and policies.

In addition to the outreach efforts described above, the City maintained a public engagement website throughout the visioning process and the development of Our Camas 2045. During spring 2024, a community survey and interactive map gathered feedback from the community on things they like about Camas, things they would change in the future, important topics to address in the plan, and areas of opportunity or concern both downtown and in the wider Camas community. A second online survey accompanied the second community summit to seek input on the draft land use alternatives and development concepts for downtown. The City prepared a Story Map in Spring 2025 to present and obtain feedback on the preferred land use alternative and proposed zoning and comprehensive plan land use designation changes.

The City of Camas values residents' opinions and is committed to being responsive. The final comprehensive plan incorporates the contributions and comments from those who participated in the project engagement. A summary of all engagement activities is included in Appendix X.

ourCamas 2045



03 Community Character

Community Character

This element integrates art, culture, growth and identity into the comprehensive plan, while ensuring community engagement is inclusive and open.

03. Community Character

Vision

In 2045, Camas is an inclusive community where residents experience a sense of belonging and connection. The city's unique identity is defined by its small-town feel and the incorporation of the natural landscape into walkable neighborhoods and high-quality development. Camas maintains its distinct sense of place through inclusive community engagement, sustainable development practices, and intentional placemaking that reinforces Camas' beauty, livability, and lasting connection to nature.

Introduction

The community character element establishes a framework for preserving and enhancing the physical, cultural, and social characteristics that make Camas feel like Camas. Community character is shaped not only by the built environment, but also by the natural landscape, cultural identity, historic context, and the ways in which people engage with their surroundings. As Camas plans for continued growth through the 2045 horizon, this element ensures that the qualities residents value—such as the City's small-town atmosphere, its connection to nature, and its strong civic identity—are maintained and reinforced through thoughtful development, design standards, public investment, and public engagement.

Camas' natural and built environment is defined by its integration of the natural features of the land with the development of housing, commercial buildings and its connecting infrastructure. In 2025, the City of Camas is home to 16 parks, 12 miles of scenic trails, and over 1,060 acres of parks and open space. From the forested paths around Lacamas Lake to the many playgrounds throughout the city, the natural beauty of Camas is a defining part of community life.

Camas' diversifying community is comprised of just over 27,000 people and expected to grow to over 37,000 by 2045. While most people who live in Camas commute to nearby cities for employment, in 2025, there are approximately 9,550 jobs within the city with the largest employment sectors being education and

healthcare, followed by professional services. The Georgia Pacific Mill remains a significant part of the city's economic history and a symbol of Camas' working roots.

The majority of housing in Camas is single family detached homes. Most residents own their home, with renters making up 20% of residents. There are approximately 10,000 housing units in Camas in 2025. By 2045, the city needs to add 4,226 new units to support the growing population. Camas also needs a greater variety of housing types at a range of price points to meet residents' diverse needs. By 2045, new multifamily and mixed-use buildings near transit, in Downtown, North Shore, and along NW Parker Street and Pacific Rim Boulevard will expand options for existing and new residents. These future developments will complement the strong sense of place already present in Camas' established neighborhoods like Prune Hill, Crown Park, and Evergreen Terrace.

Access to public art and community events is an important priority to define and enhance the identity of Camas. Beloved local traditions like Camas Days, the Camas Farmers Markets, and seasonal parades and festivals foster a deep sense of connection and pride. New development will include and support inclusive public gathering spaces to host events, ensuring that the community spirit thrives as the city grows.

Key community resources to preserve and enhance include the existing built infrastructure, high quality schools, access to living wage jobs, parks, open space and recreational amenities, and the distinctive Downtown area, where historic storefronts, local restaurants, and venues like the Liberty Theatre draw residents and visitors alike.

The community will connect with city government and processes through accessible engagement and neighborhood leadership. Ongoing collaboration will help ensure that Camas remains a place where people feel heard, welcomed, and at home.

Community Character Goals and Policies

Goal CC-1 Art, Culture, and Heritage

Camas is a city where history, art, and culture are celebrated and accessible to all. Camas events and activities will instill a sense of belonging among residents of all ages, making Camas an ideal place to live and work.

Policy CC-1.1 Encourage and promote a wide range of artistic and cultural activities by reducing barriers and increasing access to hosting and attending community events that define and enhance Camas' community identity.

Policy CC-1.2 Incentivize development sites to create spaces conducive to the provision of art and other cultural activities and amenities. Encourage murals, sculptures, interactive art installations, and

interpretive displays that celebrate the history, culture, and creativity of Camas.

Policy CC-1.3 Develop a process to memorialize historic sites and create and maintain an official inventory of Camas' historic and cultural resources.

Policy CC-1.4 Support the formation of a local arts commission that provides funding and support for local artists and artistic events in Camas.

Policy CC-1.5 Require a percentage of capital project budgets to be allocated for public art and design enhancements.

Policy CC-1.6 Prioritize naming streets, parks, and public facilities after historically significant people, events, geographic features, or native flora and fauna. Consider allowing naming rights in recognition of significant donations.

Goal CC-2 Sustainable Growth and Distinct Identity

Camas' unique identity is enhanced by high-quality urban design that respects the natural landscape, fosters a connection to nature, and integrates sustainable development.

Policy CC-2.1 Establish and enforce clear and objective design standards to ensure that new development respects and enhances Camas' architectural, historical, and natural character.

Policy CC-2.2 Regulate land use and development to protect natural topographic, geologic, vegetative, and hydrologic features, and natural contours of undeveloped properties.

Policy CC-2.3 Promote and provide educational resources for tree-lined streets, rain gardens, and preservation and use of native landscaping to reinforce Camas' connection to nature.

Policy CC-2.4 Align development regulations and design guidelines with dark sky standards to encourage the preservation of the night sky.

Policy CC-2.5 Establish distinctive gateway features at major points of entry into Camas, including attractive signage, landscaping, and public art that reflect Camas' distinct identity.

Policy CC-2.6 Ensure that street signage, lighting, landscaping, and street furniture are designed and maintained with a cohesive aesthetic that enhances community identity.

Policy CC-2.7 Revise the City's sign standards to ensure that all permanent and temporary signage is attractive and well-maintained, with clear regulations and enforcement mechanisms.

Policy CC-2.8 Provide educational and volunteer programs related to climate science, the connections between habitat conditions and native species, and effective ways to mitigate the impacts of climate change.

Goal CC-3 Community Engagement

Camas will have a strong sense of community through open communication, inclusive and meaningful outreach efforts, and enduring partnerships throughout the community.

Policy CC-3.1 Increase access to public engagement by ensuring materials and procedures are accessible for all community members, especially vulnerable groups such as low-income, Limited English Proficiency (LEP) individuals, youth, elderly, and differently abled.

Policy CC-3.2 Utilize outreach strategies such as focus groups and listening posts that accommodate the needs of everyone and account for the broad spectrum of community members.

Policy CC-3.3 Develop and implement strategies to support neighborhood leadership and associations to increase community involvement and provide opportunities to participate in the development processes.

Policy CC-3.4 Regularly inform the community of activities and events through a range of outreach methods including traditional and social media, partnerships with schools, and information at fairs and events.

Policy CC-3.5 Develop a City education program to inform the community on the inner workings of their local government, city functions, and an opportunity to engage with staff.

ourCamas 2045



Land Use

04

04. Land Use

Land Use Element

The land use element is designed to support development that adheres to the City's vision to ensure Camas' future is as bright as its past.

Vision

Camas embraces its small-town feel while responsibly managing growth, ensuring a prosperous and livable future for all. Camas provides a variety of housing options that meet the needs of all residents, while ensuring the town's charm and livability are sustained. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities and access to high wage jobs. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity.

Land Use Overview

The City of Camas is home to great schools, family-wage jobs, high quality neighborhoods, and an abundance of open space and recreational amenities. Camas has grown into a dynamic, vibrant city with diversified employment opportunities and services that cater to its residents' various needs. In 2025, Camas maintains its small town charm and character, and downtown remains the heart of the City with a mix of restaurants, shops, professional offices, and residential development. The Grass Valley area is home to several national and international technology and manufacturing firms. Newer residential development has occurred recently in the Green Mountain area, and planned transportation improvements in the North Shore area will improve connectivity and provide better transportation options throughout the City.

The land use element is designed to support development that adheres to the City's vision to ensure Camas' future is as bright as its past. The GMA identifies the land use element as the foundation of the comprehensive plan. GMA outlines the framework by which the plan will be implemented and establishes land use designations to accommodate the City's population and employment projections. The development of land in accordance with the goals and policies included in the land use element will ensure the achievement of an appropriate balance of public facilities, housing, employment, services, and recreational uses throughout the City.

Population Projections

GMA requires that each jurisdiction accommodate its share of the region's growth. The City of Camas is expected to have a population of 37,080 by 2045 (based on the County adopted growth rate of 1.2 percent per year), a 7,729-person increase from the 2023 population of 29,352. During the same period, Camas is expected to add 13,658 jobs.

Land Use Designations

In order to ensure the City's vision and land use goals are achieved, land use designations are used to assign a variety of development uses and building densities to land throughout the City. The plan identifies areas for residential, commercial, mixed use, mixed employment and industrial development. The plan also identifies areas for parks and open space to support recreation and enhance natural areas, including habitat and wildlife corridors.

Table 1 Land Use Designations

Comprehensive Plan Designation	Corresponding Zones	Total (Acres)[1]
Residential Low	Residential 15,000 (R-15)	407
	Residential 12,000 (R-12)	27
	Residential 10,000 (R-10)	280
	Residential 7,500 (R-7.5)	151
	Residential 6,000 (R-6)	19
	North Shore Lower Density (LD-NS)	145
	Downtown Residential (R-DT)	68
Residential Medium	Multi-Family 10 (MF-10)	37
Residential High	Multi-Family 18 (MF-18)	41
	Multi-Family 26 (MF-26)	33
	Multi-Family 34 (MF-34)	6
	North Shore Higher Density (HD-NS)	109
Mixed Use	Mixed Use (MX)	141
	North Shore Mixed-Use (MX-NS)	85
	Downtown Mixed-Use Low Rise (MX-LR)	41
	Downtown Mixed-Use Mid Rise (MX-MR)	55
Mixed Employment	Mixed Employment (ME)	235
	North Shore Mixed Employment (ME-NS)	99
Commercial	Neighborhood Commercial (NC)	2
	Community Commercial (CC)	63
	North Shore Commercial (C-NS)	54
	Regional Commercial (RC)	298

	Historic Main Street Core (HMSC)	17
Industrial	Heavy Industrial	545
Parks and Open Space	Neighborhood Park (NP) Special Use Park (SU) Open Space (OS)	1,343

[1]Total acres within each zoning designation are gross acres and inclusive of rights-of-way and infrastructure.

Overlays

In addition to the land use designations listed in Table 1, land use overlays further define appropriate uses and development standards for particular areas within the City. Overlays in Camas include an Airport Overlay and a Design Overlay. Development within all overlay areas must comply with the goals and policies of the underlying land use designation and the specific standards included in the overlay.

The Airport Overlay area applies to land adjacent to Grove Field, an airport owned and operated by the Port of Camas-Washougal and located northeast of Lacamas Lake. Grove Field adjoins the City's UGA and is proposed to be included in the UGA with this update. The Airport Overlay is designated to ensure land uses adjacent to the airport are compatible with air traffic and do not interfere with safe air navigation. For example, the comprehensive plan designation of lands adjacent to the airport is generally Mixed Employment, rather than residential, and the Airport Overlay area restricts uses tending to have higher concentrations of people, such as schools or hospitals.

The Design Overlay is a new overlay with the 2025 update and replaces the Gateways and Corridors Overlay included in the prior plan. The Design Overlay generally applies to the following locations. The specific extents of the overlay are included on the Camas Zoning Map.

- 6th Avenue
- 3rd Avenue
- Everett Street
- 38th Avenue
- Lake Road
- Green Mountain - Goodwin
- Brady Road
- Union Street
- Parker Street

The Design Overlay is intended to enhance the walkability, pedestrian experience, and design of the corridors it covers. Development/redevelopment within a designated Design Overlay must adhere to the Design Overlay goals and policies included in this element. See Goal LU-6 and Policies LU-6.1 – 6.7.

Figure 2 Comprehensive Plan Map

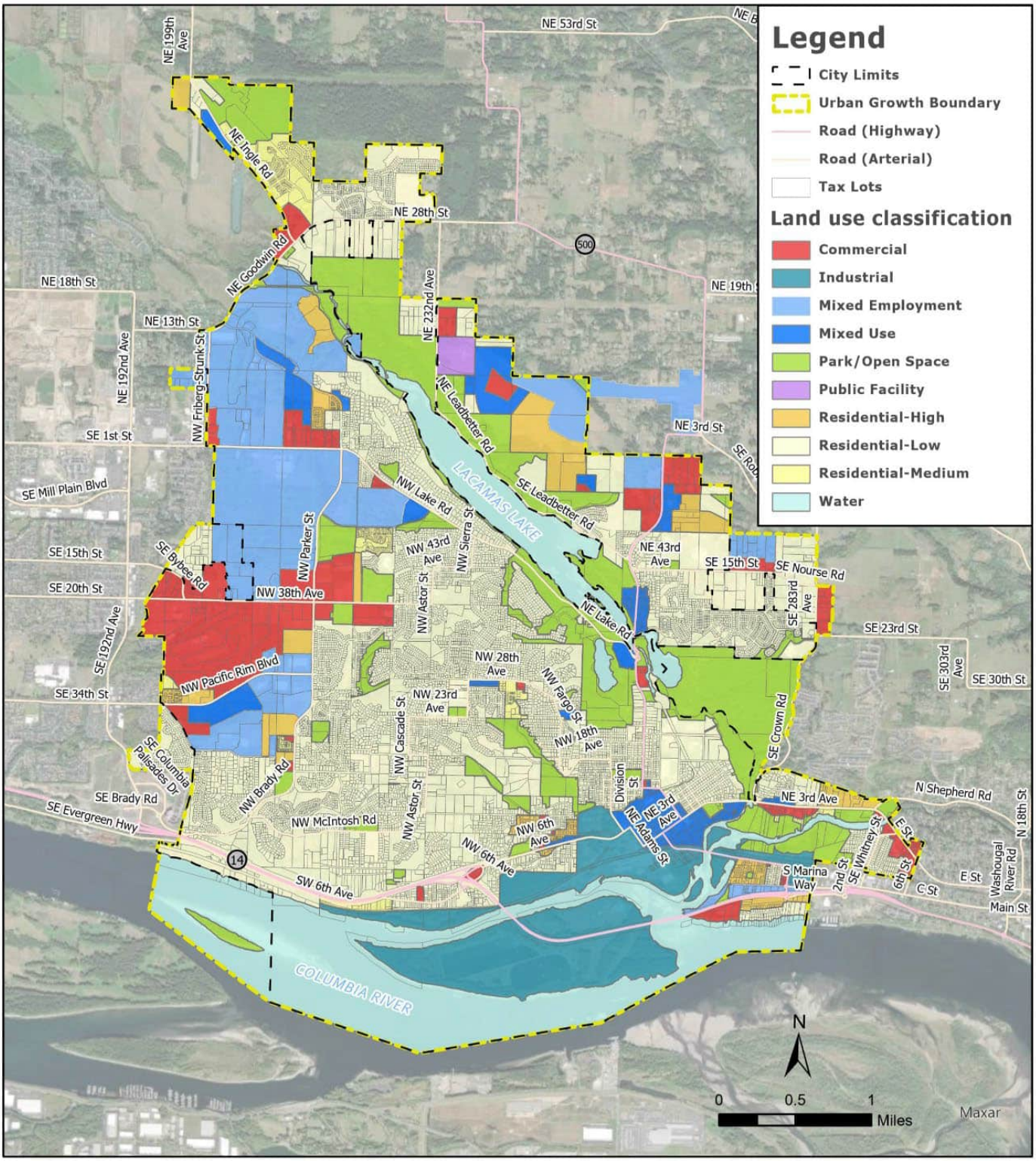
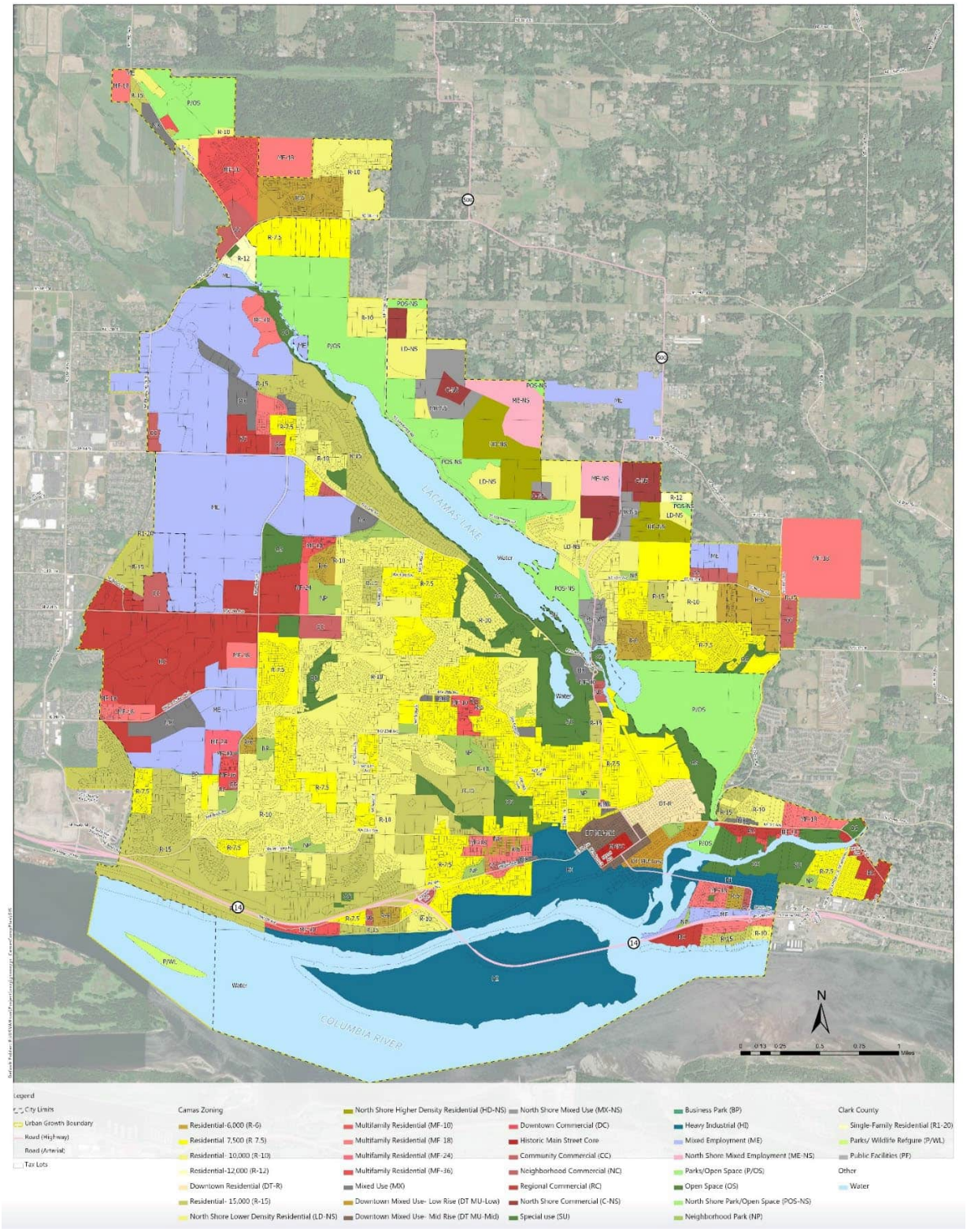


Figure 3 Zoning Map



Land Use Goals and Policies

Goal LU-1 Citywide Land Use

Maintain a land use pattern that respects the natural environment and existing uses while accommodating a mix of housing and employment opportunities to meet the City's growth projections in coordination with the capital improvement plan.

Policy LU-1.1 Ensure the appropriate mix of commercial, residential, and industrial zoned land accommodates the City's share of the regional population and employment projections for the 20-year planning horizon.

Policy LU-1.2 Coordinate with Clark County, the state, and special districts to identify future needs for essential public facilities such as airports, state education facilities, state and regional transportation facilities, state and local correctional facilities, solid waste handling facilities, regional parks and others as identified in RCW 36.70A.200. (See policies ED-3.1, 3.2, and 3.3 regarding Grove Field airport, policy TR-2.1 regarding transportation, and policy PFS-4.27 regarding solid waste.)

Policy LU-1.3 Implement design standards for new development, redevelopment, and infill that consider the surrounding built and natural environments and support a natural transition between uses.

Policy LU-1.4 Ensure that park and recreation land is distributed equitably throughout the City and work to achieve park and continuous trail corridors from Green Mountain to the Columbia River. (See policies PFS-2.1 and 2.4 regarding increasing connectivity to natural areas and continuous trail around Lacamas Lake.)

Policy LU-1.5 Ensure adequate public facilities, including roads, emergency services, utilities, and schools, exist to serve new development, and mitigate potential impacts to current residents. Establish and maintain policies for impact fees for new development.

Policy LU-1.6 Ensure consistency with County-wide planning policies.

Policy LU-1.7 Evaluate and improve design and building standards for new and redeveloped sites in high-risk natural hazard areas.

Policy LU-1.8 Incorporate sustainable and low climate impact design into development codes and standards.

Policy LU-1.9 Encourage high density concentrations of housing, commercial, and other uses needed in daily life along major transportation corridors to support the reduction in vehicle miles traveled and opportunities to increase physical activity.

Policy LU-1.10 Protect the viability of the airport as a significant economic resource to the community by encouraging compatible land uses and densities, and reducing hazards that may endanger the lives and property of the public and aviation users consistent with state laws RCW 36.701A.510 and RCW 36.70547.

Goal LU-2 Employment Land

Create a diversified economy and serve Camas residents, businesses, and tourists by providing sufficient land throughout the City to support a variety of business types and employment opportunities.

Policy LU-2.1 Protect employment land to ensure an adequate supply of commercial and industrial land to meet 20-year employment projections. Encourage a balance of new and existing commercial, light industrial, knowledge-based business, medical, and high-tech uses.

Policy LU-2.2 Encourage mixed-use developments (residential and commercial) that support adjacent uses, reduce vehicle miles traveled, and balance job creation.

Policy LU-2.3 Implement development and landscaping standards to ensure industrial development and other employment lands integrate with the surrounding neighborhoods.

Goal LU-3 Neighborhoods

Create vibrant, stable, and livable neighborhoods with a variety of housing choices that meet all stages in the life cycle and the range of affordability.

Policy LU-3.1 Encourage connectivity between neighborhoods and adjoining natural areas and trails to increase access to recreation amenities. (See policies PFS-2.1 and 2.2)

Policy LU-3.2 Discourage exclusive neighborhoods, privacy walls, and gated communities.

Policy LU-3.3 Provide commercial zoning within a half mile of residential areas for the development of food retailers (grocery stores and farmers' markets) to improve food access.

Goal LU-4 Natural Environment

Develop an interconnected network of parks, trails, and open space to enhance the quality of life for Camas residents and visitors and support and preserve wildlife corridors and natural resources.

Policy LU-4.1 Maintain development regulations that encourage the preservation of trees and natural areas, including the use of density bonuses and other tools to protect sensitive areas and encourage tree replacement. (See policy NE-4.1)

Policy LU-4.2 Support the purchase and preservation of open space by the City and private owners. Encourage careful consideration and integration of the natural environment in planning activities to maintain the park-like setting of Camas.

Policy LU-4.3 Encourage connectivity and increase access to regional trails throughout the City to support multi-modal transportation and physical activity. (See policies PFS-2.1)

Policy LU-4.4 Protect the quality and quantity of groundwater used for public water supplies through conservation of water usage and treatment of runoff.

Goal LU-5 Mixed-Use Areas

Foster economically and socially diverse mixed-use neighborhoods that meet the multi-modal transportation, housing, employment, education, recreation, and health needs of the community.

Policy LU-5.1 Mixed-use developments should be unique to the area in which they are located, encourage small business development, provide a mix of housing types to ensure affordability, increase pedestrian and transit connections, and include design that is sensitive to the natural environment.

Policy LU-5.2 Develop mixed-use areas that are oriented to the public street and scaled and designed to integrate with surrounding land uses.

Policy LU-5.3 Create a mixed-use zone that requires developments to include a minimum percentage of commercial space in both vertical and horizontal mixed-use settings.

Goal LU-6 Design Overlay Areas

Create attractive and welcoming areas in the City and distinguish Camas from adjacent jurisdictions through the development of design overlays.

Policy LU-6.1 Encourage development and redevelopment along the design overlay corridors that respects the historic character of the areas, improves pedestrian mobility/safety, and supports small-scale retail and commercial services.

Policy LU-6.2 Encourage development of commercial uses and multi-family residential within the NE 6th Avenue and NE 3rd Avenue design overlay corridors to support downtown businesses (such as through the Downtown subarea plan). Consider rezoning low-density residential land to support the downtown area. Consider rezoning low-density residential land to support the downtown area.

Policy LU-6.3 Orient building entrances toward the street and provide pedestrian connections from building entrances to the sidewalk. Encourage landscaping, rather than parking, between the building and the street to create a welcoming streetscape.

Policy LU-6.4 Collaborate with partners to support community events, public art, and infrastructure investments that celebrate cultural heritage, provide community amenities, and strengthen community branding. Develop area identities through events, festivals,

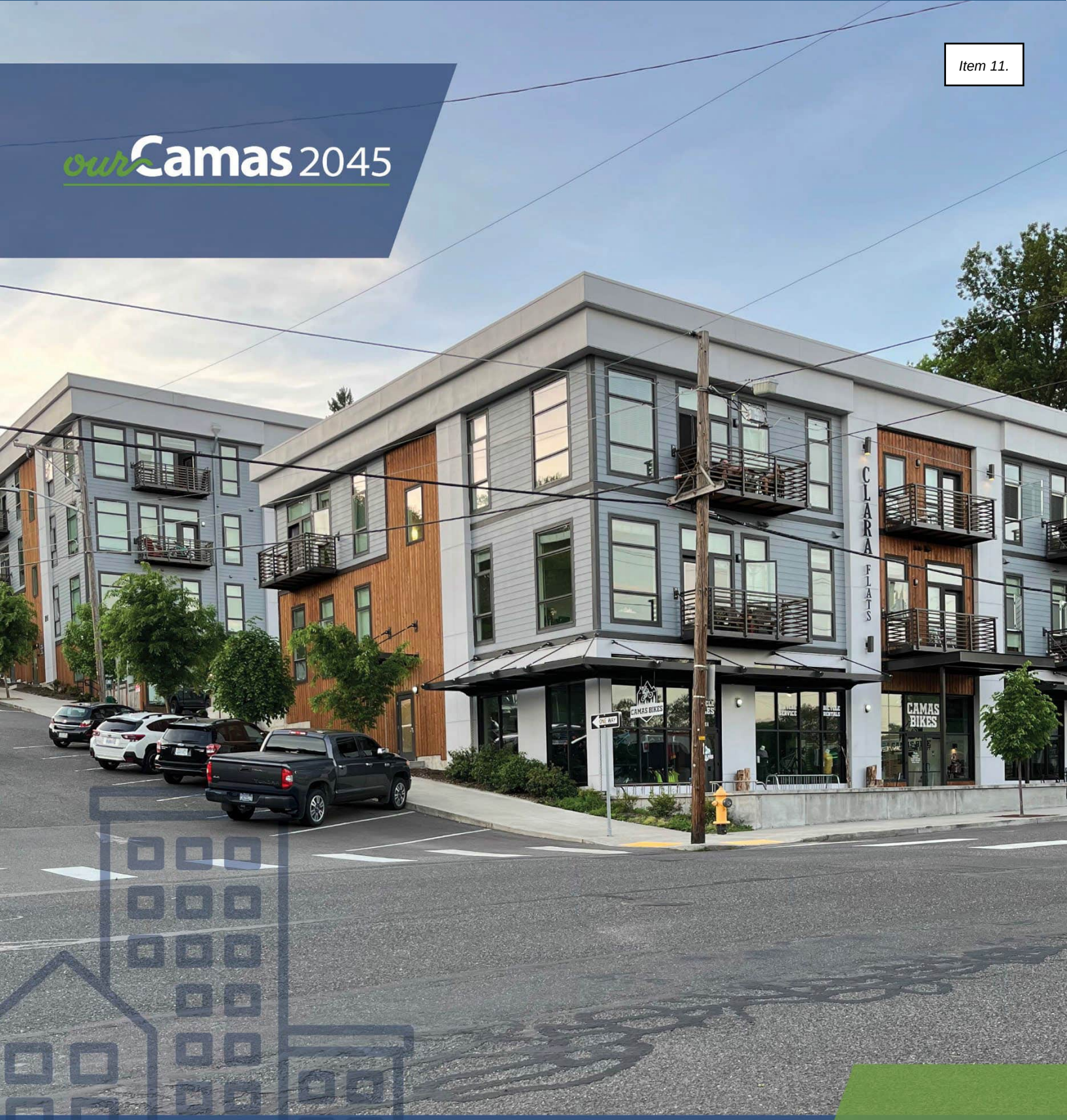
signage, and other improvements that help establish or enhance existing character within the overlay areas.

Policy LU-6.5 Encourage the designation and development of design overlay features in strategic areas to create a distinct pedestrian scale identity and attract visitors.

Policy LU-6.6 Identify streets in the design overlay areas as public places to encourage pedestrian and bicycle mobility and to reinforce the connection between the corridors and the surrounding neighborhoods.

Policy LU-6.7 Improve and increase wayfinding signage in design overlay areas to nearby recreational and other amenities.

ourCamas 2045



Housing

05

05. Housing

Vision

In the year 2045, residents of Camas continue to appreciate their safe, diverse, and welcoming community. Those raised in Camas will return for living-wage jobs and to ultimately retire here. Camas is a well-planned and connected city where residents enjoy pedestrian and bicycle paths between neighborhoods and to downtown. Camas provides a wide variety of housing options that meets the needs of all residents and provides a range of housing for all ages, abilities, needs, preferences, and income levels.

Background

This element of the comprehensive plan sets out the vision, goals, and policies to address current and projected housing needs for the next 20 years (2025 to 2045), inclusive of the diverse needs of the whole community across the income spectrum. Camas is facing housing challenges that could benefit from improved access to more housing options including more housing for seniors and young adults, smaller housing, more rental units, and affordable homeownership opportunities, all of which the City can have a role in supporting.

The housing element is supported by a housing needs assessment (provided below) that quantifies existing housing stock and projected housing needed to accommodate projected growth. Housing analysis is an important exercise as the housing needs in Camas tend to continually evolve based on changes in the broader economy, local demographics, and the regulatory environment. In addition to an assessment of housing needs based on the best available existing data, the housing element goals and policies reflect community input, state legislative requirements, and City of Camas' priorities.

The following section provides background on the planning framework and highlights the analytical findings associated with current and projected housing including details on Camas' community demographics, housing stock, housing market dynamics, expected housing demand, and special housing needs. The insights from this analysis help to build a factual basis for the housing policy updates.

Housing Challenges

Camas is facing housing challenges that could benefit from improved access to more housing options including more housing for seniors and young adults, smaller housing, more rental units, and affordable homeownership opportunities, all of which the City can have a role in supporting.

Planning Framework

In Clark County, RCW 36.70A.040 requires all cities to "fully plan" for the Elements of a Comprehensive Plan, including land use, housing, capital facilities, utilities, transportation, and climate change.[1] The current update process is part of a periodic update also required by the Growth Management Act (GMA), as part of an established schedule by the County.

At the state level, the GMA requires local jurisdictions to adopt Housing Elements that are consistent with statewide goals and objectives. The Housing Element must include an inventory and analysis of existing and projected housing needs that identifies the number of housing units by income level necessary to manage projected growth including permanent supportive and emergency housing.

Recent state legislation calls for cities to expand middle housing allowances in single family residential zones (HB 1110) and support Accessory Dwelling Unit development (HB 1337). These changes require cities to allow up to two Accessory Dwelling Units (ADUs) on all lots zoned to allow single-family homes. Lots with critical areas or their buffers are exempt from the requirements of both HB 1110 and HB 1337. In addition, via HB 1220, the Washington State Department of Commerce instructed local governments to "plan for and accommodate" housing affordable to all income levels.

MIDDLE HOUSING POLICY IN WA

'Middle housing' refers to moderate-density housing types between single-family detached homes and larger multifamily housing. HB 1110 became effective in July 2023 and requires that designated Growth Management Act (GMA) planning cities in Washington must allow certain minimum densities for middle housing within 6 months after their periodic update due date.

Camas is counted as a Tier 2 city under this policy, which must allow for 2 dwelling units per lot or higher in predominantly residential zones, as well as 4 dwelling units per lot within a quarter mile of major transit stops and for affordable housing (ESHB 1110, Sec. 3(1)(c)).

The Clark County Countywide Planning Policies provide helpful guidance on the Comprehensive Plan update. Clark County is currently in the process of updating its Comprehensive Plan and its Countywide Planning Policies. The existing 20-year growth plan spans 2015-2035 and includes a Housing Element with relevant policies for jurisdictions within the County. Please see Appendix X for a summary of the existing relevant Clark County Countywide Planning Policies.

Lastly, the City of Camas completed its Housing Action Plan (HAP) in 2021, including a housing needs assessment and a thorough community engagement process focused on learning about housing experiences and identifying ways to meet housing needs and overcome core challenges. The engagement included two virtual public meetings, seven focus groups and

[1] The GMA includes other optional Elements for economic development, parks and recreation, conservation, energy, sub areas, and ports.

interviews, a housing survey with over 300 responses, a project website, and written public comments. Key findings helped to shape the updates to the Camas Housing Element.

Community Engagement

The project team held interactive open houses and interviewed stakeholders to learn about housing challenges, opportunities, and actions. Engagement activities identified the following themes that could contribute to future decision-making related to housing in Camas.

Housing Insights

- **North Shore:** Need infill development.
- **General:** Are there model cities Camas would strive to look like? (Lake Oswego, Bend, etc.) Compare plans with cities that have experienced similar growth? What did they do well?
- **Housing:** Allow work/live housing along and around UGA/schools and major transportation corridors. Ensure workforce housing is available for current and future workers. Having diverse housing options will lead to a more diverse city.
- **Barriers to development and safety issues for pedestrians:** Height restrictions and fees are challenging, since rents are lower it is harder to make a project pencil, and need for safer crossings on 3rd Ave and difficult to cross 5th in some areas.

Public Engagement Findings Regarding Housing Strategies

- Citywide: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community. This goal seems very wide and difficult to achieve. More focused on affordability?
- More moderate density in and near Downtown with good connectivity (Safe, lit, easy).
- Be intentional- positive in messaging about adding middle housing and moderate density so community gets accustomed to why it is so important for our community and culture to include all. Show that it's not scary.
- Consider incentivizing housing developers through zoning, taxes and fees, and partnerships.
- Partnerships: Partner with Vancouver Housing Authority and other organizations to develop affordable housing. Partner with habitat for humanity and housing authority. Proud ground for moderate- and low-income housing.
- Attract a large senior housing project.
- More 4-5 story multi-family units, especially Downtown.
- Builder incentives to focus on mixed use/ apartments.
- Don't forget the bike paths.
- Make it easy to build ADUs in backyards.
- Support yes in my backyard policies.

- Incentivize small developers (housing & economic development combined!).

Housing Action Plan

The City of Camas completed its Housing Action Plan (HAP) in 2021, including a housing needs assessment and a thorough community engagement process focused on learning about housing experiences and identifying ways to meet housing needs and overcome core challenges. The engagement included two virtual public meetings, seven focus groups and interviews, a housing survey with over 300 responses, a project website, and written public comments. Key findings about community priorities and HAP goals and strategies are summarized below.

HAP Goals

- **Develop Housing to Accommodate Growth.** Thoughtful changes to Camas' zoning and development regulations can allow the City to better accommodate projected growth.
- **Diversify the Mix.** A greater variety of housing types can better serve young families, small households, seniors, people with disabilities, and people with diverse incomes.
- **Increase Housing Affordability.** Young families, seniors, and people who work in Camas may have difficulty finding affordable housing in Camas.
- **Preserve Existing Affordable Housing.** Camas should adopt strategies to preserve its existing affordable housing and prevent the displacement of residents. Community members noted concern for preserving existing affordable housing, particularly smaller single-family properties, in older neighborhoods near Downtown.

STRATEGY	GOALS			
	DEVELOP HOUSING	DIVERSIFY HOUSING MIX	INCREASE HOUSING AFFORDABILITY	PRESERVE AFFORDABLE HOUSING
Strategy 1: Expand housing opportunity in mixed use and downtown commercial districts.	◆	◆		
Strategy 2: Consider making targeted reasons during Comprehensive Plan updates.	◆			
Strategy 3: Diversify allowed housing types and update related lot and dimensional standards.	◆	◆	◆	
Strategy 4: Focus on key areas with residential development or redevelopment potential. Expand more mixed-use areas throughout the city.	◆	◆		
Strategy 5: Continue community conversations around housing and housing for all.	◆	◆	◆	◆
Strategy 6: Communicate available affordable housing resources.			◆	
Strategy 7: Build partnerships to develop and preserve affordable housing for individuals, families, and seniors. Explore expansion of the MFTE program.			◆	◆
Strategy 8: Explore funding source and cost reduction options for affordable housing.	◆	◆	◆	◆

Housing Targets

Planning for future housing demand is critical to ensure that the City can meet demand driven by population growth. This section summarizes projected future housing demand for Camas to provide context for the City's housing policies.

Population and Housing Allocations

Table 2 below demonstrates the City of Camas and Clark County's anticipated population forecast between 2023 and 2045. Since 2000, Camas has grown at a faster rate than the County overall with an Average Annual Growth Rate (AAGR) of 5.2% in the City (including annexations), compared to the County's AAGR of 2.4% (Housing Appendix). However, the County's estimates assume a slower growth scenario for the City in the next 22 years. With this assumption, new population growth in Camas is estimated to comprise 4.05% of growth in Clark County overall.

The population growth forecast indicates that the City of Camas will make up 4.05 percent of new growth population in Clark County between 2023 and 2045 with an AAGR of 1.2% in the City. The County's methodology also acknowledges Washington State Department of Commerce's HAPT estimates for current housing supply in Camas and allocates a number of net new units for the Urban Growth Area(s).

Table 2 Population Growth Forecast, Camas and Clark County, 2023 to 2045

Source: Clark County Interim Population Allocations and Clark County Comprehensive Plan 2025 Update, 2025 Population, Housing, and Employment Allocation – Issue Paper 5.

Jurisdiction	2023 Est. Population	Vacant Buildable Land Model Percent Capacity	2023-2045 Growth	2045 Estimate	Change (percent)	AAGR
City of Camas	**29,352**	**4.26%**	**7,729** ***(4.05% of total growth)***	**37,080**	**26%**	**1.2%**
Clark County	527,400	100%	190,754 *(100% of total growth)*	718,154	36%	1.6%

In May 2024, Clark County adopted housing allocations for jurisdictions located within county boundaries. In total, this shows an estimated 4,226 housing units needed by 2045 in the City of Camas and UGA(s).[2] The City would add about 311 new units to meet the new permanent

[2] The Washington State Department of Commerce Housing for All Planning Tool (HAPT) provides two allocation methods for determining the share of a County's housing supply to be met by jurisdictions. Method A assumes all housing needs will be accommodated through new housing production. Method B assumes all jurisdictions will accommodate equivalent shares of the total countywide housing need at each income level, proportional to their size, in the projection year. Clark County elected to use a hybrid method of 75/25 for Camas.

supportive housing target and 1,766 units affordable to low-income households below 80% of AMI by 2045. Camas currently has 143 units of housing affordable for households at or below 30% of AMI that are not Permanently Supportive Housing (PSH)[3] and 14 emergency units[4] according to the HAPT estimate. With this allocation, the City will need to accommodate 172 new units of temporary emergency housing by 2045.[5]

HOUSING ALLOCATIONS

In 2021, HB 1220 created a new way that communities in the state are required to plan for housing needs. This legislation requires that jurisdictions plan for sufficient land capacity for housing needs, including all economic segments of the population (moderate, low, very low and extremely low income, as well as emergency housing and permanent supportive housing).

- **Since 2000, the City of Camas had an average annual growth rate of 221 new housing units per year.**
- **Comparatively, the City will need to add an average of 195 new housing units per year between 2024 and 2045 to reach its allocation of net new units.**

[3] Permanent Supportive Housing is defined as: "subsidized, leased housing with no limit on length of stay that prioritizes people who need comprehensive support services to retain tenancy and utilizes admissions practices designed to use lower barriers to entry than would be typical for other subsidized or unsubsidized rental housing, especially related to rental history, criminal history, and personal behaviors" Washington RCW 36.70A.030(31).

[4] Temporary emergency housing is defined as: "temporary indoor accommodations for individuals or families who are homeless or at imminent risk of becoming homeless that is intended to address the basic health, food, clothing, and personal hygiene needs of individuals or families. Emergency housing may or may not require occupants to enter into a lease or an occupancy agreement." – Washington RCW 36.70A.030(14).

[5] Clark County's interim allocations do not include designated temporary emergency housing units at the City level. Estimates in this section for the City of Camas are derived directly from the Department of Commerce HAPT tool.

Figure 4 Housing Unit Allocations by Income, Camas and its UGA, 2024-2045

Source: Washington State Department of Commerce HAPT, Clark County Interim Housing Allocations, City of Camas
Note: Current supply includes both the estimate from the HAPT with the addition of 599 additional units since its calibration in 2020.



4,226 new homes will be needed over the next 20 years in the City of Camas

In addition, there will also need to be:
172 Emergency housing beds (temporary housing)

	0-30% AMI		>30-50% AMI	>50-80% AMI	>80-100% AMI	>100-120% AMI	>120% AMI	Total	Emergency housing beds
	Non-PSH	PSH							
2024: Current Housing Supply Estimate	143	0	458	1,874	1,182	1,965	4,201	**9,832**	14
2024-2045: New Housing Unit Needed for the Allocation	**564**	**331**	**811**	**955**	**516**	**249**	**799**	**4,226**	172
2045: Total Target Supply	707	331	1,269	2,811	1,627	2,214	4,499	**13,459**	186

Residential Capacity

Residential capacity is generally defined as the amount of existing housing units plus new housing a city can accommodate based on city zoning regulations (e.g., residential density requirements in the zoning code) and land available for new development. Residential capacity relates to residential growth allocations in a number of ways. Evaluating residential growth capacity is necessary to determine whether the housing growth allocation (determined by the

county) can be accommodated within the City of Camas and its UGA. Sufficient capacity is available if residential growth capacity is equal to or greater than the City's allocation. If sufficient capacity is not available, the shortfall must be addressed by rezoning, or revising allowable density, or by modifying or creating a new UGA or annexed area to provide additional area for residential growth capacity. The Vacant Buildable Lands Model (VBLM) for Clark County provided a basis for the available housing capacity in the City of Camas based on available buildable land (including both vacant and underutilized land) and current zoning. The existing zoning and UGA showed insufficient housing capacity.

The City of Camas is proposing zoning modifications that would allow for more residential capacity. Consequently, another analysis was completed to consider future modifications to select zones. According to the housing capacity estimates, Camas would have capacity for 5,329 housing units which would result in a surplus over the 2045 housing target of 4,226 housing units. Results (summarized below) from the updated capacity analysis show sufficient residential growth capacity to meet the 2045 housing target. The estimates depend on the final preferred alternative which could be refined further.

Summary of Housing Analysis Findings

A summary of key findings from the housing data analysis is provided below to help describe key insights to inform Comprehensive Plan policy updates (Technical Appendix provides the full findings).

Community Demographic Trends

- **Since 2000, Camas has grown at a faster rate than Clark County or Washington State overall, more than doubling in size by 2023 from 12,462 to 27,420 persons.** As population increases, the demand for housing also rises and affects planning.
- **In terms of land, Camas has expanded incrementally over time through annexations.** In the 2000's and early 2010's, the City added large new areas on the north side of Lacamas Lake, with a large portion of this area zoned for multifamily housing alongside employment and commercial areas.
- **Camas is becoming a more diverse community.** The share of people of color increased from 13% in 2012 to 24% in 2022 and is slightly more diverse than the county (21% were people of color in 2022).
- **Camas is seeing a larger share of couples and families with children (39%) and has a higher share of both groups than the County or State (24%, 22%, respectively).** The City also had a larger median household size (almost 3 persons) compared to the county (2.65 persons).
- **Median household income in Camas is higher than both Clark County and the state at $133,000 in 2022.** Adjusting for inflation, median income in the City still increased by 31 percentage

points since 2012 which is primarily due to growth in high-income households earning over $100,000 per year.[6]

- **Four out of five households in Camas owned their homes in 2018-2022, at a higher rate than either Clark County or Washington.** The share of renter households stayed the same in Camas since 2012, showing less than a 1% increase over this time period.
- **County-level trends indicate that homeownership disparities exist for some groups by race and ethnicity in Clark County,** with households who are Black or African American, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Hispanic or Latino, or mixed/other races having lower rates of homeownership.
- **At the County level, income levels also vary by race and ethnicity.** Households who were Black or African American, Native Hawaiian or Pacific Islander, Hispanic or Latino, two or more races, or another race had lower median household incomes than the overall average.
- **Overall levels of housing cost burden are decreasing, but more renters and low-income households experience higher rates.** Around 24% of all Camas households experienced cost burden (2022) with a higher share of renter households experienced cost burden compared to homeowners and with 100% of households earning less than $20,000 experienced severe cost burden (paying at least half of their monthly income towards housing). Although cost burden is generally lower for homeowners, more people of color in Camas who own their homes experience cost burden compared to white, non-Hispanic homeowners.

Existing Housing Inventory

- **Camas has seen growth in their number of housing units in the past two decades,** with a 108% change between 2000 and 2023 (annually this equates with an average of 221 new homes). The City of Camas' growth in housing units was lower than its population change (120%), indicating that the City has not been keeping pace by adding to its supply to meet the rising demand.
- **Camas has steadily low vacancy rates for all housing units in total** (4% in 2022 with little change over the last decade). This level of vacancy is indicative of a healthy housing market with natural rates of turnover; however, the slight decrease could begin to indicate constrained supply of housing.
- **For two-bedroom multifamily units, Camas has seen spikes in vacancy, but these align with new construction trends** which can temporarily raise vacancy rates for newly delivered units but do not indicate long-term vacancy. In 2023, the City saw over 200 new housing units delivered, likely accounting for the fluctuation in vacancies, as well as deliveries in 2017 and 2020.
- **Since 2015, the City has permitted 2,763 new housing units.** Single detached homes have accounted for the largest share (70%) of new permits in the City of Camas, and another 8 percent

[6] The median income in Camas is above the area median income (AMI) for 2023. HUD determined the AMI to be $114,400 for a family of four in the Portland-Vancouver-Hillsboro, OR-WA MSA (including Camas). This is lower than median income in Camas itself which was $133,000 in 2022 (Exhibit 14) and has been consistently lower than the City over time.

were made up of attached townhomes. While apartments, condos, and units in mixed-use buildings made up 20 percent of new permits between 2015-2024, middle housing types like duplexes, triplexes, quadplexes, and accessory dwelling units (ADUs) were only 2 percent of all permits.

- **Median home sale prices in Camas has increased over the last ten years,** with Camas' average prices generally remaining higher than the County. In 2023, the average home sale price in the City was **$704,000,** increasing by 119% since 2013 which is more expensive than the average home in the City of Portland (by $196,000) or Clark County (by $173,000).
- **Prices are also increasing quickly in Camas and Clark County for the average 2-bedroom multifamily rental.** The average 2-bedroom apartment rent was over $1,800 in the City and over $1,700 in Clark County (2024 year-to-date), indicating a 35% increase since 2010. Average 2-bedroom multifamily rents in Portland tracked closely with Camas in the 2010's, while rents in Vancouver remained lower (generally following countywide trends).
- **Compared with home sale price and rent increases in Camas, only households earning over 150% or more of AMI would be able to afford the average home in the City as of 2023.** However, the average 2-bedroom apartment is still affordable to households between 50 and 80% AMI in Camas.
- **The City of Camas had 98 units of regulated affordable housing in 6 buildings** according to data from Oregon Metro and the City. Approximately half of these units are affordable respectively for residents between 30-50% of AMI and 50-80% of AMI. The City also has several long-term care residential facilities for older adults providing 135 units.

Future Housing Demand

- **Since 2000, Camas has grown at a faster rate than Clark County overall but is expected to slow based on County estimates for 2045.** The County's projections assume that new population growth in Camas is estimated to grow at an annual rate of 1.2% to account for 4.05% of county growth.
- **County allocations show the need for 4,226 new housing units in Camas by 2045, adding around 211 new housing units per year.**
- **The City would add about 331 new units to meet the new permanent supportive housing target and 1,766 units affordable to low-income households below 80% of AMI by 2045.**
- **Camas residents with disabilities may require additional housing features for accessibility.** Around 8% of residents in Camas had at least one disability (2022), with the most common being cognitive difficulties, followed by ambulatory and vision difficulties. These disabilities can require housing accommodations such as zero-step entryways, ramps, lifts, or other accessibility features.

Housing Goals and Policies

Goal H-1 Citywide Housing

Promote safe, attractive, and vibrant neighborhoods with access to housing, jobs, services, schools, amenities, and healthy active living that meet the needs of all members of the community.

Policy H-1.1 Provide a range of housing choices and options to support all ages and income levels. Provide an adequate supply of land to accommodate the City's housing growth target.

Policy H-1.2 Support low impact development (LID) in residential development that minimizes both impervious areas and site grading to retain the natural contours of the land. LID strategies include conserving native vegetation, narrower streets, stormwater gardens, and other landscape practices that store and filter runoff.

Policy H-1.3 Promote the use of flexible development options (e.g., planned residential developments and development agreements) to create a variety of accessible housing types within new developments.

Policy H-1.4 Require new residential developments to demonstrate how proposed lot, street, and utility layouts can accommodate development of single-story dwellings, duplexes, and attached or detached accessory dwelling units.

Policy H-1.5 Ensure housing in mixed-use buildings (or developments) will complement the commercial and retail portion of the development and increase local living-wage jobs. Amend the municipal code to support mixed-use and middle housing development in the Downtown Subarea and near other community hubs.

Policy H-1.6 Support in-fill housing development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services. Ensure development compatibility with the surrounding neighborhood.

Policy H-1.7 Require all new housing developments to provide a range of housing types and sizes that are evaluated through the land use approval process and stipulated on the final plat.

Policy H-1.8 Support the maintenance, repair, and rehabilitation of Camas' existing housing stock by promoting resources that provide financial and other assistance to community members to maintain or repair health and safety features of their home.

Policy H-1.9 Support investment in existing neighborhoods to enhance livability, safety, and accessibility in a way that preserves unique physical character.

Policy H-1.10 Develop objective design standards to ensure new development is compatible in scale, architectural style, and landscape composition with existing and planned neighborhoods.

Policy H-1.11 Provide ongoing education and community engagement regarding Camas' housing needs, including available programs and incentives. Provide permit process support to affordable housing developers.

Policy H-1.12 Achieve and sustain the housing targets by income group allocation for Camas as adopted by the Clark County Council. Monitor and assess the City's progress in meeting housing needs at least every five years.

Policy H-1.13 Support and encourage housing legislation at the county, state, and federal levels that promotes and supports the City's housing goals and policies.

Goal H-2 Housing Choice and Affordability

Create a diversified housing stock that meets the needs of all lifestyles and economic segments of the community through new developments, preservation, and collaborative partnerships.

Policy H-2.1 Support and encourage a wide variety of housing types throughout the City to provide choice, diversity, and affordability and promote homeownership.

Policy H-2.2 Promote the preservation and rehabilitation of the City's existing affordable housing stock of all types, including low-cost rentals and

affordable owner-occupied single-family homes. Support measures that preserve affordable housing, such as home repair programs with partners to rehabilitate existing housing that serve low to moderate-income households.

Policy H-2.3 Create opportunities for ownership housing in a variety of settings, styles, sizes, and affordability levels throughout Camas.

Policy H-2.4 Provide incentives and bonuses for the development of affordable housing and middle housing. Ensure that any affordable housing built with the support of city incentives or bonuses (including, but not limited to, public funds, through development agreements, incentives, or by regulation) remains affordable for the longest possible term.

Policy H-2.5 Participate in collaborative partnerships with local and regional public and non-profit housing groups to ensure that affordable housing and supportive services are provided throughout the City.

Policy H-2.6 Encourage and support collaborations between for-profit and non-profit developers to expand affordable housing options.

Policy H-2.7 Evaluate the existing Multifamily Tax Exemption (MFTE) program provisions and participation. Consider changes and expansions to program options and associated costs and benefits that support housing production and affordable housing targets.

Policy H-2.8 Review and update the Camas Municipal Code to be consistent with State guidelines for housing and residential use.

Policy H-2.9 Plan for and accommodate Camas' allocated share of countywide future housing needs for moderate-, low-, very low-, and extremely low-income households as well as manufactured housing, multifamily housing, group homes, foster care facilities, emergency housing, emergency shelters, and permanent supportive housing.

Goal H-3 Housing Accessibility and Livability

Encourage and support a variety of housing opportunities for those with special needs, particularly those with challenges relating to age, health, or disability.

Policy H-3.1 Encourage and incentivize special needs and senior housing to be dispersed throughout the community and close to public transportation, shopping, medical clinics, and other essential services.

Policy H-3.2 Encourage, support, and work with partners, such as the Clark County Health District, that support social and health service organizations and offer programs and facilities to help persons with special needs remain in the community.

Policy H-3.3 Treat residential structures occupied by persons with disabilities the same as residential structures occupied by a family or by non-disabled unrelated individuals.

Policy H-3.4 Encourage the creation and retrofitting of senior housing and accessible housing types that allow residents to "age in place" to support aging populations and allow residents to continue living in Camas.

Policy H-3.5 Develop and implement a strategy or action plan to work with partners to secure grants and loans by agencies, private developers, and nonprofit organizations that are tied to the provision of permanent supportive housing, emergency shelter beds, transitional housing, and other housing serving at-risk populations.

Policy H-3.6 Work with other jurisdictions and health and social service organizations to develop a coordinated, regional approach to address the impacts of displacement and people at risk of becoming homeless.

Policy H-3.7 Promote the use of universal design principles for new development or redevelopment housing projects to ensure housing is designed for all people and abilities.

Goal H-4 Streamlining Permitting for Housing

Support the development of quality and sustainable housing in Camas with streamlined regulations and permitting processes.

Policy H-4.1 Periodically review and update the City's residential zoning regulations, design standards, and permitting procedures to promote quality development with timely and predictable outcomes.

Policy H-4.2 Create regulations and procedures that balance clarity and objectivity with flexibility for design innovation.

Policy H-4.3 Study the impacts of land use policy decisions and zoning code amendments and minimize the negative impacts to housing supply and affordability.

Policy H-4.4 Classify the development of middle housing and accessory dwelling units as permitted uses in lower density residential zones, consistent with the Growth Management Act.

Policy H-4.5 Review and update policies, codes, and ordinances to allow for a mix of housing types and variable lot and unit sizes in new subdivisions and development projects to promote housing choice diversity and affordability.

Policy H-4.6 Annually review the number and type of housing units built in Camas and permit timelines associated with new housing developments to inform additional changes to permitting, incentives, and housing programs.

ourCamas 2045



06 Natural Environment

06. Natural Environment

Nature in Camas

Camas has an abundance of natural areas that make it an ideal place to live. This element balances Camas' natural environment with the demands of a growing city.

Vision

Camas embraces its connection to nature and enjoys a wealth of outdoor recreational opportunities. Access to forests, clean water, parks, and trails is foundational to Camas' quality of life. The community shares a deep reverence for Camas' beauty, scenery, and tranquility, and is committed to preserving and enhancing its natural resources and tree canopy. Through proactive planning, the City mitigates the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come.

Natural Setting

Camas is blessed with an abundance of natural areas and physical features, making it a highly attractive place for people to call home. Residents and businesses who seek an exceptional quality of life are buoyed by the natural surroundings of Camas and enjoy such amenities as Lacamas, Round and Fallen Leaf Lakes, Lacamas Creek, and the Washougal River greenway. Residents also enjoy the beauty and quiet of the open space and greenbelt network throughout the community, stitched together by the City through many decades of planning and implementation.

As envisioned decades ago and to be held in perpetuity as natural, legacy lands along Lacamas Lake, Fallen Leaf Lake, and near Green Mountain are treasured for their mature stands of evergreen and deciduous trees and offer a respite for many in the community. When people think of Camas, they think of a place that values the natural environment on par with other facets of the community. Camas is a place where stewardship of greenbelts, natural areas, and open space is an essential fiber in the fabric of the community.

Overview

The natural environment element of the comprehensive plan provides a policy framework for the identification, protection, and improvement of Camas' natural environment. Goals and policies include those for environmental stewardship, the protection of

environmentally sensitive lands (critical areas), natural areas and open space, shorelines, and landscaping and tree enhancement.

Environmental stewardship refers to the City's role as chief steward of the environment for the Camas community. A chief steward in this context means how the City, on behalf of the residents, establishes a responsible relationship between the people and the land they inhabit.

Stewardship has three prongs for the benefit of all community members. The first prong relates to compliance with the Growth Management Act (GMA) and the identification, designation, and protection of certain environmentally sensitive lands, which, in GMA, are known as critical areas. The second prong relates to the community and its steadfast approach to keeping Camas a place that balances growth with preservation of a natural areas and open space network. Camas has longed placed a premium on its open space network of environmentally sensitive lands, with or without GMA requirements. The third prong is an ethic of volunteerism and stewardship from the community's citizenry, which manifests in many ways including active volunteer groups, active boards and committees, and public involvement on issues related to the environment.

The City of Camas has preserved over 700 acres of open space across 31 sites, including forests, wetlands, riparian corridors, and steep slopes, with nearly half of this land concentrated around Lacamas Lake. These natural areas, distinct from developed parks, are managed to protect ecosystem functions, water quality, native vegetation, and wildlife habitats, while allowing for limited public access through trails and modest amenities. The City prioritizes conservation and restoration of high-value landscapes such as waterfronts, forested hillsides, and sensitive wetlands, balancing environmental stewardship with recreational use. Key efforts include protecting watercourses within three major watersheds, regulating development on steep slopes and wetlands, and maintaining resilient forest lands to support biodiversity and ecological health.

Environmental Stewardship

One of the most demanding roles the City of Camas must fulfill is that of chief steward of the community's environment while also accommodating growth. The City has the duty to implement land use policies via development regulations and the responsibility to comply with federal and state statutes related to the environment.

Facing federal and state mandates, the City strives to ensure that its environment is managed in compliance with applicable laws and does so in a wise manner. While simultaneously accommodating growth, the City encourages the preservation, restoration, and improvement of the natural environment in all development.

Goal NE-1 Environmental Stewardship

Preserve Camas' natural environment citywide by developing a sustainable urban environment and protecting natural areas and open space, including critical areas.

Policy NE-1.1 Support a cleanup of the Camas Mill and other contaminated sites to protect natural resources and the city's water supply.

Policy NE-1.2 Support programs and regulations that monitor, maintain, conserve and protect water quality in Camas, including watersheds, Lacamas Lake Basin, Columbia River Basin, and Washougal River Basin.

Policy NE-1.3 Encourage restoration and protection of natural areas through the removal of invasive species.

Policy NE-1.4 Support and implement actions identified in adopted plans, including adaptive management of natural resources that is consistent with best available science and climate guidance to improve climate resiliency.

Policy NE-1.5 Protect and restore natural resources, valuable historic and cultural areas, climate refugia, habitat areas and corridors to provide biological and hydrological connectivity that fosters resilience to climate impacts.

Policy NE-1.6 Create and support natural resource management plans that consider climate change impacts and guide adaptive management.

Policy NE-1.7 Include immediate and long-term environmental impacts in the policy and regulatory decision-making process. Identify and quantify the ecosystem services benefits of natural systems and include these natural capital assets in cost-benefit assessments for community and development planning.

Policy NE-1.8 Promote and incentivize public and private landowners to restore and create local habitats and corridors to increase the availability throughout the city.

Policy NE-1.9 Regulate land use and development to protect natural topographic, geologic, vegetative, and hydrologic features of undeveloped properties.

Policy NE-1.10 Promote soil stability and minimize and control soil erosion using best management practices, best available science, ecologically sustainable site design, natural drainage systems and protection of existing native vegetation.

Critical Areas

The natural environment includes specific environmentally sensitive areas that the GMA requires the City to identify, designate, and protect. Referred to in statute (RCW 36.70A) as *critical areas.* Under GMA, critical areas include wetlands, critical aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas. Each of these critical areas is present in the City. The law further requires that the City use best available science (BAS) when developing policies and regulations to designate and protect critical areas. GMA also recognizes that salmonids (salmon and trout) play an important role in the ecosystem and are vital cultural and economic resources, which require jurisdictions to give 'special consideration to conservation and protection measures necessary to preserve or enhance anadromous fisheries'.

Functions of Critical Areas

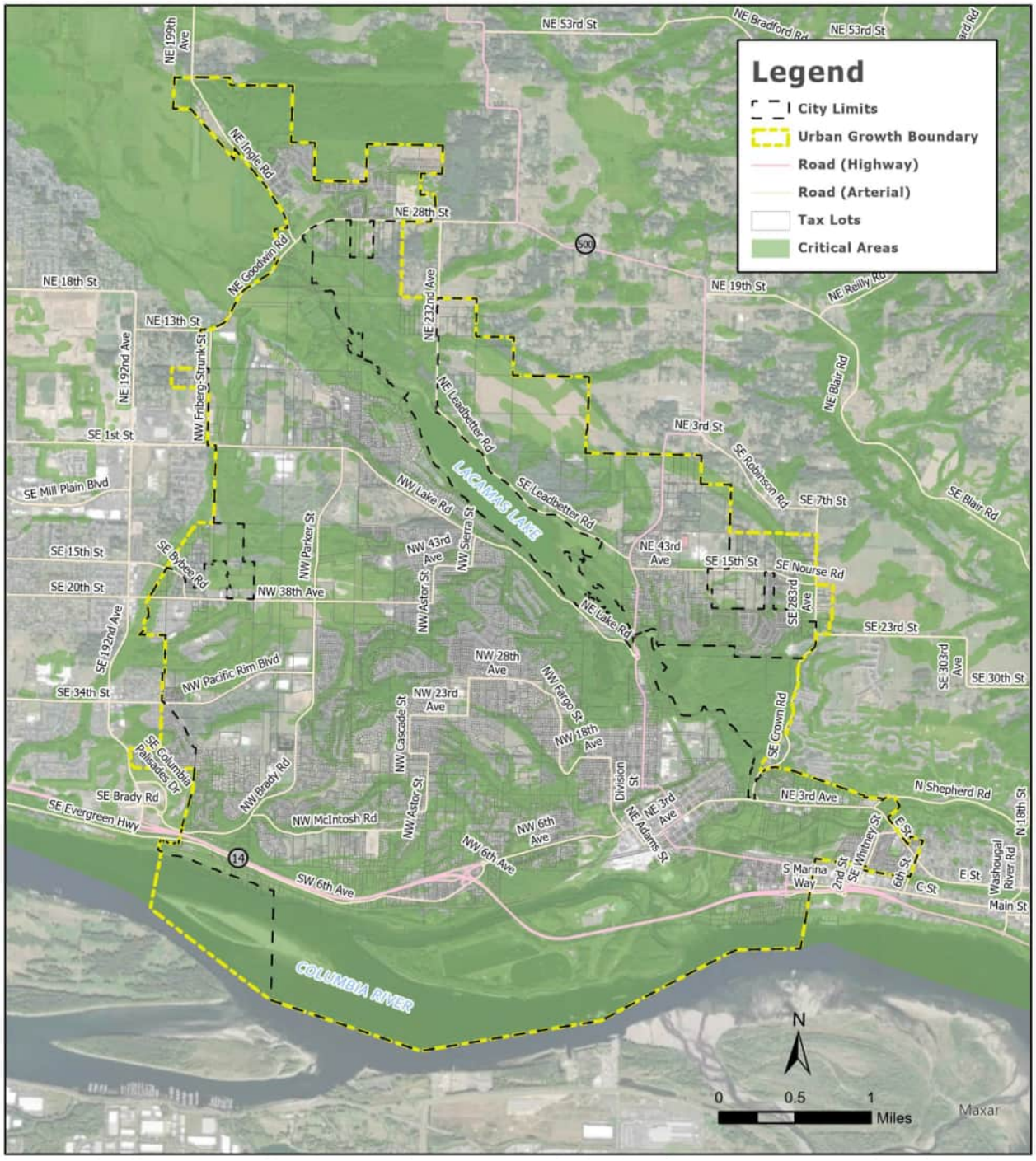
Critical areas perform key functions that enhance the environment and protect us from natural hazards. The beneficial functions and values that critical areas provide include, but are not limited to, water quality protection and enhancement; fish and wildlife habitat; food chain support; flood storage, conveyance, and attenuation of flood waters; groundwater recharge and discharge; drinking water quality and quantity; erosion control; protection from natural hazards; historical, cultural, archaeological, and aesthetic value; and recreation. Identifying the functions and values of local critical areas is essential to defining the purpose of a critical areas protection program.

Each type of critical area performs different functions and each community assesses the values of the critical areas in its environment differently. Therefore, the purpose of protecting critical areas is unique for each community. Critical areas protection is necessary to protect the public's health and safety and is essential to comply with state laws in Washington. It may also provide compliance with federal laws for such things as water quality and endangered species. There are also economic reasons to protect critical areas. For example, protection of drinking water quality and quantity supports sustainable growth, and critical areas support resource industries, such as salmon and other fisheries.

Critical areas are environmentally sensitive and hazardous areas that the State and City have identified for certain development considerations or restrictions to protect their functions and values, while allowing for reasonable use of property. Critical areas protection is regulated through the Camas Municipal Code (CMC) Title 16, which identifies five types of critical areas: wetlands, fish and wildlife habitat conservation areas, geologically hazardous areas (steep

slopes, erosion hazard areas, and seismic hazard areas), critical aquifer recharge areas (CARAs), and frequently flooded areas.

Figure 5 6Critical Areas



Wetlands

Wetlands are defined as those areas, designated in accordance with the approved federal wetland delineation manual and applicable regional supplements, which are inundated or

saturated by surface or ground water at a frequency and duration, and under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands in the community are generally located in and around the Grass Valley area in west Camas, Lacamas Lake, Lacamas Creek, and the Washougal River greenway. The largest mapped wetland is located around the south end of Lacamas Lake, identified as lake habitat. NWI does not identify mapped wetlands in downtown Camas.

Critical Aquifer Recharge Areas

Critical aquifer recharge areas (CARAs) are those areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge. The quality and quantity of groundwater in an aquifer is inextricably linked to its recharge area. To determine the threat to groundwater quality, existing land use activities and their potential to lead to contamination should be evaluated.

The goal of establishing CARAs is to protect the functions and values of the community's drinking water supply by preventing pollution and/or contamination of the supply directly or recharge areas indirectly.

Frequently Flooded Areas

Floodplains and other areas subject to flooding perform important hydrologic functions and may present a risk to persons and property. Classifications of frequently flooded areas should include, at a minimum, the 100-year floodplain designations of the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP), known as the 'special flood hazard area', which is defined further as having a special flood, mudflow, or flood-related erosion hazards and shown on Flood Insurance Rate Maps (FIRM), which also includes the regulatory floodway.

Geologically Hazardous Areas

In the physical context of Camas, geologically hazardous areas include areas susceptible to erosion hazard, seismic hazard, mine hazard, and other geological events. Geologically hazardous areas in Camas include severe erosion hazard areas adjacent to Lacamas Lake, north of the Columbia River, and to the east along the Washougal River.

Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas (FWHCAs) are critical ecological zones that support essential habitats and species necessary for maintaining ecosystem integrity and biodiversity. These areas may include rare ecosystems, high-density wildlife zones, breeding and migration corridors, and habitats for endangered or sensitive species. Their designation plays a key role in guiding land use planning, urban growth boundaries, and conservation strategies. FWHCAs must be identified using the best available science, considering factors such as habitat connectivity, human activity levels, riparian and salmonid protection, and the impact of

surrounding land uses. Buffer zones are also recommended to minimize conflicts between development and habitat preservation.

Aquatic and Riparian Habitat

Fish and wildlife habitat conservation areas in Camas include habitats for state or federally listed endangered, threatened, or sensitive species, as well as areas associated with state priority species identified by the Washington Department of Fish and Wildlife. These areas encompass naturally occurring ponds under twenty acres, classified state waters, and water bodies stocked with game fish by governmental or tribal entities. Key aquatic habitats in Camas include the Columbia and Washougal Rivers, Lacamas Creek, Camas Slough, Lacamas Lake, and various streams, ponds, and wetlands, all often bordered by riparian zones. Lacamas Lake is the largest aquatic habitat in the city aside from the Columbia River system.

Terrestrial Habitat

Terrestrial habitats in Camas, like aquatic ones, include areas supporting state or federally listed endangered, threatened, or sensitive species, as well as state priority species identified by the Washington Department of Fish and Wildlife (WDFW), State Natural Area Preserves, and locally important habitats. Locally designated habitats include Oregon white oak trees and stands, and Camas lily fields of specific sizes. While much of the city is mapped as "cave rich" by WDFW, actual cave presence is limited, though caves are considered a priority habitat feature. The Camas biodiversity corridor, which includes mature timber and sightings of Vaux swifts, runs through parts of the city. Oak woodland habitat is primarily found near Lacamas Lake, and the northern part of Camas including the Lacamas Prairie Natural Area Preserve, which protects rare Willamette Valley wet prairie habitat and several endangered plant species, including Bradshaw's lomatium.

Critical Areas Goals & Policies

Preserve, maintain, and restore the City's critical areas to protect their function and value.

Policy NE-2.1 Use best management practices and best available science to preserve, protect, and restore the biological health and diversity of Camas' critical areas.

Policy NE-2.2 Preserve and restore aquatic and riparian habitats consistent with applicable regulations.

Policy NE-2.3 Preserve and avoid development of areas with endangered, threatened, and sensitive species and species of local importance as required by local, state, and federal laws.

Policy NE-2.4 Ensure that development throughout the City meets or exceeds standards and practices for long-term wetland protection and mitigation.

Shorelines

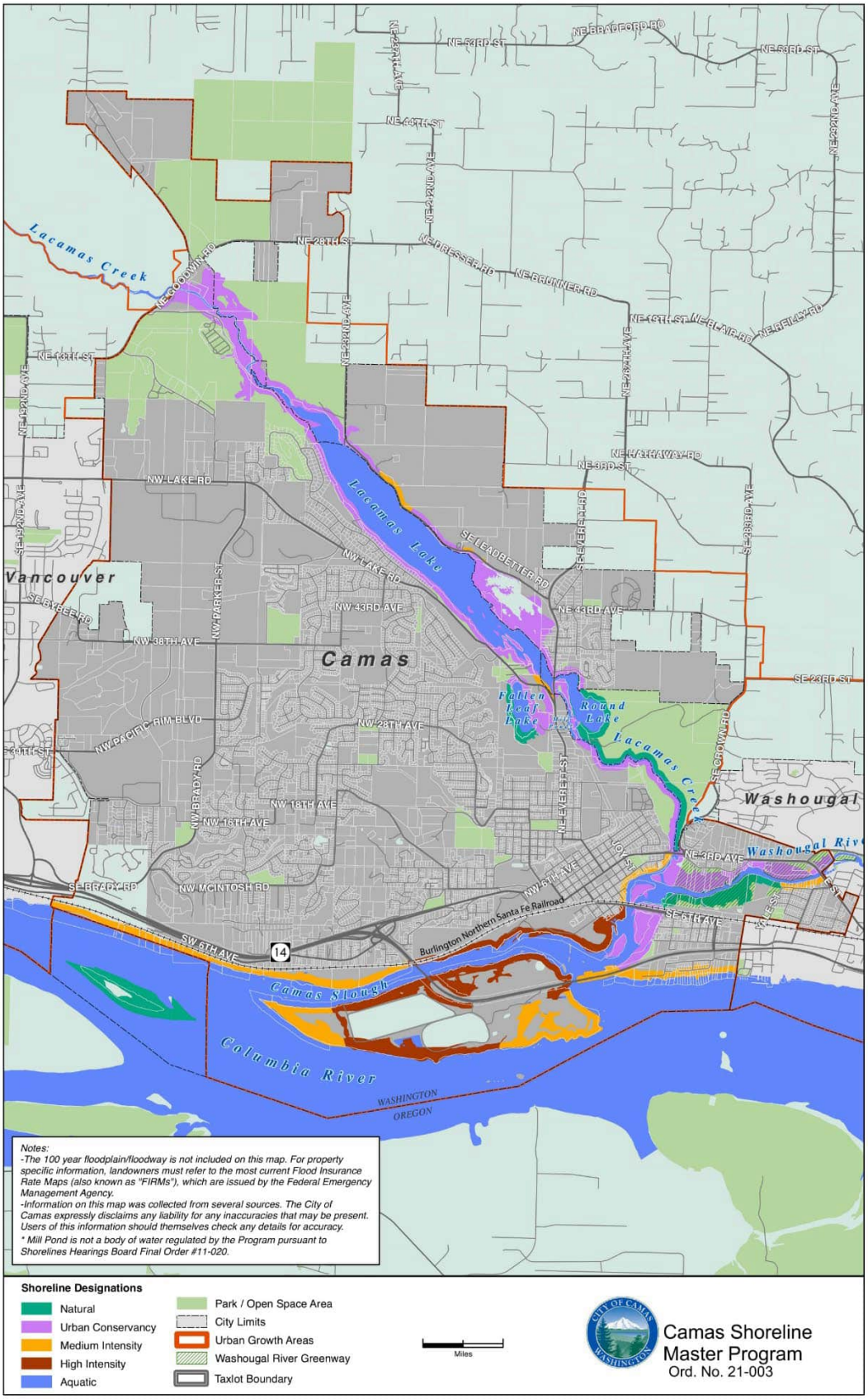
Overview

The Shoreline Management Act, enacted in 1972, created a collaborative framework between Washington State and local governments to manage and protect shorelines. Under this law, local jurisdictions are required to develop Shoreline Master Programs (SMPs) tailored to their specific needs.

Camas encompasses 946 acres of shoreline across 26 miles, including areas along Lacamas Creek, several lakes, and the Columbia and Washougal Rivers. The SMP outlines strategies to minimize flood risks, enhance recreational opportunities, and ensure sustainable shoreline use through voluntary programs and regulatory measures.

To guide development and conservation, Camas assigns specific shoreline designations based on land use, ecological characteristics, and community vision. These designations—Aquatic, Natural, Urban Conservancy, Medium Intensity, and High Intensity—are aligned with state guidelines and the city's comprehensive plan. Each designation comes with tailored policies and development regulations, such as height and setback limits. For example, High Intensity areas support industrial use, while Natural areas prioritize ecological preservation. These designations help ensure that shoreline development aligns with environmental protection and long-term community goals.

Figure 7 Shoreline Map



Shoreline Goals and Policies

Goal NE-3 Shorelines

Use the full potential of shoreline in accordance with the opportunities presented by their relationship to the surrounding area their natural resource values, and their unique aesthetic qualities offered by water, topography, and views. Develop a physical environment that is both ordered and diversified, and which integrates water and shoreline uses while achieving a net gain of ecological function.

Policy NE-3.1 Adopt the goals and policies as outlined in the current Camas Shoreline Master Program.

Landscape Enhancement and Tree Preservation

The natural landscape and existing tree cover are important aspects of Camas' natural environment. Native, mature landscaping and trees contribute to the City's ecological health, supply valuable animal habitat, and enhance the community's natural beauty.

Goal NE-4 Landscape Enhancement and Tree Preservation

Preserve existing natural landscapes and tree canopy. Support opportunities for increasing native and climate resilient landscaping and tree canopy.

Policy NE-4.1 Develop and implement a program to prioritize retention of existing trees and planting of new trees within development sites to maximize cooling and energy savings. Encourage planting of hardy and climate resilient native trees.

Policy NE-4.2 Develop an urban forestry program that articulates a long-term strategy for future-proofing the City's tree canopy, including actions for tree protection, management, education, and collecting and maintaining data on citywide tree canopy.

Policy NE-4.3 Require the use of native and climate resilient plants in residential, commercial, and industrial landscapes to support the implementation of low impact development.

Policy NE-4.4 Develop and implement a program to mitigate and compensate for tree canopy loss when retention of mature trees within development sites is impractical.

Policy NE-4.5 Develop and implement a program to prioritize retention of existing trees and planting of new trees within development sites to maximize cooling and energy savings. Encourage planting of hardy and climate resilient native trees.

Policy NE-4.6 Develop an urban forestry program that articulates a long-term strategy for future-proofing the City's tree canopy, including actions for tree protection, management, education, and collection and maintaining data on citywide tree canopy.

Policy NE-4.7 Require the use of native and climate resilient plants in residential, commercial, and industrial landscapes to support the implementation of low impact development.

Policy NE-4.8 Develop and implement a program to mitigate and compensate for tree canopy loss when retention of mature trees within development sites is impractical.

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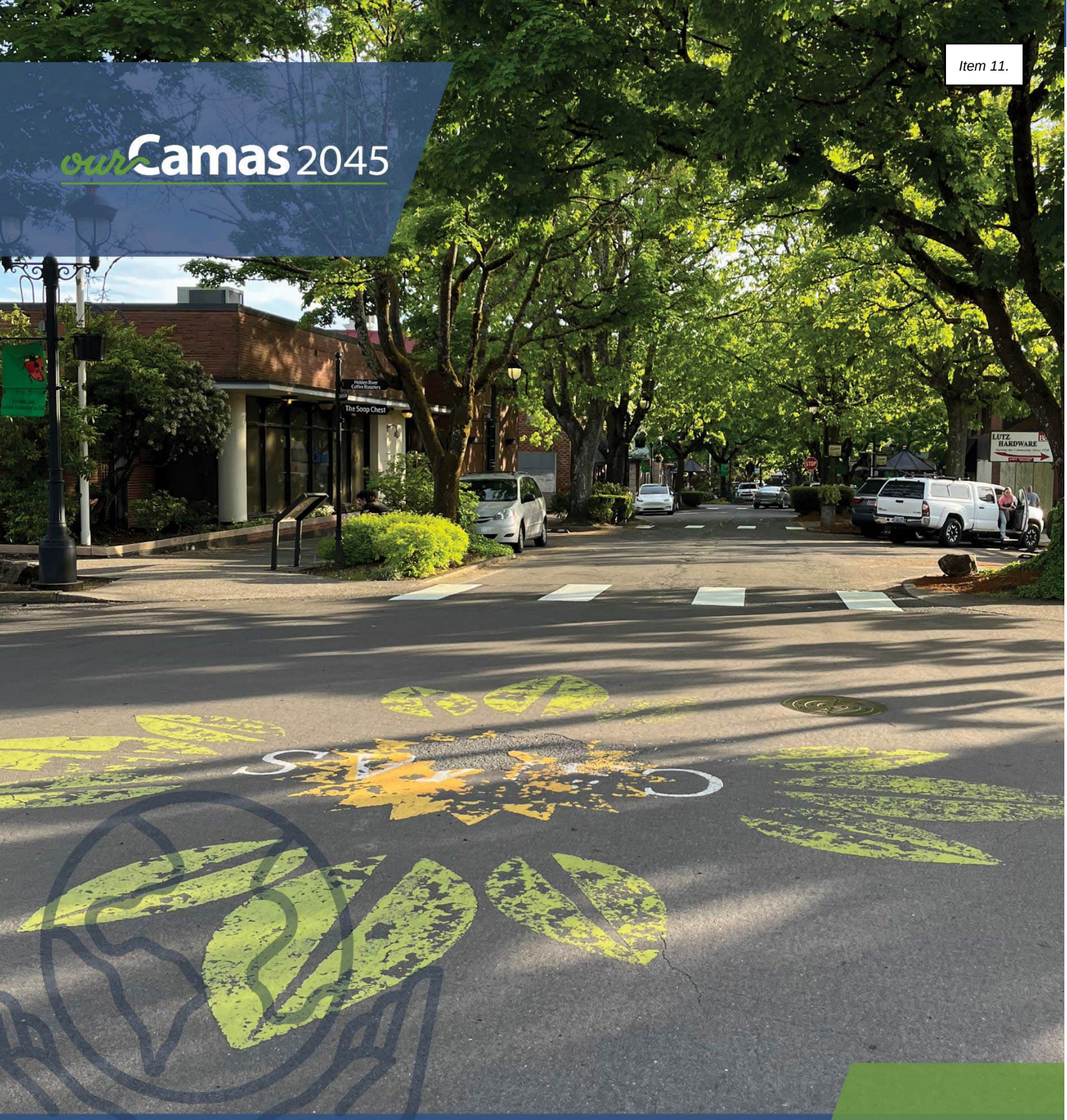


Climate Change & Resliency

07

07. Climate Change & Resiliency

Community Impacts from Climate Change

Climate hazards (i.e., natural hazards exacerbated by climate change) of the highest concern and priority are extreme heat and precipitation. Camas can address anticipated impacts by reducing GHG emissions and building community resiliency.

Vision

In 2045, Camas has proactive plans to reduce greenhouse gas (GHG) emissions and mitigate the effects of changing climate conditions and natural hazards, ensuring a resilient community for generations to come. The most vulnerable communities are protected, and climate planning contributes to improvements in community health and well-being.

Introduction

The City developed this climate change and resiliency element consistent with House Bill 1181, signed into law in 2023. This new state law integrates climate planning into Washington's GMA and requires cities and counties to include a climate element in their comprehensive plans.

Climate change refers to long-term shifts in temperatures and weather patterns. The burning of fossil fuels and other human activities are increasing emissions of greenhouse gases (GHGs) that trap heat in the atmosphere and contribute to global and local climate change. Negative effects include impacts on the community caused by natural hazards that are exacerbated by climate change (e.g., the increased frequency and severity of drought conditions). Natural hazards are also referred to as "climate hazards" in this element as climate change is anticipated to affect the frequency and intensity of natural hazards.

The purpose of this climate element is twofold: to reduce contributions to climate change (i.e., GHG emissions) and to build community resilience to climate change.

To support these two overarching goals, the City formed a Climate Policy Advisory Group (CPAT) to advise on the creation of this new element. The 17 CPAT members included community members, City staff, City Council and Planning Commission liaisons, and representatives from the Port of Camas-Washougal, Clark Public Utilities, NW Natural, and the Camas School District. CPAT members held five meetings between early 2024 and early 2025.

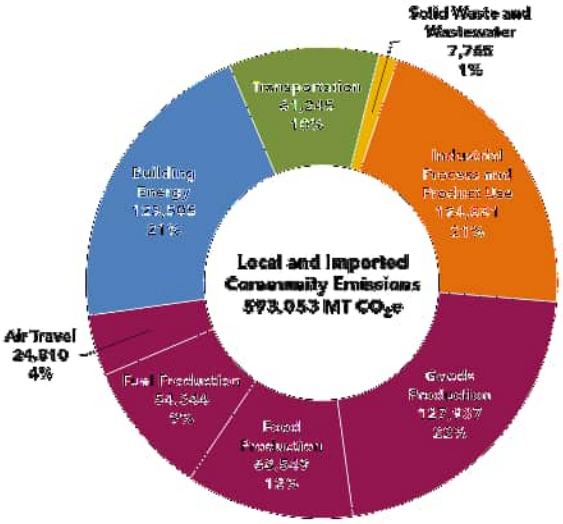
The CPAT was instrumental in the identification and development of climate goals and policies.

Climate Overview

Greenhouse Gas Emissions

The GHG reduction subelement identifies actions to reduce GHG emissions and decrease per capita vehicle miles traveled (VMT). One of the requirements of the GHG reduction subelement is to meet the GHG reduction requirements in RCW 36.70a.070(9)(d), including reducing per capita VMT within Camas but without increasing GHG emissions elsewhere in the state. To identify actions for VMT reduction, Clark County worked with local cities to prepare a VMT study and travel market assessment to understand baseline travel patterns and strategies for VMT reduction. According to the VMT study, data from the Highway Performance Monitoring System shows that the city's estimated per capita VMT, which represents the average weekday VMT within Camas divided by the city's population, is 11.1. The travel market assessment identified key travel destinations in the city for short trips (i.e., trips 3 miles or less), showing that areas near Lacamas Lake, Camas high school, and Downtown Camas are popular destinations. Both assessments will help inform a regional target for VMT, which will be established outside the climate element/comprehensive plan framework. In addition to VMT reduction, Clark County's Countywide Planning Policies establish requirements for cities to reach net-zero emissions by 2050 (14.1.2) in alignment with statewide GHG emission reductions (RCW 70A.45.020(1)) and set interim (5-year) objectives or targets (14.1.4). A GHG inventory for Camas was also prepared to inform GHG reduction strategies. The inventory provides an estimate of the city's carbon footprint from local emissions (building energy, transportation, solid waste and wastewater, and industrial process and product use) and imported emissions (consumption of goods). Figure 8 Camas Emissions, 2022 shows the combined and per capita emissions for the city.

Figure 8 Camas Emissions, 2022



With a population of 27,250, all 2022 GHG emissions combined (local and imported) for City of Camas totaled

593,035 MT CO_2e

21.8 MT CO_2e Per Capita

Local emissions include sector-based emissions that are generated within Camas. Imported emissions are generated outside of Camas to produce and provide the goods, food, services, air travel, and production of transport of fuels consumed by households. Additionally, wildfires have become one of the largest sources of carbon emissions in Washington state. From 2014 to 2018, wildfires in the state generated 39,200,000 MT CO_2e.

Figure 9 Local and Imported Emissions in Camas

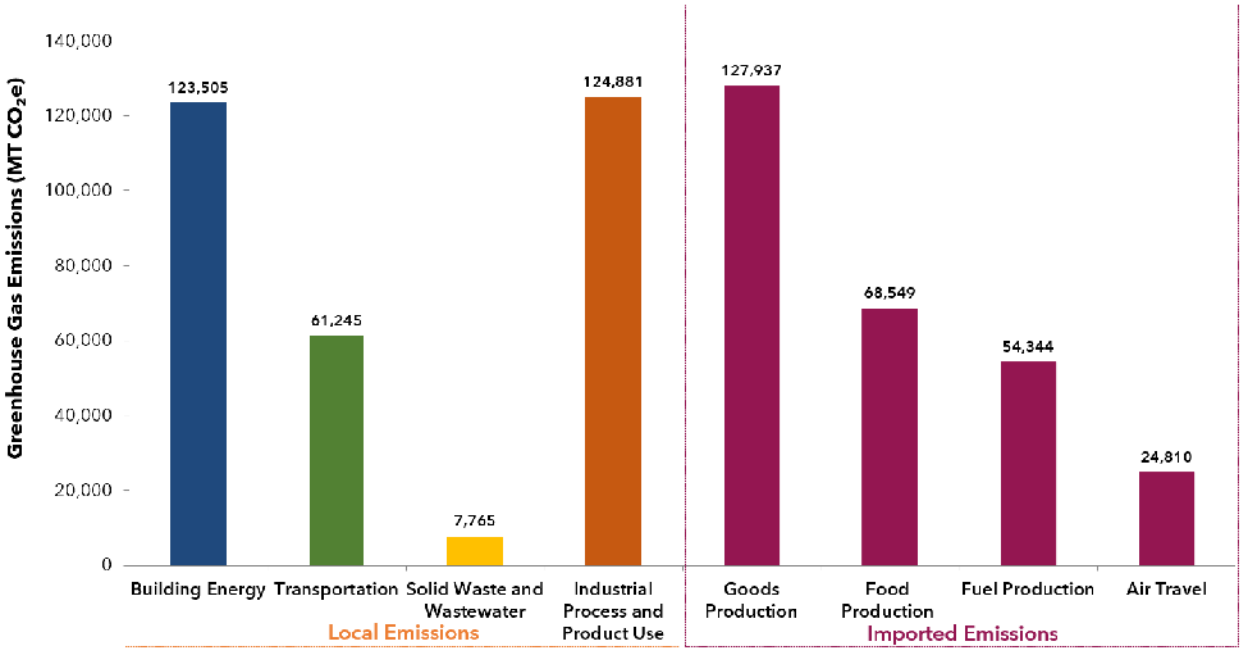


Figure 9 shows a breakdown of the sources of local and imported emissions in Camas. Most sources of local emissions include **industrial process and product use** and **building energy**, which accounts for **78%** of local emissions. Emissions from the industrial process and product use sector generally involve facilities with silicon semiconductor manufacturing. While emissions from these facilities contribute to a large share of local emissions, demand for these goods is global and not specific to Camas. Therefore, goals and policies target reducing local emissions and support existing GHG reduction strategies or targets that are being implemented by businesses and industries in Camas.

Climate Resiliency

Community resiliency is the ongoing process of preparing for, anticipating, and responding to natural hazards created or aggravated by climate change.

Natural hazards relevant to Camas are identified in the 2023 Clark County Natural Hazard Mitigation Plan (NHMP) (CRESA 2023). Table 3 Natural Hazards in Camas lists hazards of concern in order of ranking and their priority, which were evaluated as part of the risk assessment in the NHMP. The risk rating reflects the probability of a hazard weighted against its potential impact on people, property, and the economy. The table also shows the projected climate impacts for each hazard and how hazards have affected the community in the past.

Table 3 Natural Hazards in Camas

Natural Hazard (NHMP Rating[7])	Projected Changes by 2050[8]	Effects on the Community[9]
Extreme Heat (High)	40+ days per year that feel hotter than 90 degrees.	Increased demand for air conditioning, higher utility bills, heat-related illness for sensitive populations and youth at school playgrounds and sports fields, disruption of outdoor activities.
Extreme Precipitation (High)	12% increase in total annual precipitation	Overflowing of streams or rivers, unsafe driving and walking conditions.
Landslide (Medium)	13% increase in heavy rain events	Physical damage to residential and commercial property, energy infrastructure, communication infrastructure, and transportation infrastructure.
Flood (Medium)	17% increase in peak streamflow in Washougal River	Property damage, particularly for older buildings and low-income housing near the floodplain, and temporary or permanent displacement. Temporary closures of businesses and other services.
Wildfire (Medium)	9+ days per year that have high fire danger	Wildfire smoke can impact human health, particularly people with respiratory illnesses or diseases. Increased health risks and property damage for communities near the wildland-urban interface[10].

[7] 2023 CRESA Regional Natural Hazard Mitigation Plan Volume 2 – Planning Partner Annexes
[8] University of Washington's Climate Mapping for a Resilient Washington webtool. Projections are based on a "business as usual" emissions scenario.
[9] Includes effects identified by the Camas community in a 2025 survey.
[10] Clark County Code (15.13.030) defines the wildland-urban interface as areas with elevation in excess of 500 feet and one or more of the following conditions: (a) slope equal to or greater than 25%, (b) forest type vegetation, and (c) outside of an organized fire protection district.

Drought (Low)	14% decrease in summer rains	Impacts to water quality and quantity, decrease in habitat quality and quantity for salmon and other aquatic species.

Vulnerability

Vulnerable Communities

Climate change can impact certain groups of people (vulnerable populations) and areas of the city (overburdened communities) differently. Vulnerable populations are groups of people who are more vulnerable to environmental harms due to socioeconomic factors and other health risk factors (RCW 70A.02.010(14)). Overburdened communities are areas where vulnerable populations experience environmental harms and health impacts (RCW 70A.02.010(11)). Together, vulnerable and overburdened communities are disproportionately impacted by climate change due to the concentration of environmental harms (e.g., air pollution near major roadways) and socioeconomic characteristics (e.g., low income, youth and children). People and communities in Camas who are vulnerable to climate hazards are generally described in the *Our Camas 2045* Equity Framework (see **Introduction** for a description of Equity Communities in Camas).

In addition to communities described in the Equity Framework, CPAT members identified additional communities that could be more vulnerable to climate hazards. These communities include areas that are located near floodplains (such as Lacamas Lake and the Columbia River), near mobile sources of air pollution (such as major roadways), near steep slopes and steep road grades, and/or near the wildland urban interface (e.g., homes adjacent to forested areas).

Vulnerable Assets

In Camas, the impact of climate hazards can depend on the proximity of people and buildings to each hazard. The approximate location of these hazards is shown in Figure 10 Wildfire Hazard Areas and Figure 11 Flood and Landslide Hazard Areas. Climate hazard locations are based on data from publicly available sources such as Clark County's Open Data Hub and include approximate areas of increased risk. While this information provides a visualization of higher risk areas, data may not include all potential risks and data gaps may exist depending on when data was published. Therefore, these figures provide a conceptual understanding of the location of climate hazards and potential effects on the community.

Figure 10 Wildfire Hazard Areas

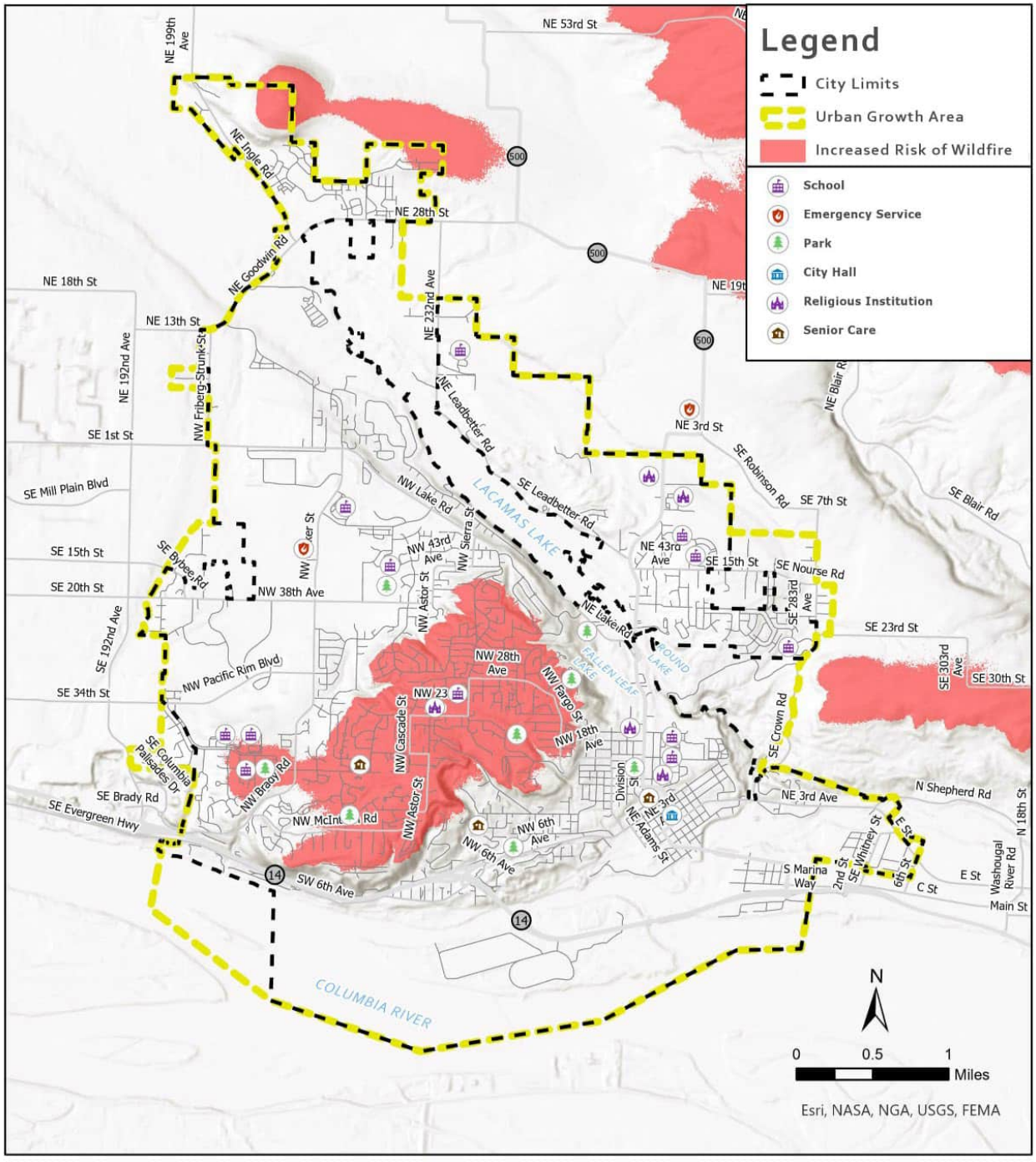
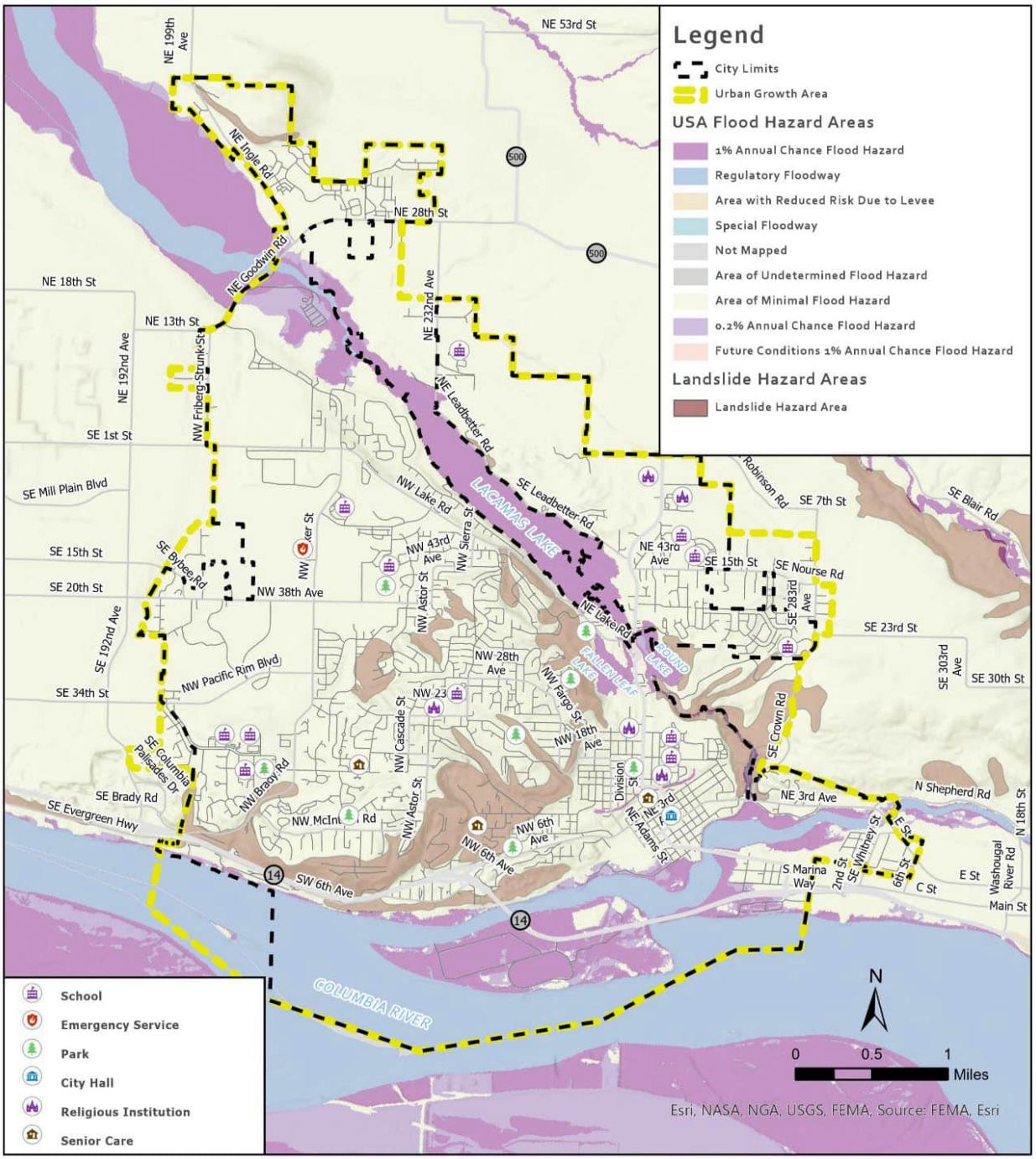


Figure 11 Flood and Landslide Hazard Areas



In Camas, buildings and infrastructure that could be vulnerable to climate hazards include aging water and sewer lines, buildings constructed before adopted seismic codes (e.g., city hall, public works operations center), and high-pressure natural gas lines. High tension power lines may also be vulnerable to severe storms (i.e., wind and ice), homes along the Washougal and Columbia Rivers, including the Georgia Pacific paper mill, may be susceptible to flooding, and the dam at Lacamas Lake could be impacted by an earthquake or flooding.

Extreme heat is one of the highest rated hazards for Camas. Buildings and impervious surfaces such as streets are factors in the urban heat island effect, where urban areas are warmer than surrounding rural or less developed areas. The County's department of public health collected heat data on one day in July 2024 and prepared a heat watch summary report describing how urban heat varies across neighborhoods in the county and how landscape features affect temperature and humidity. Across the county, areas with more buildings and paved surfaces tend to be hotter during the afternoon and evening. In Camas, the hottest areas of the city during the afternoon and evening are near Downtown Camas while cooler areas with more vegetation and shade are in west Camas, northeast of downtown, and near Lacamas Lake.

Vulnerability Assessment

A vulnerability and risk assessment prepared for Camas evaluated the risk of extreme heat on outdoor recreation sites, including (1) Lakes, (2) Parks & Trails, (3) School Playgrounds & Sport Fields, and (4) Downtown Camas. Both vulnerability (sensitivity and adaptive capacity) and risk (probability and magnitude) were evaluated.

The assessment produced composite scores for vulnerability and risk. For the lakes, Lacamas Lake and Round Lake scored high and Fallen Leaf Lake scored low. Under parks and trails, seven scored low, two scored medium, and 11 scored high. School playgrounds and sports fields scored medium (6) and high (6). Lastly, Downtown Camas scored high as it features the hottest area of the city.

To reduce vulnerability and risk, this element includes policies to mitigate the impacts of extreme heat.

Climate Change and Resiliency Goals and Policies

Climate goals and policies are established to meet the State's vision to reduce greenhouse gas emissions, plan for resilience, and support environmental justice. While these goals and policies directly focus on emissions and resiliency, additional policies in other elements of the plan tangentially support these goals. Those policies are noted with a leaf symbol.

Goal CL-1 Energy

Ensure that development and redevelopment projects, including buildings and energy infrastructure (generation, storage, and transmission) are designed to accommodate and use renewable energy, conservation, and efficiency technologies and practices to reduce GHG emissions and increase resiliency to natural hazards.

Policy CL-1.1 Support residents' efforts to improve energy efficiency and resiliency in existing and new residences.

Policy CL-1.2 Encourage renewable energy sources for new and existing buildings.

Policy CL-1.3 Provide commercial buildings, particularly restaurants and food services, with incentives to retrofit buildings for energy efficiency (e.g., grant programs, reduce permit fees, etc.).

Policy CL-1.4 Incentivize and streamline the review process for renewable resource projects.

Goal CL-2 Transportation

Improve the efficiency and resiliency of the transportation system to achieve GHG reduction goals and better withstand natural hazards.

Policy CL-2.1 Promote and complement state and utility incentives to provide electric vehicle charging infrastructure throughout the city, particularly at existing and new multi-family buildings and large employers.

Policy CL-2.2 Provide homeowners and renters information on state and federal tax credits/rebates for electric vehicles, renewable resources and energy efficiency.

Policy CL-2.3 Incorporate projected hydrologic climate impacts into the design and maintenance of water-crossing structures (e.g., climate-smart culverts and bridges).

Goal CL-3 Local Agency Sustainability and Preparedness

Support agencies, districts, and businesses in establishing and achieving their own sustainability goals, initiatives, and programs.

Policy CL-3.1 Support the sustainability initiatives of local agencies, districts, and businesses.

Policy CL-3.2 Support local businesses efforts to bolster climate preparedness and continuity of operations (e.g., develop on-site electricity storage to reduce energy demand during peak hours, incentives to install backup power, building retrofits).

Policy CL-3.3 Support the local economy's resilience to climate disruptions by providing information and resources on how to prepare for extreme heat, flooding, and wildfire.

Policy CL-3.4 Support economic opportunities for green jobs in Camas, including businesses that produce goods or services that benefit the environment and jobs that support business production processes to be more environmentally friendly or use fewer natural resources.

Policy CL-3.5 Develop a sustainable purchasing policy and sustainable construction standards for the City of Camas.

Goal CL-4 Community Health

Protect community health and well-being from the impacts of climate-exacerbated hazards and ensure that the most vulnerable residents do not bear disproportionate health impacts.

Policy CL-4.1 Promote the use of health impact assessments and other tools to identify and address the impacts on health and equity from climate change.

Policy CL-4.2 Develop and implement an urban heat resilience strategy that addresses land use, urban design, urban greening, and waste heat reduction actions.

Goal CL-5 Emergency Preparedness

Enhance emergency preparedness, response, and recovery efforts to mitigate risks and impacts associated with natural hazards.

Policy CL-5.1 Create accessible evacuation plans and outreach materials to help residents plan and practice actions that make evacuation and reunification quicker and safer during a natural hazard event (e.g., notification alerts).

Policy CL-5.2 Develop a comprehensive, communitywide wildfire resilience strategy to improve emergency response capabilities, create fire-resilient landscapes, promote fire-adapted communities, and support the development of community wildfire protection plans.

Policy CL-5.3 Support enhanced data collection for hazard events of all magnitudes to provide a fuller understanding of the community's hazard characteristics.

Policy CL-5.4 Develop resiliency hubs, such as community-serving facilities that support residents, coordinate communication, distribute resources, and enhance quality of life.

Policy CL-5.5 Prepare, plan, and provide ongoing training for those responding to adverse environmental events.

Goal CL-6 Water Resources

Protect and preserve the long-term quality and quantity of Camas' water, and natural and cultural resources from climate change hazards such asdrought and extreme participation.

Policy CL-6.1 Develop and implement a comprehensive drought resilience strategy that factors in projected climate impacts and sets action levels for different drought stages.

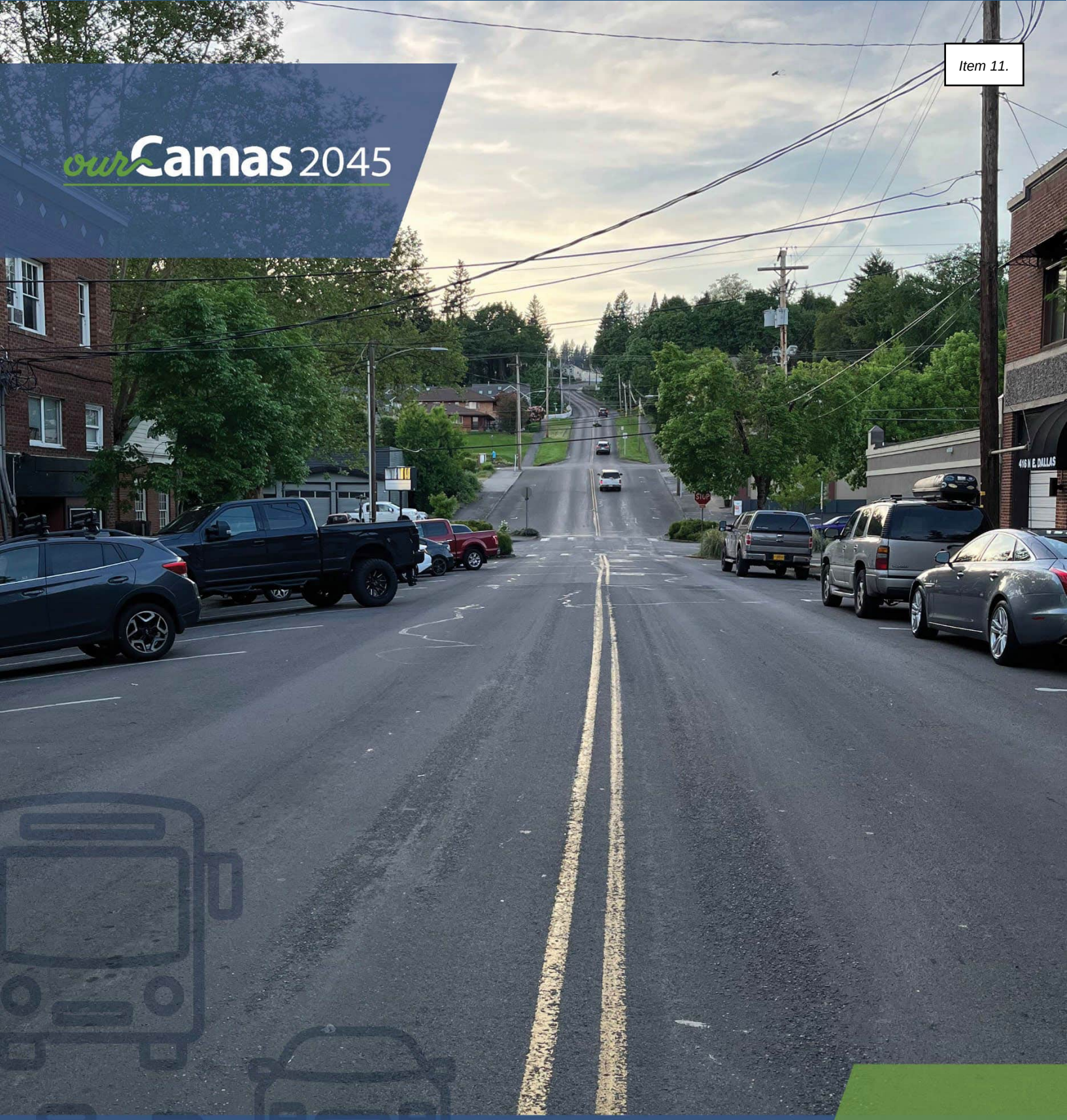
Policy CL-6.2 Evaluate the long-term adequacy of water delivery and storage infrastructure to ensure projected changes in hydrological conditions can be anticipated and managed effectively.

Policy CL-6.3 Implement actions recommended by the Lacamas, Round, and Fallen Leaf Lakes Management Plan to reduce the frequency of harmful algae blooms in lakes due to water pollution and projected changes in climate conditions, including higher temperatures.

Policy CL-6.4 Identify funding mechanisms for mitigation measures recommended by the Lake Management Plan to address the impacts of climate hazards on Lacamas, Round, and Fallen Leaf Lakes.

Policy CL-6.5 Introduce adaptive cooling features at local parks and school playgrounds and sports fields to help mitigate the effects of extreme heat on vulnerable park users and young children.

ourCamas 2045



Transportation

08

08. Transportation

GMA Planning Goal

Encourage efficient multimodal transportation systems that will reduce greenhouse gas emissions and per capita vehicle miles traveled, and are based on regional priorities and coordinated with county and city comprehensive plans.

Vision

In 2045, residents of Camas continue to appreciate their safe transportation infrastructure that equitably serves all users.

Introduction

As part of the comprehensive plan periodic update, the City of Camas reviewed and updated its Transportation System Plan (TSP). The TSP is adopted by reference and included as Appendix X. The TSP is a long-range plan to guide transportation investments for Camas and its UGA for the planning horizon to 2045. The TSP provides the following:

- Inventory of the current transportation system for all modes of travel
- Summary of land use assumptions used for estimating travel demands
- Summary of level of service (LOS) standards
- List of actions to address deficiencies
- Forecast of traffic demand for twenty years
- System needs to meet the current and forecasted demand
- Six-year Transportation Improvement Plan (TIP)

These items are foundational to a comprehensive plan and integral to implementing the Land Use plan.

The transportation element is one of the main parts of the comprehensive plan and is an effective tool for shaping the city's future development patterns. Growth and development patterns have a major influence on the fiscal health of local governments and on the economic performance of the community. The nature of public streets can shape the level of traffic congestion, the use of multiple modes, and the character of neighborhoods. Related requirements, such as parking and loading, will influence the cost to develop in a community and can present both opportunities and barriers to how people can access homes, schools, recreational opportunities, and businesses within the community and in the region.

Ownership, control, development, and the operation and maintenance of streets and public rights-of-way are primary functions of local governments. A transportation system is one of the most expensive facilities a community will construct, operate and maintain. Each new facility adds an asset to the city's portfolio, but it also must be managed, resulting in an incremental increase in operating costs and a new set of maintenance, preservation, and rehabilitation obligations.

Decisions about transportation facilities greatly influence the safety and security of the community. How the streets, roads and other transportation facilities are designed, built and maintained will influence safety in multiple ways for all users.

Federal, state, county and city transportation systems are interrelated, so coordination with other units of government is essential. Responsibility for transportation systems spans all levels of government. The Camas transportation network connects to state highways, neighboring city streets and adjacent county roads and indirectly to federal and interstate highways. It also interacts with transportation facilities operated by other special purpose districts like C-TRAN and for-profit businesses. Moreover, the public does not experience the transportation system as a series of separate systems, but as a single, unified system, and it expects all the parts to function in an integrated fashion.

The GMA requires the transportation element to implement and be consistent with the land use element. Counties and cities should use consistent land use assumptions, population forecasts, and planning periods for both elements. Coordination of the land use and transportation elements must be dynamic and iterative with an ongoing feedback loop coordinating land use and transportation in the plan development and in local implementation. The transportation element is also required to be consistent with state and regional plans. The transportation element is certified by the regional transportation organization, which is the Southwest Washington Regional Transportation Council (RTC), to ensure consistency with the regional transportation plan (RTP).

Performance Standards

Level of Service (LOS)

The TSP includes level of service as a measure of performance standards for motor vehicles. A LOS "D" and a vehicle to capacity (v/c) ratio not higher than 0.85 is the minimum performance standard during the highest one-hour period of the day for signalized, all-way stop and roundabout controlled intersections under City jurisdiction. These standards shall be applied to the intersection as a whole.

A LOS "E" and a v/c ratio not higher than 0.90 is the minimum performance standard during the highest one-hour period of the day for two-way stop and yield controlled intersections under City jurisdiction. These standards shall be applied to all intersection approaches serving more than 20 vehicles. Mobility standards do not apply to approaches at intersections serving 20 vehicles or fewer during the highest one-hour period of the day8. This mobility standard allows

more flexibility in the tension between larger intersection and street designs that are sometimes needed to accommodate peak vehicle demands, and the desire to maintain smaller designs that encourage slower vehicle speeds and tend to be more accommodating to pedestrian and bicycle users.

Level of Service for Highways of Statewide Significance is set by the State. In Clark County, the standard is set as LOS "D" for urban areas, including SR 14. Level of Service for regional state highway facilities (not part of the HSS), including SR 500 in Camas, is set through the Southwest Washington RTC. The Southwest Washington RTC Board adopted LOS 'E' or better for non-HSS urban state highway facilities.

As part of the City's TSP update, forecasted 2045 motor vehicle volumes for peak hour conditions were utilized to determine areas on the baseline roadway network that will be congested and may require future investments to accommodate forecasted growth. The corridors recommended to prioritize for improvements include:

- SR 500-NE Everett Street between NE 23rd Avenue and SE Leadbetter Road
- NW 6th Avenue between Norwood Street and Adams Street
- NE 3rd Avenue between NE Dallas Street and SE Lechner Street

Level of Traffic Stress (LTS)

The TSP includes Level of Traffic Stress (LTS) to measure the comfort of those who are walking, biking or rolling on streets shared with vehicles. The best way to make these facilities comfortable to use while walking, biking and rolling is with space, separation, and visibility. The specific application depends on the conditions of each street. LTS is measured on a scale of one to four. A road with an LTS of 1 is best and is suitable for all users. A road with an LTS of 4 has the highest level of stress for a user and is typically used by those with a high level of confidence or those who don't have an alternative option. The TSP indicates LTS 2 is the standard, meaning streets should be comfortable for most adults, including most adults experiencing disabilities. There may be some separation between pedestrians and vehicles, though no physical barrier.

Travel Demands and Characteristics

The number of people who choose to walk, bike, ride transit, or drive alone with the distances they travel is important for assessing how well existing transportation facilities serve the needs of users. Available data on travel demand, travel mode choice, and trip length are used to better understand travel behavior in the community and inform the needs analysis for the transportation system. This data is largely derived from the US Census Bureau on employment-based trips; however, no other travel data is available from this source. The following sections provide a summary of travel demands and characteristics in the City's planning area.

Commuter Trips

Much of the traffic in the Camas planning area, especially during the more congested weekday peak periods, is related to employment. In other words, how do people get to and from work

from their place of residence. People who live in Camas and who are employed overwhelmingly commute to work outside of the planning area (87 percent), while jobs in the planning area are overwhelmingly filled by people who live outside of the planning area (83 percent).[11]

In terms of the predominant travel mode, on average, almost 75 percent of employed residents in the Camas planning area commute to work using single-occupant motor vehicles. About 8 percent of residents carpool to work and the remaining 17 percent work from home, walk, bike, take transit, or use some other means of travel[12].

About 11 percent of employed residents in the Camas planning area worked from home pre-COVID, and that figure likely increased due to COVID-19. It seems likely that a higher percentage of workers will continue a hybrid work schedule that includes teleworking, at least part time. Any increase in the hybrid work week (e.g. 2-3 days in an office with the balance at home or some other remote location) will change the demand on the transportation network, including when and how people travel.

Transportation Demand by Mode

Pedestrian, bicycle, and motor vehicle traffic counts were conducted at key intersections throughout Camas on typical weekdays[13]. This information indicates where and when travel demand is highest for each mode of travel. It also provides a basis for assessing how well existing transportation facilities are able to meet the needs of users during peak demand periods.

- Pedestrian volumes during the PM peak hour are generally highest near downtown Camas, including along NE 3rd Avenue and NE Adams Street (the traffic count summary is included in the appendix). The highest hourly pedestrian activity during the evening peak occurred at the NW Sierra Drive intersection with NW 28th Avenue, near Dorothy Fox Elementary school, with 30 pedestrian crossings in the one-hour period. Other study intersections with more than 15 pedestrian crossings during the one-hour period included many downtown locations such as NE 6th Avenue at NE Adams Street, NE 3rd Avenue at NE Dallas Street, NE 3rd Avenue at NE 4th Street, and Weir Road at NE 3rd Avenue, near the border of Camas and Washougal.
- Bicycle volumes indicate limited biking, with the highest volumes along NW Lake Road, and NW Sierra Street (the traffic count summary is included in the appendix). During the evening peak hour, 20 of the 50 study intersections had no observed bicyclists during the one-hour period. The NE Lake Road at SR 500, NW Lake Road at NW Sierra Street, NW Lake Road at NW Leadbetter Drive, NW Sierra Street at NW 45th Avenue, and NE 6th Avenue at NE Garfield Street intersections had the highest observed bicycle volumes, with 4 or more bicyclists counted during the single hour at each of the intersections.

[11] US Census Bureau, OnTheMap. Home/Work Distance/Direction Analysis, 2015.
[12] US Census Bureau, 2012-2016 American Community Survey
[13] Based on counts conducted in April of 2018.

- Motor vehicle volumes on the roadways in Camas (the traffic count summary is included in the appendix) most commonly peak during weekday evenings between 4:50 and 5:50 p.m. The highest hourly motor vehicle volumes during the evening peak occurred along the NW 6th Avenue corridor between the SR 14 ramps and NE Adams Street, with more than 1,300 trips during the one-hour period. This corridor is the primary entrance into Camas from eastbound travel. The NE Lake Road at NE Everett Street, and NW 6th Avenue at SR 14 Ramps intersections had the highest observed volumes, with more than 1,800 entering vehicle trips during the single hour at each of the intersections.

Active Transportation Networks

Camas is a community with an active citizenry and, therefore, requires a fairly robust active transportation system that includes pedestrian and biking facilities. The TSP inventoried the pedestrian and biking facilities, listed gaps in the systems, and assessed the facilities for how a pedestrian and bicyclist experiences them.

Multimodal Network Design

The design of the streets in the City's planning area is based on the network classifications and area designation. All streets in the planning area are multimodal and include travel lanes and on-street parking for vehicles, sidewalks for pedestrians, and on-street or separated facilities for bicyclists. Accommodating these modes varies by the functional classification and area designations. For a typical street cross-section, the functional classification determines the minimum design requirements for the number of vehicle travel way lanes and on-street parking, and the minimum acceptable bike facility, and the area designation is used to determine the minimum acceptable design for pedestrian facilities, and the minimum travel lane and median/turn lane width. Together, these cross-section standards identify the design characteristics needed to meet the function and demand for each facility type for streets in the City's planning area. Since the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, this system allows standardization of key characteristics to provide consistency.

The typical designs are intended to be implemented in newly developing or redeveloping areas of the City's planning area, where constrained conditions do not limit the ability to construct the typical cross-section. A variety of physical and natural constraints may prevent adherence to the multimodal network design requirements. A deviation to the street standards may be requested from the City Engineer or City Engineer's designee with justification of constraints to consider a constrained cross-section or other adjustments.

Pedestrian Network

Walking supports healthy lifestyles, is an easy and economical way to travel, and is well-suited for people of all ages and abilities. In this plan, "walking" and "pedestrian" are terms that include people who walk independently or use canes, wheelchairs, or other walking aids, or strollers. Approximately two percent of commuters in the city walk to work, with three percent

utilizing public transportation, which often includes walking at the beginning or end of the trip.[14] In addition to the work commute trips, walking trips are made to and from recreational areas, shopping areas, schools, and other key destinations in the community. Continuous and direct sidewalk connections to all key destinations and along all streets, in addition to safe crossing opportunities along major roadways, are essential to encourage walking and transit use.

A pedestrian network assessment of streets, showing the extent to which the walking network on collector and arterial streets provides a level of comfort and safety for users, was completed throughout the city. About 30 percent of the collector and arterial street miles in Camas were rated "good (i.e., level of traffic stress (LTS) 2)" or "excellent (i.e., LTS 1)" for pedestrians. However, over 35 percent of the collector and arterial street miles rate poorly (i.e., LTS 4). Most of the street miles rated "poor" are located in high growth areas, be that housing or business growth. The pedestrian network in these areas is largely unimproved due to the once rural nature of the surrounding land use. As future urban development occurs, pedestrian facilities will improve in those areas. Overall, the pedestrian network rates relatively high near downtown, and generally poorer towards the edges of the city. See Figure 13 for an inventory of the pedestrian network.

Bicycle Network

Cycling is important for both transportation and recreation in the Camas planning area. This includes people who bike to work and school, bike for recreation or running errands. Approximately one percent of commuters in the city bicycle to work[15]. Riding bicycles also plays a key role in the transportation system's ability to support healthy and active lifestyles and provide a viable alternative to the automobile. Continuous bicycle connections between all activity generators and arterial/collector roadways are desirable to allow for safe and attractive non-motorized travel options.

The bicycle network in the City's planning area, shown in

Figure 12, is composed of bike lanes, roadway shoulders, shared roadways, and shared-use paths.

- Bike lanes are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. Bike lanes are most appropriate for arterials and collectors, where high traffic volumes and speeds warrant greater separation of the travel modes. Significant segments of continuous bicycle lanes exist along portions of NW Lake Road, NW 38th Avenue, NW Parker Street, NW Friberg-Strunk Street, and SR 500.
- Shoulder bikeways are paved with striped shoulders wide enough for bicycle travel. A six-foot paved shoulder is desired to adequately provide for bicyclists, with a four-foot minimum width in constrained areas. Roadways with shoulders less than four feet are

[14] US Census Bureau, 2012-2016 American Community Survey
[15] US Census Bureau, 2012-2016 American Community Survey

considered shared roadways. Some shoulder bikeways are signed to alert motorists to expect bicycle travel along the roadway

- Shared roadways include those on which bicyclists and motorists share the same travel lane. The most suitable roadways for shared bicycle use are those with low speeds (25 mph or less) and low traffic volumes (3,000 vehicles or fewer per day). Shared roadways, often signed as bicycle routes, serve to provide continuity to other bicycle facilities (e.g., bicycle lanes) or can be designated as a preferred route through the community. Shared roadways can have signs that highlight a special route or provide directional information in bicycling minutes or distance. Most local roadways in the city are considered shared roadways, but do not have signs or pavement markings, although some are planned to be improved in the TSP.
- Shared-use paths provide off-street travel for bicyclists and pedestrians, and are wider than an average sidewalk (e.g., 10 – 14 feet). Shared-use paths are typically paved (asphalt or concrete) but may also consist of an unpaved smooth surface, such as compacted gravel, as long as it meets Americans with Disabilities Act (ADA) standards. Paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout the residential neighborhoods.

A bicycle network assessment of streets in Camas shows the extent to which the bicycle network on collector and arterial streets provides a level of comfort and safety for users. About 20 percent of the collector and arterial street miles' in Camas rate "good (i.e., LTS 2)" or "excellent (i.e., LTS1)" for bicyclists. However, about 65 percent of the collector and arterial street miles' rate poorly (i.e., LTS 4) for bicyclists.

Overall, the bicycle network rates relatively high on the northwest side of the city and poor on the south and east side. The streets with the lowest ratings are the streets important for local and regional through travel (e.g. portions of NW 6th Avenue, NE 3rd Avenue, and SR 500), where many businesses and services are located. These streets rate low due to the relatively high motor vehicle traffic volumes and speeds and lack of separated bicycle facilities.

Transition Plan for Transportation

Title II of the Americans with Disabilities Act requires cities to establish a transition plan for transportation. The plan shall, at a minimum:

1. Identify physical obstacles in Camas' facilities that limit the accessibility of its programs or activities to individuals with disabilities;
2. Describe in detail the methods that will be used to make the facilities accessible;
3. Specify the schedule for taking the steps necessary to achieve compliance and, if the time period of the transition plan is longer than one year, identify steps that will be taken during each year of the transition period; and
4. Indicate the official responsible for implementation of the plan.

Camas has a relatively well-developed pedestrian network that is also potentially suitable for those who use mobility devices. The network is composed of sidewalks, shared-use paths and pedestrian trails, and other accessways. A large part of downtown Camas was developed prior to 1950, a time in which sidewalks were incorporated into the design of neighborhoods and streets. Although most areas incorporated into Camas over the following decades have sidewalk coverage, a few areas have noticeable gaps that do not make for a complete sidewalk network. These gaps are most significant in southwest, southeast, and northeast Camas, and on roadway segments outside city limits. Paved shared-use paths exist along portions of NW Parker Street, NW 18th Avenue, Lacamas Lake, Washougal River, and scattered throughout residential neighborhoods. Unpaved pedestrian only trails are scattered throughout the city.

Many intersections in older parts of the city lack ADA-compliant ramps, which provide important connections between sidewalks, making it easier to cross streets and handle the vertical drop at curbs. Knowing these conditions, the city has been recently installing new curb ramps in many of these locations. The presence of curb ramps is fairly consistent along streets in downtown Camas, and in the newer neighborhoods in the city. Additional work is required by the City to ensure all existing and future sidewalks have curb ramps.

About 38 percent of street miles (including City arterial, collector and local streets) lack sidewalk coverage along one or both sides (see Figure 13). These gaps are more common along arterial streets than collector streets, at 40 and 23 percent, respectively, of the street miles with no sidewalk on either side. These numbers do not incorporate off-street shared-use paths that may run alongside some roadways. Any future streets constructed in association with development projects will be required to construct sidewalks with curb ramps, increasing the overall sidewalk supply.

Transportation Projects and Priorities

This section describes the transportation system improvement projects- multimodal street improvement, intersection improvement, pedestrian/bike improvement, transit enhancement, and demand/system management – to address the system needs identified in earlier text.

The list of projects was developed through three main sources including stakeholders, relying on previous plans (such as the North Shore Subarea Plan), and independent project team evaluation.

The full list of projects is identified to improve the transportation network along major streets in the City's planning area, regardless of their priority or their likelihood of being funded. The TSP focuses on streets in the planning area with a functional classification of Collector or higher. Additional improvements will occur with private development in the planning area, including the build-out of the local street network consistent with the applicable standards.

The planning process from the TSP screens candidate projects to set aside those that may not be feasible due to environmental or existing development limitations. The remaining projects

are a combination of new and previous ideas for the transportation system that seek to address the gaps and deficiencies in the city.

The full project list, included as Appendix X, includes 99 projects totaling over $180 million in total investments. For the purposes of cost estimates, project design elements are identified, however, the actual design elements for any project are subject to change and will ultimately be determined through a preliminary and final design process and are subject to City, WSDOT, Clark County, and/or other partner agency approval. The projects were assigned to one of several categories:

- Multimodal Street Improvement - these projects will improve or construct new multimodal streets throughout the planning area, each with facilities for motorists, pedestrians, and bicyclists. A total of 29 projects have been identified that, as of 2024, will cost an estimated $72 million to complete.
- Intersection Improvement – these projects will improve safety and mobility at intersections throughout the planning area. A total of 19 projects were identified to construct new or improve existing intersections that, as of 2024, will cost an estimated $64 million to complete.
- Pedestrian/Bike Improvement – these projects include stand-alone sidewalk, path and roadway crossing improvements, and an integrated network of bicycle lanes, marked on-street routes and shared-use paths to facilitate safe and convenient travel citywide. A total of 39 pedestrian and bicycle projects were identified that, as of 2024, will cost an estimated $38 million to complete.
- Transit Enhancement – these projects will enhance the quality and convenience for transit passengers. One transit project was identified that, as of 2024, will cost an estimated $1 million.
- Demand/System Management – this will encourage more efficient usage of the transportation system. Two projects were identified that, as of 2024, will cost an estimated $450,000.

Transportation Facility Maps

Figure 12 Bicycle Facilities

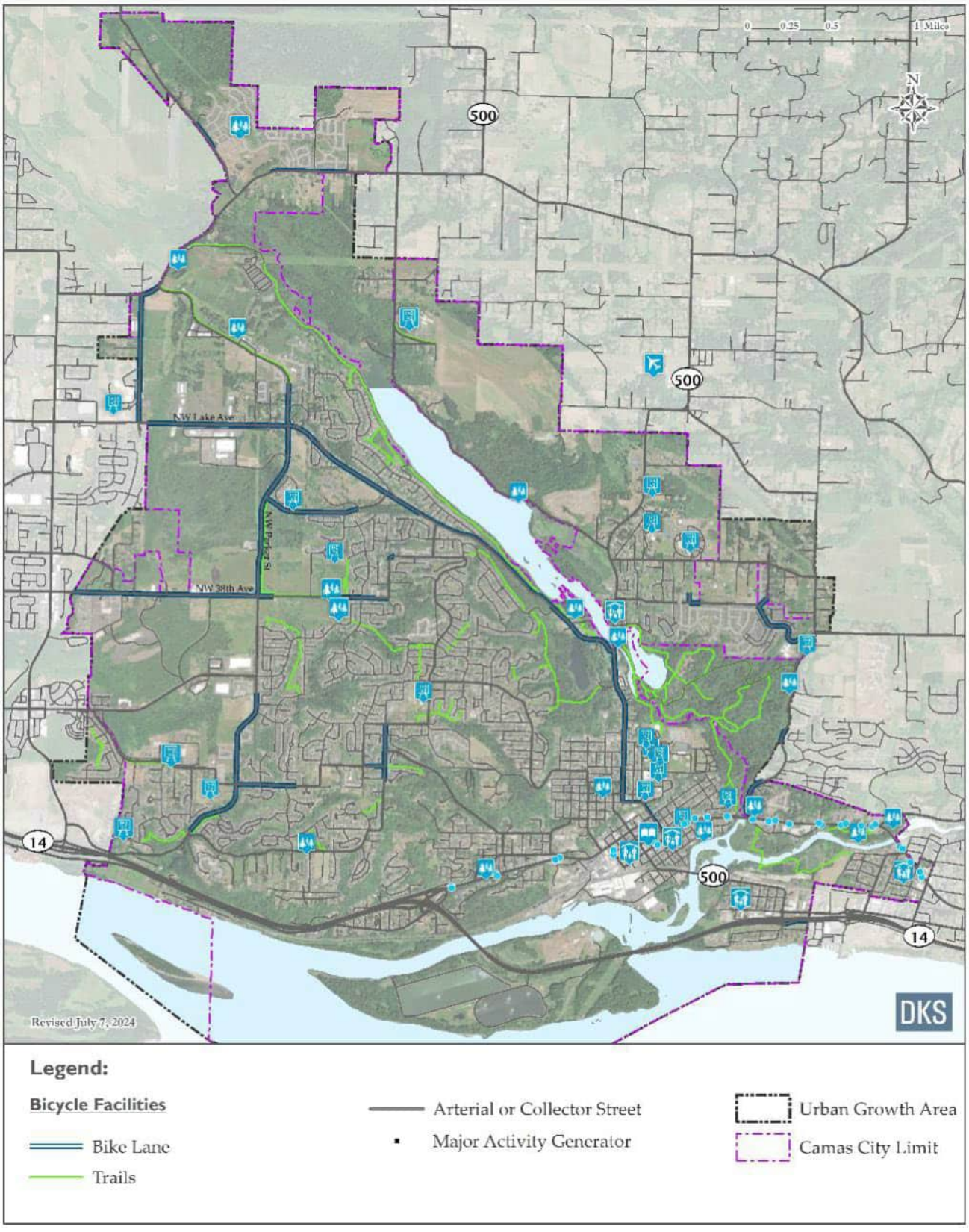


Figure 13 Pedestrian Facilities

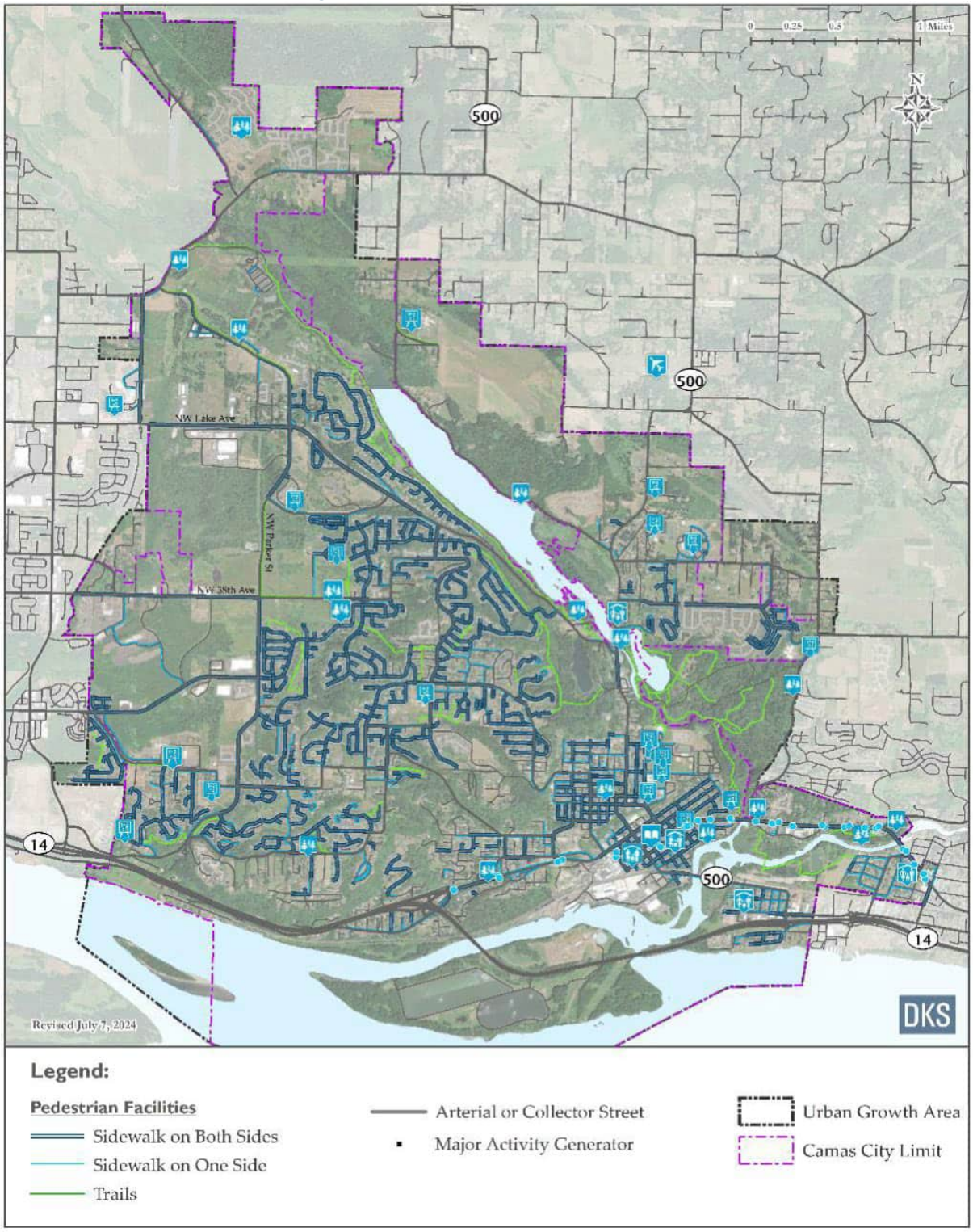


Figure 14 Street Network

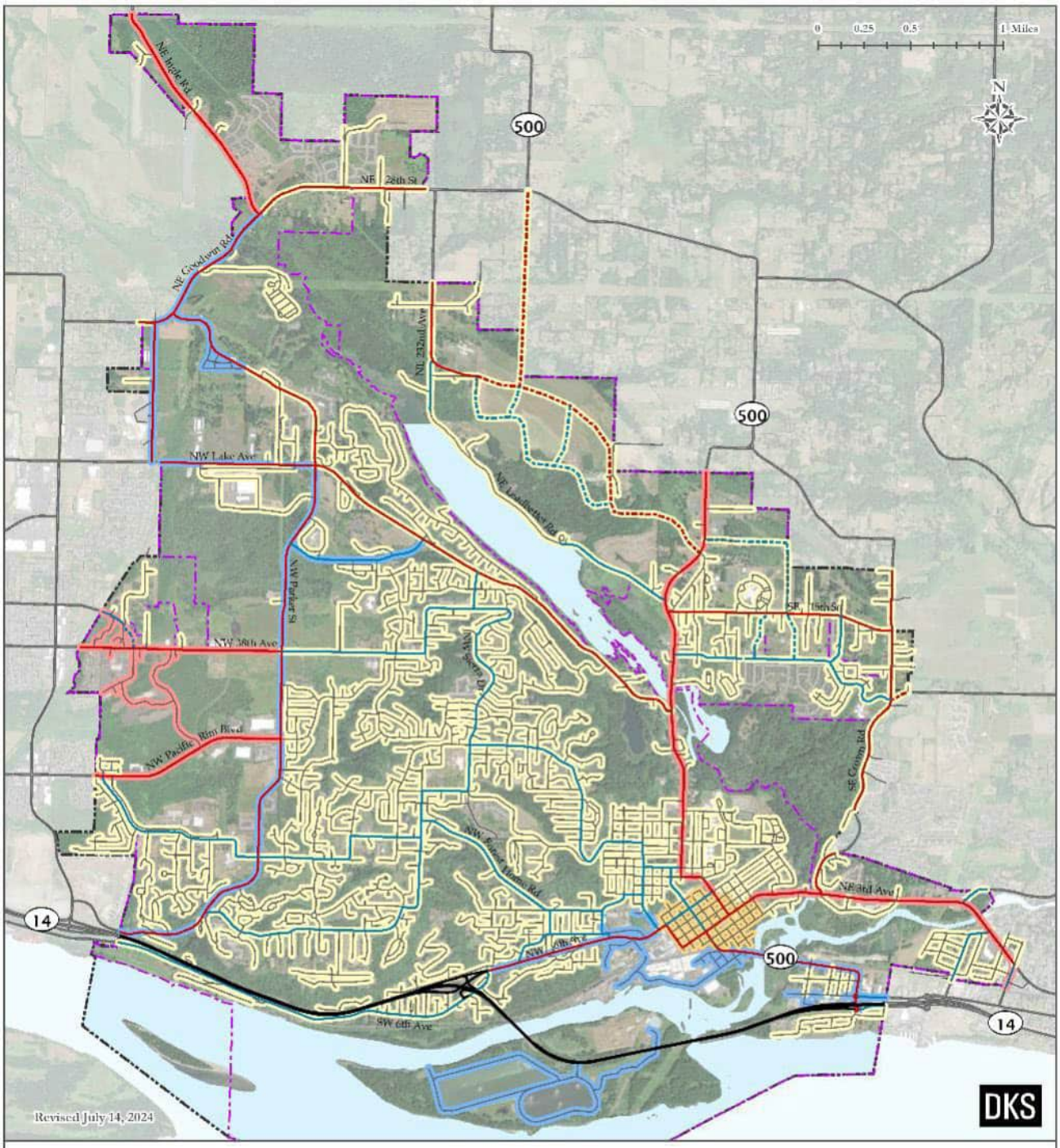
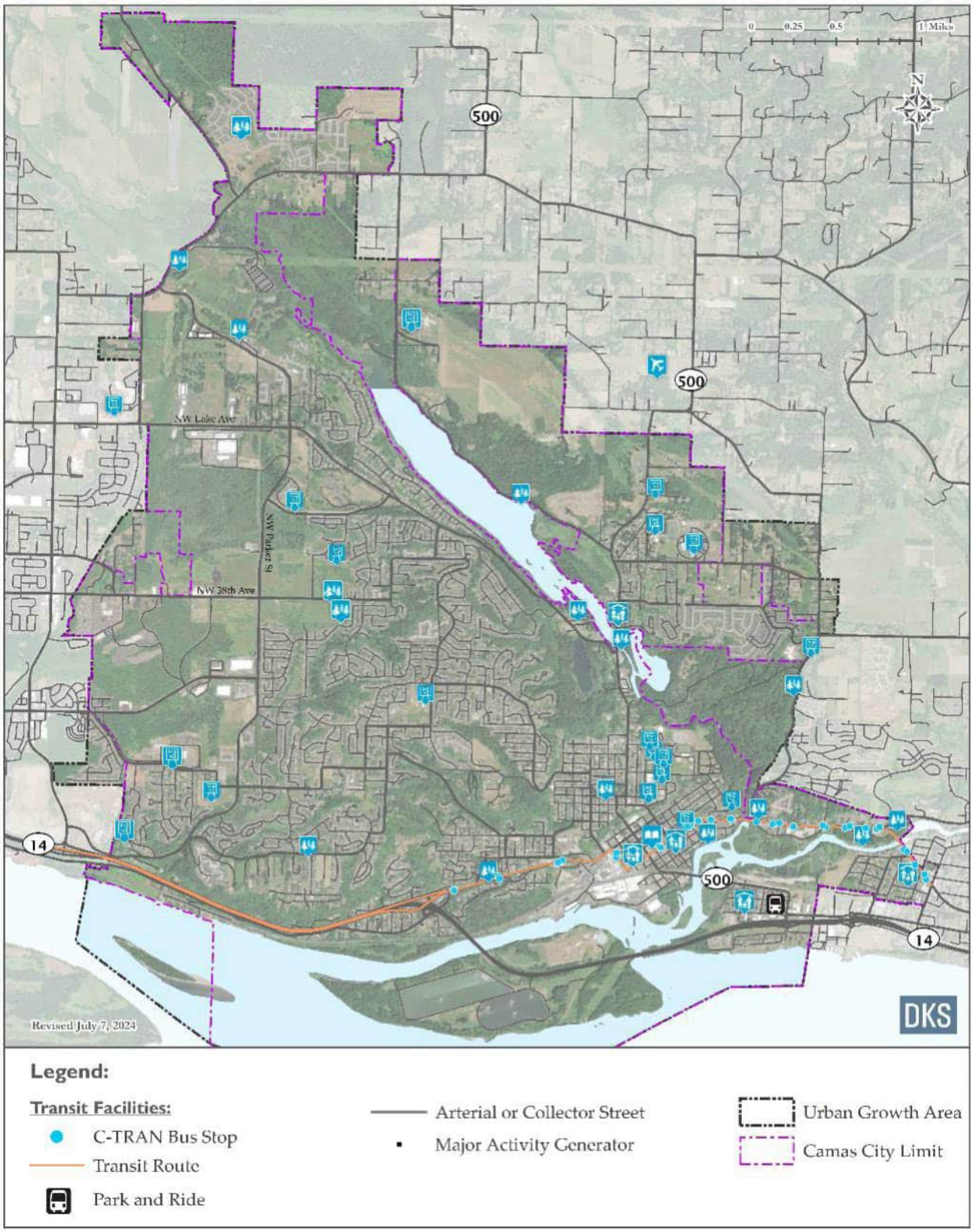


Figure 15 Transit Facilities



Transportation Goals and Policies

Goal TR-1 Complete Streets

Streets will function for all users of all abilities including bicyclists, pedestrians, transit users, and motorists.

Policy TR-1.1 Implement the Transportation System Plan (TSP) to maintain the livability of Camas and guide decision-making for transportation-related projects, policies, and design. Ensure consistency between the TSP, the Parks, Recreation and Open Space Plan and the 6-year street plan.

Policy TR-1.2 Maintain the transportation system to enhance safety and efficiency for all users, facility aesthetics, access management measures and the overall integrity of the system.

Policy TR-1.3 Construct streets that are interconnected and avoid long cul-de-sacs or dead ends. Block lengths should be less than 1,000 feet. Include pedestrian and bicycle linkages in the construction of cul-de-sacs and other forms of dead-end streets. Existing dead-end streets should be retrofitted to provide bicycle and pedestrian linkages as practicable.

Policy TR-1.4 Develop and implement design standards that provide attractive streetscapes, encourage appropriate traffic volumes and speeds, and support multi-modal safety. Include enhanced roadway features such as roundabouts, decorative lighting, and landscaping in gateways and design overlay areas.

Policy TR-1.5 Minimize access to new development and redevelopment along City arterials and consolidate access points when spacing is insufficient.

Policy TR-1.6 Provide routes designed for active transportation to encourage mode shift for short trips. Route planning should seek shortcuts and other opportunities that provide advantages to active transportation users. Public investments should support active transportation routes such as street lighting, safe crosswalks, and protected bike lanes.

Policy TR-1.7 Coordinate with Camas School District to implement a safe routes to school program to encourage the use of alternative and active transportation.

Policy TR-1.8 Develop and implement Complete Streets design in all new and retrofit street projects to support the use of alternative travel modes. Adopt engineering design standards consistent with Complete Streets goals.

Policy TR-1.9 Increase wayfinding signage for outdoor destinations throughout the City.

Policy TR-1.10 Inventory current bicycle and pedestrian networks to identify gaps in route coverage. Support filling in network gaps as new development and redevelopment occurs to create a bicycle and pedestrian network that is safe, comfortable, and accessible to people of all ages and abilities.

Policy TR-1.11 Minimize cut and fill roadway design and, where feasible, minimize restructuring the natural contours of the land.

Policy TR-1.12 Encourage the inclusion of low impact development (LID) design features (e.g. rain gardens, grass pavers, pervious pavement) in the design of road surfaces.

Policy TR-1.13 Require LED lights in new development and replace existing inventory that lack LED features.

Goal TR-2 Local and Regional Transit

Regional transit will provide safe, efficient, and dependable service to the Camas community for a variety of trips within and outside of the city.

Policy TR-2.1 Coordinate with local municipalities, Washington Department of Transportation, adjacent counties, and C-TRAN to ensure that minimum roadway and multi-modal design standards are consistent.

Policy TR-2.2 Partner with C-Tran to advocate for and develop transit options that are safe, convenient, frequent, and accessible for Camas residents.

Goal TR-3 Traffic Safety

Design and construct safe transportation facilities that meet applicable requirements.

Policy TR-3.1 Encourage traffic safety through education, enforcement, and engineering. Use traffic calming, traffic diversion, and other available tools such as landscaping, trees, and art to ensure a comfortable and safe environment for all users.

Policy TR-3.2 Provide adequate access for emergency vehicles throughout the city.

Policy TR-3.3 Develop safe pedestrian and bicycle routes between residential areas, schools, and public facilities.

Policy TR-3.4 Require new development to implement designs standards using the Neighborhood Traffic Management Plan.

Policy TR-3.5 Identify high accident areas and implement specific measures to reduce accident occurrences.

Goal TR-4 Transportation Demand Management

Transportation planning will achieve the efficient use of transportation infrastructure, increase its person carrying capacity, and accommodate and facilitate future growth consistent with land use objectives.

Policy TR-4.1 Require large employers to implement a commute trip reduction program for employees, as mandated by state law.

Policy TR-4.2 Support intergovernmental development review.

Policy TR-4.3 Support the Regional Transportation Council (RTC) with funding and staff participation to the extent possible.

Goal TR-5 Concurrency and Level of Service

The City will maintain the adopted LOS standards for all arterial streets and transit routes.

Policy TR-5.1 Encourage growth in areas with existing or planned infrastructure capacity.

Policy TR-5.2 Require new development to demonstrate that adequate person trips are available, or that multi-modal improvements to the transportation system will be made to accommodate the impacts concurrent with the development.

Policy TR-5.3 Utilize traffic impact fee studies, development traffic impact analyses, and corridor studies to identify deficiencies and plan improvements to maintain or improve LOS standards.

Policy TR-5.4 Take the following actions (in no priority order) if the probable funding falls short of meeting identified needs: 1) delay development until programs, facilities, or services can be funded; 2) obtain the revenue needed or revise the transportation plan to reflect known financial resources; or 3) change the transportation LOS standard, which is a last resort measure.

Goal TR-6 Transportation Revenue

Maximize the use of state and federal funds for transportation capital, operating, service, and demand improvements.

Policy TR-6.1 Maintain a capital improvement plan (CIP) that identifies construction and improvement priorities and funding.

Policy TR-6.2 Ensure that the transportation impact fee program responds to land use changes, supports connectivity, and requires new development to pay its proportionate share of needed capacity.

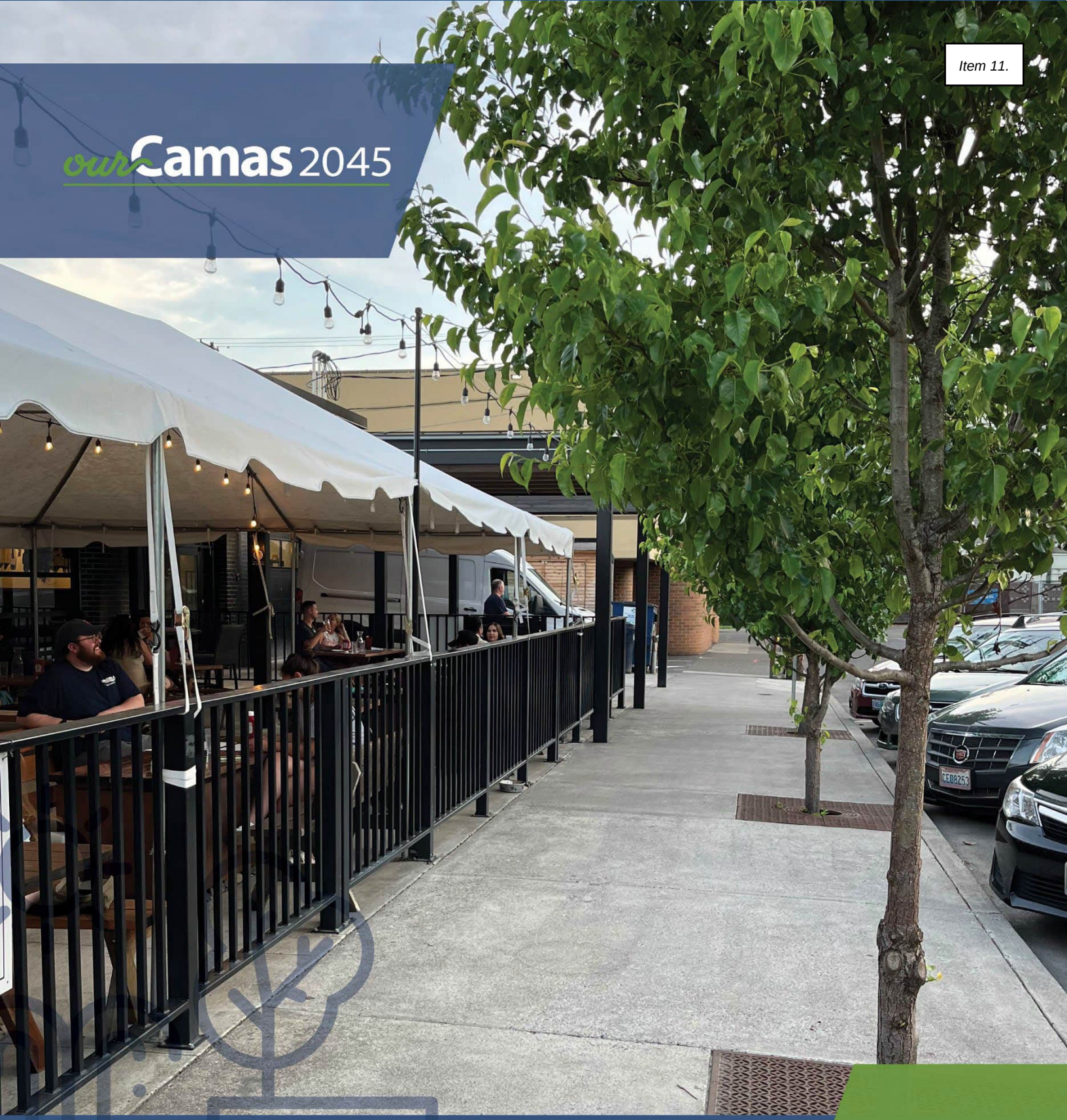
Policy TR-6.3 Support the Pavement Asset Management System and other maintenance programs to ensure cost-effective maintenance of transportation facilities and efficient use of public funds.

Policy TR-6.4 Develop equitable transportation impact fees to assess developers a fair-share contributions for any transportation improvements.

Policy TR-6.5 Prioritize transportation funding for multi-modal improvements that will enhance safety and access between infill areas, schools, and employment centers.

Policy TR-6.6 Focus transportation projects in economic development areas to act as catalysts for job growth.

ourCamas 2045



Public Facilities & Services

09

09. Public Facilities & Services

Purpose

Plan for adequate facilities that are consistent with the other elements, goals and policies of Our Camas 2045, can accommodate the projected population and employment growth and land use plan, and based on sound fiscal policies for the City.

Vision

In 2045, Camas residents enjoy the city's parks, trails, community centers, and other recreational opportunities. The school district draws families to the community and the library continues its vital role as a place of learning. Residents value accessible police, fire, and emergency response services. Proficient government agencies maintain existing City assets and coordinate future development.

Introduction

The City of Camas is a full-service community that offers a breadth of public facilities, services, and utilities. Public facilities include such things as City Hall, the Camas Public Library, the Public Works Operation Center, Lacamas Lodge, the Community Center, the Camas Police Department headquarters, and Fire Stations 41 and 42. The majority of the City's functions and services are carried out from these facilities.

General government services include such departments as Administration and Human Resources, Community Development, Finance, Information Technology, and the Camas Public Library. General services include but are not limited to utility billing, human resources, city clerk functions, building and engineering permits and inspection, and activities of the City Council and city boards and commissions.

Other city services include Fire and Emergency Medical Services (EMS), Police, and Parks and Recreation. Fire and EMS services are provided in Camas and, via intergovernmental agreements, beyond Camas city limits. The Camas Police Station dispatches law enforcement services throughout the community. Parks and Recreation services are housed in several facilities including Lacamas Lodge, the Community Center, and through a myriad of parks, trails, open spaces, and special use buildings.

Public utilities, administered by the Public Works Department, includes the city's sewer system, water system, and municipal stormwater system. These systems have a variety of assets that support them and are scattered throughout the city.

Public Works also operates solid waste service. Garbage trucks are dispatched from the Operations Center, the hub of Public Works' activities, and the solid waste is transported to an off-site transfer station and then to a landfill in eastern Washington. The City budgets money for capital equipment, however, the solid waste system does not require the same kinds of investments that the sewer, water, and stormwater systems require.

The public facilities and services element is divided into four sections:

- Public Facilities and Services including fire, emergency medical and police services, parks and open space, and City owned facilities
- Public and Franchise Utilities including water, sewer, stormwater, solid waste, electricity, natural gas, and telecommunications
- Capital Improvement Plan
- School Districts

Related to this element is the City's Capital Facilities Plan (CFP) (Appendix X), which provides a comprehensive project list and schedule guiding the investment of city resources in facilities and infrastructure. These resources are made up of local revenues as well as State, Federal and other sources. The CFP identifies those projects which have secured funding as well as a list of projects which have not yet been funded. The projects included in the overall CFP have largely been identified through other planning documents and efforts which are all incorporated into the City's comprehensive plan.

Level of Service (LOS) Standards

Under the GMA, adequate provisions for urban governmental services must be provided in the UGA. The goals and policies in this element are provided to address anticipated growth and maintain adopted LOS standards.

Public Facilities and Services

Many of the public facilities and services listed in this element have strategic plans and actions that guide maintenance and service improvements. The identified goals and policies were given consideration based on a framework of budgetary and operational guidelines as well as these strategic plans.

Fire Protection, Emergency Medical Services, and Police Protection

The city is served by the Camas-Washougal Fire Department (CWFD), which covers 20 square miles and 33,000 residents for fire protection and 80 square miles and 65,000 residents for emergency medical services. The Camas and Washougal fire departments consolidated in 2011 through a joint contract for service to improve efficiency and lower costs. CWFD averages approximately 5,000 fire and medical calls annually. The CWFD is the only fire department in

Clark County to provide ambulance transport services, which requires additional training for the firefighters in addition to fire suppression techniques.

Camas Fire and EMS operates out of two stations – Station 41 located in City Hall on NE Fourth Avenue and Station 42 located off NW Parker Street. Station 42 is relatively new, while Station 41 is many decades old.

Voters approved a capital construction bond in August of 2024 for a new downtown station and headquarters to replace Station 41. It will be located on the property occupied by the City Hall Annex building just west of City Hall on NE Fourth Avenue. When the new Station 41 is completed, there will be vacated space in the City Hall building. Future uses for the vacated space have not been determined.

A Facility Conditions Assessment (Appendix X) was completed in 2021 and lists some deficiencies in Station 42 in the form of HVAC, plumbing, electrical, and interior finishes that will be addressed with funding from a general obligation bond.

The Camas Police Department operates a full-service police department from one location near the downtown core. This 15,000 square-foot facility was built in 1998 and includes a 1,500 square-foot community/training room. Services include police response, community engagement, school resource officers, investigative follow-up, parking enforcement, code enforcement, and records services.

The City is currently investing over $400,000 in upgrades to the Camas Police Station by replacing end-of-life mechanical equipment. This investment will make it more cost-effective and environmentally resilient.

Parks, Trails, and Open Space

Camas' Comprehensive Parks, Recreation, and Open Space (PROS) plan , updated in March 2022, outlines a community vision for Camas that includes a high-quality park and recreation system, with a comprehensive open space and trail system linking all recreational sites to the regional trail network. The PROS plan is adopted by reference and included as Appendix X.

Parks and recreational opportunities in Camas include neighborhood parks that serve individual neighborhoods, natural open space areas that preserve resources throughout the community, and special use areas for specific recreation needs. Supplementing these are public and private sites and facilities, such as school sites, regional parks, and privately-owned recreation facilities.

In response to the community's feedback on the PROS plan, the City is currently working on a Parks and Open Space Management Plan (POSMP). The purpose of the POSMP is to maintain the existing facilities, fill gaps and improve trail connections, and develop and improve existing parks. The POSMP will outline a strategic vision for the thoughtful management of parks and open spaces within the city, ensuring that they continue to serve as resources for all users. The City will need to coordinate the POSMP with the comprehensive plan to ensure consistency.

During the City's review of land use designations, the PROS plan was reviewed to ensure that sufficient land is designated as Park, Open Space/Green Space, and NS-Parks/Open Space. Because the North Shore Subarea Plan was adopted after the last comprehensive plan update, this update includes revisions that incorporate the new NS-Parks/Open Space designation.

Camas receives impact fees paid by new development for park, trail, and open space improvements that increase the capacity of the system. The expenditure of the collected fees will be applied to the total costs of implementing projects that are identified in the PROS Plan project list, and as further refined by the City's Capital Improvements Plan.

City Facilities

The comprehensive FCA reviewed 17 publicly owned buildings located at 11 different sites. The total square footage of the surveyed buildings is just under 276,000 square feet.

The FCA report notes the total replacement value of all facilities at $61 million in 2022 dollars. The reported deficiencies for the years 2022-2027 total $17 million with the priority needs (life safety and code issue deficiencies) at $6.3 million. Long-term needs would require $18 million for major maintenance projects.

Recently, the City appropriated funding, through limited general obligation bonds, to pay for many of the items listed as priority needs in the FCA. This approximately $7 million has allowed the City to attend to some of the high priority deficiencies.

Noteworthy on the list is Station 41 and the City Hall Annex. With passage of a voter approved bond in 2024 specifically to replace Station 41, the City Hall Annex building will be demolished, and the site will house the new Station 41, which will also serve as the Fire Department's headquarters.

The Camas Public Library, located across the street from City Hall on NE Fourth Avenue, provides library services to the community at-large. According to the FCA, the library is in need of priority improvements to address immediate deficiencies. Since the date of the report, the City is funding a number of deficiencies through a general obligation bond.

City and Franchise Utilities

Water

The City owns and operates a multi-source municipal water system which includes supply, treatment, storage, and distribution of potable water to residential and commercial customers. The City currently obtains its water from ten groundwater wells and two surface water sources that are treated to provide high quality water to customers. The City owns over 143 miles of pipelines in its water transmission and distribution system. Service is provided to customers across five major pressure zones and 18 subzones. Eight booster pumping stations are used to move water between pressure zones. Seven storage facilities, with a combined total of 8.45 million gallons (MG), provide storage for normal and emergency conditions, such as fire

suppression. Additionally, distribution system includes numerous meters, isolation valves, and hydrants. Additional information regarding Camas Water Service, including capacity analysis, is available in Appendix X, Water System Plan (2019).

Sewer

The majority of the 7,700-acre UGA and the sewage collecting infrastructure inside the city limits is owned and operated by the City of Camas. The collecting system consists of traditional gravity sewers, pump stations, force mains, and septic tank effluent systems. The system includes 38,260 linear feet of force main, 29 lift stations, and 236,200 linear feet of gravity mains. Approximately half of the city is served by septic tank effluent systems and the other half by a traditional collection system. The City gathers, treats, and discharges wastewater into the Columbia River at the Camas Wastewater Treatment Plant (WWTP).

The City of Camas Sewer Division serves residences and commercial buildings, with approximately 8,500 customers, comprised of industrial, commercial, and residential users.

A collection system flow metering and projection was conducted in 2018/2019 to evaluate the collection system using the City's hydraulic model. The results of this analysis are available in Appendix X, General Sewer Plan (2022), which develops a management plan for the system over the next 20 years.

Stormwater

The stormwater runoff generated from approximately 7,500 acres across the city of Camas is managed through 75 miles of stormwater conveyance pipe and 1,800 stormwater inlets and catch basins. The stormwater conveyance system is owned and maintained by the City. The City also owns and maintains stormwater facilities, including underground treatment vaults, detention ponds, biofiltration swales, wet ponds, drainage ditches, and culverts. These have been geolocated on the City's Stormwater Management Action Plan (SMAP) Public Input Map. The SMAP identifies actions to protect and improve receiving waters' water quality. Commercial and residential stormwater facilities are privately owned and maintained per stormwater code CMC 14.02.200 Ownership and Maintenance. These privately owned facilities within the city are geolocated on the SMAP Public Input Map. Additional details on stormwater management in Camas can be found in Appendix X, Stormwater Management Program (2024).

Solid Waste

The City owns and operates its own solid waste utility which provides for the collection and transfer of solid waste refuse to the Clark County-owned Washougal Transfer Station. The City is responsible for managing garbage collection within the Camas boundaries. The City has established universal compulsory solid waste collection, requiring all residents and businesses to maintain solid waste service. The City contracts with Waste Connections of Washington to provide recycling and yard debris management, collection, and disposal. The City also contracts with Waste Connections to provide large container service (larger than 2 cubic yards) to those with greater solid waste handling needs.

All cities and towns in Clark County have delegated responsibility for solid waste transfer and disposal planning to the County, including Camas. The currently adopted Clark County Solid Waste Management Plan (CSWMP) of 2015 is undergoing updates and anticipated to be adopted by the end of 2025. Agreements between Clark County and its cities commit each to the plan and to the plan's waste disposal system.

Franchise Utilities

There are several other utilities, some of which are provided by public entities and others by private entities, that contribute to the functionality and prosperity of the community. The main utilities include electricity, natural gas, and telecommunications. Electricity is provided by Clark Public Utilities (CPU), a customer-owned public utility; natural gas is provided by Northwest Natural; and telecommunications, including high-speed internet, are provided by a variety of companies (e.g. Comcast, Verizon, Frontier, etc.). No detailed inventory regarding the capacity of these utilities is available.

Electrical

Clark Public Utilities (CPU) (https://www.clarkpublicutilities.com/) provides electricity to Camas and throughout Clark County. CPU balances strategic planning for the future with present rate and service stability in compliance with changing requirements at the local, state, and federal levels. CPU is led by an elected board to plan for integration of new technologies and has indicated there is ample capacity to meet existing demand for areas within both the incorporated City limits and the UGA. Power supplies are provided through a combination of power supply contracts and purchases from the generating system.

Natural Gas

Delivery of natural gas to Camas and its UGA is provided by Northwest Natural (https://www.nwnatural.com/). The delivery of natural gas is governed by the Federal Energy Regulatory Commission, the National Office of Pipeline Safety, and the Washington Utilities and Transportation Commission (WUTC). The City's regulations include safety and emergency provisions, LOS standards, and rate limitations. Northwest Natural provides natural gas service to all of Clark County. The alignment of the main pipeline crosses the Columbia River at the area of the Port of Camas-Washougal. Additionally, Northwest Natural is improving its backbone through the City with the installation of a large-diameter high-pressure gas main connecting Lake Road and Pacific Rim Boulevard.

Telecommunications

Verizon provides local telephone service to the City and its UGA. Many of the telecommunication facilities, including aerial and underground, are co-located with those of the electrical power provider. Frontier Communications also provides telecommunications to a large number of customers in the Camas area. Contact information for telecommunication utility providers is available on the City of Camas website (https://www.cityofcamas.us/utilities/page/new-resident-information).

Capital Improvement Plan

The 6-year Capital Improvement Plan (CIP) is a significant component of the financing plan and is adopted as part of the biennial budget. It includes a list of projects, project start dates, estimated cost, and funding. The CIP is a shorter term funding plan that directs available resources to specific projects including street preservation and improvements, fire and EMS, parks and recreation, stormwater, water, and sewer projects. The 2025-2026 CIP is included as Appendix X.

The first two years of the capital facilities plan are typically consistent with the adopted City budget. However, since capital expenditures often impact multiple years after funding has been committed, it is prudent to plan ahead for the expenditure of funds for at least four years or longer. Additionally, some of the City's adopted plans include longer term expenditure plans in which resources are actively being pursued when opportunities arise.

School Districts

Public schools are recognized as one of the largest public services within the community. Education serves one of the most important roles in community health as the quality of education today impacts the skill levels, employment rates, labor supply, and wages of tomorrow.

The Camas School District has the most, and some of largest, public facilities in the Camas Urban Growth Area. The UGA spans two school districts. Camas and Evergreen School Districts are responsible for facility planning and service levels of the districts and coordination with the city's overall development. Both school districts are currently evaluating school facilities and overall needs to serve the community.

The Camas School District has prepared a 2022 Capital Facilities Plan (CFP) to provide the County and the Cities with a schedule and financing program for capital improvement needs over a six year period (2022-2028) to ensure that adequate facilities are available to serve new growth and development.

The collection of school impact fees generates partial funding for construction of public facilities needed to accommodate new development. School impact fees are collected by the cities and County on behalf of the District at the time plats are approved or building permits are issued. Impact fees are calculated based on a formula, which includes the portion of District construction resulting in increased capacity in schools. The districts submit their capital facilities plans every other year, accompanied by impact fee calculations. The plans describe the existing and planned school facilities and services.

Anticipated property acquisition and new construction is based on the enrollment forecast, capacity, the District's educational standards and the community's support of finance tools to fund improvements.

Public Facilities and Services Goals and Policies

Goal PFS-1 Fire Protection, Emergency Medical Services, Police Protection

Provide fire protection, emergency medical services, and police protection to Camas and accommodate growth in the community.

Policy PFS-1.1 Plan for fire and emergency medical services to include adequate land, building, and equipment to effectively serve the geographic area of the city north of Lacamas Lake (North Shore).

Policy PFS-1.2 Assess the level of service needs and provide fire, advanced life support emergency medical, and police services that meet the community demand. Maintain service levels as growth occurs.Ensure

Policy PFS-1.3 Ensure the installation of commercial fire sprinklers where required by code and strongly encourage their use when installation is optional.Require

Policy PFS-1.4 Pursue funding to maintain fire facilities, including all fire apparatus at levels that best serve the community. Fire apparatus includes fire suppression equipment such as engine, water tenders, brush trucks and command officer vehicles.

Policy PFS-1.5 Require all new residences to install fire sprinkler systems.

Policy PFS-1.6 Plan police annex facilities at strategic locations throughout the City.

Goal PFS-2 Parks, Trails and Open Space

A network of parks, trails, and open space will connect neighborhoods, wildlife corridors, and natural resources and enhance the quality of life for residents and visitors. Refer to the Camas PROS plan for additional goals and policies.

Policy PFS-2.1 Provide and maintain an active transportation network to increase connectivity to natural areas, wildlife corridors, and other natural resources in Camas.

Policy PFS-2.2 Ensure every neighborhood has access to a park within a 15-minute walk or roll.

Policy PFS-2.3 Provide safe and maintained parks, natural areas, and other recreational spaces that are accessible for all ages and abilities.

Policy PFS-2.4 Provide a continuous trail network around Lacamas Lake with ample access points, prioritizing active transportation users. Consider new public access points through dedications, easements, and acquisitions. Partner with transit agencies to plan and implement transit service to Lacamas and Round Lake.X

Policy PFS-2.5 Explore the development of dog parks within special use park areas to balance the needs of pet owners and other park users.

Policy PFS-2.6 Encourage the development of parks and playgrounds that have ample facilities for all users.

Policy PFS-2.7 Work with the Camas Parks & Recreation Department to acquire land for parks, trails, recreational uses, and habitat conservation.

Policy PFS-2.8 Enhance water conservation methods and technologies in development of irrigation infrastructure within parks and recreation areas.

Goal PFS-3 City Facilities and Services

Provide facilities and services to support the functions of City government and the community, including cemetery, animal control, and the public library.

Policy PFS-3.1 Develop an expansion plan (e.g., new municipal facility, meeting space) to accommodate additional personnel.

Policy PFS-3.2 Ensure that the municipal building and primary services remain downtown.

Policy PFS-3.3 Incorporate sustainable and low climate impact design into city buildings. Promote LEED certification (or similar) for all publicly owned facilities.

Policy PFS-3.4 Utilize the City's capital improvement program to develop alternative transportation facilities and electric vehicle charging infrastructure for public facilities.

Policy PFS-3.5 Maximize the developed and undeveloped property for cemetery use to meet future burial needs and trends and meet residents' service expectations.

Policy PFS-3.6 Provide economic stability to the cemetery fund by reducing dependency on the general fund.

Policy PFS-3.7 Develop a strong volunteer and donation program for the cemetery.

Policy PFS-3.8 Continue animal control partnership with the City of Washougal.

Policy PFS-3.9 Maintain funding and support for library services that meet the demands of current and future residents.

Policy PFS-3.10 Assess need and solutions for additional library services throughout the growing City.

Goal PFS-4 City and Franchise Utilities

Provide utility services, including energy and communication facilities and their services, to all businesses, residents, and properties in the City limits.

General Utilities Policy

Policy PFS-4.1 Maintain and improve City utility systems through preventative maintenance and regular assessments and improvements to meet regulatory standards.

Policy PFS-4.2 Where service is available, require connection to public water for domestic and irrigation needs and connection to sewer systems. Promote connection to sewer and water before system failure of private well or septic.

Policy PFS-4.3 The City should be the sole provider of urban services, including water and sewer, within the UGA for sewer service and the Water Service Area for water. Require all new construction connect to city systems. Prohibit construction of new private wells and subsurface sewage disposal systems in new developments.

Policy PFS-4.4 Do not extend utilities without annexation or commitments for annexation. Exceptions may be made in cases where human

health is threatened. In areas where utilities presently extend beyond City limits, but are within UGAs, plan development jointly with the County. A joint development must be consistent with City standards.

Policy PFS-4.5 Coordinate plans for providing public utility services in UGAs and rural areas with plans for transitioning undeveloped land to urban uses.

Policy PFS-4.6 Plan public utility services so that service provision maximizes efficiency and cost effectiveness and ensures concurrency. Coordinate with other entities to provide services within the urban area.

Water Service Policy

Policy PFS-4.7 Extend adequate public water service throughout the City's urban areas that meets state requirements and provides minimum fire flow as required by the Fire Marshal.

Policy PFS-4.8 Conserve and protect groundwater resources to provide safe, clean, high quality drinking water to residents.

Policy PFS-4.9 Ensure water infrastructure is designed to City standards and is in place prior to land development.

Policy PFS-4.10 Coordinate with Clark County and other purveyors to eliminate private systems in accordance with the Clark County Coordinated Water System Plan.

Policy PFS-4.11 Coordinate with the County and the cities of Vancouver and Washougal to protect groundwater from contamination.

Policy PFS-4.12 Expand municipal reclaimed water systems and allow onsite non-potable water systems to reduce water demand in private-sector commercial and residential buildings.

Policy PFS-4.13 Eliminate the introduction of groundwater and surface water into the sewer system.

Sewer Services Policy

Policy PFS-4.14 Extend public sanitary sewer service, as required, throughout urban areas. Service may be provided outside urban areas to serve areas where imminent health hazards exist.

Policy PFS-4.15 Use traditional gravity sewer systems (in lieu of STEP systems) to serve future customers and reduce maintenance and power costs.

Policy PFS-4.16 Coordinate with Clark County to eliminate septic systems.

Stormwater Policy

Policy PFS-4.17 Provide a stable funding source to meet National Pollutant Discharge Elimination Systems (NPDES) Phase II requirements to manage and control stormwater runoff.

Policy PFS-4.18 Inspect homeowner association and other private facilities and provide directions and standards for repair.

Policy PFS-4.19 Meet water quality standards by providing best management practices for development activities.

Policy PFS-4.20 Establish baseline flows on each drainage basin or sub-basin for the analysis of deficiencies.

Policy PFS-4.21 Consider stormwater impacts during land use review processes and develop standards that would reduce the amount of impervious surface on existing and new development, including the creation and adoption of low-impact development standards and the use of green infrastructure, to address increased storm intensities and stormwater runoff.

Policy PFS-4.22 Require new development or redevelopment to comply with the Camas Stormwater Design Standards Manual and design criteria.

Policy PFS-4.23 Protect natural stream courses for water quality.

Policy PFS-4.24 Manage stormwater to safely pass surface water and maintain water quality of lakes, streams, and rivers.

Solid Waste Policy

Policy PFS-4.25 Provide for solid waste service throughout the City through continuance of self-collection of solid waste and contracting with private waste management companies to provide recycling and yard debris collection options.

Policy PFS-4.26 Continue a system of universal compulsory solid waste collection.

Policy PFS-4.27 Coordinate with the County to implement the Clark County Solid Waste Management Plan (CSWMP). Reduce the total production of waste, increase the recycling rate of waste that is produced, and properly manage and dispose of waste that is not recycled. Provide education and outreach to businesses and the public on benefits and opportunities for waste reduction and recycling. Focus on residential recycling rates to improve participation rates similar to the rest of the County.

Policy PFS-4.28 Work with solid waste utility companies to determine if household food waste/compost can be accommodated in yard waste bins.

Franchise Utility Policy

Policy PFS-4.29 Minimize the effects on adjacent properties, the environment, and the visual quality of the community of siting, developing, operating, and maintaining facilities.

Policy PFS-4.30 Coordinate to provide reliable service through partnerships and agreements with utility companies.

Policy PFS-4.31 Promote the conservation of energy resources through the adoption of appropriate energy codes and efficient land use and transportation systems.

Policy PFS-4.32 Work with energy utilities to improve the safety and reliability of infrastructure vulnerable to climate change (e.g., undergrounding transmission lines).

Goal PFS-5 Capital Improvement Plan

Maintain and implement the Capital Improvement Plan in coordination with the biennial budget.

Policy PFS-5.1 Update the capital improvement plan biannually and include a statement of projected costs and sources of revenue.

Policy PFS-5.2 Ensure capital improvements enhance the community and add physical value to the City.

Policy PFS-5.3 Apply earnings from bond proceeds toward the debt service fund reserved for the future repayment of debt directly for enhancement of the project.

Policy PFS-5.4 Dedicate all or a portion of the first year of property taxes generated from newly incorporated areas to the Capital Fund.

Policy PFS-5.5 Dedicated funds and bonds may be used to fund essential capital improvement projects such as police, fire, and general municipal structures.

Policy PFS-5.6 Use voted, general obligation debt for discretionary projects such as recreation and library facilities.

Policy PFS-5.7 Prioritize projects that support the core services provided by the City.

Policy PFS-5.8 Ensure consistency of capital improvement plans with the adopted comprehensive plan map and evaluate if funding is adequate to provide necessary public facilities and services to implement the plan.

Goal PFS-6 School Districts

Support access to quality education and public schools through partnerships and investments.

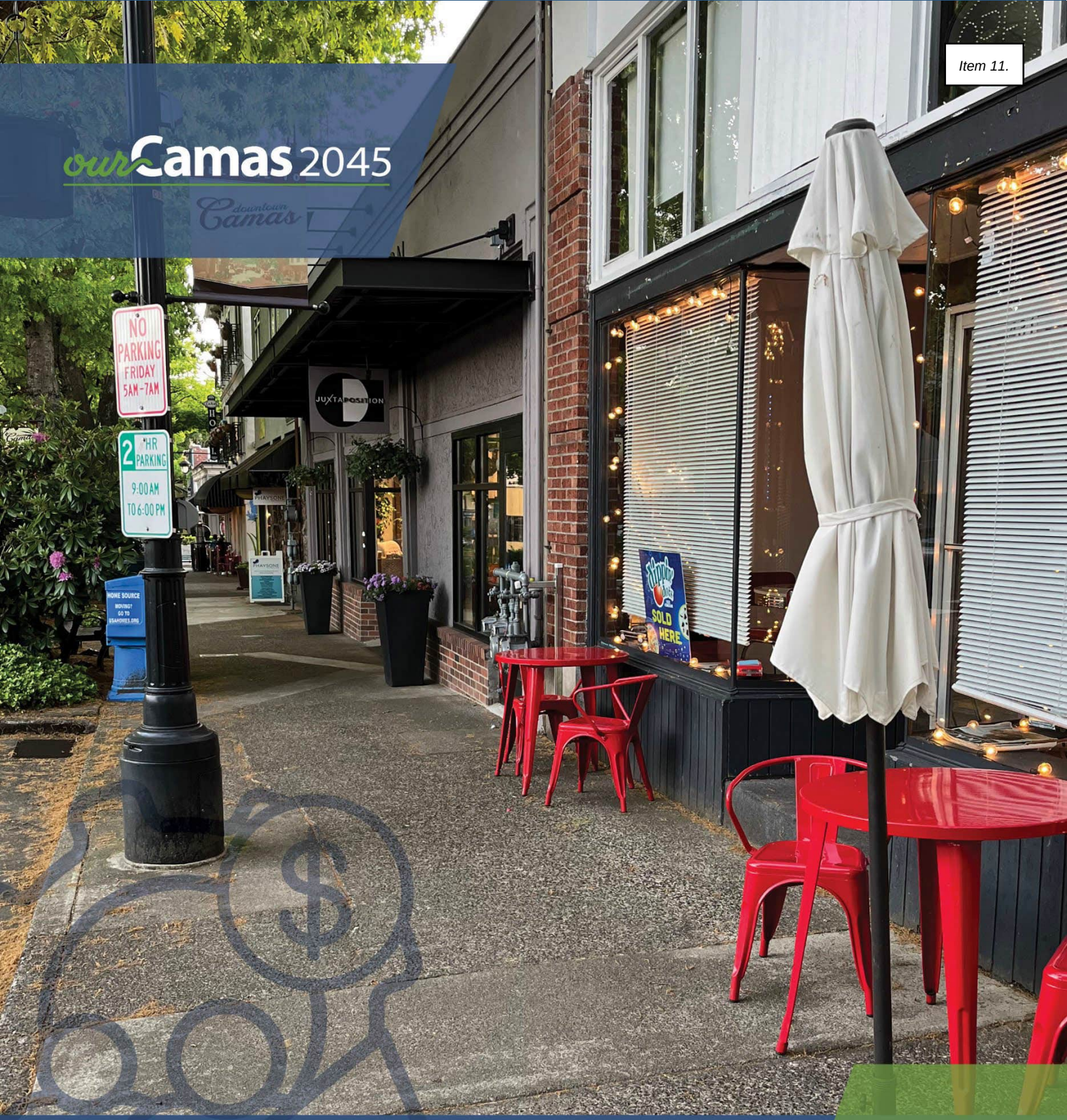
Policy PFS-6.1 Encourage the Camas School District, Clark County, and the City of Camas to invest in mutual use facilities that support intergenerational and intercultural use.

Policy PFS-6.2 Coordinate planning between the Camas School District and the City of Camas to reflect school facility needs in response to growth forecasts.

Policy PFS-6.3 Ensure equitable access to schools and educational programs, specifically considering those in underserved areas, where needs and abilities may differ.

ourCamas 2045

Downtown Camas



Economic Development

10

10. Economic Development

Boosting the Local Economy

The economic health and well-being of the City of Camas is supported by providing a wide range of employment opportunities throughout the community and a setting and quality of life that is attractive to businesses and residents.

Vision

In 2045, Camas has cultivated a diverse and thriving economy with stable employment opportunities and living-wage jobs across various sectors, including technology, healthcare, manufacturing, retail, recreation, and professional services. Camas residents have access to a wide range of services and amenities in their community, while benefiting from excellent regional connectivity and the city's proximity to Portland International Airport. Camas is a gateway to nature and recreational opportunities, supporting regional tourism in the area. Camas is home to a thriving economy and diverse businesses, affording residents ample employment opportunities. Neighborhood commercial hubs connect residents to daily services and amenities through a network of sidewalks and bike lanes, improving access and connectivity. Professional office, medical, and industrial uses typify western Camas, with retail businesses supporting these firms and nearby residents. The North Shore area will fulfill the employment and retail needs of the growing population on the northeast side, and reduce trips outside the city. Downtown Camas anchors the community with a dynamic economic landscape and retains its historic atmosphere as a walkable, attractive place to shop, dine, and gather. Inclusive housing options within the city's core contributes to a town center that supports local businesses.

Approach for Updating this Element

The approach for updating the economic development element for the 2025 to 2045 planning horizon was informed by community input (outlined below), state legislation requirements, priorities, and a comprehensive economic profile. This profile integrated the best available information from public and private data sources to assess the city's economic trajectory, opportunities, challenges, and economic conditions and competitiveness. These insights help build a factual basis for the updates.

Community Engagement Insights

Interactive open houses and interviews with stakeholders provided information about economic development strengths,

challenges, opportunities, and actions in Downtown Camas and other areas in the City. Engagement activities identified the following themes that could contribute to future decision-making related to economic development in Camas.

Economic Development

- **North Shore:** Need infill development.
- **Grass Valley:** Needs mixed/light industrial park with athlete fields/parks. Why no Grass Valley Subarea Plan? Be clear on what kinds of businesses would be most beneficial to Camas in Grass Valley to build awareness when talking with prospective businesses.
- **General:** Need more commercial space, more manufacturing jobs, and a dedicated economic development director or staff person (apply for grant), and plan. Focus on tourism and bring in money. Are there model cities Camas would strive to look like? (Lake Oswego, Bend, etc.) Compare plans with cities that have experienced similar growth? What did they do well?
- **Housing:** Allow work/live housing along and around UGA/schools and major transportation corridors. Ensure workforce housing is available for current and future workers. Having diverse housing options will lead to a more diverse city.

Downtown Strengths

- **Strong sense of place:** Downtown stakeholders feel supported by Camas community. They discussed the quaint, small-town character, with unique features attracting visitors and services and how the mix of new and old/established businesses contributes to vitality of Downtown.
- **Positive support for businesses**: Good interactions with the DCA, overall good experience working with the City and business owners cultivate a collaborative environment.
- **Increases in housing density seen as a positive direction:** New housing is opportunity for more amenities to support the growth and expansion of amenities can make Downtown more walkable.

Downtown Opportunities

- **Improvements to public realm** to increase / improve street lighting, address issues with street trees (some interfere with sidewalks, other infrastructure), improve the civic area of Fire Dept. plan, add connectivity to adjacent residential neighborhoods, and open spaces, and provide outdoor dining spilling out onto sidewalk.
- **Community gathering spaces**: Need more meeting places indoor/outdoor and outdoor spaces for children/families, should expand Downtown Core beyond 4th Ave, support redevelopment of underutilized land on 3rd and 5th Ave, and should create more spaces for retail that extends walkability of Downtown, cohesiveness.
- **Development potential:** Explore more ways to activate ground floors and embrace walkability / modern parking standards.

Downtown Challenges

- **Parking is a concern for some:** Two-hour duration (especially difficult for employees) and Mill property / parking lot.
- **Pace of development:** Concern over what new development will mean for current businesses and need for balance between new development and preserving historic structures in Downtown.
- **Growth opportunities are limited:** Need to expand the definition of Downtown (beyond just 4th Ave) to expand and provide more amenities. There is limited space on 4th Ave where businesses would like to locate.
- **Barriers to development and safety issues for pedestrians:** Height restrictions and fees are challenging, since rents are lower it is harder to make a project pencil, and need for safer crossings on 3rd Ave and difficult to cross 5th in some areas.

Public Engagement Findings Regarding Strategies

- **Need more responsive permitting and ongoing maintenance to the public realm** since this supports the success of Downtown.
- **More partnerships between City and Downtown businesses:** City can increase interaction and build relationships with business / property owners.
- **Identify ways to keep local presence and restore historic structures:** Some expressed concern over losing historic structures and asked for ways to balance preservation with new development. The City could provide incentives for existing business owners who would like to expand or stay in Downtown Camas as new development continues.
- **Explore ways to address underutilized property**: For example, opportunities at GP parking lot.
- **Pedestrian Safety and Connectivity:** Address 3rd and 5th Avenue pedestrian safety and improve connections to and from Downtown. Focus on pedestrian activation through plazas and public spaces. Address accessibility needs both with ADA and beyond.
- **Improvements:** Expand character of Downtown to the broader boundary defined in the plan. Accommodate a flexibility of spaces and variety of uses through use of public space (sidewalks, parking, etc.). Define the historic character of 4th Avenue through specific streetscape elements.

City of Camas Competitive Position

The city's competitive position can be summarized in terms of strengths, weaknesses, opportunities, and threats. These represent internal and external factors that can have positive or negative impacts on economic outcomes in Camas. Several ideas added to the summary below are based on feedback received through community engagement activities. Table 4 below outlines key findings associated with economic growth and development.

Table 4 Strengths, Weaknesses, Opportunities, and Threats Summary Analysis

STRENGTHS	WEAKNESSES
• High quality of life amenities like parks and recreation opportunities including new City investments in capital projects. • Downtown experiencing high visitation and high demand for retail spaces (increasing rents, low vacancy). • Responsive permitting, ongoing maintenance of the public realm. • No Washington State income tax. • Proximity to Portland International Airport. • Well regarded public schools. • The Downtown Camas Association is completing a comprehensive Downtown lighting plan with a state grant to support safety.	• Rising housing costs, purchasing a home is unaffordable for those under 120% AMI. • High industrial rents and very low industrial real estate vacancies. • Development standards related to height was cited as a barrier by stakeholders. • Need Downtown development to be feasible to build (pencil). • Highly constrained lands may be difficult to develop for commercial or industrial land uses (such as in Washougal).
OPPORTUNITIES	**THREATS**
• Attract highly skilled workers with locational flexibility. • Develop pathways for youth to gain skills and seek jobs in Camas. • Identify target industries for managing land capacity and expected growth. • Incentives for existing business owners, wishing to expand their operations. • Opportunities for Downtown redevelopment and partnerships with Downtown businesses and nonprofits (such as Downtown Camas Association, the Port, Chamber, Farmers Market, and more). • Develop mill ditch into a compelling, easy, and beautiful trail system that is clear to connect with from Downtown and improve the trails to encourage local resident activity and to attract visitors. • Need more hotels and conference space. • City should partner more with the Downtown Camas Association on incentive programs. • Improve pedestrian safety throughout downtown.	• Unequal rates of homeownership by race and ethnicity indicating unequal economic opportunities. • Disparities between remote and non-remote workers. • Anchor employer changes. • Safety threats that could be supported by better lighting, street tree improvements, safer crossings for pedestrians in the Downtown. • Need to balance preserving historic features with new development in Downtown.

Broad Planning Context

Comprehensive planning in Washington is guided by the Growth Management Act (GMA), a series of statutes first adopted in 1990 which requires cities and towns within the state's most populous counties to fully plan for future growth (RCW 36.70A) and develop mandatory comprehensive plan elements. State provisions set limits on what actions cities and counties can take to support economic development. Article 8, Section 7 of the state constitution specifies that "No county, city, town or other municipal corporation shall hereafter give any money, property, or loan its money, or credit to or in aid of any individual, association, company or corporation, except for the necessary support of the poor and infirm."[16] Given this limitation, cities generally cannot directly use public funds to attract private development and instead target policies that facilitate economic growth through land use, infrastructure, tourism, marketing, and partnerships with nonprofit community-based organizations.

Cities in Washington also coordinate with county-level Associate Development Organizations (ADOs) that represent each of Washington's counties, funded in part by the state Department of Commerce. The Columbia River Economic Development Council (CREDC) represents Clark County and presents a baseline of goals and objectives for the region. Their former 2018-2023 Comprehensive Economic Development Plan outlined goals and actions based on a vision and set of values and guiding principles identified through extensive engagement with local partners, which have carried through and expanded with the more recent 2024 Comprehensive Economic Development Plan with new supplemental actions to encourage economic development for communities within Clark County.

New objectives in CREDC's regional economic development plan expand on support for entrepreneurship, placemaking investments, fostering development and redevelopment projects, and expanding equitable employment opportunities. The Plan also recognizes the growing role of smaller cities like Camas outside of Vancouver which are seeing fast population growth and opportunities to develop their own employment bases.

[16] RCW 35.21.703 does allow cities to contract with nonprofit corporations to advance economic development.

Table 5 Goals and Objectives from 2018-2023 CREDC Comprehensive Economic Development Plan

Source: CREDC

	2018 Plan Objectives	2024 Update Objectives
Expand the Existing Base	• Become Industry Experts • Strategically Market Industry Clusters • Build a Start-Up Ecosystem	• Reduce Site Infrastructure Hurdles • Grow Start-Up Ecosystem • Support Permitting Consistency • Explore Commercial Code Flexibility • Foster Small Business Networking
Support People	• Foster Skills Development • Prepare Youth for Economic Opportunity • Launch a Brain Gain Initiative	• Align Workforce with Employer Needs • Enhance Access to Career Pathways • Support Talent Retention
Create Place	• Each Community Creates a Placemaking Strategy • Embrace Economic Opportunity in Urban Center • CREDC Tells the Story of Place • Make Areas Desired by Industry Clusters Shovel-Ready • Determine All Transportation Needs on a Regional Level	• Leverage Placemaking Investments • Encourage Infrastructure Investments That Cross Municipal Boundaries

The Clark Countywide Planning Policies provide guidance on economic development across incorporated and unincorporated areas of the County (the County also distinguishes policies specifically for unincorporated areas, but not for jurisdictions and their UGAs). These policies (adopted in 2015) are currently being updated. The updated version will be reviewed as a part of the policy and goal development stage of the Comprehensive Plan update.

Buildable Land Capacity and Employment Capacity

Cities fully planning for adequate land capacity to meet the needs of the community must understand their current employment base, development trends, workforce housing availability, income segments of the population, and future projections. To fully plan for growth and meet community needs in compliance with state provisions, more suburban cities like Camas that are

growing in terms of employment must understand the dynamics of the local and regional economy, consider where employment is concentrated and how residents and workers access employment opportunities, what industries are growing or declining, and whether there is sufficient space to fulfill anticipated employment land needs alongside other uses.

Washington's Review and Evaluation Program (the Buildable Lands Program, RCW 36.70A.215) requires certain counties, including Clark County, to establish their own buildable lands programs and review past development and density patterns to see if local policies are effective and prepare to plan for the next 20 years of growth, through a "Buildable Lands Report" released before a Comprehensive Plan update.

Clark County has updated its Vacant Buildable Lands Model (VBLM) as a part of their 2025 periodic update of their Comprehensive Plan. This VBLM provides a basis for the available employment capacity in the City of Camas based on available buildable land (including both vacant and underutilized land), current zoning, and market and employment density assumptions. Table 6 below shows the County's current allocation of jobs for the City of Camas and the Camas Urban Growth Area (UGA) and the 2023 Vacant Buildable Lands Model (VBLM) capacity and yield calculations.[17]

This analysis shows that the City of Camas has a job target of 13,658 jobs, with a preliminary estimated capacity showing availability for 11,363 jobs, as well as additional assumptions for work from home, construction, and government jobs which have specific land need considerations documented in Clark County's 2025 Population, Housing and Employment Allocation memorandum.[18]

Evaluating employment capacity is necessary to determine whether the job growth allocation (determined by the county) can be accommodated within the City of Camas and Camas UGA(s). Sufficient capacity is available if employment growth capacity is equal to or greater than the City's allocation. If sufficient capacity is not available, the shortfall must be addressed by rezoning, or revising allowable density, or by modifying or creating a new UGA or annexed area to provide additional area for employment growth capacity. To help provide geographic context for this analysis, a map of the City of Camas and its existing and proposed Urban Growth Areas was created see Figure 16.

[17] This has been modified since the County's 2020 Buildable Lands Report, which identified 963 net buildable acres (296 on commercial land, 667 on industrial land) in the Camas UGA (Clark County Buildable Lands Report, 2023).

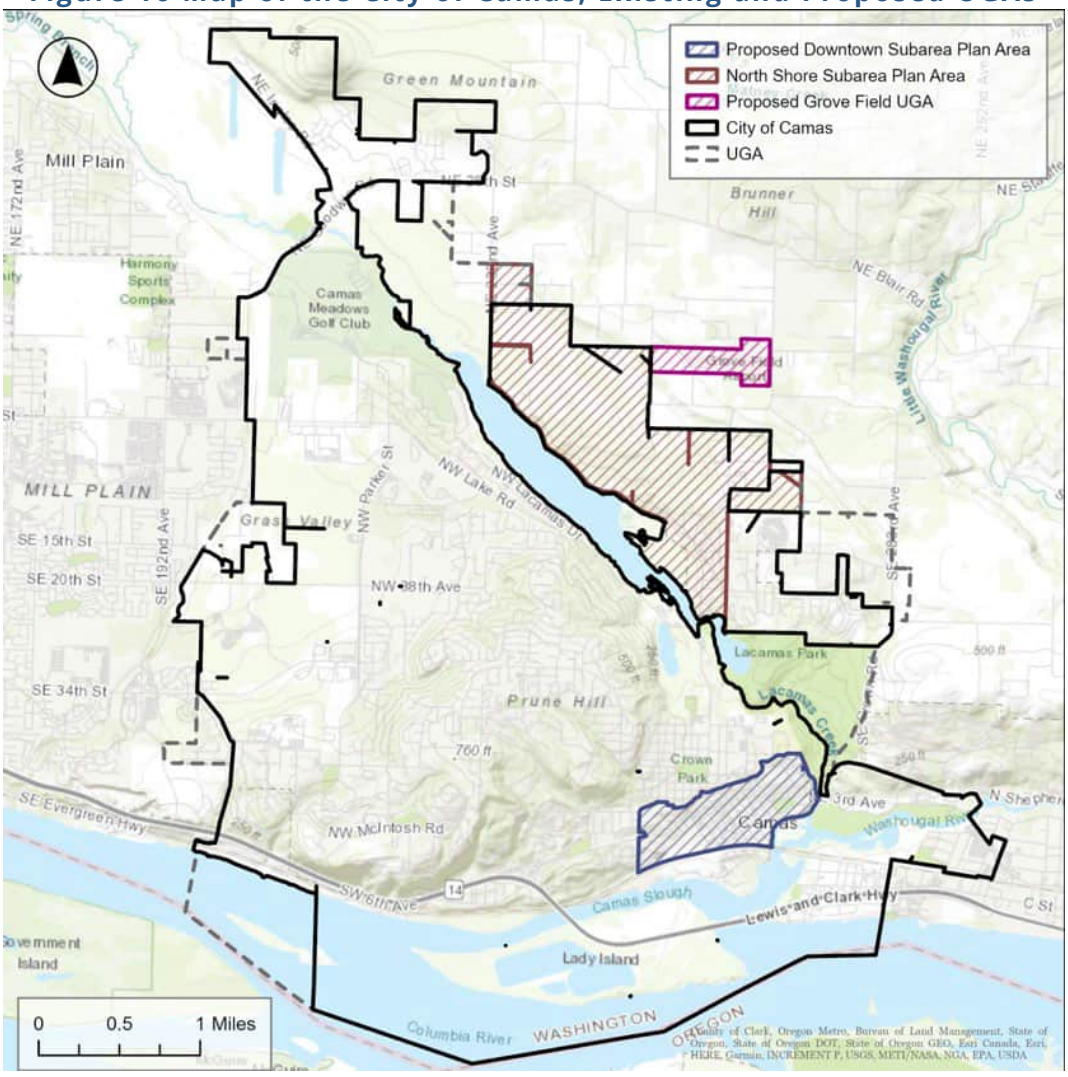
[18] Clark County Community Planning, 'Clark County Comprehensive Plan 2025 Update 2025 Population, Housing and Employment Allocation – Issue Paper 5,' April 2024, https://clark.wa.gov/sites/default/files/media/document/2024-04/issue_paper_5_pop-emp_alloc_4_17_24.pdf.

Table 6 Employment Capacity and Allocation by UGA, Clark County

Source: VBLM 2023, Capacity and Yield by Jurisdiction. Note: The County total estimate is 88,100 jobs accounting for government, construction, rural, and work from home jobs.

Jurisdiction	2023-2045 Employment Allocation	2023 VBLM Capacity	Assumptions		
			Work from Home	Construction	Government
City of Camas and Camas UGA	**13,658 jobs**	**11,363 jobs**	615 jobs	879 jobs	549 jobs
Total Clark County UGAs and Cities	**83,695 jobs**	65,091 jobs	3,524 jobs	5,038 jobs	8,600 jobs

Figure 16 Map of the City of Camas, Existing and Proposed UGAs



Additional analysis refining the employment capacity is underway that is based on key City of Camas zoning and UGA modifications. The City of Camas is proposing zoning modifications and the addition of a new UGA that would allow for additional employment capacity. According to these refined employment capacity estimates, Camas would have capacity for 12,273 jobs which would almost meet the 2045 employment target of 13,658 jobs. The finalized estimates will depend on the final preferred alternative.

CLARK COUNTY'S BUILDABLE LANDS REPORT, 2023, KEY FINDINGS

Clark County's Buildable Lands Report was adopted in June 2022 to update the methodology and Vacant Buildable Lands Model (VBLM) and updated with 2023 data.

- The Clark County Buildable Lands Report and employment allocations and City of Camas estimates indicate that there is sufficient employment capacity for employment growth in the county through 2045.
- Camas has the second largest share of total projected jobs in Clark County (17.5%) after the City of Vancouver and the Vancouver Unincorporated Urban Area (U). The City of Camas is expected to have capacity to accommodate 11,363 jobs, with about half (55%) of new employment on commercial land and half on industrial (45%).

City of Camas Profile

More than 10,000 years ago, Native Americans occupied the Columbia River Valley in the area where Camas is now situated. Before Camas was incorporated, a paper mill owned by the LaCamas Colony Company was established in 1883 to help supply newsprint for The Oregonian. Shortly thereafter, the City of Camas became an incorporated city in 1906. The City is named after the camas lily, a deep blue flowered plant with edible onion-like bulbs valued by various Columbia river Native American Tribes.[19] The paper mill expanded in the early 20th Century playing an important role in the local economy and grew to become Clark County's largest manufacturing company with 2,700 employees by 1971.[20] Located in the western edge of Downtown Camas along the Columbia River, the mill then experienced a downturn beginning in the 1980s that continued into the 21st Century, resulting in a reduced workforce. More recently, in 2018, the mill now owned by Georgia-Pacific, shut down several facilities and all but one of its paper machines and downsized its workforce to roughly 150 workers. In 2024, the mill continues to operate with a reduced workforce.

[19] City of Camas history: https://www.cityofcamas.us/community/page/camas-history
[20] Source: https://www.camaspostrecord.com/news/2023/sep/07/camas-mill-celebrates-its-140th-birthday/#:~:text=An%20entire%20wall%20of%20photos,built%20the%20mill%20to%20produce

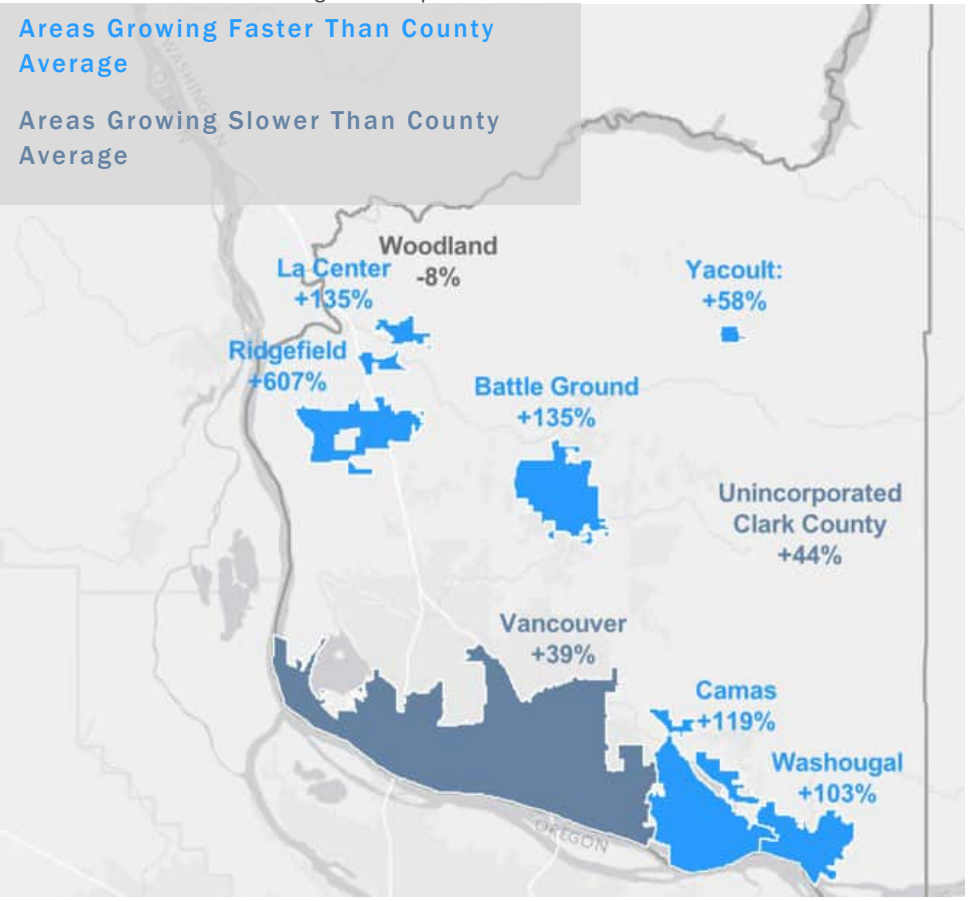
The early economy in Camas was at first dominated by manufacturing but has shifted and diversified over time. The 2015 Comp Plan describes a transition where the City's past economic health was closely tied to the paper mill and then shifted to become more diversified supporting many technology and manufacturing firms, as well as a growing school system and professional offices. In the last four decades, the family-friendly City with close ties to the Portland Metropolitan Region has continued to attract more residents especially from 1990 to 2000 by almost doubling in size to almost 13,000 people, increasing to a little over 19,000 people in 2010, and then reaching 27,420 people by 2023. Similar to the City of Vancouver, Camas has experienced high population growth over the last two decades, with an average annual growth rate of 5.2% which is double the rate in Clark County and Washington State.

Today, the City of Camas is a highly desirable place to live, offering a prime location nearby the growing cities and employment centers of Vancouver and Portland, and the smaller cities of Washougal and Battle Ground in south Clark County. The City of Camas is sandwiched between the City of Vancouver (sharing a border on the west side of Camas) to the west and the City of Washougal to the east. At a regional level, the City is interconnected to the Portland Metropolitan region, located northeast of Portland (see map below).

Camas has been working to advance its economic development goals in recent years while investing in quality-of-life amenities that make it as competitive location for attracting workers and residents. Recently, the City adopted a North Shore subarea plan (2022) to support community vibrancy and economic development strategies and the City is working to adopt a new Downtown subarea plan as a part of the 2025 Comprehensive Plan periodic update project. The City has also been expanding its inventory of parks space by leveraging the County's Legacy Lands program to expand its offerings of natural areas and recreation facilities. As larger economic trends increase locational flexibility (especially for professional services and traditionally office-based jobs), these types of investments will be critical for cities in the region to continue drawing in and retaining a residential base and workforce. The Port of Camas-Washougal manages an airport that is outside City limits, but most of the developable land in the North Shore area is within the airport influence area.

Figure 17 Camas Compared to Clark County Cities

Source: Office of Financial Management Population Estimates



Economic Development Overview

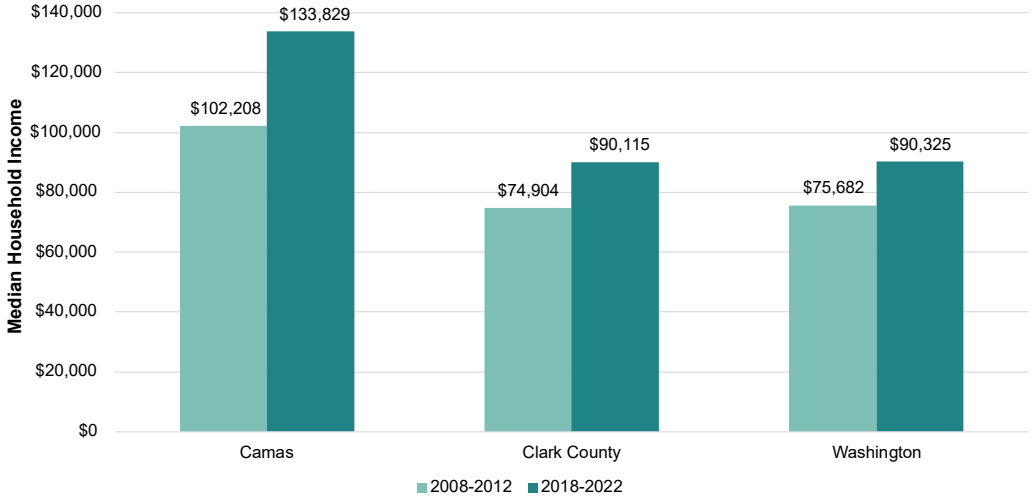
Economic development for the City of Camas is the creation and sustenance of a diverse array of employment opportunities, ensuring the tax base currently enjoyed by the City endures and is strengthened. The economic health and well-being of the City are tied to commitments to promote a wide range of employment opportunities for the citizens of the community and to provide a setting and quality of life that attract businesses and residents.

Planning a diverse and vibrant economy must start by understanding current economic conditions in the City and Clark County. While the City's past economic health was closely tied to the paper mill, in more recent years, the City's economy has diversified and now supports many technology and manufacturing firms, as well as a growing school system and professional offices. The figures below compare the median household income for Camas, Clark County, and Washington as well as employment and related trends over time.

As illustrated in Figure 18 when compared with Clark County, wages in Camas are higher and have grown over the last decade. Higher wages can have positive impacts on other aspects of the economy, and community members have expressed their desire to support living-wage jobs, particularly in healthcare and high technology.

Figure 18 Median Household Income, Camas, Clark County, and Washington

Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates
Note: 2008-2012 values are adjusted for inflation. Median household incomes are shown in 2022 $.



Growth in employment, population, and housing are interconnected. In general, communities with a high ratio of population to jobs can be characterized as "bedroom" or commuter communities, where there are fewer jobs than residents in the city. In Camas, there are roughly three residents for every one employee, indicating a continued trend from the past decade.

The ratio of jobs to housing has slightly increased from 0.9 to 1.0, indicating a healthy balance of housing units in comparison with employment and meeting the jobs-to-housing ratio of 1:1 adopted by Clark County (Resolution 2016-03-01). As the City grows, maintaining this trend can help to ensure there is adequate housing for those who work in Camas.

Table 7 Population, Employment, and Jobs Comparison Ratios, Camas, 2010-2021

Source: OFM, LEHD-LODES. Note: Employment data is currently only available at the City level through 2021.

	Trends			Ratios	
	Population	Employment	Housing Units	Population : Jobs	Jobs : Housing
2010	19,355	6,508	7,072	3.0	0.9
2021	26,870	9,558	9,586	2.8	**1.0**

Overall, Clark County has seen fluctuations in employment since 2000, with the most notable decline in employment in the wake of the 2008 recession and at the onset of the COVID-19 in 2020. However, the County has also seen a rapid rebound from pandemic trends, with sharp employment growth after 2020. The City has generally seen positive growth in employment over the last two decades. The City saw less of a decrease during 2020 compared to Clark County overall, which may reflect Camas' growth in remote workers during this period (Figure 19).

Figure 19 Total Covered Employment Change YOY, Clark County (2001-2022)

Source: Washington Employment Security Department

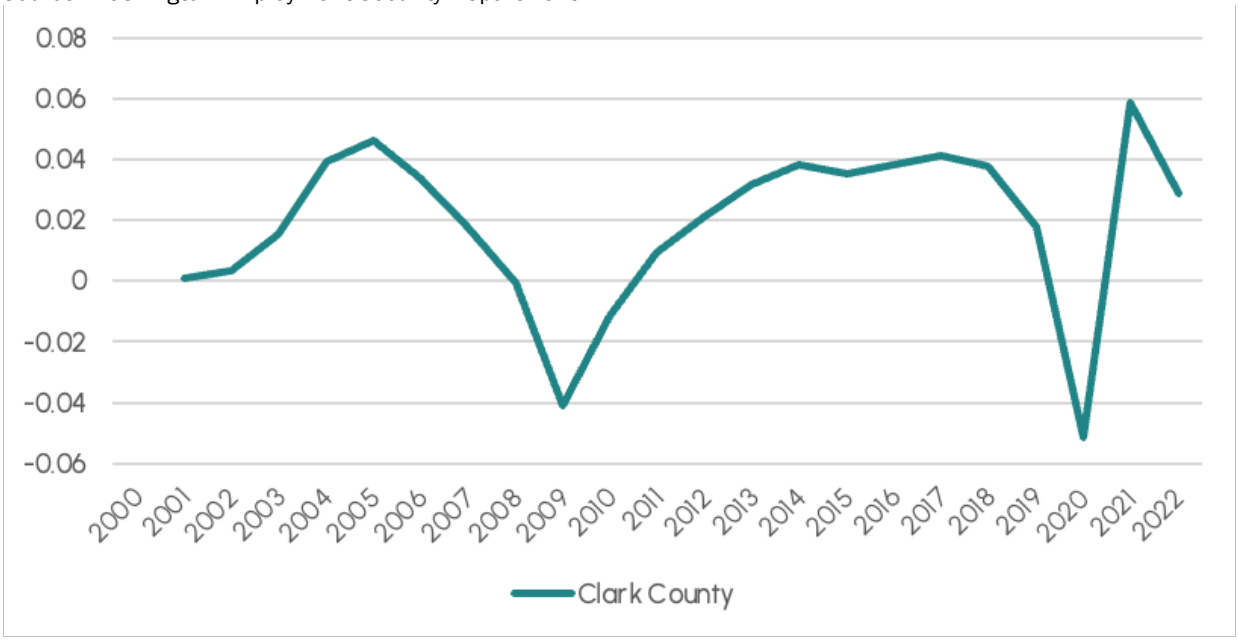
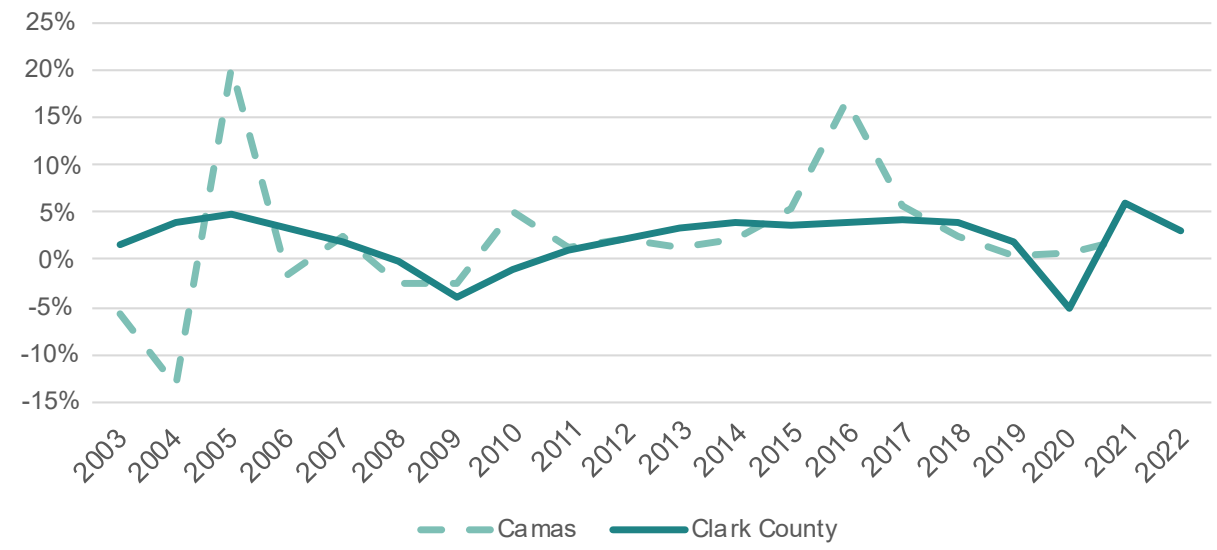


Figure 20 Total Employment Change YOY (Primary Jobs), Camas and Clark County

Source: Washington Employment Security Department, LEHD-LODES. Note: LEHD-LODES data for the City of Camas only available through 2021



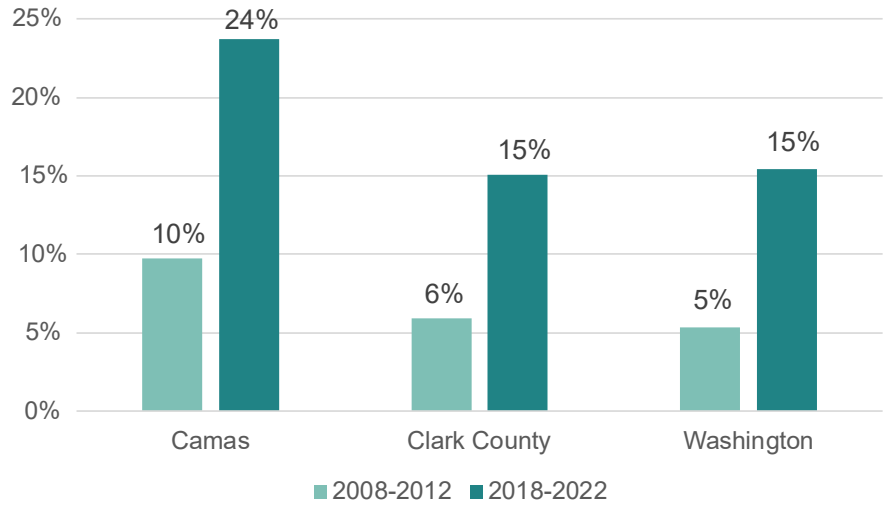
The Economic Development Element establishes goals and policies that seek to maintain the diversification of employment opportunities and support the continued growth of the Camas economy and attainment of the jobs target by 2045.

The City is targeting businesses that provide a greater proportion of living-wage jobs. Increasing retail services in support of residential, industrial, and professional business growth

is highly desirable. Camas is also seeing an increasing share of remote workers at a higher rate than the County or State, with nearly a quarter of workers falling into this category in 2022.

Figure 21 Share of Remote Workers, Camas, Clark County, and Washington, 2012-2022

Source: ACS, 2008-2012, 2018-2022



Summary of Demographic and Economic Trends

A summary of key findings from this Economic Development Element analysis is provided below to help describe key insights regarding the economic context, economic opportunities and challenges informing plan updates (Technical Appendix provides the full findings).

- **Camas has an aging population with a median age of 40 years in 2022 and a growing share of residents aged 60 years and over.** This group typically represents late-career workers or retirees. Median age in Camas is higher than Clark County overall and quickly growing since 2012, likely indicating a combination of natural growth and in-migration of older adults.
- **Camas has a higher share of residents 25 or older with at least a college level bachelor degree compared to Clark County or Washington State**, with 79% of residents holding these degrees in 2022. This share of residents rose quickly from only 37% in 2012.
- **Median household income for all households in Camas was nearly $134,000 in 2022, higher than Clark County or Washington State.** Since 2012, median income for residents of Camas increased by about 30% (in nominal dollars, not adjusted for inflation), more than either the County or State.
- **The City of Camas has seen generally positive trends in employment growth over the last two decades,** with notable increases in the number of workers in 2005, 2010, and 2016. The City of Camas employment grew from approximately 6,584 to 9,558 between 2011 and 2021.

- **The current employment to housing ratio in Camas was 1.0 in 2021, meaning that there is about one employee working in the City for every housing unit.** This ratio indicates that Camas has a well-balanced housing stock to accommodate workers in the City.
- **In 2021, the top five industries by employment in Camas were Finance and Insurance; Manufacturing; Educational Services; Professional, Scientific, and Technical Services; and Wholesale Trade.** Four of these five top industries paid above average wages (all except Educational Services paid below average wages). Finance and Insurance was the City's fastest growing industry (with an average annual growth rate of about 33%).
- **Top employers also reflect many of the County's largest industries, including professional services like finance and insurance, technology, manufacturing, and health care. Four of the City's top ten employers were in the manufacturing industry as of 2020.** Within Camas, employment has concentrated at two nodes, including the Downtown area to the southeast and corporate campuses in the Grass Valley near the border with the City of Vancouver.
- **Camas is part of an interconnected region, with more residents commuting out of Camas for work (8,159) than employees commuting in (6,982) as of 2021. Approximately 9,102 people are employed in Camas and among this total nearly 90% live in Camas (8,159) but work outside of the city and the remaining 10% live and work in Camas (943 people).** Top commuting destinations for Camas residents are primarily nearby, larger cities with employment hubs like Vancouver and Portland, while only 10% remained in the City. Nearly 59% commute less than 10 miles. The fourth most common destination for residents was Seattle, likely indicating remote workers at companies based in the Puget Sound area. Workers commuting to Camas originated from similar destinations, with one quarter coming from Vancouver.
- **Washington State Employment Security Department projections for future employment growth estimated that the Southwest Washington region will grow by about 19% overall by 2031.** The sectors expected to see the greatest increase in their share of employment are Professional/ Business Services, Leisure/ Hospitality, Education/ Health Services, Information, and Other Services.
- **Camas has a larger share of remote workers compared with Clark County and Washington State.** In 2022 one in four workers in Camas was a remote employee, compared to 15% in both the County and State overall. The share of remote workers in Camas has grown since 2012.
- **Since 2020, the City has issued 8,652 new business permits, with the largest volume of new permits in 2020 and a decreasing amount annually after 2020.** General business establishments accounted for the largest portion of these permits (74%), followed by home occupations (25%), and nonprofits (1%).
- **Camas' taxable retail sales were higher than those in most comparable jurisdictions in Clark County over the past decade**, competing primarily with the City of Battle

Ground for the highest annual sales. In 2022, total taxable retail sales reached an all-time high of over $600 million.

- **Retail rents in Camas had slight upward growth since 2014 while vacancies trended downward, indicating increasing demand for retail. Industrial real estate in the City of Camas is also performing well compared to Clark County in 2024.** The City is home to only about 3.9% of Clark County's industrial real estate in square footage but saw a sharp increase of industrial rents PSF in 2022, growing by over 200% year-over-year (YOY) to $23. Vacancy rates for industrial real estate were also extremely low in Camas in 2024 YTD at 1.7%, indicating high demand in the industrial market.

Implementation Tools and Strategies

Realizing the City of Camas economic development goals requires building on the City's potential while overcoming existing constraints. The following implementation strategies will generate positive momentum toward creating a more balanced and healthy economy.

Programmatic Strategies

- **Economic Development Committee:** Establish a mayor-appointed committee to help refine and implement Camas' economic development goals and strategies. The committee will:
  - Convene government, private sector, and nonprofit partners to leverage resources or secure financial support for economic development initiatives that benefit Camas and the broader region. In addition, this committee would help provide input on the Economic Development Strategy.
- **Economic Development Strategy**: Create an Economic Development Strategic Plan involving the Economic Development Committee, local businesses, community groups, school districts, and city leadership that further identifies priorities for job creation in targeted industries, infrastructure needs, reducing regulatory barriers, and incentives to attract needed and desired businesses.
  - Promote the development of an economic development strategy that will capitalize on the creation and retention of industries that provide living-wage jobs.
  - Future economic development strategy planning should capitalize on existing facilities and infrastructure and include a mix of uses that are trail- and transit-oriented and designed with high-quality streetscape appeal.
  - Lead an economic development strategy update every 1 to 3 years.

Financial Strategies

- **Leverage Grant Dollars**: Utilize federal, state, and county grants to support the establishment and expansion of small local businesses and infrastructure improvements benefiting economic development areas.
- **Incentives**: Explore incentives to encourage mixed-use development and provide affordable housing options (such as TIF, LID, MFTE changes).

- **Partnership**: Coordinate with the Columbia River Economic Development Council (CREDC) or other relevant organizations, to explore collaborative opportunities in promoting regional workforce development.
- **Opportunity Site Inventory**: Identify sites where the city can participate in cost-sharing mechanisms for infrastructure development.
    - Establish a policy that prioritizes capital investments to or on opportunities sites or other capital projects that better connect commercial nodes. This could include sidewalks, trails, bike paths, etc.

Regulatory Strategies

- **Code Audit**: Ensure the zoning code supports/incentivizes a broad range of needed and desired businesses in various zones.
    - **Study Allowed Uses:** Ensure needed and desired businesses are allowed in certain zones, including accessory uses which can support home-based businesses.
    - **Design standards**: Consider revisiting existing design standards to ensure they adequately support efforts to maintain and enhance existing character without compromising development feasibility.
    - **Flexible parking standards:** Develop flexible parking standards that can respond to site conditions.
    - **Revised Gateway Corridor Design Standards:** Update the design standards and allowed uses for gateway corridors to enhance its natural beauty but deemphasize its auto-oriented environment.

Procedural Strategies

- **Capacity Building**: Leverage increased tax revenue from population growth to support Camas' economic development strategy.
- **Clear and Objective Development Standards**: Establish clear and objective development standards for all development types, reducing the need for conditional use processes or other discretionary review processes.
- **Monitoring**: Monitor the performance of economic development such as with business retention and attrition, changes in tax revenues, and permitting of employment facilities. Monitor the financial impact of new programs, policies, and regulatory requirements on development feasibility by providing a report update every 1-3 years describing key metrics such as development changes and infrastructure projects.

Economic Development Goals and Policies

Goal ED-1 Citywide Economic Development

Maintain a diverse range of employment opportunities to support all residents, provide sufficient land supporting employment needs, and provide a setting and quality of life that attract and retain living-wage jobs[21] throughout the community.

Policy ED-1.1 Work with partners to identify strategies to proactively recruit businesses and ensure that tools and incentives are in place to attract sustainable and innovative industries to expand and provide stable living-wage employment.

Policy ED-1.2 Work with partners (such as the Chamber of Commerce, education programs, Workforce SW WA, CREDC) to provide apprenticeships, internships, vocational training schools, entrepreneurship programs, equitable opportunities, and on-the-job training in targeted industry sectors.

Policy ED-1.3 Encourage appropriate reuse, environmental cleanup, and redevelopment of older and deteriorating commercial areas and industrial brownfield sites. Identify opportunities to support place-based economic development, provide connections to the waterfront, diversify the economy, and support mixed-use development.

Policy ED-1.4 Foster and expand year-round recreational services, lodging, conference spaces, dining, and retail options to support tourism, benefit residents and employers, leverage Camas' strong parks and open space assets, and connect to the waterfront.

Policy ED-1.5 Participate in regional recruitment organizations to ensure the availability of an adequate supply of commercial and industrial employment land to support the City's economic development goals. Evaluate city resources to support economic development

[21] A living-wage job is one that pays an income sufficient to cover basic living expenses without financial hardship, allowing an individual or family to afford essential needs such as housing, food, healthcare, transportation, childcare, and other necessities without relying on public assistance. MIT Living wage calculation (2024): https://livingwage.mit.edu/counties/53053.

planning and implementation by designating a point-of-contact for economic development programs and serving as a liaison to the business community.

Policy ED-1.6 Support and encourage employees to use the Commute Trip Reduction Program. Encourage businesses to support remote work to reduce trips and implement a trip reduction program with incentives for carpooling, transit ridership, and other options beyond single-occupancy vehicles.

Policy ED-1.7 Encourage mixed-use development and complementary businesses throughout the City to support industry clusters and leverage resources.

Policy ED-1.8 Review regulatory design standards and planning procedures for industrial and commercial facilities and provide economic incentives to promote private investment in start-ups, incubator businesses, and businesses relocating to Camas.

Policy ED-1.9 Coordinate with Clark County and evaluate adding a Grove Field Urban Growth Area (UGA) for employment purposes to support employment targets.

Policy ED-1.10 Explore ways to support remote workers such as community hubs and third places and code revisions for co-working spaces.

Policy ED-1.11 Implement the Downtown Camas subarea plan and the associated goals and actions (see downtown subarea element).

Policy ED-1.12 Promote the growth of residential development in the North Shore as described in the Camas North Shore Subarea Plan.

Goal ED-2 Local Business Development

Promote business creation, expansion, retention, and diversification throughout the community to create a consistent and reliable tax base and a healthy, diversified local economy.

Policy ED-2.1 Identify and plan for infrastructure (such as the capital facilities plan) to nurture and incubate new businesses. Explore financing tools such as tax increment financing to fund infrastructure to support development and investment in targeted areas.

Policy ED-2.2 Support retention, expansion, and recruitment of local businesses in Camas.

Policy ED-2.3 Support development standards that promote high-quality building and site design, encourage businesses to operate in a sustainable and environmentally responsible manner and integrate energy efficient design features.

Policy ED-2.4 Collaborate with partners and agencies (such as CREDC and the Port of Camas Washougal) to develop economic strategies that promote diversification of business and industry in the city and facilitate opportunities for entrepreneurship.

Policy ED-2.5 Work with partners to proactively recruit and promote the growth of businesses and industries that provide, at a minimum, cost-of-living wages and economic diversity in alignment with the CREDC regional economic development plan.

Policy ED-2.6 Explore the creation of an economic development grant program for local businesses in connection with local partners.

Policy ED-2.7 Facilitate an environment for the success and growth of small businesses to maintain a strong, diverse, and resilient local economy.

Policy ED-2.8 Encourage investments and programs that provide resources and support to minority-owned and woman-owned businesses.

Policy ED-2.9 Increase the number of neighborhood business districts to expand local access to goods and services. Consider expanding mixed-use zoning options with ground floor commercial uses that allow residents to walk or roll from home.

Policy ED-2.10 Encourage shopping local to support Camas businesses.

Goal ED-3 Mixed Use and Commercial Areas

Encourage efficient and innovative development that thoughtfully mixes commercial and residential land uses that are pedestrian-friendly and consider the context of the surrounding area.

Policy ED-3.1 Develop commercial and mixed-use areas that are safe, comfortable, and attractive to pedestrians.

Policy ED-3.2 Encourage efficient land use in the mixed-use land use designation by facilitating compact, high-density development and minimizing the amount of land that is needed for surface parking.

Policy ED-3.3 Promote the growth of businesses such as grocery stores, medical offices, and restaurants that meet the retail and service needs of the community.

Policy ED-3.4 Encourage new developments to provide neighborhood parks and shared use paths to encourage greater physical activity and connect residential areas to commercial centers, public transit, and community facilities.

Goal ED-4 Mixed Employment and Industrial Areas

Providing a mix of traditional industrial and non-industrial land uses to maximize opportunities and partnerships and facilitate employers to remain, expand, or locate in Camas.

Policy ED-4.1 Evaluate the costs and benefits associated with adding the Grove Field Urban Growth Area to the North Shore Subarea Plan.

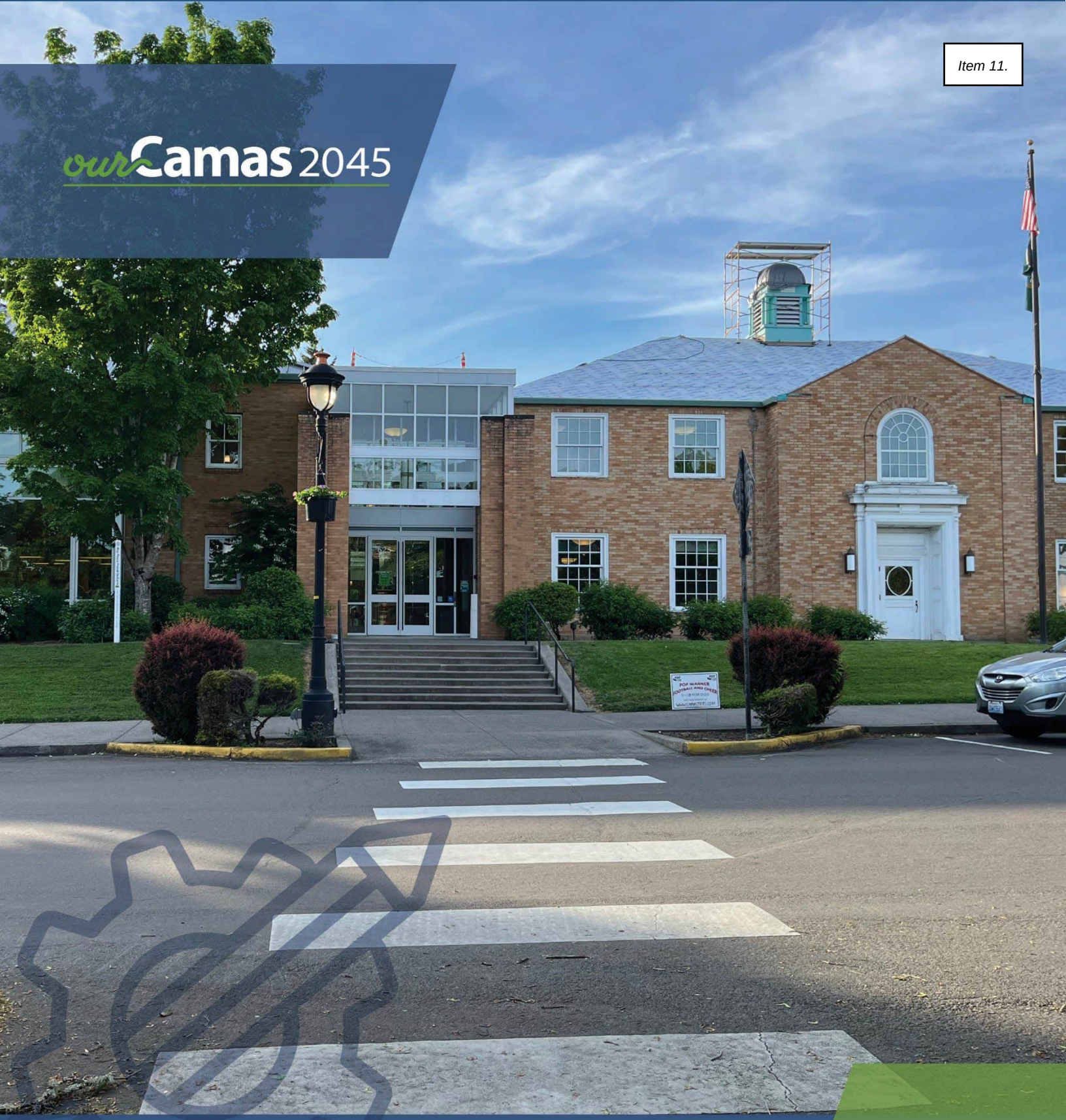
Policy ED-4.2 Preserve large tracts of land for large industry and master-planned commercial development within mixed employment land use areas.

Policy ED-4.3 Support a mix of light industrial, research and development, manufacturing, and office spaces through flexible zoning that allows for evolving business needs.

Policy ED-4.4 Support the development of business parks, incubators, and innovation hubs that integrate industrial and high-tech employment uses.

Policy ED-4.5 Ensure zoning and development regulations support both large-scale employers and small businesses, including start-ups and maker spaces.

ourCamas 2045



Technical Appendices

11

11. Technical Appendices

[Appendices to be included in future draft]

2025-2026 Capital Improvement Project List

6-Year Street Plan

Camas General Sewer Plan (2022)

Camas School District Capital Facilities Plan (2022)

Camas Stormwater Management Plan (2024)

Camas Water System Plan (2019)

Capital Facilities Plan

Clark County Comprehensive Plan (2025)

Economic Opportunity Analysis (2024)

Engagement Summary

Facility Conditions Assessment, Volumes 1 and 2

Housing Action Plan (2021)

Housing Needs Assessment (2024)

Parks and Open Space Management Plan (POSMP) (2025)

Parks, Recreation & Open Space Plan (2022)

Transportation System Plan (2025)

ATTACHMENT D

RDII PARAMETERS

RDII PARAMETERS

Table D.1 Connected Basin Area

Basin	Area (acres)	Connected Impervious (acres)	Connected Pervious (acres)	Total Connected (acres)	Total Connected (%)
4-1-3	92.8	82.4	9.1	82.4	88.8%
5-1-2	1,898.2	1,067.4	18.7	1,067.4	56.2%
5-2-1	958.8	199.6	17.6	199.6	20.8%
8-1-2	220.7	120.7	5.2	120.7	54.7%
STEP/WWTF	3,868.3	2,011.1	99.3	2,011.1	52.0%
Goodwin Road	637.8	89.3	0.0	89.3	14.0%
Leadbetter Road	1,076.9	85.1	15.8	85.1	7.9%

Table D.2 Model A Parameters

Basin	Impervious (%)	Time of Concentration (min)	Reduction Factor	Initial Loss (ft)
4-1-3	5	7	0.9	0.00196
5-1-2	0.25	7	0.9	0.00196
5-2-1	0.6	7	0.9	0.00196
8-1-2	0.6	7	0.9	0.00196
STEP/WWTF	0.1	7	0.9	0.00196
Goodwin Road	1	7	0.9	0.00196
Leadbetter Road	2	7	0.9	0.00196

Table D.3 RDI Parameters

Basin	Percent RDI Area (%)	Surface Storage (Umax)	Root Zone Storage (Lmax)	Overland Coefficient (Cqof)	Groundwater Coefficient (Carea)	TC Overland Flow (CKof)	TC Interflow (CKif)	TC Baseflow (CKbf)	Overland Flow Threshold (Tof)	Interflow Threshold (Tif)	Groundwater Threshold (Tg)	Initial Surface Storage (U)	Initial Root Zone Moisture (L)	Initial Groundwater Depth (GWL)	Initial Overland Flow (OF)	Initial Interflow (IF)	Specific Yield (Sy)	Minimum Groundwater Depth (GWLmin)	Max GW depth causing Baseflow (GWLbf0)	GW Depth for Unit Capillary flux (GWLfl1)
8-1-2	0.5	0.0328	0.328	0.30	1	20	500	2000	0	0	0	0	0	32.8084	0	0	0.1	0	32.808399	0
5-1-2	8.0	0.0328	0.50	0.53	1	5	55	500	0	0	0	0	0.16	32.8084	0	0	0.1	0	32.808399	0
5-2-1	8.0	0.0328	0.328	0.30	1	20	500	2000	0	0	0	0	0	32.8084	0	0	0.1	0	32.808399	0
4-1-3	62.0	0.0328	0.50	0.75	1	4.5	10	100	0	0	0	0	0.28	32.8084	0	0	0.1	0	32.808399	0
STEP/WWTF	18.0	0.0328	0.328	0.20	1	20	500	2000	0	0	0	0	0.20	32.8084	0	0	0.1	0	32.808399	0
Goodwin Road	4.0	0.0328	0.328	0.30	1	20	500	2000	0	0	0	0	0	32.8084	0	0	0.1	0	32.808399	0
Leadbetter Road	7.0	0.0328	0.328	0.90	1	20	500	2000	0	0	0	0	0	32.8084	0	0	0.1	0	32.808399	0

ATTACHMENT E

DRY WEATHER CALIBRATION RESULTS

DRY WEATHER CALIBRATION RESULTS

Table E.1 Dry Weather Flow Calibration Results

Meter Number	Pipe Diameter (inches)	Weekday Dry Weather Flow			Weekend Dry Weather Flow			Average Dry Weather Flow(4)		
		Percent Error(3)			Percent Error(3)			Measured ADWF (mgd)	Modeled ADWF (mgd)	Percent Difference (%)
		Average Flow (%)	Peak Flow (%)	Max Level Difference (inches)	Average Flow (%)	Peak Flow (%)	Max Level Difference (inches)			
Meter 4-1-3	12	-2.6%	0.7%	2.07	-1.1%	-0.4%	2.01	0.24	0.24	-2.2%
Meter 5-1-2	21	1.3%	-1.9%	1.35	0.9%	0.9%	1.32	0.85	0.86	1.2%
Meter 5-2-1	18	0.4%	-7.8%	0.21	-3.9%	3.0%	0.32	0.20	0.20	-0.9%
Meter 8-1-2	12	0.4%	-1.7%	0.37	4.1%	2.0%	0.30	0.12	0.12	1.4%
WWTF/STEP		2.2%	-0.4%		1.0%	-1.2%		2.80	2.86	1.8%
Leadbetter Rd	18	10.0%	0.7%		-1.3%	-5.6%		0.13	0.14	6.5%
Goodwin Rd	18	4.0%	2.8%		-3.3%	-4.2%		0.09	0.10	1.8%

Notes:
(1) Source: City of Camas Temporary Flow Monitoring Program dated May 28, 2025, ADS.
(2) Average flow, level, and velocity are calculated from weekday/weekend dry weather flow monitoring data. Maximum flow values are hourly peaks corresponding to either weekend or weekday conditions, as appropriate.
(3) Percent Difference = (Modeled - Measured)/Measured*100.
(4) Average Dry Weather Flow = (5*Weekday Dry Weather Flow + 2*Weekend Dry Weather Flow)/7.

Table E.2 Meter 4-1-3

Hour		Measured Data			Modeled Data			Diurnal	
		Flow	Level	Velocity	Flow	Level	Velocity	Initial	Calibrated
		(mgd)	(inches)	(ft/s)	(mgd)	(inches)	(ft/s)	Curve	Diurnal
Weekday	0	0.20	2.47	1.79	0.23	4.46	1.42	0.82	0.46
	1	0.18	2.36	1.74	0.16	4.04	1.33	0.76	0.53
	2	0.15	2.12	1.64	0.14	3.38	1.21	0.61	0.46
	3	0.15	2.10	1.62	0.13	3.14	1.15	0.60	0.50
	4	0.14	2.07	1.64	0.13	3.04	1.13	0.58	0.57
	5	0.14	2.09	1.66	0.13	3.02	1.15	0.59	0.71
	6	0.19	2.41	1.79	0.15	3.11	1.14	0.79	0.79
	7	0.26	2.84	1.94	0.23	3.24	1.16	1.06	1.09
	8	0.30	3.10	2.01	0.28	4.06	1.33	1.22	1.28
	9	0.29	3.06	2.01	0.29	4.46	1.42	1.19	1.33
	10	0.28	3.01	1.99	0.28	4.59	1.44	1.15	1.31
	11	0.28	3.04	1.98	0.28	4.50	1.42	1.17	1.28
	12	0.26	2.91	1.95	0.27	4.46	1.42	1.09	1.23
	13	0.26	2.89	1.97	0.26	4.43	1.41	1.09	1.14
	14	0.25	2.83	1.94	0.24	4.32	1.39	1.04	1.09
	15	0.25	2.82	1.93	0.24	4.19	1.36	1.04	1.09
	16	0.24	2.77	1.92	0.25	4.19	1.36	1.00	1.12
	17	0.27	2.96	1.96	0.26	4.22	1.36	1.13	1.18
	18	0.29	3.06	1.99	0.27	4.35	1.39	1.19	1.33
	19	0.31	3.19	2.03	0.28	4.40	1.41	1.28	1.38
	20	0.31	3.21	2.04	0.29	4.52	1.43	1.30	1.28
	21	0.31	3.20	2.03	0.31	4.57	1.44	1.29	1.13
	22	0.28	3.02	1.99	0.32	4.73	1.47	1.17	0.94
	23	0.23	2.69	1.89	0.28	4.76	1.47	0.96	0.79
Weekend	24	0.19	2.44	1.78	0.23	4.45	1.41	0.81	0.51
	25	0.18	2.37	1.74	0.16	4.04	1.34	0.77	0.53
	26	0.16	2.20	1.65	0.14	3.40	1.21	0.67	0.46
	27	0.13	2.03	1.59	0.13	3.18	1.16	0.56	0.54
	28	0.14	2.03	1.56	0.13	3.07	1.14	0.58	0.71
	29	0.12	1.96	1.55	0.12	3.03	1.12	0.51	0.71
	30	0.14	2.09	1.64	0.11	2.97	1.12	0.60	1.22
	31	0.18	2.33	1.74	0.14	2.79	1.07	0.75	1.31
	32	0.23	2.67	1.87	0.22	3.29	1.18	0.96	1.25
	33	0.30	3.11	2.01	0.26	3.94	1.31	1.25	1.14
	34	0.33	3.29	2.06	0.31	4.34	1.39	1.37	1.17
	35	0.33	3.31	2.05	0.33	4.69	1.46	1.38	1.16
	36	0.30	3.16	1.99	0.32	4.84	1.49	1.27	1.12
	37	0.29	3.09	1.98	0.32	4.81	1.48	1.22	0.97
	38	0.28	3.03	1.97	0.29	4.76	1.47	1.19	1.04
	39	0.27	2.92	1.93	0.28	4.60	1.45	1.12	1.09
	40	0.25	2.85	1.91	0.26	4.50	1.43	1.07	1.14
	41	0.27	2.98	1.94	0.26	4.30	1.39	1.15	1.19
	42	0.28	2.99	1.94	0.27	4.29	1.39	1.16	1.19
	43	0.30	3.13	1.99	0.28	4.39	1.40	1.26	1.01
	44	0.30	3.13	1.99	0.30	4.46	1.42	1.25	1.05
	45	0.28	3.04	1.97	0.30	4.62	1.45	1.19	1.12
	46	0.27	2.94	1.93	0.27	4.64	1.46	1.14	1.16
	47	0.22	2.59	1.83	0.25	4.43	1.42	0.91	1.08
Average									
Weekday		**0.24**	**2.76**	**1.89**	**0.24**	**4.09**	**1.34**	**1.0**	**0.98**
Weekend		**0.24**	**2.74**	**1.86**	**0.24**	**4.08**	**1.34**	**1.0**	**1.05**
ADWF(1)		**0.24**	**2.75**	**1.88**	**0.24**	**4.08**	**1.34**	**1.0**	**1.00**
% Error									
Weekday					**-2.6%**	**48.2%**	**-29.1%**		
Weekend					**-1.1%**	**48.9%**	**-28.0%**		

Notes:
(1) ADWF = (5xWeekday Average + 2xWeekend Average)/7

Table E.3 Meter 5-1-2

Hour		Measured Data			Modeled Data			Diurnal	
		Flow	Level	Velocity	Flow	Level	Velocity	Initial	Calibrated
		(mgd)	(inches)	(ft/s)	(mgd)	(inches)	(ft/s)	Curve	Curve
Weekday	0	0.65	5.52	1.95	0.75	6.87	1.98	-8.3%	0.65
	1	0.55	5.17	1.82	0.58	6.28	1.90	-8.8%	0.55
	2	0.49	4.89	1.72	0.50	5.40	1.83	-8.3%	0.53
	3	0.47	4.81	1.69	0.42	4.89	1.70	-8.8%	0.50
	4	0.48	4.83	1.71	0.46	4.50	1.69	-8.3%	0.50
	5	0.50	4.95	1.74	0.53	4.70	1.65	-8.8%	0.56
	6	0.66	5.58	1.96	0.70	5.12	1.75	-8.3%	0.69
	7	0.88	6.39	2.20	0.88	5.95	1.89	-8.8%	1.15
	8	1.04	6.92	2.35	1.08	6.87	2.03	-8.3%	1.21
	9	1.06	6.97	2.37	1.05	7.72	2.11	-8.8%	1.39
	10	1.02	6.86	2.35	1.04	7.62	2.11	-8.3%	1.39
	11	1.01	6.82	2.34	1.09	7.59	2.10	-8.8%	1.39
	12	0.97	6.68	2.30	1.01	7.76	2.10	-8.3%	1.39
	13	0.94	6.57	2.28	1.02	7.42	2.10	-8.8%	1.34
	14	0.92	6.52	2.26	0.97	7.49	2.08	-8.3%	1.26
	15	0.90	6.46	2.24	0.95	7.27	2.05	-8.8%	1.14
	16	0.92	6.50	2.26	0.92	7.16	2.06	-8.3%	1.11
	17	0.95	6.62	2.29	0.96	7.05	2.03	-8.8%	1.14
	18	1.01	6.81	2.34	0.92	7.20	2.04	-8.3%	1.19
	19	1.07	7.02	2.39	1.00	7.02	2.05	-8.8%	1.22
	20	1.11	7.13	2.42	0.98	7.43	2.05	-8.3%	1.10
	21	1.06	6.98	2.38	1.04	7.28	2.08	-8.8%	0.99
	22	0.94	6.59	2.28	0.91	7.59	2.09	-8.3%	0.83
	23	0.82	6.16	2.16	0.91	7.01	2.04	-8.8%	0.81
Weekend	24	0.69	5.71	2.02	0.75	6.99	2.00	-8.3%	0.53
	25	0.59	5.34	1.89	0.64	6.26	1.91	-8.8%	0.50
	26	0.50	4.98	1.77	0.55	5.73	1.83	-8.3%	0.50
	27	0.48	4.89	1.73	0.44	5.23	1.76	-8.8%	0.56
	28	0.45	4.74	1.67	0.49	4.59	1.67	-8.3%	0.69
	29	0.45	4.76	1.69	0.40	4.87	1.70	-8.8%	1.03
	30	0.51	5.02	1.79	0.51	4.34	1.65	-8.3%	1.26
	31	0.63	5.47	1.94	0.51	4.99	1.71	-8.8%	1.26
	32	0.85	6.28	2.18	0.80	4.96	1.77	-8.3%	1.26
	33	1.05	6.97	2.36	0.97	6.44	1.95	-8.8%	1.26
	34	1.17	7.35	2.46	1.15	7.24	2.06	-8.3%	1.23
	35	1.19	7.39	2.49	1.16	8.00	2.14	-8.8%	1.22
	36	1.12	7.15	2.44	1.20	8.09	2.17	-8.3%	1.20
	37	1.08	7.03	2.40	1.19	8.24	2.17	-8.8%	1.17
	38	1.03	6.87	2.37	1.14	8.17	2.17	-8.3%	1.10
	39	0.98	6.71	2.33	1.05	7.97	2.15	-8.8%	1.08
	40	0.98	6.70	2.32	1.02	7.64	2.11	-8.3%	1.06
	41	0.97	6.68	2.32	0.92	7.47	2.06	-8.8%	1.09
	42	1.00	6.77	2.34	0.98	7.07	2.04	-8.3%	1.15
	43	1.04	6.92	2.37	0.98	7.30	2.05	-8.8%	1.18
	44	1.07	7.03	2.39	1.06	7.30	2.08	-8.3%	1.08
	45	0.99	6.73	2.34	0.99	7.65	2.10	-8.8%	0.99
	46	0.90	6.43	2.25	0.94	7.36	2.06	-8.3%	0.82
	47	0.75	5.93	2.10	0.79	7.16	2.06	-8.8%	0.80
Average									
Weekday		**0.85**	**6.24**	**2.16**	**0.86**	**6.72**	**1.98**	1.98	**1.00**
Weekend		**0.85**	**6.24**	**2.17**	**0.86**	**6.71**	**1.97**	1.97	**1.00**
ADWF(1)		**0.85**	**6.24**	**2.16**	**0.86**	**6.71**	**1.98**	1.98	**1.00**
% Error									
Weekday					**1.3%**	7.6%	-8.3%		
Weekend					**0.9%**	7.5%	-8.8%		

Notes:
(1) ADWF = (5xWeekday Average + 2xWeekend Average)/7

Table E.4 Meter 5-2-1

Hour		Measured Data			Modeled Data			Diurnal	
		Flow	Level	Velocity	Flow	Level	Velocity	Initial	Calibrated
		(mgd)	(inches)	(ft/s)	(mgd)	(inches)	(ft/s)	Curve	Diurnal
Weekday	0	0.15	1.37	2.75	0.12	1.50	3.41	0.74	0.51
	1	0.11	1.23	2.30	0.13	1.22	3.13	0.57	0.45
	2	0.09	1.12	1.98	0.09	1.25	3.27	0.44	0.51
	3	0.08	1.09	1.83	0.10	1.09	2.56	0.41	0.53
	4	0.10	1.14	2.01	0.08	1.18	2.96	0.48	0.61
	5	0.10	1.18	2.10	0.16	1.04	2.75	0.52	0.71
	6	0.14	1.30	2.35	0.17	1.38	3.28	0.70	1.07
	7	0.22	1.61	3.23	0.23	1.47	3.43	1.08	1.12
	8	0.25	1.76	3.62	0.20	1.69	3.73	1.27	1.12
	9	0.25	1.74	3.63	0.26	1.66	3.73	1.23	1.28
	10	0.24	1.72	3.61	0.22	1.82	3.96	1.22	1.31
	11	0.23	1.69	3.57	0.23	1.70	3.80	1.17	1.31
	12	0.23	1.65	3.53	0.22	1.74	3.82	1.13	1.28
	13	0.22	1.64	3.48	0.21	1.65	3.72	1.10	1.07
	14	0.21	1.59	3.42	0.20	1.66	3.75	1.04	1.12
	15	0.20	1.57	3.34	0.24	1.58	3.61	1.01	1.17
	16	0.21	1.60	3.38	0.21	1.81	3.95	1.05	1.30
	17	0.23	1.67	3.52	0.25	1.64	3.68	1.15	1.29
	18	0.25	1.76	3.69	0.26	1.84	3.99	1.28	1.45
	19	0.25	1.76	3.75	0.25	1.81	3.94	1.27	1.36
	20	0.28	1.86	3.83	0.26	1.80	3.92	1.42	1.20
	21	0.27	1.81	3.73	0.26	1.84	3.97	1.34	0.97
	22	0.24	1.70	3.50	0.19	1.82	3.97	1.18	0.75
	23	0.19	1.53	3.14	0.23	1.56	3.56	0.95	0.58
Weekend	24	0.16	1.41	2.93	0.15	1.74	3.84	0.76	0.45
	25	0.13	1.28	2.46	0.07	1.32	3.19	0.61	0.42
	26	0.12	1.27	2.43	0.10	0.98	2.67	0.60	0.53
	27	0.06	1.02	1.68	0.13	1.12	2.86	0.31	0.52
	28	0.08	1.08	1.85	0.07	1.30	3.21	0.40	0.65
	29	0.08	1.08	1.84	0.14	0.87	2.42	0.38	1.09
	30	0.10	1.17	2.13	0.12	1.36	3.29	0.48	1.09
	31	0.15	1.35	2.62	0.19	1.26	3.11	0.70	1.19
	32	0.20	1.53	3.19	0.21	1.54	3.53	0.95	1.23
	33	0.24	1.72	3.62	0.23	1.67	3.78	1.17	1.19
	34	0.27	1.83	3.87	0.23	1.70	3.78	1.33	1.14
	35	0.29	1.88	3.85	0.27	1.75	3.87	1.39	1.12
	36	0.28	1.88	4.02	0.27	1.88	4.02	1.37	1.09
	37	0.26	1.79	3.77	0.23	1.85	3.96	1.26	1.02
	38	0.27	1.82	3.75	0.23	1.75	3.85	1.30	1.06
	39	0.25	1.76	3.65	0.19	1.74	3.85	1.21	1.16
	40	0.25	1.75	3.62	0.25	1.59	3.63	1.19	1.29
	41	0.26	1.78	3.62	0.25	1.81	3.98	1.25	1.28
	42	0.26	1.80	3.64	0.25	1.79	3.86	1.25	1.43
	43	0.26	1.80	3.69	0.30	1.81	3.93	1.27	1.35
	44	0.28	1.86	3.86	0.28	1.98	4.18	1.34	1.19
	45	0.27	1.83	3.63	0.24	1.91	4.05	1.32	1.06
	46	0.22	1.67	3.45	0.19	1.79	3.94	1.08	0.87
	47	0.17	1.48	2.98	0.14	1.56	3.53	0.87	0.61
Average									
Weekday		**0.20**	**1.55**	**3.14**	**0.20**	**1.57**	**3.58**	**1.00**	**1.00**
Weekend		**0.21**	**1.58**	**3.17**	**0.20**	**1.59**	**3.60**	**1.00**	**1.00**
ADWF(1)		**0.20**	**1.55**	**3.15**	**0.20**	**1.58**	**3.58**	**1.00**	**1.00**
% Error									
Weekday					**0.4%**	**1.8%**	**14.1%**		
Weekend					**-3.9%**	**0.7%**	**13.5%**		

Notes:
(1) ADWF = (5xWeekday Average + 2xWeekend Average)/7

Table E.5 Meter 8-1-2

Hour		Measured Data			Modeled Data			Diurnal	
		Flow	Level	Velocity	Flow	Level	Velocity	Initial	Calibrated
		(mgd)	(inches)	(ft/s)	(mgd)	(inches)	(ft/s)	Curve	Diurnal
Weekday	0	0.08	1.80	1.65	0.09	1.99	1.60	0.69	0.47
	1	0.07	1.69	1.47	0.06	1.78	1.50	0.58	0.45
	2	0.05	1.56	1.32	0.06	1.53	1.38	0.46	0.45
	3	0.05	1.52	1.30	0.05	1.46	1.33	0.44	0.47
	4	0.06	1.55	1.36	0.06	1.33	1.28	0.48	0.49
	5	0.06	1.63	1.47	0.05	1.44	1.32	0.54	0.55
	6	0.08	1.78	1.65	0.08	1.40	1.32	0.68	0.69
	7	0.11	2.07	1.93	0.12	1.71	1.46	0.99	1.23
	8	0.14	2.25	2.11	0.15	2.15	1.68	1.21	1.30
	9	0.15	2.34	2.13	0.15	2.34	1.77	1.28	1.27
	10	0.15	2.34	2.09	0.15	2.37	1.78	1.25	1.33
	11	0.15	2.36	2.15	0.15	2.39	1.79	1.31	1.37
	12	0.16	2.40	2.15	0.15	2.39	1.79	1.35	1.34
	13	0.15	2.40	2.11	0.15	2.40	1.79	1.32	1.33
	14	0.15	2.46	2.04	0.15	2.40	1.79	1.31	1.26
	15	0.14	2.38	2.00	0.14	2.37	1.78	1.24	1.18
	16	0.13	2.26	2.01	0.14	2.32	1.75	1.16	1.19
	17	0.14	2.25	2.06	0.14	2.25	1.73	1.17	1.27
	18	0.14	2.31	2.11	0.14	2.26	1.73	1.25	1.27
	19	0.15	2.31	2.12	0.14	2.29	1.74	1.25	1.22
	20	0.14	2.28	2.07	0.14	2.31	1.75	1.20	1.18
	21	0.13	2.25	2.05	0.13	2.28	1.74	1.16	1.08
	22	0.12	2.15	1.99	0.12	2.22	1.71	1.06	0.88
	23	0.10	1.97	1.84	0.10	2.14	1.67	0.87	0.74
Weekend	24	0.08	1.76	1.73	0.09	1.98	1.59	0.73	0.47
	25	0.07	1.66	1.59	0.07	1.81	1.52	0.62	0.45
	26	0.06	1.58	1.48	0.05	1.56	1.39	0.54	0.45
	27	0.06	1.54	1.41	0.06	1.41	1.30	0.50	0.47
	28	0.05	1.50	1.39	0.05	1.43	1.33	0.48	0.49
	29	0.05	1.46	1.37	0.06	1.38	1.28	0.46	0.55
	30	0.06	1.55	1.52	0.06	1.48	1.35	0.54	0.69
	31	0.09	1.75	1.80	0.08	1.50	1.36	0.77	1.26
	32	0.12	1.99	2.08	0.13	1.76	1.49	1.05	1.30
	33	0.14	2.13	2.20	0.15	2.17	1.69	1.22	1.33
	34	0.15	2.22	2.28	0.15	2.36	1.77	1.33	1.33
	35	0.16	2.26	2.33	0.15	2.38	1.78	1.39	1.37
	36	0.16	2.27	2.32	0.16	2.41	1.80	1.40	1.34
	37	0.15	2.24	2.29	0.16	2.45	1.81	1.35	1.33
	38	0.14	2.17	2.26	0.16	2.44	1.81	1.28	1.25
	39	0.14	2.15	2.18	0.15	2.42	1.80	1.22	1.17
	40	0.13	2.10	2.17	0.14	2.36	1.77	1.17	1.18
	41	0.14	2.13	2.19	0.14	2.31	1.75	1.21	1.26
	42	0.14	2.15	2.19	0.15	2.30	1.75	1.22	1.26
	43	0.14	2.20	2.24	0.15	2.35	1.77	1.29	1.21
	44	0.14	2.19	2.21	0.15	2.35	1.77	1.27	1.17
	45	0.13	2.13	2.19	0.14	2.33	1.76	1.20	1.07
	46	0.12	2.06	2.11	0.13	2.27	1.73	1.11	0.88
	47	0.10	1.88	1.93	0.11	2.18	1.69	0.89	0.74
Average									
Weekday		**0.117**	**2.10**	**1.88**	**0.118**	**2.06**	**1.63**	**1.00**	**1.00**
Weekend		**0.113**	**1.96**	**1.98**	**0.118**	**2.06**	**1.63**	**1.00**	**1.00**
ADWF(1)		**0.116**	**2.06**	**1.91**	**0.118**	**2.06**	**1.63**	**1.00**	**1.00**
% Error									
Weekday					**0.4%**	**-1.5%**	**-13.2%**		
Weekend					**4.1%**	**4.9%**	**-17.6%**		

Notes:
(1) ADWF = (5xWeekday Average + 2xWeekend Average)/7

Table E.6 Meter WWTF/STEP

Hour		Measured Data			Modeled Data			Diurnal	
		Flow	Level	Velocity	Flow	Level	Velocity	Initial	Calibrated
		(mgd)	(inches)	(ft/s)	(mgd)	(inches)	(ft/s)	Curve	Diurnal
Weekday	0	3.18	-	-	3.06	-	-	1.13	1.13
	1	2.84	-	-	2.67	-	-	1.01	1.01
	2	2.46	-	-	2.43	-	-	0.88	0.88
	3	2.16	-	-	2.02	-	-	0.77	0.77
	4	2.01	-	-	2.16	-	-	0.72	0.72
	5	1.84	-	-	2.09	-	-	0.66	0.66
	6	1.85	-	-	2.22	-	-	0.66	0.66
	7	1.93	-	-	2.31	-	-	0.69	0.69
	8	2.21	-	-	2.36	-	-	0.79	0.79
	9	2.92	-	-	2.99	-	-	1.04	1.04
	10	3.33	-	-	2.97	-	-	1.19	1.19
	11	3.22	-	-	3.01	-	-	1.15	1.15
	12	3.08	-	-	3.19	-	-	1.10	1.10
	13	3.06	-	-	3.33	-	-	1.09	1.09
	14	3.06	-	-	3.32	-	-	1.09	1.09
	15	3.12	-	-	3.34	-	-	1.11	1.11
	16	2.97	-	-	3.10	-	-	1.06	1.06
	17	2.91	-	-	2.95	-	-	1.04	1.04
	18	2.91	-	-	3.38	-	-	1.04	1.04
	19	3.06	-	-	2.68	-	-	1.09	1.09
	20	3.12	-	-	3.39	-	-	1.11	1.11
	21	3.33	-	-	3.26	-	-	1.19	1.19
	22	3.43	-	-	3.42	-	-	1.23	1.23
	23	3.41	-	-	3.24	-	-	1.22	1.22
Weekend	24	3.08	-	-	2.93	-	-	1.10	1.13
	25	2.75	-	-	2.72	-	-	0.98	1.01
	26	2.46	-	-	2.42	-	-	0.88	0.88
	27	2.19	-	-	2.19	-	-	0.78	0.77
	28	2.09	-	-	2.09	-	-	0.74	0.72
	29	1.98	-	-	1.93	-	-	0.71	0.66
	30	1.78	-	-	1.84	-	-	0.63	0.66
	31	1.79	-	-	1.99	-	-	0.64	0.69
	32	1.96	-	-	2.05	-	-	0.70	0.79
	33	2.19	-	-	2.22	-	-	0.78	1.04
	34	2.65	-	-	2.90	-	-	0.94	1.19
	35	3.21	-	-	3.35	-	-	1.14	1.15
	36	3.45	-	-	3.47	-	-	1.23	1.10
	37	3.54	-	-	3.50	-	-	1.26	1.09
	38	3.55	-	-	3.20	-	-	1.27	1.09
	39	3.29	-	-	2.99	-	-	1.18	1.11
	40	3.12	-	-	3.03	-	-	1.11	1.06
	41	3.05	-	-	3.51	-	-	1.09	1.04
	42	3.05	-	-	3.23	-	-	1.09	1.04
	43	3.00	-	-	2.94	-	-	1.07	1.09
	44	3.23	-	-	3.30	-	-	1.15	1.11
	45	3.11	-	-	3.23	-	-	1.11	1.19
	46	3.21	-	-	3.30	-	-	1.15	1.23
	47	3.16	-	-	3.28	-	-	1.13	1.22
Average									
Weekday		**2.81**	**-**	**-**	**2.87**	**-**	**-**	**1.00**	**1.00**
Weekend		**2.79**	**-**	**-**	**2.82**	**-**	**-**	**0.99**	**1.00**
ADWF(1)		**2.80**	**-**	**-**	**2.86**	**-**	**-**	**1.00**	**1.00**
% Error									
Weekday					**2.2%**				
Weekend					**1.0%**				

Notes:
(1) ADWF = (5xWeekday Average + 2xWeekend Average)/7

Table E.7 Meter Goodwin Road LS

Hour		Measured Data			Modeled Data			Diurnal	
		Flow	Level	Velocity	Flow	Level	Velocity	Initial	Calibrated
		(mgd)	(inches)	(ft/s)	(mgd)	(inches)	(ft/s)	Curve	Diurnal
Weekday	0	0.08	-	-	0.08	-	-	0.80	0.61
	1	0.06	-	-	0.06	-	-	0.61	0.49
	2	0.05	-	-	0.05	-	-	0.49	0.41
	3	0.04	-	-	0.04	-	-	0.41	0.38
	4	0.04	-	-	0.04	-	-	0.38	0.43
	5	0.04	-	-	0.04	-	-	0.43	0.66
	6	0.06	-	-	0.07	-	-	0.66	1.12
	7	0.11	-	-	0.11	-	-	1.12	1.37
	8	0.13	-	-	0.13	-	-	1.37	1.24
	9	0.12	-	-	0.12	-	-	1.24	1.15
	10	0.11	-	-	0.11	-	-	1.15	1.10
	11	0.10	-	-	0.11	-	-	1.10	1.03
	12	0.10	-	-	0.10	-	-	1.03	0.99
	13	0.09	-	-	0.10	-	-	0.99	0.96
	14	0.09	-	-	0.09	-	-	0.96	0.95
	15	0.09	-	-	0.09	-	-	0.95	0.95
	16	0.09	-	-	0.10	-	-	0.95	1.04
	17	0.10	-	-	0.10	-	-	1.04	1.17
	18	0.11	-	-	0.12	-	-	1.17	1.32
	19	0.13	-	-	0.13	-	-	1.32	1.42
	20	0.13	-	-	0.14	-	-	1.42	1.44
	21	0.14	-	-	0.14	-	-	1.44	1.38
	22	0.13	-	-	0.13	-	-	1.38	1.08
	23	0.10	-	-	0.10	-	-	1.08	0.78
Weekend	24	0.07	-	-	0.08	-	-	0.78	0.75
	25	0.07	-	-	0.07	-	-	0.75	0.48
	26	0.05	-	-	0.05	-	-	0.48	0.46
	27	0.04	-	-	0.04	-	-	0.46	0.33
	28	0.03	-	-	0.03	-	-	0.33	0.30
	29	0.03	-	-	0.03	-	-	0.30	0.35
	30	0.03	-	-	0.03	-	-	0.35	0.51
	31	0.05	-	-	0.05	-	-	0.51	1.02
	32	0.10	-	-	0.09	-	-	1.02	1.39
	33	0.13	-	-	0.13	-	-	1.39	1.51
	34	0.14	-	-	0.14	-	-	1.51	1.52
	35	0.14	-	-	0.14	-	-	1.52	1.49
	36	0.14	-	-	0.13	-	-	1.49	1.31
	37	0.12	-	-	0.12	-	-	1.31	1.37
	38	0.13	-	-	0.12	-	-	1.37	1.22
	39	0.12	-	-	0.11	-	-	1.22	1.28
	40	0.12	-	-	0.12	-	-	1.28	1.28
	41	0.12	-	-	0.12	-	-	1.28	1.20
	42	0.11	-	-	0.11	-	-	1.20	1.43
	43	0.14	-	-	0.13	-	-	1.43	1.45
	44	0.14	-	-	0.13	-	-	1.45	1.44
	45	0.14	-	-	0.13	-	-	1.44	1.33
	46	0.13	-	-	0.12	-	-	1.33	1.11
	47	0.10	-	-	0.10	-	-	1.11	0.80
Average									
Weekday		**0.093**	**-**	**-**	**0.096**	**-**	**-**	**0.98**	**1.00**
Weekend		**0.100**	**-**	**-**	**0.096**	**-**	**-**	**0.98**	**1.00**
ADWF(1)		**0.095**	**-**	**-**	**0.096**	**-**	**-**	**0.98**	**1.00**
% Error									
Weekday					**4.0%**				
Weekend					**-3.3%**				

Notes:
(1) ADWF = (5xWeekday Average + 2xWeekend Average)/7

Table E.8 Meter Leadbetter Road LS

Hour		Measured Data			Modeled Data			Diurnal	
		Flow	Level	Velocity	Flow	Level	Velocity	Initial	Calibrated
		(mgd)	(inches)	(ft/s)	(mgd)	(inches)	(ft/s)	Curve	Diurnal
Weekday	0	0.10	-	-	0.13	-	-	0.79	0.40
	1	0.07	-	-	0.09	-	-	0.57	0.19
	2	0.06	-	-	0.07	-	-	0.48	0.35
	3	0.05	-	-	0.06	-	-	0.36	0.08
	4	0.05	-	-	0.05	-	-	0.40	0.15
	5	0.04	-	-	0.06	-	-	0.32	0.48
	6	0.07	-	-	0.09	-	-	0.51	0.45
	7	0.12	-	-	0.13	-	-	0.92	0.91
	8	0.17	-	-	0.16	-	-	1.30	1.28
	9	0.17	-	-	0.18	-	-	1.30	1.28
	10	0.15	-	-	0.16	-	-	1.19	1.57
	11	0.14	-	-	0.16	-	-	1.06	1.47
	12	0.14	-	-	0.15	-	-	1.09	1.36
	13	0.13	-	-	0.14	-	-	1.00	1.25
	14	0.14	-	-	0.14	-	-	1.09	1.24
	15	0.13	-	-	0.14	-	-	0.98	1.11
	16	0.12	-	-	0.15	-	-	0.94	1.23
	17	0.14	-	-	0.15	-	-	1.09	1.12
	18	0.15	-	-	0.16	-	-	1.12	1.42
	19	0.18	-	-	0.19	-	-	1.35	1.32
	20	0.20	-	-	0.20	-	-	1.52	1.50
	21	0.19	-	-	0.20	-	-	1.44	1.46
	22	0.18	-	-	0.19	-	-	1.37	1.24
	23	0.14	-	-	0.17	-	-	1.11	1.18
Weekend	24	0.11	-	-	0.13	-	-	0.80	0.34
	25	0.07	-	-	0.10	-	-	0.49	0.22
	26	0.08	-	-	0.07	-	-	0.56	0.26
	27	0.05	-	-	0.06	-	-	0.31	0.18
	28	0.07	-	-	0.05	-	-	0.50	0.36
	29	0.03	-	-	0.04	-	-	0.19	0.73
	30	0.04	-	-	0.05	-	-	0.28	1.18
	31	0.09	-	-	0.07	-	-	0.64	1.40
	32	0.09	-	-	0.10	-	-	0.62	1.26
	33	0.16	-	-	0.15	-	-	1.13	1.13
	34	0.21	-	-	0.18	-	-	1.43	1.16
	35	0.19	-	-	0.19	-	-	1.35	1.07
	36	0.19	-	-	0.19	-	-	1.34	1.01
	37	0.19	-	-	0.18	-	-	1.30	1.05
	38	0.18	-	-	0.17	-	-	1.25	1.01
	39	0.16	-	-	0.17	-	-	1.14	1.01
	40	0.17	-	-	0.16	-	-	1.19	1.16
	41	0.16	-	-	0.17	-	-	1.14	1.19
	42	0.18	-	-	0.16	-	-	1.28	1.62
	43	0.18	-	-	0.17	-	-	1.25	1.54
	44	0.20	-	-	0.19	-	-	1.39	1.54
	45	0.20	-	-	0.19	-	-	1.36	1.47
	46	0.18	-	-	0.18	-	-	1.23	1.18
	47	0.16	-	-	0.17	-	-	1.11	0.93
Average									
Weekday		**0.126**	**-**	**-**	**0.139**	**-**	**-**	**0.97**	**1.00**
Weekend		**0.140**	**-**	**-**	**0.138**	**-**	**-**	**0.97**	**1.00**
ADWF(1)		**0.130**	**-**	**-**	**0.139**	**-**	**-**	**0.97**	**1.00**
% Error									
Weekday					**10.0%**				
Weekend					**-1.3%**				

Notes:
(1) ADWF = (5xWeekday Average + 2xWeekend Average)/7

ATTACHMENT F

WET WEATHER CALIBRATION RESULTS

WET WEATHER CALIBRATION RESULTS

Table F.1 Wet Weather Flow Calibration

Meter Number	Pipe Diameter (inches)	Storm 1 (03/12/2025-03/18/2025)			Storm 2 (03/20/2025-04/01/2025)			Storm 3 (04/05/2025-04/09/2025)		
		Percent Error[3]			Percent Error[3]			Percent Error[3]		
		Total Volume Flow (%)	Peak Flow (%)	Max Level Difference (inches)	Total Volume Flow (%)	Peak Flow (%)	Max Level Difference (inches)	Total Volume Flow (%)	Peak Flow (%)	Max Level Difference (inches)
4-1-3	12	8.0%	13.0%	2.5	6.1%	12.0%	2.5	28.2%	81.1%	3.7
5-1-2	20	-4.2%	-4.6%	2.4	6.0%	12.8%	4.0	33.7%	74.8%	6.1
5-2-1	18	-18.9%	-49.3%	-0.3	-9.4%	-11.7%	1.3	1.9%	3.1%	1.1
8-1-2	12	6.5%	-1.8%	0.2	6.8%	3.3%	0.1	11.5%	13.4%	0.1
WWTP/STEP[4][5]	-	5.2%	0.8%		19.6%	13.0%		39.8%	53.5%	
Leadbetter Rd[4]	18	-8.2%	-28.3%		4.1%	-10.1%		6.2%	-4.6%	
Goodwin Rd[4]	18	-6.4%	-9.1%		3.2%	20.8%		7.1%	38.3%	

Notes:
(1) Source: City of Camas Flow Monitoring Report 2025 dated May 28, 2025 by ADS
(2) Average flows are computed from hydraulic modeling results. Maximum flow values are hourly peaks
(3) Percent Difference = (Modeled – Measured)/Measured*100.
(4) Flow meter information was provided by the City
(5) No upstream pipe ID information was available for the STEP basin. Flow for this area was therefore estimated using GIS-derived upstream drainage data and a mass balance approach to represent inflows to the WWTF.

Location: 1724 NE Franklin
Site Name: CAM_100290
Pipeline diameter: 18"
City Manhole ID: MH100290

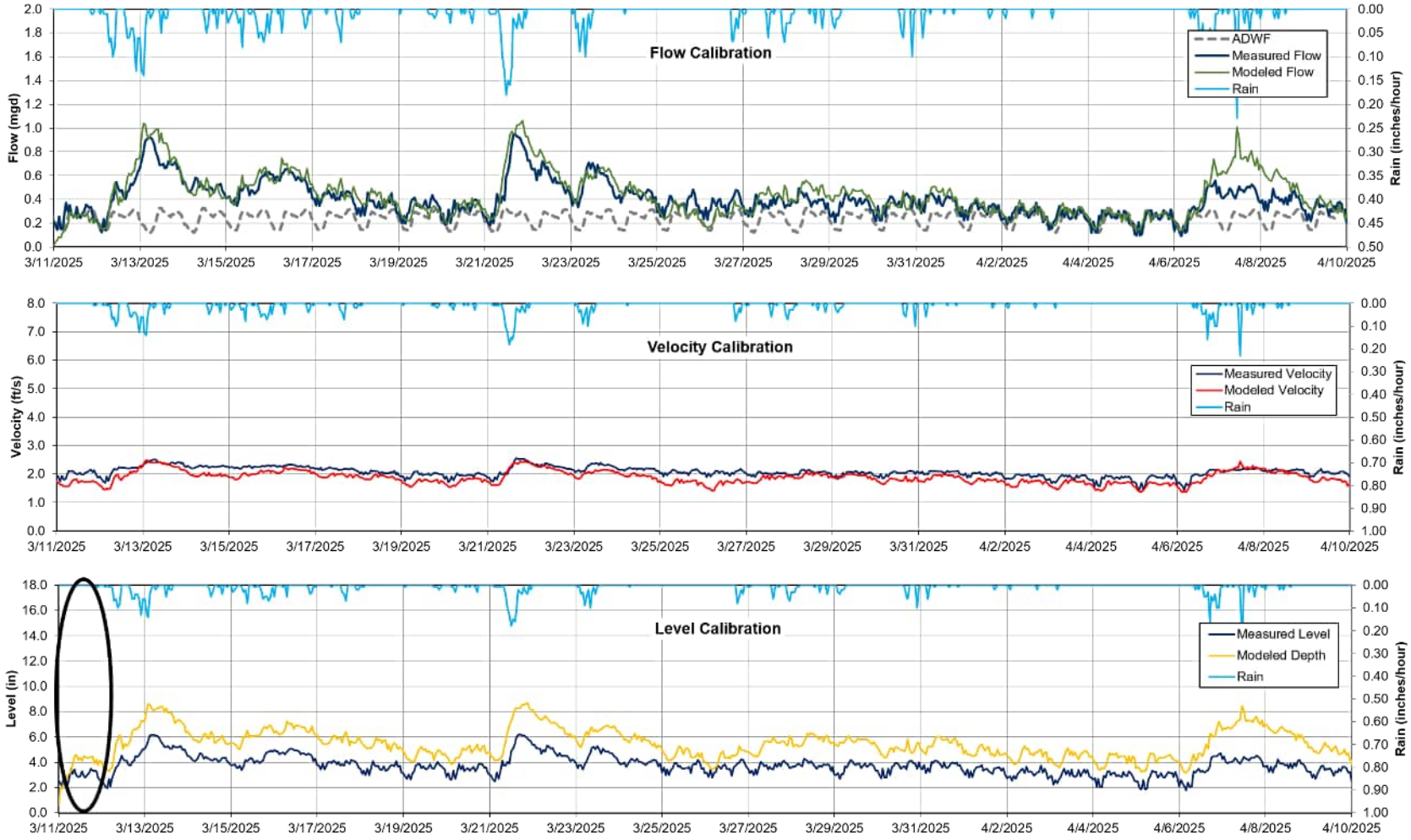


Figure F.1 Flow Monitoring Meter 4-1-3 Wet Weather Flow Calibration

Location: SE Cedar St and SE 3rd Ave		
Site Name: CAM_51123		
Pipeline diameter: 20"		
City Manhole ID: MH100271		

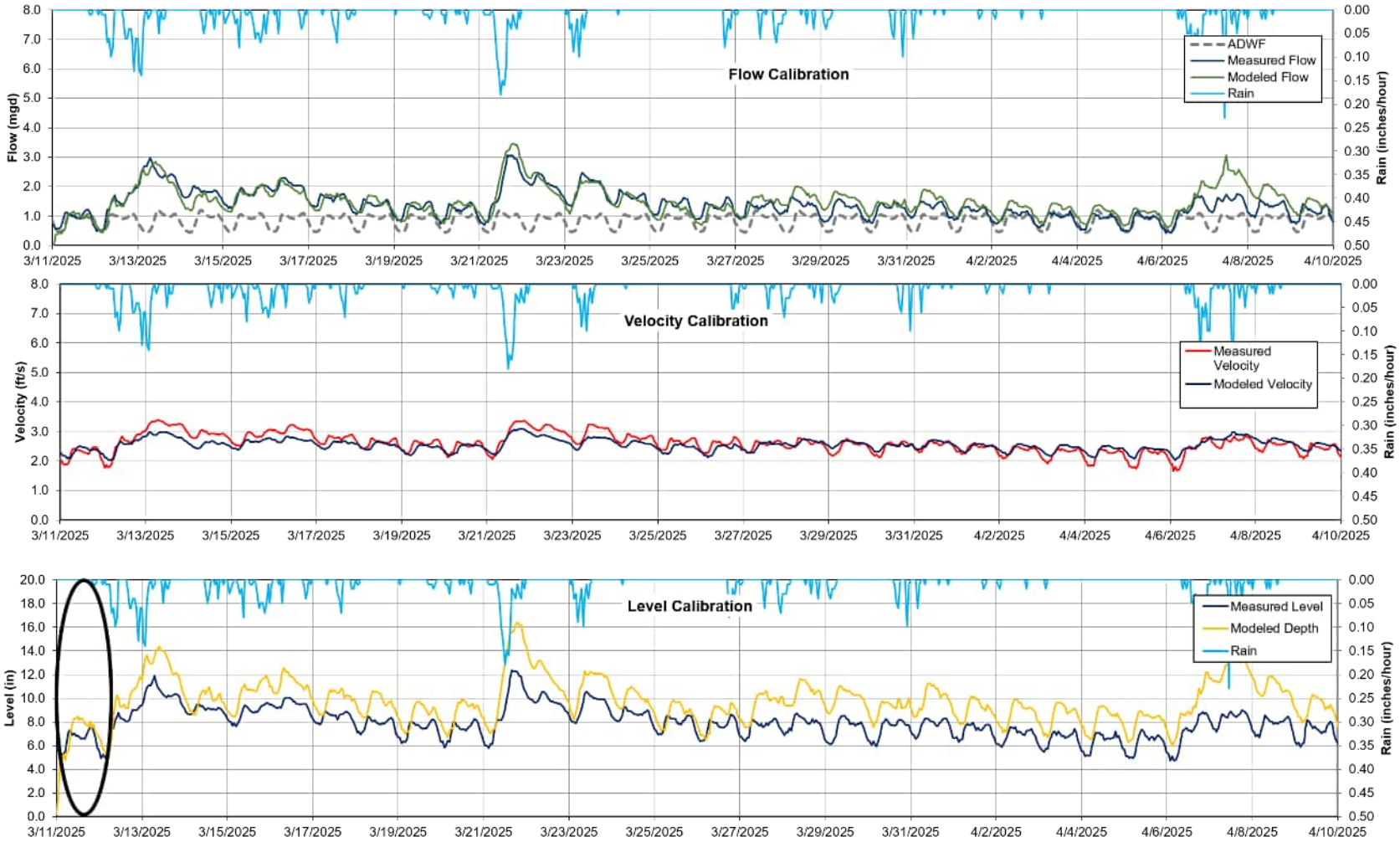


Figure F.2 Flow Monitoring Meter 5-1-2 Wet Weather Flow Calibration

Location: SE Dallas St and SE 3rd Av
Site Name: CAM_52167
Pipeline diameter: 18"
City Manhole ID: MH100270

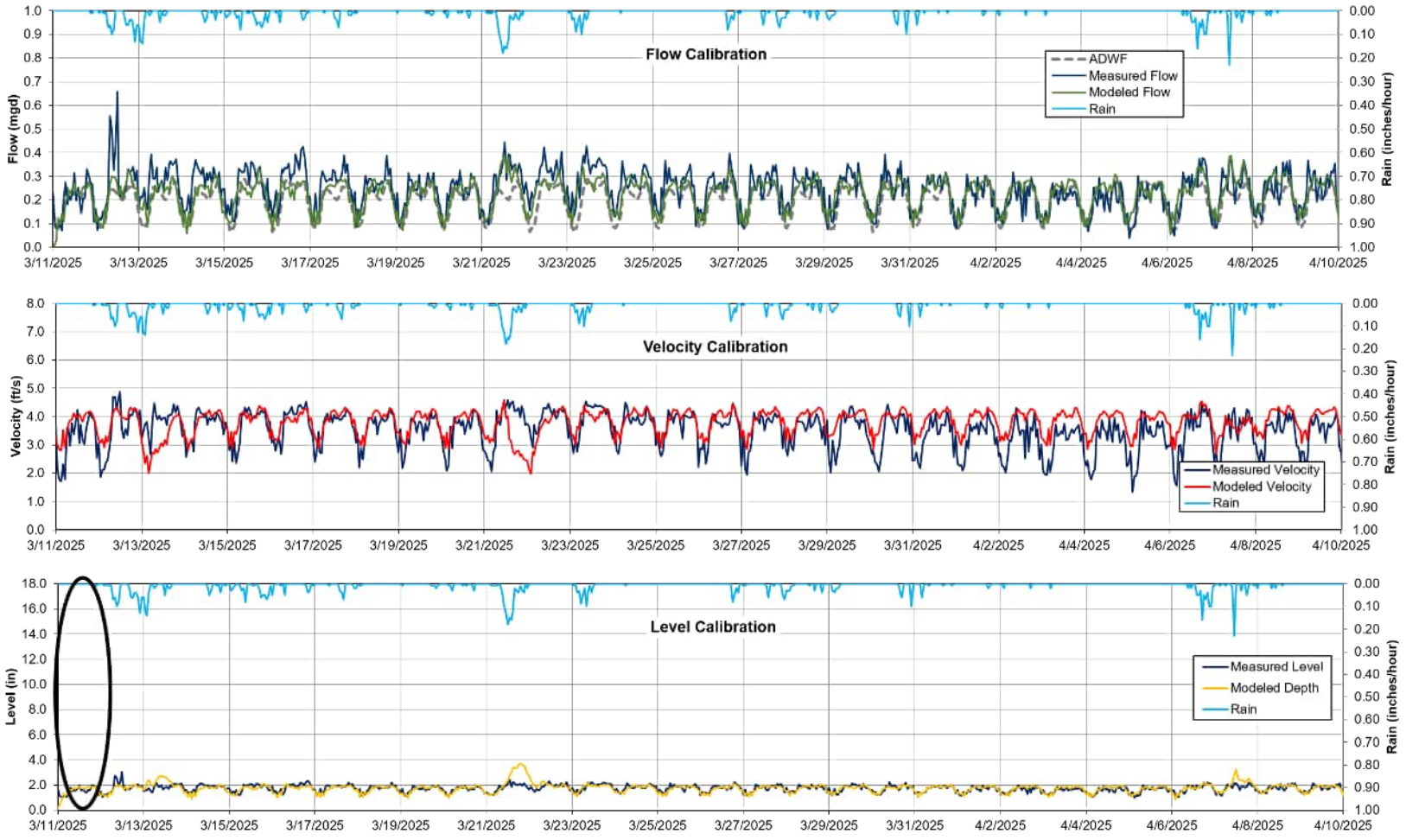


Figure F.3 Flow Monitoring Meter 5-2-1 Wet Weather Flow Calibration

Location: 820 SE Polk St
Site Name: CAM_81189
Pipeline diameter: 12"
City Manhole ID: MH100081

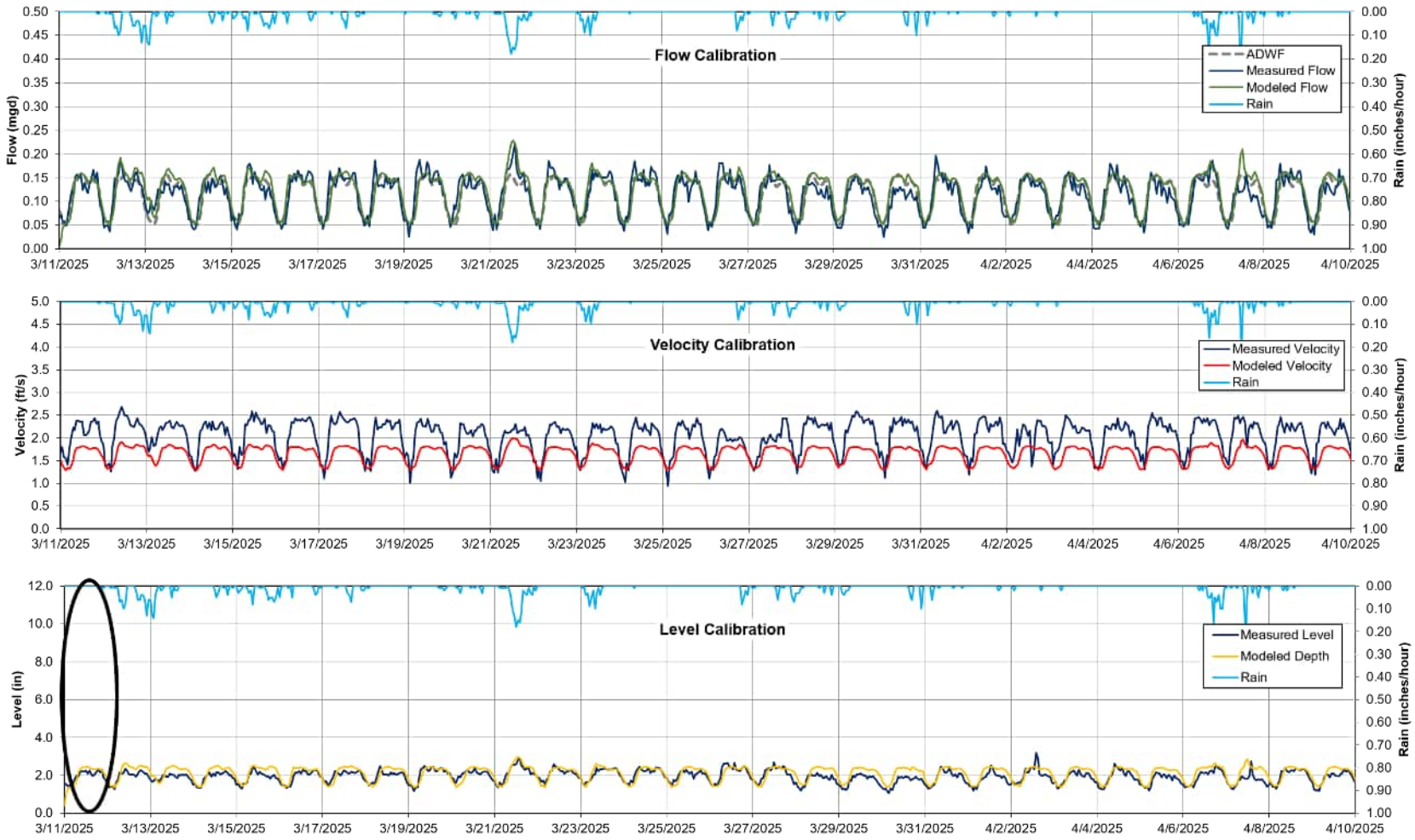


Figure F.4 Flow Monitoring Meter 8-1-2 Wet Weather Flow Calibration

Location: WWTF	
Site Name: -	
Pipeline diameter: "	
City Manhole ID: -	

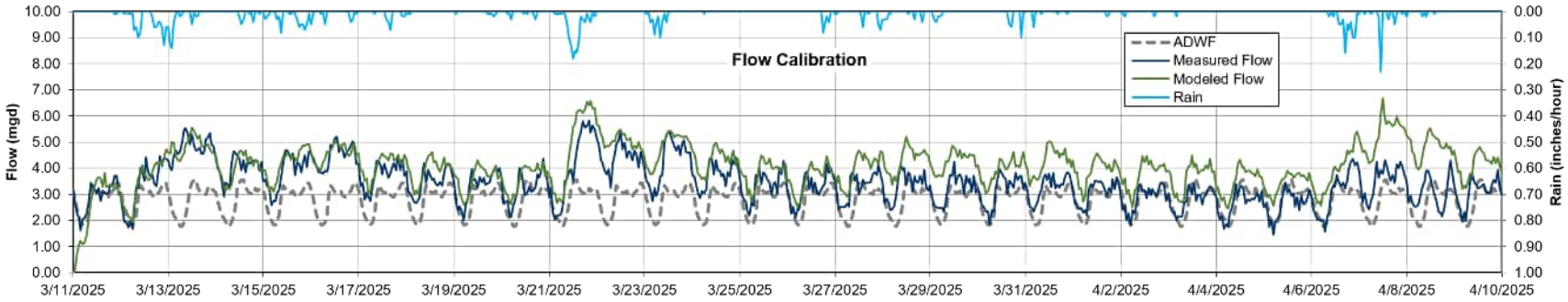


Figure F.5 Flow Monitoring Meter WWTF/STEP Wet Weather Flow Calibration

Location: Leadbetter Rd LS		
Site Name: -		
Pipeline diameter: 18"		
City Manhole ID: -		

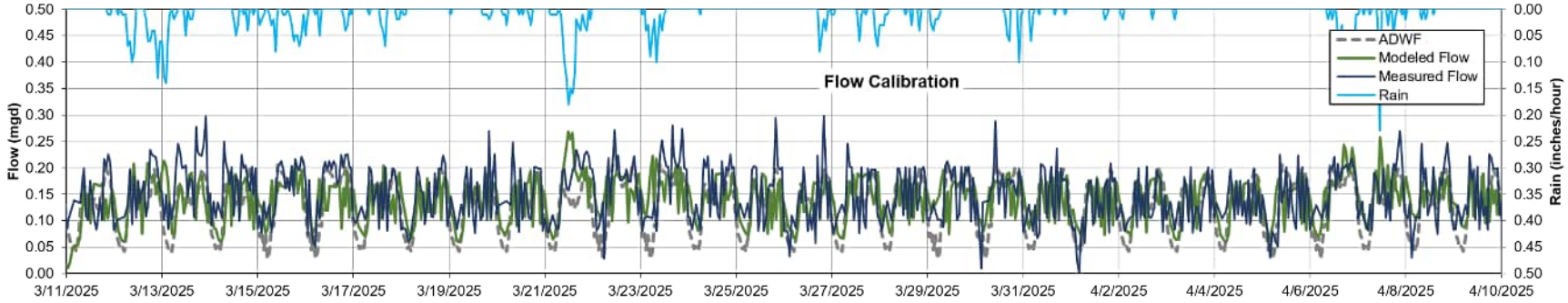


Figure F.6 Flow Monitoring Meter Leadbetter Rd LS Wet Weather Flow Calibration

Location: Goodwin Rd LS	
Site Name: -	
Pipeline diameter: 18"	
City Manhole ID: -	

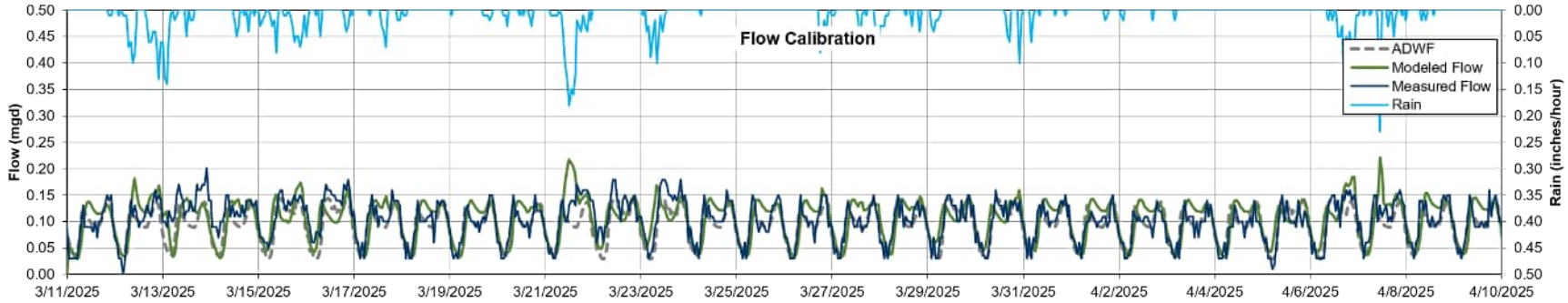


Figure F.7 Flow Monitoring Meter Goodwin Rd LS Wet Weather Flow Calibration

APPENDIX F

I/I PROGRAM REPORTS

City of Camas Washing
Public Works Department
616 NE 4th Avenue
Camas, WA 98607

July 15, 2019

Carey Cholski
Washington State Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: **May 2018 – April 2019 Annual Inflow and Infiltration Report**
City of Camas, WA Wastewater Treatment Facility (Permit No. WA0020249)

Ms. Cholski,

Pursuant to Section S4.E of our current NPDES Permit, enclosed is our annual Inflow and Infiltration (I/I) report. Section S4.E.3 of our permit states:

> *The Permittee must conduct an annual analysis of infiltration and inflow according to Ecology's guidance manual for treatment plant operators. This report shall consider the 12-month period May 1st through the following April 30th as the annual period and shall be submitted by July 15, 2017 and annually thereafter. This report shall include an update on the status of each inflow reduction project completed in fulfillment of S4.E.2 (above) including the funds expended or contractually obligated, and the proportion of the project completed as of the end of the reporting period. For each basin or sub-basin in which work has been done within the reporting period, the report shall include the estimated inflow rates before and after the project and the estimated effect on the overall Publicly Owned Treatment Works (POTW) inflow rate.*

According to Ecology's Information Manual for Treatment Plant Operators (Feb. 2004), an Annual I/I Report should include each of the following elements:

1. *The average monthly flow and total precipitation for each month for the past year together with a graph … plotting a comparison of precipitation versus influent flow.*
2. *The maximum monthly and peak hourly hydraulic design capacity for the plant.*
3. *The design population equivalent for the treatment plant and the population served by the facility, per month, for the past year.*

4. *The amount of I/I for each year since the base year and the percent of maximum monthly design capacity each year's I/I represents.*
5. *The percent increase or reduction in I/I for each year subsequent to the base year I/I.*
6. *The additional lengths of sewer lines added to the collection system, per month, for the past year. Also include a brief summary of any major sewer rehabilitation or I/I reduction projects.*

The following information and attachments are now being submitted to satisfy these requirements and to provide documentation of the City of Camas' ongoing inflow reduction effort, as detailed in Gray & Osborne's June 2016 Infiltration and Inflow Study (indicated hereafter as the "2016 I/I Study").

I. REPORTING PERIOD AND BASE YEAR

As described in Section S4.E.3 of our current NPDES permit, the annual period for our I/I report is May 1st through April 30th. Accordingly, please note that when this report refers to the "reporting period" or "year", it is referring to the 12-month period from May 1st through April 30th. For any particular year that is referenced in the report, it is denoting the May through April reporting year and the calendar year in which May falls.

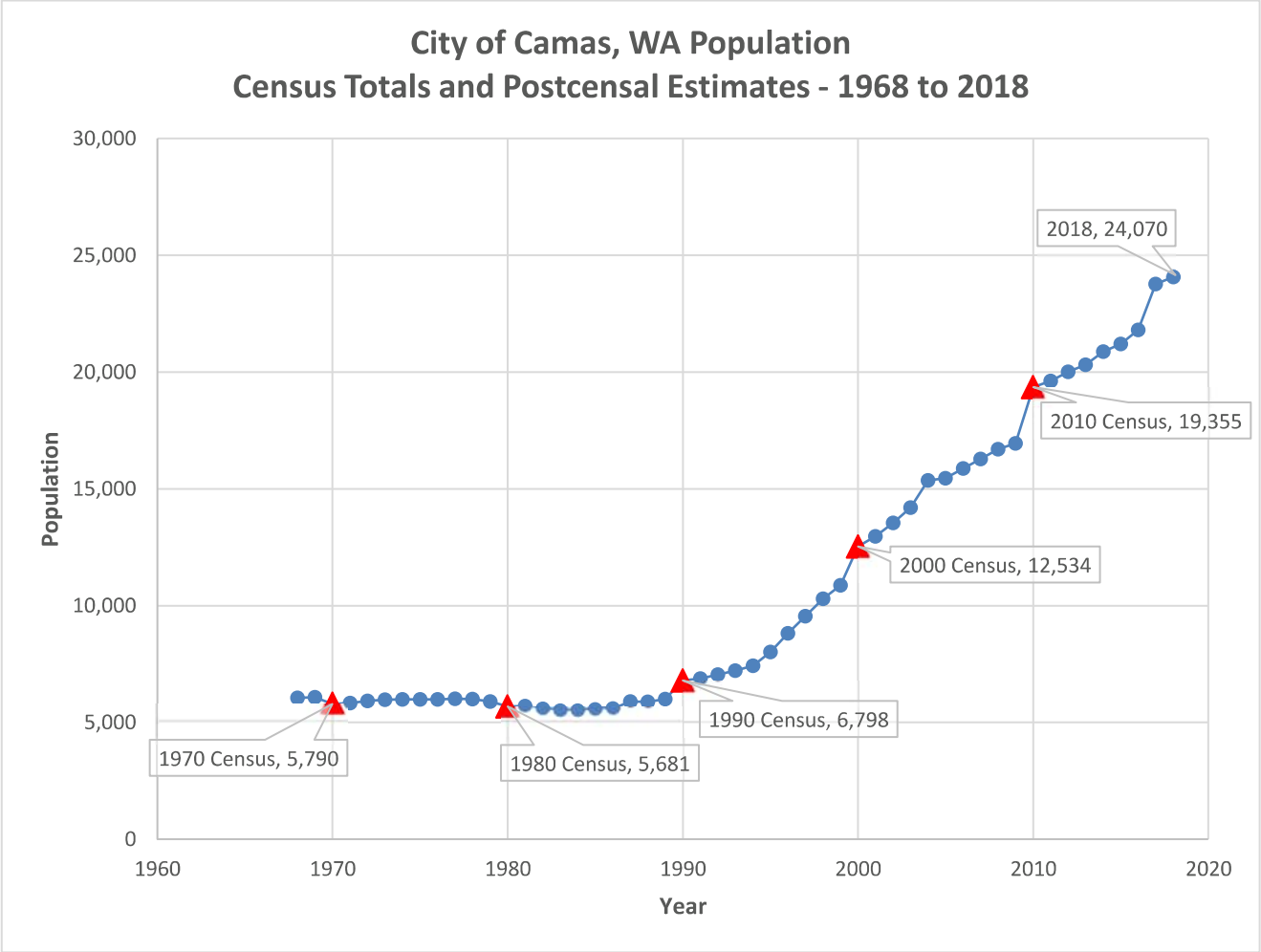
For the purposes of selecting an appropriate Base Year, the past twenty years of historical precipitation and plant influent flow data are reviewed annually. A summary of the monthly precipitation totals and influent flow averages for the past twenty years are included in Attachment A.

From analysis of the historical data, May 2011-April 2012 continues to best represent an average, annual rainfall in Camas and therefore continues to serve as the Base Year for the purposes of this report. For the twenty-year period of May 1, 1999 to April 30, 2019, the average 12-month rainfall in Camas was 45.18 inches. From May 1, 2011 to April 30th 2012, the rainfall was 47.60, which is approximately the 50th percentile of all twenty 12-month totals and only 2.42 inches more than the twenty-year average.

TABLE 1 - 12-Month May Through April Rainfall Totals, 1999-2018

	Average	Minimum	50th Percentile	Maximum
Annual Total Rainfall (in.)	45.18	31.44 (May 2018 – April 2019)	47.60 (May 2011-April 2012)	73.36 (May 2010-April 2011)

In addition to representing the 20-year median rainfall, using 2011-2012 as the "Base Year" incorporates the City's rapid growth that has occurred in the last 20 years. In I/I annual reports prior to 2016, the City of Camas had been using 1989 as the Base Year. Since 1989, the City of Camas has seen rapid growth in population and significant additions to its wastewater collection system. The May 2011-April 2012 period captures that growth, which has taken place primarily after 1990. The chart below illustrates the City's annual, calendar year, population growth since 1968:



Historical Population Estimates for Camas, WA by Washington State Office of Financial Management
(http://www.ofm.wa.gov/pop/april1/hseries/default.asp)

II. INFLOW AND INFILTRATION ANALYSIS

Facility Design Parameters

The maximum monthly hydraulic design capacity for the Camas Wastewater Treatment Plant (WWTP) is 6.10 million gallons per day (MGD) and has a peak hourly hydraulic design capacity of 13.44 MGD. The Design Population Equivalent for the Camas WWTP is 28,075.

Calculated I/I and Annual Rainfall 20-Year History

The following chart is a summary of the calculated I/I, the percent of maximum monthly design capacity the calculated I/I represents, the percentage increase or decrease of I/I from the previous year and the total rainfall for each reporting year from May 1999 to April 2019:

TABLE 2 – Camas Calculated I/I & Rainfall

Year	Calculated I/I (MGD)	I/I as % of Design Capacity	I/I % Increase/Decrease from Prior Year	Total 12-Month Rainfall (in.)
1999	1.047	17%	-30%	37.30
2000	1.587	26%	+52%	31.46
2001	1.260	21%	-21%	42.63
2002	1.069	18%	-15%	41.48
2003	1.258	21%	+18%	37.74
2004	0.661	11%	-47%	36.81
2005	2.093	34%	+217%	53.16
2006	1.400	23%	-33%	47.80
2007	2.145	35%	+53%	48.05
2008	0.911	15%	-58%	49.72
2009	1.242	20%	+36%	49.92
2010	1.615	26%	+30%	73.36
2011	1.511	25%	-6%	47.60
2012	2.340	38%	+55%	51.79
2013	0.591	10%	-75%	39.19
2014	0.985	16%	+67%	38.15
2015	2.277	37%	+131%	48.17
2016	1.920	31%	-16%	57.06
2017	1.021	17%	-47%	40.74
2018	1.052	17%	+3%	31.44
Average	**1.399**	**23%**	**18%**	**45.18**

Yellow Highlight = Base Year

Annual Report Form

Please see Attachment B for the Annual I/I Report form which summarizes the following data:

- The average monthly flow and total precipitation for each month, for the past three years.
- The calculated amount of I/I for each year.
- The percent of maximum monthly design capacity that each period's I/I represents.
- The population served by the facility, per month, for the past three years.
- The additional lengths of sewer lines added to the collection system, per month and per year, for the past three years.
- A summary of the I/I from the past three years, including a comparison with the selected Base Year (2011)

Charts

Please see Attachment C for several charts which plot I/I data to illustrate the following:

- Chart I: Comparison of precipitation versus influent flow for each month of the current reporting period.
- Chart II: Comparison of 12-month total precipitation and calculated I/I, for each year since the Base Year.
- Chart III: Monthly Average Influent Flow at the WWTP since the Base Year.
- Chart IV: Monthly Total Rainfall since the Base Year.

III. COLLECTION SYSTEM AND I/I REDUCTION PROJECTS AND MEASURES

Collection System Details

According the City of Camas' General Sewer/Wastewater Facility Plan, last updated in November 2009, the city sanitary collection system was comprised of approximately 462,000 linear feet (87.5 miles) of pipe. Since 2009, approximately 133,000 linear feet of sewer line has been added, giving Camas approximately 595,000 linear feet (113 miles) of sewer line, as of the end of 2018.

In 2018, the nearly twelve miles of new sanitary sewer line and three, new sanitary lift stations were added to the City of Camas sanitary collection system. The three new lift stations and the majority of the new sewer line were related to the City's North Shore Sewer Transmission System (NSSTS) project. The NSSTS project provided HDPE gravity sewer mains to support current and future development in the City's northern urban growth boundary, located East of Lacamas Lake.

Camas' collection system is comprised of a combination of both traditional gravity sewer, force mains, pressure sewer lines, and 27 lift stations. Please see Attachment B for the lengths of sewer lines added to the collection system, per month and per year, for the past three years.

Summary of I/I Reduction Projects

Please see Attachment D for a copy of "Table 7-6, Project Schedule" from the 2016 I/I Study. This table is the full list of I/I reduction projects that were proposed by the study, scheduled by year. Projects that are underway or have been competed are highlighted as indicated. Project completion date(s) are noted.

Mill Ditch Sewer Main Replacement

In the previous reporting period, the City completed the "Mill Ditch Sewer Main Replacement" project, which took place between the intersections of NE 1th & Adams St. to the intersection of NE 1th Ave. and Everett St., along the Georgia-Pacific Mill Ditch. The project replaced approximately 900 linear feet of deteriorated 15" concrete sewer pipe and 5 manhole structures. The 15" concrete main was replaced with 21" HDPE pipe.

The following is a summary of the work:

Project Name: Mill Ditch Sewer Main Replacement
Collection System Basin: 3s
Project Started: 10/16/2017
Project Competed: 04/16/2018
Total Funds Expended: $417,105.25
Total Sewer Line Replaced: 900
Total Manholes Replaced: 5

Due to the timing of the project's completion and the unseasonably dry spring our area experienced last year, flow monitoring to document I/I removal could not be conducted until after last year's I/I report was submitted. Therefore, we are providing those results and the I/I removal evaluation now.

Table 3 below summarizes the Basin 3s flows measured at Manhole 5-8-1, prior to and after the Mill Ditch sewer replacement project. Calculations for flows prior to the project were documented in our 2016 I/I Study, and were based on flow measurements from February 5, 2016 to February 23, 2016. Calculations for flows after the project are based on data collected by a flow meter placed in manhole 5-8-1 from March 19, 2019 to June 4, 2019.

As established in the 2016 I/I Study, inflow calculations assume a Winter Dry Weather Flow of 0.21521 MGD for combined Basins 3n, 3s and 4 measured at manhole 5-8-1, and 2.20 MGD for the entire city. Also, only measurements on peak influent flow days for the WWTP (those exceeding 3.6 MGD) were considered for inflow calculations. Table 4 summarizes the WWTP influent flow and rainfall for the two measurement periods.

TABLE 3 – Estimated Inflow Rates Before and After the Mill Ditch Sewer Replacement Work

Manhole	Basin Measured	Flow Meter Installed	Flow Meter Removed	Parameter	Daily Flows (MGD)		
					Min.	Ave.	Max.
MH 5-8-1 Before Project	3n, 3s, 4	2/5/2016	2/23/2016	Flow (MGD)	0.352	0.909	1.969
				Inflow (MGD)	0.680	1.114	1.617
				% of Total Camas Inflow	43.7%	**67.2%**	100%
MH 5-8-1 After Project	3n, 3s, 4	3/19/2019	6/4/2019	Flow (MGD)	0.460	0.795	2.496
				Inflow (MGD)	0.245	0.580	2.280
				% of Total Camas Inflow	79.2%	**85.1%**	91.6%

TABLE 4 – WWTP Influent Flow and Rainfall During Flow Measurement at Manhole 5-8-1

	Measurement Period	Daily Average WWTP Influent Flow (MGD)	Highest Daily WWTP Influent Flow (MGD)	Total Rainfall (in.)	Average Daily Rainfall (in.)
Before Project	2/5/16 – 2/23/16	3.370	4.882	3.74	0.197
After Project	3/19/19 - 6/4/19	2.277	5.008	6.38	0.082

Based upon the above inflow calculations, it appears that the I/I contribution from basins, 3n, 3s and 4 has actually increased since the Mill Ditch Sewer Replacement Project.

During flow monitoring in 2016, prior to the Mill Ditch project, Basins 3n, 3s and 4 contributed an average of 67.2% of the city's total inflow. Though the City's overall, calculated I/I has decreased since 2016, this year's flow monitoring conducted at manhole 5-8-1 indicates that the inflow contribution from basins 3n, 3s and 4 has increased to 85.1%. Therefore, the repairs to the Mill Ditch Sewer line do not appear to have resulted in a measurable reduction in the total I/I from sewer basins 3n, 3s and 4.

Though the reason for the increase is not immediately apparent, it seems it may be related to the size of the rain events captured in each monitoring period. We hope that this result will be clarified during our upcoming follow-up to the 2016 I/I Study, which will be submitted to Ecology in 2020.

View Ridge Court Sewer Replacement

On June 18, 2019, the City of Camas awarded a project to replace approximately 800 linear feet of existing 8" diameter concrete sewer pipe with new 8" PVC and 10" HDPE sewer pipe, between NW View Ridge Court and NW View Ridge Street. The work is also to include the replacement of four existing manholes and the replacement of all affected sewer laterals.

The following is a summary of the work:

Project Name: View Ridge Court Sewer Replacement
Collection System Basin: 10
Scheduled Project Start Date: 8/5/2019
Estimated Project Completion Date: 10/7/2019
Project Bid Amount: $369,709.04
Total Sewer Line to be Replaced (feet): 800
Total Manholes to be Replaced: 4

Though it was not mentioned in the 2016 I/I Study, this section of sewer pipe has since been identified as being badly deteriorated and is likely a major contributor of I&I into the City's sewer Basin 10. In the 2016 study, our South Prune Hill and West Camas pump stations were both identified as exceeding the 3.4:1 peaking factor criterion. Both of these pump stations are downstream of the sewer segment being repaired.

Flow monitoring of the View Ridge Court Sewer repair project will be conducted before and after the piping replacement occurs, and the results of which will be included in the 2019 I/I report that will be submitted in July of 2020.

If you have any questions regarding this report or require any additional information, please do not hesitate to contact me at (360) 834-3263 or via email at bbusch@cityofcamas.us.

Best Regards

Bob Busch
Wastewater Operations Supervisor

Cc: Sam Adams
Steve Wall

ATTACHMENT A - Camas 20-Year WWTP Influent Flow and Rainfall

WWTP Design Capacity	
Peak Day Design Flow (MGD):	10.04
Max. Monthly Average Design (MMAD) Flow (MGD):	6.10
Design Population Equivalent:	28,075

Monthly Average Influent Flow (MGD) - MAY 1, 1999 to APRIL 30, 2019

Month	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	AVG
May	1.694	1.490	1.413	1.542	1.622	1.953	2.607	2.177	2.064	2.056	2.255	2.370	2.563	2.446	2.576	2.299	2.155	2.259	2.263	1.946	**2.087**
June	1.678	1.410	1.423	1.547	1.520	1.996	2.083	2.095	1.997	2.092	1.918	2.833	2.190	2.480	2.149	2.623	2.118	2.244	2.019	1.983	**2.020**
July	1.619	1.471	1.358	1.458	1.483	1.832	1.925	2.023	1.954	1.903	1.904	1.973	1.994	2.129	2.015	2.915	2.028	2.135	1.831	1.828	**1.889**
August	1.618	1.364	1.334	1.420	1.450	2.011	1.981	2.050	1.948	2.015	1.921	1.955	2.029	2.093	2.033	3.284	2.088	2.112	1.881	1.890	**1.924**
September	1.598	1.449	1.336	1.434	1.549	1.948	2.031	2.087	2.035	1.971	1.963	2.055	2.062	2.079	2.454	2.935	2.187	2.169	1.985	1.884	**1.961**
October	1.588	1.930	1.486	1.447	1.619	2.089	2.212	2.101	2.252	2.013	2.078	2.226	2.148	2.518	2.324	2.961	2.292	3.185	2.262	2.035	**2.138**
November	2.396	2.951	2.014	1.500	1.903	2.202	2.700	3.423	2.484	2.391	2.510	3.057	2.653	3.312	2.528	2.849	2.867	3.312	2.764	2.178	**2.600**
December	2.008	1.972	2.594	2.066	2.573	2.494	3.086	3.148	3.465	2.433	2.580	3.364	2.396	3.540	2.556	2.560	4.305	3.191	2.465	2.648	**2.772**
January	2.273	1.653	2.399	2.431	2.708	2.262	4.018	2.798	4.094	2.814	3.146	3.042	3.222	2.995	2.606	2.810	3.548	2.988	2.852	2.480	**2.857**
February	2.162	1.673	2.128	2.220	2.414	2.165	2.584	2.754	2.643	2.061	2.567	2.648	2.748	2.522	2.422	2.863	3.251	4.031	2.405	2.880	**2.557**
March	1.831	1.751	2.199	2.488	1.887	2.345	2.576	2.819	2.442	2.504	2.388	3.570	3.505	4.419	2.314	2.784	3.099	3.442	2.552	2.156	**2.654**
April	1.349	1.689	1.770	2.052	1.627	2.156	2.377	2.327	2.302	2.327	2.308	2.904	2.898	2.428	2.191	2.425	2.321	2.643	2.710	2.639	**2.272**
AVG	**1.818**	**1.734**	**1.788**	**1.800**	**1.863**	**2.121**	**2.515**	**2.483**	**2.473**	**2.215**	**2.295**	**2.666**	**2.534**	**2.747**	**2.347**	**2.776**	**2.688**	**2.809**	**2.332**	**2.212**	**2.311**
MAX	**2.396**	**2.951**	**2.594**	**2.488**	**2.708**	**2.494**	**4.018**	**3.423**	**4.094**	**2.814**	**3.146**	**3.570**	**3.505**	**4.419**	**2.606**	**3.284**	**4.305**	**4.031**	**2.852**	**2.880**	**3.229**
MIN	**1.349**	**1.364**	**1.334**	**1.420**	**1.450**	**1.832**	**1.925**	**2.023**	**1.948**	**1.903**	**1.904**	**1.955**	**1.994**	**2.079**	**2.015**	**2.299**	**2.028**	**2.112**	**1.831**	**1.828**	**1.830**
Annual I/I	**1.047**	**1.587**	**1.260**	**1.069**	**1.258**	**0.661**	**2.093**	**1.400**	**2.145**	**0.911**	**1.242**	**1.615**	**1.511**	**2.340**	**0.591**	**0.985**	**2.277**	**1.920**	**1.021**	**1.052**	**1.399**
% of MMAD Flow	17%	26%	21%	18%	21%	11%	34%	23%	35%	15%	20%	26%	25%	38%	10%	16%	37%	31%	17%	17%	23%
% +/- vs Prior Year	11%	52%	-21%	-15%	18%	-47%	217%	-33%	53%	-58%	36%	30%	-6%	55%	-75%	67%	131%	-16%	-47%	3%	18%

YELLOW = BASE YEAR

Monthly Total Rainfall (in.) - MAY 1, 1999 to APRIL 30, 2019

Month	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	AVG
May	2.61	3.65	1.58	1.65	2.00	1.65	6.14	2.94	2.11	2.11	4.44	3.93	4.94	4.58	4.64	2.35	0.50	2.10	3.13	0.46	**2.88**
June	3.09	1.27	2.97	1.75	0.52	1.52	3.22	1.24	2.01	2.19	1.18	7.03	1.16	4.83	1.88	2.05	0.52	2.06	1.74	1.87	**2.21**
July	1.05	0.06	0.66	0.25	0.00	0.24	0.71	0.67	0.74	0.04	0.09	0.35	0.85	0.41	0.00	1.07	0.57	1.17	0.00	0.06	**0.45**
August	1.24	0.17	1.23	0.02	0.09	3.91	0.74	0.02	0.99	1.98	0.60	0.90	0.09	0.01	0.26	0.13	0.90	0.15	0.27	0.47	**0.71**
September	0.12	3.71	0.80	1.41	1.36	2.45	2.37	2.35	3.46	0.81	1.18	3.64	1.00	0.05	5.98	1.02	1.25	1.76	2.66	1.03	**1.92**
October	2.66	4.12	2.40	1.09	3.09	5.32	5.02	2.44	5.15	4.43	4.11	6.39	2.78	9.52	1.47	6.26	4.80	10.43	5.13	4.39	**4.55**
November	6.96	3.51	7.51	2.90	5.57	3.19	5.10	12.77	6.29	11.17	7.59	10.76	8.39	11.62	3.33	3.56	5.31	6.39	7.21	3.62	**6.64**
December	4.77	3.34	6.34	9.30	8.99	4.87	8.88	6.57	10.54	7.27	5.98	10.26	3.77	10.58	2.73	6.58	13.84	4.24	3.21	6.33	**6.92**
January	6.99	2.27	6.94	8.83	6.73	2.28	11.35	2.69	4.82	6.30	8.87	6.87	7.69	4.52	3.68	3.56	7.17	3.64	6.15	3.19	**5.73**
February	4.15	1.60	3.65	2.75	5.68	1.81	2.92	5.54	2.59	2.19	4.97	6.05	3.95	2.01	5.83	4.17	5.49	9.68	3.05	4.67	**4.14**
March	0.88	4.73	4.93	7.49	2.28	4.65	3.86	6.79	3.71	6.97	6.17	9.75	9.98	0.74	5.35	4.89	5.31	9.85	3.49	1.66	**5.17**
April	2.78	3.03	3.62	4.04	1.43	4.92	2.85	3.78	5.64	4.26	4.74	7.43	3.00	2.92	4.04	2.51	2.51	5.59	4.70	3.69	**3.87**
TOTAL	**37.30**	**31.46**	**42.63**	**41.48**	**37.74**	**36.81**	**53.16**	**47.80**	**48.05**	**49.72**	**49.92**	**73.36**	**47.60**	**51.79**	**39.19**	**38.15**	**48.17**	**57.06**	**40.74**	**31.44**	**45.18**
AVG	**3.11**	**2.62**	**3.55**	**3.46**	**3.15**	**3.07**	**4.43**	**3.98**	**4.00**	**4.14**	**4.16**	**6.11**	**3.97**	**4.32**	**3.27**	**3.18**	**4.01**	**4.76**	**3.40**	**2.62**	**3.76**
MAX	**6.99**	**4.73**	**7.51**	**9.30**	**8.99**	**5.32**	**11.35**	**12.77**	**10.54**	**11.17**	**8.87**	**10.76**	**9.98**	**11.62**	**5.98**	**6.58**	**13.84**	**10.43**	**7.21**	**6.33**	**9.01**
MIN	**0.12**	**0.06**	**0.66**	**0.02**	**0.00**	**0.24**	**0.71**	**0.02**	**0.74**	**0.04**	**0.09**	**0.35**	**0.09**	**0.01**	**0.00**	**0.13**	**0.50**	**0.15**	**0.00**	**0.06**	**0.20**

20-Year Rainfall Summary	
20-Year Average Annual Rainfall (in.):	**45.18**
20-Year Maximum Annual Rainfal (in.):	**73.36** (2010)
20-Year Minimum Annual Rainfall (in.):	**31.44** (2018)

City of Camas WWTP (WA0020249) - Annual Infiltration and Inflow Report

May 2016 to April 2019

WWTP Design Capacity

Peak Hourly Hydraulic Design Flow (MGD):	**13.44**
Maximum Monthly Average Design Flow (MGD):	**6.10**
Design Population Equivalent:	**28,075**

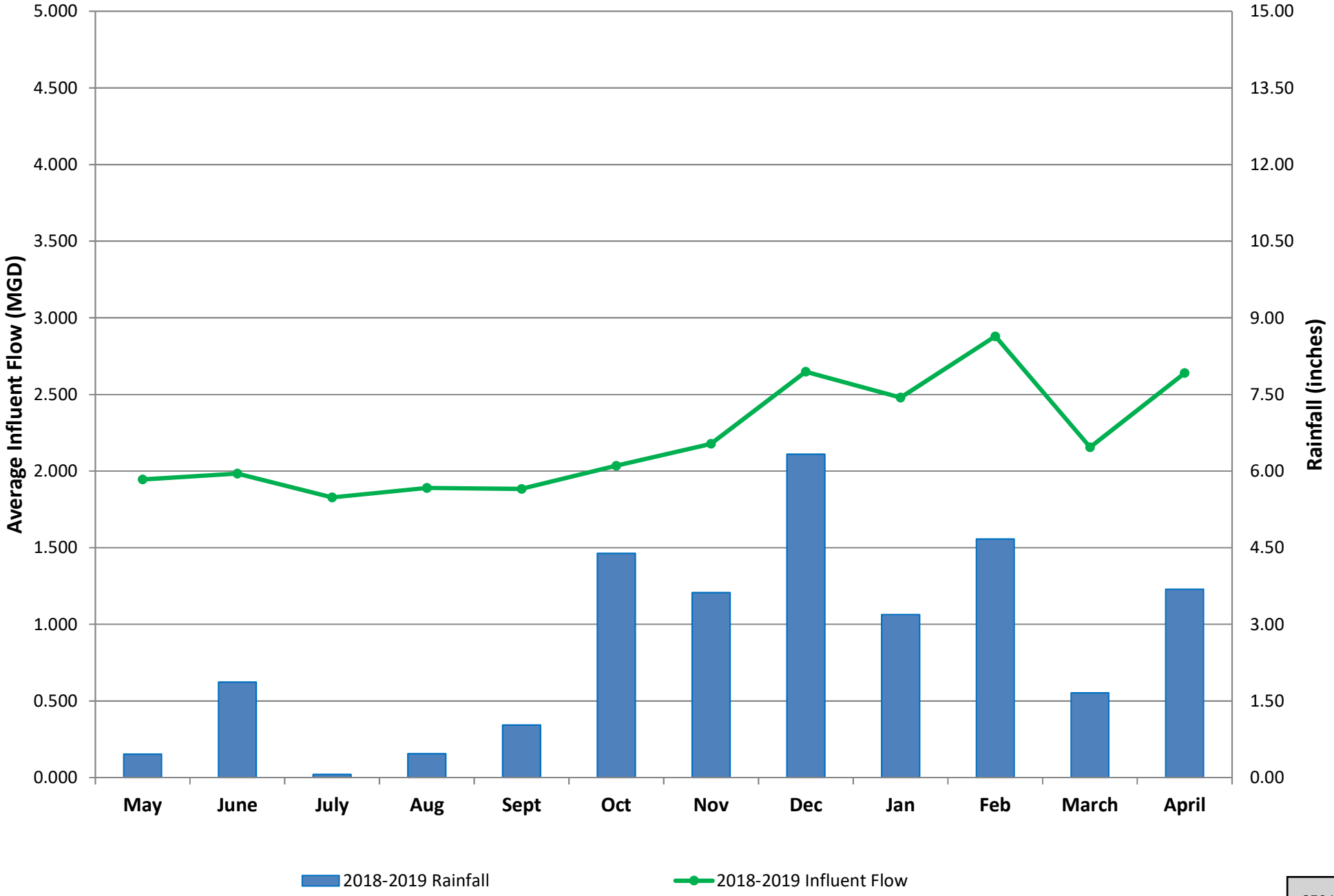
	Monthly Average WWTP Influent Flow (MGD)			Total Monthly Rainfall (inches)			Population Served			Additional Sewer Lines Added (ft.)		
Month	**2016**	**2017**	**2018**	**2016**	**2017**	**2018**	**2016**	**2017**	**2018**	**2016**	**2017**	**2018**
May	2.259	2.263	1.946	2.10	3.13	0.46	21,810	23,080	23,770	3,609	0	1,871
June	2.244	2.019	1.983	2.06	1.74	1.87	21,810	23,080	23,770	5,307	0	45,563
July	2.135	1.831	1.828	1.17	0.00	0.06	21,810	23,080	23,770	2,576	11,060	1,311
Aug	2.112	1.881	1.890	0.15	0.27	0.47	21,810	23,080	23,770	0	0	0
Sept	2.169	1.985	1.884	1.76	2.66	1.03	21,810	23,080	23,770	837	0	2,395
Oct	3.185	2.262	2.035	**10.43**	5.13	4.39	21,810	23,080	23,770	0	0	0
Nov	3.312	2.764	2.178	6.39	**7.21**	3.62	21,810	23,080	23,770	0	0	8,728
Dec	3.191	2.465	2.648	4.24	3.21	**6.33**	21,810	23,080	23,770	622	0	1,679
Jan	2.988	**2.852**	2.480	3.64	6.15	3.19	22,085	23,770	24,070	0	0	0
Feb	**4.031**	2.405	**2.880**	9.68	3.05	4.67	22,085	23,770	24,070	819	0	0
March	3.442	2.552	2.156	9.85	3.49	1.66	22,085	23,770	24,070	0	4,663	0
April	2.643	2.710	2.639	5.59	4.70	3.69	22,085	23,770	24,070	0	0	0
Period Total:	33.710	27.989	26.546	57.06	40.74	31.44				**Total Added (feet):**	13,770	15,723	61,547
Low Month:	2.112	1.831	1.828	0.15	0.00	0.06				**Total Added (miles):**	2.61	2.98	11.66
High Month:	**4.031**	**2.852**	**2.880**	**10.43**	**7.21**	**6.33**							
Annual Average:	2.809	2.332	2.212	4.76	3.40	2.62							
Period I/I:	1.920	1.021	1.052										

INFILTRATION/INFLOW SUMMARY

Year	I/I	% Increase/Decrease From Base I/I	% Increase/Decrease from Prior Year	% of Max Month. Design Flow	Total Rainfall
Base Year: 2011	***1.511***	***n/a***	***-6%***	***25%***	***47.60***
2016-2017	1.920	27%	131%	31%	48.17
2017-2018	1.021	-32%	-47%	17%	57.06
2018-2019	1.052	-30%	3%	17%	40.74

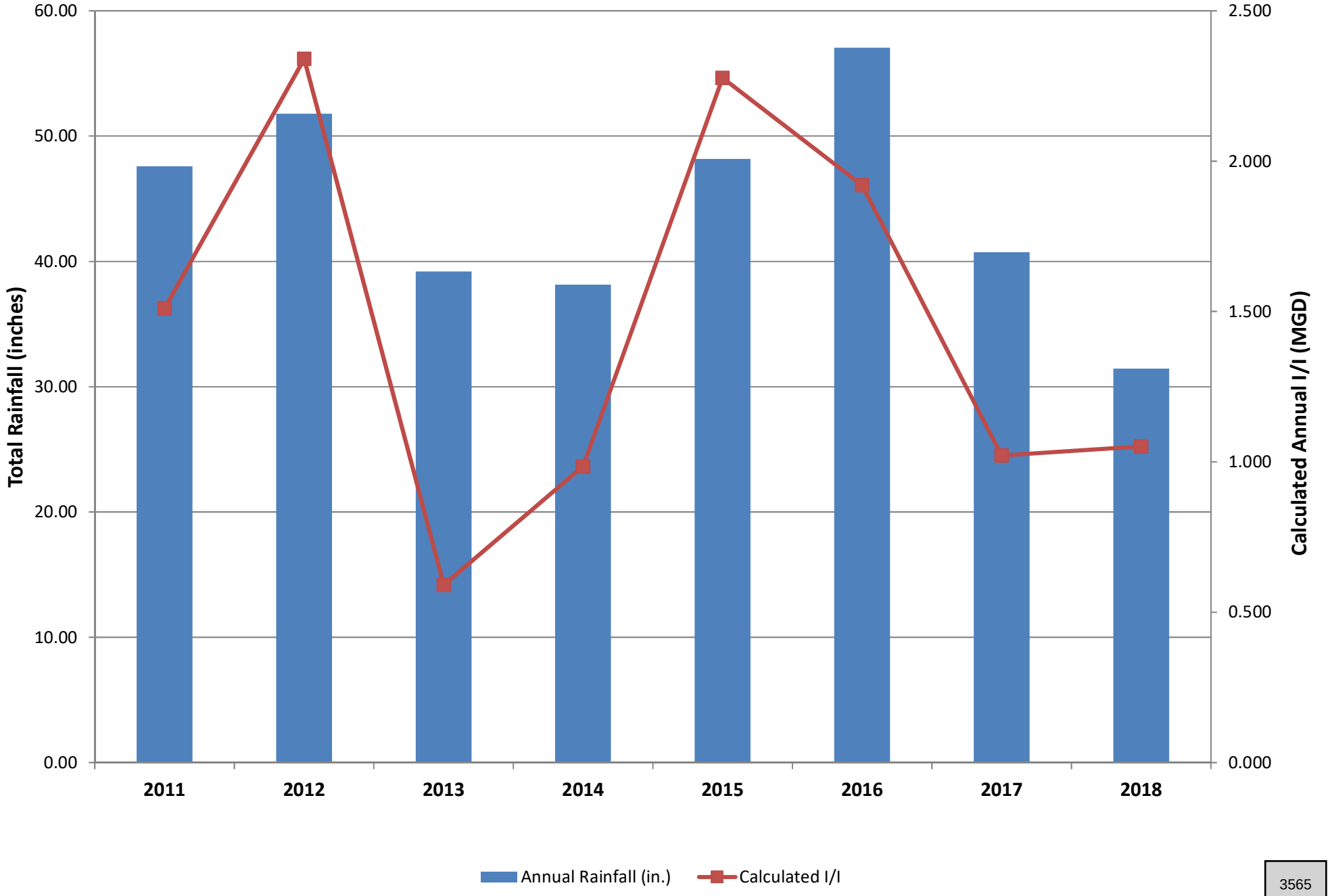
ATTACHMENT C, CHART I

May 2018 - April 2019 Monthly Average Influent Flow and Monthly Total Rainfall



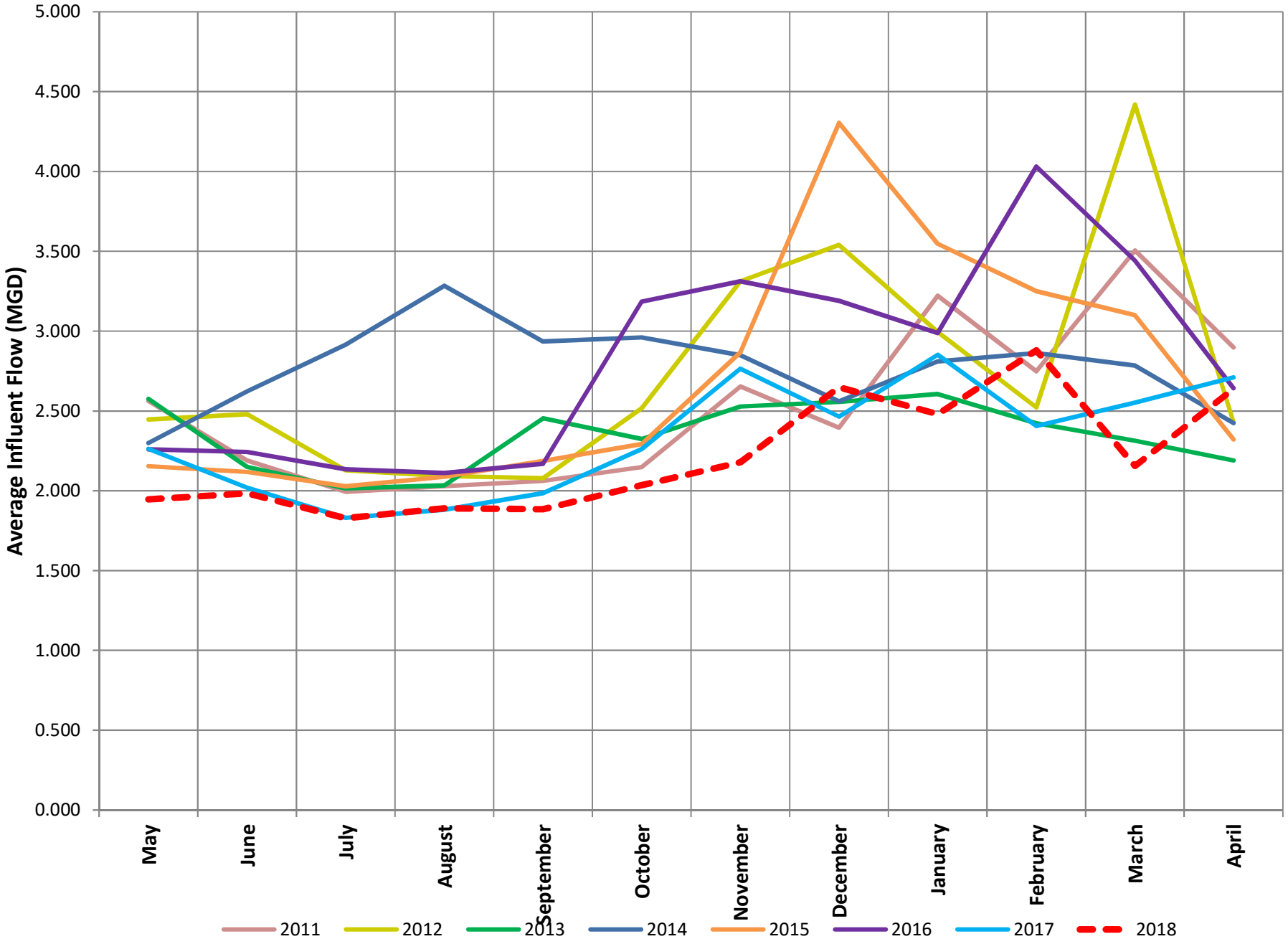
ATTACHMENT C, CHART II

Annual Rainfall & Calculated I/I Since Base Year (2011)



ATTACHMENT C, CHART III

WWTP Monthly Average Influent Flow Since Base Year (2011)



ATTACHMENT C, CHART IV

Monthly Total Rainfall Since Base Year (2011)

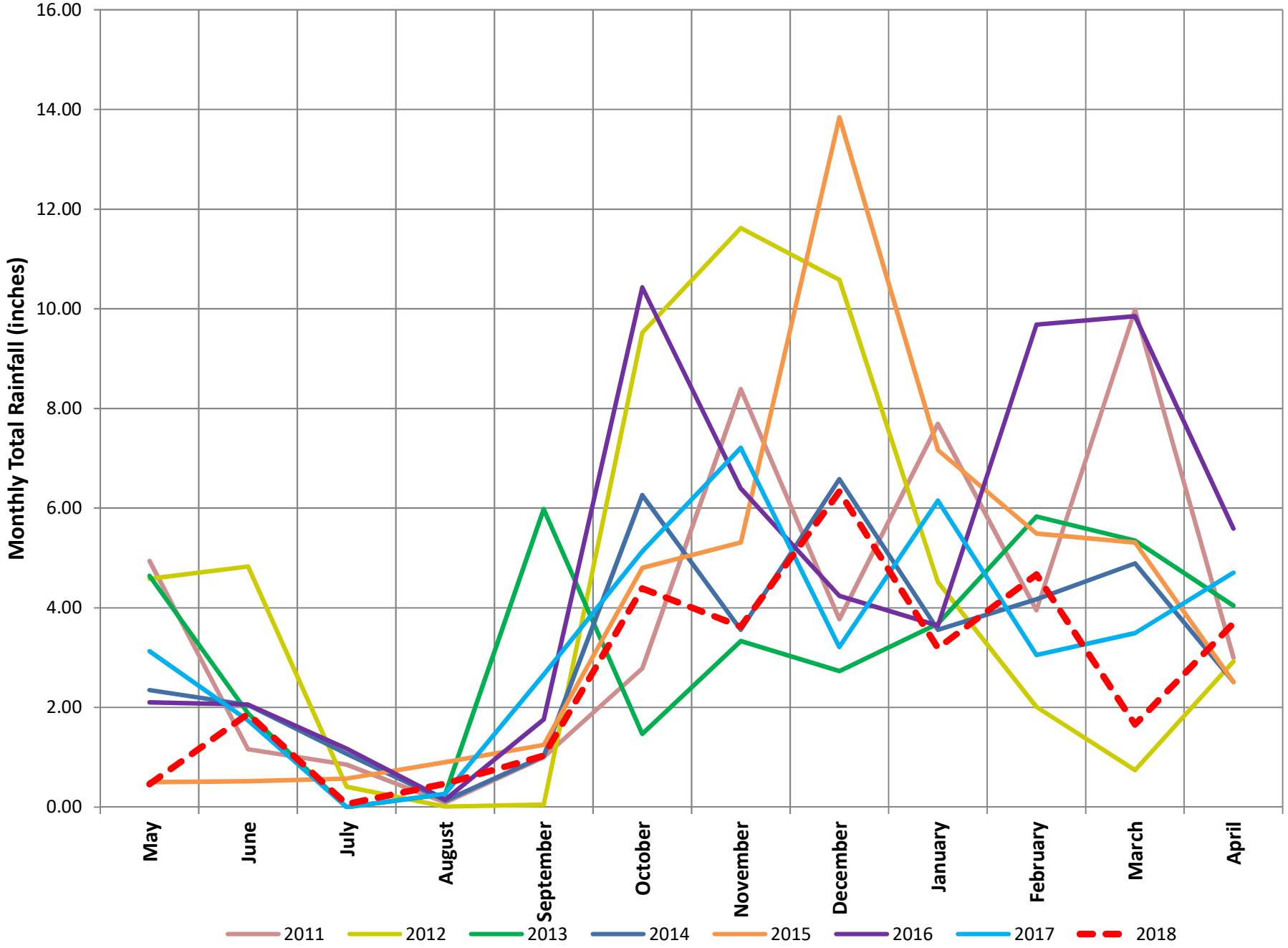


TABLE 7-6

Project Schedule[1]

COMPLETED	Year	Basin(s)	Location	Description	Cost
10/2016	2016	4	NE Franklin Street	Replace sewer line between MH 4-1-1 and MH 4-1-4	$250,000
03/2014	2016	3n	Basin 3n	Clean and Video All Sewer Lines in Basin 3n, begin Basin 3s (Note: Crown View Lift Station subbasin, 13,500 feet, was video inspected for the I/I study in the Spring, the remainder of Basin 3n will be cleaned/videoed in the fall of 2016)	$50,000
02/2018	2016	3s	Mill Ditch	Replaced section of sewer line between Dallas Street and Birch Street	$78,000
	2016	**Total Inflow Removal Projects (does not include cleaning and video inspection work)**			**$328,000**
02/2018	2017	3s	Mill Ditch	Rehabilitate or replace 15-inch CONC from MH 3-2-6 to 3-1-1 (1,370 ft).	$180,000
	2017	4	NE 23rd Avenue	Replace existing sewerline between Everett and Birch	$110,000
	2017	1, 2, 3n	Various (see Table 7-2)	Repair cleanouts /or replace missing/broken caps as needed at 13 locations.	$13,500
	2017	3n, 3s, 4, 5, 6	Various (see Table 7-2)	Disconnect Roof Drains at five residences.	$2,500
	2017	4, 5, 6, 10	Various (see Table 7-3)	Disconnect Stormwater Catch Basins from Sanitary Sewer at five locations.	$74,000
03/2014	2017	4, 3s	Basins 4 and 3s	Clean and Video Remaining Sewer Lines in Basin 3s and All Lines in Basin 4, begin video inspection of Basin 5.	$50,000
	2017	**Total Inflow Removal Projects (does not include cleaning and video inspection work)**			**$380,000**
	2018	4	Everett and 19th Avenue	Replace 1,140 feet of existing sewer line and manholes	$240,000
	2018	5	SE Adams Street	Slipline 18-inch CONC from MH 3-1-1 to 5-8-1 (446 ft).	$60,000
	2018	5	Various (see Table 7-3)	Replace three manholes (MHs 5-1-13, 5-1-15, 5-7-3).	$75,000
	2018	4, 5, 7	Various (see Table 7-3)	Modify below grade manhole lids (MHs 4-1-1, 4-1-12, 5-7-3, 7-3A-1).	$16,000
	2018	3s, 3n, 5	Various (see Table 7-4)	Seal leaks around pipes and regrout joints (MH 3-1-6, 3-6-4, 3-22-9, 3-1-44, 3-22-8, 3-221-3, 3-22B-2, 3-22C-2, 5-6-1).	$24,000
	2018	2	NW Drake Street	Fix sag in 8-inch HDPE between MH 2-3-5 and 2-3-3.	$20,000
	2018	3n	NW Kent Street	Repair broken 8-inch CONC pipe between MH3-21A-1 and 3-21-4.	$15,000
	2018	3s	NE Adams Street	Repair cracks, debris, holes in the 8-inch CONC pipe and laterals between MH 3-3-2 and 3-3-1.	$15,000
	2018	3s	NE Adams Street	Repair separated and offset joints, and broken pipe and check for return of roots in the 8-inch CONC pipe between MH 3-3-1 and 3-1-1.	$15,000

TABLE 7-6 – (continued)

Project Schedule[1]

Year	Basin(s)	Location	Description	Cost
2018	5	NE 5th Avenue	Repair cracks and separated and offset joints in the 8-inch VCP pipe between MH 5-7-3 and 5-7-2.	$20,000
2018	5, 6	Basins 5 and 6	Video and Clean Remainder of Basin 5, video inspection all of Basin 6 and begin video inspection of Basin 7.	$50,000
2018	**Total Inflow Removal Projects (completes all High Priority projects does not include I/I Report or Video Work)**			**$500,000**
2019	5	NE 6th Avenue	Repair cracks and offset joints in the 8-inch VCP pipe between MH 5-1-15 and 5-1-14	$20,000
2019	5	NE 6th Avenue	Repair broken lateral in the 8-inch VCP pipe between MH 5-1-13 and 5-1-12.	$15,000
2019	5	NE 6th Avenue	Repair broken pipe and voids in the 8-inch PVC pipe between MH 5-1-20 and 5-1-19. (265')	$15,000
2019	8	SE Russell Street	Fix lateral connection problems, and check for grease sags in 8-inch CONC pipe between MH 8-4-1 and 8-1-4.	$20,000
2019	10	NW 6th Avenue	Repair void and collapsed section of pipe in the 10-inch CONC pipe between MH 10-1-3 and 10-1-2.	$30,000
2019	10	NW 11th Avenue	Repair broken 8-inch CONC pipe between MH 10-1-31 and 10-1-30.	$15,000
2019	10	NW McIntosh Road	Slip line the 8-inch CONC pipe between MH 10-1-27 and 10-1-26.	$15,000
2019	N/A	N/A	I/I Report	$100,000
2019	7, 8, 9	Basins 7, 8, 9	Clean and Video Remainder of Basin 7 and All of Basins 8, 9 and 10.	$50,000
2019	**Total Inflow Removal Projects (completes all Medium High Priority projects does not include I/I Report or Video Work)**			**$130,000**
2020	3n	NW 29th Avenue	Repair broken 8-inch CONC pipe between MH 3-20B-1 and 3-20-6.	$15,000
2020	3n	NW 29th Circle	Repair cracked 8-inch CONC pipe between MH 3-1-60 and 3-1-59.	$15,000
2020	3n	NW 30th Avenue	Repair broken 8-inch CONC pipe between MH 3-21-7 and 3-21-4.	$15,000
2020	3n	NW 30th Avenue	Repair broken 8-inch CONC pipe between MH 3-21-4 and 3-21-3.	$15,000
2020	3n	NW 32nd Avenue	Repair separated and offset joints in the 8-inch CONC pipe between MH 3-1-43 and 3-1-42.	$15,000
2020	3n	NW 32nd Avenue	Repair cracked 8-inch CONC pipe between MH 3-1-41 and 3-1-39.	$15,000
2020	3n	NW Logan Street	Repair broken pipe in the 8-inch CONC pipe between MH 3-21-5 and 3-21-4.	$15,000

TABLE 7-6 – (continued)

Project Schedule[(1)]

Year	Basin(s)	Location	Description	Cost
2020	3n	NW Norwood Circle	Repair cracks in the 8-inch CONC pipe between CO – Norwood Cir A and CO – Norwood Cir B. (508')	$15,000
2020	3n	NW Sierra Drive	Repair cracks in the 8-inch CONC pipe between MH 3-22-7 and 3-22-6.	$15,000
2020	3n	NW Quartz Place	Repair cracks in the 8-inch CONC pipe between MH 3-22A-1 and 3-22-6.	$15,000
2020	**Total Inflow Removal Projects**			**$150,000**
2021	3n	NW Quartz Place	Remove roots in the 8-inch PVC pipe between MH 3-22-6 and 3-22-4 and repair pipe as needed.	$15,000
2021	3n	NW Norwood Circle	Repair cracks in the 8-inch CONC pipe between CO – Norwood Cir A and CO – Norwood Cir B.	$15,000
2021	3n	NW Sierra Drive	Repair cracks in the 8-inch CONC pipe between MH 3-22-7 and 3-22-6.	$15,000
2021	3n	NW Quartz Place	Repair cracks in the 8-inch CONC pipe between MH 3-22A-1 and 3-22-6.	$15,000
2021	3n	NW Quartz Place	Remove roots in the 8-inch PVC pipe between MH 3-22-6 and 3-22-4 and repair pipe as needed.	$15,000
2021	3s	NW 15th Avenue	Repair broken pipe, cracks and check for regrown roots in 8-inch CONC pipe between MH 3-4-8 and MH 3-4-7.	$15,000
2021	3s	NW 15th Avenue	Repair cracks and check for regrown roots in 8-inch CONC pipe between MH 3-4-7 and MH 3-4-6.	$15,000
2021	3s	NW 16th Avenue	Fix sag in 8-inch HDPE pipe between MH 3-6-2 and 3-6-1.	$20,000
2021	**Total Inflow Removal Projects**			**$135,000**
2022	3s	NW Ash Street	Fix sags in the 8-inch CONC pipe between MH 3-4A-4 and 3-4A-2.	$20,000
2022	3s	NW Ash Street	Fix sags in 8-inch HDPE pipe between MH 3-4A-4 and 3-4A-2.	$20,000
2022	3s	NW Ash Street	Repair broken pipe in the 8-inch HDPE pipe between MH 3-4A-2 and 3-4A-1.	$15,000
2022	3s	NW Benton Street	Repair broken pipe, cracks, and check for roots in 8-inch CONC pipe between MH 3-4-3 and MH 3-4-2.	$15,000
2022	3s	NE Birch Street	Repair separated and offset joints in the 8-inch CONC pipe between MH 3-2A-4 and 3-2A-3.	$20,000
2022	3s	NE Birch Street	Repair cracks and check for roots in the 8-inch CONC pipe between MH 3-2A-3 and 3-2A-2.	$15,000

TABLE 7-6 – (continued)

Project Schedule[1]

Year	Basin(s)	Location	Description	Cost
2022	3s	NE Birch Street	Repair broken pipe, fix sag and check for roots and in the 8-inch CONC pipe between MH 3-2A-2 and 3-2A-1.	$20,000
2022	3s	NE Birch Street	Repair separated and offset joints, and cracks and check for roots in the 8-inch CONC pipe between MH 3-2A-1 and 3-2-1.	$15,000
2022	**Total Inflow Removal Projects**			**$150,000**
2023	3s	NE Birch Street	Repair broken pipe, fix sag and check for roots and in the 8-inch CONC pipe between MH 3-2A-2 and 3-2A-1.	$15,000
2023	3s	NE Birch Street	Repair separated and offset joints, and cracks and check for roots in the 8-inch CONC pipe between MH 3-2A-1 and 3-2-1.	$15,000
2023	3s	NW Drake Way	Repair cracks in the 8-inch CONC pipe between MH 3-4B-4 and 3-4B-3.	$15,000
2023	3s	NW Drake Way	Repair broken pipe, cracks in the 8-inch CONC pipe between MH 3-4B-3 and 3-4B-2.	$15,000
2023	4	NW 19th Avenue	Repair cracks in the 8-inch VCP pipe between MH 4-7-8 and 4-7-7.	$15,000
2023	4	NW 19th Avenue	Repair cracks in the 8-inch PVC pipe between MH 4-7-7 and 4-7-6.	$15,000
2023	4	NW 19th Avenue	Repair cracks in the 8-inch VCP pipe between MH 4-7-6 and 4-7-5.	$15,000
2023	4	NE 19th Avenue	Repair broken pipe and cracks in the 8-inch VCP pipe between MH 4-7-3 and 4-7-2.	$15,000
2023	4	NE 19th Avenue	Repair cracks, check for roots, fix sag in the 8-inch VCP pipe between MH 4-7-2 and 4-7-1.	$15,000
2023	4	NW 21st Avenue	Repair broken 8-inch CONC pipe between MH 4-9-6 and 4-9-5.	$15,000
2023	**Total Inflow Removal Projects**			**$150,000**
2024	4	NW 21st Avenue	Repair broken 8-inch CONC pip and check for return of roots between MH 4-9-4 and 4-9-3.	$15,000
2024	4	NW 21st Avenue	Repair broken 8-inch CONC pipe between MH 4-9-3 and 4-9-2.	$15,000
2024	5	NE 4th Avenue	Fix sag and check for regrown roots in joints and laterals in the 8-inch VCP pipe between MH 5-6-3 and 5-6-2.	$20,000
2024	8	SE 7th Avenue	Fix lateral connection problems and sags and investigate signs of debris, in the 8 inch CONC pipe between MH 8-3A-1 and 8-3-1.	$20,000

TABLE 7-6 – (continued)

Project Schedule[1]

Year	Basin(s)	Location	Description	Cost
2024	8	SE 7th Avenue	Fix sags and check for debris and in the 8-inch CONC pipe between MH 8-3B-1 and 8-3-1.	$20,000
2024	8	SE 9th Avenue	Fix sags and check for debris in 12" CONC pipe between MH 8-1-4 and 8-1-3.	$20,000
2024	9	SE James Street	Repair cracks, check for debris and regrown roots in laterals, and fix sag in the 8 inch CONC pipe between MH 9-1-8 and 9-1-7. (440')	$20,000
2024	9	SE Whitney Street	Fix sag in the 8-inch CONC pipe between MH 9-4-3 and 9-4-2.	$20,000
2024	**Total Inflow Removal Projects**			**$150,000**
2025	9	SE Whitney Street	Fix sag in the 8-inch CONC pipe between MH 9-4-3 and 9-4-2.	$20,000
2025	10	NW 6th Avenue	Repair cracks and separated joints in the 10-inch PVC pipe between MH 10-1-2 and 10-1-1. (304')	$15,000
2025	10	NW Fremont Street	Repair cracks in the 8-inch CONC pipe between MH 10-8-1 and 10-1-22.	$15,000
2025	**Total Inflow Removal Projects (completes Medium Priority projects)**			**$50,000**
2026-2028	1	NW 8th Avenue	Repair crack in 8-inch PVC pipe between the cleanout and MH 1-3A-9. (350')	$15,000
2026-2028	2	NW 10th Avenue	Repair offset joint and sag in the 8-inch HDPE pipe between MH 2-3-7 and 2-3-6. (265')	$15,000
2026-2028	5	NE 4th Avenue	Repair cracks and check for return of roots in joints in the 8-inch VCP pipe between MH 5-6-1 and 5-1-10. (289')	$15,000
2026-2028	5	NE 6th Avenue	Repair broken pipe, offset joints, and check for regrown roots in the 6-inch VCP pipe and 6-inch DI pipe between MH 5-13-1 and 5-1-20. (369')	$20,000
2026-2028	6	SE 1st Avenue	Repair offset joint in the 8-inch pipe between MH 6-5-3 and 6-5-2.	$15,000
2026-2028	6	NE 4th Avenue	Repair offset joints in the 8-inch VCP pipe between MH 6-8-3 and 6-8-2.	$15,000
2026-2028	6	NE 4th Avenue	Repair cracks and offset joints in the 8-inch VCP pipe between MH 6-8-2 and 6-8-1. (314')	$15,000
2026-2028	6	NE 5th Avenue	Repair separated/offset joints and fix sag in the 8-inch VCP pipe between MH 6-7B-1 and 6-7B-2. (336')	$25,000

TABLE 7-6 – (continued)

Project Schedule[1]

Year	Basin(s)	Location	Description	Cost
2026-2028	7	NE 3rd Avenue	Repair cracks in the 8-inch CONC pipe between MH 7-8-2 and 7-8-1. (255')	$15,000
2026-2028	7	NE 3rd Avenue	Repair cracks and check for regrown roots in 8-inch CONC pipe between MH LH and 7-5-1A.	$15,000
2026-2028	7	NE 3rd Loop	Repair cracks and check for regrown roots in laterals and 8-inch CONC pipe between MH 7-1-8 and 7-1-7.	$15,000
2026-2028	8	SE Russell Street	Fix lateral connection problems in the 8-inch CONC pipe between MH 8-4-2 and 8-4-1.	$20,000
2026-2028	9	SE 1st Avenue	Repair cracks in the 8-inch CONC pipe between MH 9-3A-2 and 9-3A-1. (418')	$15,000
2026-2028	9	SE 1st Avenue	Fix sags in the 8-inch CONC pipe between MH 9-3A-1 and 9-3-1. (420')	$15,000
2026-2028	9	NE 2nd Avenue	Repair broken 8-inch CONC pipe between MH 9-1-5 and 9-1-4. (224')	$15,000
2026-2028	9	NE 3rd Avenue	Fix lateral connection problems, check for grease and roots in laterals in 8-inch CONC pipe between MH 9-5-6 and 9-5-5.	$15,000
2026-2028	9	NE 3rd Avenue	Repair cracks and check for grease in 8-inch CONC pipe between MH 9-5-5 and 9-5-4. (111')	$15,000
2026-2028	9	SE 3rd Avenue	Fix sags in the 8-inch CONC pipe between MH 9-6-2 and 9-6-1.	$20,000
2026-2028	9	SE James Street	Repair cracks, check for grease, and investigate sag in the 8-inch CONC pipe between MH 9-6-1 and 9-1-11. (337')	$15,000
2026-2028	9	SE James Street	Repair cracks and check for regrown roots in the 8-inch CONC pipe between MH 9-1-9 and 9-1-8. (380')	$15,000
2026-2028	**Total Inflow Removal projects (completes Low Priority projects)**			**$325,000**

(1) Project list will be reassessed and potentially modified each year to meet objectives.

City of Camas Washington
Public Works Department
616 NE 4th Avenue
Camas, WA 98607

July 14, 2021

Carey Cholski
Washington State Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: **May 2020 – April 2021 Annual Inflow and Infiltration Report**
City of Camas, WA Wastewater Treatment Facility (Permit No. WA0020249)

Ms. Cholski,

Pursuant to Section S4.E of our current NPDES Permit, enclosed is our annual Inflow and Infiltration (I/I) report. Section S4.E.3 of our permit states:

> *The Permittee must conduct an annual analysis of infiltration and inflow according to Ecology's guidance manual for treatment plant operators. This report shall consider the 12-month period May 1st through the following April 30th as the annual period and shall be submitted by July 15, 2017 and annually thereafter. This report shall include an update on the status of each inflow reduction project completed in fulfillment of S4.E.2 (above) including the funds expended or contractually obligated, and the proportion of the project completed as of the end of the reporting period. For each basin or sub-basin in which work has been done within the reporting period, the report shall include the estimated inflow rates before and after the project and the estimated effect on the overall Publicly Owned Treatment Works (POTW) inflow rate.*

According to Ecology's Information Manual for Treatment Plant Operators (Feb. 2004), an Annual I/I Report should include each of the following elements:

1. *The average monthly flow and total precipitation for each month for the past year together with a graph … plotting a comparison of precipitation versus influent flow.*
2. *The maximum monthly and peak hourly hydraulic design capacity for the plant.*
3. *The design population equivalent for the treatment plant and the population served by the facility, per month, for the past year.*

4. *The amount of I/I for each year since the base year and the percent of maximum monthly design capacity each year's I/I represents.*
5. *The percent increase or reduction in I/I for each year subsequent to the base year I/I.*
6. *The additional lengths of sewer lines added to the collection system, per month, for the past year. Also include a brief summary of any major sewer rehabilitation or I/I reduction projects.*

The following information and attachments are now being submitted to satisfy these requirements.

I. REPORTING PERIOD AND BASE YEAR

As described in Section S4.E.3 of our current NPDES permit, the annual period for our I/I report is May 1st through April 30th. Accordingly, please note that when this report refers to the "reporting period" or "year", it is referring to the 12-month period from May 1st through April 30th. For any particular year that is referenced in the report, it is denoting the May through April reporting year and the calendar year in which May falls.

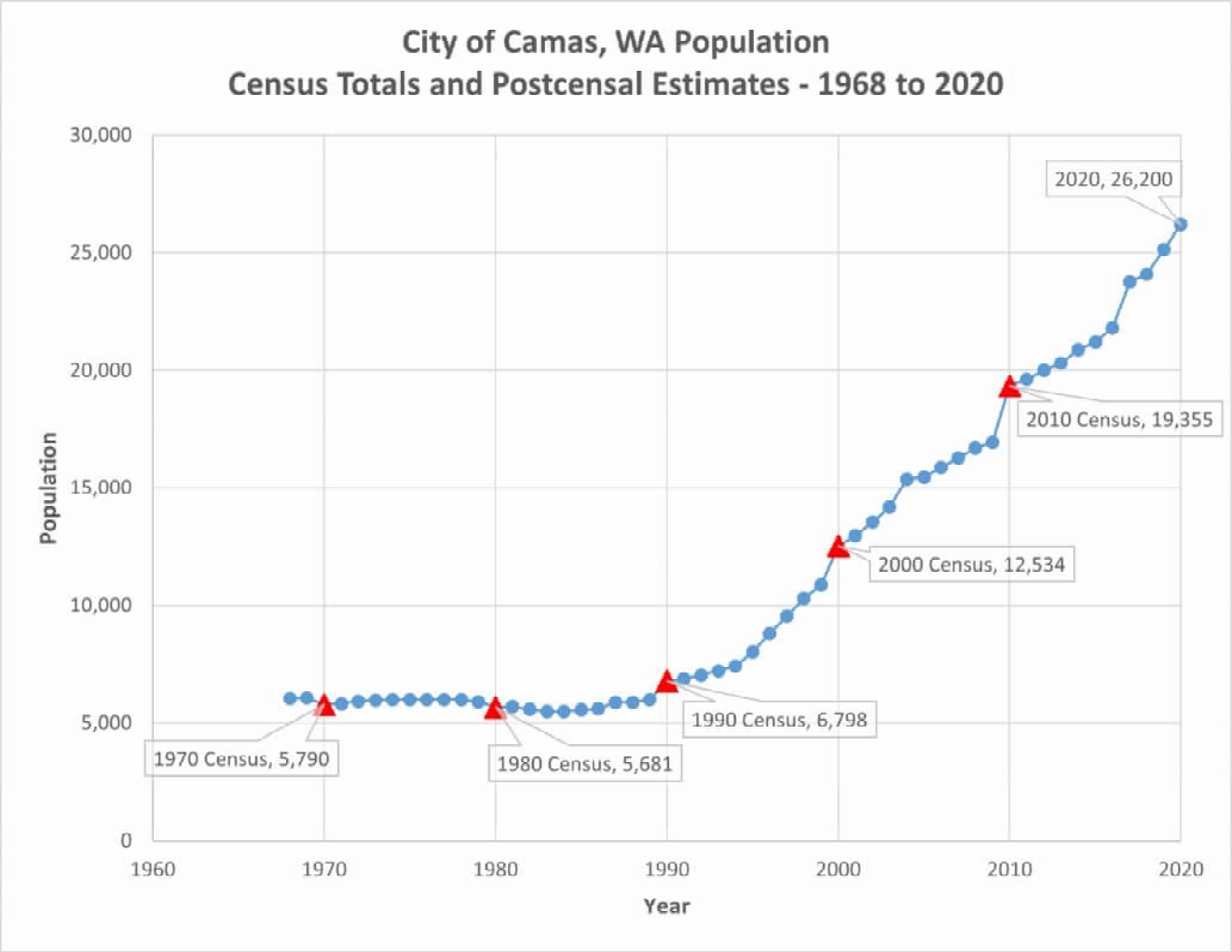
For the purposes of selecting an appropriate Base Year, the past twenty years of historical precipitation and plant influent flow data are reviewed annually. A summary of the monthly precipitation totals and influent flow averages for the past twenty years are included in Attachment A.

From analysis of the historical data, May 2011-April 2012 continues to best represent an average, annual rainfall in Camas and therefore continues to serve as the Base Year for the purposes of this report. For the twenty-year period of May 1, 2001 to April 30, 2021, the average 12-month rainfall in Camas was 45.57 inches. From May 1, 2011 to April 30th 2012, the rainfall was 47.60, which is approximately the 50th percentile of all twenty 12-month totals and only 2.03 inches more than the twenty-year average.

TABLE 1 - 12-Month May Through April Rainfall Totals, 2001-2020

	Average	Minimum	50th Percentile	Maximum
Annual Total Rainfall (in.)	45.57	28.35 (May 2019 – April 2020)	47.60 (May 2011-April 2012)	73.36 (May 2010-April 2011)

In addition to representing the 20-year median rainfall, using 2011-2012 as the "Base Year" incorporates the City's rapid growth that has occurred in the last 20 years. In I/I annual reports prior to 2016, the City of Camas had been using 1989 as the Base Year. Since 1989, the City of Camas has seen rapid growth in population and significant additions to its wastewater collection system. The May 2011-April 2012 period captures that growth, which has taken place primarily after 1990. The chart below illustrates the City's annual, calendar year, population growth since 1968:



Historical Population Estimates for Camas, WA by Washington State Office of Financial Management
(https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/april-1-official-population-estimates)

II. INFLOW AND INFILTRATION ANALYSIS

Facility Design Parameters

The maximum monthly hydraulic design capacity for the Camas Wastewater Treatment Plant (WWTP) is 6.10 million gallons per day (MGD) and has a peak hourly hydraulic design capacity of 13.44 MGD. The Design Population Equivalent for the Camas WWTP is 28,075.

Calculated I/I and Annual Rainfall 20-Year History

The following chart is a summary of the calculated I/I, the percent of maximum monthly design capacity the calculated I/I represents, the percentage increase or decrease of I/I from the previous year and the total rainfall for each reporting year from May 2001 to April 2021:

TABLE 2 – Camas Calculated I/I & Rainfall

Year	Calculated I/I (MGD)	I/I as % of Design Capacity	I/I % Increase/Decrease from Prior Year	Total 12-Month Rainfall (in.)
2001	1.260	21%	-21%	42.63
2002	1.069	18%	-15%	41.48
2003	1.258	21%	+18%	37.74
2004	0.661	11%	-47%	36.81
2005	2.093	34%	+217%	53.16
2006	1.400	23%	-33%	47.80
2007	2.145	35%	+53%	48.05
2008	0.911	15%	-58%	49.72
2009	1.242	20%	+36%	49.92
2010	1.615	26%	+30%	73.36
2011	1.511	25%	-6%	47.60
2012	2.340	38%	+55%	51.79
2013	0.591	10%	-75%	39.19
2014	0.985	16%	+67%	38.15
2015	2.277	37%	+131%	48.17
2016	1.920	31%	-16%	57.06
2017	1.021	17%	-47%	40.74
2018	1.052	17%	+3%	31.44
2019	1.541	25%	+47%	28.35
2020	1.334	22%	-13%	48.24
Average	**1.411**	**23%**	**18%**	**45.57**

Yellow Highlight = Base Year

Annual Report Form

Please see Attachment B for the Annual I/I Report form which summarizes the following data:

- The average monthly flow and total precipitation for each month, for the past three years.
- The calculated amount of I/I for each year.
- The percent of maximum monthly design capacity that each period's I/I represents.
- The population served by the facility, per month, for the past three years.
- The additional lengths of sewer lines added to the collection system, per month and per year, for the past three years.
- A summary of the I/I from the past three years, including a comparison with the selected Base Year (2011)

Charts

Please see Attachment C for several charts which plot I/I data to illustrate the following:

- Chart I: Comparison of precipitation versus influent flow for each month of the current reporting period.
- Chart II: Comparison of 12-month total precipitation and calculated I/I, for each year since the Base Year.
- Chart III: Monthly Average Influent Flow at the WWTP since the Base Year.
- Chart IV: Monthly Total Rainfall since the Base Year.

III. COLLECTION SYSTEM AND I/I REDUCTION PROJECTS AND MEASURES

Collection System Details

According to the City of Camas' General Sewer/Wastewater Facility Plan, last updated in November 2009, the city sanitary collection system was comprised of approximately 462,000 linear feet (87.5 miles) of pipe. Since 2009, approximately 152,000 linear feet of sewer line has been added, giving Camas approximately 614,000 linear feet (116 miles) of sewer line, as of the end of 2020.

In 2020, approximately 12,000 linear feet of new sanitary sewer line were added to the City's system. The majority of that total (approximately 9,000 linear feet) was connected to several residential developments added during the year. Approximately 3,000 linear feet of sewer were added as a part of our Lacamas Creek Lift Station Improvement project, which saw the construction of two new sanitary lift stations.

Camas' collection system is comprised of a combination of both traditional gravity sewer, force mains, pressure sewer lines, and 27 lift stations. Please see Attachment B for the lengths of sewer lines added to the collection system, per month and per year, for the past three years.

Sewer Improvement and I/I Reduction Projects

The Lacamas Creek Lift Station Improvements project mentioned above, included the removal and/or abandonment of approximately 1,500 linear feet of aging sewer line, and the complete replacement of lift station that was originally built in 1958. The project saw the removal of a 300-linear-foot, 10 inch, steel gravity which traversed the creek; the abandonment of a 1,600-linear-foot, 6 inch, asbestos-cement forcemain; and the removal of the 62 year old pump station-all of which were within Lacamas Creek's 100-year floodplain. Though there were no projects that took place in the reporting year (May 2020 – April 2021) which were specifically targeted at I/I reduction, the Lacamas Creek Lift Station Improvements project arguably helped to decrease existing sources of inflow and/or infiltration and mitigate the potential for future I/I within its basin.

If you have any questions regarding this report or require any additional information, please do not hesitate to contact me at (360) 834-3263 or via email at bbusch@cityofcamas.us.

Best Regards,



Bob Busch
Wastewater Operations Supervisor

Cc: Sam Adams
Steve Wall

ATTACHMENT A - Camas 20-Year WWTP Influent Flow and Rainfall

WWTP Design Capacity	
Peak Day Design Flow (MGD):	10.04
Max. Monthly Average Design (MMAD) Flow (MGD):	6.10
Design Population Equivalent:	28,075

Monthly Average Influent Flow (MGD) - MAY 1, 2001 to APRIL 30, 2021

Month	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	AVG
May	1.413	1.542	1.622	1.953	2.607	2.177	2.064	2.056	2.255	2.370	2.563	2.446	2.576	2.299	2.155	2.259	2.263	1.946	2.050	2.319	**2.147**
June	1.423	1.547	1.520	1.996	2.083	2.095	1.997	2.092	1.918	2.833	2.190	2.480	2.149	2.623	2.118	2.244	2.019	1.983	1.992	2.409	**2.085**
July	1.358	1.458	1.483	1.832	1.925	2.023	1.954	1.903	1.904	1.973	1.994	2.129	2.015	2.915	2.028	2.135	1.831	1.828	1.961	1.972	**1.931**
August	1.334	1.420	1.450	2.011	1.981	2.050	1.948	2.015	1.921	1.955	2.029	2.093	2.033	3.284	2.088	2.112	1.881	1.890	1.943	2.043	**1.974**
September	1.336	1.434	1.549	1.948	2.031	2.087	2.035	1.971	1.963	2.055	2.062	2.079	2.454	2.935	2.187	2.169	1.985	1.884	2.151	2.192	**2.025**
October	1.486	1.447	1.619	2.089	2.212	2.101	2.252	2.013	2.078	2.226	2.148	2.518	2.324	2.961	2.292	3.185	2.262	2.035	2.199	2.231	**2.184**
November	2.014	1.500	1.903	2.202	2.700	3.423	2.484	2.391	2.510	3.057	2.653	3.312	2.528	2.849	2.867	3.312	2.764	2.178	2.143	2.691	**2.574**
December	2.594	2.066	2.573	2.494	3.086	3.148	3.465	2.433	2.580	3.364	2.396	3.540	2.556	2.560	4.305	3.191	2.465	2.648	2.461	2.991	**2.846**
January	2.399	2.431	2.708	2.262	4.018	2.798	4.094	2.814	3.146	3.042	3.222	2.995	2.606	2.810	3.548	2.988	2.852	2.480	3.484	3.306	**3.000**
February	2.128	2.220	2.414	2.165	2.584	2.754	2.643	2.061	2.567	2.648	2.748	2.522	2.422	2.863	3.251	4.031	2.405	2.880	2.644	3.222	**2.659**
March	2.199	2.488	1.887	2.345	2.576	2.819	2.442	2.504	2.388	3.570	3.505	4.419	2.314	2.784	3.099	3.442	2.552	2.156	2.476	2.470	**2.722**
April	1.770	2.052	1.627	2.156	2.377	2.327	2.302	2.327	2.308	2.904	2.898	2.428	2.191	2.425	2.321	2.643	2.710	2.639	2.330	2.139	**2.344**
AVG	**1.788**	**1.800**	**1.863**	**2.121**	**2.515**	**2.483**	**2.473**	**2.215**	**2.295**	**2.666**	**2.534**	**2.747**	**2.347**	**2.776**	**2.688**	**2.809**	**2.332**	**2.212**	**2.320**	**2.499**	**2.374**
MAX	**2.594**	**2.488**	**2.708**	**2.494**	**4.018**	**3.423**	**4.094**	**2.814**	**3.146**	**3.570**	**3.505**	**4.419**	**2.606**	**3.284**	**4.305**	**4.031**	**2.852**	**2.880**	**3.484**	**3.306**	**3.301**
MIN	**1.334**	**1.420**	**1.450**	**1.832**	**1.925**	**2.023**	**1.948**	**1.903**	**1.904**	**1.955**	**1.994**	**2.079**	**2.015**	**2.299**	**2.028**	**2.112**	**1.831**	**1.828**	**1.943**	**1.972**	**1.890**
Annual I/I	**1.260**	**1.069**	**1.258**	**0.661**	**2.093**	**1.400**	**2.145**	**0.911**	**1.242**	**1.615**	**1.511**	**2.340**	**0.591**	**0.985**	**2.277**	**1.920**	**1.021**	**1.052**	**1.541**	**1.334**	**1.411**
% of MMAD Flow	21%	18%	21%	11%	34%	23%	35%	15%	20%	26%	25%	38%	10%	16%	37%	31%	17%	17%	25%	22%	23%
% +/- vs Prior Year	11%	-15%	18%	-47%	217%	-33%	53%	-58%	36%	30%	-6%	55%	-75%	67%	131%	-16%	-47%	3%	47%	-13%	18%

YELLOW = BASE YEAR

Monthly Total Rainfall (in.) - MAY 1, 2001 to APRIL 30, 2021

Month	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	AVG
May	1.58	1.65	2.00	1.65	6.14	2.94	2.11	2.11	4.44	3.93	4.94	4.58	4.64	2.35	0.50	2.10	3.13	0.46	2.10	3.37	**2.84**
June	2.97	1.75	0.52	1.52	3.22	1.24	2.01	2.19	1.18	7.03	1.16	4.83	1.88	2.05	0.52	2.06	1.74	1.87	0.80	5.54	**2.30**
July	0.66	0.25	0.00	0.24	0.71	0.67	0.74	0.04	0.09	0.35	0.85	0.41	0.00	1.07	0.57	1.17	0.00	0.06	0.70	0.09	**0.43**
August	1.23	0.02	0.09	3.91	0.74	0.02	0.99	1.98	0.60	0.90	0.09	0.01	0.26	0.13	0.90	0.15	0.27	0.47	0.75	0.33	**0.69**
September	0.80	1.41	1.36	2.45	2.37	2.35	3.46	0.81	1.18	3.64	1.00	0.05	5.98	1.02	1.25	1.76	2.66	1.03	3.42	4.77	**2.14**
October	2.40	1.09	3.09	5.32	5.02	2.44	5.15	4.43	4.11	6.39	2.78	9.52	1.47	6.26	4.80	10.43	5.13	4.39	3.95	2.45	**4.53**
November	7.51	2.90	5.57	3.19	5.10	12.77	6.29	11.17	7.59	10.76	8.39	11.62	3.33	3.56	5.31	6.39	7.21	3.62	1.65	7.13	**6.55**
December	6.34	9.30	8.99	4.87	8.88	6.57	10.54	7.27	5.98	10.26	3.77	10.58	2.73	6.58	13.84	4.24	3.21	6.33	3.08	7.96	**7.07**
January	6.94	8.83	6.73	2.28	11.35	2.69	4.82	6.30	8.87	6.87	7.69	4.52	3.68	3.56	7.17	3.64	6.15	3.19	6.71	8.64	**6.03**
February	3.65	2.75	5.68	1.81	2.92	5.54	2.59	2.19	4.97	6.05	3.95	2.01	5.83	4.17	5.49	9.68	3.05	4.67	1.44	4.62	**4.15**
March	4.93	7.49	2.28	4.65	3.86	6.79	3.71	6.97	6.17	9.75	9.98	0.74	5.35	4.89	5.31	9.85	3.49	1.66	2.97	2.63	**5.17**
April	3.62	4.04	1.43	4.92	2.85	3.78	5.64	4.26	4.74	7.43	3.00	2.92	4.04	2.51	2.51	5.59	4.70	3.69	0.78	0.71	**3.66**
TOTAL	**42.63**	**41.48**	**37.74**	**36.81**	**53.16**	**47.80**	**48.05**	**49.72**	**49.92**	**73.36**	**47.60**	**51.79**	**39.19**	**38.15**	**48.17**	**57.06**	**40.74**	**31.44**	**28.35**	**48.24**	**45.57**
AVG	**3.55**	**3.46**	**3.15**	**3.07**	**4.43**	**3.98**	**4.00**	**4.14**	**4.16**	**6.11**	**3.97**	**4.32**	**3.27**	**3.18**	**4.01**	**4.76**	**3.40**	**2.62**	**2.36**	**4.02**	**3.80**
MAX	**7.51**	**9.30**	**8.99**	**5.32**	**11.35**	**12.77**	**10.54**	**11.17**	**8.87**	**10.76**	**9.98**	**11.62**	**5.98**	**6.58**	**13.84**	**10.43**	**7.21**	**6.33**	**6.71**	**8.64**	**9.20**
MIN	**0.66**	**0.02**	**0.00**	**0.24**	**0.71**	**0.02**	**0.74**	**0.04**	**0.09**	**0.35**	**0.09**	**0.01**	**0.00**	**0.13**	**0.50**	**0.15**	**0.00**	**0.06**	**0.70**	**0.09**	**0.23**

20-Year Rainfall Summary	
20-Year Average Annual Rainfall (in.):	**45.57**
20-Year Maximum Annual Rainfal (in.):	**73.36** (2010)
20-Year Minimum Annual Rainfall (in.):	**28.35** (2019)

City of Camas WWTP (WA0020249) - Annual Infiltration and Inflow Report

May 2018 to April 2021

WWTP Design Capacity

Peak Hourly Hydraulic Design Flow (MGD):	**13.44**
Maximum Monthly Average Design Flow (MGD):	**6.10**
Design Population Equivalent:	**28,075**

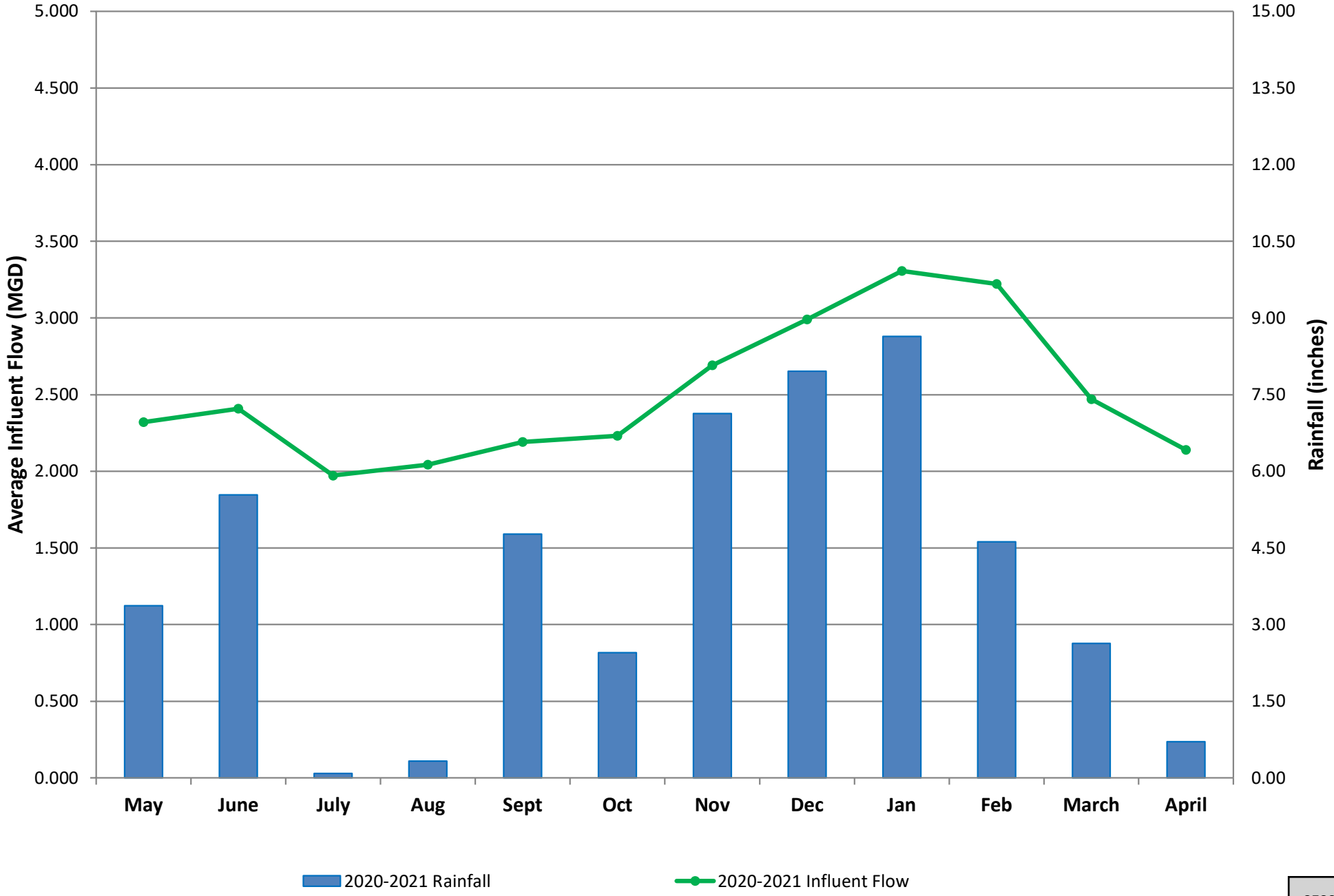
	Monthly Average WWTP Influent Flow (MGD)			Total Monthly Rainfall (inches)			Population Served			Additional Sewer Lines Added (ft.)		
Month	**2018**	**2019**	**2020**	**2018**	**2019**	**2020**	**2018**	**2019**	**2020**	**2018**	**2019**	**2020**
May	1.946	2.050	2.319	0.46	2.10	3.37	23,770	24,090	25,140	1,871	0	0
June	1.983	1.992	2.409	1.87	0.80	5.54	23,770	24,090	25,140	45,563	0	0
July	1.828	1.961	1.972	0.06	0.70	0.09	23,770	24,090	25,140	1,311	2,060	3,130
Aug	1.890	1.943	2.043	0.47	0.75	0.33	23,770	24,090	25,140	0	0	1,910
Sept	1.884	2.151	2.192	1.03	3.42	4.77	23,770	24,090	25,140	2,395	0	4,171
Oct	2.035	2.199	2.231	4.39	3.95	2.45	23,770	24,090	25,140	0	0	3,076
Nov	2.178	2.143	2.691	3.62	1.65	7.13	23,770	24,090	25,140	8,728	0	0
Dec	2.648	2.461	2.991	**6.33**	3.08	7.96	23,770	24,090	25,140	1,323	722	0
Jan	2.480	**3.484**	**3.306**	3.19	**6.71**	**8.64**	24,090	25,140	26,200	356	3,026	0
Feb	**2.880**	2.644	3.222	4.67	1.44	4.62	24,090	25,140	26,200	12,100	0	0
March	2.156	2.476	2.470	1.66	2.97	2.63	24,090	25,140	26,200	0	225	0
April	2.639	2.330	2.139	3.69	0.78	0.71	24,090	25,140	26,200	0	0	0
Period Total:	26.546	27.834	29.984	31.44	28.35	48.24						
Low Month:	1.828	1.943	1.972	0.06	0.70	0.09						
High Month:	**2.880**	**3.484**	**3.306**	**6.33**	**6.71**	**8.64**						
Annual Average:	2.212	2.320	2.499	2.62	2.36	4.02						
Period I/I:	1.052	1.541	1.334									
									Total Added (feet):	73,647	6,033	12,287
									Total Added (miles):	13.95	1.14	2.33

INFILTRATION/INFLOW SUMMARY

Year	I/I	% Increase/Decrease From Base I/I	% Increase/Decrease from Prior Year	% of Max Month. Design Flow	Total Rainfall
Base Year: 2011	***1.511***	***n/a***	***-6%***	***25%***	***47.60***
2018-2019	1.052	-30%	131%	17%	31.44
2019-2020	1.541	2%	47%	25%	28.35
2020-2021	1.334	-12%	-13%	22%	48.24

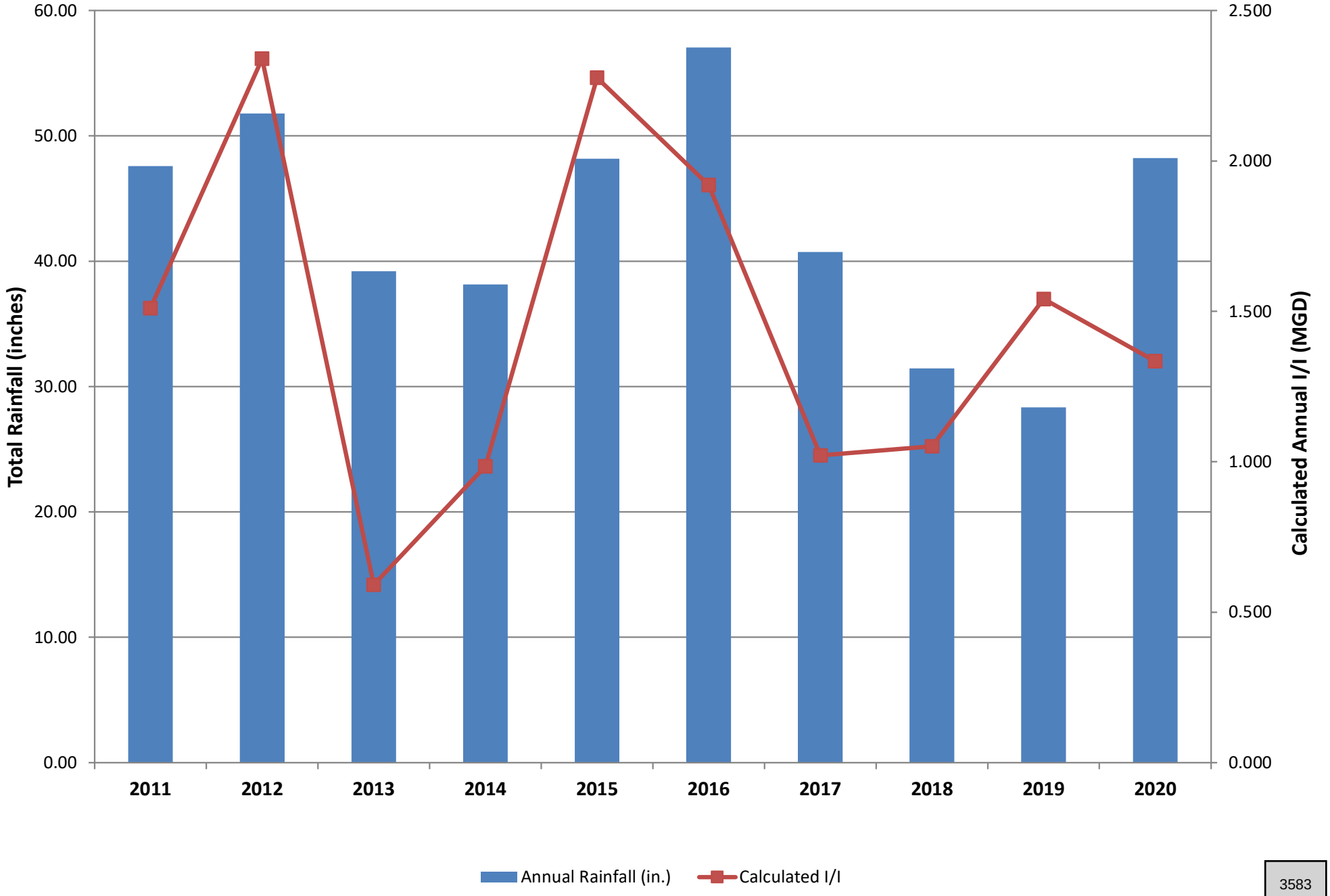
ATTACHMENT C, CHART I

May 2020 - April 2021 Monthly Average Influent Flow and Monthly Total Rainfall



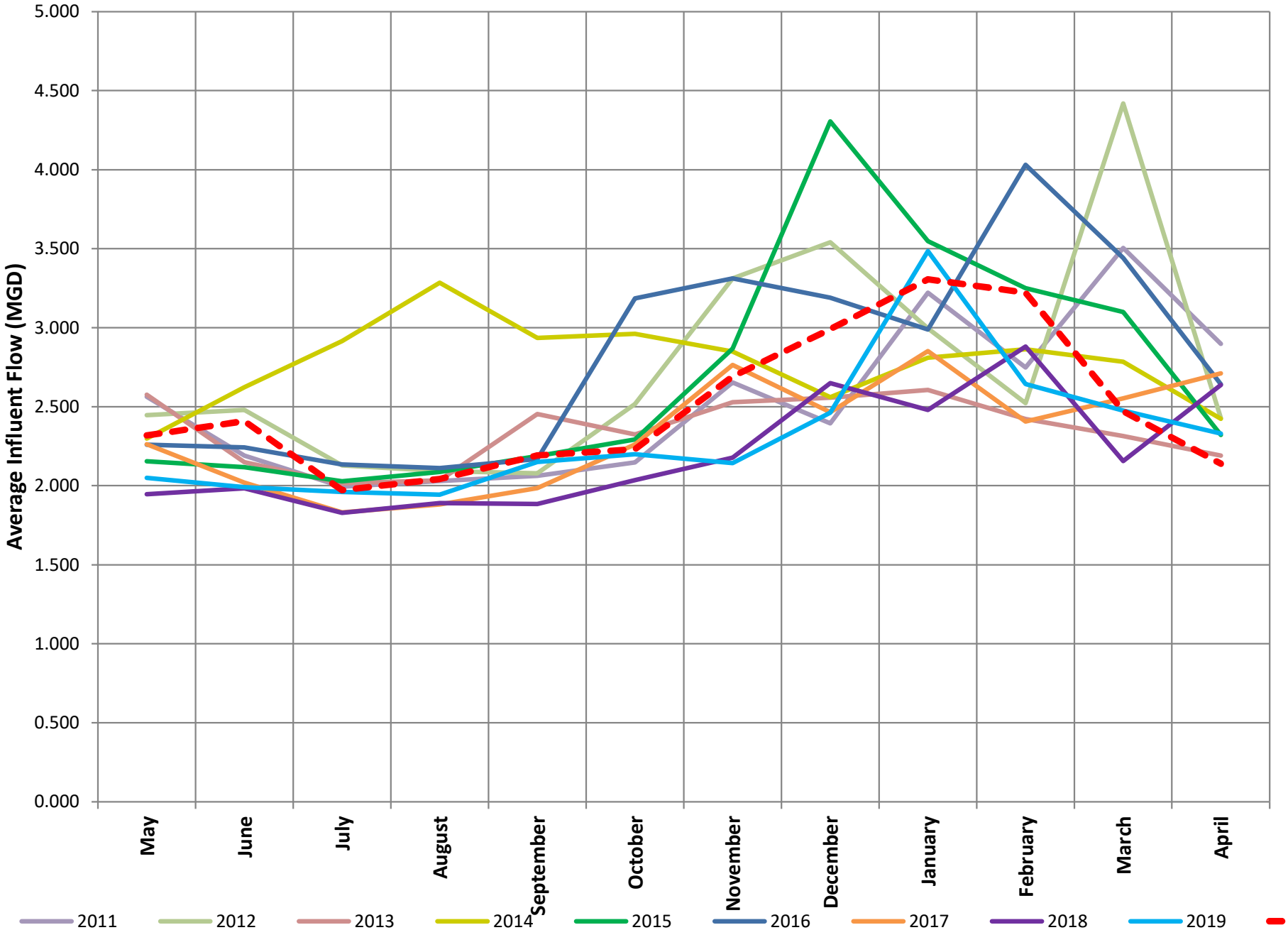
ATTACHMENT C, CHART II

Annual Rainfall & Calculated I/I Since Base Year (2011)



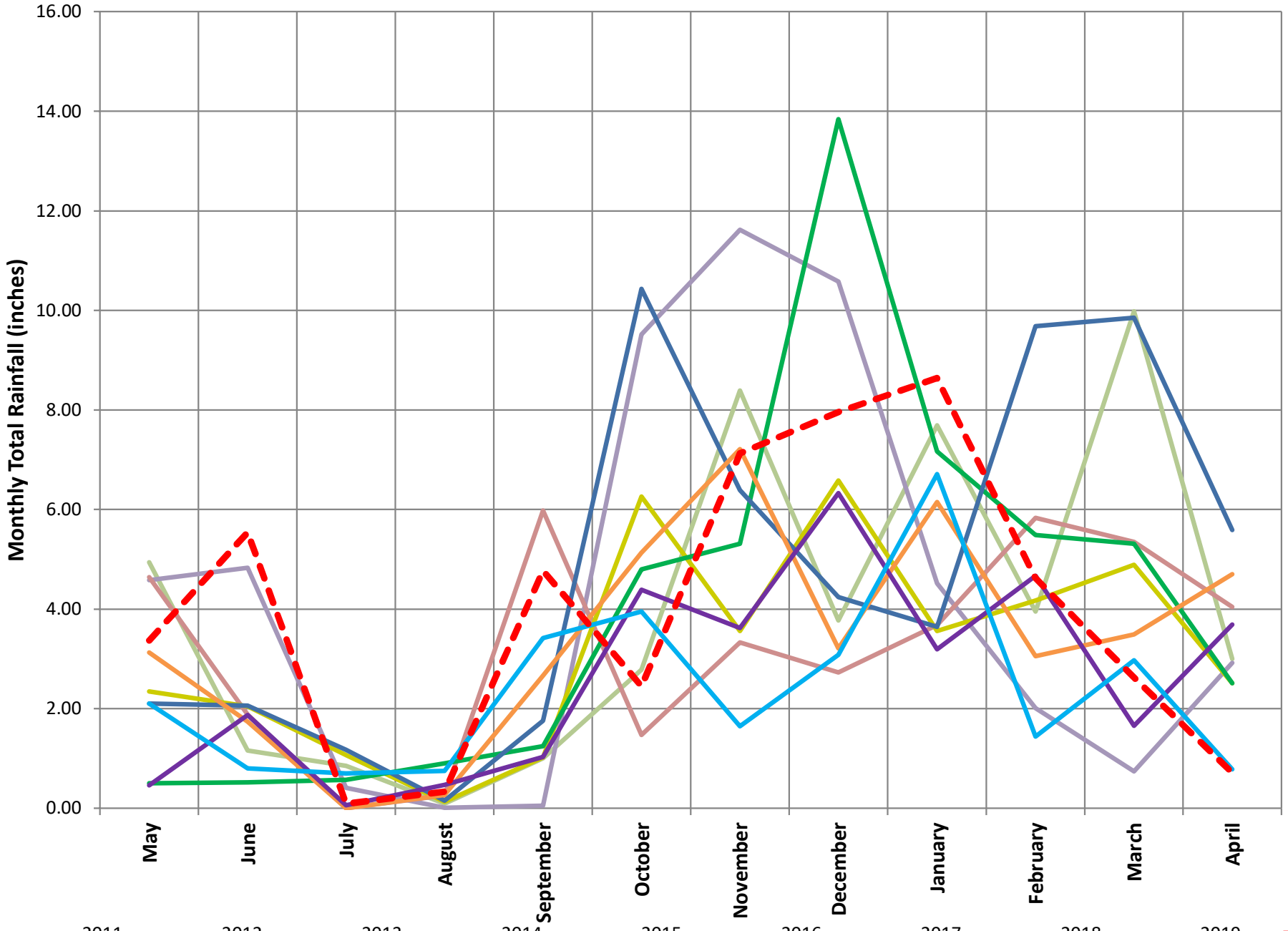
ATTACHMENT C, CHART III

WWTP Monthly Average Influent Flow Since Base Year (2011)



ATTACHMENT C, CHART IV

Monthly Total Rainfall Since Base Year (2011)



City of Camas Washing
Public Works Department
616 NE 4th Avenue
Camas, WA 98607

June 1, 2022

Carey Cholski
Washington State Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: **May 2021 – April 2022 Annual Inflow and Infiltration Report**
City of Camas, WA Wastewater Treatment Facility (Permit No. WA0020249)

Ms. Cholski,

Pursuant to Section S4.E of our current NPDES Permit, enclosed is our annual Inflow and Infiltration (I/I) report. Section S4.E.3 of our permit states:

> *The Permittee must conduct an annual analysis of infiltration and inflow according to Ecology's guidance manual for treatment plant operators. This report shall consider the 12-month period May 1st through the following April 30th as the annual period and shall be submitted by July 15, 2017 and annually thereafter. This report shall include an update on the status of each inflow reduction project completed in fulfillment of S4.E.2 (above) including the funds expended or contractually obligated, and the proportion of the project completed as of the end of the reporting period. For each basin or sub-basin in which work has been done within the reporting period, the report shall include the estimated inflow rates before and after the project and the estimated effect on the overall Publicly Owned Treatment Works (POTW) inflow rate.*

According to Ecology's Information Manual for Treatment Plant Operators (Feb. 2004), an Annual I/I Report should include each of the following elements:

1. *The average monthly flow and total precipitation for each month for the past year together with a graph … plotting a comparison of precipitation versus influent flow.*
2. *The maximum monthly and peak hourly hydraulic design capacity for the plant.*
3. *The design population equivalent for the treatment plant and the population served by the facility, per month, for the past year.*

4. *The amount of I/I for each year since the base year and the percent of maximum monthly design capacity each year's I/I represents.*
5. *The percent increase or reduction in I/I for each year subsequent to the base year I/I.*
6. *The additional lengths of sewer lines added to the collection system, per month, for the past year. Also include a brief summary of any major sewer rehabilitation or I/I reduction projects.*

The following information and attachments are now being submitted to satisfy these requirements.

I. REPORTING PERIOD AND BASE YEAR

As described in Section S4.E.3 of our current NPDES permit, the annual period for our I/I report is May 1st through April 30th. Accordingly, please note that when this report refers to the "reporting period" or "year", it is referring to the 12-month period from May 1st through April 30th. For any particular year that is referenced in the report, it is denoting the May through April reporting year and the calendar year in which May falls.

For the purposes of selecting an appropriate Base Year, the past twenty years of historical precipitation and plant influent flow data are reviewed annually. A summary of the monthly precipitation totals and influent flow averages for the past twenty years are included in Attachment A.

Since our facility's 2016 I&I report, the May 2011-April 2012 reporting year has been used as the Base Year, as it has reflected Camas' average rainfall, population growth and disposition of the City's sanitary sewer collection system.

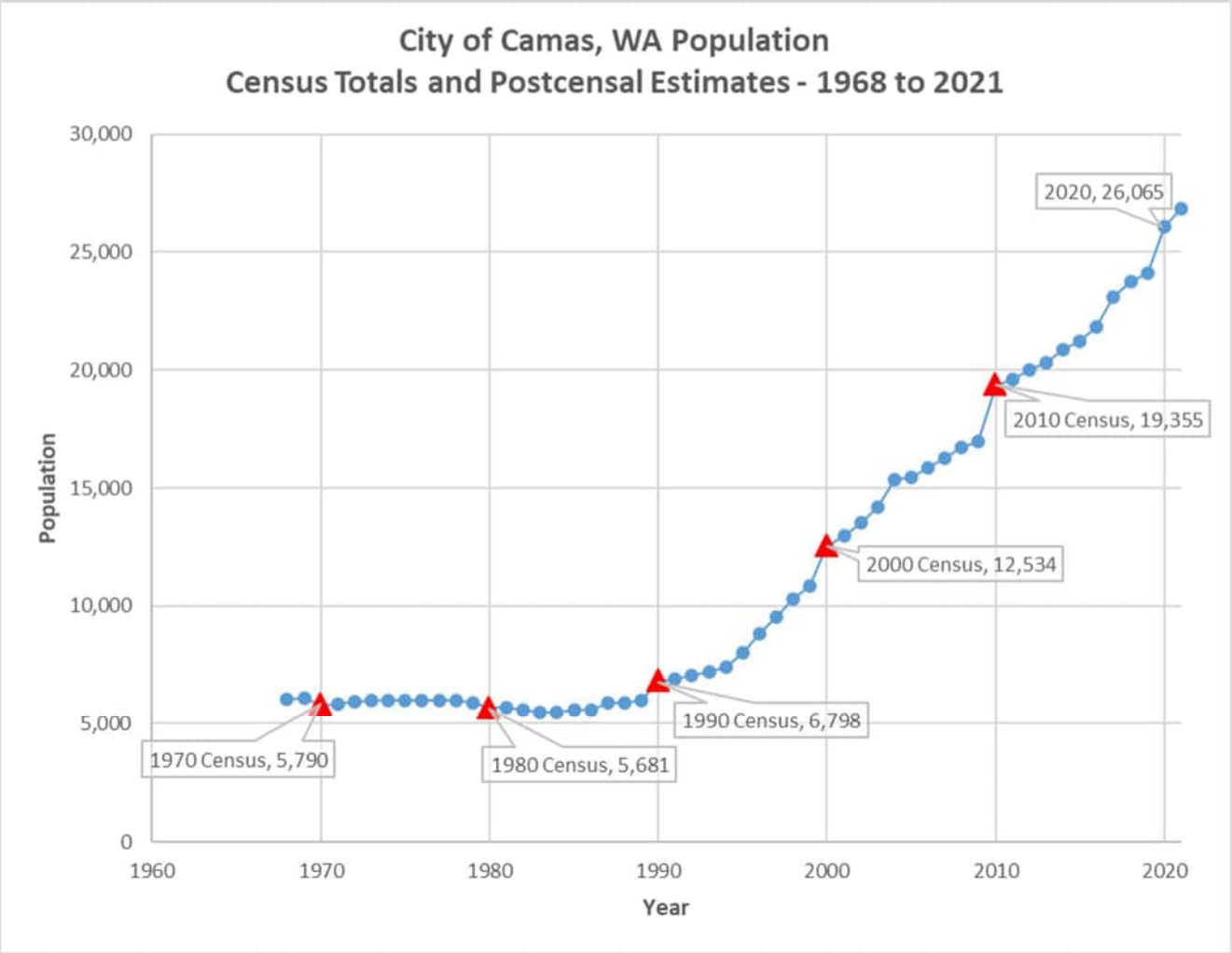
From analysis of the historical data, May 2011-April 2012 continues to best an average, annual rainfall in Camas and therefore continues to serve as the Base Year for the purposes of this report.

For the twenty-year period of May 1, 2002 to April 30, 2021, the average 12-month rainfall in Camas was 46.33 inches. From May 1, 2011 to April 30th 2012, the rainfall was 47.60, only 1.27 inches more than the twenty-year average. This represented the closest annual total to the twenty-year average, of all twenty years of data reviewed.

TABLE 1 - 12-Month May Through April Rainfall Totals, 2002-2021

	Average	Minimum	Base Year	Maximum
Annual Total Rainfall (in.)	46.33	28.35 (May 2019 – April 2020)	47.93 (May 2011-April 2012)	73.36 (May 2010-April 2011)

In addition to representing the 20-year median rainfall, using 2011-2012 as the "Base Year" incorporates the City's rapid growth that has occurred in the last 20 years. In I/I annual reports prior to 2016, the City of Camas had been using 1989 as the Base Year. Since 1989, the City of Camas has seen rapid growth in population and significant additions to its wastewater collection system. The May 2011-April 2012 period captures that growth, which has taken place primarily after 1990. The chart below illustrates the City's annual, calendar year, population growth since 1968:



Historical Population Estimates for Camas, WA by Washington State Office of Financial Management
(https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/april-1-official-population-estimates)

II. INFLOW AND INFILTRATION ANALYSIS

Facility Design Parameters

The maximum monthly hydraulic design capacity for the Camas Wastewater Treatment Plant (WWTP) is 6.10 million gallons per day (MGD) and has a peak hourly hydraulic design capacity of 13.44 MGD. The Design Population Equivalent for the Camas WWTP is 28,075.

Calculated I/I and Annual Rainfall 20-Year History

The following chart is a summary of the calculated I/I, the percent of maximum monthly design capacity the calculated I/I represents, the percentage increase or decrease of I/I from the previous year and the total rainfall for each reporting year from May 2002 to April 2021:

TABLE 2 – Camas Calculated I/I & Rainfall

Year	Calculated I/I (MGD)	I/I as % of Design Capacity	I/I % Increase/Decrease from Prior Year	Total 12-Month Rainfall (in.)
2002	1.069	18%	-15%	41.48
2003	1.258	21%	+18%	37.74
2004	0.661	11%	-47%	36.81
2005	2.093	34%	+217%	53.16
2006	1.400	23%	-33%	47.80
2007	2.145	35%	+53%	48.05
2008	0.911	15%	-58%	49.72
2009	1.242	20%	+36%	49.92
2010	1.615	26%	+30%	73.36
2011	1.511	25%	-6%	47.60
2012	2.340	38%	+55%	51.79
2013	0.591	10%	-75%	39.19
2014	0.985	16%	+67%	38.15
2015	2.277	37%	+131%	48.17
2016	1.920	31%	-16%	57.06
2017	1.021	17%	-47%	40.74
2018	1.052	17%	+3%	31.44
2019	1.541	25%	+47%	28.35
2020	1.334	22%	-13%	48.24
2021	1.400	23%	5%	57.77
Average				

Yellow Highlight = Base Year

Annual Report Form

Please see Attachment B for the Annual I/I Report form which summarizes the following data:

- The average monthly flow and total precipitation for each month, for the past three years.
- The calculated amount of I/I for each year.
- The percent of maximum monthly design capacity that each period's I/I represents.
- The population served by the facility, per month, for the past three years.
- The additional lengths of sewer lines added to the collection system, per month and per year, for the past three years.
- A summary of the I/I from the past three years, including a comparison with the selected Base Year (2011)

Charts

Please see Attachment C for several charts which plot I/I data to illustrate the following:

- Chart I: Comparison of precipitation versus influent flow for each month of the current reporting period.
- Chart II: Comparison of 12-month total precipitation and calculated I/I, for each year since the Base Year.
- Chart III: Monthly Average Influent Flow at the WWTP since the Base Year.
- Chart IV: Monthly Total Rainfall since the Base Year.

III. COLLECTION SYSTEM AND I/I REDUCTION PROJECTS AND MEASURES

Collection System Details

According to the City of Camas' General Sewer/Wastewater Facility Plan, last updated in November 2009, the city sanitary collection system was comprised of approximately 462,000 linear feet (87.5 miles) of pipe. Since 2009, approximately 156,000 linear feet of sewer line has been added, giving Camas approximately 618,000 linear feet (117 miles) of sewer line, as of the end of 2021.

In 2021, approximately 4,000 linear feet of new sanitary sewer line were added to the City's system. All of which were installed in connection with residential developments projects occurring throughout the year.

Camas' collection system is comprised of a combination of both traditional gravity sewer, force mains, pressure sewer lines, and 27 lift stations. Please see Attachment B for the lengths of sewer lines added to the collection system, per month and per year, for the past three years.

If you have any questions regarding this report or require any additional information, please do not hesitate to contact the Camas Wastewater Treatment Facility at (360) 834-3263.

Best Regards,



Bob Busch
Wastewater Treatment Plant Operations Supervisor

Cc: Steve Wall

ATTACHMENT A - Camas 20-Year WWTP Influent Flow and Rainfall

WWTP Design Capacity	
Peak Day Design Flow (MGD):	10.04
Max. Monthly Average Design (MMAD) Flow (MGD):	6.10
Design Population Equivalent:	28,075

Monthly Average Influent Flow (MGD) - MAY 1, 2002 to APRIL 30, 2022

Month	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	AVG
May	1.542	1.622	1.953	2.607	2.177	2.064	2.056	2.255	2.370	2.563	2.446	2.576	2.299	2.155	2.259	2.263	1.946	2.050	2.319	2.138	**2.183**
June	1.547	1.520	1.996	2.083	2.095	1.997	2.092	1.918	2.833	2.190	2.480	2.149	2.623	2.118	2.244	2.019	1.983	1.992	2.409	2.156	**2.122**
July	1.458	1.483	1.832	1.925	2.023	1.954	1.903	1.904	1.973	1.994	2.129	2.015	2.915	2.028	2.135	1.831	1.828	1.961	1.972	2.084	**1.967**
August	1.420	1.450	2.011	1.981	2.050	1.948	2.015	1.921	1.955	2.029	2.093	2.033	3.284	2.088	2.112	1.881	1.890	1.943	2.043	2.146	**2.015**
September	1.434	1.549	1.948	2.031	2.087	2.035	1.971	1.963	2.055	2.062	2.079	2.454	2.935	2.187	2.169	1.985	1.884	2.151	2.192	2.284	**2.073**
October	1.447	1.619	2.089	2.212	2.101	2.252	2.013	2.078	2.226	2.148	2.518	2.324	2.961	2.292	3.185	2.262	2.035	2.199	2.231	2.493	**2.234**
November	1.500	1.903	2.202	2.700	3.423	2.484	2.391	2.510	3.057	2.653	3.312	2.528	2.849	2.867	3.312	2.764	2.178	2.143	2.691	3.187	**2.633**
December	2.066	2.573	2.494	3.086	3.148	3.465	2.433	2.580	3.364	2.396	3.540	2.556	2.560	4.305	3.191	2.465	2.648	2.461	2.991	3.401	**2.886**
January	2.431	2.708	2.262	4.018	2.798	4.094	2.814	3.146	3.042	3.222	2.995	2.606	2.810	3.548	2.988	2.852	2.480	3.484	3.306	3.484	**3.054**
February	2.220	2.414	2.165	2.584	2.754	2.643	2.061	2.567	2.648	2.748	2.522	2.422	2.863	3.251	4.031	2.405	2.880	2.644	3.222	2.570	**2.681**
March	2.488	1.887	2.345	2.576	2.819	2.442	2.504	2.388	3.570	3.505	4.419	2.314	2.784	3.099	3.442	2.552	2.156	2.476	2.470	2.949	**2.759**
April	2.052	1.627	2.156	2.377	2.327	2.302	2.327	2.308	2.904	2.898	2.428	2.191	2.425	2.321	2.643	2.710	2.639	2.330	2.139	2.952	**2.403**
AVG	**1.800**	**1.863**	**2.121**	**2.515**	**2.483**	**2.473**	**2.215**	**2.295**	**2.666**	**2.534**	**2.747**	**2.347**	**2.776**	**2.688**	**2.809**	**2.332**	**2.212**	**2.320**	**2.499**	**2.654**	**2.417**
MAX	**2.488**	**2.708**	**2.494**	**4.018**	**3.423**	**4.094**	**2.814**	**3.146**	**3.570**	**3.505**	**4.419**	**2.606**	**3.284**	**4.305**	**4.031**	**2.852**	**2.880**	**3.484**	**3.306**	**3.484**	**3.346**
MIN	**1.420**	**1.450**	**1.832**	**1.925**	**2.023**	**1.948**	**1.903**	**1.904**	**1.955**	**1.994**	**2.079**	**2.015**	**2.299**	**2.028**	**2.112**	**1.831**	**1.828**	**1.943**	**1.972**	**2.084**	**1.927**
Annual I/I	**1.069**	**1.258**	**0.661**	**2.093**	**1.400**	**2.145**	**0.911**	**1.242**	**1.615**	**1.511**	**2.340**	**0.591**	**0.985**	**2.277**	**1.920**	**1.021**	**1.052**	**1.541**	**1.334**	**1.400**	**1.418**
% of MMAD Flow	18%	21%	11%	34%	23%	35%	15%	20%	26%	25%	38%	10%	16%	37%	31%	17%	17%	25%	22%	23%	23%
% +/- vs Prior Year	-15%	18%	-47%	217%	-33%	53%	-58%	36%	30%	-6%	55%	-75%	67%	131%	-16%	-47%	3%	47%	-13%	5%	18%

YELLOW = BASE YEAR

Monthly Total Rainfall (in.) - MAY 1, 2002 to APRIL 30, 2022

Month	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	AVG
May	1.65	2.00	1.65	6.14	2.94	2.11	2.11	4.44	3.93	4.94	4.58	4.64	2.35	0.50	2.10	3.13	0.46	2.10	3.37	2.46	**2.88**
June	1.75	0.52	1.52	3.22	1.24	2.01	2.19	1.18	7.03	1.16	4.83	1.88	2.05	0.52	2.06	1.74	1.87	0.80	5.54	2.40	**2.28**
July	0.25	0.00	0.24	0.71	0.67	0.74	0.04	0.09	0.35	0.85	0.41	0.00	1.07	0.57	1.17	0.00	0.06	0.70	0.09	0.00	**0.40**
August	0.02	0.09	3.91	0.74	0.02	0.99	1.98	0.60	0.90	0.09	0.01	0.26	0.13	0.90	0.15	0.27	0.47	0.75	0.33	0.16	**0.64**
September	1.41	1.36	2.45	2.37	2.35	3.46	0.81	1.18	3.64	1.00	0.05	5.98	1.02	1.25	1.76	2.66	1.03	3.42	4.77	4.64	**2.33**
October	1.09	3.09	5.32	5.02	2.44	5.15	4.43	4.11	6.39	2.78	9.52	1.47	6.26	4.80	10.43	5.13	4.39	3.95	2.45	4.89	**4.66**
November	2.90	5.57	3.19	5.10	12.77	6.29	11.17	7.59	10.76	8.39	11.62	3.33	3.56	5.31	6.39	7.21	3.62	1.65	7.13	10.43	**6.70**
December	9.30	8.99	4.87	8.88	6.57	10.54	7.27	5.98	10.26	3.77	10.58	2.73	6.58	13.84	4.24	3.21	6.33	3.08	7.96	8.06	**7.15**
January	8.83	6.73	2.28	11.35	2.69	4.82	6.30	8.87	6.87	7.69	4.52	3.68	3.56	7.17	3.64	6.15	3.19	6.71	8.64	7.88	**6.08**
February	2.75	5.68	1.81	2.92	5.54	2.59	2.19	4.97	6.05	3.95	2.01	5.83	4.17	5.49	9.68	3.05	4.67	1.44	4.62	3.36	**4.14**
March	7.49	2.28	4.65	3.86	6.79	3.71	6.97	6.17	9.75	9.98	0.74	5.35	4.89	5.31	9.85	3.49	1.66	2.97	2.63	5.37	**5.19**
April	4.04	1.43	4.92	2.85	3.78	5.64	4.26	4.74	7.43	3.00	2.92	4.04	2.51	2.51	5.59	4.70	3.69	0.78	0.71	8.12	**3.66**
TOTAL	**41.48**	**37.74**	**36.81**	**53.16**	**47.80**	**48.05**	**49.72**	**49.92**	**73.36**	**47.60**	**51.79**	**39.19**	**38.15**	**48.17**	**57.06**	**40.74**	**31.44**	**28.35**	**48.24**	**57.77**	**46.33**
AVG	**3.46**	**3.15**	**3.07**	**4.43**	**3.98**	**4.00**	**4.14**	**4.16**	**6.11**	**3.97**	**4.32**	**3.27**	**3.18**	**4.01**	**4.76**	**3.40**	**2.62**	**2.36**	**4.02**	**4.81**	**3.86**
MAX	**9.30**	**8.99**	**5.32**	**11.35**	**12.77**	**10.54**	**11.17**	**8.87**	**10.76**	**9.98**	**11.62**	**5.98**	**6.58**	**13.84**	**10.43**	**7.21**	**6.33**	**6.71**	**8.64**	**10.43**	**9.34**
MIN	**0.02**	**0.00**	**0.24**	**0.71**	**0.02**	**0.74**	**0.04**	**0.09**	**0.35**	**0.09**	**0.01**	**0.00**	**0.13**	**0.50**	**0.15**	**0.00**	**0.06**	**0.70**	**0.09**	**0.00**	**0.20**

20-Year Rainfall Summary		
20-Year Average Annual Rainfall (in.):	46.33	
20-Year Maximum Annual Rainfal (in.):	73.36	(2010)
20-Year Minimum Annual Rainfall (in.):	28.35	(2019)

ATTACHMENT B

City of Camas WWTP (WA0020249) - Annual Infiltration and Inflow Report

May 2021 to April 2022

WWTP Design Capacity

Peak Hourly Hydraulic Design Flow (MGD): **13.44**

Maximum Monthly Average Design Flow (MGD): **6.10**

Design Population Equivalent: **28,075**

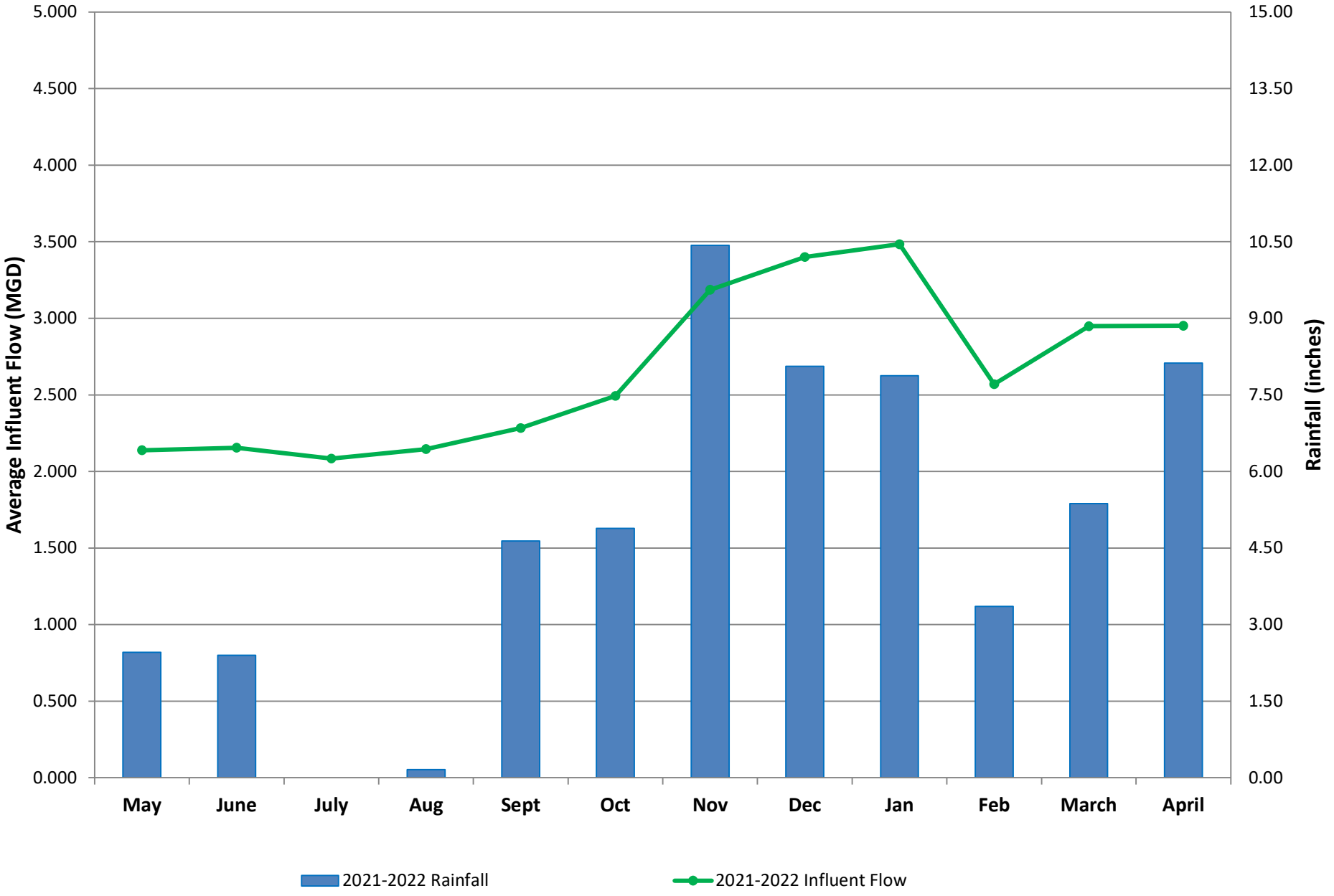
	Monthly Average WWTP Influent Flow (MGD)			Total Monthly Rainfall (inches)			Population Served			Additional Sewer Lines Added (ft.)		
Month	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**
May	2.050	2.319	2.138	2.10	3.37	2.46	24,090	26,065	26,870	0	0	1,714
June	1.992	2.409	2.156	0.80	5.54	2.40	24,090	26,065	26,870	0	0	1,114
July	1.961	1.972	2.084	0.70	0.09	0.00	24,090	26,065	26,870	2,060	3,130	0
Aug	1.943	2.043	2.146	0.75	0.33	0.16	24,090	26,065	26,870	0	1,910	0
Sept	2.151	2.192	2.284	3.42	4.77	4.64	24,090	26,065	26,870	0	4,171	0
Oct	2.199	2.231	2.493	3.95	2.45	4.89	24,090	26,065	26,870	0	3,076	0
Nov	2.143	2.691	3.187	1.65	7.13	**10.43**	24,090	26,065	26,870	0	0	0
Dec	2.461	2.991	3.401	3.08	7.96	8.06	24,090	26,065	26,870	722	0	0
Jan	**3.484**	**3.306**	**3.484**	**6.71**	**8.64**	7.88	26,065	26,870	*26,870*	3,026	0	0
Feb	2.644	3.222	2.570	1.44	4.62	3.36	26,065	26,870	*26,870*	0	0	0
March	2.476	2.470	2.949	2.97	2.63	5.37	26,065	26,870	*26,870*	225	525	0
April	2.330	2.139	2.952	0.78	0.71	8.12	26,065	26,870	*26,870*	0	580	0
Period Total:	27.834	29.984	31.842	28.35	48.24	57.77			**Total Added (feet):**	6,033	13,392	2,828
Low Month:	1.943	1.972	2.084	0.70	0.09	0.00			**Total Added (miles):**	1.14	2.54	0.54
High Month:	**3.484**	**3.306**	**3.484**	**6.71**	**8.64**	**10.43**						
Annual Average:	2.320	2.499	2.654	2.36	4.02	4.81						
Period I/I:	1.541	1.334	1.400									

INFILTRATION/INFLOW SUMMARY

Year	I/I	% Increase/Decrease From Base I/I	% Increase/Decrease from Prior Year	% of Max Month. Design Flow	Total Rainfall
Base Year: 2011	***1.511***	***n/a***	***-6%***	***25%***	***47.60***
2019-2020	1.541	2%	131%	25%	28.35
2020-2021	1.334	-12%	-13%	22%	48.24
2021-2022	1.400	-7%	5%	23%	57.77

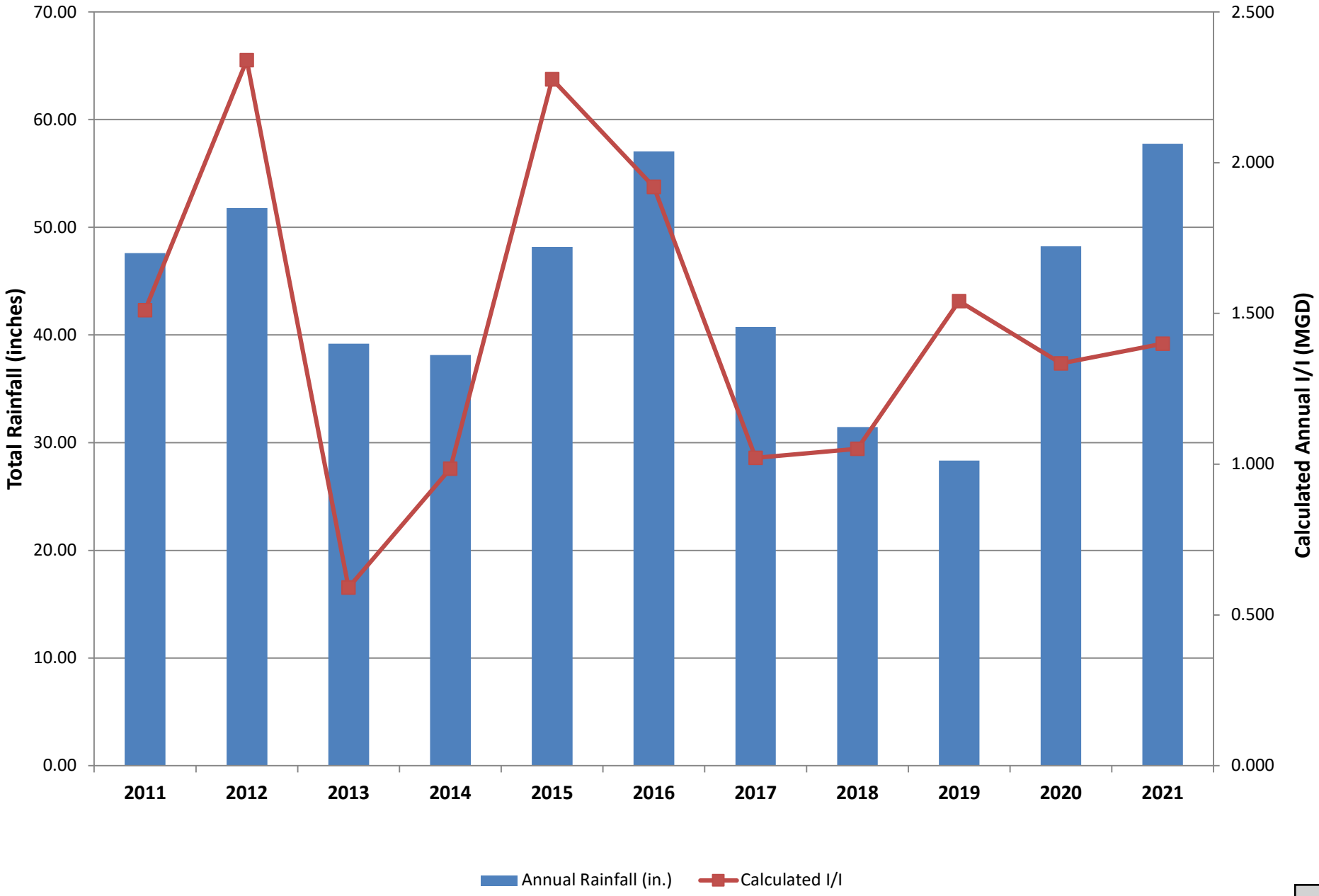
ATTACHMENT C, CHART I

May 2021 - April 2022 Monthly Average Influent Flow and Monthly Total Rainfall



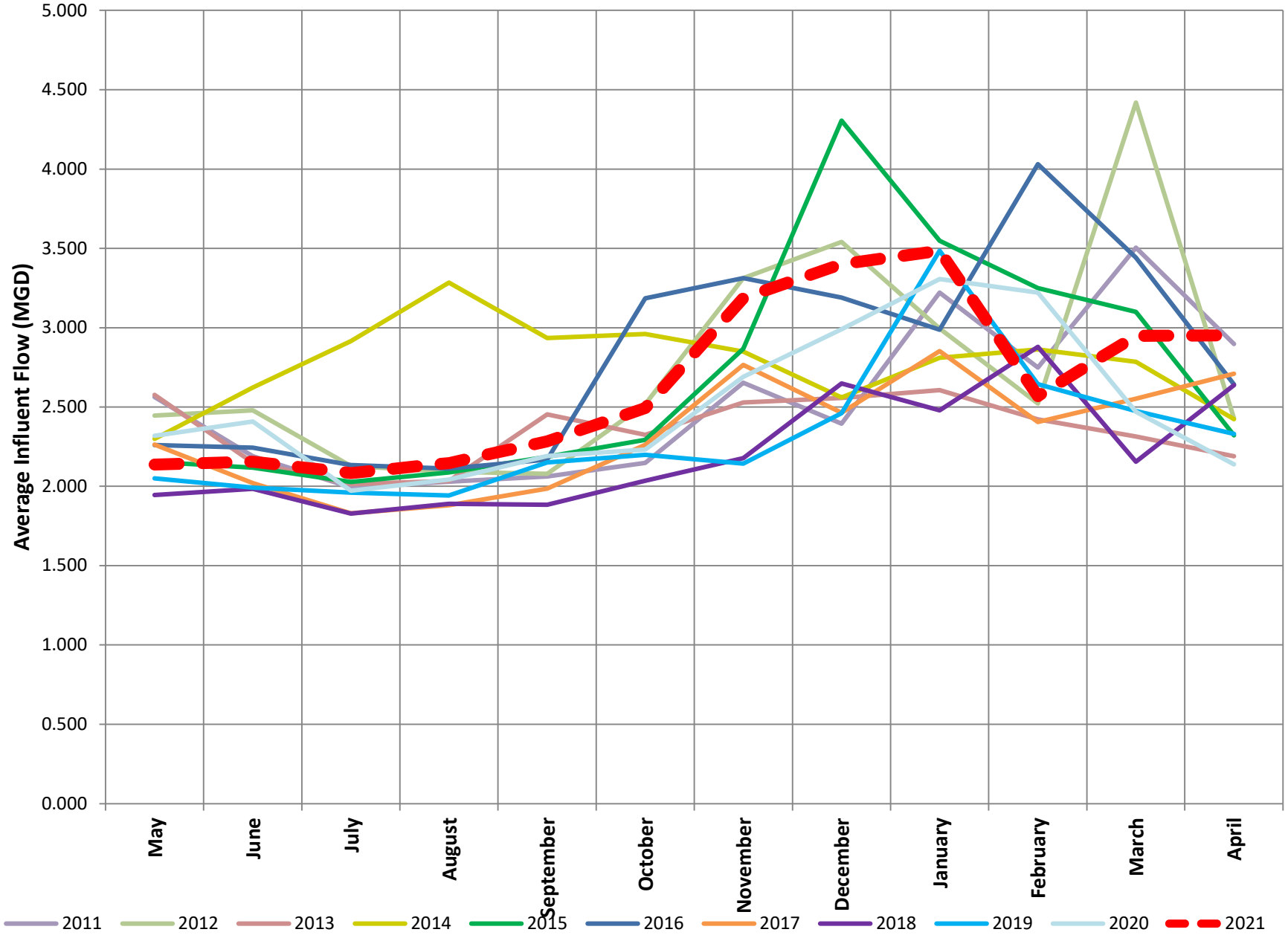
ATTACHMENT C, CHART II

Annual Rainfall & Calculated I/I Since Base Year (2011)



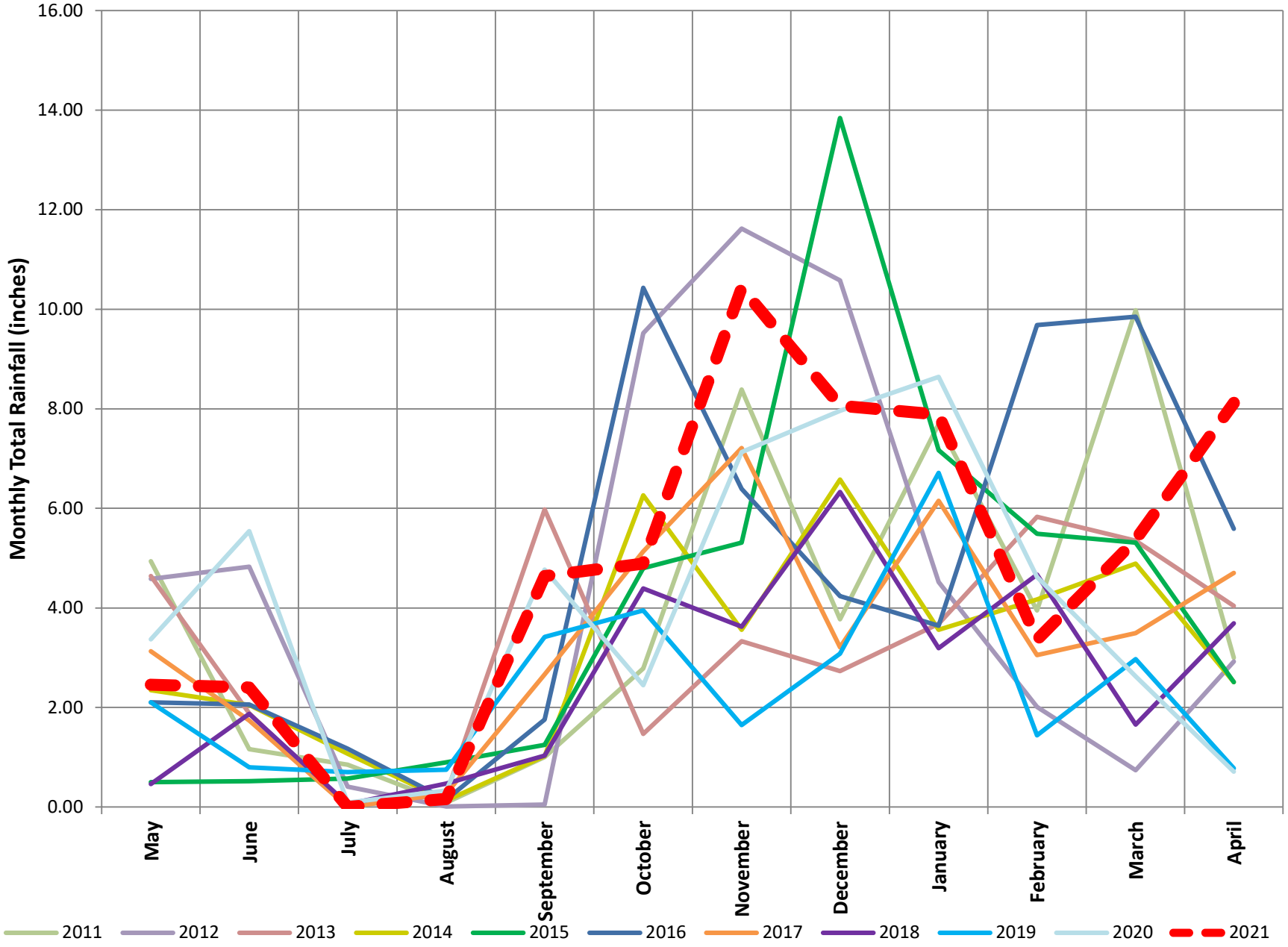
ATTACHMENT C, CHART III

WWTP Monthly Average Influent Flow Since Base Year (2011)



ATTACHMENT C, CHART IV

Monthly Total Rainfall Since Base Year (2011)



City of Camas Washington
Public Works Department
616 NE 4th Avenue
Camas, WA 98607

June 1, 2023

Carey Cholski
Washington State Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: **May 2022 – April 2023 Annual Inflow and Infiltration Report**
City of Camas, WA Wastewater Treatment Facility (Permit No. WA0020249)

Ms. Cholski,

Pursuant to Section S4.E of our current NPDES Permit, enclosed is our annual Inflow and Infiltration (I/I) report. Section S4.E.3 of our permit states:

> *The Permittee must conduct an annual analysis of infiltration and inflow according to Ecology's guidance manual for treatment plant operators. This report shall consider the 12-month period May 1st through the following April 30th as the annual period and shall be submitted by July 15, 2017 and annually thereafter. This report shall include an update on the status of each inflow reduction project completed in fulfillment of S4.E.2 (above) including the funds expended or contractually obligated, and the proportion of the project completed as of the end of the reporting period. For each basin or sub-basin in which work has been done within the reporting period, the report shall include the estimated inflow rates before and after the project and the estimated effect on the overall Publicly Owned Treatment Works (POTW) inflow rate.*

According to Ecology's Information Manual for Treatment Plant Operators (Feb. 2004), an Annual I/I Report should include each of the following elements:

1. *The average monthly flow and total precipitation for each month for the past year together with a graph … plotting a comparison of precipitation versus influent flow.*
2. *The maximum monthly and peak hourly hydraulic design capacity for the plant.*
3. *The design population equivalent for the treatment plant and the population served by the facility, per month, for the past year.*

4. *The amount of I/I for each year since the base year and the percent of maximum monthly design capacity each year's I/I represents.*
5. *The percent increase or reduction in I/I for each year subsequent to the base year I/I.*
6. *The additional lengths of sewer lines added to the collection system, per month, for the past year. Also include a brief summary of any major sewer rehabilitation or I/I reduction projects.*

The following information and attachments are now being submitted to satisfy these requirements.

I. REPORTING PERIOD AND BASE YEAR

As described in Section S4.E.3 of our current NPDES permit, the annual period for our I/I report is May 1st through April 30th. Accordingly, please note that when this report refers to the "reporting period" or "year", it is referring to the 12-month period from May 1st through April 30th. For any particular year that is referenced in the report, it is denoting the May through April reporting year and the calendar year in which May falls.

For the purposes of selecting an appropriate Base Year, the past twenty years of historical precipitation and plant influent flow data are reviewed annually. A summary of the monthly precipitation totals and influent flow averages for the past twenty years are included in Attachment A.

Since our facility's 2016 I&I report, the May 2011-April 2012 reporting year has been used as the Base Year, as it has reflected Camas' average rainfall, population growth and disposition of the City's sanitary sewer collection system.

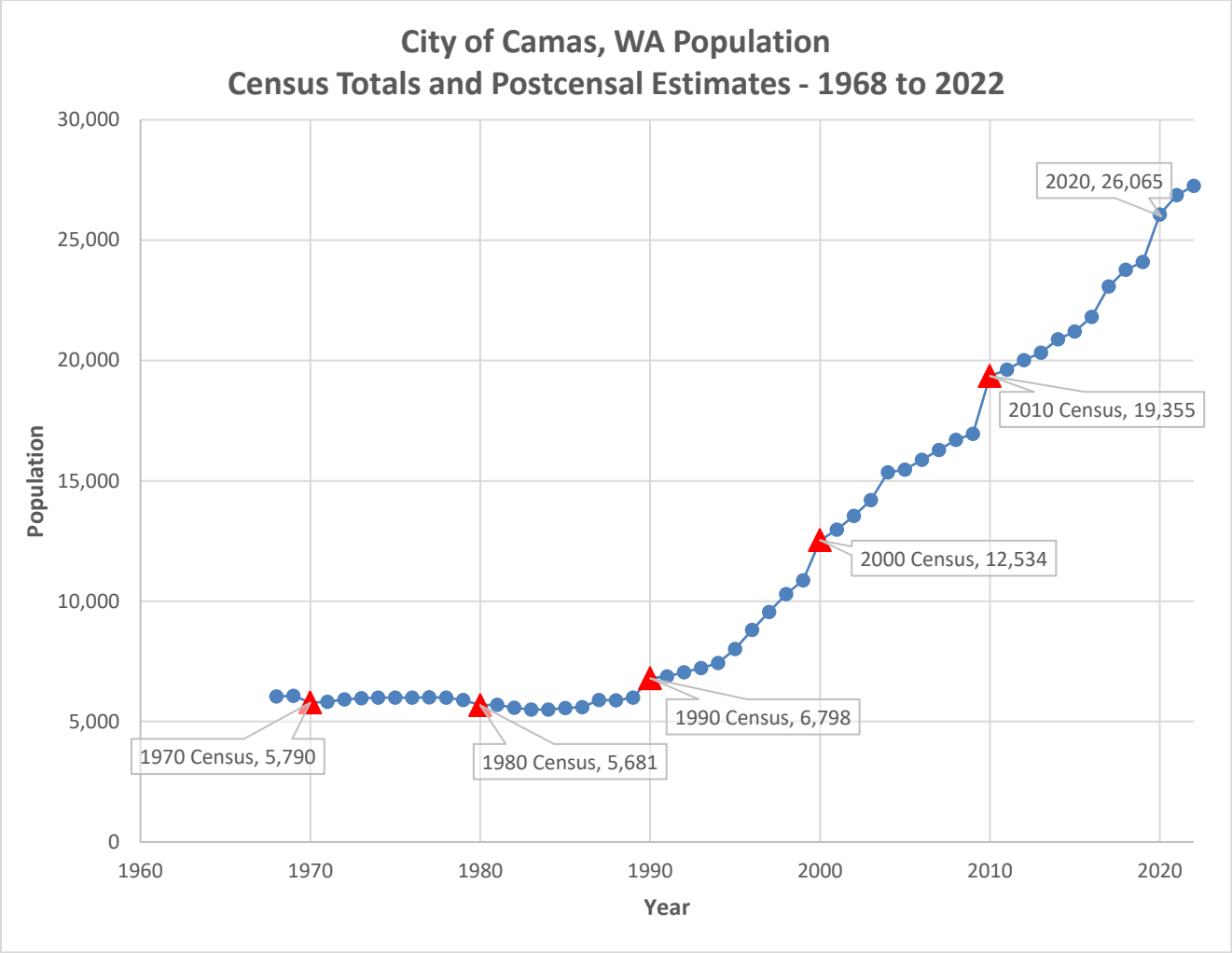
From analysis of the historical data, May 2011-April 2012 continues to best an average, annual rainfall in Camas and therefore continues to serve as the Base Year for the purposes of this report.

For the twenty-year period of May 1, 2003 to April 30, 2023, the average 12-month rainfall in Camas was 46.73 inches. From May 1, 2011 to April 30th 2012, the rainfall was 47.60, only .87 inches more than the twenty-year average. This represented the closest annual total to the twenty-year average, of all twenty years of data reviewed.

TABLE 1 - 12-Month May Through April Rainfall Totals, 2002-2022

	Average	Minimum	Base Year	Maximum
Annual Total Rainfall (in.)	46.73	28.35 (May 2019 – April 2020)	47.93 (May 2011-April 2012)	73.36 (May 2010-April 2011)

In addition to representing the 20-year median rainfall, using 2011-2012 as the "Base Year" incorporates the City's rapid growth that has occurred in the last 20 years. In I/I annual reports prior to 2016, the City of Camas had been using 1989 as the Base Year. Since 1989, the City of Camas has seen rapid growth in population and significant additions to its wastewater collection system. The May 2011-April 2012 period captures that growth, which has taken place primarily after 1990. The chart below illustrates the City's annual, calendar year, population growth since 1968:



Historical Population Estimates for Camas, WA by Washington State Office of Financial Management
(https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/april-1-official-population-estimates)

II. INFLOW AND INFILTRATION ANALYSIS

Facility Design Parameters

The maximum monthly hydraulic design capacity for the Camas Wastewater Treatment Plant (WWTP) is 6.10 million gallons per day (MGD) and has a peak hourly hydraulic design capacity of 13.44 MGD. The Design Population Equivalent for the Camas WWTP is 28,075.

Calculated I/I and Annual Rainfall 20-Year History

The following chart is a summary of the calculated I/I, the percent of maximum monthly design capacity the calculated I/I represents, the percentage increase or decrease of I/I from the previous year and the total rainfall for each reporting year from May 2002 to April 2023:

TABLE 2 – Camas Calculated I/I & Rainfall

Year	Calculated I/I (MGD)	I/I as % of Design Capacity	I/I % Increase/Decrease from Prior Year	Total 12-Month Rainfall (in.)
2002	1.069	18%	-15%	41.48
2003	1.258	21%	+18%	37.74
2004	0.661	11%	-47%	36.81
2005	2.093	34%	+217%	53.16
2006	1.400	23%	-33%	47.80
2007	2.145	35%	+53%	48.05
2008	0.911	15%	-58%	49.72
2009	1.242	20%	+36%	49.92
2010	1.615	26%	+30%	73.36
2011	1.511	25%	-6%	47.60
2012	2.340	38%	+55%	51.79
2013	0.591	10%	-75%	39.19
2014	0.985	16%	+67%	38.15
2015	2.277	37%	+131%	48.17
2016	1.920	31%	-16%	57.06
2017	1.021	17%	-47%	40.74
2018	1.052	17%	+3%	31.44
2019	1.541	25%	+47%	28.35
2020	1.334	22%	-13%	48.24
2021	1.400	23%	5%	57.77
2022	1.264	21%	-10%	47.68
Average				

Yellow Highlight = Base Year

Annual Report Form

Please see Attachment B for the Annual I/I Report form which summarizes the following data:

- The average monthly flow and total precipitation for each month, for the past three years.
- The calculated amount of I/I for each year.
- The percent of maximum monthly design capacity that each period's I/I represents.
- The population served by the facility, per month, for the past three years.
- The additional lengths of sewer lines added to the collection system, per month and per year, for the past three years.
- A summary of the I/I from the past three years, including a comparison with the selected Base Year (2011)

Charts

Please see Attachment C for several charts which plot I/I data to illustrate the following:

- Chart I: Comparison of precipitation versus influent flow for each month of the current reporting period.
- Chart II: Comparison of 12-month total precipitation and calculated I/I, for each year since the Base Year.
- Chart III: Monthly Average Influent Flow at the WWTP since the Base Year.
- Chart IV: Monthly Total Rainfall since the Base Year.

III. COLLECTION SYSTEM AND I/I REDUCTION PROJECTS AND MEASURES

Collection System Details

According to the City of Camas' General Sewer Plan, last updated in November of 2009, the city sanitary collection system was comprised of approximately 462,000 linear feet (87.5 miles) of pipe. Since 2009, approximately 156,800 linear feet of sewer line has been added, giving Camas approximately 619,000 linear feet (117 miles) of sewer line, as of the end of 2022.

In 2022, approximately 800 linear feet of new sanitary sewer line were added to the City's system. All of which were installed in connection with residential development projects occurring throughout the year.

Camas' collection system is comprised of a combination of both traditional gravity sewer, force mains, pressure sewer lines, and 28 lift stations. Please see Attachment B for the lengths of sewer lines added to the collection system, per month and per year, for the past three years.

If you have any questions regarding this report or require any additional information, please do not hesitate to contact the Camas Wastewater Treatment Facility at (360) 817-7164.

Best Regards,

Darren Eki

Darren Eki
Wastewater Treatment Plant Operations Supervisor

Cc: Steve Wall

ATTACHMENT A - Camas 20-Year WWTP Influent Flow and Rainfall

WWTP Design Capacity	
Peak Day Design Flow (MGD):	10.04
Max. Monthly Average Design (MMAD) Flow (MGD):	6.10
Design Population Equivalent:	28,075

Monthly Average Influent Flow (MGD) - MAY 1, 2002 to APRIL 30, 2022

Month	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	AVG
May	1.542	1.622	1.953	2.607	2.177	2.064	2.056	2.255	2.370	2.563	2.446	2.576	2.299	2.155	2.259	2.263	1.946	2.050	2.319	2.138	2.886	**2.217**
June	1.547	1.520	1.996	2.083	2.095	1.997	2.092	1.918	2.833	2.190	2.480	2.149	2.623	2.118	2.244	2.019	1.983	1.992	2.409	2.156	2.838	**2.156**
July	1.458	1.483	1.832	1.925	2.023	1.954	1.903	1.904	1.973	1.994	2.129	2.015	2.915	2.028	2.135	1.831	1.828	1.961	1.972	2.084	2.098	**1.974**
August	1.420	1.450	2.011	1.981	2.050	1.948	2.015	1.921	1.955	2.029	2.093	2.033	3.284	2.088	2.112	1.881	1.890	1.943	2.043	2.146	2.109	**2.019**
September	1.434	1.549	1.948	2.031	2.087	2.035	1.971	1.963	2.055	2.062	2.079	2.454	2.935	2.187	2.169	1.985	1.884	2.151	2.192	2.284	2.140	**2.076**
October	1.447	1.619	2.089	2.212	2.101	2.252	2.013	2.078	2.226	2.148	2.518	2.324	2.961	2.292	3.185	2.262	2.035	2.199	2.231	2.493	2.294	**2.237**
November	1.500	1.903	2.202	2.700	3.423	2.484	2.391	2.510	3.057	2.653	3.312	2.528	2.849	2.867	3.312	2.764	2.178	2.143	2.691	3.187	2.842	**2.643**
December	2.066	2.573	2.494	3.086	3.148	3.465	2.433	2.580	3.364	2.396	3.540	2.556	2.560	4.305	3.191	2.465	2.648	2.461	2.991	3.401	3.362	**2.909**
January	2.431	2.708	2.262	4.018	2.798	4.094	2.814	3.146	3.042	3.222	2.995	2.606	2.810	3.548	2.988	2.852	2.480	3.484	3.306	3.484	3.044	**3.054**
February	2.220	2.414	2.165	2.584	2.754	2.643	2.061	2.567	2.648	2.748	2.522	2.422	2.863	3.251	4.031	2.405	2.880	2.644	3.222	2.570	2.710	**2.682**
March	2.488	1.887	2.345	2.576	2.819	2.442	2.504	2.388	3.570	3.505	4.419	2.314	2.784	3.099	3.442	2.552	2.156	2.476	2.470	2.949	3.141	**2.777**
April	2.052	1.627	2.156	2.377	2.327	2.302	2.327	2.308	2.904	2.898	2.428	2.191	2.425	2.321	2.643	2.710	2.639	2.330	2.139	2.952	3.320	**2.446**
AVG	**1.800**	**1.863**	**2.121**	**2.515**	**2.483**	**2.473**	**2.215**	**2.295**	**2.666**	**2.534**	**2.747**	**2.347**	**2.776**	**2.688**	**2.809**	**2.332**	**2.212**	**2.320**	**2.499**	**2.654**	**2.732**	**2.417**
MAX	**2.488**	**2.708**	**2.494**	**4.018**	**3.423**	**4.094**	**2.814**	**3.146**	**3.570**	**3.505**	**4.419**	**2.606**	**3.284**	**4.305**	**4.031**	**2.852**	**2.880**	**3.484**	**3.306**	**3.484**	**3.362**	**3.346**
MIN	**1.420**	**1.450**	**1.832**	**1.925**	**2.023**	**1.948**	**1.903**	**1.904**	**1.955**	**1.994**	**2.079**	**2.015**	**2.299**	**2.028**	**2.112**	**1.831**	**1.828**	**1.943**	**1.972**	**2.084**	**2.098**	**1.927**
Annual I/I	**1.069**	**1.258**	**0.661**	**2.093**	**1.400**	**2.145**	**0.911**	**1.242**	**1.615**	**1.511**	**2.340**	**0.591**	**0.985**	**2.277**	**1.920**	**1.021**	**1.052**	**1.541**	**1.334**	**1.400**	**1.264**	**1.418**
% of MMAD Flow	18%	21%	11%	34%	23%	35%	15%	20%	26%	25%	38%	10%	16%	37%	31%	17%	17%	25%	22%	23%	21%	23%
% +/- vs Prior Year	-15%	18%	-47%	217%	-33%	53%	-58%	36%	30%	-6%	55%	-75%	67%	131%	-16%	-47%	3%	47%	-13%	5%	-10%	18%

YELLOW = BASE YEAR

Monthly Total Rainfall (in.) - MAY 1, 2002 to APRIL 30, 2022

Month	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	AVG
May	1.65	2.00	1.65	6.14	2.94	2.11	2.11	4.44	3.93	4.94	4.58	4.64	2.35	0.50	2.10	3.13	0.46	2.10	3.37	2.46	6.63	**3.06**
June	1.75	0.52	1.52	3.22	1.24	2.01	2.19	1.18	7.03	1.16	4.83	1.88	2.05	0.52	2.06	1.74	1.87	0.80	5.54	2.40	6.73	**2.49**
July	0.25	0.00	0.24	0.71	0.67	0.74	0.04	0.09	0.35	0.85	0.41	0.00	1.07	0.57	1.17	0.00	0.06	0.70	0.09	0.00	0.43	**0.40**
August	0.02	0.09	3.91	0.74	0.02	0.99	1.98	0.60	0.90	0.09	0.01	0.26	0.13	0.90	0.15	0.27	0.47	0.75	0.33	0.16	0.00	**0.61**
September	1.41	1.36	2.45	2.37	2.35	3.46	0.81	1.18	3.64	1.00	0.05	5.98	1.02	1.25	1.76	2.66	1.03	3.42	4.77	4.64	0.01	**2.22**
October	1.09	3.09	5.32	5.02	2.44	5.15	4.43	4.11	6.39	2.78	9.52	1.47	6.26	4.80	10.43	5.13	4.39	3.95	2.45	4.89	5.16	**4.68**
November	2.90	5.57	3.19	5.10	12.77	6.29	11.17	7.59	10.76	8.39	11.62	3.33	3.56	5.31	6.39	7.21	3.62	1.65	7.13	10.43	7.49	**6.74**
December	9.30	8.99	4.87	8.88	6.57	10.54	7.27	5.98	10.26	3.77	10.58	2.73	6.58	13.84	4.24	3.21	6.33	3.08	7.96	8.06	6.01	**7.10**
January	8.83	6.73	2.28	11.35	2.69	4.82	6.30	8.87	6.87	7.69	4.52	3.68	3.56	7.17	3.64	6.15	3.19	6.71	8.64	7.88	5.83	**6.07**
February	2.75	5.68	1.81	2.92	5.54	2.59	2.19	4.97	6.05	3.95	2.01	5.83	4.17	5.49	9.68	3.05	4.67	1.44	4.62	3.36	3.54	**4.11**
March	7.49	2.28	4.65	3.86	6.79	3.71	6.97	6.17	9.75	9.98	0.74	5.35	4.89	5.31	9.85	3.49	1.66	2.97	2.63	5.37	5.85	**5.19**
April	4.04	1.43	4.92	2.85	3.78	5.64	4.26	4.74	7.43	3.00	2.92	4.04	2.51	2.51	5.59	4.70	3.69	0.78	0.71	8.12	7.13	**3.66**
TOTAL	**41.48**	**37.74**	**36.81**	**53.16**	**47.80**	**48.05**	**49.72**	**49.92**	**73.36**	**47.60**	**51.79**	**39.19**	**38.15**	**48.17**	**57.06**	**40.74**	**31.44**	**28.35**	**48.24**	**57.77**	**54.81**	**46.73**
AVG	**3.46**	**3.15**	**3.07**	**4.43**	**3.98**	**4.00**	**4.14**	**4.16**	**6.11**	**3.97**	**4.32**	**3.27**	**3.18**	**4.01**	**4.76**	**3.40**	**2.62**	**2.36**	**4.02**	**4.81**	**4.57**	**3.86**
MAX	**9.30**	**8.99**	**5.32**	**11.35**	**12.77**	**10.54**	**11.17**	**8.87**	**10.76**	**9.98**	**11.62**	**5.98**	**6.58**	**13.84**	**10.43**	**7.21**	**6.33**	**6.71**	**8.64**	**10.43**	**7.49**	**9.34**
MIN	**0.02**	**0.00**	**0.24**	**0.71**	**0.02**	**0.74**	**0.04**	**0.09**	**0.35**	**0.09**	**0.01**	**0.00**	**0.13**	**0.50**	**0.15**	**0.00**	**0.06**	**0.70**	**0.09**	**0.00**	**0.00**	**0.20**

20-Year Rainfall Summary		
20-Year Average Annual Rainfall (in.):	46.33	
20-Year Maximum Annual Rainfal (in.):	73.36	(2010)
20-Year Minimum Annual Rainfall (in.):	28.35	(2019)

ATTACHMENT B

City of Camas WWTP (WA0020249) - Annual Infiltration and Inflow Report

May 2022 to April 2023

WWTP Design Capacity

Peak Hourly Hydraulic Design Flow (MGD):	**13.44**
Maximum Monthly Average Design Flow (MGD):	**6.10**
Design Population Equivalent:	**28,075**

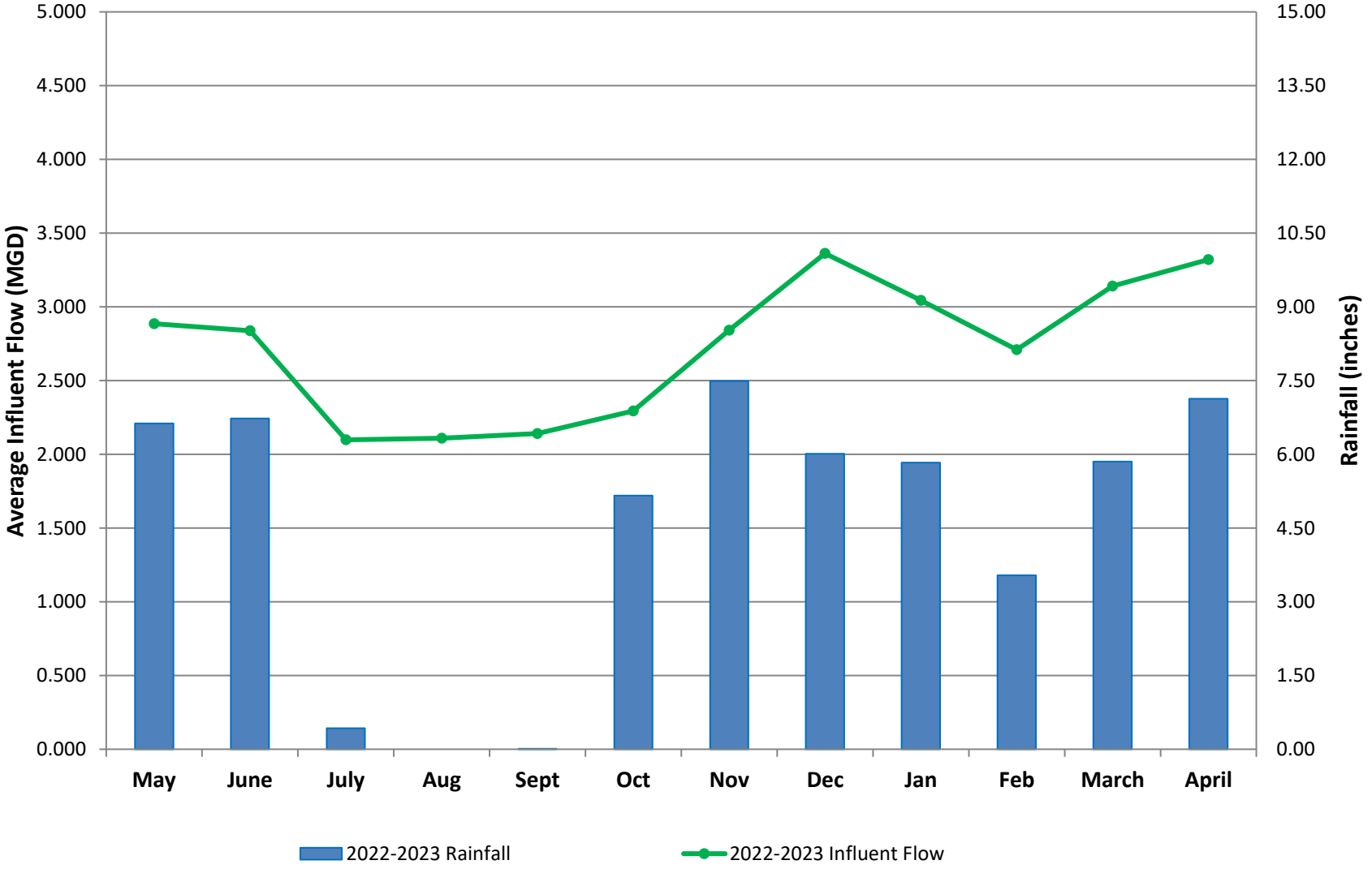
	Monthly Average WWTP Influent Flow (MGD)			Total Monthly Rainfall (inches)			Population Served			Additional Sewer Lines Added (ft.)		
Month	**2020**	**2021**	**2022**	**2020**	**2021**	**2022**	**2020**	**2021**	**2022**	**2020**	**2021**	**2022**
May	2.319	2.138	2.886	3.37	2.46	6.63	26,065	26,870	27,250	0	1,714	0
June	2.409	2.156	2.838	5.54	2.40	6.73	26,065	26,870	27,250	0	1,114	0
July	1.972	2.084	2.098	0.09	0.00	0.43	26,065	26,870	27,250	3,130	0	0
Aug	2.043	2.146	2.109	0.33	0.16	0.00	26,065	26,870	27,250	1,910	0	0
Sept	2.192	2.284	2.140	4.77	4.64	0.01	26,065	26,870	27,250	4,171	0	0
Oct	2.231	2.493	2.294	2.45	4.89	5.16	26,065	26,870	27,250	3,076	0	0
Nov	2.691	3.187	2.842	7.13	**10.43**	**7.49**	26,065	26,870	27,250	0	0	0
Dec	2.991	3.401	**3.362**	7.96	8.06	6.01	26,065	26,870	27,250	0	0	0
Jan	**3.306**	**3.484**	3.044	**8.64**	7.88	5.83	26,870	27,250	27,598	0	0	0
Feb	3.222	2.570	2.710	4.62	3.36	3.54	26,870	27,250	27,598	0	0	0
March	2.470	2.949	3.141	2.63	5.37	5.85	26,870	27,250	27,598	525	795	0
April	2.139	2.952	3.320	0.71	8.12	7.13	26,870	27,250	27,598	580	0	0
Period Total:	29.984	31.842	32.784	48.24	57.77	54.81			**Total Added (feet):**	13,392	3,623	0
Low Month:	1.972	2.084	2.098	0.09	0.00	0.00			**Total Added (miles):**	2.54	0.69	0.00
High Month:	**3.306**	**3.484**	**3.362**	**8.64**	**10.43**	**7.49**						
Annual Average:	2.499	2.654	2.732	4.02	4.81	4.57						
Period I/I:	1.334	1.400	1.264									

INFILTRATION/INFLOW SUMMARY

Year	I/I	% Increase/Decrease From Base I/I	% Increase/Decrease from Prior Year	% of Max Month. Design Flow	Total Rainfall
Base Year: 2011	***1.511***	***n/a***	***-6%***	***25%***	***47.60***
2020-2021	1.334	-12%	131%	22%	48.24
2021-2022	1.400	-7%	5%	23%	57.77
2022-2023	1.264	-16%	-10%	21%	54.81

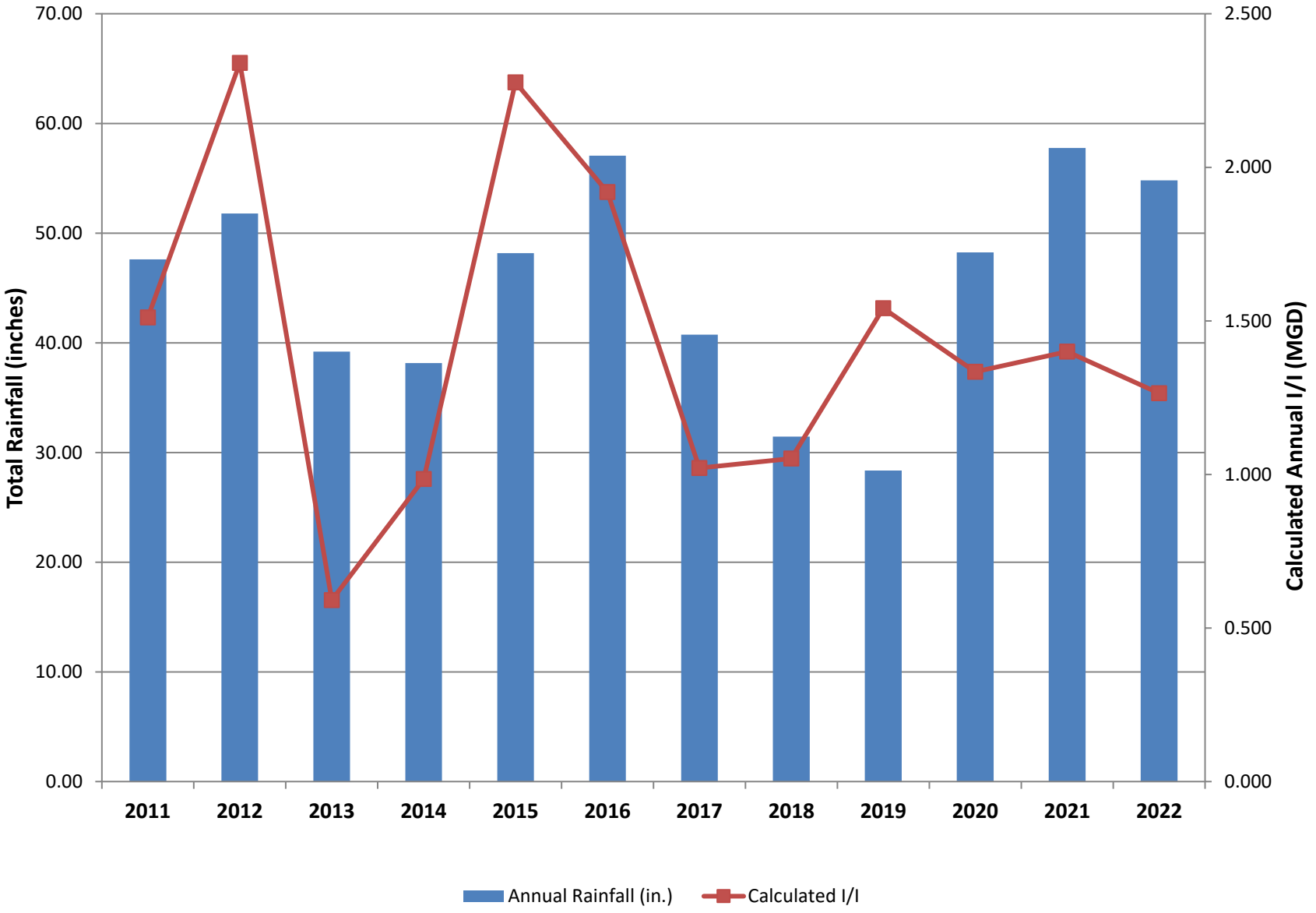
ATTACHMENT C, CHART I

May 2022 - April 2023 Monthly Average Influent Flow and Monthly Total Rainfall



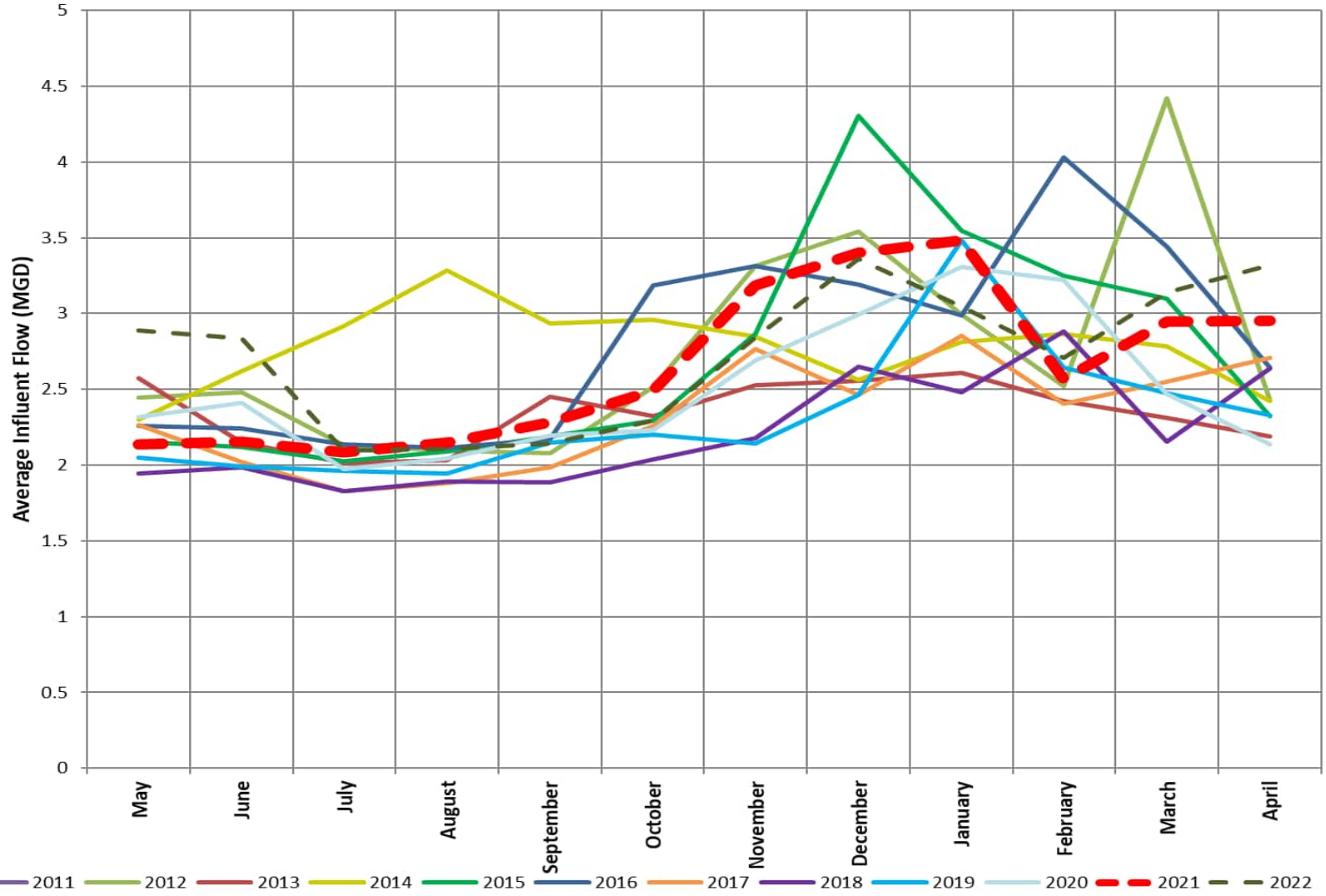
ATTACHMENT C, CHART II

Annual Rainfall & Calculated I/I Since Base Year (2011)



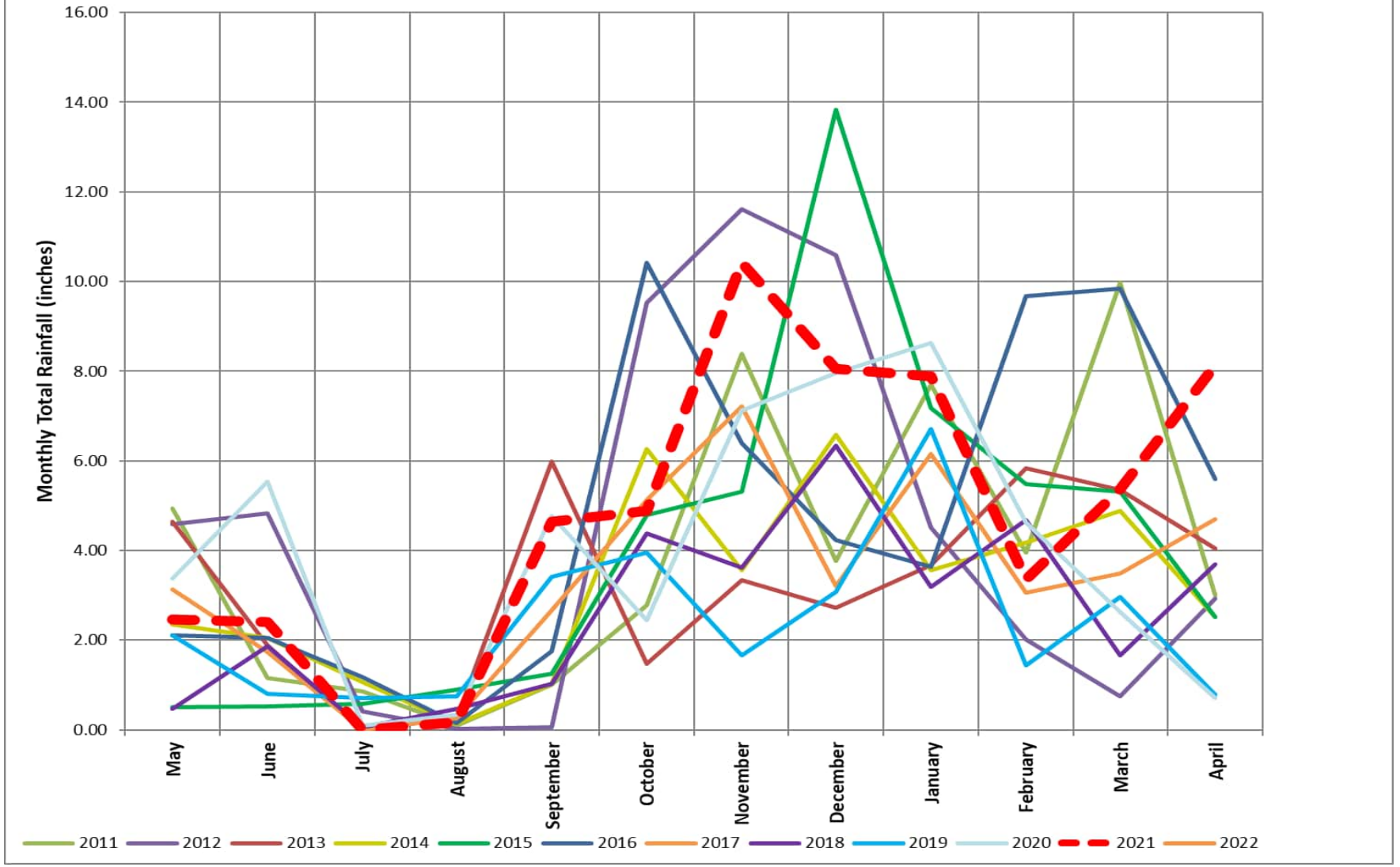
ATTACHMENT C, CHART III

WWTP Monthly Average Influent Flow Since Base Year (2011)



ATTACHMENT C, CHART IV

Monthly Total Rainfall Since Base Year (2011)



City of Camas Washington
Public Works Department
616 NE 4th Avenue
Camas, WA 98607

July 9, 2024

Carey Cholski
Washington State Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: **May 2023 – April 2024 Annual Inflow and Infiltration Report**
City of Camas, WA Wastewater Treatment Facility (Permit No. WA0020249)

Ms. Cholski,

Pursuant to Section S4.E of our current NPDES Permit, enclosed is our annual Inflow and Infiltration (I/I) report. Section S4.E.3 of our permit states:

> *The Permittee must conduct an annual analysis of infiltration and inflow according to Ecology's guidance manual for treatment plant operators. This report shall consider the 12-month period May 1st through the following April 30th as the annual period and shall be submitted by July 15, 2017 and annually thereafter. This report shall include an update on the status of each inflow reduction project completed in fulfillment of S4.E.2 (above) including the funds expended or contractually obligated, and the proportion of the project completed as of the end of the reporting period. For each basin or sub-basin in which work has been done within the reporting period, the report shall include the estimated inflow rates before and after the project and the estimated effect on the overall Publicly Owned Treatment Works (POTW) inflow rate.*

According to Ecology's Information Manual for Treatment Plant Operators (Feb. 2004), an Annual I/I Report should include each of the following elements:

1. *The average monthly flow and total precipitation for each month for the past year together with a graph … plotting a comparison of precipitation versus influent flow.*
2. *The maximum monthly and peak hourly hydraulic design capacity for the plant.*

3. *The design population equivalent for the treatment plant and the population served by the facility, per month, for the past year.*
4. *The amount of I/I for each year since the base year and the percent of maximum monthly design capacity each year's I/I represents.*
5. *The percent increase or reduction in I/I for each year subsequent to the base year I/I.*
6. *The additional lengths of sewer lines added to the collection system, per month, for the past year. Also include a brief summary of any major sewer rehabilitation or I/I reduction projects.*

The following information and attachments are now being submitted to satisfy these requirements.

I. REPORTING PERIOD AND BASE YEAR

As described in Section S4.E.3 of our current NPDES permit, the annual period for our I/I report is May 1st through April 30th. Accordingly, please note that when this report refers to the "reporting period" or "year", it is referring to the 12-month period from May 1st through April 30th. For any particular year that is referenced in the report, it is denoting the May through April reporting year and the calendar year in which May falls.

For the purposes of selecting an appropriate Base Year, the past twenty years of historical precipitation and plant influent flow data are reviewed annually. A summary of the monthly precipitation totals and influent flow averages for the past twenty years are included in Attachment A.

Since our facility's 2016 I&I report, the May 2011-April 2012 reporting year has been used as the Base Year, as it has reflected Camas' average rainfall, population growth and disposition of the City's sanitary sewer collection system.

From analysis of the historical data, May 2011-April 2012 continues to best an average, annual rainfall in Camas and therefore continues to serve as the Base Year for the purposes of this report.

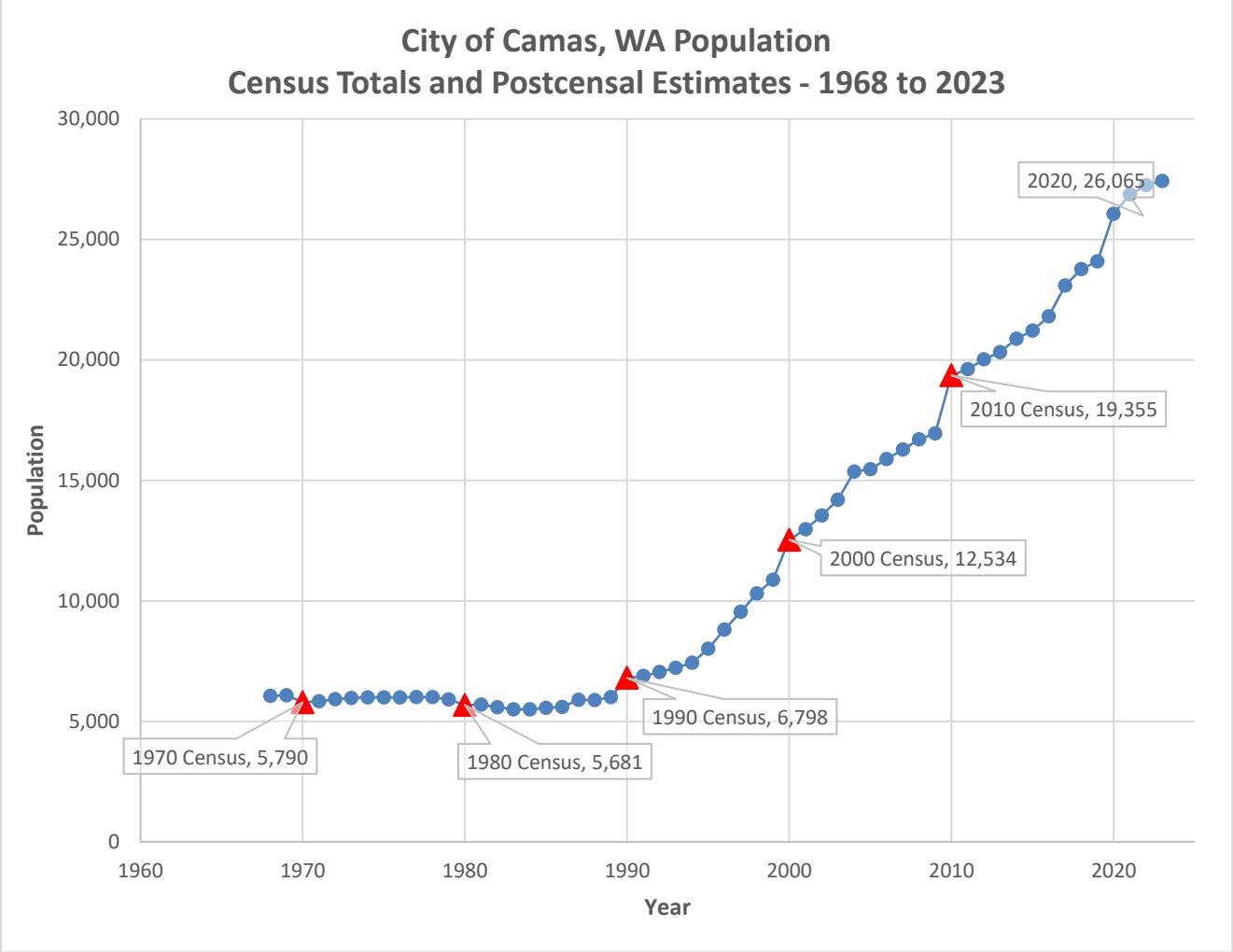
For the twenty-year period of May 1, 2003 to April 30, 2023, the average 12-month rainfall in Camas was 47.56 inches. From May 1, 2011 to April 30th 2012, the rainfall was 47.60, only 1.27 inches more than the twenty-year average. This represented the closest annual total to the twenty-year average, of all twenty years of data reviewed.

TABLE 1 - 12-Month May Through April Rainfall Totals, 2003-2023

	Average	Minimum	Base Year	Maximum
Annual Total Rainfall (in.)	47.56	28.35 (May 2019 – April 2020)	47.60 (May 2011-April 2012)	73.36 (May 2010-April 2011)

In addition to representing the 20-year median rainfall, using 2011-2012 as the "Base Year" incorporates the City's rapid growth that has occurred in the last 20 years. In I/I annual reports prior to 2016, the City of Camas had been using 1989 as the Base Year. Since 1989, the City of Camas has seen rapid growth in population and significant additions to its wastewater collection system. The May 2011-April 2012 period captures that growth,

which has taken place primarily after 1990. The chart below illustrates the City's annual, calendar year, population growth since 1968:



Historical Population Estimates for Camas, WA by Washington State Office of Financial Management
(https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/april-1-official-population-estimates)

II. INFLOW AND INFILTRATION ANALYSIS

Facility Design Parameters

The maximum monthly hydraulic design capacity for the Camas Wastewater Treatment Plant (WWTP) is 6.10 million gallons per day (MGD) and has a peak hourly hydraulic design capacity of 13.44 MGD. The Design Population Equivalent for the Camas WWTP is 28,075.

Calculated I/I and Annual Rainfall 20-Year History

The following chart is a summary of the calculated I/I, the percent of maximum monthly design capacity the calculated I/I represents, the percentage increase or decrease of I/I from the previous year and the total rainfall for each reporting year from May 2002 to April 2023:

TABLE 2 – Camas Calculated I/I & Rainfall

Year	Calculated I/I (MGD)	I/I as % of Design Capacity	I/I % Increase/Decrease from Prior Year	Total 12-Month Rainfall (in.)
2002	1.069	18%	-15%	41.48
2003	1.258	21%	+18%	37.74
2004	0.661	11%	-47%	36.81
2005	2.093	34%	+217%	53.16
2006	1.400	23%	-33%	47.80
2007	2.145	35%	+53%	48.05
2008	0.911	15%	-58%	49.72
2009	1.242	20%	+36%	49.92
2010	1.615	26%	+30%	73.36
2011	1.511	25%	-6%	47.60
2012	2.340	38%	+55%	51.79
2013	0.591	10%	-75%	39.19
2014	0.985	16%	+67%	38.15
2015	2.277	37%	+131%	48.17
2016	1.920	31%	-16%	57.06
2017	1.021	17%	-47%	40.74
2018	1.052	17%	+3%	31.44
2019	1.541	25%	+47%	28.35
2020	1.334	22%	-13%	48.24
2021	1.400	23%	+5%	57.77
2022	1.264	21%	-10%	54.81
2023	2.266	37%	+79%	58.80
Average				

Yellow Highlight = Base Year

Annual Report Form

Please see Attachment B for the Annual I/I Report form which summarizes the following data:

- The average monthly flow and total precipitation for each month, for the past three years.
- The calculated amount of I/I for each year.
- The percent of maximum monthly design capacity that each period's I/I represents.
- The population served by the facility, per month, for the past three years.
- The additional lengths of sewer lines added to the collection system, per month and per year, for the past three years.
- A summary of the I/I from the past three years, including a comparison with the selected Base Year (2011)

Charts

Please see Attachment C for several charts which plot I/I data to illustrate the following:

- Chart I: Comparison of precipitation versus influent flow for each month of the current reporting period.
- Chart II: Comparison of 12-month total precipitation and calculated I/I, for each year since the Base Year.
- Chart III: Monthly Average Influent Flow at the WWTP since the Base Year.
- Chart IV: Monthly Total Rainfall since the Base Year.

III. COLLECTION SYSTEM AND I/I REDUCTION PROJECTS AND MEASURES

Collection System Details

According to the City of Camas' General Sewer Plan, last updated in November of 2009, the city sanitary collection system was comprised of approximately 462,000 linear feet (87.5 miles) of pipe. Since 2009, approximately 156,800 linear feet of sewer line has been added, giving Camas approximately 619,637 linear feet (117 miles) of sewer line, as of the end of 2023.

In 2023/24, approximately 7878 linear feet of new sanitary sewer line were added to the City's system. All of which were installed in connection with residential development projects occurring throughout the year.

Camas' collection system is comprised of a combination of both traditional gravity sewer, force mains, pressure sewer lines, and 28 lift stations. Please see Attachment B for the lengths of sewer lines added to the collection system, per month and per year, for the past three years.

If you have any questions regarding this report or require any additional information, please do not hesitate to contact the Camas Wastewater Treatment Facility at (360) 834-3263.

Best Regards,

Darren Eki

Darren Eki
Wastewater Treatment Plant Operations Supervisor

Cc: Steve Wall

ATTACHMENT A - Camas 20-Year WWTP Influent Flow and Rainfall

WWTP Design Capacity	
Peak Day Design Flow (MGD):	10.04
Max. Monthly Average Design (MMAD) Flow (MGD):	6.10
Design Population Equivalent:	28,075

Monthly Average Influent Flow (MGD) - MAY 1, 2003 to APRIL 30, 2023

Month	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	AVG
May	1.622	1.953	2.607	2.177	2.064	2.056	2.255	2.370	2.563	2.446	2.576	2.299	2.155	2.259	2.263	1.946	2.050	2.319	2.138	2.886	2.230	**2.249**
June	1.520	1.996	2.083	2.095	1.997	2.092	1.918	2.833	2.190	2.480	2.149	2.623	2.118	2.244	2.019	1.983	1.992	2.409	2.156	2.838	2.180	**2.186**
July	1.483	1.832	1.925	2.023	1.954	1.903	1.904	1.973	1.994	2.129	2.015	2.915	2.028	2.135	1.831	1.828	1.961	1.972	2.084	2.098	2.068	**2.003**
August	1.450	2.011	1.981	2.050	1.948	2.015	1.921	1.955	2.029	2.093	2.033	3.284	2.088	2.112	1.881	1.890	1.943	2.043	2.146	2.109	2.141	**2.053**
September	1.549	1.948	2.031	2.087	2.035	1.971	1.963	2.055	2.062	2.079	2.454	2.935	2.187	2.169	1.985	1.884	2.151	2.192	2.284	2.140	2.199	**2.112**
October	1.619	2.089	2.212	2.101	2.252	2.013	2.078	2.226	2.148	2.518	2.324	2.961	2.292	3.185	2.262	2.035	2.199	2.231	2.493	2.294	2.314	**2.278**
November	1.903	2.202	2.700	3.423	2.484	2.391	2.510	3.057	2.653	3.312	2.528	2.849	2.867	3.312	2.764	2.178	2.143	2.691	3.187	2.842	2.732	**2.701**
December	2.573	2.494	3.086	3.148	3.465	2.433	2.580	3.364	2.396	3.540	2.556	2.560	4.305	3.191	2.465	2.648	2.461	2.991	3.401	3.362	3.553	**2.980**
January	2.708	2.262	4.018	2.798	4.094	2.814	3.146	3.042	3.222	2.995	2.606	2.810	3.548	2.988	2.852	2.480	3.484	3.306	3.484	3.044	4.334	**3.144**
February	2.414	2.165	2.584	2.754	2.643	2.061	2.567	2.648	2.748	2.522	2.422	2.863	3.251	4.031	2.405	2.880	2.644	3.222	2.570	2.710	3.244	**2.731**
March	1.887	2.345	2.576	2.819	2.442	2.504	2.388	3.570	3.505	4.419	2.314	2.784	3.099	3.442	2.552	2.156	2.476	2.470	2.949	3.141	2.932	**2.799**
April	1.627	2.156	2.377	2.327	2.302	2.327	2.308	2.904	2.898	2.428	2.191	2.425	2.321	2.643	2.710	2.639	2.330	2.139	2.952	3.320	2.517	**2.469**
AVG	**1.863**	**2.121**	**2.515**	**2.483**	**2.473**	**2.215**	**2.295**	**2.666**	**2.534**	**2.747**	**2.347**	**2.776**	**2.688**	**2.809**	**2.332**	**2.212**	**2.320**	**2.499**	**2.654**	**2.732**	**2.704**	2.464
MAX	**2.708**	**2.494**	**4.018**	**3.423**	**4.094**	**2.814**	**3.146**	**3.570**	**3.505**	**4.419**	**2.606**	**3.284**	**4.305**	**4.031**	**2.852**	**2.880**	**3.484**	**3.306**	**3.484**	**3.362**	**4.334**	3.389
MIN	**1.450**	**1.832**	**1.925**	**2.023**	**1.948**	**1.903**	**1.904**	**1.955**	**1.994**	**2.079**	**2.015**	**2.299**	**2.028**	**2.112**	**1.831**	**1.828**	**1.943**	**1.972**	**2.084**	**2.098**	**2.068**	1.961
Annual I/I	**1.258**	**0.661**	**2.093**	**1.400**	**2.145**	**0.911**	**1.242**	**1.615**	**1.511**	**2.340**	**0.591**	**0.985**	**2.277**	**1.920**	**1.021**	**1.052**	**1.541**	**1.334**	**1.400**	**1.264**	**2.266**	1.428
% of MMAD Flow	21%	11%	34%	23%	35%	15%	20%	26%	25%	38%	10%	16%	37%	31%	17%	17%	25%	22%	23%	21%	37%	23%
% +/- vs Prior Year	-15%	-47%	217%	-33%	53%	-58%	36%	30%	-6%	55%	-75%	67%	131%	-16%	-47%	3%	47%	-13%	5%	-10%	79%	16%

YELLOW = BASE YEAR

Monthly Total Rainfall (in.) - MAY 1, 2003 to APRIL 30, 2024

Month	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	AVG
May	2.00	1.65	6.14	2.94	2.11	2.11	4.44	3.93	4.94	4.58	4.64	2.35	0.50	2.10	3.13	0.46	2.10	3.37	2.46	6.63	1.44	**3.05**
June	0.52	1.52	3.22	1.24	2.01	2.19	1.18	7.03	1.16	4.83	1.88	2.05	0.52	2.06	1.74	1.87	0.80	5.54	2.40	6.73	1.51	**2.48**
July	0.00	0.24	0.71	0.67	0.74	0.04	0.09	0.35	0.85	0.41	0.00	1.07	0.57	1.17	0.00	0.06	0.70	0.09	0.00	0.43	0.00	**0.39**
August	0.09	3.91	0.74	0.02	0.99	1.98	0.60	0.90	0.09	0.01	0.26	0.13	0.90	0.15	0.27	0.47	0.75	0.33	0.16	0.00	0.83	**0.65**
September	1.36	2.45	2.37	2.35	3.46	0.81	1.18	3.64	1.00	0.05	5.98	1.02	1.25	1.76	2.66	1.03	3.42	4.77	4.64	0.01	2.02	**2.25**
October	3.09	5.32	5.02	2.44	5.15	4.43	4.11	6.39	2.78	9.52	1.47	6.26	4.80	10.43	5.13	4.39	3.95	2.45	4.89	5.16	2.85	**4.76**
November	5.57	3.19	5.10	12.77	6.29	11.17	7.59	10.76	8.39	11.62	3.33	3.56	5.31	6.39	7.21	3.62	1.65	7.13	10.43	7.49	7.40	**6.95**
December	8.99	4.87	8.88	6.57	10.54	7.27	5.98	10.26	3.77	10.58	2.73	6.58	13.84	4.24	3.21	6.33	3.08	7.96	8.06	6.01	12.01	**7.23**
January	6.73	2.28	11.35	2.69	4.82	6.30	8.87	6.87	7.69	4.52	3.68	3.56	7.17	3.64	6.15	3.19	6.71	8.64	7.88	5.83	15.57	**6.39**
February	5.68	1.81	2.92	5.54	2.59	2.19	4.97	6.05	3.95	2.01	5.83	4.17	5.49	9.68	3.05	4.67	1.44	4.62	3.36	3.54	6.54	**4.29**
March	2.28	4.65	3.86	6.79	3.71	6.97	6.17	9.75	9.98	0.74	5.35	4.89	5.31	9.85	3.49	1.66	2.97	2.63	5.37	5.85	4.13	**5.07**
April	1.43	4.92	2.85	3.78	5.64	4.26	4.74	7.43	3.00	2.92	4.04	2.51	2.51	5.59	4.70	3.69	0.78	0.71	8.12	7.13	4.50	**3.87**
TOTAL	**37.74**	**36.81**	**53.16**	**47.80**	**48.05**	**49.72**	**49.92**	**73.36**	**47.60**	**51.79**	**39.19**	**38.15**	**48.17**	**57.06**	**40.74**	**31.44**	**28.35**	**48.24**	**57.77**	**54.81**	**58.80**	47.56
AVG	**3.15**	**3.07**	**4.43**	**3.98**	**4.00**	**4.14**	**4.16**	**6.11**	**3.97**	**4.32**	**3.27**	**3.18**	**4.01**	**4.76**	**3.40**	**2.62**	**2.36**	**4.02**	**4.81**	**4.57**	**4.90**	3.92
MAX	**8.99**	**5.32**	**11.35**	**12.77**	**10.54**	**11.17**	**8.87**	**10.76**	**9.98**	**11.62**	**5.98**	**6.58**	**13.84**	**10.43**	**7.21**	**6.33**	**6.71**	**8.64**	**10.43**	**7.49**	**15.57**	9.25
MIN	**0.00**	**0.24**	**0.71**	**0.02**	**0.74**	**0.04**	**0.09**	**0.35**	**0.09**	**0.01**	**0.00**	**0.13**	**0.50**	**0.15**	**0.00**	**0.06**	**0.70**	**0.09**	**0.00**	**0.00**	**0.00**	0.20

20-Year Rainfall Summary		
20-Year Average Annual Rainfall (in.):	47.56	
20-Year Maximum Annual Rainfall (in.):	73.36	(2010)
20-Year Minimum Annual Rainfall (in.):	28.35	(2019)

ATTACHMENT B

City of Camas WWTP (WA0020249) - Annual Infiltration and Inflow Report

May 2023 to April 2024

WWTP Design Capacity

Peak Hourly Hydraulic Design Flow (MGD):	13.44
Maximum Monthly Average Design Flow (MGD):	6.10
Design Population Equivalent:	28,075

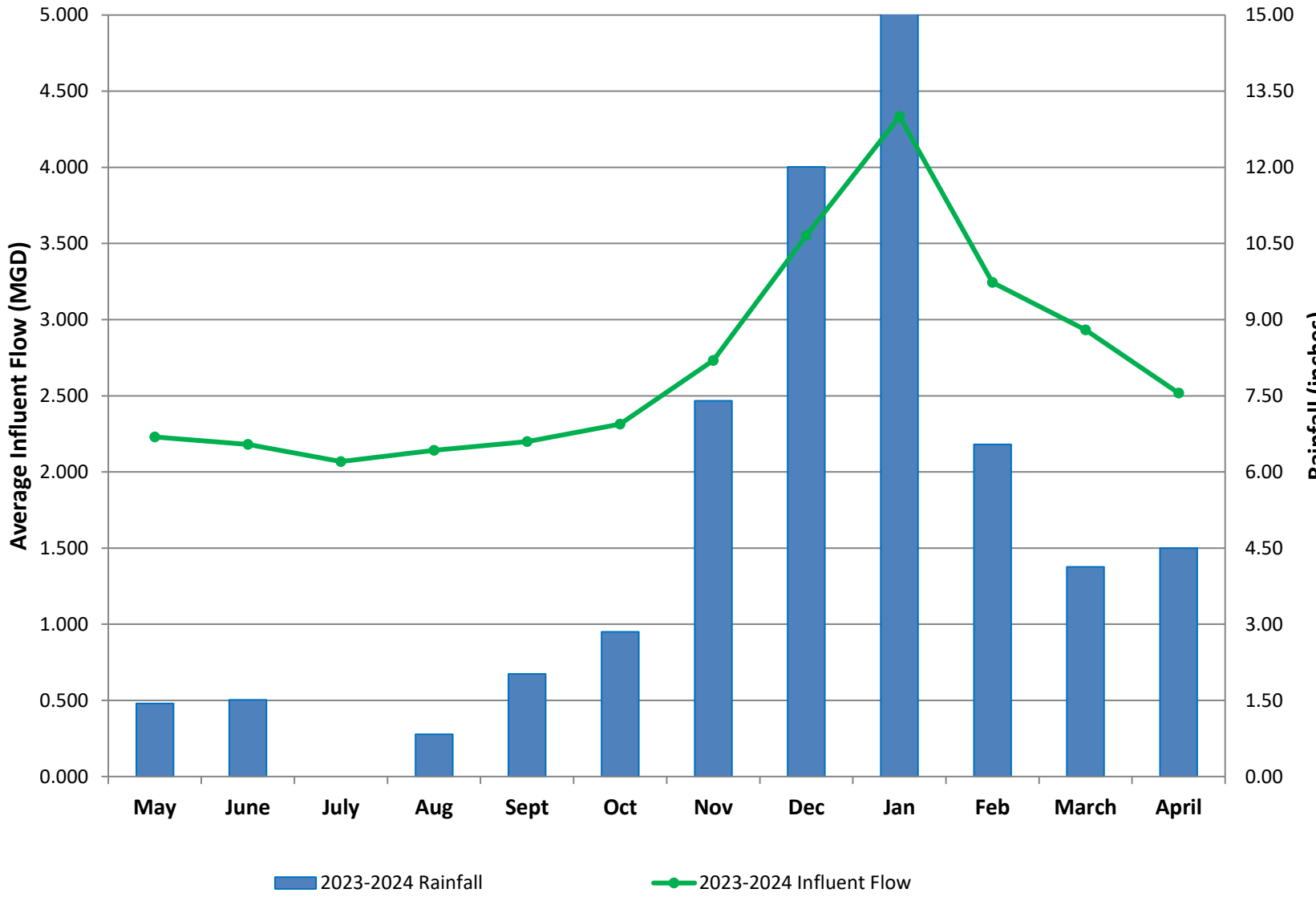
	Monthly Average WWTP Influent Flow (MGD)			Total Monthly Rainfall (inches)			Population Served			Additional Sewer Lines Added (ft.)		
Month	**2021**	**2022**	**2023**	**2021**	**2022**	**2023**	**2021**	**2022**	**2023**	**2021**	**2022**	**2023**
May	2.138	2.886	2.230	2.46	6.63	1.44	26,870	27,250	27,420	1,714	0	1,269
June	2.156	2.838	2.180	2.40	6.73	1.51	26,870	27,250	27,420	1,114	0	0
July	2.084	2.098	2.068	0.00	0.43	0.00	26,870	27,250	27,250	0	0	0
Aug	2.146	2.109	2.141	0.16	0.00	0.83	26,870	27,250	27,420	0	0	4,135
Sept	2.284	2.140	2.199	4.64	0.01	2.02	26,870	27,250	27,420	0	0	0
Oct	2.493	2.294	2.314	4.89	5.16	2.85	26,870	27,250	27,420	0	0	0
Nov	3.187	2.842	2.732	**10.43**	**7.49**	7.40	26,870	27,250	27,420	0	0	0
Dec	3.401	**3.362**	3.553	8.06	6.01	12.01	26,870	27,250	27,420	0	0	0
Jan	**3.484**	3.044	**4.334**	7.88	5.83	**15.57**	27,250	27,420	27,420	0	0	0
Feb	2.570	2.710	3.244	3.36	3.54	6.54	27,250	27,420	27,420	0	0	0
March	2.949	3.141	2.932	5.37	5.85	4.13	27,250	27,420	27,420	795	1,269	0
April	2.952	3.320	2.517	8.12	7.13	4.50	27,250	27,420	27,420	0	0	2,474
Period Total:	31.842	32.784	32.445	57.77	54.81	58.80			**Total Added (feet):**	3,623	1,269	7,878
Low Month:	2.084	2.098	2.068	0.00	0.00	0.00			**Total Added (miles):**	0.69	0.24	1.49
High Month:	**3.484**	**3.362**	**4.334**	**10.43**	**7.49**	**15.57**						
Annual Average:	2.654	2.732	2.704	4.81	4.57	4.90						
Period I/I:	1.400	1.264	2.266									

INFILTRATION/INFLOW SUMMARY

Year	I/I	% Increase/Decrease From Base I/I	% Increase/Decrease from Prior Year	% of Max Month. Design Flow	Total Rainfall
Base Year: 2011	***1.511***	***n/a***	***-6%***	***25%***	***47.60***
2021-2022	1.400	-7%	-7%	23%	57.77
2022-2023	1.264	-16%	-10%	21%	54.81
2023-2024	2.266	50%	79%	37%	58.80

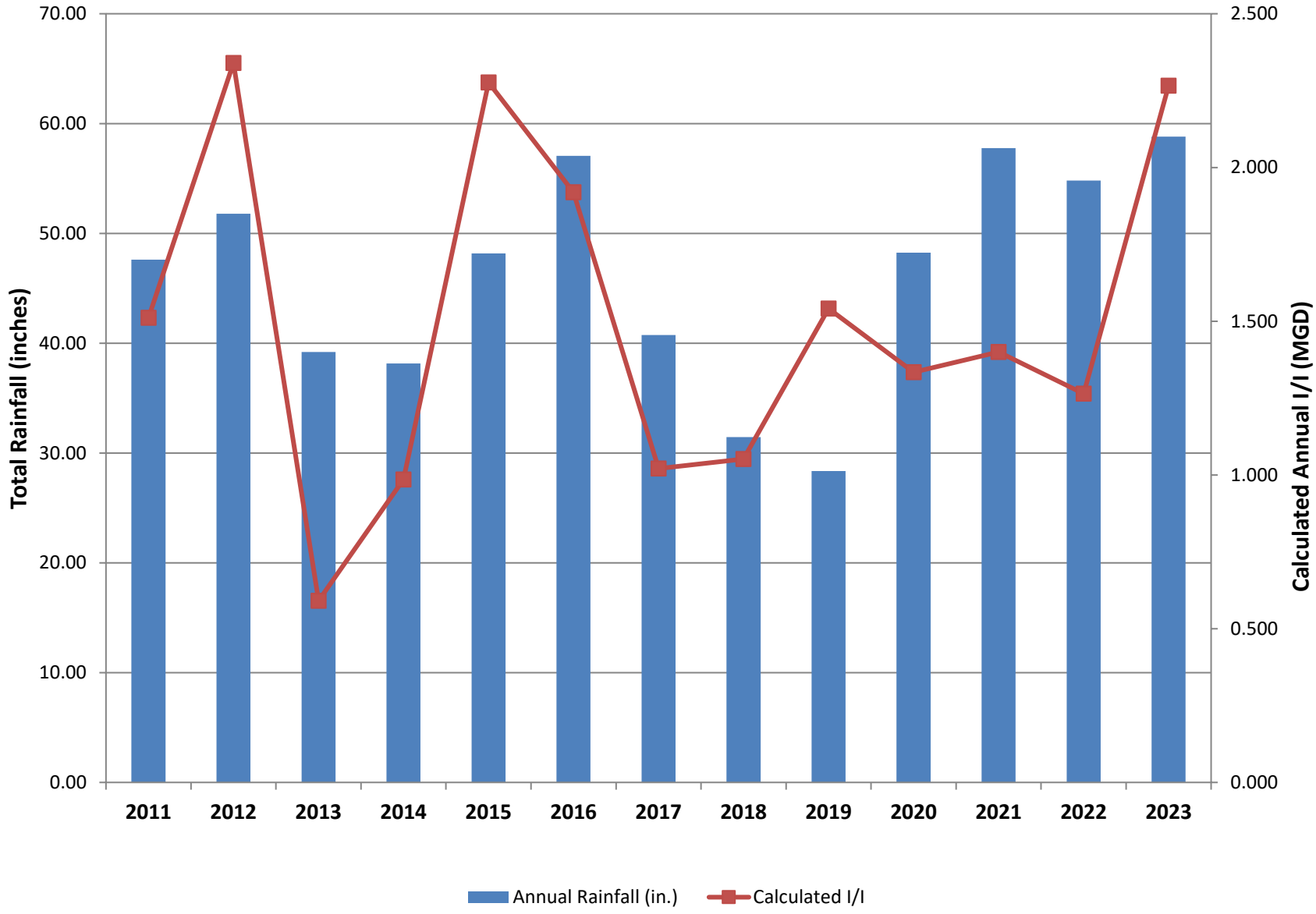
ATTACHMENT C, CHART I

May 2023 - April 2024 Monthly Average Influent Flow and Monthly Total Rainfall



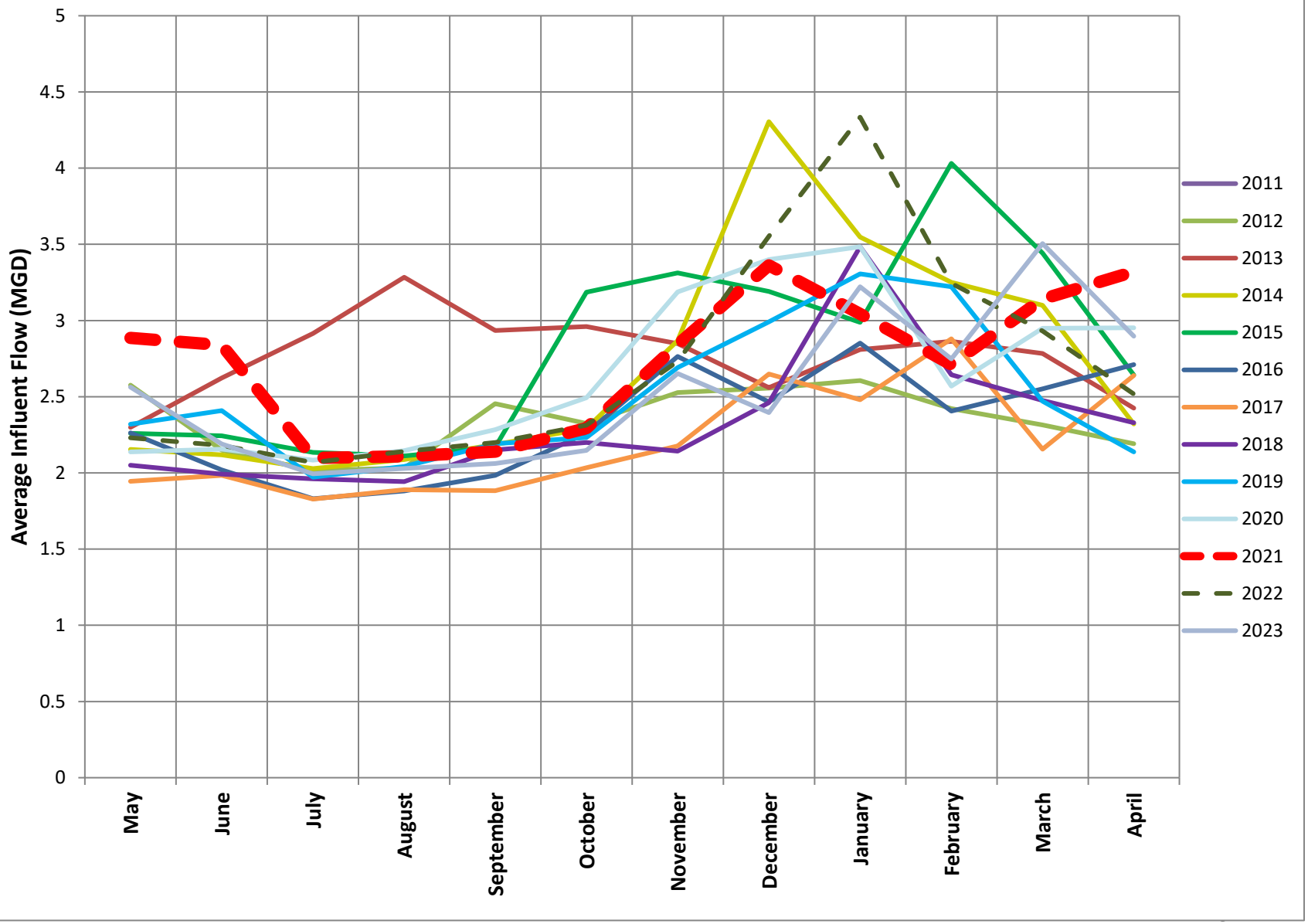
ATTACHMENT C, CHART II

Annual Rainfall & Calculated I/I Since Base Year (2012)



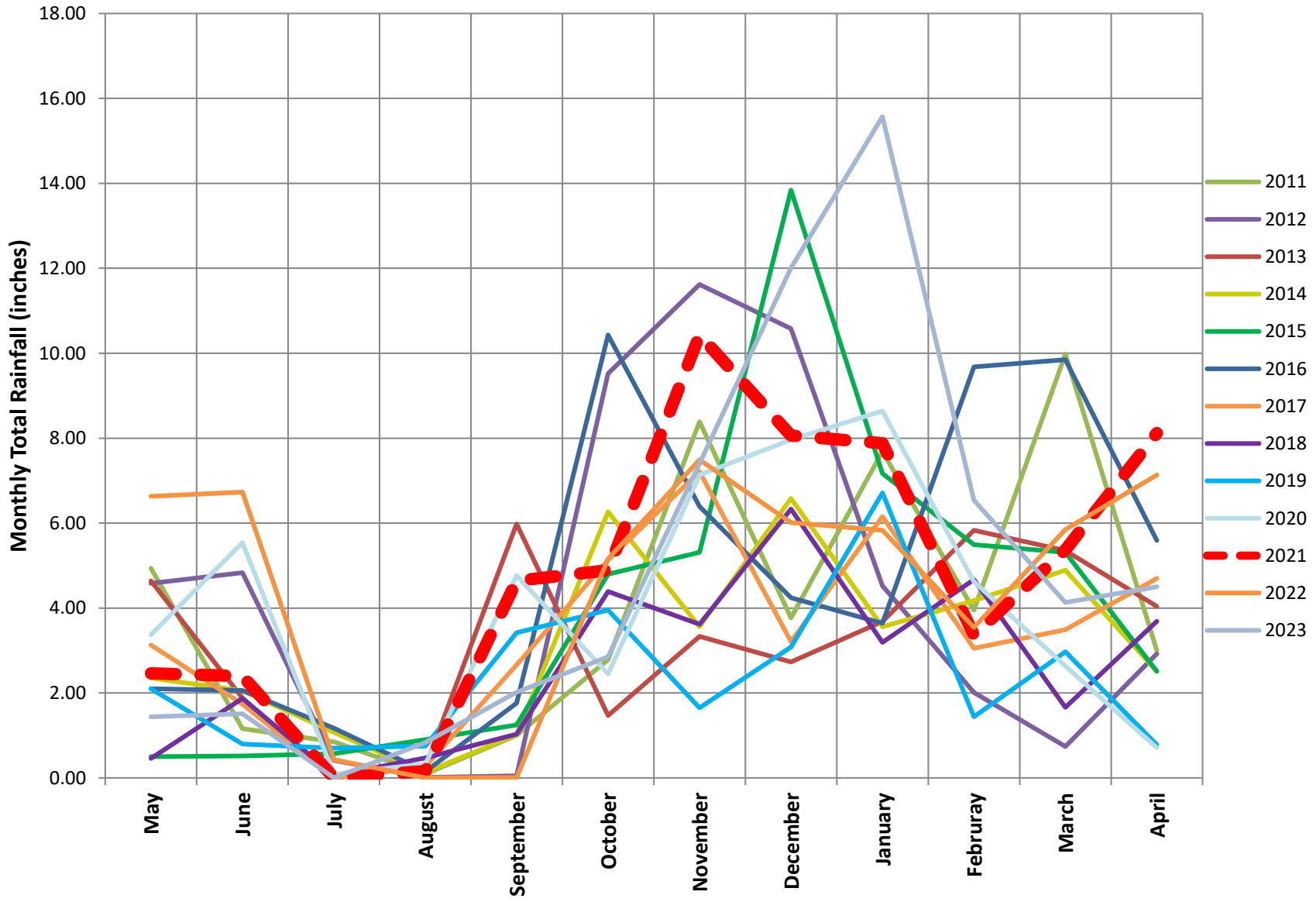
ATTACHMENT C, CHART III

WWTP Monthly Average Influent Flow Since Base Year (2011)



ATTACHMENT C, CHART IV

Monthly Total Rainfall Since Base Year (2011)



City of Camas Washington
Public Works Department
616 NE 4th Avenue
Camas, WA 98607

July 7, 2025

Carey Cholski
Washington State Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: **May 2024 – April 2025 Annual Inflow and Infiltration Report**
City of Camas, WA Wastewater Treatment Facility (Permit No. WA0020249)

Ms. Cholski,

Pursuant to Section S4.E of our current NPDES Permit, enclosed is our annual Inflow and Infiltration (I/I) report. Section S4.E.3 of our permit states:

> *The Permittee must conduct an annual analysis of infiltration and inflow according to Ecology's guidance manual for treatment plant operators. This report shall consider the 12-month period May 1st through the following April 30th as the annual period and shall be submitted by July 15, 2017 and annually thereafter. This report shall include an update on the status of each inflow reduction project completed in fulfillment of S4.E.2 (above) including the funds expended or contractually obligated, and the proportion of the project completed as of the end of the reporting period. For each basin or sub-basin in which work has been done within the reporting period, the report shall include the estimated inflow rates before and after the project and the estimated effect on the overall Publicly Owned Treatment Works (POTW) inflow rate.*

According to Ecology's Information Manual for Treatment Plant Operators (Feb. 2004), an Annual I/I Report should include each of the following elements:

1. *The average monthly flow and total precipitation for each month for the past year together with a graph … plotting a comparison of precipitation versus influent flow.*
2. *The maximum monthly and peak hourly hydraulic design capacity for the plant.*

3. *The design population equivalent for the treatment plant and the population served by the facility, per month, for the past year.*
4. *The amount of I/I for each year since the base year and the percent of maximum monthly design capacity each year's I/I represents.*
5. *The percent increase or reduction in I/I for each year subsequent to the base year I/I.*
6. *The additional lengths of sewer lines added to the collection system, per month, for the past year. Also include a brief summary of any major sewer rehabilitation or I/I reduction projects.*

The following information and attachments are now being submitted to satisfy these requirements.

I. REPORTING PERIOD AND BASE YEAR

As described in Section S4.E.3 of our current NPDES permit, the annual period for our I/I report is May 1st through April 30th. Accordingly, please note that when this report refers to the "reporting period" or "year", it is referring to the 12-month period from May 1st through April 30th. For any particular year that is referenced in the report, it is denoting the May through April reporting year and the calendar year in which May falls.

For the purposes of selecting an appropriate Base Year, the past twenty years of historical precipitation and plant influent flow data are reviewed annually. A summary of the monthly precipitation totals and influent flow averages for the past twenty years are included in Attachment A.

Since our facility's 2016 I&I report, the May 2011-April 2012 reporting year has been used as the Base Year, as it has reflected Camas' average rainfall, population growth and disposition of the City's sanitary sewer collection system.

From analysis of the historical data, May 2011-April 2012 continues to best an average, annual rainfall in Camas and therefore continues to serve as the Base Year for the purposes of this report.

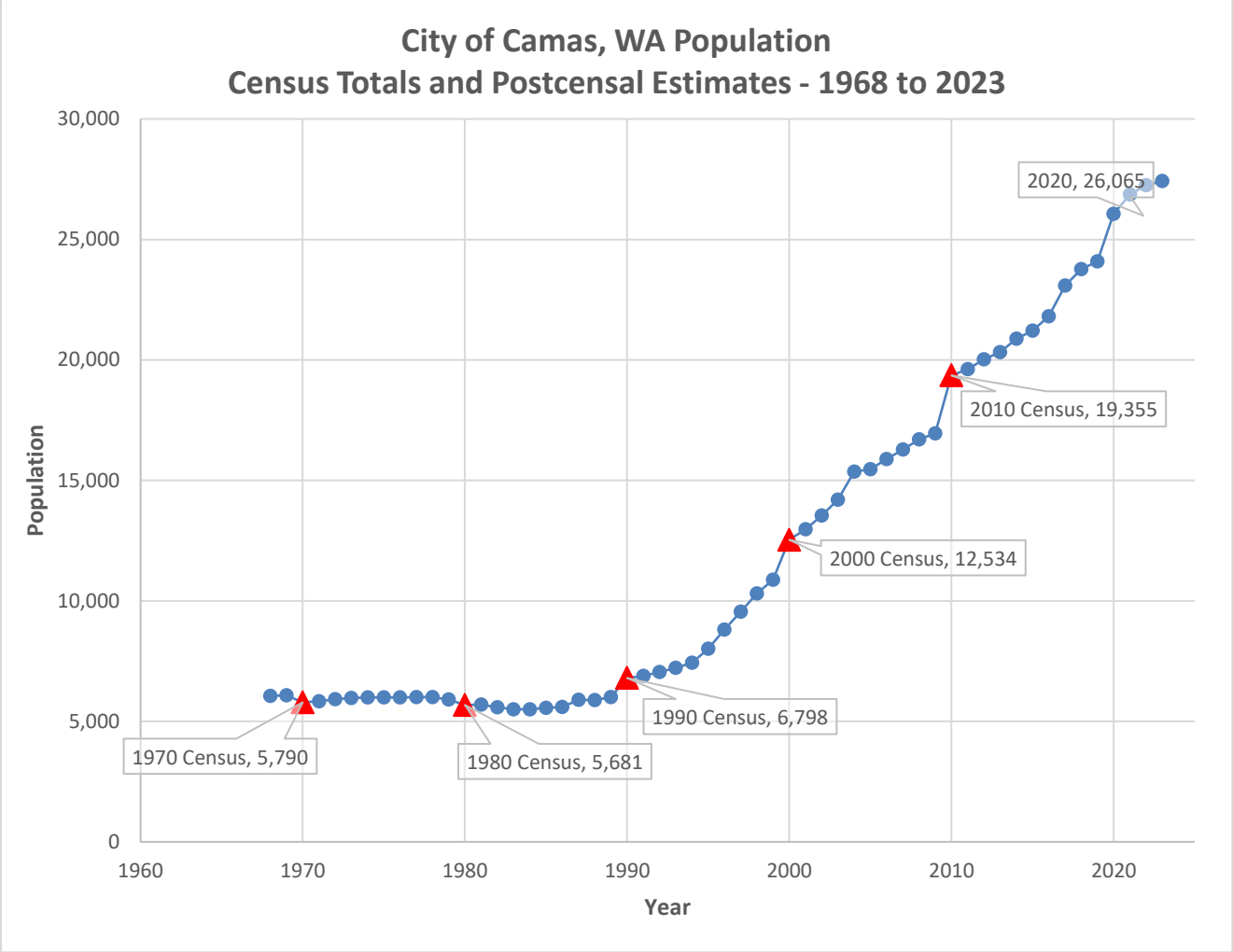
For the twenty-year period of May 1, 2003 to April 30, 2023, the average 12-month rainfall in Camas was 47.56 inches. From May 1, 2011 to April 30th 2012, the rainfall was 47.60, only 1.27 inches more than the twenty-year average. This represented the closest annual total to the twenty-year average, of all twenty years of data reviewed.

TABLE 1 - 12-Month May Through April Rainfall Totals, 2003-2023

	Average	Minimum	Base Year	Maximum
Annual Total Rainfall (in.)	47.56	28.35 (May 2019 – April 2020)	47.60 (May 2011-April 2012)	73.36 (May 2010-April 2011)

In addition to representing the 20-year median rainfall, using 2011-2012 as the "Base Year" incorporates the City's rapid growth that has occurred in the last 20 years. In I/I annual reports prior to 2016, the City of Camas had been using 1989 as the Base Year. Since 1989, the City of Camas has seen rapid growth in population and significant additions to its wastewater collection system. The May 2011-April 2012 period captures that growth,

which has taken place primarily after 1990. The chart below illustrates the City's annual, calendar year, population growth since 1968:



Historical Population Estimates for Camas, WA by Washington State Office of Financial Management
(https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/april-1-official-population-estimates)

II. INFLOW AND INFILTRATION ANALYSIS

Facility Design Parameters

The maximum monthly hydraulic design capacity for the Camas Wastewater Treatment Plant (WWTP) is 6.10 million gallons per day (MGD) and has a peak hourly hydraulic design capacity of 13.44 MGD. The Design Population Equivalent for the Camas WWTP is 28,075.

Calculated I/I and Annual Rainfall 20-Year History

The following chart is a summary of the calculated I/I, the percent of maximum monthly design capacity the calculated I/I represents, the percentage increase or decrease of I/I from the previous year and the total rainfall for each reporting year from May 2002 to April 2025:

TABLE 2 – Camas Calculated I/I & Rainfall

Year	Calculated I/I (MGD)	I/I as % of Design Capacity	I/I % Increase/Decrease from Prior Year	Total 12-Month Rainfall (in.)
2002	1.069	18%	-15%	41.48
2003	1.258	21%	+18%	37.74
2004	0.661	11%	-47%	36.81
2005	2.093	34%	+217%	53.16
2006	1.400	23%	-33%	47.80
2007	2.145	35%	+53%	48.05
2008	0.911	15%	-58%	49.72
2009	1.242	20%	+36%	49.92
2010	1.615	26%	+30%	73.36
2011	1.511	25%	-6%	47.60
2012	2.340	38%	+55%	51.79
2013	0.591	10%	-75%	39.19
2014	0.985	16%	+67%	38.15
2015	2.277	37%	+131%	48.17
2016	1.920	31%	-16%	57.06
2017	1.021	17%	-47%	40.74
2018	1.052	17%	+3%	31.44
2019	1.541	25%	+47%	28.35
2020	1.334	22%	-13%	48.24
2021	1.400	23%	+5%	57.77
2022	1.264	21%	-16%	54.81
2023	2.266	37%	+79%	58.80
2024	1.734	28%	-23%	55.00
Average				

Yellow Highlight = Base Year

Annual Report Form

Please see Attachment B for the Annual I/I Report form which summarizes the following data:

- The average monthly flow and total precipitation for each month, for the past three years.
- The calculated amount of I/I for each year.
- The percent of maximum monthly design capacity that each period's I/I represents.
- The population served by the facility, per month, for the past three years.
- The additional lengths of sewer lines added to the collection system, per month and per year, for the past three years.
- A summary of the I/I from the past three years, including a comparison with the selected Base Year (2011)

Charts

Please see Attachment C for several charts which plot I/I data to illustrate the following:

- Chart I: Comparison of precipitation versus influent flow for each month of the current reporting period.
- Chart II: Comparison of 12-month total precipitation and calculated I/I, for each year since the Base Year.
- Chart III: Monthly Average Influent Flow at the WWTP since the Base Year.
- Chart IV: Monthly Total Rainfall since the Base Year.

III. COLLECTION SYSTEM AND I/I REDUCTION PROJECTS AND MEASURES

Collection System Details

According to the City of Camas' General Sewer Plan, last updated in November of 2009, the city sanitary collection system was comprised of approximately 462,000 linear feet (87.5 miles) of pipe. Since 2009, approximately 165,515 linear feet of sewer line has been added, giving Camas approximately 627,515 linear feet (118 miles) of sewer line, as of the end of 2024.

In 2024/25, approximately 17,149 linear feet of new sanitary sewer line were added to the City's system. All of which were installed in connection with residential development projects occurring throughout the year.

Camas' collection system is comprised of a combination of both traditional gravity sewer, force mains, pressure sewer lines, and 28 lift stations. Please see Attachment B for the lengths of sewer lines added to the collection system, per month and per year, for the past three years.

If you have any questions regarding this report or require any additional information, please do not hesitate to contact the Camas Wastewater Treatment Facility at (360) 834-3263.

Best Regards,

Jacob Taylor

Jacob Taylor
Lead Wastewater Treatment Plant Operator

Cc: Rob Charles, Utilities Manager

ATTACHMENT A - Camas 20-Year WWTP Influent Flow and Rainfall

WWTP Design Capacity	
Peak Day Design Flow (MGD):	10.04
Max. Monthly Average Design (MMAD) Flow (MGD):	6.10
Design Population Equivalent:	28,075

Monthly Average Influent Flow (MGD) - MAY 1, 2004 to APRIL 30, 2024

Month	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	AVG
May	1.622	1.953	2.607	2.177	2.064	2.056	2.255	2.370	2.563	2.446	2.576	2.299	2.155	2.259	2.263	1.946	2.050	2.319	2.138	2.886	2.230	2.733	**2.271**
June	1.520	1.996	2.083	2.095	1.997	2.092	1.918	2.833	2.190	2.480	2.149	2.623	2.118	2.244	2.019	1.983	1.992	2.409	2.156	2.838	2.180	2.205	**2.187**
July	1.483	1.832	1.925	2.023	1.954	1.903	1.904	1.973	1.994	2.129	2.015	2.915	2.028	2.135	1.831	1.828	1.961	1.972	2.084	2.098	2.068	2.021	**2.004**
August	1.450	2.011	1.981	2.050	1.948	2.015	1.921	1.955	2.029	2.093	2.033	3.284	2.088	2.112	1.881	1.890	1.943	2.043	2.146	2.109	2.141	2.049	**2.053**
September	1.549	1.948	2.031	2.087	2.035	1.971	1.963	2.055	2.062	2.079	2.454	2.935	2.187	2.169	1.985	1.884	2.151	2.192	2.284	2.140	2.199	2.288	**2.120**
October	1.619	2.089	2.212	2.101	2.252	2.013	2.078	2.226	2.148	2.518	2.324	2.961	2.292	3.185	2.262	2.035	2.199	2.231	2.493	2.294	2.314	2.619	**2.294**
November	1.903	2.202	2.700	3.423	2.484	2.391	2.510	3.057	2.653	3.312	2.528	2.849	2.867	3.312	2.764	2.178	2.143	2.691	3.187	2.842	2.732	3.525	**2.739**
December	2.573	2.494	3.086	3.148	3.465	2.433	2.580	3.364	2.396	3.540	2.556	2.560	4.305	3.191	2.465	2.648	2.461	2.991	3.401	3.362	3.553	3.756	**3.015**
January	2.708	2.262	4.018	2.798	4.094	2.814	3.146	3.042	3.222	2.995	2.606	2.810	3.548	2.988	2.852	2.480	3.484	3.306	3.484	3.044	4.334	3.269	**3.150**
February	2.414	2.165	2.584	2.754	2.643	2.061	2.567	2.648	2.748	2.522	2.422	2.863	3.251	4.031	2.405	2.880	2.644	3.222	2.570	2.710	3.244	3.438	**2.763**
March	1.887	2.345	2.576	2.819	2.442	2.504	2.388	3.570	3.505	4.419	2.314	2.784	3.099	3.442	2.552	2.156	2.476	2.470	2.949	3.141	2.932	3.420	**2.827**
April	1.627	2.156	2.377	2.327	2.302	2.327	2.308	2.904	2.898	2.428	2.191	2.425	2.321	2.643	2.710	2.639	2.330	2.139	2.952	3.320	2.517	2.749	**2.481**
AVG	**1.863**	**2.121**	**2.515**	**2.483**	**2.473**	**2.215**	**2.295**	**2.666**	**2.534**	**2.747**	**2.347**	**2.776**	**2.688**	**2.809**	**2.332**	**2.212**	**2.320**	**2.499**	**2.654**	**2.732**	**2.704**	**2.565**	**2.464**
MAX	**2.708**	**2.494**	**4.018**	**3.423**	**4.094**	**2.814**	**3.146**	**3.570**	**3.505**	**4.419**	**2.606**	**3.284**	**4.305**	**4.031**	**2.852**	**2.880**	**3.484**	**3.306**	**3.484**	**3.362**	**4.334**	**3.756**	**3.389**
MIN	**1.450**	**1.832**	**1.925**	**2.023**	**1.948**	**1.903**	**1.904**	**1.955**	**1.994**	**2.079**	**2.015**	**2.299**	**2.028**	**2.112**	**1.831**	**1.828**	**1.943**	**1.972**	**2.084**	**2.098**	**2.068**	**2.021**	**1.961**
Annual I/I	**1.258**	**0.661**	**2.093**	**1.400**	**2.145**	**0.911**	**1.242**	**1.615**	**1.511**	**2.340**	**0.591**	**0.985**	**2.277**	**1.920**	**1.021**	**1.052**	**1.541**	**1.334**	**1.400**	**1.264**	**2.266**	**1.734**	**1.428**
% of MMAD Flow	21%	11%	34%	23%	35%	15%	20%	26%	25%	38%	10%	16%	37%	31%	17%	17%	25%	22%	23%	21%	37%	28%	23%
% +/- vs Prior Year	-15%	-47%	217%	-33%	53%	-58%	36%	30%	-6%	55%	-75%	67%	131%	-16%	-47%	3%	47%	-13%	5%	-10%	62%	37%	16%

YELLOW = BASE YEAR

Monthly Total Rainfall (in.) - MAY 1, 2004 to APRIL 30, 2024

Month	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	AVG
May	2.00	1.65	6.14	2.94	2.11	2.11	4.44	3.93	4.94	4.58	4.64	2.35	0.50	2.10	3.13	0.46	2.10	3.37	2.46	6.63	1.44	4.93	**3.13**
June	0.52	1.52	3.22	1.24	2.01	2.19	1.18	7.03	1.16	4.83	1.88	2.05	0.52	2.06	1.74	1.87	0.80	5.54	2.40	6.73	1.51	2.20	**2.46**
July	0.00	0.24	0.71	0.67	0.74	0.04	0.09	0.35	0.85	0.41	0.00	1.07	0.57	1.17	0.00	0.06	0.70	0.09	0.00	0.43	0.00	0.18	**0.38**
August	0.09	3.91	0.74	0.02	0.99	1.98	0.60	0.90	0.09	0.01	0.26	0.13	0.90	0.15	0.27	0.47	0.75	0.33	0.16	0.00	0.83	1.36	**0.68**
September	1.36	2.45	2.37	2.35	3.46	0.81	1.18	3.64	1.00	0.05	5.98	1.02	1.25	1.76	2.66	1.03	3.42	4.77	4.64	0.01	2.02	2.38	**2.26**
October	3.09	5.32	5.02	2.44	5.15	4.43	4.11	6.39	2.78	9.52	1.47	6.26	4.80	10.43	5.13	4.39	3.95	2.45	4.89	5.16	2.85	5.12	**4.78**
November	5.57	3.19	5.10	12.77	6.29	11.17	7.59	10.76	8.39	11.62	3.33	3.56	5.31	6.39	7.21	3.62	1.65	7.13	10.43	7.49	7.40	9.20	**7.05**
December	8.99	4.87	8.88	6.57	10.54	7.27	5.98	10.26	3.77	10.58	2.73	6.58	13.84	4.24	3.21	6.33	3.08	7.96	8.06	6.01	12.01	11.04	**7.40**
January	6.73	2.28	11.35	2.69	4.82	6.30	8.87	6.87	7.69	4.52	3.68	3.56	7.17	3.64	6.15	3.19	6.71	8.64	7.88	5.83	15.57	3.92	**6.28**
February	5.68	1.81	2.92	5.54	2.59	2.19	4.97	6.05	3.95	2.01	5.83	4.17	5.49	9.68	3.05	4.67	1.44	4.62	3.36	3.54	6.54	6.30	**4.38**
March	2.28	4.65	3.86	6.79	3.71	6.97	6.17	9.75	9.98	0.74	5.35	4.89	5.31	9.85	3.49	1.66	2.97	2.63	5.37	5.85	4.13	6.58	**5.07**
April	1.43	4.92	2.85	3.78	5.64	4.26	4.74	7.43	3.00	2.92	4.04	2.51	2.51	5.59	4.70	3.69	0.78	0.71	8.12	7.13	4.50	1.79	**3.87**
TOTAL	**37.74**	**36.81**	**53.16**	**47.80**	**48.05**	**49.72**	**49.92**	**73.36**	**47.60**	**51.79**	**39.19**	**38.15**	**48.17**	**57.06**	**40.74**	**31.44**	**28.35**	**48.24**	**57.77**	**54.81**	**58.80**	**55.00**	**47.89**
AVG	**3.15**	**3.07**	**4.43**	**3.98**	**4.00**	**4.14**	**4.16**	**6.11**	**3.97**	**4.32**	**3.27**	**3.18**	**4.01**	**4.76**	**3.40**	**2.62**	**2.36**	**4.02**	**4.81**	**4.57**	**4.90**	**4.58**	**3.92**
MAX	**8.99**	**5.32**	**11.35**	**12.77**	**10.54**	**11.17**	**8.87**	**10.76**	**9.98**	**11.62**	**5.98**	**6.58**	**13.84**	**10.43**	**7.21**	**6.33**	**6.71**	**8.64**	**10.43**	**7.49**	**15.57**	**11.04**	**9.25**
MIN	**0.00**	**0.24**	**0.71**	**0.02**	**0.74**	**0.04**	**0.09**	**0.35**	**0.09**	**0.01**	**0.00**	**0.13**	**0.50**	**0.15**	**0.00**	**0.06**	**0.70**	**0.09**	**0.00**	**0.00**	**0.00**	**0.18**	**0.20**

20-Year Rainfall Summary		
20-Year Average Annual Rainfall (in.):	47.89	
20-Year Maximum Annual Rainfal (in.):	73.36	(2010)
20-Year Minimum Annual Rainfall (in.):	28.35	(2019)

ATTACHMENT B

City of Camas WWTP (WA0020249) - Annual Infiltration and Inflow Report

May 2024 to April 2025

WWTP Design Capacity

Peak Hourly Hydraulic Design Flow (MGD):	**13.44**
Maximum Monthly Average Design Flow (MGD):	**6.10**
Design Population Equivalent:	**28,075**

	Monthly Average WWTP Influent Flow (MGD)			Total Monthly Rainfall (inches)			Population Served			Additional Sewer Lines Added (ft.)		
Month	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**	**2022**	**2023**	**2024**
May	2.886	2.230	2.733	6.63	1.44	4.93	27,250	27,420	27,420	0	1,269	1,269
June	2.838	2.180	2.205	6.73	1.51	2.20	27,250	27,420	27,420	0	0	0
July	2.098	2.068	2.021	0.43	0.00	0.18	27,250	27,250	27,250	0	0	0
Aug	2.109	2.141	2.049	0.00	0.83	1.36	27,250	27,420	27,420	0	4,135	4,135
Sept	2.140	2.199	2.288	0.01	2.02	2.38	27,250	27,420	27,420	0	0	0
Oct	2.294	2.314	2.619	5.16	2.85	5.12	27,250	27,420	27,420	0	0	0
Nov	2.842	2.732	3.525	**7.49**	7.40	9.20	27,250	27,420	27,420	0	0	0
Dec	**3.362**	3.553	**3.756**	6.01	12.01	**11.04**	27,250	27,420	27,420	0	0	0
Jan	3.044	**4.334**	3.269	5.83	**15.57**	3.92	27,420	27,420	27,660	0	0	1351
Feb	2.710	3.244	3.438	3.54	6.54	6.30	27,420	27,420	27,660	0	0	0
March	3.141	2.932	3.420	5.85	4.13	6.58	27,420	27,420	27,660	0	0	6098
April	3.320	2.517	2.749	7.13	4.50	1.79	27,420	27,420	27,660	0	2,474	4296
Period Total:	32.784	32.445	34.072	54.81	58.80	55.00			**Total Added (feet):**	0	7,878	17,149
Low Month:	2.098	2.068	2.021	0.00	0.00	0.18			**Total Added (miles):**	0.00	1.49	3.25
High Month:	**3.362**	**4.334**	**3.756**	**7.49**	**15.57**	**11.04**						
Annual Average:	2.732	2.704	2.839	4.57	4.90	4.58						
Period I/I:	1.264	2.266	1.734									

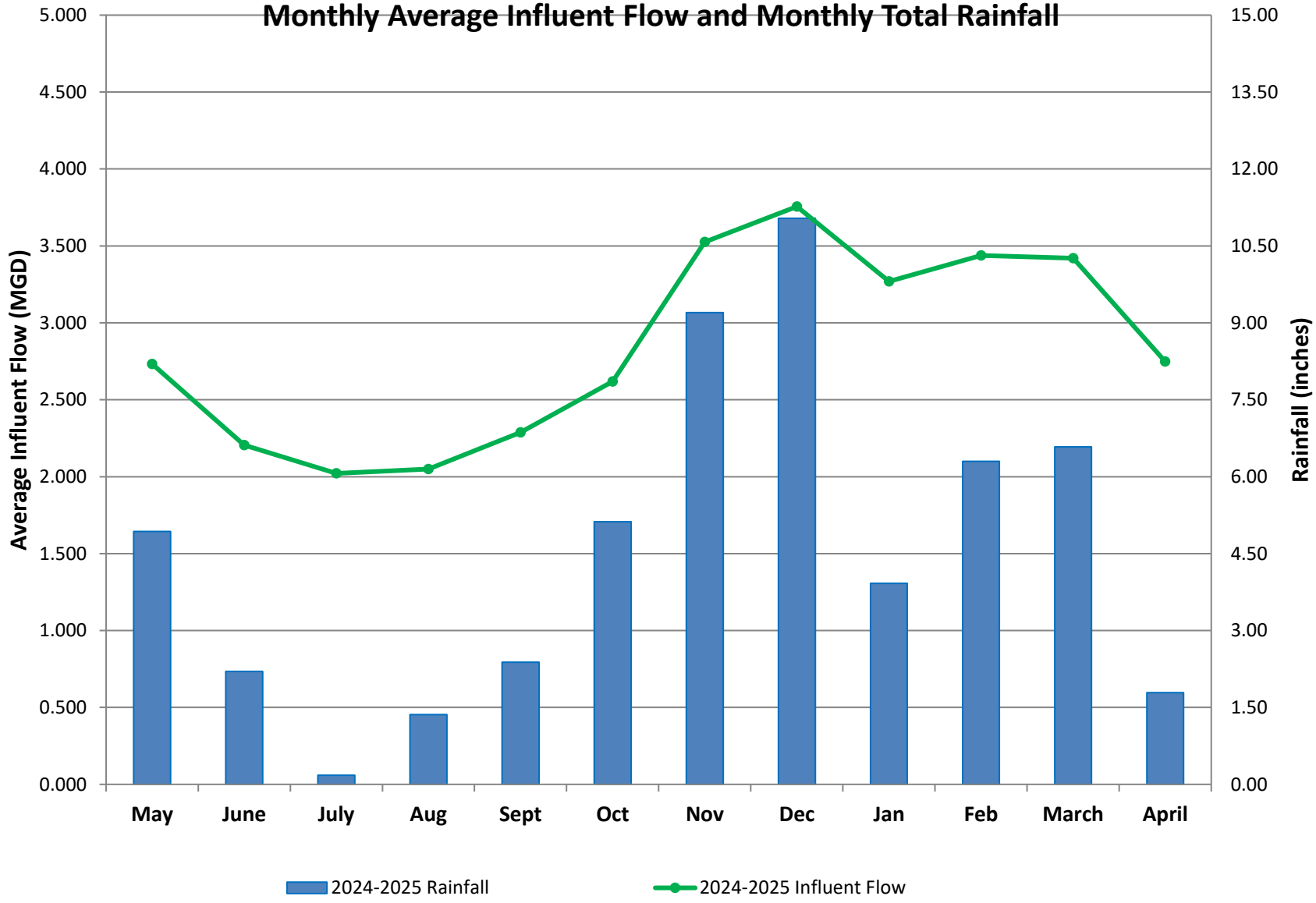
INFILTRATION/INFLOW SUMMARY

Year	I/I	% Increase/Decrease From Base I/I	% Increase/Decrease from Prior Year	% of Max Month. Design Flow	Total Rainfall
Base Year: 2011	***1.511***	***n/a***	***-6%***	***25%***	***47.60***
2022-2023	1.264	-16%	-16%	21%	54.81
2023-2024	2.266	50%	79%	37%	58.80
2024-2025	1.734	15%	-23%	28%	55.00

ATTACHMENT C, CHART I

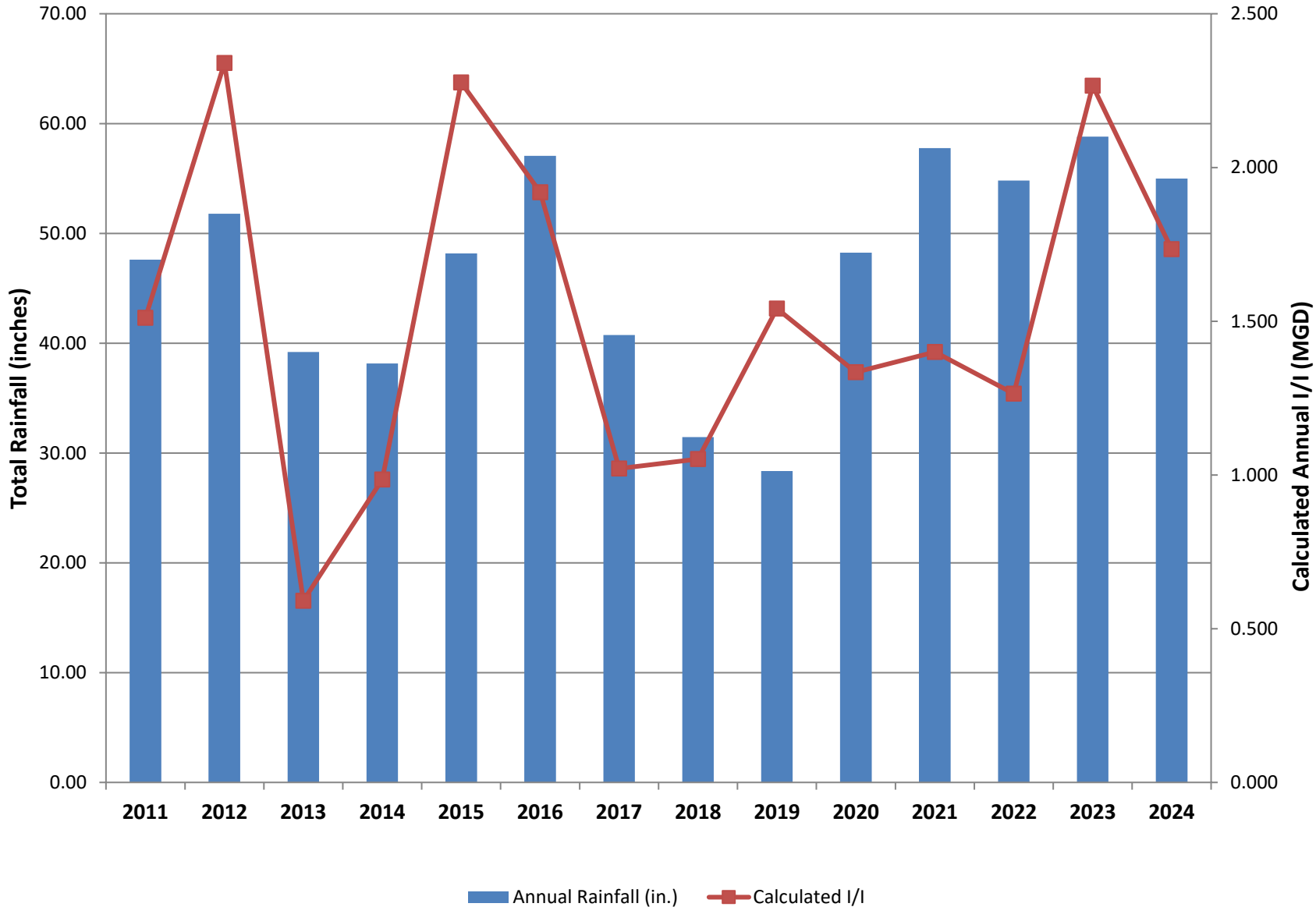
May 2024 - April 2025

Monthly Average Influent Flow and Monthly Total Rainfall



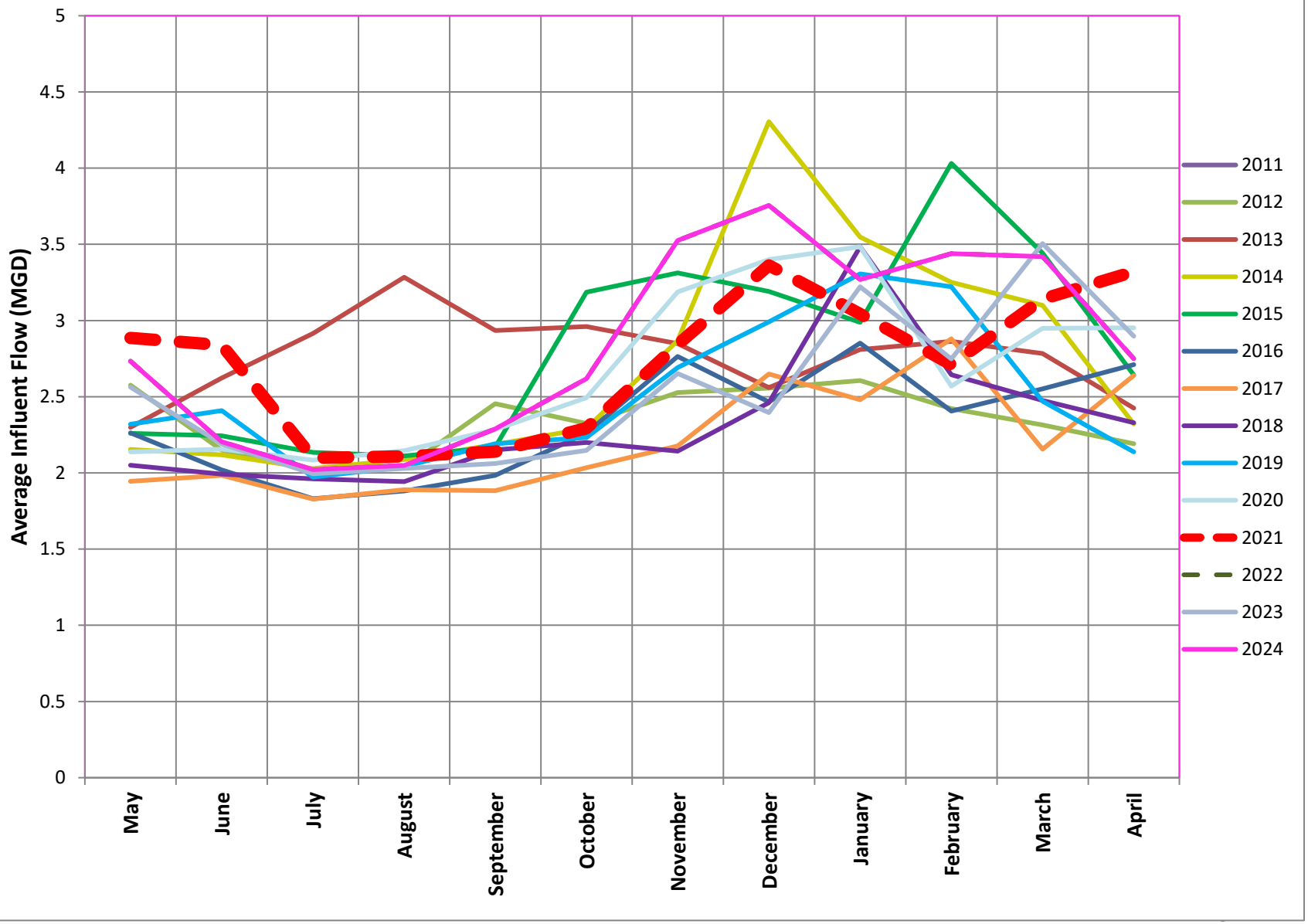
ATTACHMENT C, CHART II

Annual Rainfall & Calculated I/I Since Base Year (2011)



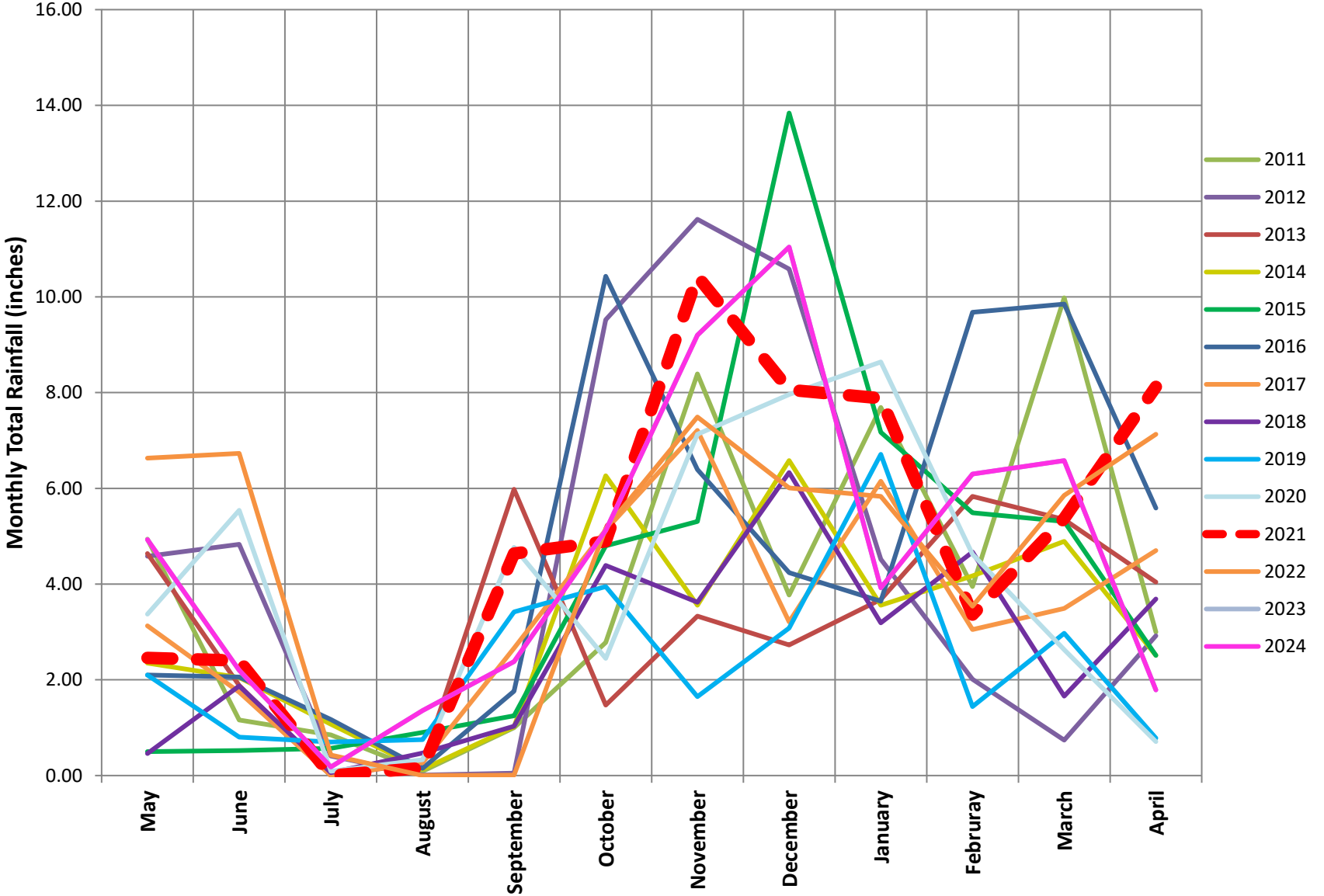
ATTACHMENT C, CHART III

WWTP Monthly Average Influent Flow Since Base Year (2011)



ATTACHMENT C, CHART IV

Monthly Total Rainfall Since Base Year (2011)



APPENDIX G

LOCAL LIMITS PROGRAM REPORTS

~ To be included in a future submittal. ~

APPENDIX H

WASTEWATER TREATMENT PLANT PERMITS

DEPARTMENT OF ECOLOGY
State of Washington

Issuance Date: July 1, 2025
Effective Date: August 1, 2025
Expiration Date: July 31, 2030

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT WA0020249

State of Washington
DEPARTMENT OF ECOLOGY

Southwest Region Office
PO Box 47775
Olympia, WA 98504-7775

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1342 et seq

City of Camas
616 Northeast 4th Avenue
Camas, Washington 98607

is authorized to discharge in accordance with the Special and General Conditions that follow.

Facility Location: 1129 Southeast Polk Street Camas, WA 98607
Treatment Type: Activated sludge with nutrient removal, pH adjustment, filtration and UV disinfection
Receiving Water: Columbia River, RM 121

Digitally signed by Kolosseus, Andrew (ECY)
Date: 2025.06.24 14:57:21 -07'00'

Andrew Kolosseus
Water Quality Section Manager
Southwest Region Office
Washington State Department of Ecology

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SUMMARY OF PERMIT SUBMITTALS

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Table 1 - Summary of permit submittals

Permit section	Submittal	Frequency	First submittal date
S3.A	Monthly Discharge Monitoring Report (DMR)	Monthly	September 15, 2025
S3.A	Quarterly Discharge Monitoring Report (DMR)	Quarterly	January 15, 2026
S3.A	Annual Discharge Monitoring Report (DMR)	Annual	January 15, 2027
S3.F	Reporting permit violations	As necessary	
S4.B	Plans for maintaining adequate capacity	As necessary	
S4.D	Notification of new or altered sources	As necessary	
S5.F	Bypass notification	As necessary	
S5.G	Operations and maintenance manual review confirmation letter	Annually	October 15, 2025
S6.A	Notify Ecology when Industrial Users violate discharge prohibitions	As necessary	
S6.B.1	Notify Ecology of any proposed discharger which may be a SIU	As necessary	
S6.C	Industrial User survey submittal	1/permit cycle	July 31, 2028
S6.E	Local Limit Evaluation	Every 5 years	August 1, 2026
S8	Application for permit renewal	1/permit cycle	February 1, 2030
S9.A	Spill control plan update	As necessary	
S10.A	Sediment sampling and analysis plan	1/permit cycle	February 15, 2026
S10.B	Sediment data report	1/permit cycle	February 15, 2027
S11	Outfall Evaluation	Every 5 years	October 31, 2029
S12.A	Acute toxicity: effluent test results for permit renewal application	Twice per permit cycle	August 1, 2028 February 1, 2029
S13.A	Chronic toxicity: effluent test results for permit renewal application	Twice per permit cycle	August 1, 2028 February 1, 2029
G1	Notice of change in authorization	As necessary	
G4	Reporting planned changes	As necessary	
G5	Engineering report for construction or modification activities	As necessary	
G7	Notice of permit transfer	As necessary	
G10	Duty to provide information	As necessary	
G20	Compliance schedules	As necessary	
G21	Contract submittal	As necessary	

SPECIAL CONDITIONS

S1. Discharge limits

S1.A. Effluent limits

All discharges and activities authorized by this permit must comply with the terms and conditions of this permit. The discharge of any of the following pollutants more frequently than, or at a level in excess of, that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee may discharge treated domestic wastewater to the Columbia River at the permitted location subject to compliance with the following limits:

Table 2 – Effluent limits: Outfall 0001

Latitude: 45.57479° N Longitude: 122.391897° W

Parameter	Average Monthly [a]	Average Weekly [b]
Biochemical Oxygen Demand (5-day) (BOD_5)	20 mg/L	30 mg/L
BOD_5	842 lbs/day	1,264 lbs/day
BOD_5	85% removal of influent BOD_5	N/A
Total Suspended Solids (TSS)	20 mg/L	30 mg/L
TSS	1,017 lbs/day	1,525 lbs/day
TSS	85% removal of influent TSS	N/A
Heat Load [d]	5.87 x 10^8 kilocalories per day (kcal/day)	N/A

Parameter	Minimum	Maximum
pH	6.0 standard units	9.0 standard units

Parameter	Monthly Geometric Mean	Weekly Geometric Mean
Fecal Coliform Bacteria [c]	200/100 mL	400/100 mL

Parameter	Average Monthly	Average Weekly [b]
Total Ammonia (WQ-based) – June - September	20 mg/L	30 mg/L
Total Ammonia (WQ-based) – October - May	7 mg/L	11 mg/L

[a] Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of

each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured.

[b] Average weekly discharge limit means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. See footnote c for bacteria calculations.

[c] Ecology provides directions to calculate the monthly and the 7-day geometric mean in the *Information Manual for Treatment Plant Operators* (Ecology, 2004).

[d] Applicable only from June 1 – September 30

S1.B. Mixing zone authorization

Mixing zone for Outfall 0001

The following paragraphs define the maximum boundaries of the mixing zones.

Chronic mixing zone

The width of the chronic mixing zone is limited ¼ of the width of the Columbia River (approximately 1,000 feet). The length of the chronic mixing zone extends 100 feet upstream and 321 feet downstream of the outfall. The mixing zone extends from the bottom to the top of the water column. The mixing zone must not utilize greater than 25% of the flow. The concentration of pollutants at the edge of the chronic zone must meet chronic aquatic life criteria and human health criteria.

Acute mixing zone

The width of the acute mixing zone is limited to a distance of 1,000 feet in any horizontal direction from the outfall. The length of the acute mixing zone extends 10 feet upstream and 32 feet downstream of the outfall. The mixing zone extends from the bottom to the top of the water column. The acute mixing zone must not utilize greater than 2.5% of the flow. The concentration of pollutants at the edge of the acute zone must meet acute aquatic life criteria.

Table 3 – Dilution factors

Criteria	Dilution factor
Acute Aquatic Life Criteria	27 (summer) 23 (winter)
Chronic Aquatic Life Criteria	185 (summer) 121 (winter)
Human Health Criteria - Carcinogen	185
Human Health Criteria - Non-carcinogen	185

S2. Monitoring requirements

S2.A. Monitoring schedule

The Permittee must monitor in accordance with the following schedule and the requirements specified in Appendix A.

Table 4 – Wastewater influent

Wastewater influent means the raw sewage flow from the collection system into the treatment facility. Sample the wastewater entering the headworks of the treatment plant excluding any side-stream returns from inside the plant.

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Flow	MGD	Continuous [c]	Metered/Recorded
BOD_5	mg/L	4/week [h]	Composite Sample (24 hour) [a]
BOD_5	lbs/day	4/week	Calculated [b]
TSS	mg/L	4/week	Composite Sample (24 hour) [a]
TSS	lbs/day	4/week	Calculated [b]

Table 5 – Final wastewater effluent

Final wastewater effluent means wastewater exiting the last treatment process or operation. Typically, this is after or at the exit from the chlorine contact chamber or other disinfection process. The Permittee may take effluent samples for the BOD_5 analysis before or after the disinfection process. If taken after, the Permittee must dechlorinate and reseed the sample.

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Flow	MGD	Continuous [c]	Metered/Recorded
BOD_5	mg/L	4/week [h]	Composite Sample (24 hour) [a]
BOD_5	lbs/day	4/week	Calculated [b]
BOD_5	% removal	Monthly [i]	Calculated [d]
TSS	mg/L	4/week	Composite Sample (24 hour) [a]
TSS	lbs/day	4/week	Calculated [b]
TSS	% removal	Monthly	Calculated [d]
Fecal Coliform [f]	# /100 ml	4/week	Grab [e]
E. coli [j]	#/100 ml	Monthly	Grab
pH [g]	standard units	Continuous [c]	Metered/Recorded
Temperature [k]	°C	Continuous	Metered/Recorded
Heat Load [l]	Kcal/day	Monthly (June – September)	Calculated
Total Ammonia	mg/L as N	4/week	Composite Sample (24 hour)

Table 6 – Permit renewal application requirements, final wastewater effluent

The Permittee must record and report the wastewater treatment plant flow discharged on the day it collects the sample for priority pollutant testing with the discharge monitoring report. Data collected for pretreatment monitoring (Table 7) may be used to satisfy this monitoring requirement.

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Dissolved Oxygen	mg/L	Once per year	Grab [e]
Total Kjeldahl Nitrogen	mg/L as N	Once per year	24-Hour Composite
Nitrate plus Nitrite	mg/L as N	Once per year	24-Hour Composite
Oil and Grease	mg/L	Once per year	Grab
Phosphorus (Total)	mg/L as P	Once per year	24-Hour Composite
Total Dissolved Solids	mg/L	Once per year	24-Hour Composite
Total Hardness	mg/L	Once per year	24-Hour Composite
Cyanide	µg/L	Once per year	Grab
Total Phenolic Compounds	µg/L	Once per year	Grab
Priority Pollutants (PP) – Total Metals [m]	µg/L; ng/L for Mercury	Once per year	24-Hour Composite Grab for Mercury
PP – Volatile Organic Compounds	µg/L	Once per year	Grab
PP – Acid-extractable Compounds	µg/L	Once per year	24-Hour Composite
PP – Base-neutral Compounds	µg/L	Once per year	24-Hour Composite
PP – Dioxin	pg/L	Once per year	24-Hour Composite
PP – Pesticides/PCBs	µg/L	Once per year	24-Hour Composite

Table 7 – Pretreatment Monitoring

The Permittee must monitor the following parameters in the influent at the headworks, effluent, and biosolids in accordance with pretreatment requirements in Special Condition S6.D.

Parameter	Units & speciation	Minimum sampling frequency	Sample location(s)	Sample type
pH	Standard Units	Quarterly [n]	Influent Biosolids	Grab [e]
Oil and Grease	mg/L	Quarterly [n]	Influent Effluent	Grab
Cyanide	µg/L	Quarterly [n]	Influent Effluent	Grab
Total Phenolic Compounds	µg/L	Quarterly [n]	Influent Effluent	Grab
Chromium (hex), dissolved	µg/L	Quarterly [n]	Influent Effluent	24-Hour composite

Molybdenum, total	µg/L; mg/kg for biosolids	Quarterly [n]	Influent Biosolids	24-Hour composite
Priority Pollutants (PP) – Total Metals [m]	µg/L; ng/L for mercury; mg/kg for biosolids	Quarterly [n]	Influent Effluent Biosolids	24-Hour composite; Grab for mercury
PP – Volatile Organic Compounds	µg/L	Once per year	Influent Effluent	Grab
PP – Acid-extractable Compounds	µg/L	Once per year	Influent Effluent	24-Hour composite
PP – Base-neutral Compounds	µg/L	Once per year	Influent Effluent	24-Hour composite
PP – Dioxin	pg/L	Once per year	Influent Effluent	24-Hour Composite
PP – Pesticides/PCBs	µg/L or ng/L	Once per year	Influent Effluent	24-Hour composite

Table 8 – Additional monitoring

Monitoring type	Description
Sediment study	As specified in condition S10
Acute whole effluent toxicity testing	As specified in condition S12
Chronic whole effluent toxicity testing	As specified in condition S13

Footnotes:

[a] Twenty-four (24)-hour composite means a series of individual samples collected over a 24-hour period into a single container and analyzed as one sample.

[b] Calculated means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in MGD) X Conversion Factor (8.34) = lbs/day

[c] Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. Sample every three hours when continuous monitoring is not possible.

[d] Calculate the percent removal of BOD_5 and TSS as follows: Percent (%) removal = [(Influent concentration (mg/L) – Effluent concentration (mg/L)]/[Influent concentration (mg/L)] x 100%

[e] Grab means an individual sample collected over a fifteen (15) minute, or less, period.

[f] Report a numeric value for fecal coliforms following the procedures in the Information Manual for Wastewater Treatment Plant Operators, Publication 04-10-020 (Ecology, 2004). Do not report a result as Too Numerous to Count (TNTC).

[g] Report the instantaneous maximum and minimum pH daily. Do not average pH values.

[h] 4/week means four (4) times during each calendar week and on a rotational basis throughout the days of the week.

[i] Monthly means once every calendar month during alternate weeks.

[j] *E. coli* and Fecal Coliform analyses must occur on the same day. Split a single grab sample upon collection, prior to laboratory analysis.

[k] Conduct temperature grab sampling when the effluent is at or near its daily maximum temperature, which usually occurs in the late afternoon. If measuring temperature continuously, report a daily maximum from half-hour measurements over a 24-hour period. Continuous monitoring instruments must achieve an accuracy of 0.2 degrees C, and the Permittee must verify accuracy annually.

[l] The average monthly head load is calculated as the product of the average monthly effluent temperature (°C) multiplied by the average monthly flow (MGD) and the conversion factor of 3.776×10^6. The average monthly temperature is the sum of the average daily temperature divided by the number of discharges measured during the month. The average monthly flow is the same value as historically reported as average monthly flow. It is the sum of all the flows in the month divided by the number of days in the month.

[m] Priority Pollutant Scans for Total Metals must use total recoverable metal laboratory methods for all parameters except for hexavalent chromium. The 40 Code of Federal Regulations (CFR) 136 method for hexavalent chromium measures only its dissolved form.

[n] Quarterly sampling periods are January through March, April through June, July through September and October through December starting October 1, 2025. Begin quarterly monitoring for the quarter beginning on October 1, 2025, and submit results by January 15, 2026.

S2.B. Sampling and analytical procedures

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136 (or as applicable in 40 CFR subchapter N [Parts 400–471] or 40 CFR subchapter O [Parts 501-503]) unless otherwise specified in this permit. Ecology may specify alternative methods for parameters without limits and for those parameters without an EPA approved test method in 40 CFR Part 136.

S2.C. Flow measurement, field measurement, and continuous monitoring devices

The Permittee must:

1. Select and use appropriate flow measurement, field measurement, and continuous monitoring devices and methods consistent with accepted scientific practices.
2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard, the manufacturer's recommendation, and approved O&M manual procedures for the device and the wastestream.
3. Calibrate continuous monitoring instruments weekly unless it can demonstrate a longer period is sufficient based on monitoring records. The Permittee:
   a. May calibrate apparatus for continuous monitoring of dissolved oxygen by air calibration.
   b. Must calibrate continuous pH measurement instruments according to the manufacturer's requirements.
4. Calibrate micro-recording temperature devices, known as thermistors, using protocols from *Standard Operating Procedure EAP080, Version 2.2, Continuous Temperature Monitoring of Freshwater Rivers and Streams* (Ecology, 2022). Calibration as specified in this document is not required if the Permittee uses recording devices certified by the manufacturer.
5. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates.
6. Establish a calibration frequency for each device or instrument in the O&M manual that conforms to the frequency recommended by the manufacturer.
7. Calibrate flow-monitoring devices at a minimum frequency of at least one calibration per year.
8. Maintain calibration records for at least three years.

S2.D. Laboratory accreditation

The Permittee must ensure that all monitoring data required by Ecology for permit specified parameters is prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 Washington Administrative Code (WAC), Accreditation of Environmental Laboratories. Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement. The Permittee must obtain accreditation for conductivity and pH if it must receive accreditation or registration for other parameters.

S2.E. Request for reduction in monitoring

The Permittee may request a reduction of the sampling frequency after twelve (12) months of monitoring. Ecology will review each request and at its discretion grant the request when it reissues the permit or by a permit modification.

The Permittee must:

1. Provide a written request.

2. Clearly state the parameters for which it is requesting reduced monitoring.
3. Clearly state the justification for the reduction.

S3. Reporting and recording requirements

The Permittee must monitor and report in accordance with the following conditions. Falsification of information submitted to Ecology is a violation of the terms and conditions of this permit.

S3.A. Discharge Monitoring Reports

The first monitoring period begins on the effective date of the permit (unless otherwise specified). The Permittee must:

1. Summarize, report, and submit monitoring data obtained during each monitoring period on the electronic Discharge Monitoring Report (DMR) form provided by Ecology within the Water Quality Permitting Portal[1]. Include data for each of the parameters tabulated in Special Conditions S2 and as required by the form. Report a value for each day sampling occurred (unless specifically exempted in the permit) and for the summary values (when applicable) included on the electronic form.
2. Submit DMRs no later than the dates specified below, unless otherwise specified in this permit.
3. Submit DMRs for parameters with the monitoring frequencies specified in S2 (monthly, quarterly, annual, etc.) at the reporting schedule identified below. The Permittee must:
   a. Submit **monthly** DMRs by the 15th day of the following month.
   b. Submit **quarterly** DMRs, unless otherwise specified in the permit, by the 15th day of the month following the monitoring period. Quarterly sampling periods are January through March, April through June, July through September, and October through December. The Permittee must submit the first quarterly DMR by (Reserved for Issuance) for the quarter beginning on (Reserved for Issuance).
   c. Submit **annual** DMRs, unless otherwise specified in the permit, by January 15th for the previous calendar year. The annual sampling period is a calendar year, starting (Reserved for Issuance).
4. Enter the “No Discharge” reporting code for an entire DMR, for a specific monitoring point, or a specific parameter as appropriate, if the Permittee did not discharge wastewater or a specific pollutant during a given monitoring period.
5. Report single analytical values below detection as “less than the Detection Level (DL)” by entering the < followed by the numeric value of the detection level (e.g. < 2.0) on the DMR. If the method used did not meet the minimum

[1] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance

DL and Quantitation Level (QL) identified in the permit report the actual QL and DL in the comments or in the location provided.

6. Report single analytical values between the DL and the QL by entering the estimated value, the code for estimated value/below quantitation limit (J) and any additional information in the comments.
7. When an outside laboratory performs the analysis, submit a copy of the laboratory report as an attachment using WQWebDMR. Contract laboratory reports must include the chain of custody and QA/QC results.
8. Submit bacteria monitoring results as follows:
   a. Do Not report zero for bacterial monitoring. Report as required by the laboratory method.
   b. Calculate and report an arithmetic average value for each day for bacteria if multiple samples were taken in one day.
   c. Calculate the geometric mean values for bacteria (unless otherwise specified in the permit) using the reported numeric value for all bacteria samples measured above the detection value except when it took multiple samples in one day. If multiple samples are taken in one day, use the arithmetic average for the day in the geometric mean calculation. Use the detection value for those samples measured below detection.
9. Report the test method used for analysis in the comments if the laboratory used an alternative method not specified in the permit and as allowed in Appendix A.
10. Calculate average values and calculated total values (unless otherwise specified in the permit) using:
    a. The reported numeric value for all parameters measured between the detection value and the quantitation value for the sample analysis.
    b. One-half (1/2) the detection value (for values reported below detection) if the lab detected the parameter in another sample from the same monitoring point for the reporting period.
    c. Zero (for values reported below detection) if the lab did not detect the parameter in another sample for reporting period.
11. Report single sample grouped parameters (for example: priority pollutants, PAHs, pulp and paper chlorophenolics, TTOs) on the WQWebDMR form and include: sample date, concentration detection, DL (as necessary), and laboratory QL (as necessary).

S3.B. Permit submittals and schedules

The Permittee must use the Water Quality Permitting Portal – Permit Submittals application (unless otherwise specified in the permit) to submit all permit-required reports by the date specified in the permit.

When another permit condition requires submittal of a paper (hard copy) report, the Permittee must ensure that it is postmarked or received by Ecology no later than the dates specified by this permit. Send these paper reports to Ecology at:

Water Quality Permit Coordinator
Department of Ecology
Southwest Region Office
P.O. Box 47775
Olympia, WA 98504-7775

S3.C. Records retention

The Permittee must retain records of all monitoring information for a minimum of three years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

S3.D. Recording of results

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The date and time the analysis was performed.
4. The individual who performed the analysis.
5. The analytical technique or method used.
6. The results of all analyses.

S3.E. Additional monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by Special Condition S2 of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's DMR unless otherwise specified by Special Condition S2.

S3.F. Reporting permit violations

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.

The permittee must make reasonable attempts to collect a sample of any unusual discharge or discharge condition including prohibited bypasses, upsets,

and maintenance-related conditions affecting effluent quality. The sample must be representative of the volume and nature of the uncharacteristic discharge and must represent a relevant subset of parameters required to be monitored under section S2.A. The additional monitoring results must be reported on the monthly DMR, along with a note of explanation. Refer to the Information Manual for Treatment Plant Operators, Publication 04-10-020 (Ecology, 2004), for guidance on incorporating extra sampling results into DMR calculations.

2. Immediate reporting

The Permittee must immediately report (see definition of “immediate reporting” in Appendix C of the Fact Sheet) to Ecology and the local health jurisdiction at the numbers listed below, all:

- Failures of the disinfection system.
- Plant bypasses resulting in a discharge to a waterbody.
- Any upset that causes an exceedance of an effluent limit in the permit (See G.15, "Upset").
- Collection system overflows.
- Any other failures of the sewage system (pipe breaks, etc.).

Southwest Region Office	360-407-6300
Clark County Public Health	564-397-8000

The Permittee must also immediately report any sanitary sewer overflow (SSO) that discharges to a municipal separate storm sewer system (MS4) to the appropriate MS4 owner or operator.

3. Twenty-four (24) hour reporting

The Permittee must report the following to Ecology at the telephone number listed in S3.F.2, within 24 hours from the time the Permittee becomes aware of any of the following:

- Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Special Condition S1.A of this permit.
- Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.

4. Five-day follow up report

The Permittee must also submit a written report within five days of the time that the Permittee becomes aware of any reportable event under S3.F.2 or S3.F.3.

(See definition of “Days (compliance period interval)” in Appendix C of the Fact Sheet.)

Submit the written report electronically using the Water Quality Permitting Portal – Permit Submittals application.

The permittee may use any reporting form that includes all the required content listed in this section.

The report must contain:

a. A description of the noncompliance and its cause.
b. The period of noncompliance, including exact dates and times.
c. The estimated time the Permittee expects the noncompliance to continue if not yet corrected.
d. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
e. If the noncompliance involves an overflow prior to the treatment works:
   (i) Indicate the type of event (e.g., combined sewer overflow, sanitary sewer overflow, or bypass event).
   (ii) Indicate the type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall).
   (iii) Estimate the quantity (in gallons) of the untreated overflow.
   (iv) Indicate whether the noncompliance was related to wet weather; and
   (v) Indicate the types of human health and environmental impacts of the event.
f. Include a description of actions taken to stop, contain, and cleanup unauthorized discharges and to mitigate any associated environmental impacts.
g. If an ERTS number was assigned to the event when it was initially reported, include this number in the five-day follow up report for reference.
h. Identification of other agencies contacted per the emergency notification call list in S3.F.2.
i. If samples were taken to characterize the event, provide any analytical results that are available with the five-day report. If the data was collected at the same monitoring points and for parameters specified on the DMR, the sample results must also be reported on the DMR.

5. Waiver of written reports

   Ecology may waive the report required in S3.F.4 on a case-by-case basis if the Permittee has submitted a timely oral report. If a waiver is requested, the Permittee must obtain documentation of this waiver in writing or email from Ecology.

6. All other permit violation reporting

The Permittee must report all other permit violations when they submit monitoring reports under Special Condition S3.A. (Reporting). The reports must contain the information listed in S3.F.4. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or from the resulting liability for failure to comply.

S3.G. Other reporting

1. Spills of oil or hazardous materials

In addition to the requirements in S3.F, the Permittee must report a spill of oil or hazardous materials in accordance with the requirements of Revised Code of Washington (RCW) 90.56.280 and WAC 173-303-145. Visit the website How to Report a Spill[2] for further instructions.

2. Failure to submit relevant or correct facts

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to Ecology, it must submit such facts or information promptly.

S3.H. Maintaining a copy of this permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S4. Facility loading

S4.A. Design criteria

The flows or waste loads for the permitted facility must not exceed the following design criteria:

Table 9 - Design criteria

Parameter	Unit
Maximum Month Design Flow (MMDF)	6.10 MGD
BOD_5 Influent Loading for Maximum Month	5,616 lbs/day
TSS Influent Loading for Maximum Month	8,011 lbs/day

S4.B. Plans for maintaining adequate capacity

1. The Permittee must submit a plan and a schedule for continuing to maintain capacity to Ecology when:
   a. The actual flow or waste load reaches 85 percent of any one of the design criteria in S4.A for three consecutive months.

[2] https://ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue/Report-a-spill

b. The projected plant flow or loading would reach design capacity within five years.

2. The plan and schedule must identify the actions necessary to maintain adequate capacity for the expected population growth and to meet the limits and requirements of the permit. The Permittee must consider the following topics and actions in its plan:
   a. Analysis of the present design and proposed process modifications.
   b. Reduction or elimination of excessive infiltration and inflow of uncontaminated ground and surface water into the sewer system.
   c. Limits on future sewer extensions or connections or additional waste loads.
   d. Modification or expansion of facilities.
   e. Reduction of industrial or commercial flows or waste loads.

Engineering documents associated with the plan must meet the requirements of WAC 173-240-060, "Engineering Report," and must be approved by Ecology prior to any construction.

S4.C. Duty to mitigate

The Permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

S4.D. Notification of new or altered sources

1. The Permittee must submit written notice to Ecology whenever any new discharge or a substantial change in volume or character of an existing discharge into the wastewater treatment plant is proposed which:
   a. Would interfere with the operation of, or exceed the design capacity of, any portion of the wastewater treatment plant.
   b. Is not part of an approved general sewer plan or approved plans and specifications.
   c. Is subject to pretreatment standards under 40 CFR Part 403 and Section 307(b) of the Clean Water Act.
2. This notice must include an evaluation of the wastewater treatment plant's ability to adequately transport and treat the added flow and/or waste load, the quality and volume of effluent to be discharged to the treatment plant, and the anticipated impact on the Permittee's effluent [40 CFR 122.42 (b)].

S5. Operation and maintenance

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes keeping a daily operation logbook (paper or electronic),

adequate laboratory controls, and appropriate quality assurance procedures. This provision of the permit requires the Permittee to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this permit.

S5.A. Certified operator

This permitted facility must be operated by an operator certified by the state of Washington for at least a Class IV plant. This operator must be in responsible charge of the day-to-day operation of the wastewater treatment plant. An operator certified for at least a Class III plant must be in charge during all regularly scheduled shifts.

S5.B. Operation and maintenance program

The Permittee must:

1. Institute an adequate operation and maintenance program for the entire sewage system.
2. Keep maintenance records on all major electrical and mechanical components of the treatment plant, as well as the sewage system and pumping stations. Such records must clearly specify the frequency and type of maintenance recommended by the manufacturer and must show the frequency and type of maintenance performed.
3. Make maintenance records available for inspection at all times.

S5.C. Short-term reduction

The Permittee must schedule any facility maintenance, which might require interruption of wastewater treatment and degrade effluent quality, during non-critical water quality periods and carry this maintenance out according to the approved O&M manual or as otherwise approved by Ecology.

If a Permittee contemplates a reduction in the level of treatment that would cause a violation of permit discharge limits on a short-term basis for any reason, and such reduction cannot be avoided, the Permittee must:

1. Give written notification to Ecology, if possible, thirty (30) days prior to such activities.
2. Detail the reasons for, length of time of, and the potential effects of the reduced level of treatment.

This notification does not relieve the Permittee of its obligations under this permit.

S5.D. Electrical power failure

The Permittee must ensure that adequate safeguards prevent the discharge of untreated wastes or wastes not treated in accordance with the requirements of this permit during electrical power failure at the treatment plant and/or sewage lift

stations. Adequate safeguards include, but are not limited to, alternate power sources, standby generator(s), or retention of inadequately treated wastes.

The Permittee must maintain Reliability Class II (EPA 430-99-74-001) at the wastewater treatment plant. Reliability Class II requires a backup power source sufficient to operate all vital components and critical lighting and ventilation during peak wastewater flow conditions. Vital components used to support the secondary processes (i.e., mechanical aerators or aeration basin air compressors) need not be operable to full levels of treatment but must be sufficient to maintain the biota.

S5.E. Prevent connection of inflow

The Permittee must strictly enforce its sewer ordinances and not allow the connection of inflow (roof drains, foundation drains, etc.) to the sanitary sewer system.

S5.F. Bypass procedures

A bypass is the intentional diversion of waste streams from any portion of a treatment facility. This permit prohibits all bypasses except when the bypass is for essential maintenance, as authorized in special condition S5.F.1, or is approved by Ecology as an anticipated bypass following the procedures in S5.F.2.

1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions: This permit allows bypasses for essential maintenance of the treatment system when necessary to ensure efficient operation of the system. The Permittee may bypass the treatment system for essential maintenance only if doing so does not cause violations of effluent limits. The Permittee is not required to notify Ecology when bypassing for essential maintenance. However, the Permittee must comply with the monitoring requirements specified in special condition S2.B.
2. Anticipated bypasses for non-essential maintenance: Ecology may approve an anticipated bypass under the conditions listed below. This permit prohibits any anticipated bypass that is not approved through the following process.
    a. If a bypass is for non-essential maintenance, the Permittee must notify Ecology, if possible, at least ten (10) days before the planned date of bypass. The notice must contain:

        - A description of the bypass and the reason the bypass is necessary.
        - An analysis of all known alternatives which would eliminate, reduce, or mitigate the potential impacts from the proposed bypass.
        - A cost-effectiveness analysis of alternatives.
        - The minimum and maximum duration of bypass under each alternative.

- A recommendation as to the preferred alternative for conducting the bypass.
- The projected date of bypass initiation.
- A statement of compliance with SEPA.
- A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
- Details of the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.

b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during the project planning and design process. The project-specific engineering report as well as the plans and specifications must include details of probable construction bypasses to the extent practical. In cases where the Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.
c. Ecology will determine if the Permittee has met the conditions of special condition S5.F.2 a and b and consider the following prior to issuing a determination letter, an administrative order, or a permit modification as appropriate for an anticipated bypass:

    - If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.
    - If the bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. “Severe property damage” means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.
    - If feasible alternatives to the bypass exist, such as:
        - The use of auxiliary treatment facilities.
        - Retention of untreated wastes.
        - Stopping production.
        - Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance.
        - Transport of untreated wastes to another treatment facility.

S5.G. Operations and maintenance (O&M) manual

1. The Permittee must:
   a. Review the O&M Manual at least annually and confirm this review by letter to Ecology by **October 15th** of each year.
   b. Submit to Ecology for review and approval substantial changes or updates to the O&M Manual.
   c. Keep the approved O&M Manual at the permitted facility.
   d. Follow the instructions and procedures of this manual.
2. In addition to the requirements of WAC 173-240-080(1) through (5), the O&M Manual must be consistent with the guidance in Section G1-4.4 in the *Criteria for Sewage Works Design (Orange Book)* (Ecology, 2023). The O&M Manual must include:
   a. Emergency procedures for cleanup in the event of wastewater system upset or failure.
   b. A review of system components which if failed could pollute surface water or could impact human health. Provide a procedure for a routine schedule of checking the function of these components.
   c. Wastewater system maintenance procedures that contribute to the generation of process wastewater.
   d. Reporting protocols for submitting reports to Ecology to comply with the reporting requirements in the discharge permit.
   e. Any directions to maintenance staff when cleaning or maintaining other equipment or performing other tasks which are necessary to protect the operation of the wastewater system (for example, defining maximum allowable discharge rate for draining a tank, blocking all floor drains before beginning the overhaul of a stationary engine).
   f. The treatment plant process control monitoring schedule.
   g. Minimum staffing adequate to operate and maintain the treatment processes and carry out compliance monitoring required by the permit.

S6. Pretreatment

The Permittee must work with Ecology to ensure that all industrial users (see “industrial user” and “industrial wastewater” definitions in the fact sheet glossary) of the publicly owned treatment works (POTW) comply with the pretreatment requirements of the federal Clean Water Act, Washington state law and the federal General Pretreatment Regulations. Pretreatment requirements apply to sewers, pipes, and other conveyances in addition to devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature (see “POTW” definition in the fact sheet glossary).

S6.A. Duty to enforce discharge prohibitions

The Permittee must notify Ecology, within 30 days of becoming aware, if any industrial user violates the following discharge prohibitions and initiate enforcement action to promptly curtail any such discharge.

1. The Permittee must not authorize or knowingly allow the discharge of any pollutants into its POTW which may be reasonably expected to cause pass through or interference.
2. The Permittee must not authorize or knowingly allow the introduction of any of the following into their treatment works:
   a. Pollutants which create a fire or explosion hazard in the POTW (including but not limited to waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21).
   b. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, or greater than 11.0 standard units, unless the works are specifically designed to accommodate such discharges.
   c. Solid or viscous pollutants in amounts that could cause obstruction to the flow in the collection system or otherwise cause interference with the POTW.
   d. Any pollutant, including oxygen-demanding pollutants, (BOD_5, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.
   e. Petroleum oil, non-biodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass through.
   f. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity which may cause acute worker health and safety problems.
   g. Heat in amounts that will inhibit biological activity in the POTW resulting in interference but in no case heat in such quantities that the temperature at the POTW headworks exceeds 40 degrees Celsius (104 degrees Fahrenheit) unless Ecology, upon request of the Permittee, approves alternate temperature limits in writing.
   h. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.
   i. Wastewaters prohibited to be discharged to the POTW by the Dangerous Waste Regulations (chapter 173-303 WAC), unless authorized under the Domestic Sewage Exclusion (WAC 173-303-071).
3. The Permittee must not allow the following discharges to the POTW unless approved in writing by Ecology:
   a. Noncontact cooling water in significant volumes.
   b. Stormwater and other direct inflow sources.

c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment, or would not be afforded a significant degree of treatment by the system.

S6.B. Identification of new industrial wastewater sources and notification of permit requirements

The Permittee must establish a process for authorizing industrial wastewater discharges.

The Permittee must:

1. Immediately notify Ecology of any proposed industrial wastewater discharges from a source which is or may be a significant industrial user (SIU).
2. Within 30 days of becoming aware, notify Ecology of existing industrial users which change operations or increase wastewater discharge volume in a manner which makes them an SIU.
3. Within 30 days of becoming aware, notify Ecology of existing, unpermitted industrial users that are an SIU.
4. Require all SIUs to obtain a state waste discharge permit (SWDP) from Ecology prior to accepting or as a condition of continuing to accept their industrial wastewater.

S6.C. Industrial user survey

The Permittee must complete an industrial user survey and must submit a report of the survey to Ecology by **July 31, 2028.** The Permittee should use Ecology's "Guidance Manual for Performing an Industrial User Survey" to develop and compile the survey. In addition to identifying new industrial users, the Permittee must reevaluate existing nondomestic users identified in previous surveys for significantly altered processes or discharge practices. The intent of the industrial user survey is to compile a master list of nondomestic users (commercial and industrial, including hauled waste) introducing pollutants to the POTW and identify significant industrial users. The survey must capture nondomestic users in the entire sewershed of the receiving POTW. If the Permittee receives wastewater to the POTW from other jurisdictions, the Permittee must identify nondomestic users in those jurisdictions as well.

The survey report must include:

1. A description of the survey procedures (information gathering methods) the Permittee used to develop the master list of nondomestic users.
2. Identification of other jurisdictions that contribute wastewater to the POTW, as well as the process used to identify nondomestic users in those jurisdictions.
3. Example survey forms.
4. A master list of nondomestic users. The master list must include:
   a. Names and addresses of all nondomestic users.

b. A description of the processes that affect or contribute to the user's wastewater.
c. The principal products and raw materials of each user that affects or contributes to the user's wastewater.
d. The average daily volume of wastewater discharged by each user, indicating the estimated amount attributable to process wastewater.
e. A statement of whether the user is subject to one or more categorical standards, and if so, under which category and subcategory.
f. A statement of whether the user is a significant industrial user and why (i.e. hydraulic or organic loading, categorical standards).
g. A statement whether the user is subject to local restrictions or requirements.
h. A statement whether any problems at the POTW, including upset, pass through, or interference, have been attributed to the user in the past 4.5 years.

S6.D. Monitoring requirements

The Permittee must:

1. Monitor the influent and effluent for the pollutants identified in Special Condition S2, any compounds identified because of Special Condition S6.E.8, and any other pollutants expected from non-domestic sources. Use the methods for collection, preservation, storage, and analysis, and monitoring frequencies, identified in Special Condition S2.
2. Monitor the sludge for the pollutants identified in Special Condition S2. Monitoring frequencies are identified in Special Condition S2.
3. Sample POTW influent and effluent on a day when industrial discharges are occurring at normal-to-maximum levels.
4. Obtain 24-hour composite samples for the analysis of acid and base/neutral extractable compounds and metals.
5. Ensure that all reported test data for metals represents the total amount of the constituents present in all phases, whether solid, suspended, or dissolved elemental or combined, including all oxidation states unless otherwise indicated.
6. Collect a sludge sample concurrently with a wastewater sample as a single grab of residual sludge. Sludge metals priority pollutant sampling and analysis must conform to EPA SW 846 6000 Series Methods and EPA SW 846 7000 Series Methods unless the Permittee requests an alternate method and Ecology has approved.
7. Collect grab samples for cyanide, phenols, and oils. Measure hexane soluble oils (or equivalent) only in the influent and effluent.
8. Make a reasonable attempt to identify all other substances and quantify all pollutants shown to be present by gas chromatograph/mass spectrometer

(GC/MS) analysis per 40 CFR 136, Appendix A, EPA Method 624.1 and EPA Method 625.1, in addition to quantifying pH, oil and grease, and all priority pollutants. The Permittee should attempt to make determinations of pollutants for each fraction, which produces identifiable spectra on total ion plots (reconstructed gas chromatograms). The Permittee may express results for non-substituted aliphatic compounds as total hydrocarbon content.

9. Use a laboratory whose computer data processing programs are capable of comparing sample mass spectra to a computerized library of mass spectra, with visual confirmation by an experienced analyst.
10. Conduct additional sampling and appropriate testing to determine concentration and variability, and to evaluate trends for all detected substances determined to be pollutants.

S6.E. Local Limit Evaluation

The Permittee must submit a written technical evaluation of the need to revise local limits under 40 CFR 403.5(c)(1) within 1 year of the permit effective date, on or before **August 1, 2026**, and every 5 years thereafter, or sooner if any of the following occur:

- A new industrial user(s) begins a discharge that may significantly impact the POTW, including but not limited to:
  - The flow is ≥5% of the average dry weather hydraulic or organic capacity of the POTW treatment plant, or
  - The flow represents a 25% or greater increase in the total industrial flow to the POTW, or
  - The discharge contains elevated levels of pollutants for which there are established local limits or permit limits, or
  - The discharge contains a new pollutant(s) of concern to the POTW.
- Any existing industrial user(s) modifies their discharge in a manner that may significantly impact the POTW as listed above.
- Changes or upgrades occur to the POTW's operations or treatment capacities.

The written technical evaluation submittal must include, at a minimum, the following:

1. Evaluation of the maximum allowable headworks loading and the maximum allowable industrial loading for each previously identified pollutant of concern.
   a. Evaluation must consider water quality in the receiving water, inhibition levels for biological processes at the treatment plant, sludge quality goals, and any other applicable, limiting factors.
   b. Evaluation of pollutants of additional pollutants of concern; including, hexavalent chromium. The Permittee must evaluate any other pollutants of concern based on impacts to water quality, sludge quality, and worker health and safety.

2. Narrative discussion of the need to revise allocated local limits.
3. All supporting calculations and a narrative of all assumptions used in the calculations.

The Permittee must notify Ecology of any local limit modifications that arise from a technical evaluation.

S7. Solid wastes

S7.A. Solid waste handling

The Permittee must handle and dispose of all solid waste material in such a manner as to prevent its entry into state ground or surface water.

S7.B. Leachate

The Permittee must not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of the State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC. The Permittee must apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

S8. Application for permit renewal or modification for facility changes

The Permittee must submit an application for renewal of this permit by **February 1, 2030.**

The Permittee must also submit a new application or addendum at least one hundred eighty (180) days prior to commencement of discharges, resulting from the activities listed below, which may result in permit violations. These activities include any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility.

S9. Spill control plan

S9.A. Spill control plan submittals and requirements

The Permittee must:

1. Review the plan at least annually and update the spill plan as needed.
2. Send changes to the plan to Ecology.
3. Follow the plan and any supplements throughout the term of the permit.

S9.B. Spill control plan components

The spill control plan must include the following:

1. A list of all oil and petroleum products and other materials used and/or stored on-site, which when spilled, or otherwise released into the environment, designate as Dangerous Waste (DW) or Extremely Hazardous Waste (EHW)

by the procedures set forth in WAC 173-303-070. Include other materials used and/or stored on-site which may become pollutants or cause pollution upon reaching state's waters.

2. A description of preventive measures and facilities (including an overall facility plot showing drainage patterns) which prevent, contain, or treat spills of these materials.
3. A description of the reporting system the Permittee will use to alert responsible managers and legal authorities in the event of a spill.
4. A description of operator training to implement the plan.

The Permittee may submit plans and manuals required by 40 CFR Part 112, contingency plans required by Chapter 173-303 WAC, or other plans required by other agencies, which meet the intent of this section.

S10. Sediment monitoring

S10.A. Sediment sampling and analysis plan

The Permittee must submit to Ecology for review and approval a sediment sampling and analysis plan for sediment monitoring by **February 15, 2026**. The purpose of the plan is to characterize or recharacterize sediment (the nature and extent of chemical contamination and biological toxicity) quality in the vicinity of the Permittee's discharge locations. The Permittee must follow the guidance provided in Appendix A of the *Sediment Cleanup User's Manual* (Ecology, 2021) (or most recent edition), Sampling Guidance for NPDES Permits under the Sediment Management Standards.

S10.B. Sediment data report

Following Ecology approval of the sediment sampling and analysis plan, the Permittee must collect sediments between August 15th and September 30th. The Permittee must submit to Ecology a sediment data report containing the results of the sediment sampling and analysis no later than **February 15, 2027**. The sediment data report must conform to the approved sediment sampling and analysis plan. In addition, the Permittee must follow the guidance provided in the Sediment Cleanup User's Manual, Appendix A: Sampling Guidance for NPDES Permits under the Sediment Management Standards (Ecology, 2021) (or most recent edition). The report must document when the data was successfully loaded into EIM as required below.

In addition to the sediment data report, submit the sediment chemical data, biological data, or both, to Ecology's Environmental Information System (EIM)[3]. Data

[3] https://ecology.wa.gov/Research-Data/Data-resources/Environmental-Information-Management-database

must be submitted to EIM according to the instructions on the EIM website. The EIM website provides information on submitting data, and a link to the EIM Help Center.

In addition to the EIM data submittal, Ecology's MyEIM[4] tools must be used to confirm that the submitted data was accurately entered into EIM. Any differences between the MyEIM analytical results and sediment data report must be identified and explained.

S11. Outfall Evaluation

The Permittee must inspect, every five years, the submerged portion of the outfall line and diffuser to document its integrity and continued function. If conditions allow for a photographic verification, the Permittee must include such verification in the report. By **October 31, 2029**, the Permittee must submit the inspection report to Ecology through the Water Quality Permitting Portal – Permit Submittals application. The Permittee must submit hard copies of any video files to Ecology as required by Permit Condition S3.B. The Portal does not support submittal of video files.

The inspector must at minimum:

- Assess the physical condition of the outfall pipe, diffuser, and associated couplings.
- Determine the extent of sediment accumulation in the vicinity of the diffuser.
- Ensure diffuser ports are free of obstructions and are allowing uniform flow.
- Confirm physical location (latitude/longitude) and depth of the diffuser section of the outfall.

S12. Acute toxicity

S12.A. Testing when there is no permit limit for acute toxicity

The Permittee must:

1. Conduct acute toxicity testing on the final effluent once in June 2028 and once in December 2028.
2. Conduct acute toxicity testing on a series of at least five concentrations of effluent, including 100 percent effluent and a control.
3. Use each of the following species and protocols for each acute toxicity test:

Table 10 - Freshwater acute toxicity tests

Acute Toxicity Tests	Species	Method
Fathead Minnow 96-Hour Static-Renewal Test	Pimephales Promelas	EPA-821-R-02-012

[4] https://ecology.wa.gov/Research-Data/Data-resources/Environmental-Information-Management-database/Using-MyEIM

Daphnid 48-Hour Static Test	Ceriodaphnia Dubia, Daphnia Pulex, OR Daphnia Magna	EPA-821-R-02-012

4. Submit a written report to Ecology no later than August 1, 2028, and February 1, 2029.

S12.B. Sampling and reporting requirements

1. The Permittee must submit all reports for toxicity testing in accordance with *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*, Publication 95-80 (Ecology, 2016). Reports must contain toxicity data, bench sheets, and reference toxicant results for test methods. In addition, the Permittee must submit toxicity test data in electronic format (CETIS export file preferred) for entry into Ecology's database.
2. The Permittee must collect 24-hour composite effluent samples for toxicity testing. The Permittee must cool the samples to 0 – 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.
3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (Ecology, 2016).
4. All toxicity tests must meet quality assurance criteria and test conditions specified in the EPA methods listed in Subsection C and *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (Ecology, 2016). If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.
5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Section A or pristine natural water of sufficient quality for good control performance.
6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.
7. The Permittee may choose to conduct a full dilution series test during compliance testing in the order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the ACEC. The summer ACEC equals 3.7 percent effluent. The winter ACEC equals 4.3 percent effluent.
8. All whole effluent toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing must comply with the acute statistical power standard of 29 percent as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

S13. Chronic toxicity

S13.A. Testing when there is no permit limit for chronic toxicity

The Permittee must:

1. Conduct chronic toxicity testing on final effluent once in June 2028 and once in December 2028.
2. Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the seasonal ACEC. The summer ACEC equals 3.7 percent effluent; the winter ACEC equals 4.3 percent effluent. The series of dilutions should also contain the summer or winter CCEC of 0.83 and 0.54 percent effluent, respectively.
3. Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89/001.
4. Submit a written report to Ecology no later than **August 1, 2028,** and **February 1, 2029.**
5. Perform chronic toxicity tests with all the following species and the most recent version of the following protocols:

Table 11 - Freshwater chronic toxicity tests

Freshwater Chronic Test	Species	Method
Fathead Minnow Survival and Growth	*Pimephales Promelas*	EPA-821-R-02-013
Water Flea Survival and Reproduction	*Ceriodaphnia Dubia*	EPA-821-R-02-013

S13.B. Sampling and reporting requirements

1. The Permittee must submit all reports for toxicity testing in accordance with *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (Ecology, 2016). Reports must contain toxicity data, bench sheets, and reference toxicant results for test methods. In addition, the Permittee must submit toxicity test data in electronic format (CETIS export file preferred) for entry into Ecology's database.
2. The Permittee must collect 24-hour composite effluent samples for toxicity testing. The Permittee must cool the samples to 0 – 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.
3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (Ecology, 2016).

4. All toxicity tests must meet quality assurance criteria and test conditions specified in the EPA methods listed in Subsection C and *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (Ecology, 2016). If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.
5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Section A or pristine natural water of sufficient quality for good control performance.
6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.
7. The Permittee may choose to conduct a full dilution series test during compliance testing in the order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the CCEC and the ACEC. The CCEC and the ACEC may either substitute for the effluent concentrations that are closest to them in the dilution series or be extra effluent concentrations. The summer CCEC equals 0.83 percent effluent. The winter CCEC equals 0.54 percent effluent. The summer ACEC equals 3.7 percent effluent. The winter ACEC equals 4.3 percent effluent
8. All whole effluent toxicity tests that involve hypothesis testing must comply with the chronic statistical power standard of 39 percent as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

REFERENCES

Doneker, R. L., & Jirka, G. H. (2007). *CORMIX User Manual: A Hydrodynamic Mixing Zone Model and Decision Support System for Pollutant Discharges into Surface Waters, EPA-823-K-07-001.* Retrieved from http://www.mixzon.com/downloads/

Ecology. (2004). *Information Manual for Treatment Plant Operators, Publication 04-10-020.* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/0410020.html

Ecology. (2016). *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies.* Retrieved from https://apps.ecology.wa.gov/publications/summarypages/0403030.html

Ecology. (2016). *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria (Publication 95-80).* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/9580.html

Ecology. (2018). *Water Quality Program Permit Writer's Manual, Publication 92-109.* Retrieved from https://apps.ecology.wa.gov/publications/summarypages/92109.html

Ecology. (2021). *Sediment Cleanup User's Manual SCUM.* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/1209057.html

Ecology. (2022). *Standard Operating Procedure EAP080, Version 2.2: Continuous Temperature Monitoring of Freshwater Rivers and Streams, Publication 22-03-216.* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/2203216.html

Ecology. (2023). *Criteria for Sewage Works Design, Publication 98-37 (Orange Book).* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/9837.html

Ecology and Department of Health. (2019). *Reclaimed Water Facilities Manual: The Purple Book.* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/1510024.html

Frick, W. E., Roberts, P. J., Davis, L. R., Keyes, D. J., & Baumgartner, G. K. (2003). *Dilution Models for Effluent Discharges, 4th Edition (Visual Plumes).* Athens, GA: Ecosystems Research Division, USEPA. Retrieved from https://www.epa.gov/sites/production/files/documents/VP-Manual.pdf

Kilpatrick, F. A., & Cobb, E. D. (1985). *Measurement of Discharge Using Tracers, Chapter A16, Techniques of Water-Resources Investigations of the USGS, Book 3, Application of Hydraulics.* Reston VA: USGS. Retrieved from https://pubs.usgs.gov/twri/twri3-a16/pdf/TWRI_3-A16.pdf

USEPA. (1985). *Infiltration/Inflow: I/I Analysis and Project Certification.* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/9703.html

USEPA. (1996). *Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels.* Retrieved from https://www.epa.gov/sites/default/files/2015-10/documents/method_1669_1996.pdf

Wilson, J. F., Cobb, E. D., & Kilpatrick, F. A. (1986). *Fluorometric Procedures for Dye Tracing, Chapter A12. Techniques of Water-Resources Investigations of the USGS, Book 3, Application of Hydraulics.* Reston, VA: USGS. Retrieved from https://pubs.usgs.gov/twri/twri3-a12/pdf/TWRI_3-A12.pdf

GENERAL CONDITIONS

G1. Signatory requirements

1. All applications submitted to Ecology must be signed and certified.
   a. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

      - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or
      - The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

   b. In the case of a partnership, by a general partner.
   c. In the case of sole proprietorship, by the proprietor.
   d. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

      Applications for permits for domestic wastewater facilities that are either owned or operated by, or under contract to, a public entity shall be submitted by the public entity.

2. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
   a. The authorization is made in writing by a person described above and submitted to Ecology.
   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to authorization. If an authorization under paragraph G1.2, above, is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G1.2, above, must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification. Any person signing a document under this section must make the following certification:

> "I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G2. Right of inspection and entry

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

1. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.
2. To have access to and copy, at reasonable times and at reasonable cost, any records required to be kept under the terms and conditions of this permit.
3. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.
4. To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G3. Permit actions

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the permittee) or upon Ecology's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 40 CFR 122.64 or WAC 173-220-150 according to the procedures of 40 CFR 124.5.

1. The following are causes for terminating this permit during its term, or for denying a permit renewal application:
   a. Violation of any permit term or condition.

b. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.
c. A material change in quantity or type of waste disposal.
d. A determination that the permitted activity endangers human health or the environment or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination.
e. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit.
f. Nonpayment of fees assessed pursuant to RCW 90.48.465.
g. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

2. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:
   a. A material change in the condition of the waters of the state.
   b. New information not available at the time of permit issuance that would have justified the application of different permit conditions.
   c. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.
   d. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions or requiring permit revision.
   e. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.
   f. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.
   g. Incorporation of an approved local pretreatment program into a municipality's permit.
3. The following are causes for modification or alternatively revocation and reissuance:
   a. When cause exists for termination for reasons listed in 1.a through 1.g of this section, and Ecology determines that modification or revocation and reissuance is appropriate.
   b. When Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G7) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

G4. Reporting planned changes

The Permittee must, as soon as possible, but no later than one hundred eighty (180) days prior to the proposed changes, give notice to Ecology of planned physical

alterations or additions to the permitted facility, production increases, or process modification which will result in:

1. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).
2. A significant change in the nature or an increase in quantity of pollutants discharged.
3. A significant change in the Permittee's sludge use or disposal practices.

Following such notice, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. Plan review required

Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications must be submitted to Ecology for approval in accordance with chapter 173-240 WAC. Engineering reports, plans, and specifications must be submitted at least one hundred eighty (180) days prior to the planned start of construction unless a shorter time is approved by Ecology. Facilities must be constructed and operated in accordance with the approved plans.

G6. Compliance with other laws and statutes

Nothing in this permit excuses the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. Transfer of this permit

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, a copy of which must be forwarded to Ecology.

1. Transfers by Modification

   Except as provided in paragraph (2) below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR 122.62(b)(2), or a minor modification made under 40 CFR 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

2. Automatic Transfers

   This permit may be automatically transferred to a new Permittee if:

a. The Permittee notifies Ecology at least thirty (30) days in advance of the proposed transfer date.
b. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.
c. Ecology does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G8. Reduced production for compliance

The Permittee, in order to maintain compliance with its permit, must control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G9. Removed substances

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

G10. Duty to provide information

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

G11. Other requirements of 40 CFR

All other requirements of 40 CFR 122.41 and 40 CFR 122.42 are incorporated in this permit by reference.

G12. Additional monitoring

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G13. Payment of fees

The Permittee must submit payment of fees associated with this permit as assessed by Ecology.

G14. Penalties for violating permit conditions

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to ten thousand dollars ($10,000) and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

G15. Upset

Definition – “Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limits if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that the Permittee can identify the cause(s) of the upset.
2. The permitted facility was being properly operated at the time of the upset.
3. The Permittee submitted notice of the upset as required in Special Condition S3.F.
4. The Permittee complied with any remedial measures required under S3.F of this permit.

In any enforcement action the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. Property rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. Duty to comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. Toxic pollutants

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. Penalties for tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two (2) years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or by both.

G20. Compliance schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than fourteen (14) days following each schedule date.

G21. Service agreement review

The Permittee must submit to Ecology any proposed service agreements and proposed revisions or updates to existing agreements for the operation of any wastewater treatment facility covered by this permit. The review is to ensure consistency with chapters 90.46 and 90.48 RCW as required by RCW 70.150.040(9). In the event that Ecology does not comment within a thirty-day (30) period, the Permittee may assume consistency and proceed with the service agreement or the revised/updated service agreement.

APPENDIX A – List of Pollutants, Analytical Methods, Detection Levels and Quantitation Levels

The Permittee must use the specified analytical methods, detection levels (DLs) [1] and quantitation levels (QLs) [2] in the following table for permit and application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136.

If the Permittee uses an alternative method, not specified in the permit, and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

If the Permittee is unable to obtain the required DL and QL due to matrix effects, the Permittee must submit a matrix-specific detection level (MDL) and a quantitation level (QL) to Ecology with appropriate laboratory documentation when the detection levels are too high to provide results near or below criteria (or applicable permit limits).

The lists below include conventional pollutants (as defined in CWA section 502(6) and 40 CFR Part 122), toxic or priority pollutants as defined in CWA section 307(a)(1) and listed in 40 CFR Part 122 Appendix D, 40 CFR Part 401.15 and 40 CFR Part 423 Appendix A), and nonconventionals. 40 CFR Part 122 Appendix D (Table V) also identifies toxic pollutants and hazardous substances which are required to be reported by dischargers if expected to be present. This permit appendix A list does not include those parameters.

The list also includes:

- Dioxin and furan congeners identified using EPA Method 1613.

Appendix A Table 1 – Conventional pollutants

Pollutant	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
Biochemical Oxygen Demand		SM5210-B		2 mg/L
Biochemical Oxygen Demand, Soluble		SM5210-B [3]		2 mg/L

Fecal Coliform		SM 9221E, 9221F SM 9222D	N/A	Specified in method sample aliquot dependent
Oil and Grease (HEM) (Hexane Extractable Material)		1664 A or B	1,400	5,000
pH		SM4500-H+ B	N/A	N/A
Total Suspended Solids		SM2540-D		5 mg/L

Appendix A Table 2 - Nonconventional pollutants

Pollutant	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
Alkalinity, Total		SM2320-B		5 mg/L as $CaCO_3$
Aluminum, Total	7429-90-5	200.8	2.0	10
Ammonia, Total (as N)		SM4500-NH3-B and C/D/E/G/H		20
Barium Total	7440-39-3	200.8	0.5	2.0
BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes)		EPA SW 846 8021/8260	1	2
Boron, Total	7440-42-8	200.8	2.0	10.0
Chemical Oxygen Demand		SM5220-D		10 mg/L
Chloride		SM4500-Cl B/C/D/E and SM4110 B		Sample and limit dependent
Chlorine, Total Residual		SM4500 Cl G	10	50
Cobalt, Total	7440-48-4	200.8	0.05	0.25
Color		SM2120 B/C/E		10 color units
Dissolved oxygen		SM4500-OC/OG		0.2 mg/L
E.coli		SM 9221B, 9221F, 9223B	N/A	Specified in method; sample aliquot dependent

Enterococci		EPA 1600 SM 9230B, 9230C, 9230D,	N/A	Specified in method; sample aliquot dependent
Flow		Calibrated device		
Fluoride	16984-48-8	SM4500-F E	25	100
Hardness, Total		SM2340B		200 as $CaCO_3$
Iron, Total	7439-89-6	200.7	12.5	50
Magnesium, Total	7439-95-4	200.7	10	50
Manganese, Total	7439-96-5	200.8	0.1	0.5
Molybdenum, Total	7439-98-7	200.8	0.1	0.5
Nitrate + Nitrite Nitrogen (as N)		SM4500-NO_3- E/F/H		100
Nitrogen, Total Kjeldahl (as N)		SM4500-N_{org}B/C and SM4500NH_3-B/C/D/EF/G/H		300
NWTPH Dx [4]		Ecology NWTPH Dx	250	250
NWTPH Gx [5]		Ecology NWTPH Gx	250	250
Phosphorus, Total (as P)		SM 4500 PB followed by SM4500-PE/PF	3	10
Salinity		SM2520-B		3 practical salinity units or scale (PSU or PSS)
Settleable Solids		SM2540 -F		Sample and limit dependent
Soluble Reactive Phosphorus (as P)		SM4500-P E/F/G	3	10
Sulfate (as mg/L SO_4)		SM4110-B		0.2 mg/L
Sulfide (as mg/L S)		SM4500-S2F/D/G		0.2 mg/L
Sulfite (as mg/L SO_3)		SM4500-SO3B		2 mg/L
Temperature		Analog recorder or micro-recording devices (thermistors)		0.2°C
Tin, Total	7440-31-5	200.8	0.3	1.5
Titanium, Total	7440-32-6	200.8	0.5	2.5

Total Coliform		SM 9221B SM 9222B	N/A	Specified in method; sample aliquot dependent
Total Organic Carbon		SM5310-B/C/D		1 mg/L
Total Dissolved solids		SM2540 C		20 mg/L

Appendix A Table 3 - Priority pollutants: Metals, chromium (hex), cyanide & total phenols

Priority pollutants	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
Antimony, Total	114	7440-36-0	200.8	0.3	1.0
Arsenic, Total	115	7440-38-2	200.8	0.1	0.5
Beryllium, Total	117	7440-41-7	200.8	0.1	0.5
Cadmium, Total	118	7440-43-9	200.8	0.05	0.25
Chromium (hex) dissolved	119	18540-29-9	SM3500-Cr C	0.3	1.2
Chromium, Total	119	7440-47-3	200.8	0.2	1.0
Copper, Total	120	7440-50-8	200.8	0.4	2.0
Lead, Total	122	7439-92-1	200.8	0.1	0.5
Mercury, Total	123	7439-97-6	1631E	0.0002	0.0005
Nickel, Total	124	7440-02-0	200.8	0.1	0.5
Selenium, Total	125	7782-49-2	200.8	1.0	1.0
Silver, Total	126	7440-22-4	200.8	0.04	0.2
Thallium, Total	127	7440-28-0	200.8	0.09	0.36
Zinc, Total	128	7440-66-6	200.8	0.5	2.5
Cyanide, Total	121	57-12-5	335.4	5	10
Cyanide, Weak Acid Dissociable	121		SM4500-CN I	5	10
Cyanide, Free Amenable to Chlorination (Available Cyanide)	121		SM4500-CN G	5	10
Phenols, Total	65		EPA 420.1		50

Appendix A Table 4 - Priority pollutants: Acid compounds

Priority pollutants	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
2-Chlorophenol	24	95-57-8	625.1	3.3	9.9
2,4-Dichlorophenol	31	120-83-2	625.1	2.7	8.1
2,4-Dimethylphenol	34	105-67-9	625.1	2.7	8.1
4,6-dinitro-o-cresol (2-methyl-4,6,-dinitrophenol)	60	534-52-1	625.1/1625B	24	72
2,4 dinitrophenol	59	51-28-5	625.1	42	126
2-Nitrophenol	57	88-75-5	625.1	3.6	10.8
4-Nitrophenol	58	100-02-7	625.1	2.4	7.2
Parachlorometa cresol (4-chloro-3-methylphenol)	22	59-50-7	625.1	3.0	9.0
Pentachlorophenol	64	87-86-5	625.1	3.6	10.8
Phenol	65	108-95-2	625.1	1.5	4.5
2,4,6-Trichlorophenol	21	88-06-2	625.1	2.7	8.1

Appendix A Table 5 - Priority pollutants: Volatile compounds

Priority pollutants	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
Acrolein	2	107-02-8	624.1	5	10
Acrylonitrile	3	107-13-1	624.1	1.0	2.0
Benzene	4	71-43-2	624.1	4.4	13.2
Bromoform	47	75-25-2	624.1	4.7	14.1
Carbon tetrachloride	6	56-23-5	624.1/601 or SM6230B	2.8	8.4
Chlorobenzene	7	108-90-7	624.1	6.0	18.0
Chloroethane	16	75-00-3	624/601	1.0	2.0
2-Chloroethylvinyl Ether	19	110-75-8	624.1	1.0	2.0
Chloroform	23	67-66-3	624.1 or SM6210B	1.6	4.8

Dibromochloromethane (chlordibromomethane)	51	124-48-1	624.1	3.1	9.3
1,2-Dichlorobenzene	25	95-50-1	624.1	1.9	7.6
1,3-Dichlorobenzene	26	541-73-1	624.1	1.9	7.6
1,4-Dichlorobenzene	27	106-46-7	624.1	4.4	17.6
Dichlorobromomethane	48	75-27-4	624.1	2.2	6.6
1,1-Dichloroethane	13	75-34-3	624.1	4.7	14.1
1,2-Dichloroethane	10	107-06-2	624.1	2.8	8.4
1,1-Dichloroethylene	29	75-35-4	624.1	2.8	8.4
1,2-Dichloropropane	32	78-87-5	624.1	6.0	18.0
1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene)6	33	542-75-6	624.1	5.0	15.0
Ethylbenzene	38	100-41-4	624.1	7.2	21.6
Methyl bromide (Bromomethane)	46	74-83-9	624/601	5.0	10.0
Methyl chloride (Chloromethane)	45	74-87-3	624.1	1.0	2.0
Methylene chloride	44	75-09-2	624.1	2.8	8.4
1,1,2,2-Tetrachloroethane	15	79-34-5	624.1	6.9	20.7
Tetrachloroethylene	85	127-18-4	624.1	4.1	12.3
Toluene	86	108-88-3	624.1	6.0	18.0
1,2-Trans-Dichloroethylene (Ethylene dichloride)	30	156-60-5	624.1	1.6	4.8
1,1,1-Trichloroethane	11	71-55-6	624.1	3.8	11.4
1,1,2-Trichloroethane	14	79-00-5	624.1	5.0	15.0
Trichloroethylene	87	79-01-6	624.1	1.9	5.7
Vinyl chloride	88	75-01-4	624/SM6200B	1.0	2.0

Appendix A Table 6 - Priority pollutants: Base/neutral compounds

Priority pollutants	PP #	CAS number (if available)	Recommended analytical Protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
Acenaphthene	1	83-32-9	625.1	1.9	5.7

Acenaphthylene	77	208-96-8	625.1	3.5	10.5
Anthracene	78	120-12-7	625.1	1.9	5.7
Benzidine	5	92-87-5	625.1	44	132
Benzyl butyl phthalate	67	85-68-7	625.1	2.5	7.5
Benzo(a)anthracene	72	56-55-3	625.1	7.8	23.4
Benzo(b)fluoranthene (3,4-benzofluoranthene) [7]	74	205-99-2	610/625.1	4.8	14.4
Benzo(k)fluoranthene (11,12-benzofluoranthene) [7]	75	207-08-9	610/625.1	2.5	7.5
Benzo(a)pyrene	73	50-32-8	610/625.1	2.5	7.5
Benzo(ghi)Perylene	79	191-24-2	610/625.1	4.1	12.3
Bis(2-chloroethoxy)methane	43	111-91-1	625.1	5.3	15.9
Bis(2-chloroethyl)ether	18	111-44-4	611/625.1	5.7	17.1
Bis(2-chloro-1-methylethyl)Ether (Bis(2-chloroisopropyl)ether) [8]	42	108-60-1	625.1	5.7	17.1
Bis(2-ethylhexyl)phthalate	66	117-81-7	625.1	2.5	7.5
4-Bromophenyl phenyl ether	41	101-55-3	625.1	1.9	5.7
2-Chloronaphthalene	20	91-58-7	625.1	1.9	5.7
4-Chlorophenyl phenyl ether	40	7005-72-3	625.1	4.2	12.6
Chrysene	76	218-01-9	610/625.1	2.5	7.5
Dibenzo(a-h)anthracene (1,2,5,6-dibenzanthracene)	82	53-70-3	625.1	2.5	7.5
3,3-Dichlorobenzidine	28	91-94-1	605/625.1	16.5	49.5
Diethyl phthalate	70	84-66-2	625.1	1.9	5.7
Dimethyl phthalate	71	131-11-3	625.1	1.6	4.8
Di-n-butyl phthalate	68	84-74-2	625.1	2.5	7.5
2,4-dinitrotoluene	35	121-14-2	609/625.1	5.7	17.1
2,6-dinitrotoluene	36	606-20-2	609/625.1	1.9	5.7
Di-n-octyl phthalate	69	117-84-0	625.1	2.5	7.5
1,2-Diphenylhydrazine (as Azobenzene)	37	122-66-7	1625B/625.1	5.0	20
Fluoranthene	39	206-44-0	625.1	2.2	6.6
Fluorene	80	86-73-7	625.1	1.9	5.7

Hexachlorobenzene	9	118-74-1	612/625.1	1.9	5.7
Hexachlorobutadiene	52	87-68-3	625.1	0.9	2.7
Hexachlorocyclopentadiene	53	77-47-4	1625B/625.1	2.0	4.0
Hexachloroethane	12	67-72-1	625.1	1.6	4.8
Indeno(1,2,3-cd)Pyrene	83	193-39-5	610/625.1	3.7	11.1
Isophorone	54	78-59-1	625.1	2.2	6.6
Naphthalene	55	91-20-3	625.1	1.6	4.8
Nitrobenzene	56	98-95-3	625.1	1.9	5.7
N-Nitrosodimethylamine	61	62-75-9	607/625.1	2.0	4.0
N-Nitrosodi-n-propylamine	63	621-64-7	607/625.1	0.5	1.0
N-Nitrosodiphenylamine	62	86-30-6	625.1	1.0	2.0
Phenanthrene	81	85-01-8	625.1	5.4	16.2
Pyrene	84	129-00-0	625.1	1.9	5.7
1,2,4-Trichlorobenzene	8	120-82-1	625.1	1.9	5.7

Appendix A Table 7 - Base/neutral compounds – Ecology PBTs

Pollutant	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
Benzo(j)fluoranthene [7]	205-82-3	625	0.5	1.0
Benzo(r,s,t)pentaphene	189-55-9	625	1.3	5.0
Dibenzo (a,h)acridine	226-36-8	610M/625M	2.5	10.0
Dibenzo (a,j)acridine	224-42-0	610M/625M	2.5	10.0
Dibenzo(a,e)pyrene	192-65-4	610M/625M	2.5	10.0
Dibenzo(a,h)pyrene	189-64-0	625M	2.5	10.0
3-Methyl cholanthrene	56-49-5	625	2.0	8.0
Perylene	198-55-0	625	1.9	7.6

Appendix A Table 8 - Dioxin

Priority pollutant	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (2,3,7,8 TCDD)	129	1746-01-6	1613B	1.3 pg/L	5 pg/L

Appendix A Table 9 - Pesticides and PCBs

Priority pollutants	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
Aldrin	89	309-00-2	608.3	4.0 ng/L	12 ng/L
alpha-BHC	102	319-84-6	608.3	3.0 ng/L	9.0 ng/L
beta-BHC	103	319-85-7	608.3	6.0 ng/L	18 ng/L
gamma-BHC (Lindane)	104	58-89-9	608.3	4.0 ng/L	12 ng/L
delta-BHC	105	319-86-8	608.3	9.0 ng/L	27 ng/L
Chlordane [9]	91	57-74-9	608.3	14 ng/L	42 ng/L
4,4'-DDT	92	50-29-3	608.3	12 ng/L	36 ng/L
4,4'-DDE	93	72-55-9	608.3	4.0 ng/L	12 ng/L
4,4' DDD	94	72-54-8	608.3	11ng/L	33 ng/L
Dieldrin	90	60-57-1	608.3	2.0 ng/L	6.0 ng/L
alpha-Endosulfan	95	959-98-8	608.3	14 ng/L	42 ng/L
beta-Endosulfan	96	33213-65-9	608.3	4.0 ng/L	12 ng/L
Endosulfan Sulfate	97	1031-07-8	608.3	66 ng/L	198 ng/L
Endrin	98	72-20-8	608.3	6.0 ng/L	18 ng/L
Endrin Aldehyde	99	7421-93-4	608.3	23 ng/L	70 ng/L
Heptachlor	100	76-44-8	608.3	3.0 ng/L	9.0 ng/L
Heptachlor Epoxide	101	1024-57-3	608.3	83 ng/L	249 ng/L
PCB-1242 [10]	106	53469-21-9	608.3	0.065	0.195
PCB-1254	107	11097-69-1	608.3	0.065	0.195
PCB-1221	108	11104-28-2	608.3	0.065	0.195

PCB-1232	109	11141-16-5	608.3	0.065	0.195
PCB-1248	110	12672-29-6	608.3	0.065	0.195
PCB-1260	111	11096-82-5	608.3	0.065	0.195
PCB-1016 [10]	112	12674-11-2	608.3	0.065	0.195
Toxaphene	113	8001-35-2	608.3	240 ng/L	720 ng/L

Appendix A Table 10 - Nonconventionals – dioxin & furan congeners

Pollutant	CAS number (if available)	Recommended analytical protocol	Detection level (DL) [1] µg/L unless specified	Quantitation level (QL) [2] µg/L unless specified
2,3,7,8- Tetrachlorodibenzo-p-dioxin (TCDD) (this is a priority pollutant also listed in Table 8)	1746-01-6	EPA 1613	1.3 pg/L	5 pg/L
Total TCDD	41903-57-5			
2,3,7,8- Tetrachlorodibenzofuran (TCDF)	51207-31-9		1.3 pg/L	5 pg/L
Total-TCDF	55722-27-5			
1,2,3,7,8- Pentachlorodibenzo-p-dioxin (PeCDD)	40321-76-4			
Total-PeCDD	36088-22-9			
1,2,3,7,8- Pentachlorodibenzofuran (PeCDF)	57117-41-6			
2,3,4,7,8-PeCDF	57117-31-4			
Total-PeCDF	30402-15-4			
1,2,3,4,7,8- Hexachlorodibenzo-p-dioxin (HxCDD)	39227-28-6			
1,2,3,6,7,8-HxCDD	57653-85-7			
1,2,3,7,8,9-HxCDD	19408-74-3			
Total-HxCDD	34465-46-8			
1,2,3,4,7,8- Hexachlorodibenzofuran (HxCDF)	70648-26-9			
1,2,3,6,7,8-HxCDF	57117-44-9			
1,2,3,7,8,9-HxCDF	72918-21-9			
2,3,4,6,7,8-HxCDF	60851-34-5			

Total-HxCDF	55684-94-1			
1,2,3,4,6,7,8- Heptachlorodibenzo-p-dioxin (HpCDD)	35822-46-9			
Total-HpCDD	37871-00-4			
1,2,3,4,6,7,8- Heptachlorodibenzofuran (HpCDF)	67562-39-4			
1,2,3,4,7,8,9-HpCDF	55673-89-7			
Total-HpCDF	38998-75-3			
Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9			
Octachlorodibenzofuran (OCDF)	39001-02-0			

Footnotes

[1] Detection level (DL) – or method detection limit means the minimum concentration of an analyte (substance) that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results as determined by the procedure given in 40 CFR part 136, Appendix B.

[2] Quantitation Level (QL) – also known as Minimum Level (ML) – The term ‘‘minimum level’’ refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (DL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the DL in a method, or the DL determined by a laboratory, by a factor of 3. For the purposes of NPDES compliance monitoring, EPA considers the following terms to be synonymous: ‘‘quantitation limit,” ‘‘reporting limit,’’ and ‘‘minimum level’’.

[3] Soluble Biochemical Oxygen Demand – method note: First, filter the sample through a Millipore Nylon filter (or equivalent) - pore size of 0.45-0.50 um (prep all filters by filtering 250 ml of laboratory grade deionized water through the filter and discard). Then, analyze sample as per method 5210-B.

[4] Northwest Total Petroleum Hydrocarbons Diesel Extended Range OR NWTPH Dx – Analytical Methods for Petroleum Hydrocarbons https://apps.ecology.wa.gov/publications/documents/97602.pdf

[5] Northwest Total Petroleum Hydrocarbons Gasoline Extended Range OR NWTPH Gx – Analytical Methods for Petroleum Hydrocarbons https://apps.ecology.wa.gov/publications/documents/97602.pdf

[6] 1, 3-dichloroproylene (mixed isomers) – You may report this parameter as two separate parameters: cis-1, 3-dichlorpropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).

[7] Total Benzofluoranthenes – Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzofluoranthenes.

[8] Bis(2-Chloro-1-Methylethyl) Ether – This compound was previously listed as Bis(2-Chloroisopropyl) Ether (39638-32-9)

[9] Chlordane – You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 14/42 ng/L.

[10] PCB 1016 & PCB 1242 – You may report these two PCB compounds as one parameter called PCB 1016/1242.

FACT SHEET FOR NPDES PERMIT WA0020249

City of Camas Wastewater Treatment Plant

Date of Public Notice: April 15, 2025

Permit Effective Date: August 1, 2025

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for the city of Camas wastewater treatment plant (WWTP).

This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for city of Camas, NPDES permit WA0020249, are available for public review and comment from **April 15, 2025, to May 16, 2025.** For more details on preparing and filing comments about these documents, please see Appendix A - Public Involvement Information.

The city of Camas reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, discharges, or receiving water prior to publishing this draft fact sheet for public notice.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as Appendix E - Response to Comments and publish it when issuing the final NPDES permit. Ecology generally will not revise the rest of the fact sheet. The full document will become part of the legal history contained in the facility's permit file.

Summary

The city of Camas operates an activated sludge wastewater treatment plant that discharges to the Columbia River. Ecology issued the previous permit for this facility on September 25, 2015.

The proposed permit includes the same effluent limits for Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), fecal coliform bacteria, and pH as the permit issued in 2015. Average monthly ammonia limits were continued in this permit and average weekly limits for ammonia were developed. Ecology added a new water quality-based limit for heat load based on the wasteload allocation from the Columbia

and Lower Snake River Temperature Total Maximum Daily Load (TMDL). The proposed permit requires the POTW to meet the 85% removal requirements for BOD_5 and TSS as several I/I reduction projects have removed these excessive flows from the collection system. The permit includes new monitoring requirements for *E. coli* and continues pretreatment related monitoring to support Ecology's implementation of the Federal Pretreatment and State Waste Discharge Permit programs.

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I. Introduction

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the state of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The Legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations in the Washington Administrative Code (WAC) apply to domestic wastewater NPDES permits:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC)
- Discharge standards for domestic wastewater facilities (chapter 173 221 WAC)
- Water quality criteria for surface waters (chapter 173-201A WAC)
- Water quality criteria for ground waters (chapter 173-200 WAC)
- Whole effluent toxicity testing and limits (chapter 173-205 WAC)
- Sediment management standards (chapter 173-204 WAC)
- Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC)

These rules require any treatment facility owner/operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for performance requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050). (See *Appendix A-Public Involvement Information* for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in Appendix E.

II. Background information

Table 1 - Facility information

Applicant:	**City of Camas Wastewater Treatment Plant**
Facility name and address	City of Camas WWTP 1129 Southeast Polk Street Camas, WA 98607
Contact at facility	Jacob Taylor Wastewater Operations Supervisor 360-316-8925 jtaylor@cityofcamas.us
Responsible official	Steve Hogan Mayor 616 NE 4th Ave Camas, WA 98607 Telephone #:360-834-6864 Email: shogan@cityofcamas.us
Type of treatment	Activated sludge (Modified Ludzack-Ettinger) with selectors, alkalinity addition, anaerobic digestion, and effluent filtration.
Facility location (NAD83/WGS84 reference datum)	Latitude: 45.57866° N Longitude: 122.39447° W
Discharge waterbody name and location (NAD83/WGS84 reference datum)	Columbia River, RM 121 Latitude: 45.57479° N Longitude: 122.391897° W

Permit status

Issuance date of previous permit: September 25, 2015

Application for permit renewal submittal date: April 3, 2020

Inspection status

Date of last non-sampling inspection: January 7, 2025

Figure 1 - Facility location map



II.A. Facility description

1. History

The treatment facility for the city of Camas (City) was constructed in 1972 along the Columbia River in the southeastern portion of the sewer service area. The facility has undergone several modifications since original construction. The Phase I upgrade and expansion (primarily liquid stream) was completed in February of 2000. The Phase 2A upgrade primarily addressing solids treatment, including anaerobic digesters and sludge drying facilities occurred in 2012. Phase 2B, the most recent upgrade, occurred in 2014 and consisted of improved blower controls, the addition of a third secondary clarifier, new effluent filters and digester gas treatment facilities.

The EPA classifies the Camas Wastewater Treatment Plant as a major facility as design flows exceed 1 MGD.

2. Collection system status

The City of Camas sewer service area covers approximately 7,400 acres. The collection system includes conventional gravity sewers with lift stations, septic tank effluent pumping stations (STEP), septic tank effluent filter systems (STEF) and septic tank effluent gravity systems (STEG). Conventional gravity sewers are the most common type of conveyance within the city limits.

Portions of the service area served by conventional gravity sewers are from the 1920s. These early sections of the gravity sewer were constructed with vitrified clay pipe (VCP). Over time, most of the VCP was replaced with cast iron, concrete and eventually PVC. Gravity sewers range from four inch to 24-inches in diameter. The majority of gravity collection system is 8-inches in diameter. There are approximately 45 miles of gravity sewer mains in the service area.

Beginning in the mid-1980s, Camas required customers in the western portion of the sewer service area to connect using STE systems. STEP systems consist of a septic tank equipped with a pump at the outlet to convey effluent flows to the STEP transmission main. STEG systems consist of a septic tank with an outlet that conveys effluent flows by gravity to the STE transmission main. And STEF systems utilize a siphon to convey flows to the STE transmission main. Camas owns and maintains the residential STE systems. They pump out septage from the STE systems on an eight-year cycle. Commercial and industrial STE systems are owned and maintained by the property owner. Septage from commercial, industrial and residential STE systems receive treatment at the WWTP.

Twenty-nine lift stations convey sewage and septic tank effluent to the treatment plant when gravity sewers cannot be utilized. Thirteen lift stations serve the gravity system while fifteen serve the septic tank effluent (STE) systems. One lift station is dedicated to odor control. There is approximately 51,460 LF of forcemain ranging from 4 to 18-inches. The majority of lift stations serve a relatively small service area and have capacities of less than 500 gallons per minute (GPM); however, the main lift station has a capacity of 7,700 GPM and conveys the majority of the gravity collection system to the WWTP through an 18-inch diameter forcemain under Lacamas Creek.

Inflow and infiltration (I/I) from the STE systems is fairly low; however, historically, the inflow from the gravity collection system is fairly high. Since the 1970s, the city has an ongoing I/I reduction program. In 2020, the city conducted a follow up study to document the I/I reduction stemming from implementing recommendations from the 2016 I/I evaluation. This study showed that the City has observed a reduction in peak WWTP flows and high flow events, even though the population of the city and extent of the sewer system have both increased over the study period. As a result, the city’s WWTP no longer sees excessive I/I as defined by the EPA criteria. While excessive I/I may have been

addressed, the city has planned I/I reduction projects for the next five years. These include:

- Ongoing gravity main repair and replacement.
- Crown view pump station improvements.
- Lacamas Creek Pump Station improvements.

3. Treatment process

Liquid stream treatment at the Camas WWTP begins with climbing perforated filter screens at the plant headworks to remove larger material which is washed, compacted, and disposed of at the local landfill. Primary solids -liquid separation occurs in two circular primary clarifiers with the primary effluent discharging to a splitter box where it is combined with returned activated sludge (RAS) from the secondary clarifiers and split between three aeration basins (ABs), where biomass is aerated to promote biological oxidation. Secondary treatment in the ABs consists of influent channel selector zones followed by two anoxic zones and three aerobic zones to remove carbonaceous material and reduce ammonia concentrations. Magnesium hydroxide is added at the splitter box to provide supplemental alkalinity ahead of aeration.

Mixed liquor from the three ABs is combined and split between three secondary clarifiers. Each clarifier proves separation of the biomass from the secondary treatment process and discharges treated effluent to two mechanical disc filters. Ultraviolet disinfection is provided in an open channel system prior to discharge to the outfall in the Columbia River.

Disinfected effluent flows by gravity or is pumped to the outfall via three effluent pumps which are operated in a two duty, one standby configuration. The transition between gravity and pumped effluent flow occurs automatically when pumps are placed in “auto” mode. As the Columbia River level rises, gravity effluent discharge is stopped by closing the flap gate in the effluent manhole.

Solids from the primary clarifiers enter two hydro-cyclones and a grit classifier before thickening by via gravity thickener. Thickened primary sludge is then pumped to anaerobic digesters. Solids from the secondary clarifiers are removed and either pumped back to the aeration splitter box as RAS or wasted to a storage tank and thickened via rotary drum thickener. Thickened primary and secondary solids are combined in the anaerobic digesters for stabilization, removal of volatile solids and production of biogas. Digested sludge is dewatered by centrifuge and is then conveyed to a belt dryer which evaporates the remaining water content in the finished biosolids.

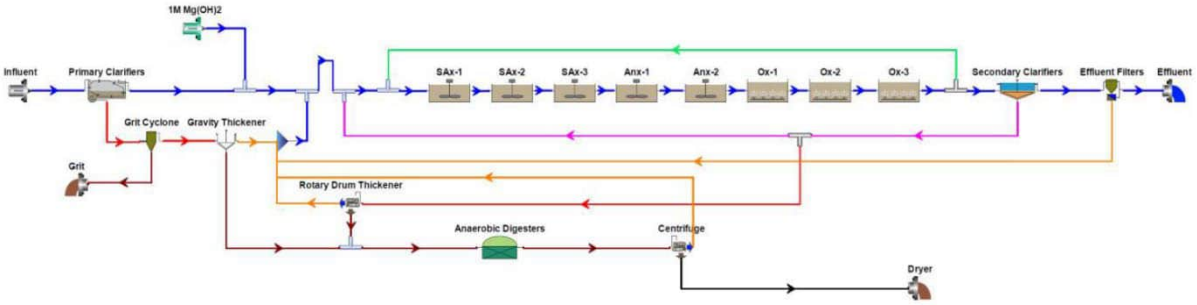
The Camas WWTP is a major facility as classified by EPA as it is over 1 MGD. It is also a Class IV facility requiring the operator in responsible charge of the facility to have a Group IV license.

The plant hours of operation are 5:00 am to 3:30 pm seven days per week.

There are four significant industrial users that have pretreatment permits issued by Ecology. Camas has not been delegated pretreatment authorities. The four industries permitted by Ecology that discharge to the Camas WWTP are:

- Analog Devices, Inc., ST0006154
- nLight Inc, ST0006270
- Northwest Paper Box Manufacturers, Inc., ST0005027
- TSMC Washington, LLC, ST0006200

Figure 2 – Process Flow Diagram



4. Solid wastes and residual solids

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. The Camas WWTP drains grit, rags, scum, and screenings and disposes this solid waste at the local landfill. Solids removed from the primary and secondary clarifiers are thickened, treated by anaerobic digestion and dried before being land applied. This facility has met the solid waste requirements for screening, as required by WAC 173-308-205, by having screens with an aperture of less than 3/8-inch.

5. Discharge outfall

The treated and disinfected effluent flows into the Columbia River through a 36-inch corrugated metal pipe (CMP) and extends approximately 850 feet into the river channel. The diffuser portion of the outfall is located along the outer 150 feet of the pipe and is equipped with 16 vertical risers, each oriented vertically with rubber Tideflex check valve nozzles. The vertical risers discharge effluent perpendicular to the flow of the Columbia River.

II.B. Description of the receiving water

The Camas WWTP discharges to the Columbia River at River Mile (RM) 121. Other nearby point source outfalls include the Washougal WWTP and MS4 discharges. Significant nearby non-point sources of pollutants include diffuse stormwater and agricultural practices. Section IIIE of this fact sheet describes any receiving waterbody impairments.

The ambient background data used for this permit includes the following from the City of Camas Receiving Water Study Report (CH2M,2017):

Table 2 - Ambient background data

Parameter	Value
pH (Maximum / Minimum)	8.10/7.29 standard units
Total Ammonia-N	0.183 mg/L
Hardness	74.0 mg/L as CaCO3
Alkalinity	66.2 mg/L as CaCO3
Arsenic, dissolved	1.02 µg/L
Cadmium, dissolved	<0.03 µg/L
Chromium, dissolved	0.416 µg/L
Chromium, hexavalent, dissolved	0.086 µg/L
Copper, dissolved	1.43 µg/L
Lead, dissolved	0.064 µg/L
Mercury, dissolved	0.884 µg/L
Nickel, dissolved	0.604 µg/L
Selenium, dissolved	0.274 µg/L
Silver, dissolved	<0.025 µg/L
Thallium, dissolved	<0.025 µg/L
Zinc, dissolved	1.25 µg/L
Temperature	23.2 °C

II.C. Wastewater influent characterization

Camas WWTP reported the concentration of pollutants in the wastewater influent in the permit application and in discharge monitoring reports. The tabulated data represents the quality of the wastewater influent from October 1, 2019 – October 31, 2024.

Table 3 - Wastewater influent characterization

Parameter	Units	# of Samples	Average value	Maximum value
Flow	MGD	1858	2.6	7.8
Biochemical Oxygen Demand (BOD_5)	mg/L	1154	120	314
Biochemical Oxygen Demand (BOD_5)	lbs/day	1154	2,552	6,160
Total Suspended Solids (TSS)	mg/L	1176	128	380
Total Suspended Solids (TSS)	lbs/day	1156	2,742	12,421

Parameter	Units	# of Samples	Average value	Maximum value
Ammonia, Total	mg/L	1155	41.7	59.6
Antimony, Total Recoverable	µg/L	20	0.3	0.67
Arsenic, Total Recoverable	µg/L	20	0.9	1.26
Cadmium, Total Recoverable	µg/L	20	0.1	0.26
Chromium, Total Recoverable	µg/L	20	2.6	4.13
Chromium, Hexavalent	µg/L	20	79.1	490
Copper, Total Recoverable	µg/L	20	42.5	81.7
Cyanide, Total Recoverable	µg/L	20	5.1	20.0
Lead, Total Recoverable	µg/L	20	0.8	4.70
Mercury, Total Recoverable	ng/L	20	10.2	19.2
Molybdenum, Total Recoverable	µg/L	20	5.9	10.5
Nickel, Total Recoverable	µg/L	20	3.8	7.50
Oil & Grease	mg/L	20	18.5	37.2
Petroleum Hydrocarbons	µg/L	20	167	250
Selenium, Total Recoverable	µg/L	20	0.5	1.00
Silver, Total Recoverable	µg/L	20	0.1	0.38
Sulfate	µg/L	20	178,924	334,000
Zinc, Total Recoverable	µg/L	20	77.1	269

Parameter	Units	# of Samples	Minimum value	Maximum value
pH	SU	1858	6.9	9.7

II.D. Wastewater effluent characterization

Camas WWTP reported the concentration of pollutants in the discharge in the permit application and in discharge monitoring reports. The tabulated data represents the quality of the wastewater effluent discharged from October 1, 2019 – October 31, 2024.

Table 4 - Wastewater effluent characterization

Parameter	Units	# of Samples	Average value	Maximum value
Flow	MGD	1,858	2.96	8.24
Biochemical Oxygen Demand (BOD_5)	mg/L	1,157	3.68	22.4
Biochemical Oxygen Demand (BOD_5)	lbs/day	1,157	93.8	1,527
Total Suspended Solids (TSS)	mg/L	1,158	3.68	28.2
Total Suspended Solids (TSS)	lbs/day	1,158	91.3	1,922
Ammonia, Total	mg/L	1,156	0.297	5.17
Antimony, Total Recoverable	µg/L	20	0.240	0.345
Arsenic, Total Recoverable	µg/L	20	0.660	0.95
Butyl benzyl phthalate	µg/L	3	0.11	0.27
Cadmium, Total Recoverable	µg/L	20	0.015	0.022

Parameter	Units	# of Samples	Average value	Maximum value
Chlorine	mg/L	3	0.023	0.030
Chloroform	µg/L	4	0.55	0.71
Chromium, Total Recoverable	µg/L	20	0.536	0.970
Chromium, Hexavalent	µg/L	20	92.0	490
Copper, Total Recoverable	µg/L	20	5.80	11.1
Cyanide, Total Recoverable	µg/L	20	7.58	20.0
di-n-octyl phthalate	µg/L	3	0.15	0.22
Diethyl phthalate	µg/L	3	0.59	1.1
Dissolved Oxygen	mg/L	3	4.95	5.12
Fluoride	µg/L	20	2,584	4,150
Hardness, as $CaCO_3$	mg/L	4	168	238
Total Kjeldahl Nitrogen	mg/L	61	2.89	21.4
Lead, Total Recoverable	µg/L	20	0.099	0.150
Mercury, Total Recoverable	ng/L	20	0.653	1.01
Molybdenum, Total Recoverable	µg/L	20	4.09	8.20
Naphthalene	µg/L	3	0.16	0.45
Nickel, Total Recoverable	µg/L	20	1.94	2.82
Oil & Grease	mg/L	24	4.11	17.2
Petroleum Hydrocarbons	µg/L	20	158	250
Phenol	µg/L	3	1.96	5.5
Phosphate, Ortho-phosphate	mg/L	61	7.15	10
Phosphorus, Total	mg/L	61	7.62	27.2
Selenium, Total Recoverable	µg/L	20	0.680	1.00
Silver, Total Recoverable	µg/L	20	0.015	0.020
Sulfate	µg/L	20	176,770	241,000
Temperature	°C	3,716	19.9	24
Total Phenolic Compounds	µg/L	4	0.244	1.07
Zinc, Total Recoverable	µg/L	20	21.1	28.4

Parameter	Units	# of Samples	Maximum Monthly Geometric Mean	Maximum Weekly Geometric Mean
Fecal Coliform	#/100 mL	1061	51	213

Parameter	Units	# of Samples	Minimum value	Maximum value
pH	SU	1858	6.9	8.70

II.E. Summary of compliance with previous permit issued September 25, 2015

The previous permit placed effluent limits on BOD_5, TSS, ammonia, pH and fecal coliform bacteria.

Camas WWTP has not consistently complied with the effluent limits and permit conditions throughout the duration of the permit issued on September 25, 2015.

Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections.

The following table summarizes the violations that occurred during the permit term.

Table 5 - Violations, October 1, 2019 – October 31, 2024

Violation date	Parameter type	Unit type	Max limit	Measurement value quantity	Statistical base type	Violation
10/28/2019	pH (Hydrogen Ion) Daily Min	Standard Units	6	5.9	Single Sample	Numeric effluent violation
04/01/2020						Late Submittal of DMRs
06/01/2020						Late Submittal of DMRs
10/01/2020	Cyanide	Micrograms/L (ug/L)			Average	Analysis not Conducted
10/28/2020	Cyanide	Micrograms/L (ug/L)			Single Sample	Analysis not Conducted
10/01/2020	Petroleum Hydrocarbons	Micrograms/L (ug/L)			Average	Analysis not Conducted
10/28/2020	Petroleum Hydrocarbons	Micrograms/L (ug/L)			Single Sample	Analysis not Conducted
01/01/2022	Chlorine	Milligrams/L (mg/L)			Average	Analysis not Conducted
12/06/2022	Chlorine	Milligrams/L (mg/L)			Single Sample	Analysis not Conducted
01/01/2022	Dissolved Oxygen	Milligrams/L (mg/L)			Average	Analysis not Conducted
12/06/2022	Dissolved Oxygen	Milligrams/L (mg/L)			Single Sample	Analysis not Conducted
11/14/2022	pH (Hydrogen Ion) Daily Min	Standard Units	6	3	Single Sample	Numeric effluent violation*
12/27/2022	Biochemical Oxygen	Percent			Single Sample	Analysis not Conducted

Violation date	Parameter type	Unit type	Max limit	Measurement value quantity	Statistical base type	Violation
	Demand (BOD_5)					
12/29/2022	pH (Hydrogen Ion) Daily Min	Standard Units	6	3	Single Sample	Numeric effluent violation*
12/27/2022	Biochemical Oxygen Demand (BOD_5)	Lbs/Day			Single Sample	Analysis not Conducted
12/27/2022	Biochemical Oxygen Demand (BOD_5)	Milligrams/L (mg/L)			Single Sample	Analysis not Conducted
02/01/2023	pH (Hydrogen Ion) Daily Min	Standard Units	6	3	Single Sample	Numeric effluent violation*
03/08/2023	pH (Hydrogen Ion) Daily Min	Standard Units	6	3	Single Sample	Numeric effluent violation*
04/05/2023	pH (Hydrogen Ion) Daily Min	Standard Units	6	3	Single Sample	Numeric effluent violation*
05/06/2024	pH (Hydrogen Ion) Daily Min	Standard Units	6	4	Single Sample	Numeric effluent violation*
10/11/2024	pH (Hydrogen Ion) Daily Min	Standard Units	6	3	Single Sample	Numeric effluent violation*

*Note that the low pH excursions were related to instrumentation malfunction and not a true measurement of effluent pH.

The following table summarizes compliance with report submittal requirements over the permit term.

Table 6 - Permit submittals

Submittal name	Submittal status	Due date	Received date
Infiltration And Inflow Evaluation	Accepted	07/15/2016	07/15/2016
Infiltration And Inflow Evaluation	Accepted	07/15/2017	07/14/2017
Infiltration And Inflow Evaluation	Accepted	07/15/2018	07/13/2018
Infiltration And Inflow Evaluation	Accepted	07/15/2019	07/15/2019
Infiltration And Inflow Evaluation	Accepted	07/15/2020	06/10/2020
Infiltration And Inflow Evaluation	Submitted	07/15/2021	07/15/2021

Submittal name	Submittal status	Due date	Received date
Infiltration And Inflow Evaluation	Reviewed	07/15/2022	06/01/2022
Infiltration And Inflow Evaluation	Accepted	07/15/2023	06/21/2023
Infiltration And Inflow Evaluation	Accepted	07/15/2024	07/12/2024
Wasteload Assessment	Accepted	06/15/2016	06/14/2016
Wasteload Assessment	Accepted	06/15/2017	06/14/2017
Wasteload Assessment	Accepted	06/15/2018	06/15/2018
Wasteload Assessment	Accepted	06/15/2019	06/14/2019
Wasteload Assessment	Accepted	06/15/2020	06/12/2020
Wasteload Assessment	Accepted	06/15/2021	06/9/2021
Wasteload Assessment	Reviewed	06/15/2022	05/27/2022
Wasteload Assessment	Accepted	06/15/2023	05/24/2023
Wasteload Assessment	Accepted	07/15/2024	06/21/2024
O&M Manual Review Confirmation Letter	Accepted	10/15/2016	10/09/2015
O&M Manual Review Confirmation Letter	Submitted	10/15/2017	10/13/2017
O&M Manual Review Confirmation Letter	Accepted	10/15/2016	10/14/2016
O&M Manual Review Confirmation Letter	Accepted	10/15/2018	10/12/2018
O&M Manual Review Confirmation Letter	Reviewed	10/15/2019	10/14/2019
O&M Manual Review Confirmation Letter	Submitted	10/15/2020	10/13/2020
O&M Manual Review Confirmation Letter	Submitted	10/15/2021	10/11/2021
O&M Manual Review Confirmation Letter	Accepted	10/15/2022	09/27/2022
O&M Manual Review Confirmation Letter	Accepted	10/15/2023	10/03/2023
O&M Manual Review Confirmation Letter	Received	10/15/2024	10/17/2024
Industrial User Survey	Submitted	01/15/2017	01/14/2017
Industrial User Survey Update	Submitted	01/15/2019	01/15/2019
Industrial User Survey Update	Accepted	01/15/2021	01/15/2021
Industrial User Survey Update	Accepted	01/15/2023	01/13/2023
Local Limits Sampling & Evaluation Plan	Submitted	07/15/2017	07/14/2017
Local Limits Sampling & Evaluation Plan	Accepted	07/15/2017	09/22/2017
Results of Initial Screening	Accepted	12/01/2017	11/30/2017
Results of Local Limits Monitoring	Submitted	02/15/2019	02/08/2019
Local Limits Proposed for Ecology Approval	Submitted	07/15/2019	07/12/2019
Local Limits Proposed for Ecology Approval	Accepted	07/15/2019	10/2/2019

II.F. State environmental policy act (SEPA) compliance

State law exempts the issuance, reissuance or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions that are no less stringent than federal and state rules and regulations (RCW 43.21C.0383). The exemption applies only to existing discharges, not to new discharges.

III. Proposed permit limits

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the Federal Water Quality Criteria Applicable to Washington (40 CFR 131.45).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Ecology does not usually develop limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent [40 CFR 122.42(a)]. Until Ecology modifies the permit to reflect additional discharge of pollutants, a permitted facility could be violating its permit.

III.A. Design criteria

Under WAC 173-220-150 (1)(g), flows and waste loadings must not exceed approved design criteria. Ecology approved design criteria for this facility's treatment plant in the General Sewer Plan/Wastewater Facility Plan prepared by Gray & Osborne, Inc (G&O, 2011). The table below includes design criteria from the referenced report.

Table 7 - Design criteria for Camas WWTP

Parameter	Design quantity
Maximum Month Design Flow (MMDF)	6.10 MGD
Monthly Average Dry Weather Flow	2.86 MGD
Peak Instantaneous Design Flow (PIDF)	13.44 MGD

Parameter	Design quantity
BOD_5 Loading for Maximum Month	5,616 lb/day
TSS Loading for Maximum Month	8,011 lb/day
Ammonia, Total as N for maximum month	1,956 lbs/day

III.B. Technology-based effluent limits

Federal and state regulations define some technology-based effluent limits for domestic wastewater treatment plants. These effluent limits are given in 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). Chapter 173-220-130 WAC requires that "effluent limitations shall not be less stringent than those based upon the treatment facility design efficiency contained in approved engineering plans and reports." The proposed permit includes technology-based limits based on the approved treatment facility design.

The table below identifies technology-based limits for pH and fecal coliform as listed in chapter 173-221 WAC. BOD_5 and TSS limits are based on design of the facility. Section III.F of this fact sheet describes the potential for water quality-based limits.

Table 8 - Technology-based limits

Parameter	Average Monthly	Average Weekly
BOD_5	20 mg/L	30 mg/L
BOD_5	The BOD_5 effluent concentration must not exceed fifteen percent (15%) of the average influent concentration	
TSS	20 mg/L	30 mg/L
TSS	The TSS effluent concentration must not exceed fifteen percent (15%) of the average influent concentration	

Parameter	Monthly Geometric Mean	Weekly Geometric Mean
Fecal coliform bacteria	200 organisms/100 mL	400 organisms/100 mL

Parameter	Daily Minimum	Daily Maximum
pH	6.0 standard units	9.0 standard units

Technology-based mass limits for BOD_5 and TSS are based on WAC 173-220-130(3)(b) and WAC 173 221-030(11)(b). Ecology calculated the monthly and weekly average mass limits for BOD_5 and TSS as follows:

Mass limit = CL x DF x CF, where:

CL = Technology-based concentration limit (mg/L)

DF = Maximum monthly average design flow (MGD)

CF = Conversion factor = 8.34

Technology-based mass limits for BOD_5 and TSS are based on WAC 173-220-130(3)(b), WAC 173 221 030(11)(b), WAC 173-220-130(1)(a) and (g), and WAC 173-221-040(1). Ecology calculated the monthly and weekly average mass limits for BOD_5 and TSS as follows:

Average monthly mass limit = Influent mass monthly design load (lbs/day) x 0.15

Average weekly mass limit = Average monthly mass limit x 1.5

Ecology uses the more stringent of the two methods for the mass limit in the proposed permit.

In previous permit cycles, the Camas WWTP was not held to the 85% removal requirement; however, the facility can now consistently meet this requirement given recent upgrades and reduction of I/I in the collection system. Therefore, Ecology will apply the 85% removal requirement to the discharge in this permit cycle.

Table 9 - Technology-based mass limits

Parameter	Concentration limit (mg/L)	Influent design load (lbs/day)	Mass limit (lbs/day)
BOD_5 Monthly Average	20		1,017
BOD_5 Weekly Average	30		1,525
BOD_5 Monthly Average		5,616	842
BOD_5 Weekly Average			1,264
TSS Monthly Average	20		1,017
TSS Weekly Average	30		1,525
TSS Monthly Average		8,011	1,202
TSS Weekly Average			1,802

III.C. Surface water quality-based effluent limits

The Washington State surface water quality standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

1. Numeric criteria for the protection of aquatic life and recreation

Numeric water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numeric criteria along with chemical and physical data for

the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

2. Numeric criteria for the protection of human health

Numeric criteria for the protection of human health are promulgated in Chapter 173-201A WAC and 40 CFR 131.45. These criteria are designed to protect human health from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

3. Narrative criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1)) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200) and of all marine waters (WAC 173-201A-210) in the state of Washington.

4. Antidegradation

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

Tier I: ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions.

Tier II: ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities.

Tier III: prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

Facility specific requirements – This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.
- For waters that do not meet assigned criteria, or protect existing or designated uses, Ecology will take appropriate and definitive steps to bring the water quality back into compliance with the water quality standards.
- Ecology's analysis described in this section of the fact sheet demonstrates that the proposed permit conditions will protect existing and designated uses of the receiving water.

5. Mixing zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones, the pollutant concentrations may exceed water quality numeric standards, so long as the discharge doesn't interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already

receive all known, available, and reasonable methods of prevention, control, and treatment (AKART). Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and must not use more than 25% of the available width of the water body for dilution (WAC 173-201A-400 (7)).

Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur. Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term “reasonable worst-case” applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 4 means the effluent is 25% and the receiving water is 75% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Each aquatic life acute criterion is based on the assumption that organisms are not exposed to that concentration for more than one hour and more often than one exposure in three years. Each aquatic life chronic criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two and four tenths (2.4) liters/day for drinking water (increased from two liters/day in the 2016 Water Quality Standards update).
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

a. Ecology must specify both the allowed size and location in a permit.

The proposed permit specifies the size and location of the allowed mixing zone (as specified below).

b. The facility must fully apply "all known, available, and reasonable methods of prevention, control and treatment" (AKART) to its discharge.

Ecology has determined that the treatment provided at the Camas WWTP meets the requirements of AKART (see "Technology-based Limits").

c. Ecology must consider critical discharge conditions.

Surface water quality-based limits are derived for the water body's critical condition (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated waterbody uses). The critical discharge condition is often pollutant-specific or waterbody-specific.

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology's ***Permit Writer's Manual*** (Ecology, 2018) describes additional guidance on criteria/design conditions for determining dilution factors.

Table 10 - Critical conditions used to model the discharge

Critical condition	Value
Seven-day-average low river flow with a recurrence interval of ten years (7Q10)	81,400 cfs
River depth at the 7Q10 period	21 feet
River velocity	0.26 – 0.99 ft/sec
Maximum average monthly effluent flow for chronic and human health non-carcinogen	5.09 MGD

Critical condition	Value
Annual average flow for human health carcinogen	5.09 MGD
Maximum daily flow for acute mixing zone	10.04 MGD (Winter) 6.36 MGD (Summer)

Ecology obtained ambient data at critical conditions in the vicinity of the outfall from Ecology's ambient study conducted in 2007 from ambient station 28A100 located near the I-205 bridge at Vancouver, WA and the previous permit.

d. Supporting information must clearly indicate the mixing zone would not:

- Have a reasonable potential to cause the loss of sensitive or important habitat.
- Substantially interfere with the existing or characteristic uses.
- Result in damage to the ecosystem.
- Adversely affect public health.

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms and set the criteria to generally protect the species tested and to fully protect all commercially and recreationally important species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criteria concentration for one hour. They set chronic standards assuming organisms are exposed to the pollutant at the criteria concentration for four days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of discharge.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column. Ecology has additionally determined that the effluent will not exceed 33 degrees C for more than two seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics and the discharge location. Based on this review, Ecology concluded that the discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in

damage to the ecosystem, or adversely affect public health if the permit limits are met.

e. The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.

Ecology conducted a reasonable potential analysis, using procedures established by the EPA and by Ecology, for each pollutant and concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone if permit limits are met.

f. The size of the mixing zone and the concentrations of the pollutants must be minimized.

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. The plume mixes as it rises through the water column therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving waterbody. When a diffuser is installed, the discharge is more completely mixed with the receiving water in a shorter time. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

Because of the above reasons, Ecology has effectively minimized the size of the mixing zone authorized in the proposed permit.

g. Maximum size of mixing zone.

The authorized mixing zone does not exceed the maximum size restriction.

h. Acute mixing zone.

- The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.

Ecology determined the acute criteria will be met at 10% of the distance (or volume fraction) of the chronic mixing zone at the ten-year low flow.

- The pollutant concentration, duration, and frequency of exposure to the discharge will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.

As described above, the toxicity of any pollutant depends upon the exposure, the pollutant concentration, and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organisms near the point of discharge (below the rising effluent).

- Comply with size restrictions.

The mixing zone authorized for this discharge complies with the size restrictions published in chapter 173-201A WAC.

i. Overlap of Mixing Zones.

This mixing zone does not overlap another mixing zone.

III.D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. The table included below summarizes the criteria applicable to this facility's receiving water and its designated uses.

1. Freshwater aquatic life uses and associated criteria

Aquatic life uses are designated based on the presence of, or the intent to provide protection for the key uses. All indigenous fish and non-fish aquatic species must be protected in waters of the state in addition to the key species. The aquatic life uses for this receiving water are identified below.

Table 11 - Salmonid spawning, rearing, and migration

Criteria	Value
Temperature – Highest 7-DAD MAX	20.0°C (63.5°F)
Dissolved oxygen – Lowest 1-Day minimum	8.0 mg/L
Turbidity	5 NTU over background when the background is 50 NTU or less; or A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
Total dissolved gas	Total dissolved gas must not exceed 110 percent of saturation at any point of sample collection.
pH	The pH must measure within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

2. Recreational use and criteria

The recreational use for this receiving water is primary contact recreation. *E. coli* organism levels must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL.

3. Water supply uses

The water supply uses are domestic, agricultural, industrial, and stock watering.

4. Miscellaneous freshwater uses

The miscellaneous freshwater uses are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

III.E. Water quality impairments

The Columbia and Lower Snake Rivers are listed on the state's polluted waters list for high water temperatures that are above Washington water quality standards and can harm salmon. Because the Columbia and Snake Rivers cross multiple state boundaries and span almost 900 miles, the federal Environmental Protection Agency (EPA) established the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load (TMDL)[1] on May 20, 2020 (USEPA Region 10, 2021). The TMDL includes a waste load allocation for the Camas WWTP.

The other listing in the vicinity of the discharge includes a category 4A listing for total dissolved gas. The Total Dissolved Gas TMDL does not include a wasteload allocation for the Camas WWTP.

III.F. Evaluation of surface water quality-based effluent limits for narrative criteria

Ecology must consider the narrative criteria described in WAC 173-201A-260 when it determines permit limits and conditions. Narrative water quality criteria limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health.

Ecology considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements all known, available, and reasonable methods of treatment and prevention (AKART) as described above in the technology-based limits section. When Ecology determines if a facility is meeting AKART it considers the pollutants in the wastewater and the adequacy of the treatment to prevent the violation of narrative criteria.

[1] https://www.epa.gov/columbiariver/tmdl-temperature-columbia-and-lower-snake-rivers

In addition, Ecology considers the toxicity of the wastewater discharge by requiring whole effluent toxicity (WET) testing when there is a reasonable potential for the discharge to contain toxics. Ecology's analysis of the need for WET testing for this discharge is described later in the fact sheet.

III.G. Evaluation of surface water quality-based effluent limits for numeric criteria

1. Mixing zones and dilution factors

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants; their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biological oxygen demand (BOD) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

With technology-based controls (AKART), predicted pollutant concentrations in the discharge exceed water quality criteria. Ecology therefore authorizes a mixing zone in accordance with the geometric configuration, flow restriction, and other restrictions imposed on mixing zones by chapter 173-201A WAC.

The diffuser at Outfall 0001 is a 36-inch pipe which extends 850 feet from the North Bank of the Columbia River at river mile 121.2. The diffuser array is 150-feet long with a total of 16, 6-inch diameter Tideflex diffusers. The distance between ports is 10 feet and the diffuser depth is 21 feet below the Columbia River datum. Ecology obtained this information from the Dilution Ratio Study Report submitted in 2007 and refined in 2009 after the addition of the Tideflex valves.

Chronic mixing zone – WAC 173-201A-400(7)(a) specifies that mixing zones must not extend in a downstream direction from the discharge ports for a distance greater than 300 feet plus the depth of water over the discharge ports or extend upstream for a distance of over 100 feet, not utilize greater than 25% of the flow, and not occupy greater than 25% of the width of the water body. The mixing zone extends from the bottom to the top of the water column.

The chronic dilution factor below is based on a downstream distance of 318 feet.

Acute mixing zone – WAC 173-201A-400(8)(a) specifies that in rivers and streams a zone where acute toxics criteria may be exceeded must not extend beyond 10% of the distance towards the upstream and downstream boundaries of the chronic zone, not use greater than 2.5% of the flow and not occupy greater than 25% of the width of the water body. The mixing zone extends from the bottom to the top of the water column.

The acute dilution factor below is based on a downstream distance of 32 feet.

Ecology determined the dilution factors that occur within these zones at the critical condition using the 2007 mixing zone study approved by Ecology. The dilution factors are listed below.

Table 12 - Dilution factors

Criteria	Acute	Chronic
Aquatic Life	23 (winter) 27 (summer)	121 (winter) 185 (summer)
Human Health, Carcinogen		185
Human Health, Non-carcinogen		185

Ecology determined the impacts of dissolved oxygen deficiency, pH, fecal coliform, ammonia, metals, other toxics, and temperature as described below, using the dilution factors in the above table. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

2. Dissolved Oxygen: BOD_5 and Ammonia Effects

Natural decomposition of organic material in wastewater effluent impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. The 5-day Biochemical Oxygen Demand (BOD_5) of an effluent sample indicates the amount of biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water. The amount of ammonia-based nitrogen in the wastewater also provides an indication of oxygen demand in the receiving water.

Ecology modeled the impact of BOD_5 on the receiving water at critical condition and with the technology-based effluent limit for BOD_5 described under "Technology-Based Effluent Limits" above. The calculations to determine dissolved oxygen impacts are shown in Appendix D.

Ecology predicted no violation of the surface water quality standards for dissolved oxygen at the edge of the mixing zone due to the impacts of biochemical oxygen demand (BOD_5) under critical conditions. Therefore, the proposed permit contains the plant specific technology-based effluent limit for BOD_5. The permit also does not contain a limit on ammonia based on dissolved oxygen impacts (ammonia toxicity is examined elsewhere in this fact sheet).

3. pH

Ecology modeled the impact to receiving waters under critical conditions using technology-based limits for pH (6.0 – 9.0) and the *pH-mix-fresh* worksheet in Ecology's PermitCalc spreadsheet. Appendix D includes the model results. Model calculations predict no violation of the pH criteria under critical conditions.

4. Bacteria

In the previous permit cycle, Ecology modeled the number of fecal coliform by simple mixing analysis using the technology-based limit of 400 organisms per 100 mL and a dilution factor of 121. That analysis showed no violation of the fecal coliform recreational use criterion under critical conditions. The domestic technology-based limits for fecal coliform in WAC 173-221 are still in effect. Without effluent data for *E. coli*, Ecology cannot determine whether the discharge will violate the recreational use criterion for *E. coli*. Given that the characteristics of the receiving water and the discharge have not changed substantially since the analysis conducted in the previous permit cycle, and the transition is a change in bacterial indicator not more or less stringent than the previous criterion, the proposed permit will maintain the technology-based effluent limit for fecal coliform. In addition, the permittee will be required to monitor for both fecal coliform and *E. coli*. Ecology will then use this data to assess the reasonable potential to exceed the applicable recreational use criterion in the next iteration of this permit.

5. Turbidity

Ecology evaluated the impact of turbidity based on the range of turbidity in the effluent and turbidity of the receiving water. Ecology expects no violations of the turbidity criteria outside the designated mixing zone provided the facility meets its technology-based total suspended solids permit limits.

6. Toxic pollutants – aquatic life criteria

Federal regulations at 40 CFR 122.44 require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are present in the discharge: ammonia and heavy metals. Ecology conducted a reasonable potential analysis (See Appendix D) on these parameters to determine whether it would require effluent limits in this permit.

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature and pH in the receiving freshwater. To evaluate ammonia toxicity, Ecology used the available receiving water information and Ecology spreadsheet tools.

Valid ambient background data were available for ammonia and heavy metals (See Table 2). Ecology used all applicable data to evaluate reasonable potential for this discharge to cause a violation of water quality standards. If no data was available, zero was used for background concentrations.

Ecology determined that ammonia pose no reasonable potential to cause or contribute to exceedances of the water quality criteria at the critical conditions using procedures given in the ***Technical Support Document for Water Quality-Based Toxics Control*** (EPA/505/2-90-001) (USEPA, 1991) (Appendix D) and as described above. Ecology's determination assumes that this facility meets the other effluent limits of this permit. However, the Camas WWTP has had an ammonia limit in the previous permit and therefore is subject to anti-backsliding provisions of the Clean Water Act since absent a limit, there is no assurance that treatment for ammonia would continue. Average weekly limits were added to satisfy 40 CFR 122.45(d) which requires effluent limits for continuous discharger be expressed in short- and long-term limits.

Ecology found that hexavalent chromium has a reasonable potential to cause or contribute to a violation of water quality standards. However, the POTW is not a source for this pollutant. Rather than assess an effluent limit for this pollutant in this permit cycle, Ecology has required the city to reevaluate its local limits and develop a local limit for hexavalent chromium. The facility must also sample influent and effluent for hexavalent chromium on a quarterly basis throughout the permit term. In the event that the city cannot control the source of hexavalent chromium in the collection system, Ecology will reopen the proposed permit and implement an effluent limit using methods from the ***Technical Support Document for Water Quality-Based Toxics Control*** (EPA/505/2-90-001) (USEPA, 1991).

7. Temperature

The state temperature standards (WAC 173-201A, WAC 173-201A-200, WAC 173-201A-600, and WAC 173-201A-602) include multiple elements:

a. Annual summer maximum threshold criteria (June 15 to September 15)
b. Supplemental spawning and rearing season criteria (September 15 to June 15)
c. Incremental warming restrictions
d. Guidelines on preventing acute lethality and barriers to migration of salmonids

Ecology evaluates each criterion independently to determine reasonable potential and derive permit limits.

a. Annual summer maximum and supplementary spawning/rearing criteria

Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), and WAC 173-201A-602, Table 602]. These threshold criteria (e.g., 12, 16, 17.5, 20°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures.

Some waters have an additional threshold criterion to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-602, Table 602]. These criteria apply during specific date-windows.

The threshold criteria apply at the edge of the chronic mixing zone. Criteria for most fresh waters are expressed as the highest 7-Day average of daily maximum temperature (7-DADMax). The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. Criteria for some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

b. Incremental warming criteria

The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-200(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone.

At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment. These increments are permitted only to the extent doing so does not cause temperatures to exceed either the annual maximum or supplemental spawning criteria.

c. Guidelines to prevent acute lethality or barriers to migration of salmonids. These site-level considerations do not override the temperature criteria listed above.
   i. Instantaneous lethality to passing fish: The upper 99th percentile daily maximum effluent temperature must not exceed 33°C, unless a dilution analysis indicates ambient temperatures will not exceed 33°C two seconds after discharge.
   ii. General lethality and migration blockage: The temperature at the edge of a chronic mixing zone must not exceed either a 1DMax of 23°C or a 7DADMax of 22°C. When adjacent downstream temperatures are 3°C or cooler, the 1DMax at the edge of the chronic mixing zone must not exceed 22°C.
   iii. Lethality to incubating fish: The temperature must not exceed 17.5°C at locations where eggs are incubating.

Reasonable potential analysis

EPA has completed a temperature TMDL, Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load (TMDL)[2] and established a wasteload allocation for this discharge. The proposed permit includes an effluent limit for temperature derived from the completed TMDL.

[2] https://www.epa.gov/columbiariver/tmdl-temperature-columbia-and-lower-snake-rivers

III.H. Evaluation of human health-based water quality criteria

Washington's water quality standards include numeric human health-based criteria for priority pollutants that Ecology must consider when writing NPDES permits.

Ecology determined the effluent may contain chemicals of concern for human health, based on the facility's status as an EPA major discharger and data or information indicating the discharge contains regulated chemicals.

Ecology evaluated the discharge's potential to violate the water quality standards as required by 40 CFR 122.44(d) by following the procedures published in the ***Technical Support Document for Water Quality-Based Toxics Control*** (EPA/505/2-90-001) (USEPA, 1991) and Ecology's Permit Writer's Manual (Ecology, 2018) to make a reasonable potential determination. The evaluation showed that . the discharge has no reasonable potential to cause a violation of water quality standards, and an effluent limit is not needed.

III.I. Sediment quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website[3].

Ecology determined that this discharge has potential to cause a violation of the sediment quality standards because the facility has not performed NPDES related sediment sampling and there is no sediment data available in the vicinity of the outfall. Furthermore, sediment sampling is recommended once over the permit lifetime for treatment plants with a discharge greater than 1MGD and less than 10 MGD. The proposed permit includes a Special Condition requiring Camas WWTP to demonstrate either:

- The point of discharge is not an area of deposition, or
- Toxics do not accumulate in the sediments even though the point of discharge is a depositional area.

III.J. Groundwater quality limits

The groundwater quality standards (chapter 173-200 WAC) protect beneficial uses of groundwater. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

The Camas WWTP does not discharge wastewater to the ground. No permit limits are required to protect groundwater.

[3] https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Sediment-cleanups

III.K. Whole effluent toxicity

The water quality standards for surface waters forbid discharge of effluent that has the potential to cause toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

- Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.
- Chronic toxicity tests measure various sublethal toxic responses, such as reduced growth or reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure organism survival.

Laboratories accredited by Ecology for WET testing must use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format according to the procedures in the ***Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria***, Publication 95-80 (Ecology, 2016). Ecology recommends that each regulated facility send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water acute toxicity. The proposed permit will not include an acute WET limit. The City of Camas must retest the effluent before submitting an application for permit renewal.

- If this facility makes process or material changes which, in Ecology's opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization. The Camas WWTP may demonstrate to Ecology that effluent toxicity has not increased by performing additional WET testing and/or chemical analyses after the process or material changes have been made. Ecology recommends that the Permittee check with it first to make sure that Ecology will consider the demonstration adequate to support a decision to not require an additional effluent characterization.
- If WET testing conducted for submittal with a permit application fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water chronic toxicity. The proposed permit will not include a chronic WET limit. The City of Camas must retest the effluent before submitting an application for permit renewal.

- If this facility makes process or material changes which, in Ecology's opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization
- If WET testing conducted for submittal with a permit application fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased. The Camas WWTP may demonstrate to Ecology that effluent toxicity has not increased by performing additional WET testing after the process or material changes have been made.

III.L. Comparison of effluent limits with the previous permit issued on September 25, 2015

Table 13 - Comparison of previous and proposed effluent limits – Outfall 0001

Limit	Basis of Limit	Existing permit limit	Proposed permit limit
Biochemical Oxygen Demand (5-day) – Average Monthly	Technology	20 mg/L;1,017 lbs/day; 74% Removal	20 mg/L;842 lbs/day; 85% Removal
Biochemical Oxygen Demand (5-day) – Average Weekly	Technology	30 mg/L; 1,525 lbs/day	30 mg/L; 1,264 lbs/day
Total Suspended Solids – Average Monthly	Technology	20 mg/L;1,017 lbs/day; 76% Removal	20 mg/L;1,017 lbs/day; 85% Removal
Total Suspended Solids – Average Weekly	Technology	30 mg/L; 1,525 lbs/day	30 mg/L; 1,525 lbs/day
Fecal Coliform Bacteria – Monthly Geometric Mean	Technology	200/100 mL	200/100 mL
Fecal Coliform Bacteria – Weekly Geometric Mean	Technology	400/100 mL	400/100 mL
pH – Daily Minimum	Technology	6.0	6.0
pH – Daily Maximum	Technology	9.0	9.0
Total Ammonia (June - September) – Average Monthly	WQ	20 mg/L	20 mg/L
Total Ammonia (June - September) – Average Weekly	WQ	n/a	30 mg/L
Total Ammonia (May - October) – Average Monthly	WQ	7 mg/L	7 mg/L
Total Ammonia (May - October) – Average Weekly	WQ	n/a	11 mg/L
Heat Load – Average Monthly (June 1 – September 30)	WQ	n/a	5.87×10^8 kcal/day

IV. Monitoring requirements

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

If a facility uses a contract laboratory to monitor wastewater, it must ensure that the laboratory uses the methods and meets or exceeds the method detection levels required by the permit. The permit describes when facilities may use alternative methods. It also describes what to do in certain situations when the laboratory encounters matrix effects. When a facility uses an alternative method as allowed by the permit, it must report the test method, detection level (DL), and quantitation level (QL) on the discharge monitoring report or in the required report.

IV.A. Wastewater monitoring

The monitoring schedule is detailed in the proposed permit under Special Condition S2. Specified monitoring frequencies consider the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's ***Permit Writer's Manual,*** Publication 92-109 (Ecology, 2018) for an activated sludge treatment plant, over 5 MGD maximum monthly average flow.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Biosolids monitoring is required by the current state and local solid waste management program and by EPA under 40 CFR 503.

Ecology has required monitoring of both fecal coliform and *E. coli* in the permit application. This dual monitoring will help inform both Ecology and City of Camas of the correlation between the two indicators. Dual monitoring requirements consist of splitting a sample once per month and analyzing that sample for fecal coliform and *E. coli.*

In addition, the proposed permit requires quarterly oil and grease and priority pollutant metals analyses for influent, effluent and biosolids. The proposed permit also requires annual priority pollutant analyses required for POTWs in the influent, effluent and biosolids.

IV.B. Lab accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters). Ecology accredited the laboratory at this facility for:

Table 14 - Accredited parameters

Parameter name	Category	Method name	Matrix description
Solids, Total Suspended	General Chemistry	SM 2540 D-2011	Non-Potable Water
pH	General Chemistry	SM 4500-H+ B-2011	Non-Potable Water
Ammonia	General Chemistry	Hach 10205 5th ED 2008 Method	Non-Potable Water
Dissolved Oxygen	General Chemistry	SM 4500-O G-2011	Non-Potable Water
Biochemical Oxygen Demand (BOD)	General Chemistry	SM 5210 B-2011	Non-Potable Water
Fecal coliform-count	Microbiology	SM 9222 D (mFC)-06	Non-Potable Water

V. Other permit conditions

V.A. Reporting and record keeping

Ecology based Special Condition S3 on its authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

V.B. Prevention of facility overloading

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require Camas WWTP to:

- Take the actions detailed in proposed permit Special Condition S4.
- Design and construct expansions or modifications before the treatment plant reaches existing capacity.
- Report and correct conditions that could result in new or increased discharges of pollutants.

Special Condition S4 restricts the amount of flow.

V.C. Operation and maintenance

The proposed permit contains Special Condition S5 as authorized under RCW 90.48.110, WAC 173-220-150, chapter 173-230 WAC, and WAC 173-240-080. Ecology included it to ensure proper operation and regular maintenance of equipment, and to ensure that the Camas WWTP takes adequate safeguards so that it uses constructed facilities to their optimum potential in terms of pollutant capture and treatment.

Special Condition S5 requires facility name to review and update as needed an operation and maintenance manual as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-080). Implementation of the procedures in the operation and maintenance manual ensures the facility's compliance with the terms and limits in the permit.

V.D. Pretreatment

Ecology administers the National Pretreatment Program under the terms of the "National Pollutant Discharge Elimination System (NPDES) Memorandum of Agreement Between the State of Washington and the United States Environmental Protection Agency Region 10" (1986), including any revisions, modifications, or amendments to the Memorandum of Agreement, and 40 CFR Part 403.

Under this delegation of authority, Ecology will serve as either: a) the Control Authority for those industrial users who introduce pollutants into a POTW which has not been approved to have a Pretreatment Program or b) the Approval Authority for an approved Pretreatment Program.

The City of Camas does not have an approved pretreatment program. Therefore, Ecology acts as the Control Authority pursuant to 40 CFR Part 403.10(e). In the Camas sewer service area, in accordance with WAC 173-216, Ecology issues permits for the wastewater discharges from the nondomestic users identified in Table 15.

Table 15 - Permitted nondomestic users

Facility Name	Permit Number	Industrial User Type	Permit Effective-Expiration Dates
Analog Devices, Inc	ST0006154	Categorical – semiconductors and related devices	09/01/2020-08/31/2025
nLight Inc, Camas	ST0006270	Categorical-semiconductors and related devices	09/01/2021-08/31/2026
Northwest Paper Box Manufactures, Inc	ST0005027	Minor industrial user – ink formulation and printing	05/01/2024-04/30/2029
TSMC Washington, LLC	ST0006200	Categorical – semiconductor integrated circuit fabrication	03/1/2025 – 02/28/2030

1. Duty to enforce discharge prohibitions

This provision prohibits the publicly owned treatment works (POTW) from authorizing, permitting, or allowing an industrial discharger to discharge certain types of waste into the sanitary sewer.

- The first section prohibits the POTW from accepting pollutants which causes “pass through” or “interference”. This general prohibition is from 40 CFR §403.5(a). Appendix C of this fact sheet defines these terms.
- The second section reinforces specific state and federal pretreatment prohibitions found in 40 CFR §403.5(b) and WAC 173-216-060 . The POTW

may not accept wastes which violate the specific state and federal discharge prohibitions. Wastewaters with the following characteristics are prohibited:

- Wastewaters prohibited to be discharged by the Dangerous Waste Regulations in 173-303 WAC.
- Explosive or flammable.
- Have too high or low of a pH (too corrosive, acidic or basic).
- May cause a blockage such as grease, sand, rocks, or viscous materials.
- Heat in amounts that will inhibit biological activity at the POTW.
- Are of sufficient strength or volume to interfere with treatment.
- Contain too much petroleum-based oils, mineral oil, or cutting fluid.
- Create noxious or toxic gases at any point.

- The third section reflects state prohibitions [WAC 173-216-060(2)(b)(vii)] on the POTW accepting certain types of discharges unless the discharge has received prior written authorization from Ecology. These discharges include:
  - Cooling water in significant volumes.
  - Stormwater and other direct inflow sources.
  - Wastewaters significantly affecting system hydraulic loading, which do not require treatment.

2. Requirements for performing an industrial user survey

The Camas WWTP receives wastewater from the permitted significant industrial user(s) identified in Table 15. The Camas WWTP serves many other industrial and commercial users, some of which have the potential to be or become, with changed processes, significant industrial users [40 CFR §403.3(v)]. A significant industrial user is a nondomestic indirect discharger (user) subject to categorical pretreatment standards under 40 CFR §403.6 and 40 CFR Chapter I, Subchapter N or any other nondomestic indirect discharger that meets any of the following:

- Discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater).
- Contributes a process wastestream that makes up 5% or more of the average dry weather hydraulic or organic capacity of the POTW.
- Is designated as such by the Permittee or Ecology on the basis that the nondomestic indirect discharger has a reasonable potential to adversely affect the POTW's operation.

The purpose of the IU Survey is to identify all facilities that may be subject to pretreatment standards or requirements so that Ecology can take appropriate

measures to control these discharges. The steps the POTW must document in their IU Survey submittal include:

d. The POTW must develop a master list of nondomestic users (commercial and industrial).This list must be based on several sources of information including business licenses, and water and sewer billing records.
e. The POTW must canvas all the potential sources. The POTW must identify categories of nondomestic users and have potentially significant users complete a survey form.
f. The POTW must identify SIUs in all areas served by the POTW.

Ecology uses the industrial user survey as a major mechanism to determine which nondomestic users merit further controls, such as a state waste discharge permit. Ecology describes the information needed in the survey submittal to allow Ecology to make permitting decision in the manual “Performing an Industrial User Survey”. Where surveys are incomplete, Ecology may take such enforcement as appropriate and/or require the POTW to develop a fully delegated pretreatment program.

The proposed permit requires the city of Camas to conduct an industrial user survey to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations [40 CFR Part 403 and CWA Sections 307(b) and CWA Section 308)], with state regulations (chapter 90.48 RCW and chapter 173-216 WAC), and with local ordinances.

3. Identification of new nondomestic wastewater sources and notification of permit requirements

The permit requires non-delegated POTWs to take “continuous, routine measures to identify and authorize nondomestic wastewater discharges. Examples of such routine measures include regular review of business license and building permit applications, advertisements, and personal reconnaissance. Collection system operators should be trained on what to look for so they can identify and report new industrial dischargers. The Camas WWTP may not allow SIUs to discharge prior to receiving a permit from Ecology and must notify all industrial users of their responsibility to apply for a State Waste Discharge Permit. The POTW must also notify Ecology.

4. Pretreatment Monitoring / Local Limits Evaluation

Pretreatment monitoring is required to determine if pollutants interfere with the treatment processes or pass through the plant to the biosolids or receiving water. Parameters required for pretreatment-related monitoring include priority pollutants [40 CFR Part 122 Appendix D], as well as parameters with environmental criteria. Monitoring requirements allow the POTW to comply with NPDES permit application monitoring [40 CFR 122.21(j)]. POTWs use this

monitoring data to also develop and evaluate local limits. POTWs with local limits are required to evaluate local limits after permit issuance or every 5 years, or when certain situations arise that are likely to affect POTW headworks loading or treatment efficiency.

The city of Camas developed local limits in the previous permit cycle for several pollutants of concern. The proposed permit requires the city to assess the efficacy of the existing local limits and to develop an additional local limit for hexavalent chromium. Ecology will use these reevaluated local limits as the basis for effluent limits in any pretreatment permit developed that discharges to the Camas WWTP.

V.E. Spill plan

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

The Camas WWTP developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the facility to review this plan and update as necessary. Any updates must be submitted to Ecology.

V.F. Solid waste

To prevent water quality problems the facility is required in permit Special Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under chapter 70.95J RCW, chapter 173-308 WAC “Biosolids Management,” and chapter 173-350 WAC “Solid Waste Handling Standards.” The disposal of other solid waste is under the jurisdiction of the Clark County Health Department.

Requirements for monitoring sewage sludge and record keeping are included in this permit. Ecology will use this information, required under 40 CFR 503, to develop or update local limits.

V.G. Outfall evaluation

The proposed permit requires the city of Camas to conduct an outfall inspection and submit a report detailing the findings of that inspection (Special Condition S11). The inspection must evaluate the physical condition of the discharge pipe and diffusers and evaluate the extent of sediment accumulations in the vicinity of the outfall.

V.H. General conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual domestic wastewater NPDES permits issued by Ecology.

VI. Permit issuance procedures

VI.A. Permit modifications

Ecology may modify this permit to impose numeric limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for groundwaters, after obtaining new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

VI.B. Proposed permit issuance

This proposed permit includes all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of five years.

VII. References for text and appendices

Carollo. (2022). *City of Camas General Sewer Plan.*

CH2M Hill Engineers, Inc. (2017). *City of Camas WWTP Receiving Water Study Report*

Ecology. (2011). *Waters Requiring Supplemental Spawning and Incubation Protection for Salmonid Species.* Publication 06-10-038. Retrieved from https://apps.ecology.wa.gov/publications/documents/0610038.pdf

Ecology. (2016). *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria (Publication 95-80).* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/9580.html

Ecology. (2018). *Water Quality Program Permit Writer's Manual.* Publication 92-109. Retrieved from https://apps.ecology.wa.gov/publications/summarypages/92109.html

Gray & Osborne, Inc. (2011). *City of Camas General Sewer/Wastewater Facilites Plan.*

Ecology and Department of Health. (2019). *Reclaimed Water Facilities Manual: The Purple Book.* Retrieved from https://apps.ecology.wa.gov/publications/SummaryPages/1510024.html

Lewis, E. W. (1998). *Program developed for CO2 system calculations.* Retrieved from https://doi.org/10.2172/639712

Metcalf & Eddy, Inc. (1991). *Wastewater engineering : treatment, disposal, and reuse.* New York: McGraw-Hill.

USEPA. (1985). *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. Part 2,, EPA/600/6-85/002B.*

USEPA. (1987). *Enhanced Stream Water Quality Models QUAL2E and QUAL2E-UNCAS: Documentation and User Manual, EPA/600/3-87/007.*

USEPA. (1988). *Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling.*

USEPA. (1989). *Ambient Water Quality for Ammonia (Saltwater), EPA 440/5-88-004.*

USEPA. (1991). *Handbook: Sewer System Infrastructure Analysis and Rehabilitation, EPA/625/6-91/030.* Retrieved from https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRMRL&dirEntryId=124654

USEPA. (1991). *Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001).* Washington, DC. Retrieved from https://www3.epa.gov/npdes/pubs/owm0264.pdf

USEPA Region 10. (2021). *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load.* Seattle, WA.

Washington State Department of Transportation. (2023). *Standard Specifications for Road, Bridge, and Municipal Construction, M 41-10.* Retrieved from https://www.wsdot.wa.gov/publications/manuals/fulltext/M41-10/SS.pdf

Water Environment Federation, American Society of Civil Engineers. (2020). *Existing Sewer Evaluation and Rehabilitation: Manual of Practice FD 6.*

Water Pollution Control Federation. (1976). *Chlorination of Wastewater.*

Washington State and Ecology website general reference links:

Laws and Regulations[4]

Permit and Wastewater Related Information[5]

[4] http://leg.wa.gov/LawsAndAgencyRules/Pages/default.aspx
[5] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance

Appendix A – Public Involvement Information

Ecology proposes to reissue (or issue) a permit to Camas WWTP. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology placed a Public Notice of Application on June 11, 2020, and June 17, 2020, in the Battle Ground Reflector to inform the public about the submitted application and to invite comment on the reissuance (or issuance) of this permit.

Ecology will place a Public Notice of Draft on April 15, 2025, in the Columbian to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft Permit and Fact Sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Urges people to submit their comments, in writing, before the end of the Comment Period
- Tells how to request a public hearing of comments about the proposed NPDES permit.
- Explains the next step(s) in the permitting process.

Frequently Asked Questions about Effective Public Commenting[6]

You may obtain further information from Ecology by writing to the address listed below.

Water Quality Permit Coordinator Department of Ecology
Southwest Region Office
P.O. Box 47775
Olympia, WA 98504-7775

The primary author of this permit and fact sheet is **M. Eleanor Key Ott, P.E.**

[6] https://apps.ecology.wa.gov/publications/SummaryPages/0307023.html

Appendix B – Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. “Date of receipt” is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours as defined in WAC 371-08-305 and -335. “Notice of appeal” is defined in WAC 371-08-340.
- Serve a copy of your appeal and this permit on the Department of Ecology by mail, in person, or by email (see addresses below).
- You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Filing with the PCHB

For the most current information regarding filing with the PCHB:
visit https://eluho.wa.gov/[7] or call 360-664-9160.

Service on Ecology

Street Address:

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:

ecologyappeals@ecy.wa.gov

[7] https://eluho.wa.gov/

Appendix C – Glossary

1-DMax or 1-day maximum temperature – The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

7-DADMax or 7-day average of the daily maximum temperatures – The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute toxicity – The lethal effect of a compound on an organism that occurs in a short time period, usually 48 to 96 hours.

AKART – The acronym for “all known, available, and reasonable methods of prevention, control and treatment.” AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and RCW 90.48.520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance – An alternative location in the groundwater from the point of compliance where compliance with the groundwater standards is measured. It may be established in the groundwater at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site-specific basis following an AKART analysis. An “early warning value” must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

Ambient water quality – The existing environmental condition of the water in a receiving water body.

Ammonia – Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Annual average design flow (AADF) – average of the daily flow volumes anticipated to occur over a calendar year.

Average monthly (intermittent) discharge limit – The average of the measured values obtained over a calendar months’ time taking into account zero discharge days.

Average monthly discharge limit – The average of the measured values obtained over a calendar months’ time.

Background water quality – The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of groundwater at a particular point in time upgradient of an activity that has not been affected by that activity, [WAC 173-200-020(3)]. Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

Best management practices (BMPs) – Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5 – Determining the five-day Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD_5 is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass – The intentional diversion of waste streams from any portion of a treatment facility.

Categorical pretreatment standards – National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties, which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

Chlorine – A chemical used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic toxicity – The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean water act (CWA) – The federal Water Pollution Control Act enacted by Public Law 92 500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance inspection-without sampling – A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance inspection-with sampling – A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition, it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

Composite sample – A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction activity – Clearing, grading, excavation, and any other activity, which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous monitoring – Uninterrupted, unless otherwise noted in the permit.

Critical condition – The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Date of receipt – This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

Days (compliance period interval) – When the compliance period is stated in days: (A) exclude the day of the event that triggers the period; (B) count every day, including intermediate Saturdays, Sundays, and legal holidays; and (C) include the last day of the period, but if the last day is a Saturday, Sunday, or legal holiday, the period continues to run until the end of the next day that is not a Saturday, Sunday, or legal holiday.

Detection level – or method detection limit means the minimum concentration of an analyte (substance) that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results as determined by the procedure given in 40 CFR part 136, Appendix B.

Dilution factor (DF) – A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Distribution uniformity – The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Early warning value – The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, groundwater, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

Enforcement limit – The concentration assigned to a contaminant in the groundwater at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a groundwater criterion will not be exceeded, and that background water quality will be protected.

Engineering report – A document that thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or WAC 173-240-130.

Enterococci – A subgroup of fecal streptococci that includes *S. faecalis*, *S. faecium*, *S. gallinarum*, and *S. avium*. The enterococci are differentiated from other streptococci by their ability to grow in 6.5% sodium chloride, at pH 9.6, and at 10°C and 45°C.

E. coli – A bacterium in the family Enterobacteriaceae named Escherichia coli and is a common inhabitant of the intestinal tract of warm-blooded animals, and its presence in water samples is an indication of fecal pollution and the possible presence of enteric pathogens.

Fecal coliform bacteria – Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab sample – A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Groundwater – Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

Immediate reporting – Report permit violations immediately without delay of any interval of time from the moment the permittee becomes aware of the violation. Priority should first be given to stopping an active noncompliance.

Industrial user – A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial wastewater – Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated stormwater and, also, leachate from solid waste facilities.

Interference – A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Local limits – Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

Major facility – A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum daily discharge limit – The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Maximum day design flow (MDDF) – The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum month design flow (MMDF) – The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum week design flow (MWDF) – The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

Method detection limit (MDL) – See Detection level.

Minor facility -- A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing zone – An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The permit specifies the area of the authorized mixing zone that Ecology defines following procedures outlined in state regulations (chapter 173-201A WAC).

National pollutant discharge elimination system (NPDES) – Section 402 of the Clean Water Act, the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State are joint NPDES/State permits issued under both state and federal laws.

pH – The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

Pass-through – A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

Peak hour design flow (PHDF) – The largest volume of flow anticipated to occur during a

one-hour period, expressed as a daily or hourly average.

Peak instantaneous design flow (PIDF) – The maximum anticipated instantaneous flow.

Point of compliance – The location in the groundwater where the enforcement limit must not be exceeded, and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the groundwater as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

Potential significant industrial user (PSIU) – A potential significant industrial user is defined as an Industrial User that does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

Ecology may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation level (QL) – also known as Minimum level (ML) – The term ‘‘minimum level’’ refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (DL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the DL in a method, or the DL determined by a laboratory, by a factor of 3. For the purposes of NPDES compliance monitoring, EPA considers the following terms to be synonymous: ‘‘quantitation limit,’’ ‘‘reporting limit,’’ and ‘‘minimum level’’.

Reasonable potential – A reasonable potential to cause or contribute to a water quality violation, or loss of sensitive and/or important habitat.

Responsible corporate officer – A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sample Maximum – No sample may exceed this value.

Significant industrial user (SIU) –

- All industrial users subject to Categorical Pretreatment Standards under 40 CFR Chapter I, Subchapter N and 40 CFR 403.6 and;
- Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

Upon finding that the industrial user meeting the criteria in the second paragraph has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at

any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

Slug discharge – Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate that may cause interference or pass through with the POTW or in any way violate the permit conditions or the POTW's regulations and local limits.

Soil scientist – An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5, 3, or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

Solid waste – All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

Soluble BOD_5 – Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BOD_5 test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BOD_5 test is sufficient to remove the particulate organic fraction.

State waters – Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater – That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based effluent limit – A permit limit based on the ability of a treatment method to reduce the pollutant.

Total coliform bacteria – A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

Total dissolved solids – That portion of total solids in water or wastewater that passes through a specific filter.

Total maximum daily load (TMDL) – A determination of the amount of pollutant that a water body can receive and still meet water quality standards.

Total suspended solids (TSS) – Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset – An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water quality-based effluent limit – A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

Appendix D — Technical Calculations

Simple Mixing:

Ecology uses simple mixing calculations to assess the impacts of certain conservative pollutants, such as the expected increase in fecal coliform bacteria at the edge of the chronic mixing zone boundary. Simple mixing uses a mass balance approach to proportionally distribute a pollutant load from a discharge into the authorized mixing zone. The approach assumes no decay or generation of the pollutant of concern within the mixing zone. The predicted concentration at the edge of a mixing zone (C_{mz}) is based on the following calculation:

$C_{mz} = C_a + [(C_e – C_a)/DF]$

C_a = ambient concentration

C_e = effluent concentration

DF = dilution factor

Reasonable Potential Analysis:

Ecology uses spreadsheet tools to determine reasonable potential (to cause or contribute to violations of the aquatic life and human health water quality numeric standards) and to calculate effluent limits. The process and formulas for determining reasonable potential and effluent limits in these spreadsheets come from the Technical Support Document for Water Quality-based Toxics Control, (EPA 505/2-90-001) (USEPA, 1991).

Calculation of Water Quality-Based Effluent Limits:

Ecology calculates water quality-based effluent limits by the two-value wasteload allocation process as described on page 100 of the TSD (USEPA, 1991) and shown below.

1. Calculate the acute wasteload allocation WLA_a by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic wasteload allocation (WLA_c) by multiplying the chronic criteria by the chronic dilution factor and subtracting the background factor.

WLA_a = (acute criterion x DF_a) – (background concentration x (DF_a – 1))

WLA_c = (chronic criterion x DF_c) – (background concentration x (DF_a – 1))

Where:

DF_a = acute dilution factor

DF_c = chronic dilution factor

2. Calculate the long-term averages (LTA_a and LTA_c) which will comply with the wasteload allocations WLA_a and WLA_c.

$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\sigma)}$

Where:

$\sigma^2 = \ln(CV^2 + 1)$

$z = 2.326$

CV = coefficient of variation = standard deviation/mean

$LTA_c = WLA_c \times e^{(0.5\sigma^2 - z\sigma)}$

Where:

$\sigma^2 = \ln(CV^2/4 + 1)$

$z = 2.326$

3. Use the smallest LTA of the LTA_a or LTA_c to calculate the maximum daily effluent limit (MDL) and the monthly average effluent limit (AML).

$MDL = LTA \times e^{(z\sigma - 0.5\sigma^2)}$

Where:

$\sigma^2 = \ln(CV^2 + 1)$

$z = 2.326$ (99th percentile)

LTA = limiting long-term average

$AML = LTA \times e^{(z\sigma - 0.5\sigma^2)}$

Where:

$\sigma^2 = \ln(CV^2/n + 1)$

n = number of samples per month

$z = 1.645$ (95th percentile)

LTA = limiting long-term average

Dilution Factor Calculations and Receiving Water Critical Conditions

Step 1: Enter Waterbody Type

Water Body Type	Freshwater

Facility Name	Camas WWTP
Receiving Water	Columbia River

Step 2: Enter Dilution Factors -OR- Calculate DFs by entering Facility/Receiving Water Flow Data

Do you want to enter dilution factors -or- flow data?	Dilution Factors

	Max Dilution Factor Allowed
Aquatic Life - Acute	23.0
Aquatic Life - Chronic	121.0
HH-Non-Carcinogen	185.0
HH-Carcinogen	185.0
Whole river at 7Q10	

Step 3: Enter Critical Data

	Effluent	Receiving Water
Temp, °C	25.7	23.2
pH, s.u. (for ammonia and pHmix)	7.3	8.1
pH, s.u. (for pentachlorophenol)	6.6	7.29
Alkalinity, mg/L as CaCO3	100	74
Hardness, mg/L CaCO3	168	66.2
Salinity, psu		0
Receiving water TSS, mg/L (leave blank if unknown)		
If TSS is annual data, enter 'A'; if from critical period, enter 'S'; if no TSS, leave blank		

Step 4: Specifiy if using 'Mixed' values for hardness, temperature, and pH

	Use 'Mixed Hardness' (Y/N)	Use 'Mixed Max Temp' (Y/N)	Use 'Mixed pH (Y/N)
	N	N	N
Acute Zone Boundary	70.6	23.3	8.0
Chronic Zone Boundary	67.0	23.2	8.1
Whole river at 7Q10			

Reasonable Potential Calculation

Facility	Camas WWTP
Water Body Type	Freshwater
Rec. Water Hardness	66.2 mg/L

Dilution Factors:	Acute	Chronic
Aquatic Life	23.0	121.0
Human Health Carcinogenic		185.0
Human Health Non-Carcinogenic		185.0

Pollutant, CAS No. & NPDES Application Ref. No.			AMMONIA, Criteria as Total NH3	ANTIMONY (INORGANIC) 7440360 1M	ARSENIC (dissolved) 7440382 2M	BUTYLBENZYL PHTHALATE 85687 15B	CADMIUM - 7440439 4M Hardness dependent	CHLOROFORM 67663 11V	CHROMIUM(TRI) - 16065831 5M Hardness dependent	CHROMIUM(HEX) 18540299	COPPER - 7440508 6M Hardness dependent	CYANIDE 57125 14M	DIETHYL PHTHALATE 84662 24B
Effluent Data	# of Samples (n)		1156	20	20	3	20	4	20	20	20	20	3
	Coeff of Variation (Cv)		2.02	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		1,455		0.95	0.27	0.022	0.71	0.97	420	8.3	20	1.1
	Calculated 50th percentile Effluent Conc. (when n>10)			0.237							5.47	7.5	
Receiving Water Data	90th Percentile Conc., ug/L		183		0		0.015		0.416	0.086	1.43	0	
	Geo Mean, ug/L			0		0		0			0	0	0
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	4,641	-	360	-	2.36749	-	391.424	15	11.5366	22	-
		Chronic	589	-	190	-	0.75995	-	126.974	10	7.97908	5.2	-
	WQ Criteria for Protection of Human Health, ug/L		-	6	-	0.013	-	100	-	-	1300	9	200
	Metal Criteria Translator, decimal	Acute	-	-	1	-	0.943	-	0.316	-	0.996	-	-
		Chronic	-	-	1	-	0.943	-	0.86	-	0.996	-	-
	Carcinogen?		N	N	Y	N	N	Y	N	N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950	0.950	0.950	0.950	0.950	0.950	
s	$s^2=\ln(CV^2+1)$	1.275	0.555	0.555	0.555	0.555	0.555	0.555	
Pn	$Pn=(1\text{-confidence level})^{1/n}$	0.997	0.861	0.861	0.861	0.861	0.861	0.861	
Multiplier		1.00	1.36	1.36	1.36	1.36	1.36	1.36	
Max concentration (ug/L) at edge of...	Acute	236	0.056	0.016	0.416	25.000	1.858	1.167	
	Chronic	194	0.011	0.015	0.422	4.822	1.511	0.226	
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month					4			
LTA Coeff. Var. (CV), decimal					0.6			
Permit Limit Coeff. Var. (CV), decimal					0.6			
Waste Load Allocations, ug/L	Acute				343.108			
	Chronic				1199.68			
Long Term Averages, ug/L	Acute				110.166			
	Chronic				632.751			
Limiting LTA, ug/L					110.166			
Metal Translator or 1?					1.00			
Average Monthly Limit (AML), ug/L					**171.0**			
Maximum Daily Limit (MDL), ug/L					**343.1**			

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.55451	0.55451	0.55451	0.55451	0.55451	0.55451
Pn	$Pn=(1\text{-confidence level})1/n$	0.861	0.368	0.473	0.861	0.861	0.368
Multiplier		0.54811	1.20486	1.03846	0.54811	0.54811	1.20486
Dilution Factor		185	185	185	185	185	185
Max Conc. at edge of Chronic Zone, ug/L		0.00128	0.00176	4.0E-03	0.02957	0.04054	0.00716
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Human Health Limit Calculation

# of Compliance Samples Expected per month	

Comments/Notes:

References: WAC 173-201A,
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Reasonable Potential Calculation - Page 2

Facility	Camas WWTP
Water Body Type	Freshwater
Rec. Water Hardness	66.2 mg/L

Dilution Factors:	Acute	Chronic
Aquatic Life	23.0	121.0
Human Health Carcinogenic		185.0
Human Health Non-Carcinogenic		185.0

Pollutant, CAS No. & NPDES Application Ref. No.			LEAD - 7439921 7M Dependent on hardness	MERCURY 7439976 8M	NAPHTHALENE 91203 3M3	NICKEL - 7440020 9M - Dependent on hardness	PHENOL 108952 10A	SELENIUM 7782492 10M	SILVER - 7740224 11M dependent on hardness	ZINC- 7440666 13M hardness dependent			
Effluent Data	# of Samples (n)		20	20	3	20	3	20	20	20			
	Coeff of Variation (Cv)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		0.15	0.00091		2.82	5.5	1	0.02	28.4			
	Calculated 50th percentile Effluent Conc. (when n>10)			0.00067		2		1		20.9			
Receiving Water Data	90th Percentile Conc., ug/L		0.064	0.00088		0.604		0.274	0.025	1.25			
	Geo Mean, ug/L			0		0	0	0		0			
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	41.1023	2.1	-	998.452	-	20	1.69705	60.6898			
		Chronic	1.6017	0.012	-	110.886	-	5	-	73.6821			
	WQ Criteria for Protection of Human Health, ug/L		-	0.14	-	80	9000	60	-	1000			
	Metal Criteria Translator, decimal	Acute	0.466	0.85	-	0.998	-	-	0.85	0.996			
		Chronic	0.466	-	-	0.997	-	-	-	0.996			
	Carcinogen?		N	N	N	N	N	N	N	N			

Aquatic Life Reasonable Potential

Effluent percentile value			0.950	0.950		0.950		0.950	0.950	0.950			
s	$s^2=\ln(CV^2+1)$		0.555	0.555		0.555		0.555	0.555	0.555			
Pn	$Pn=(1\text{-confidence level})^{1/n}$		0.861	0.861		0.861		0.861	0.861	0.861			
Multiplier			1.36	1.36		1.36		1.36	1.36	1.36			
Max concentration (ug/L) at edge of...		Acute	0.066	0.001		0.745		0.321	0.025	2.674			
		Chronic	0.064	0.001		0.631		0.283	0.025	1.559			
Reasonable Potential? Limit Required?			**NO**	**NO**		**NO**		**NO**	**NO**	**NO**			

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month									
LTA Coeff. Var. (CV), decimal									
Permit Limit Coeff. Var. (CV), decimal									
Effluent Concentration, ug/L		Acute							
		Chronic							
Long Term Averages, ug/L		Acute							
		Chronic							
Limiting LTA, ug/L									
Metal Translator or 1?									
Average Monthly Effluent Limit, ug/L									
Maximum Daily Effluent Limit, ug/L									

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$		0.55451		0.55451	0.55451	0.55451		0.55451				
Pn	$Pn=(1\text{-confidence level})^{1/n}$		0.861		0.861	0.368	0.861		0.861				
Multiplier			0.54811		0.54811	1.20486	0.54811		0.54811				
Dilution Factor			185		185	185	185		185				
Max Conc. at edge of Chronic Zone, ug/L			3.6E-06		0.01081	0.03582	5.4E-03		0.11297				
Reasonable Potential? Limit Required?			**NO**		**NO**	**NO**	**NO**		**NO**				

Human Health Limit Calculation

# of Compliance Samples Expected per month									
Average Monthly Effluent Limit, ug/L									
Maximum Daily Effluent Limit, ug/L									

Comments/Notes:

References: WAC 173-201A,
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Calculation of Dissolved Oxygen at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	121.0
Receiving Water DO Concentration, mg/L	8.1
Effluent DO Concentration, mg/L	5.1
Effluent Immediate DO Demand (IDOD), mg/L	2
Surface Water Criteria, mg/L	*8*
OUTPUT	
DO at Mixing Zone Boundary, mg/L	**8.06**
DO decrease caused by effluent at chronic boundary, mg/L	**0.04**

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for dissolved oxygen.

References: EPA/600/6-85/002b and EPA/430/9-82-011

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

INPUT	Test low effluent pH at the Chronic Boundary	Test high effluent pH at the Chronic Boundary
1. Dilution Factor at Mixing Zone Boundary	121.0	121.0
2. Ambient/Upstream/Background Conditions		
Temperature (deg C):	23.20	23.20
pH:	8.1	7.3
Alkalinity (mg CaCO3/L):	74.00	74.00
3. Effluent Characteristics		
Temperature (deg C):	25.70	25.70
pH:	6.0	9.0
Alkalinity (mg CaCO3/L):	100.00	100.00
4. Aquatic Life Use Designation	ther species (salmonid/redband trout/warmwater specie	
OUTPUT		
1. Ionization Constants		
Upstream/Background pKa:	6.36	6.36
Effluent pKa:	6.35	6.35
2. Ionization Fractions		
Upstream/Background Ionization Fraction:	0.98	0.90
Effluent Ionization Fraction:	0.31	1.00
3. Total Inorganic Carbon		
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	75	83
Effluent Total Inorganic Carbon (mg CaCO3/L):	322	100
4. Condtions at Mixing Zone Boundary		
Temperature (deg C):	23.22	23.22
Alkalinity (mg CaCO3/L):	74.21	74.21
Total Inorganic Carbon (mg CaCO3/L):	77.39	82.66
pKa:	6.36	6.36
5. Allowable pH change	0.50	0.50
RESULTS		
pH at Mixing Zone Boundary:	7.7	7.3
pH change at Mixing Zone Boundary:	0.37	0.00
Is permit limit needed?	NO	NO

Freshwater Un-ionized Ammonia Criteria Calculation

Based on Chapter 173-201A WAC, amended November 20, 2006

		mixed @ Acute Boundary	mixed @ Chronic Boundary	mixed @ Whole River
INPUT				
1. Receiving Water Temperature (deg C):	23.2	23.3	23.2	#VALUE!
2. Receiving Water pH:	8.1	8.0	8.1	#VALUE!
3. Is salmonid habitat an existing or designated use?	Yes	Yes	Yes	Yes
4. Are non-salmonid early life stages present or absent?	Present	Present	Present	Present
OUTPUT				
Using mixed temp and pH at mixing zone boundaries?	no			
Ratio	13.500	13.500	13.500	#VALUE!
FT	1.400	1.400	1.400	#VALUE!
FPH	1.000	1.007	1.000	#VALUE!
pKa	9.302	9.299	9.301	#VALUE!
Unionized Fraction	0.059	0.047	0.056	#VALUE!
Unionized ammonia NH3 criteria (mg/L as NH_3)				
Acute:	0.333	0.326	0.000	#VALUE!
Chronic:	0.042	0.042	0.042	#VALUE!
RESULTS				
Total ammonia nitrogen criteria (mg/L as N):				
Acute:	4.641	5.754		#VALUE!
Chronic:	0.589		0.620	#VALUE!

Streeter-Phelps Analysis of Critical Dissolved Oxygen Sag

INPUT			
1. EFFLUENT CHARACTERISTICS			
Discharge (cfs):			9.44
$CBOD_5$ (mg/L):			5
NBOD (mg/L):			3
Dissolved Oxygen (mg/L):			5
Temperature (deg C):			24
2. RECEIVING WATER CHARACTERISTICS			
Upstream Discharge (cfs):			81400
Upstream $CBOD_5$ (mg/L):			1.5
Upstream NBOD (mg/L):			0.2
Upstream Dissolved Oxygen (mg/L):			9
Upstream Temperature (deg C):			23
Elevation (ft NGVD):			75
Downstream Average Channel Slope (ft/ft):			0.00088
Downstream Average Channel Depth (ft):			21
Downstream Average Channel Velocity (fps):			0.98
3. REAERATION RATE (Base e) at 20 deg C (day^{-1}):			0.13
Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	0.07
O'Connor and Dobbins	0.1 - 1.5	2 - 50	0.13
Owens	0.1 - 6	1 - 2	0.08
Tsivoglou-Wallace	0.1 - 6	0.1 - 2	1.99
4. BOD DECAY RATE (Base e) AT 20 deg C (day^{-1}):			0.07
(or use Wright and McDonnell eqn, 1979, for small rivers.) Enter this value →			0.04

OUTPUT	
1. INITIAL MIXED RIVER CONDITION	
$CBOD_5$ (mg/L):	1.5
NBOD (mg/L):	0.2
Dissolved Oxygen (mg/L):	9.0
Temperature (deg C):	23.0
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day^-1):	0.14
BOD Decay (day^-1):	0.08
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	2.2
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	2.4
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	8.555
Initial Deficit (mg/L):	-0.44
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	11.48
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):	184.06
7. CRITICAL DO DEFICIT (mg/L):	0.55
8. CRITICAL DO CONCENTRATION (mg/L):	**8.00**

Appendix E — Response to Comments

No comments were received during the public comment period.

APPENDIX I

EVALUATION OF THE WASTEWATER TREATMENT FACILITY REPORT

General Sewer Plan

Evaluation of the Wastewater Treatment Facility



March 2026 / DRAFT

carollo

General Sewer Plan

Evaluation of the Wastewater Treatment Facility

March 2026 / DRAFT

This document is released for the purpose of information exchange review and planning only under the authority of Matthew M. Huang, March 12, 2026, State of Washington PE No. 54002.

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Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
AAD	annual average day
AADF	annual average day flow
AAF	average annual flow
ADF	average day flow
AOR	Actual (field) oxygen requirement
aSRT	aerobic solids retention time
aSRT	aerobic solids retention times
BNR	biological nutrient removal
BOD5	five-day biochemical oxygen demand
BODrem	Five-day biochemical oxygen demand removed (in biological process)
Ca	calcium
$CaCO_3$	calcium carbonate
Carollo	Carollo Engineers
$cBOD_5$	five-day carbonaceous biochemical oxygen demand
cf	cubic feet
CFU	colony-forming unit
CFU/100 mL	colony-forming units per 100 milliliters
CFU/mL	colony-forming units per milliliter
CIP	Capital Improvement Program
City	City of Camas
CMP	corrugated metal pipe
COD	chemical oxygen demand
DO	dissolved oxygen
DS	dry solids
DSHT	Digested Sludge Holding Tank
DT/d	dry ton per day
Ecology	Washington Department of Ecology
EOPCC	Engineer's Opinion of Probable Cost of Construction
f	filtered
ff	filtered and flocculated
gpd	gallons per day
gpd/sf	gallons per day per square foot
gpm	gallons per minute
GSP	General Sewer Plan

hp	horsepower
HST	high speed turbo
IR	internal recycle
ISS	inert suspended solids
kcal/d	kilocalories per day
kVA	kilovolt-amperes
kW	kilowatt
lb H20/hr	pounds of water per hour
lb SS/lb	pounds of suspended solids per pound
lbs/hr	pounds per hour
MADF	monthly average day flow
MCC	motor control center
MCRT	minimum mean cell residence time
MD	maximum day
MDDL	maximum day design mass load
MDF	maximum day flow
mg	milligrams
Mg	magnesium
MG	million gallons
mg/L	milligrams per liter
MG/yr	million gallons per year
mgd	million gallons per day
mL	milliliter
ML	mixed liquor
mL/g	milliliters per gram
MLSS	mixed liquor suspended solids
MLVSS	mixed liquor volatile suspended solids
mm	millimeters
MMAD	maximum month average day
MMDF	maximum month average day design flow
MMF	maximum month flow
MSL	mean sea level
MWAD	maximum week average day
MWDF	maximum week design flow
MWDL	maximum week average day design mass load
MWF	maximum week flow
N	nitrogen
N/A	not applicable
N/L	nitrogen per liter

NFPA	National Fire Protection Association
NH3	ammonia
NH4	ammonium
No.	number
NPDES	National Pollutant Discharge Elimination System
NPW	non-potable water
O&M	operations and maintenance
OP	ortho-phosphorus
OTE	oxygen transfer efficiency
P/L	phosphorus per liter
PFAS	per- and polyfluoroalkyl substances
PHDF	peak hour design flow
PHDL	peak hour design mass load
PHF	peak hour flow
PHL	peak hour loading
PIDF	peak instantaneous design flow
PLC	programmable logic controller
ppd	pounds per day
ppd/sf	pounds per day per square foot
psig	pounds per square inch gauge
RAS	return activated sludge
RDT	rotary drum thickener
RPA	Reasonable Potential Analysis
S/L	solids per liter
SCADA	supervisory control and data acquisition
scfm	standard cubic feet per minute
sf	square feet
SLR	solids loading rate
SOR	surface overflow rate
SOTE	standard oxygen transfer efficiency
SPA	state point analysis
SRT	solids retention time
STEP	septic tank effluent pump
SU	standard units
SVI	sludge volume index
SWBD	switch board
SWD	side water depth
TDH	total dynamic head
TKN	total Kjeldahl nitrogen

TP	total phosphorus
TS	total solids
TSS	total suspended solids
UV	ultraviolet
UVT	ultraviolet transmittance
VFA	volatile fatty acids
VFD	variable frequency drive
VSR	volatile solids reduction
VSS	volatile suspended solids
WAS	waste activated sludge
WRF	water reclamation facility
WWTF	wastewater treatment facility

SECTION 1 INTRODUCTION

The City of Camas (City) serves the water quality needs of approximately 8,500 residential, industrial, and commercial accounts by maintaining and operating its wastewater treatment facility (WWTF), which has the design treatment capacity and influent loadings summarized in Table 1. The City's sewer service area covers approximately 7,600 acres.

Table 1 Existing Treatment Design Capacity and Pollutant Loadings

Flow Parameter	Value
AAF(2)	5.3 mgd
MADF(1)	2.73 mgd
MMDF(2)	6.1 mgd
PIDF(2)	13.44 mgd
5-day Biochemical Oxygen Maximum Month Loading(2)	5,616 ppd
TSS Maximum Month Loading(2)	8,011 ppd
TKN, as N Maximum Month Loading(2)	2,573 ppd

Notes:
(1) Historical monthly average day flow from 2022-2024 plant data.
(2) Design values from 2014 - Phase 2B WWTF Improvements Record Drawings.
AAF - average annual flow; mgd - million gallons per day; MADF - monthly average day flow; MMDF - maximum month design flow; N - nitrogen; PIDF - peak instantaneous design flow; ppd - pounds per day, TKN - total Kjeldahl nitrogen; TSS - total suspended solids.

To support the development of the City's 2025 General Sewer Plan (GSP), a unit process analysis was conducted to identify shortfalls in plant capacity that could prevent the City from reliably treating and disposing of projected flows and loadings through the planning period (i.e., year 2045). To address these deficiencies, an alternatives analysis of the most viable improvement options was completed, resulting in the development of several projects to be incorporated into the 2025 GSP's Capital Improvement Program (CIP).

This report summarizes the methods and results of these tasks, defining the condition and capacities of the WWTF's unit processes and presenting sequenced recommendations that will enable the City to reliably and cost-effectively serve its customers now and into the future.

SECTION 2 CURRENT NPDES PERMIT

The treated and disinfected effluent is discharged from the WWTF into the Columbia River through a 36-inch corrugated metal pipe that extends approximately 850 feet into the river channel. The City's WWTF effluent must comply with limits on five day biochemical oxygen demand (BOD_5), TSS, ammonia, pH, and fecal coliform bacteria as required under its National Pollutant Discharge Elimination System (NPDES) permit. The current permit (No. WA0020249) was issued by the Washington Department of Ecology (Ecology) on August 1, 2025. The City will continue to work with Ecology to ensure compliance with the discharge limits summarized in Table 2.

A Reasonable Potential Analysis (RPA) was prepared to identify any new reasonable potential for the projected 2035 discharges to cause or contribute to any excursions above state water quality standards with the current design effluent water quality. This updated RPA used spreadsheets developed by Ecology with the projected maximum daily discharge and no other changes compared to the RPA prepared for the current NPDES permit. The updated RPA was conducted to identify any new reasonable potentials that would require infrastructure or process modifications to be addressed in the current capital improvement planning. The updated RPA, included in Appendix A, did not identify any new reasonable potentials.

Table 2 NPDES Permit Effluent Limits for Permit No. WA0020249

Parameter	Average Monthly	Average Weekly
Biological oxygen demand (BOD_5)	▪ 20 mg/L ▪ 842 ppd ▪ 85% removal	▪ 30 mg/L ▪ 1,264 ppd
TSS	▪ 20 mg/L ▪ 1,017 ppd ▪ 85% removal	▪ 30 mg/L ▪ 1,525 ppd
Ammonia (NH_3 as N) during summer(1)	▪ 20 mg/L	▪ 30 mg/L
Ammonia (NH_3 as N) during winter(2)	▪ 7 mg/L	▪ 11 mg/L
Parameter	**Minimum**	**Maximum**
pH	• 6 SU	• 9 SU
Parameter	**Monthly Geometric Mean**	**7-Day Geometric Mean**
Fecal coliform bacteria	▪ 200/100 mL	▪ 400/100 mL
Heat Load during summer(1)	▪ $5.87x10^8$ kcal/d	

Notes:
(1) Summer months include June through September.
(2) Winter months include October through May (inclusively).
kcal/d - kilocalories per day; mg/L - milligrams per liter; mL - milliliter; NH_3 - ammonia; SU - standard units.

SECTION 3 PAST EVALUATION OF REUSE

In the 2010 iteration of the general sewer plan, the City explored their potential to practice wastewater reclamation, or the production and beneficial use of reclaimed water. As such, an evaluation was completed to understand the feasibility of reusing effluent from the WWTF or constructing a new water reclamation facility (WRF) to treat wastewater for reuse.

The evaluation determined that, though environmental and social benefits are difficult to quantify and assess, the City and their surrounding communities can benefit indirectly from the use of reclaimed water in the following ways:

- Development of additional outdoor recreational sites for the community.
- Irrigation of parks and playfields, which can potentially increase property values.
- Conservation of the quality and quantity of the City's water resources.
- A flexible and reliable alternative water source for industrial water customers.

The previous study identified peak day demands of 0.338 mgd of reclaimed water irrigation and an annual irrigation demand of 46 million gallons per year (MG/yr).

However, the evaluation also confirmed that the production of reclaimed water is only economically feasible if the cost of producing reclaimed water is less than or equal to the cost of purchasing water or developing additional water rights.

Capital, operation, and maintenance costs for two alternative approaches to implementing reuse were taken from the 2010 GSP and converted from 2006 dollars to 2025 dollars. The two alternatives are: 1) Modify existing WWTF and 2) construct satellite WRF. A new 20-year present worth analysis was conducted with the updated values. Both the 2010 GSP and the current 20-year present worth analysis found that neither the costs to modify the existing WWTF nor construct a satellite WRF were less than or equal to the cost of developing additional water rights, which are available at notably lower costs. The cost to develop and acquire additional water rights was expected to not exceed 5 million dollars in 2006, which would be 15 million dollars in 2025.

Comparisons of the two alternatives are shown in Table 3. Alternative 1 has a 20-year present worth of $30.5 million dollars and Alternative 2 has a 20-year present worth of $81.7 million dollars. Even for Alternative 1, at a $30.5 million cost and an irrigation demand of 46 MG/yr, over a 20 year period, the cost of the reclaimed water is over $33,000 per million gallons (MG) produced, which is far more expensive than the cost to develop and acquire additional water rights. Therefore, water reclamation and reuse were determined to be economically infeasible at this time and not pursued at the City's WWTF.

Chapter 10 of the *2010 General Sewer/Wastewater Facility Plan* (Gray & Osbourne, Inc. 2010) documents the feasibility evaluation of reuse in further detail.

Table 3 Reuse Alternative Cost Comparison

	Alternative 1 Modify Existing WWTF	Alternative 2 Construct Satellite WRF
Capital Cost(1)	$24,414,000	$68,235,000
Annual O&M Cost(2)	$317,000	$705,000
20-year Present Worth(3)	$30,457,000	$81,662,000

Notes:
(1) 2010 general sewer plan used 2006 costs. The Handy-Whitman Index for the Pacific Region in July 2006 and July 2025 were used.
(2) 2010 general sewer plan reported 2004 costs. Costs were updated using the Handy-Whitman Index for the Pacific Region in January 2004.
(3) Discount rate assumed 5% bond repayment rate and 4% inflation for a total rate of 1%.
O&M - operations and maintenance.

SECTION 4 REVIEW OF PLANT HISTORICAL DATA

Carollo Engineers (Carollo) reviewed three years of plant operating data from January 2022 through December 2024. Historical flows and loadings were used to establish current operating conditions as well as design criteria for the projected 2045 flows and loads.

Tables 4 and 5 summarize the historical influent and primary effluent flows, pollutant concentrations, and loadings.

Table 4 Historical Plant Influent and Primary Effluent Summary(1)

Parameter	Flow (mgd)	BOD_5 (mg/L)	TSS (mg/L)	NH_4 (mg/L)
Plant Influent Average	2.73	122	134	40.2
Plant Influent Minimum	1.33	48.8	39.0	9.7
Plant Influent Maximum	7.80	314	380	59.3
Primary Effluent Average	-	66.6	38.6	-
Primary Effluent Minimum	-	17.7	10.0	-
Primary Effluent Maximum	-	801	201	-

Notes:
(1) Based on plant data from 2022 to 2024.
NH_4 - ammonium.

Table 5 Historical Plant Influent and Primary Effluent Pollutant Loadings Summary

Parameter	2022 Average	2023 Average	2024 Average	2022-2024 Average
Plant Influent Flow, MG	2.71	2.64	2.85	2.73
Plant Influent BOD_5 Mass Loading, ppd	2,500	2,770	2,770	2,680
Plant Influent TSS Mass Loading, ppd	2,870	3,150	2,910	2,977
Plant Influent TKN Mass Loading, ppd(1)	1,320	1,240	1,210	1,257
Primary Effluent BOD_5 Mass Loading, ppd	2,100	1,550	1,550	1,733
Primary Effluent TSS Mass Loading, ppd	1,380	921	829	1,043

Notes:
(1) TKN loadings based on assumed NH_4/TKN ratio of 0.70.

4.1 Additional Influent Wastewater Sampling

The City conducted additional influent wastewater sampling on three separate days - May 14, 2025, June 25, 2025, and July 23, 2025. Influent samples were tested for TSS, volatile suspended solids (VSS), volatile fatty acids (VFA), cBOD5, TKN, NH_3-N, ortho-phosphorus (OP), and total phosphorus (TP) during the sampling effort.

Tables 6 and 7 present summaries of the special sampling conducted in May, June, and July 2025 to characterize the influent wastewater and some of the in-plant recycle streams.

Table 6 Additional Influent Wastewater Sampling Summary (May 14, June 25, and July 22, 2025)

Parameter	Units	May 14, 2025	June 25, 2025	July 22, 2025	Average Concentration
Influent Temperature	°C			23.6	23.6
Influent pH	pH units			7.33	7.33
Influent Alkalinity	mg/L as $CaCO_3$	267	241	276	261
Influent COD	mg/L	200	228	241	223
Influent fCOD	mg/L	118	132	136	129
Influent ffCOD	mg/L	78.1	71.3	78.9	76.1
Influent TKN	mg/L	48.8	51.6	49.7	49.2

Parameter	Units	May 14, 2025	June 25, 2025	July 22, 2025	Average Concentration
Influent TP	mg/L	4.88	15.1	31.5	17.1
Influent Mg	mg/L	21.4	9.46	12.2	14.3
Influent Ca	mg/L	76.2	67	59	67.4
Influent Acetic acid	mg/L	4.5	3.3	2.8	3.5
Total VFAs	mg/L	4.5	3.3	2.8	3.5

Notes:
°C - degrees Celsius; Ca - calcium; $CaCO_3$ - calcium carbonate; COD - chemical oxygen demand; f - filtered; ff - filtered and flocculated; Mg - magnesium.

Table 7 Additional Operational Data from Special Sampling Days (May 14, June 25, and July 22, 2025)

Parameter	Average BOD_5 Concentration	Average Ammonia Concentration	Average TSS Concentration	Average VSS Concentration
Influent Wastewater (mg/L)	124	46.8	140	126
Primary Clarifier Effluent (mg/L)	89		60	50
Plant Effluent (mg/L)	4.3	2.5	3.2	3.0
Plant Drain Pump Station No. 1 (mg/L)		148.5		
Plant Drain Pump Station No.2 (mg/L)		7.3		
RDT Filtrate (mg/L)	116		297	88.5
Centrate (mg/L)	69			
RAS (mg/L)			5,687	4,497

Notes:
No. - number; RAS - return activated sludge; RDT - rotary drum thickener.

4.2 Historical Plant Performance

Table 8 summarizes the historical plant performance data from January 2022 through December 2024.

Table 8 Historical Plant Performance Data (January 2022 through December 2024)

Parameter	Average	Minimum	Maximum
Primary Effluent BOD_5 (mg/L)	65	18	169
% Removal, Primary Clarifiers, BOD_5	47%	46%	64%
Primary Effluent TSS (mg/L)	39	10	201
% Removal, Primary Clarifiers, TSS	71%	47%	74%
Aeration MLSS (mg/L)	2,356	1,250	11,130
Aeration MLVSS (mg/L)	1,816	1,110	2,480
MLVSS:MLSS ratio, %	77%		
Aeration SVI (mL/g)	91		162(2)
Aerobic Sludge Retention Time, SRT, days	6		
Total Sludge Retention Time, SRT, days	10.4		
RAS TSS (mg/L)	6,201	1,540	14,500
Effluent BOD_5, mg/L	3.7	1.7	22.2

Parameter	Average	Minimum	Maximum
Effluent TSS (mg/L)	3.6	1.9	28.2
Effluent TKN (mg/L)	0.4	0	7.4
Effluent NH_3-N (mg/L)	0.3	0	5.2
Effluent pH (SU)	7.1	6.5	7.5
Effluent Wastewater Temperature (°C)	19	13	
Effluent Fecal Coliform, CFU/100 mL	32.8	1	1,510
Effluent Alkalinity, mg/L as $CaCO_3$	244	242	247
Effluent UVT (%)	75	43	85
Magnesium Hydroxide usage (gpd)	370	34	600

Notes:
(1) TKN loadings based on assumed NH_4/TKN ratio of 0.70.
(2) 90th percentile of daily data.
CFU/100 mL - colony-forming units per 100 milliliters; gpd - gallons per day; mL/g - milliliters per gram; MLSS - mixed liquor suspended solids; MLVSS - mixed liquor volatile suspended solids; SRT - solids retention time; SVI - sludge volume index; UVT - ultraviolet transmittance; WAS - waste activated sludge

SECTION 5 PLANT UNIT PROCESSES AND UNIT OPERATIONS

This section presents an evaluation of each unit treatment process, comparing the rated or installed capacity with the treatment requirements under current and projected flows and loadings through the 2045 planning year. Any deficiencies or limitations in the plant's installed capacity to meet regulatory and operational requirements by 2045 are also summarized.

To this end, the unit process analysis was completed through the following sequential tasks:

- Compiled and analyzed three years of WWTF data (January 2022 through December 2024).
- Developed a hydraulic model of the collection system to estimate future ADF, maximum month flow (MMF), maximum day flow (MDF), and peak hour flows (PHF) at the WWTF.
- Estimated future flows and mass loadings anticipated through the planning year 2045.
- Prepared spreadsheet-based capacity estimates of existing liquid and solids processes to meet anticipated permit conditions under current and future influent characteristics.
- Updated and recalibrated hydraulic and BioWin models with recent plant data (May to June 2025) to assess future flow and loading impacts on facility performance. Both models were originally developed for the 2024 GSP and were updated and recalibrated using recent plant data. Monthly operating data from May 2025 was used to calibrate the BioWin model.
- Conducted plant tours in June 2025 to review and update prior condition assessments prepared as part of the 2024 GSP and identify any limitations.
- Using both the spreadsheet-based capacity assessment and the results of the calibrated hydraulic and BioWin models, determined future treatment capacities required for each unit process and estimated the optimal timing of necessary plant improvements.

The following sections highlight key points and findings from the above tasks.

5.1 Projected Plant Influent Flows and Loads

Table 9 summarizes the past year (2024) and projected (2045) flows and loads that must be treated and discharged to the Columbia River. These projections were developed based on historical influent flows and raw wastewater pollutant concentrations, typical septage and septic tank effluent pump (STEP) system characteristics, population growth projections, and industrial flow contributions. Projected future flows are based on Comprehensive Plan 2045 land uses and wastewater flow factors developed for the various land uses as part of the 2025 GSP. Chapter 3 Basis of Planning provides details on the methods used to develop these flow and load projections.

Table 9 Year 2045 Projected Flows and Estimated Influent Pollutant Characteristics

Parameter	Criteria	Units	Year 2045 Value
Influent Flow	AAF	mgd	5.36
	Maximum Month Peaking Factor	----	1.4
	MMF	mgd	7.5
	Maximum Week Peaking Factor	----	1.4
	MWF	mgd	8.6
	Maximum Day Peaking Factor	----	2.0
	MDF	mgd	10.7
	Peak Hour Peaking Factor	----	3.80
	PHF	mgd	20.4
	Peak Instantaneous Design Peaking Factor	----	4.15
	PIDF	mgd	22.2
$cBOD_5$[1]	AAD	mg/L	135
	AAD Mass	ppd	6,035
	MMAD Peaking Factor	----	1.25
	MMAD Mass	ppd	7,544
	MWAD Peaking Factor	----	1.4
	MWAD Mass	ppd	8,449
	MD Peaking Factor	----	1.5
	MD Mass	ppd	9,052
TSS	AAD	mg/L	130
	AAD Mass	ppd	5,811
	MMAD Peaking Factor	----	1.25
	MMAD Mass	ppd	7,264
	MWAD Peaking Factor	----	1.4
	MWAD Mass	ppd	8,136
	MD Peaking Factor	----	1.6
	MD Mass	ppd	9,298

Parameter	Criteria	Units	Year 2045 Value
TKN	AAD	mg/L	55
	AAD Mass	ppd	2,459
	MMAD Peaking Factor	----	1.15
	MMAD Mass	ppd	2,827
	MWAD Peaking Factor	----	1.20
	MWAD Mass	ppd	2,950
	MD Peaking Factor	----	1.4
	MD Mass	ppd	3,442

Notes:
AAD - annual average day; MD - maximum day; MMAD - maximum month average day; MWAD - maximum week average day; MWF - maximum week flow.

5.2 Spreadsheet Based Assessment of Activated Sludge Treatment Capacity

A spreadsheet-based desktop capacity analysis of the existing activated sludge treatment process was performed using current and projected influent wastewater characteristics to evaluate compliance with the effluent permit conditions. The analysis used the future flows and loads summarized in Table 9. Five-day carbonaceous biochemical oxygen demand ($cBOD_5$) values were increased by 10 percent for the purpose of sizing the activated sludge process. This was done to account for the effect of the nitrification inhibitor used in standard $cBOD_5$ tests.

Table 10 presents the process assumptions used for the desktop capacity analysis.

Table 10 Process Assumptions for Capacity Check of the Activated Sludge Process

Parameter	Criteria	Units	Value
Water Temperature	Minimum	°C	15.0
	Maximum	°C	26.0
Air Temperature	Minimum	°C	1.0
	Maximum	°C	35.0
Relative Humidity	Minimum (during summer)	%	60
	Maximum (during winter)	%	90
Site Elevation		Feet above MSL	40
Oxygen demand peak factor	Peak Loading	----	2.0
Process DO concentration (1)		mg/L	0.5 – 2.0
Aerobic SRT	Nitrification Safety Factor	----	2.0
	Minimum	days	8.0
Net Yield	MMAD	lb SS/lb $cBOD_5$	0.9
Clarifier Settling	SVI (98th Percentile)	mL/g	160
	SVI Formula	----	Diagger-Roper
	Clarifier Safety Factor	----	1.3
	Peak Surface Overflow Rate	gpd/sf	1,200

Parameter	Criteria	Units	Value
No. of Aeration Basins			3
Total Volume of Aeration Basins	All 3 Basins Combined	MG (cf)	2.263 (302,580)
	Anaerobic Selector Volume (2)	MG (cf)	0.133 (17,801)
	Anoxic Volume (2)	MG (cf)	0.810 (108,367)
	Aeration Volume (2)	MG (cf)	1.319 (176,412)
Primary Clarifier BOD_5 and TSS Removals	AAD	% (BOD_5/TSS)	30/54(3)
	MMAD		26/47
	MWAD		25/44
	MD		19/34
No. of Secondary Clarifiers			3(4)
Diameter of Secondary Clarifiers		feet	75

Notes:
(1) Spatial DO concentration in the aerobic zone. The maximum is 2.0 mg/L assumed during typical average day conditions and 0.5 mg/L at peak oxygen demand condition.
(2) Total Volume for all three Basins.
(3) The average BOD_5 removal of the existing primary clarifiers is ~46%.
(4) One of the secondary clarifiers (No. 1) is offline and needs to be demolished and rebuilt.
cf - cubic feet; DO - dissolved oxygen; lb SS/lb - pounds of suspended solids per pound; MSL - mean seal level.

The City's WWTF does not use Secondary Clarifier No. 1 because its flat bottom severely limits the withdrawal of settled mixed liquor, thereby negatively affecting RAS rates and the associated treatment capacity.

Activated sludge capacity curves are a graphical tool that can be used to estimate the treatment capacity of an activated sludge process. The operating MLSS concentration is the one parameter that is common to establishing the integrated or combined capacity of the biological reactors and the secondary clarifiers. Capacity curves use the MLSS concentration to graphically illustrate this integrated capacity of both unit processes as a function of the MLSS concentration. The capacity of the biological reactors increases linearly with increasing MLSS concentration while the clarifier capacity is an exponential function that increases with decreasing MLSS concentration. Therefore, the intersection of the aeration tank and clarifier curves represents the maximum capacity of the integrated process under the assumptions used to construct the graph (SRT, net yield, SVI, safety factors, etc.). However, the activated sludge process can operate successfully at any point on the capacity graph that is under both the aeration tank curve and the clarifier curve.

Figure 1 presents a capacity chart for the current operating conditions with two secondary clarifiers in service, based on the average values summarized in Table 8 for plant performance. The current capacity is estimated to range from approximately 3.1 to 4.6 mgd, depending on the SVI, using the maximum week organic loading for the biological reactors and the peak hour flow for secondary clarifier capacity, in accordance with Table G2-1 of the *Criteria for Sewage Works Design* (August 2008, Ecology).

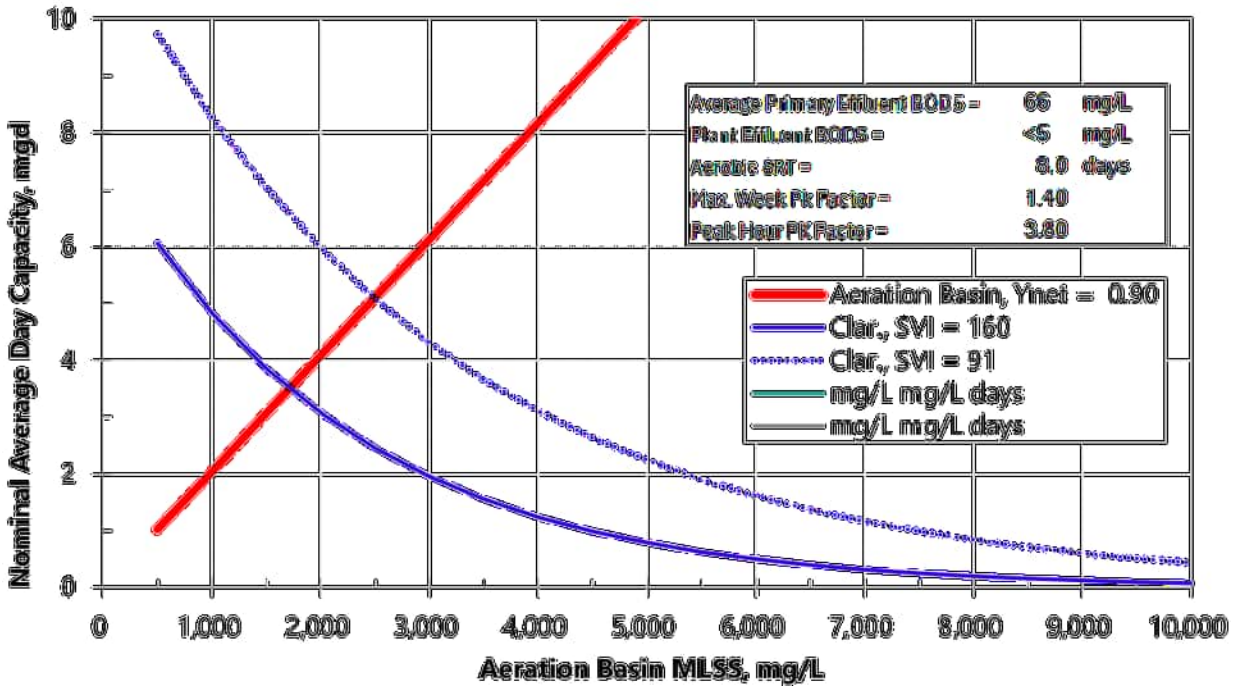


Figure 1 Capacity Chart - Current Operations with Three Aeration Tanks and Two Secondary Clarifiers

Capacity curves (and steady-state process simulation models) assume or predict the biomass inventory and the resulting MLSS concentration that results from a constant uniform plant influent flow with the assumed pollutant concentrations, thus these capacity estimates are relatively conservative. Peak flows and influent loads to wastewater treatment facilities are dynamic, short duration events during which both flow and pollutant mass loads vary. For maximum day and peak hour events, the MLSS concentration remains near the pre-storm MLSS concentration and not at the much higher concentration that would develop if the peak loads lasted for multiple days. While the MLSS concentrations will increase over the course of maximum week events, dynamic simulations are required to quantify the expected increase in MLSS concentrations and the resulting effect on treatment capacity.

In addition, during wet weather periods activated sludge processes can be operated at lower SRTs with lower MLSS concentrations to reduce the stress on the secondary clarifiers.

Secondary clarifiers will experience different behavior during peak flow events that cannot be accurately predicted using steady-state methods. Secondary clarifiers perform normally until the solids loading rate exceeds the capacity of the clarifier(s) at which time the sludge blanket will begin to propagate upwards in the clarifier. Depending on the magnitude and duration of the peak flows, the depth of the sludge blanket may or may not increase enough to result in large concentrations of TSS leaving in the clarifier effluent. Again, dynamic models can provide much better predictions of wet weather performance and thus help to size the treatment facilities appropriately.

For the reasons discussed above, common industry practice when using steady-state methods evaluates the capacity of activated sludge processes using the maximum month mass loadings and either maximum day or PHFs. This better portrays the condition that the secondary clarifiers will experience during peak flow events. Under maximum month organic loads and MDFs, the existing WWTF has an estimated capacity between about 4.4 and 6.3 mgd with three aeration tanks and two secondary clarifiers in service.

5.3 State Point Analysis

The relationship between MLSS concentrations, plant flows, and clarifier capacity can also be illustrated by another graphical method commonly called state point analysis as described below.

A clarifier state point analysis determines the effect of operating conditions on secondary clarifier capacity by comparing the actual solids loading to the theoretical maximum solids loading rate in pounds per day per square foot (ppd/sf) of the clarifier surface area as a function of the MLSS concentration. Key factors in a state point analysis are the MLSS concentration, the flow fed to the clarifiers, and the settling velocity of the MLSS as predicted by the selected correlation between SVI and settling velocity. State point analyses are very useful for predicting the ability of secondary clarifiers to operate successfully under peak flow conditions.

The state point diagram is constructed by drawing overflow and RAS underflow lines on a graph of MLSS concentration versus clarifier solids loading rate together with a solids flux curve. The solids flux curve represents the maximum possible solids loading rate to the clarifier as a function of MLSS concentration while maintaining the desired solids separation efficiency. The overflow line starts from the origin, with a slope equal to the overflow rate on the clarifiers in gallons per day per square foot (gpd/sf). The RAS line is drawn from the intersection of the overflow line and the MLSS concentration to the RAS concentration on the horizontal axis. The intersection of the overflow and RAS underflow operating lines (or state point) represents the operating point for the clarifier. If the operating point is underneath the solids flux curve and the RAS line remains below the falling limb of the solids flux curve, the clarifier is in a safe operating mode. Secondary clarifiers must operate successfully under design maximum day and peak hour flows without failing.

A state point analysis of the secondary clarifiers at the WWTF was conducted, and the results for peak flow conditions are shown in Figure 2. The state point diagram represents estimated settling characteristics based on the Daigger and Roper correlation between SVI and MLSS settling velocity. While a clarifier safety factor of 1.3 is typically used, the analysis indicates that with four secondary clarifier s online, the facility will be able to treat the 2045 design PHF of 20.4 mgd at a maximum MLSS concentration of 2,800 mg/L with no clarifier safety factor (SF = 1.0).

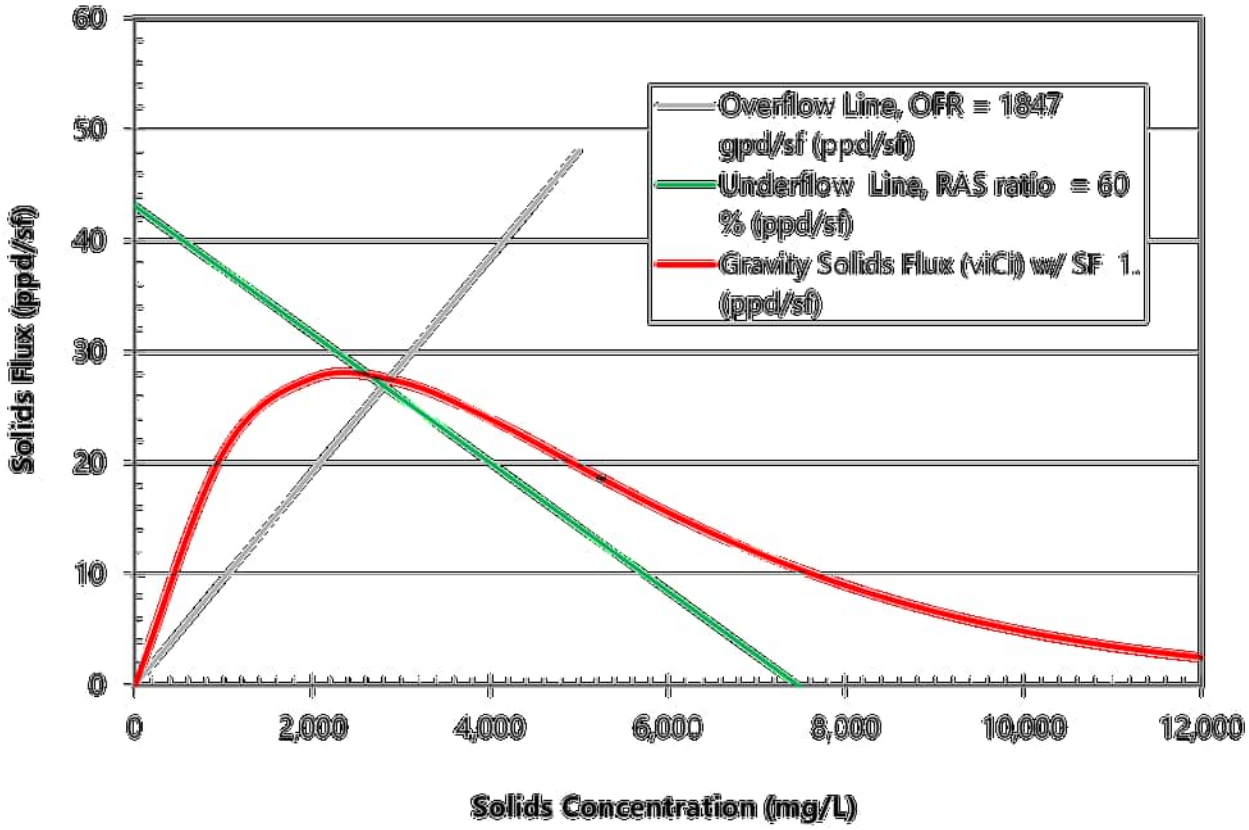


Figure 2 State Point Analysis - 2045 Peak Hour Flow with Four Secondary Clarifiers On-line

The desktop analysis indicates that the City should reconstruct Secondary Clarifier No. 1 with a new sloped bottom and spiral scraper mechanism identical to the existing Secondary Clarifier No. 3, as well as constructing a fourth Secondary Clarifier (No. 4) in the future (by 2040) to provide adequate capacity to treat flows and loads through 2045 and beyond.

The statistical evaluation of historical plant data revealed periodic occurrences of sludge bulking in the BNR process. For the three years of data examined there were three periods where the SVI's exceeded the proposed design SVI of 160. A chronological chart of daily SVIs and a frequency of occurrence chart are provided in Appendix B.

Although these periods present less than 10 percent of the days in that two-year period, they are a concern as they indicate that the current method of bulking control (chlorination) takes weeks to be effective. All three episodes occurred in winter or early spring when peak wet weather flows typically occur. The secondary clarifiers could fail in the future (when both plant flow and peak flows are projected to be higher than existing flows) if the peak flows occur during a bulking episode.

There have been significant advances in the last decade in the use of selectors and other methods of obtaining a densified activated sludge that provides lower and more stable operating SVIs. It is recommended that the WWTF evaluate the causes of the bulking including identification of the causative organisms and evaluate the feasibility of implementing at least one of the methods before or during the next design and construction project at the WWTF.

5.4 Process Simulation (BioWin Modeling)

For this update to the GSP the BioWin process simulation model developed for the previous version of the GSP was updated and calibrated with new data. Process simulation models like BioWin and others are computer applications consisting of simplified, mathematical representations of real-world physical, chemical, and biological treatment processes. They represent the state-of-the-art for the evaluation of biological wastewater treatment processes like those used at the City WWTF.

All process modeling was done with the BioWin Process Simulator Version 6.3 developed by EnviroSim Associates Ltd. BioWin simulates biological, chemical, and physical reactions using an integrated process model, and provides simulation results in user defined tables and charts. BioWin can model 82 different processes with up to 50 state variables and nine types of biomasses. This typically results in reliable predictions of expected performance for most commonly used biological wastewater treatment systems.

This calibration of the BioWin model for the WWTF used model defaults and assumptions refined using four categories of plant information including:

- Physical Plant Data - This is the dimensional data (e.g., volume, surface area) and configuration of the unit treatment processes.
- Influent Data - This is the influent flow and concentration data, including characterization of influent wastewater composition in terms of various fractions such as the particulate, colloidal, and soluble fractions of organic materials.
- Plant Operational Data - This includes RAS and WAS flow and mass rates, mixed liquor recycle rates, and DO concentrations in the aeration basins, etc.
- Kinetic and Stoichiometric Coefficients - For typical domestic wastewater modification of kinetic and stoichiometric coefficients is not necessary.

For this update to the GSP the BioWin model was calibrated using existing treatment facility operational data from January 2022 through December 2024 supplemented by data obtained from the special sampling events, and by running a dynamic simulation using the daily plant influent and effluent values (BOD_5, TSS, NH_3) and MLSS concentrations from May 2025.

Once the calibration effort was deemed acceptable, parameters were established for future conditions under which the WWTF must operate. Specifically, this effort adopted the flows and load projections presented in Tables 4 and 5 while assuming that effluent limits on ammonia would be as low as 7 mg/L for all scenarios. This is the highest allowable average monthly winter concentration of ammonia. Monthly averages are calculated from the sum of the measured daily discharge concentrations divided by the sum of the number of measurements over a calendar month.

5.4.1 Model Configuration

Figure 3 provides the process flow diagram used for the process simulations for the existing WWTF.

The key geometric features of the process as input to the model are summarized in Tables 11, 12, and 13. Detailed information on the proposed tank geometry from which the model input was derived are provided in Appendix C along with the geometry input to the model.

Table 11 Summary Geometry for the Bioreactors in the BioWin Model of the Wastewater Treatment Facility(1)

Zone	2025		2045	
	Zone Volume (MG)	Fraction Total (%)	Zone Volume (MG)	Fraction Total (%)
Selector	0.088	5.8%	0.066	2.9%
Anoxic(2)	0.270	17.9%	0.876	38.7%
Aeration	1.149	76.2%	1.320	58.4%
Total	1.507	100.0%	2.262	100.0%
Total anoxic(2)	0.238	23.8%	0.942	41.6%
Total aerobic	0.762	76.2%	1.320	58.4%

Notes:
(1) Simulations of 2025 conditions assumed two bioreactors and two secondary clarifiers in service; simulations of 2045 conditions assumed three bioreactors and four secondary clarifiers in service.
(2) For simulations of 2045 conditions the mixed liquor recycle was directed to the first anoxic zone and the second anoxic zone was simulated as an aerated bioreactor. The same, modified configurated was used for all bioreactors.

Table 12 Tank Geometry for Additional Unit Processes Used in the Wastewater Treatment Facility Process Simulation Model

Tank/Zone	No.	Diameter (feet)	Depth (feet)	Unit Area (sf)	Unit Volume (MG)	Total Area (sf)	Total Volume (MG)
Primary clarifiers	2	60.00	10.00	2,827	0.21	5,655	0.42
Secondary clarifiers(1)(2)	2/4	75.00	14.00	4,418	0.46	8,836	0.92
Anaerobic digesters	2	32.00	29.50	804	0.177	1,608	0.355
Gravity sludge thickener	1	30.00	10.00	707	0.053	707	0.053

Notes:
(1) Models of the existing process assumed two of the three existing secondary clarifiers were in service. Models simulating 2045 MMAD operation assumed four clarifiers in service.
(2) All model simulations used a clarifier depth of 14 feet. However, all existing clarifiers have different SWD. New clarifiers (No. 1 and No. 4) would be 75 foot diameter and have a 17 foot SWD to match existing clarifier No. 2. Clarifier No. 3 is shallower at 14 feet SWD.
sf - square feet; SWD - side water depth.

For simulations of 2025 conditions the WAS flow rate was controlled to match the historical mixed liquor suspended solids concentrations in the biological nutrient removal (BNR) process. For the 2045 simulations the WAS flow rate was controlled to provide the desired aerobic solids retention time (aSRT).

For all simulations, the RAS flow rate was held constant at a flow ratio of 0.6: 1 relative to the influent flow to match the historical data.

For both the 2025 and 2045 simulations the Internal mixed liquor recycle flow was held constant at 9 mgd to match the reported capacity of the internal recycle pumps. This is a total mixed liquor recycle ratio of 3.2: 1 relative to the current influent flow at 2.8 mgd and about 1.7: 1 for 2045 ADF. For the 2025 calibration the mixed liquor recycle was split with about half directed to the first selector zone and half to the third selector zone. For the simulations of future conditions, the mixed liquor recycle was directed to the first anoxic zone.

Supplemental alkalinity was assumed to be provided by adding magnesium hydroxide with a concentration of 7.7 pounds per gallon or 923,593 mg/L. For modeling purposes, magnesium hydroxide

was used for supplemental alkalinity as this is the chemical currently used by the plant. However, adding magnesium to the process increases the potential for struvite formation. It is recommended that the plant evaluate the use of an alternative source of supplemental alkalinity. No supplemental carbon was added in the simulations since the WWTF does not have a limit on oxidized nitrogen. However, maximizing denitrification in the BNR process through operation changes should recover a fraction of the alkalinity consumed by nitrification and reduce the need for supplemental alkalinity.

Assumed solids recoveries used in the model for the solids processing units and filters are provided in Table 13. The solids recovery for the sludge thickeners was adjusted to approximate the historical thickened sludge concentrations. Effluent filtration was simulated using the BioWin Separator – Dewatering unit with an assumed 55 percent removal of suspended solids to match historical performance. The filter backwash flow rate was set to 2 percent of the influent flow.

Table 13 Solids Recovery Assumed in Process Simulation Model

Unit Process	Assumed Solids Recovery (%)	
	May 2025 Calibration	2045 Average Day Maximum Month
Primary Clarifiers(1)	70	34 - 54
Gravity Thickener	95	95
Rotary Drum Thickener	85	85
Centrifuge	88	88
Dryer	95	95
Tertiary Filters(2)	35	55

Notes:
(1) Primary clarifier TSS removal was varied as a function of the surface loading rate using a common correlation between SLR and TSS removal.
(2) In the BioWin model, tertiary filtration was simulated using the solids separation module. As this module uses a constant TSS removal percentage regardless of influent flow or TSS, the assumed TSS removal by the filters in the model was adjusted so that the predicted TSS in the filter effluent would be consistent with expected performance.

Aeration was modeled in the BNR train by setting the operating DO concentrations and letting the model predict airflow and the actual oxygen transfer rates (AOR). The model default values were used for alpha (0.50) and beta (0.95) for the calibration runs and changed to 0.55 and 0.99 for the 2045 simulations. Both sets of values are conservative estimates of the ability to transfer oxygen in the mixed liquor of a BNR process using typical 9-inch circular fine pore diffusers. The aeration profile is provided in Table 14.

Table 14 Dissolved Oxygen Input for Biological Nutrient Removal Train in Process Simulation Model

Element	2025	2045
Selector 1	Unaerated	Unaerated
Selector 2	Unaerated	Unaerated
Selector 3	Unaerated	Unaerated
Anoxic 1	Unaerated	Unaerated
Anoxic 2	Unaerated	2.0
Aeration 1	0.5	2.0
Aeration 2	1.0	2.0
Aeration 3	1.0	2.0

5.4.2 Influent Wastewater Characteristics

The flows and concentrations input to the model were developed from the statistical analysis of the historical data from 2022 through 2024 and the special sampling data (presented previously in Tables 6 and 7) and are shown in Table 15. The BioWin Influent Specifier was used to estimate the values for the influent parameters and characteristic fractions needed for the process simulations but not typically measured. For the 2045 simulations the estimated influent fractions from May, June and July 2025 were averaged.

All May 2025 simulations were done using the reported daily mixed liquor temperatures while all the 2045 simulations assumed a wintertime wastewater temperature of 15°C.

Table 15 BioWin Model Influent Parameters(1)

Name	Units	2025	2045
Flow	mgd	2.8	7.5
COD	mg COD/L	260	300
TKN	mg N/L	60	55
TP	mg P/L	4.5	3.0
TS	mg S/L	10	62
Nitrate	mg N/L	0	0
pH	SU	7.2	7.3
Alkalinity	mg $CaCO_3$/L	260	260
ISS	mg ISS/L	34	13
Ca	mg/L	60	67.4
Mg	mg/L	10	14.3
DO	mg/L	0	0
Water Temperature	°C	15	15

Notes:
(1) For 2025, these are the average values for May 2025. For 2045 these are the design average day maximum month values.
ISS - inert suspended solids; mg - milligrams; N/L - nitrogen per liter; P/L - phosphorus per liter; S/L - solids per liter; TS - total solids.

The process configuration used in the BioWin model is presented in Figure 3 for the existing WWTF. The future configuration is identical with the exception that all the internal mixed liquor recycle is returned to the first pre-anoxic zone.

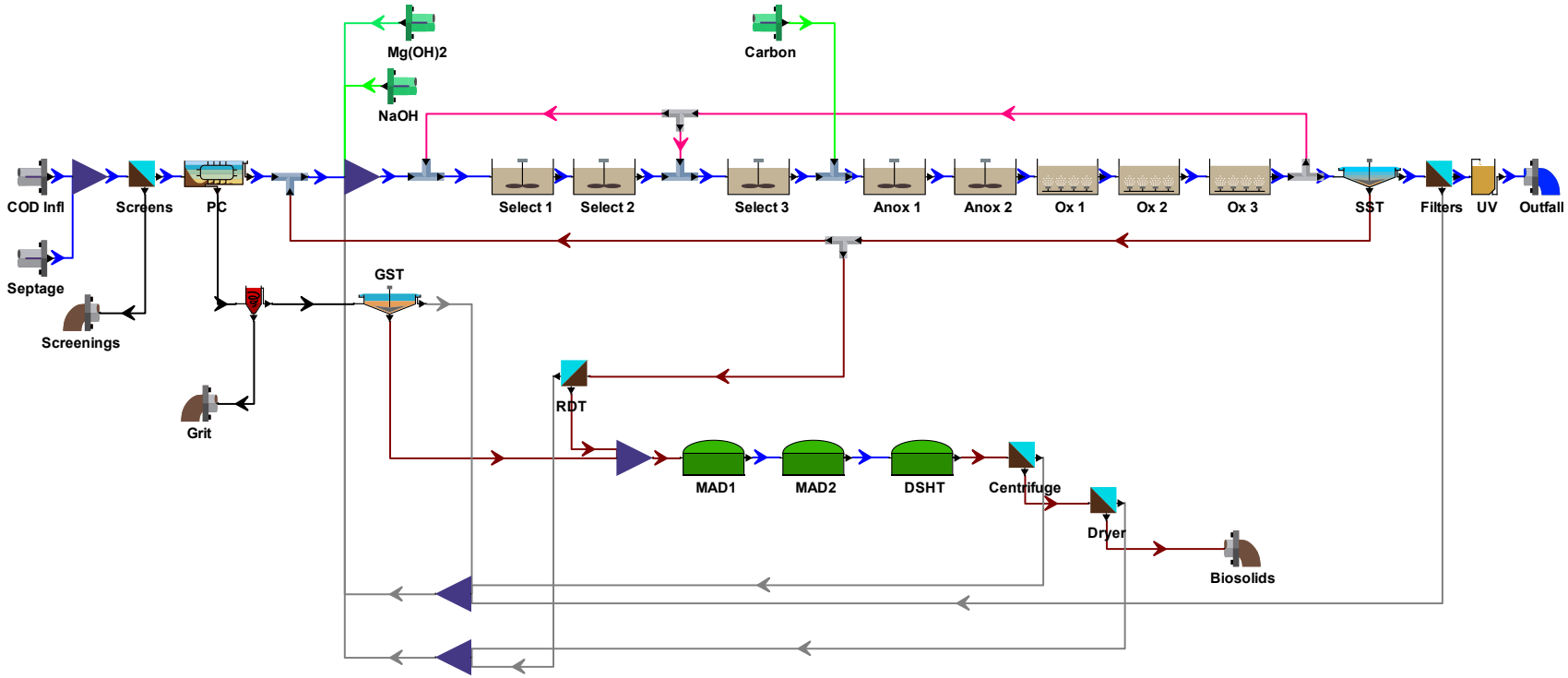


Figure 3 Process Flow Diagram Used in the BioWin Model of the Existing Camas Wastewater Treatment Facility

5.4.3 Model Kinetic and Stoichiometric Parameters

Model default values were used for kinetic and stoichiometric parameters except for the maximum specific growth rates for ordinary heterotrophic organisms and ammonia oxidizing bacteria. The values for these two parameters were set at 2.0 day^{-1} and 0.70 day^{-1} respectively to better match the predicted effluent $cBOD_5$ and ammonium concentrations to reported concentrations. This suggests that there may be one or more toxic compounds in the raw wastewater that inhibit the growth of both heterotrophs and nitrifiers. This is typical of the semiconductor industry.

The settling coefficients for the Modified Vesilind equation used in BioWin were changed to be representative of a mixed liquor with a SVI of 160 using the Daigger correlation between SVI and mixed liquor settling velocities. The values used were 0.340 feet per minute for the maximum Vesilind settling velocity and 0.418 liters per gram for the Vesilind hindered zone settling parameter.

5.4.4 Model Results

Model calibration simulations were performed at existing average daily flows and pollutant concentrations for May 2025 were applied for several purposes including:

- Checking predicted effluent quality.
- Checking historical MLSS for May 2025 against predicted performance.
- Checking predicted MLSS for 2045 average day maximum month mass loads at the desired minimum aerobic solids retention time of eight days.
- Preparing a mass balance for the treatment plant for the 2045 average day maximum month mass loads.

For the 2045 simulations, the main purpose of the simulations was to verify that proposed improvements would result in a robust facility that treats the projected future flows and mass load while meeting the current NPDES permit requirements.

Summaries of the actual and predicted effluent concentrations for the key effluent parameters from the May 2025 calibration simulations are provided in Tables 16 and 17. For those parameters that are monitored by the plant, the predicted effluent concentrations are close to those measured. As can be seen in Table 16, the predicted concentrations match the measured values reasonably well.

Table 16 Summary of Predicted Effluent Concentrations(1)

Parameters	Predicted Concentration (mg/L)(2)	Reported Concentration (mg/L)
Alkalinity (mg $CaCO_3$/L)	256	244
BOD – Total	2.5	3.3
COD - Total	26	---
TSS	3.6	2.8
N - Ammonia	0.19	0.31
N - TKN	2.2	0.44
N - Nitrate	37	---
N - Nitrite + Nitrate	37	---

Parameters	Predicted Concentration (mg/L)(2)	Reported Concentration (mg/L)
N - Nitrite	0.06	---
N - Total inorganic N	37.2	---
TP	4.6	---
pH	7.0	7.3

Notes:
(1) For May 2025
(2) At 19.4 °C, 8.7-day aerobic SRT, IR ratio = 3.2: 1, RAS ratio = 0.6: 1.

The solids balance produced by the BioWin simulation for May 2025 did not match the available operating data in one key aspect. There is a notable difference between the model predictions for the mass of WAS and the value reported by the plant in the historical data.

This discrepancy in the predicted versus measured waste sludge values also shows when comparing the predicted net sludge yield with that calculated from the plant data. The net sludge is the mass of suspended solids wasted from an activated sludge process divided by the mass of $cBOD_5$ removed in the process. This parameter provides a simple way to check or estimate the mass of sludge produced in an activated sludge process and the value is generally in the range of 0.6 to 1.0. The net sludge yield predicted by the process model is about 0.7 to 0.9 while the value calculated from the plant data is about 1.5.

There could be several reasons causing this difference between the predicted and measured WAS. These include the following:

- A historically non-representative sample location for the WAS.
- An inaccurate measurement of WAS mass. Many facilities have difficulty accurately measuring the WAS mass because they use total daily WAS flow but a TSS measurement from one grab sample to calculate mass. Since WAS TSS concentrations typically vary on a diurnal cycle this introduces the potential for error in the mass calculation.
- Inefficient operation of unit processes used to treat the solids generated by the treatment process. Low solids capture in a thickener or dewatering unit can recycle significant quantities of TSS which results in the need to operate with higher WAS rates.

5.4.5 Process Simulations

Finally, the BioWin model was used to model performance of the entire WWTF under the following anticipated future conditions:

- TSS removal rates of 54, 47, 44 and 34 percent were assumed for the primary clarifiers under 2045 AAD conditions, MMAD and MWAD and MD conditions.
- A minimum aSRT of 8.0 days under maximum month conditions and 6.05 days under maximum week conditions. These aerobic SRT result in nitrification safety factor of 2.9 and 2.2 under maximum month and maximum week flow conditions, respectively.
- A SVI, which is a quantification of MLSS settling velocity, of 160 mL/g.

The final clarifiers are expected to perform satisfactorily under the peak hour flow of 20.4 mgd at MLSS concentrations up to about 2,800 mg/L. Under maximum month mass loads, which will produce the maximum MLSS concentrations sent to the final clarifiers, the predicted MLSS concentration is about 3,000 mg/L with two primaries in service (~44 percent TSS removal). In addition to the process considerations, operating with two primaries under the predicted future PHFs, is expected to cause overflows in the headworks.

Although the plant should operate satisfactorily during anticipated future peak flows, due to the uncertainties inherent in predicting influent and operating conditions 20 years in the future, it is recommended to add a third primary clarifier. This will provide the following benefits to the WWTF:

- Maintain or increase primary clarifier BOD_5 and TSS removal efficiency.
- Decrease operating MLSS concentrations in the BNR process thus putting less stress on the final clarifiers during peak flows. With three primaries in operation, the predicted maximum month MLSS concentration drops to about 2,500 mg/L.
- Decrease process airflow demands thus facilitating the replacement of the existing multistage centrifugal blowers in the existing blower room.
- Lower process air power demands and thus reduce power consumption.
- Increase organic loadings to the anaerobic digesters thus increasing gas production and potentially lowering supplemental gas needed for the dryer.

Due to the decrease in primary clarifier performance with increasing surface loading rates, the maximum mass of primary sludge produced and the maximum concentrations of BOD5 and TSS in the primary effluent are expected to occur under maximum day loading.

5.5 Hydraulic Modeling

Carollo Engineers' Hydraulix® modeling software was used to establish the hydraulic capacities of individual unit processes and water surface elevations under 2045 peak flows. The model was built as part of previous GSP and modifications were made to the model based on the improvements made at the facility since the model was originally created in 2019. Hydraulic improvements shown in Figure 3 were implemented in the model to accommodate 2045 PIDF. More specifically, this software modeled the flow through the WWTF by calculating both the energy grade lines and hydraulic grade lines according to the head loss and velocity at each hydraulic element under various influent flow conditions identified in Table 17.

Table 17 Hydraulic Modeling Assumptions (Year 2045 Peak Instantaneous Day Flow)

Unit Process	2045 PIDF (22.3 mgd)	Assumptions
Plant Headworks	11.15 mgd per screen with 30% blinding and maximum headloss of 10 inches	Need minimum 12 inches freeboard at PIDF.
Primary Clarifiers	7.4 mgd/clarifier (3 online)	Flow split evenly between primary clarifiers. Bypass pipe available if one primary clarifier is out of service.
Aeration Basin Influent Flow Splitter Box	22.2 mgd + 60% RAS + 0.72 mgd (drain pump station 1) + 0.72 mgd (pump station 2) = 35.9 mgd	Replacement of aeration basin splitter box.

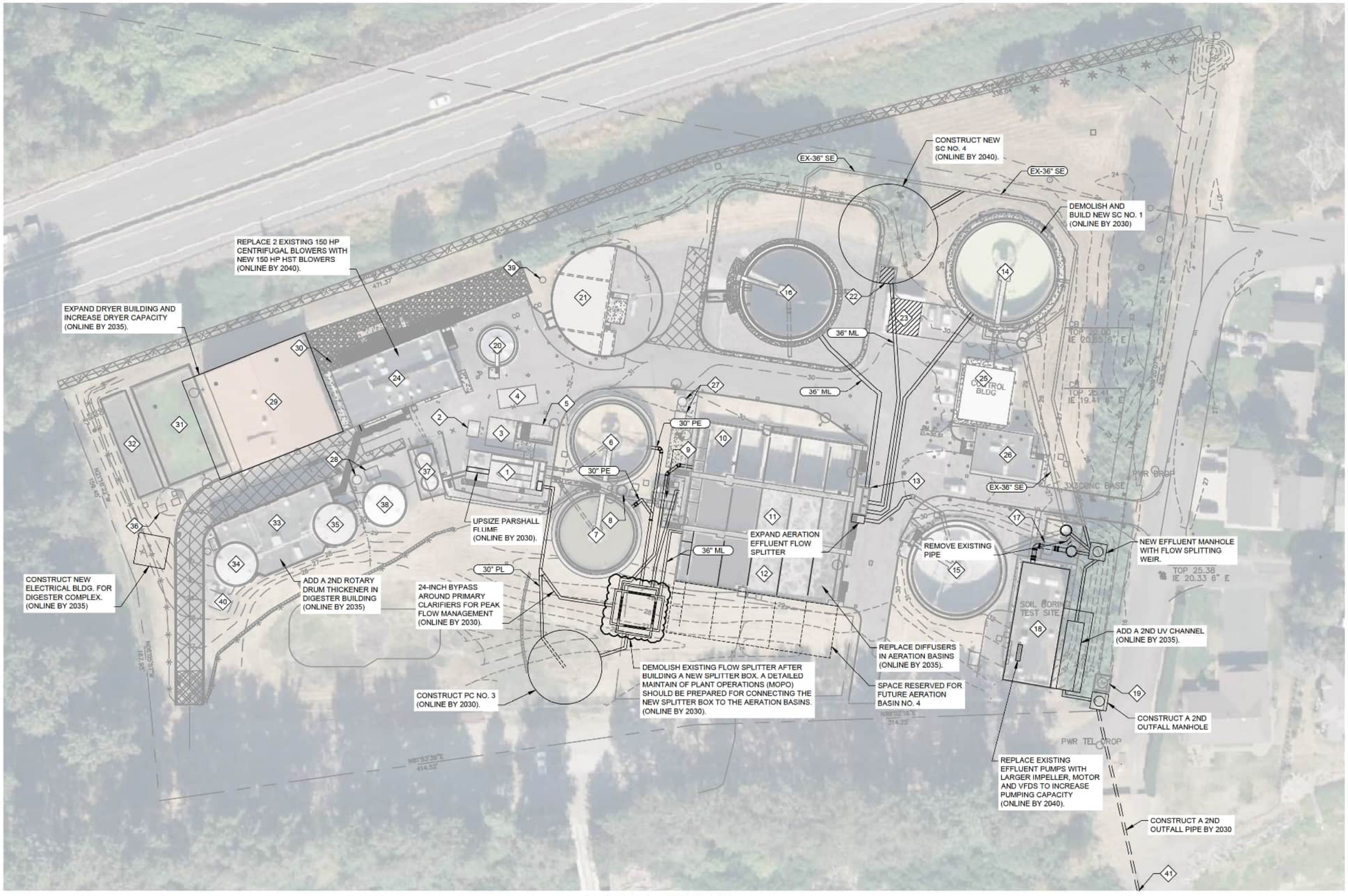
Unit Process	2045 PIDF (22.3 mgd)	Assumptions
Aeration Basins	7.4 mgd/basin (3 online) + 4.5 mgd IR/basin = 11.9 mgd/basin	Capacity of IR capped at 3,125 gpm (4.5 mgd)
Secondary Clarifiers	7.8 mgd/clarifier (3 online)	With Plant Drain Pump Stations online.
Tertiary Filters	2 filters online (each at 3 mgd) with 12 inches of headloss	Existing filter bypass utilized for flow over 6 mgd.
UV Disinfection	11.1 mgd (channel)	New UV channel. Upstream new effluent manhole with flow splitting weir to split flow between tertiary treatment.
Columbia River Outfall	11.1 mgd/outfall	Columbia River Water Elevation is assumed to be 15.0 feet.

Notes:
gpm - gallons per minute; IR - internal recycle; UV – ultraviolet.

Each individual unit process was considered "at risk" when the model indicated less than 18 inches of freeboard in a structure or less than six inches of fall from flow over a weir to the downstream water surface. A unit process was considered "overloaded," or as having a true hydraulic limitation when the model indicated less than 12 inches of freeboard or a weir was submerged. Less than 12 inches of freeboard in an open channel puts the WWTF at risk of flow overtopping a structure.

The following improvements are recommended to accommodate the 2045 peak flows. Refer to the proposed site plan showing new facilities (Figure 4 and 5) and details presented in Section 7:

1. Add a new secondary parallel UV disinfection channel with 3 UV banks identical to the ongoing UV improvements by 2040.
2. Construct a second outfall pipe and new effluent manhole for flow from new UV channel
3. Reconfigure secondary effluent piping to new effluent manhole with flow splitting weir to split flow between the two UV channels.
4. Demolish and construct existing Secondary Clarifier No. 1 and construct a new Secondary Clarifier No. 4.
    a. Upsize secondary clarifier influent piping to 36 inch mixed liquor (for all four secondary clarifiers).
    b. Expand secondary clarifier influent splitter box to accommodate for Secondary Clarifier No. 4.
5. Construct a new aeration basin influent flow splitting structure as shown on the site plan.
    a. Construct new 36 inch mixed liquor piping to the aeration basins between the aeration basin splitter box structure.
    b. Upsize primary clarifier effluent piping to 30 inch primary effluent and connect to new aeration basin splitter box.
6. Construct Primary Clarifier No. 3 and 30 inch primary clarifier bypass pipe from the headworks effluent box to the new aeration basin splitter box structure.
7. Upsize the Parshall Flume throat size in the existing headworks structure.



0 20' 40' 80'

SCALE: 1" = 40'

LEGEND:

1. HEADWORKS
2. SEPTAGE RECEIVING VALVE VAULT
3. SEPTAGE RECEIVING TANKS
4. SEPTAGE TRUCK UNLOADING PAD
5. VACTOR TRUCK UNLOADING PAD
6. PRIMARY CLARIFIER NO. 1
7. PRIMARY CLARIFIER NO. 2
8. PRIMARY CLARIFIER SCUM PUMP STATION
9. AERATION BASIN SPLITTER BOX
10. AERATION BASIN NO. 1
11. AERATION BASIN NO. 2
12. AERATION BASIN NO. 3
13. SECONDARY CLARIFIER SPLITTER BOX
14. SECONDARY CLARIFIER NO. 1
15. SECONDARY CLARIFIER NO. 2
16. SECONDARY CLARIFIER NO. 3
17. EFFLUENT FLOW METER VAULT
18. UV DISINFECTION / EFFLUENT PUMP STATION
19. EFFLUENT MANHOLE
20. GRAVITY THICKENER
21. SEPTAGE / CENTRATE / WAS STORAGE TANKS
22. STORAGE SHED (DEMOLISHED)
23. GARAGE (DEMOLISHED)
24. EQUIPMENT BUILDING
25. CONTROL BUILDING NO. 1
26. CONTROL BUILDING NO. 2
27. PLANT DRAIN PUMP STATION NO. 1
28. PLANT DRAIN PUMP STATION NO. 2
29. MODIFIED BIOSOLIDS DRYER BUILDING
30. SUCTION / DISCHARGE DRAIN MANHOLE
31. BIOFILTER NO. 1
32. BIOFILTER NO. 2
33. DIGESTER BUILDING
34. ANAEROBIC DIGESTER NO. 1
35. ANAEROBIC DIGESTER NO. 2
36. WASTE GAS BURNER
37. ALKALINITY CONTROL SYSTEM
38. DIGESTED SLUDGE HOLDING TANK
39. LOOP SEAL MANHOLE
40. DIGESTER GAS SCRUBBING SYSTEM
41. OUTFALL

OVERALL SITE PLAN

SCALE: 1" = 40'-0"

Figure 4
Proposed Site Plan Showing Hydraulic Improvements at City of Camas Wastewater Treatment Facility

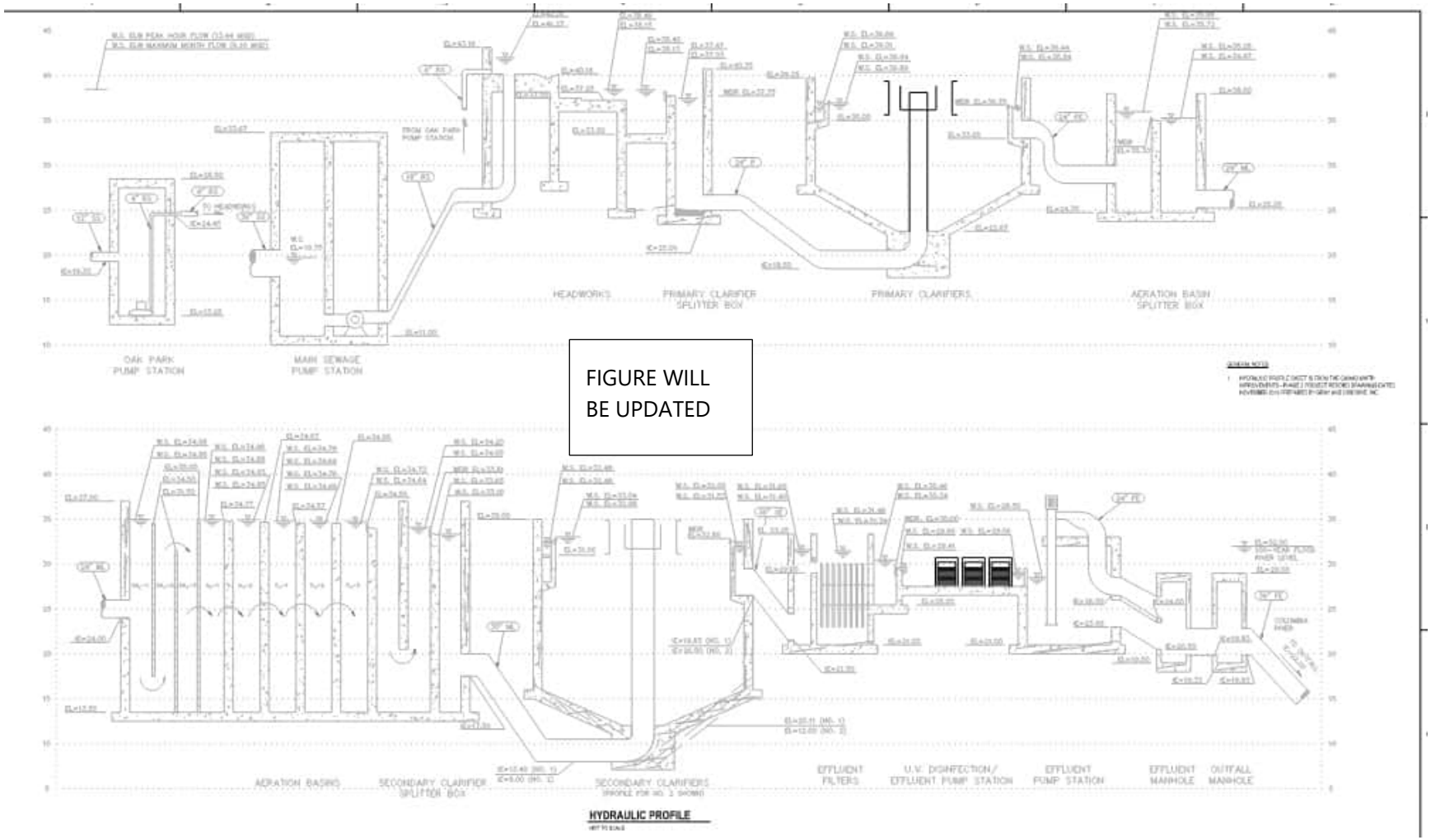


Figure 5 2045 Hydraulic Profile at Peak Instantaneous Design Flow

SECTION 6 CONDITION ASSESSMENT

A condition assessment was conducted as part of the 2024 GSP to identify major facility deficiencies and establish general priority ratings for mechanical equipment, treatment units, structures, and electrical, instrumentation, and control systems. The compiled information was updated during the plant tours conducted in June 2025 as part of the 2025 GSP to determine which portions of the facility can be retained, which require major upgrades, and which should be abandoned or replaced.

To begin, the assessment team reviewed drawings and design criteria for each unit process, including the recommended WWTF redundancy criteria for flows and loads as published in the *Criteria for Sewage Works Design* (August 2008, Department of Ecology) and summarized in Table 2.4 of Chapter 2.

Table 18 summarizes each key WWTF component's condition and rated capacity.

Next, the team discussed maintenance history, plant shortcomings, and general operational issues with City staff, who also accompanied the team on walk-through inspections of the WWTF following the general occurrence of the processes and associated major equipment in the direction of flow.

Table 18 2025 Condition Assessment Summary

WWTF Component	Rated Capacity	2019 Condition Assessment associated with 2024 GSP[1]	2025 Condition Assessment
Plant Headworks			
Influent Pipe	▪ N/A	▪ Headworks influent pipe configuration occasionally causes upstream overflow at the Parshall Flume during high flows.	▪ Same observation as in 2024 Condition Assessment. Influent piping should be modified by installing a rigid plate or concrete cover.
Influent Screens and associated washer/compactors	▪ Two mechanical screens. 7 mgd per screen, total 14 mgd. ▪ Washer/compactors are rated for 10 cf per hour.	▪ No significant condition issues identified.	▪ One of the influent screens needs a bearing replacement, and the plant is planning on doing this repair in-house.
Manual Bar Rack	▪ One manual bar rack.	▪ No significant condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Slide Gates	▪ Seven slide gates.	▪ No significant condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Primary Clarifiers	▪ 60 foot diameter, 10 foot SWD. ▪ SOR - 3,608 gpd/sf at PHF with both units operational.	▪ No significant condition issues identified.	▪ Severe corrosion of clarifier mechanisms; city replacing internals of both clarifiers as part of ongoing project
Aeration Basin Influent flow splitter box	▪ N/A	▪ N/A	▪ One shaft mixer was non-operational; staff noted the structure's freeboard is limited during high-flow events.
Aeration Basins	▪ Three aeration basins – 120 feet long, 40 feet wide and 21 feet SWD. ▪ ~3.9 to 5.7 mgd on max. week loading (3 aeration basins, 3 secondary clarifiers at SVI of 90 - 160 mL/g).	▪ Flow split between the 3 basins is uneven. ▪ Weir walls between the zones are uneven. Wooden walls in anaerobic zones	▪ Same observation as in 2024 Condition Assessment. Also, the internal recycle from the end of the aerobic zone is sent to the end of the anaerobic zone.
Secondary Clarifiers	▪ Three 75 foot diameter secondary clarifiers, 15 foot SWD.	▪ Secondary Clarifier. No. 1 is non-operational due to its flat bottom	▪ Same observation as in 2024 Condition Assessment.
Aeration System	▪ Four 150 hp centrifugal blowers. ▪ Firm capacity of 4,890 scfm at 10 psig.	▪ Unable to control blowers when operating multiple in parallel	▪ Same observation as in 2024 Condition Assessment. City is replacing two 150 hp blowers with 100 hp high speed turbos ; however, the new and old blowers will not be able to operate together.
Effluent Filters	▪ Two Cloth disk filters (10 micron). 3 mgd per filter, total 6 mgd.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment. Plant staff indicated the filters are backwashing 30% of the time, which is higher than the anticipated 20% or less.
UV Channel	▪ Four UV banks. ▪ 13.7 mgd at 65% UVT.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment. City is replacing the existing UV system with new UV system as part of an ongoing project.
Effluent Transfer Pumps	▪ Three 4,550 gpm at 16 feet TDH, 30 hp pumps. Firm Capacity is 13.09 mgd	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Non-potable Water Transfer Pumps	▪ Three 200 gpm at 185 feet TDH, 15 hp pumps.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment. City is replacing the motors for these pumps with new motors and variable frequency drives as part of an ongoing project.
RAS Pumps	▪ Each SC has two RAS pumps. ▪ Secondary Clarifier No. 1 has two pumps 1,000 gpm each. ▪ Secondary Clarifier No. 2 has two pumps 1,050 gpm each. ▪ Secondary Clarifier No. 3 has two pumps 1,400 gpm each.	▪ No condition issues identified. Secondary Clarifier No. 1 is not operation.	▪ Same observation as in 2024 Condition Assessment. ▪ City is replacing the VFD for a couple of RAS pumps as part of an ongoing project.
WAS Pumps	▪ Each Secondary Clarifier has one WAS pump. ▪ Secondary Clarifier No. 1 has one pump 85 gpm. ▪ Secondary Clarifier No. 2 has one pump 85 gpm. ▪ Secondary Clarifier No. 3 has one pump 240 gpm.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Primary Sludge Pumps	▪ Two pumps. Each 220 gpm.	▪ No condition issues identified.	▪ One of the PS pumps was making a very loud noise.
Internal Recycle Pumps	▪ Each Aeration Basin has one submersible pump. 3,125 gpm.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.

WWTF Component	Rated Capacity	2019 Condition Assessment associated with 2024 GSP[1]	2025 Condition Assessment
Degritting Cyclone ang grit classifier	▪ Two units. Each 220 gpm.	▪ End of useful life.	▪ Same observation as in 2024 Condition Assessment. City is replacing both units with new as part of an ongoing project.
Gravity Thickener	▪ One unit. 30 feet diameter, 10 feet SWD.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Thickened Primary Sludge Pumps	▪ Two units. Progressive Cavity pumps, 130 gpm each.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Rotary Drum Thickener	▪ One unit. 100-300 gpm.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Thickened WAS Pumps	▪ Two units. Progressive Cavity pumps, 50 gpm each.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Anaerobic Digesters and Digested Sludge Holding Tank (DSHT)	▪ Two anaerobic digester tanks. 32 feet diameter, 29 feet SWD. ▪ One DSHT tank. 32 feet diameter, 29 feet SWD.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Anaerobic Digester mixing and heating equipment	▪ Each digester has one draft tuber mixer and spiral heat exchanger. ▪ One hot water boiler with hot water pumps.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Digested Sludge Pumps	▪ Two units. Progressive Cavity pumps, 130 gpm each.	▪ N/A	▪ N/A
Dewatering Centrifuge	▪ One unit. 130 gpm at 2-2.5% solids.	▪ Near end of useful life.	▪ No issues observed with the existing unit. ▪ City is adding one new centrifuge (second unit) as part of an ongoing project.
Sludge Thermal Dryer	▪ One complete belt-drying system.	▪ No condition issues identified.	▪ Same observation as in 2024 Condition Assessment.
Plant Drain Pump Station No. 1	▪ Two submersible pumps. 250 gpm each.	▪ Shows signs of concrete corrosion and pumps at the end of useful life.	▪ Same observation as in 2024 Condition Assessment.
Plant Drain Pump Station No. 2	▪ Two submersible pumps. 450 gpm each.	▪ Shows signs of concrete corrosion and pumps at the end of useful life.	▪ Same observation as in 2024 Condition Assessment.
Electrical Components			
Utility Transformer No. 1	▪ 500 kVA	▪ N/A	▪ Owned and maintained by power utility. ▪ Utility Transformer No.1 shows some signs of rusting but no major concerns.
UV Electrical Room MDS-UV MCC-D1 MCC-D2 MCC-D3	▪ N/A	▪ N/A	▪ No major issues observed. ▪ City is replacing the UV system and associated power distribution panels and a new automatic transfer switch.
Old Controls Building MCC-A PLC-A Network Rack Transformer TL and Panel L	▪ N/A	▪ N/A	▪ The main concern in this building is the working clearance around electrical equipment seems low increasing likelihood of tripping hazard.
Utility Transformer No. 2	▪ 1000 kVA	▪ N/A	▪ Owned and maintained by power utility. ▪ Utility Transformer No. 2 shows some signs of rusting but no major concerns.
Equipment Blower Building MDS-EB MCC-C1/C1A MCC-C2/C2A Blower VFDs	▪ N/A	▪ N/A	▪ No major issues observed. ▪ City is replacing as part of an ongoing project the following: ▪ Two blowers and associated VFDs. ▪ New centrifuge control panels and VFDs

WWTF Component	Rated Capacity	2019 Condition Assessment associated with 2024 GSP(1)	2025 Condition Assessment
Emergency Generator	▪ 250 kW	▪ N/A	▪ City is replacing with new 450 kW generator as part of an ongoing project.
Digester Electrical Building SWBD-F MCC-F	▪ N/A	▪ N/A	▪ Main concern in this room is that it seems to be sharing walls with process areas. As such, it is very important to understand hazardous area classification of the area per NFPA 820. ▪ City is adding a new MCC-F as part of the ongoing project.
Biosolids Electrical Building SWBD-F MCC-F	▪ N/A	▪ N/A	▪ Main concern in this room is that it seems to be sharing walls with process areas. As such, it is very important to understand hazardous area classification of the area per NFPA 820.
Instrumentation and Controls			
SCADA system	▪ N/A	▪ N/A	▪ The current control system operates on standalone desktop PCs. When the remote display interface is engaged, control functionality on the primary desktop becomes inaccessible. This configuration presents a single point of failure and limits operational flexibility. To address this, a transition to a multi-user control architecture is recommended. Additionally, the system must support routine Windows updates without requiring downtime of the primary control workstation, which currently manages all plant operations.
PLC Infrastructure and Upgrade Status	▪ N/A	▪ N/A	▪ Progress on PLC upgrades have progressed. Several PLC components in use have reached end-of-life status, posing reliability and supportability risks. It is strongly advised to prioritize the replacement of these legacy PLCs to ensure continued system integrity and maintainability.

Notes:
(1) Condition Assessment performed as part of the 2024 GSP.
DSHT - Digested Sludge Holding Tank; hp - horsepower; kVA - kilovolt-amperes; kW - kilowatt; MCC - motor control center; N/A - not applicable; NFPA - National Fire Protection Association; PLC - programmable logic controller; psig - pounds per square inch gauge; SCADA - supervisory control and data acquisition; scfm - standard cubic feet per minute; SOR - surface overflow rate; SWBD - switch board; VFD - variable frequency drive; TDH - total dynamic head.

SECTION 7 RECOMMENDATIONS FOR CAPITAL IMPROVEMENTS

Based on the projected 2045 flows and loads, the following paragraphs provide a summary of the comprehensive analysis of each unit process and recommendations for improvements. Opinions of probable construction cost will be developed and included in the GSP.

7.1 Preliminary Treatment

The preliminary treatment facilities consist of a headworks structure with influent flow measurement through a Parshall flume, followed by in-channel fine screening. Two mechanically cleaned perforated plate screens with 6 millimeters (mm) openings are provided, each rated for a capacity of 7 mgd. One screen was installed as part of the Phase 1 improvements (2002), and the second was added during the Phase 2 improvements (2012). Each screen includes a washer/compactor to reduce the volume and weight of screenings before discharge into a dumpster located at grade level. A manual bar rack is installed in the bypass channel.

The Parshall flume (2 foot throat) measures influent flow to the treatment plant and was observed to be operating properly. An automatic flow-proportional sampler located near the flume collects raw influent wastewater samples.

Table 19 provides the design criteria for Plant Headworks for 2045 GSP.

Table 19 Plant Headworks Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	Hydraulic - PIDF Organic or Solids Loading - N/A
Class 1 Reliability Criteria	1 backup screen required
2045 PIDF	22.2 mgd
Parshall Flume	2 foot wide throat with Ultrasonic level sensor
No. of Influent Mechanical Screens	2
Flow per Mechanical Screen	11.1 mgd
Opening Size	6 mm
% Blinding	30%
Downstream Water Level at PIDF	2.4 feet
Maximum Headloss at PIDF and 30% Blinding	10 inches
No. of Washer/Compactors	2 (1 per screen)
Capacity of Washer/Compactor	70 cubic feet per hour
No. of Manual Bar Rack	1
Opening Size	3/4 inch

Recommendations for Improvements

1. Address the influent piping orientation at the headworks to prevent spraying of the influent wastewater during peak flow events. Add a concrete cap over the portion of the channel where the influent pipe enters vertically into the structure upstream of the Parshall Flume.
2. Conduct a structural investigation and perform required structural repairs and add appropriate coatings to the channels.
3. Remove the existing influent channel and Parshall flume. Replace the Parshall flume with the next larger size (3.0 feet throat) along with the influent channel.
4. Given the age and current condition of the screens, it is recommended to replace the two screens and associated washer/compactors by 2030. Based on correspondence with the screen manufacturer (Kusters Water Division - Zima Corporation), the existing screens have sufficient capacity to handle the 2045 PIDF of 22.2 mgd with both mechanical screens operating (11.1 mgd per screen) at the design blinding of 30 percent. If one of the screens is out of service, the bypass channel should be able to process the remaining flow. A budget proposal was requested to prepare a cost estimate to replace the two mechanical screens with new screens.
5. Replace all seven slide gates at the same time as replacing the influent screens.
6. It is recommended that the City collect appropriate samples to measure incoming TKN and NH_3 as well as influent alkalinity daily.

7.2 Septage Receiving Station

The Camas WWTF is equipped to receive septage from septage and vactor trucks. The septage receiving station has concrete unloading pads which convey the septage to a screening channel. The channel includes a mechanical screen with a dewatering chamber. The screened septage flows into a below grade concrete receiving tank equipped with submersible pumps.

Recommendations for Improvements

1. The City is replacing the septage screening equipment as part of an ongoing project. Therefore, no recommendations for further improvements are made at this time.

7.3 Primary Treatment

The screened wastewater flows through the plant headworks to the primary treatment splitter box downstream of the screens. The splitter box directs the flow towards two circular primary clarifiers (No. 1 and No. 2). A third splitter box segment is available to direct the flow to a future primary clarifier (No. 3).

Table 20 provides the design criteria for Primary Clarifiers for 2045 GSP

Table 20 Primary Clarifiers Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	Hydraulic - PHDF + Recirculation Organic or Solids Loading - PHDL (TSS)
Class 1 Reliability Criteria	50% of PHF with largest unit out of service
Surface Overflow Rate – SOR (Table T2-2, *Criteria for Sewage Design Works, August 2008*)	AADF - 800 to 1,200 gpd/sf PHF - 2,000 to 3,000 gpd/sf

WWTF Component and Parameter	2045 Design Criteria
2045 AADF	5.36 mgd
2045 MWAD Flow	7.5 mgd
2045 PHDF	20.4 mgd
2045 Average Day Influent TSS Loading	5,811 ppd
2045 Maximum Week Influent TSS Loading	8,136 ppd
2045 Maximum Day Influent TSS Loading	16,853 ppd
No. of Primary Clarifiers	3
Diameter of Primary Clarifier	60 feet
Effective settling area, each	2,827 sf
Effective settling area, total	8,482
SOR at AADF all Primary Clarifier s in service	632 gpd/sf
SOR at MWAD all Primary Clarifier s in service	1,011 gpd/sf
SOR at PHF all Primary Clarifier s in service	1,011 gpd/sf
SOR at 50% of PHF with 1 unit of service	2,401 gpd/sf
TSS removal in Primary Clarifier at 2045 ADF(1)	63%
TSS removal in Primary Clarifier at 2045 Max Week Flow (1)	52%
TSS removal in Primary Clarifier at 2045 Max Day Flow (1)	28%
2045 Minimum Primary Sludge(2)	1,500 ppd
2045 Maximum Primary Sludge(3)	4,5 ppd
2045 Minimum Primary Sludge(2)	5,000 gpd at 1%
2045 Maximum Primary Sludge(3)	40,000 gpd at 3.0%
Gravity Thickener Surface Area	707 sf
2045 Maximum Gravity Thickener Overflow rate	220 gpd/sf

Notes:
(1) Extrapolated from literature data for removal of TSS in primary clarifiers at various SORs with no recirculation and chemical addition.
(2) Calculated using 40% of 2045 estimated average day primary sludge production.
(3) Calculated using 2045 Maximum Week TSS loading and TSS removal in PC
(4) Calculated using the 2045 minimum primary sludge at 3.0% TS.
(5) Calculated using the 2045 maximum primary sludge at 1.0% TS.
AADF - annual average day flow; ADF - average day flow; PHDF - peak hour design flow; PHDL - peak hour design mass load.

Recommendations for Improvements

1. Add a weir, dropbox and piping as needed to construct a bypass around the primary clarifiers. This bypass will direct all flows greater than the maximum day flows (~10.7 mgd) around the primary clarifiers. A bypass is required whether or not a third primary clarifier is constructed because the new riser pipes being installed in the existing primary clarifiers under the current construction project do not have the needed hydraulic capacity for future peak flows.
2. To allow for robust operations during peak flow conditions and facilitate passing design peak hydraulic flows, a third primary clarifier should be added. This will maintain high removals of BOD_5 and TSS during normal operation and allow operation of the aeration tanks at lower MLSS concentrations during maximum month organic loadings. The lower operating MLSS concentrations

will in turn improve the ability of the secondary clarifiers to pass peak hour flows without significant degradation in performance. Adding a third primary clarifier will also reduce oxygen demands in the BNR process and increase gas production in the digesters, both of which will help to minimize power consumption in the future. Lower design oxygen demands will also facilitate the replacement of the existing multi-stage centrifugal blowers in the existing blower room.

7.4 Secondary Treatment

The primary clarifier effluent flows to the aeration basin influent flow splitter box. This splitter box also receives RAS and in-plant recycle flows from Plant Drain Pump Stations No. 1 and 2, which primarily consist of filtrate from the sludge thickeners and centrate from the dewatering centrifuges.

The secondary treatment process consists of three aeration basins with anaerobic selector zones, anoxic zones, and aerobic zones. Each basin is equipped with an IR pump that conveys nitrates formed in the aerobic zones back to the anoxic zones for partial nitrogen removal. The aerobic zones contain fine-pore diffusers, with air supplied by aeration blowers located in the Equipment Building.

Flow from the aeration basins is distributed to three circular secondary clarifiers via a flow-splitting structure. In the clarifiers, the MLSS are separated from the treated water, and the settled sludge is returned to the AB influent splitter box as RAS while the effluent flows downstream to the filters and UV disinfection.

Table 21 provides the design criteria for the Secondary Treatment (aeration basin and secondary clarifier) for 2045 GSP. The spreadsheet based activated sludge calculations as presented in Table 13 and the State Point Analysis presented previously indicate that a fourth secondary clarifier must be added to handle the 2045 peak flows (peak SOR < 1,200 gpd/sf).

Table 21 Secondary Treatment Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	Aeration Basin Hydraulic - MWDF Organic or Solids Loading - MWDL (BOD) Secondary Clarifier Hydraulic - PHDF + Recirculation Organic or Solids Loading - PHDL (TSS)
Class 1 Reliability Criteria	Minimum 2 aeration basins of equal size 75% of PHF with largest unit out of service
Surface Overflow Rate - SOR (Table T3-2, *Criteria for Sewage Design Works, August 2008*)	MLSS - 1,500 to 3,000 mg/L; SVI- 150 mL/g PHF - 1,200 gpd/sf
2045 AADF	5.36 mgd
2045 MWAD	8.6 mgd
2045 PHDF	20.4 mgd
Primary Clarifier Average Effluent BOD_5	60 - 90 mg/L
2045 Maximum Week BOD loading to Aeration Basins	5,300 ppd
Minimum Wastewater Temperature	15 °C

WWTF Component and Parameter	2045 Design Criteria
Aeration Basins	
No. of aeration basins	3
Total Volume	2.26 MG (302,400 cf)
Total Anaerobic Volume	0.13 MG (17,640 cf)
Total Anoxic Volume	0.41 MG (54,180 cf)
Total Aerobic Volume	1.725 MG (230,555 cf)
MLSS Concentration	~1,500 to 3,000 mg/L
aSRT	8 days
Net Yield	0.9 lb TSS/lb BOD
Average Day WAS produced	3,700 ppd
Maximum Week WAS produced	5,400 ppd
Secondary Clarifiers	
No. of Secondary Clarifiers	4
Secondary Clarifier Diameter	75 feet
Secondary Clarifier SWD	15 feet
RAS Rate	60%
Effective Settling Area per Secondary Clarifier	4,418 sf
SOR at AADF all Secondary Clarifiers in service	303 gpd/sf
SOR at PHF all Secondary Clarifiers in service	1,153 gpd/sf
SOR at 75% PHF with 1 unit out of service	1,153 gpd/sf
SLR at PHF	28.8 lb/sf/d

Notes:.
MWDF - maximum week design flow; MWDL - maximum week average day design mass load; SLR - solids loading rate.

- **RAS Pumping**: Each secondary clarifier has two RAS pumps (one duty/one standby). Secondary Clarifier No. 1 has two RAS pumps, each with capacity of 1,000 gpm. Secondary Clarifier No. 2 has two RAS pumps, each with capacity of 1,050 gpm. Secondary Clarifier No. 3 has two RAS pumps, each with capacity of 1,400 gpm. The current total RAS flow capacity is 6,900 (9.92 mgd) with firm capacity, with one pump per clarifier in operation, is 3,450 gpm (4.96 mgd). To achieve a design RAS rate of 60 percent of influent flow, the RAS flow of 12.2 mgd (8,500 gpm) is required at the 2045 peak flows. With four secondary clarifiers, a total of six RAS pumps, each with a capacity of 1,400 gpm will be sufficient to meet these criteria.
- **Internal Recycle Pumping**: Each aeration basin has a submersible IR pump with a capacity of 3,125 gpm (4.5 mgd). With three aeration basins, and assuming an even flow split, each aeration basin will receive a maximum week flow of 2.86 mgd. The IR rate at this flow will be 2.5 times the average day influent flow. Ideally the IR rate should be between 2.5 to 4 Q to achieve good denitrification, provided sufficient carbon and adequate anoxic volume are available. The BOD_5:TKN ratio in the influent flow to the aeration basins is 1.3:1 which is significantly deficient for any denitrification. Therefore, supplemental carbon will be required to achieve good denitrification and recover some alkalinity. For this evaluation, no changes to the IR rate or pumps are recommended.

Recommendations for Improvements:

1. By Year 2030:
   a. Relocate the internal recycle piping such that the recycle is introduced just upstream of the first of the two anoxic zones and not in the last anerobic zone for the three existing aeration basins.
   b. The baffle walls that divide the zones within the existing aeration basins' should be repoured to a smooth level. Plywood baffle walls in the anaerobic selector zone should be removed and replaced with 316 stainless steel baffle plates for rigidity.
   c. In conjunction with the replacement of the selector walls, the ability to improve the settling characteristics of the mixed liquor by reconfiguring the selector zones should be evaluated, and modifications implemented if deemed advantageous.
   d. Demolish and rebuild Secondary Clarifier No. 1 to match the size, slope, and other criteria of Secondary Clarifier No. 3. Install new RAS, WAS, and Scum pumps matching the size of those serving Secondary Clarifier No. 3. This Secondary Clarifier No. 1 should be constructed by 2030.
   e. Replace the RAS pumps for Secondary Clarifier No. 2 to match the size (1,400 gpm) as that of Secondary Clarifier No. 3 by 2030.
   f. Implementing hydraulic SRT control - a simpler hydraulic SRT control system should be programmed in the plant PLC using the following formula to estimate the aSRT:

$$\text{aSRT} = \frac{V_a}{Q_w} \cdot \frac{R + {Q_w}/{Q}}{1+R}$$

   Where:
   Q_w = wasting rate, mgd.
   V_a = online aeration basin volume, MG.
   Q = averaged forward flow, mgd.
   R = RAS recycle ratio, unitless.
   aSRT = desired aSRT, days.

   From this formula, the required wasting rate can be calculated based on the online aeration volume, the plant forward (influent) flow, the RAS recycle ratio (R), and the desired aSRT without measuring the MLSS concentration or the return activated sludge suspended solids concentration.

2. By year 2035:
   a. Replace the diffusers in the existing three aeration basins by 2035. Add diffusers to the second of the two anoxic zones in each aeration basin to convert it to a swing zone. Supports for diffusers in the swing zone should be adequately designed to withstand the forces exerted by the existing submersible mixers.

3. By year 2040:
   a. Construct a new Secondary Clarifier No. 4 with new RAS, WAS and scum pumps matching the size of that of Secondary Clarifier No. 3. This Secondary Clarifier No. 4 should be constructed by 2040.
   b. Construct a new Aeration Basin No. 4 with fine bubble diffusers and aeration piping and IR pump matching the size of the existing aeration basin. With four aeration basins, the plant can take one of the aeration basins out of service for cleaning and preventative maintenance and still maintain an 8-day SRT necessary for stable complete nitrification using three aeration basin with adding air to the swing zone and operating all four secondary clarifiers.

7.5 Aeration Blowers

There are four aeration blowers, multistage centrifugal blowers, each providing an airflow of 1,630 scfm at ~10 psig with 150 hp motors. The firm capacity of these blowers is 4,890 scfm with one unit out of service. Based on discussions with the plant staff, there are issues operating more than 2 blowers in parallel without overloading the motors.

The City is planning to replace two existing blowers with new high-speed turbo (HST) blowers, each providing an airflow from 667 to 1,334 scfm with a 100 hp motor. As part of this project, the blower controls will also be revised to allow parallel operation of the four blowers. With this upgrade, the firm capacity of the blower system will drop to 4,300 scfm at ~10 psig.

Table 22 provides the design criteria for the aeration blowers and diffusers for 2045 GSP.

Table 22 Aeration Blowers Design Criteria

WWTF Component and Parameter	2045 Annual Average Design Criteria	2045 Maximum Week Design Criteria	2045 Maximum Day Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	PHDL (BOD and TKN loading)		
2045 BOD loading to Aeration Basins	4243	5,400	9,421
2045 TKN loading to Aeration Basins	2,600	3,700	5268
AOR (ppd)	13,800	19,300	23,300
Standard Oxygen Demand (SOR) (ppd)	35,300	49,300	50,800
Diffuser submergence (feet)	20	20	20
Spatial DO Concentration (mg/L)	2.0	2.0	0.5
AOR/SOR	0.39	0.39	0.46
SOTE, %/foot	2.3%	2.2%	2.2%
SOTE, %	46.3%	44.9%	44.3%
Field OTE, %	18.2%	17.6%	20.3%
Total airflow (scfm)	3,100	4,500	4,600
Total No. of Diffusers	2,000	2,000	2,000
Airflow per diffuser	1.25	1.8	2.2
AT/AD (assuming 9-inch diffusers)	16.6	16.6	16.6
Aeration Blowers			
No. of Blower	4	4	4
Capacity of 2 HSTs (1)	2,667	2,667	2,667
Capacity of new 2 HSTs (2)	4,666	4,666	4,666
Firm Capacity w/ largest unit out of service	5,000	5,000	5,000

Notes:
(1) City is planning to replace two of the existing centrifugal blowers with HST blowers.
(2) Assumes the remaining two existing centrifugal blowers will also be replaced with HST blowers in the future.
AOR - actual oxygen demand; OTE - oxygen transfer efficiency; SOTE - standard oxygen transfer efficiency.

While the governing design criteria is the peak hour loading (PHL) for BOD and TKN, the proposed design assumes that the aeration equipment will be sized to handle the maximum week loadings. During PHL which only would last for an hour or so, it is assumed that the BOD and TKN loading will be significantly diluted and the PHL will be less than or equal to the maximum week loadings.

Recommendations for Improvements

1. Remove and replace the two existing 150 hp multistage centrifugal blowers with two 150 hp HST blowers. It is assumed that all four blowers will need to be on-line to satisfy the 2045 peak oxygen demand.

7.6 Tertiary Filtration

The filtration system consists of two parallel cloth disk, inside-out, filters, located in the UV Disinfection/Effluent Pump Station building. In the future as peak flows increase, it has been decided to bypass flows above the capacity of the existing filters (about 6.0 mgd) directly to the outfall. This is feasible as tertiary filtration is believed not to be necessary to meet the ammonia and TSS requirements of the NPDES permit if other modifications are made to the WWTP as discussed in this report.

Table 23 provides the design criteria for tertiary filtration for 2045 GSP.

Table 23 Tertiary Filtration Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	Hydraulic – Pass all flows requiring tertiary treatment Organic or Solids Loading - N/A
2045 AADF	5.36 mgd
2045 PHDF	20.4 mgd
2045 PIDF	22.2 mgd
2045 Annual Average Secondary Clarifier Effluent TSS	10 mg/L
2045 Maximum Secondary Clarifier Effluent TSS	20 mg/L
2045 Maximum Filtered Effluent TSS	5 mg/L
Filter Submerged Area per Unit	470 sf
Filter Submerged Area, Total	940 sf
Maximum filter hydraulic loading	4.43 gpm/sf
Filter Capacity, per Unit	3.0 mgd
Filter Capacity, Total	6.0 mgd
Maximum headloss (PHF) for each filter	12 inches

Notes:
(1) Proposal was requested from Kruger. They recommend three filter units, Model HPF2230-IF (2 duty/1 standby), each with a filtration area of 1,990 sf (submerged are 1,294 sf).

Recommendations for Improvements

1. As the existing tertiary filters approach the end of their useful life, they should be replaced with similar units.

7.7 UV Disinfection

The UV disinfection system consists of an open-channel horizontal gravity flow system with a weighted weir control gate on the downstream side of the UV disinfection banks, located in the UV Disinfection/Effluent Pump Station building. The City is planning to replace the existing UV Trojan 3000+ system with a new Trojan 3000+ system as part of an ongoing project.

Table 24 provides the design criteria for the UV disinfection system for 2045 GSP.

Table 24 UV Disinfection System Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	Hydraulic - Pass all flows Organic or Solids Loading - NA
2045 AADF	5.36 mgd
2045 PHDF	20.4 mgd
2045 PIDF	22.2 mgd
Maximum Influent TSS	5 mg/L
Minimum UVT	65%
Effluent temperature	33 °F (minimum) and 85 °F (maximum)
Effluent fecal coliforms	200 CFU/mL, monthly geometric mean of daily grab samples
No. of UV channel	1 (existing) + 1 (new)
No. of UV banks per channel	3
Type of UV	Trojan UV 3000+ (low pressure high intensity lamps)

Notes:
°F - degrees Fahrenheit; CFU/mL - colony-forming units per milliliter.

Recommendations for Improvements

1. Construct a new second UV channel outside the existing building on the west to allow disinfection of the entire plant effluent at PHF (22.2 mgd). These improvements are anticipated to be needed by 2040 if not sooner.

7.8 Effluent Pump Station and Pumps

Following the UV disinfection, treated effluent discharges to the effluent pump wet well in the UV Disinfection Building, and eventually through the 36-inch outfall pipe to the Columbia River. The effluent wet well is divided into two compartments by a sluice gate. The UV disinfection channel discharges into the first compartment. Under gravity discharge conditions, effluent discharges from the first compartment to the effluent wet well through a 36-inch pipe to the effluent manhole. This manhole contains a flap gate to prevent the river water backing up into the effluent wet well during high river flow conditions. Effluent then flows by gravity from the effluent manhole to the Outfall manhole through a 36 inch pipe.

Under high river water level conditions, when the headloss is too great for gravity flow to the Columbia River, the effluent is pumped using three vertical propeller effluent pumps, located in the second compartment of the effluent wet well. Each pump has a capacity of 4,550 gpm (6.54 mgd). The total capacity of the effluent transfer pump station is 19.6 mgd with a firm capacity of 13.09 mgd.

Table 25 provides the design criteria for upgrades to the Effluent Pumps for 2045 GSP.

Table 25 Effluent Pump Station Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	Hydraulic - Pass all flows Organic or Solids Loading - NA
2045 AADF	5.35 mgd
2045 PHDF	19.3 mgd
2045 PIDF	22.2 mgd
No. of Pumps	3
Capacity of each pump required	7.4 mgd (5,145 gpm)
TDH	21 feet

Recommendations for Improvements

1. The process implications of exceeding the effluent pumps' capacity are catastrophic, under the high river level conditions., Such conditions could quickly submerge upstream plant processes. Therefore, it is recommended to replace the existing pumps with larger impeller, motor, and associated VFDs to allow pumping of the entire plant effluent (PIDF of 22.2 mgd).

7.9 Solids Treatment

7.9.1 Primary Sludge Pumping, Degritting and Thickening

The two primary clarifiers are equipped with three primary sludge pumps (two duty/one standby), each with a capacity of 220 gpm. These pumps are sufficiently sized for the 2045 flows and loads (2045 primary sludge volume is estimated to be in the range of 6,000 gpd to 50,000 gpd at 1.0 to 3.0 percent total solids). These units pump the primary sludge settled at the bottom of the primary clarifiers to a degritting system, located in the Equipment Building.

The degritted primary sludge is thickened using a gravity thickener. The thickener is a below grade circular concrete tank, 30 feet diameter, 10 feet side water depth. Thickened primary sludge is pumped using two progressive cavity pumps, each 130 gpm to the anaerobic digesters. During the site visit in June 2025, one of the thickened primary sludge was dismantled for repairs.

Recommendations for Improvements

The City is planning to replace the two primary sludge degritting equipment (hydrocyclones and classifiers) with new. Sludge Pumping equipment should last for 10 to 15 years depending on the amount of grit and wear and tear they experience. Pumps should be repaired and replaced as needed. No additional recommendations for any primary sludge and degritting equipment are made at this time.

1. Anaerobic digesters perform best when a constant and consistent feed rate is maintained. Based on the observations from previous GSP, the thickened primary sludge pumps are too large for the system. As such, the existing units are recommended for replacement with new, appropriately sized, 70 gpm progressive cavity pumps.

7.9.2 WAS Pumping and Thickening System

There are three plunger type WAS pumps for Secondary Clarifier Nos. 1 and 2, located in the existing Control Building, each rated at a capacity of 85 gpm. Secondary Clarifier No. 3 has a submersible centrifugal WAS pump near the clarifier rated for 240 gpm. These pumps convey the WAS from the three secondary clarifiers to a WAS storage tank, which is subsequently thickened using a RDT. Alternatively, the WAS can be transferred to the gravity thickener to be co-thickened with the primary sludge, during periods when the RDT is not operational. Thickened WAS is pumped to the anaerobic digesters.

Table 26 provides the design criteria for WAS pumping and thickening for 2045 GSP.

Table 26 Waste Activated Sludge Pumping and Thickening System Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	MDDL (BOD_5 loading)
2045 Average Day Influent BOD_5 Loading	6,000 ppd
2045 Maximum Day Influent BOD_5 Loading	8,500 ppd
BOD_5 Removal in Primary Clarifier at 2045 ADF(1)	35%
BOD_5 Removal in Primary Clarifier at 2045 Maximum Day Flow (1)	29%
2045 Annual Average Day BOD_5 Loading to Aeration Basins	4,200 ppd
2045 Maximum Day BOD_5 Loading to Aeration Basins(2)	6,000 ppd
Net Yield	0.9 lb TSS/lb BODrem
WAS concentration (% TS)	0.50%
2045 Average Day WAS Sludge	81,400 gpd
2045 Maximum Day WAS Sludge	126,000 gpd
Capacity of Existing WAS Storage Tank	145,000 gallons
Hydraulic Detention Time, 2045 Average Day WAS	1.8 days
Hydraulic Detention Time, 2045 Maximum Day WAS	1.2 days
RDT Feed Pump capacity	250 gpm
RDT Feed Rate	100-300 gpm
Thickened WAS concentration (%TS)	5%
2045 Average Day Thickened WAS	6,900 gpd
2045 Maximum Day Thickened WAS	10,700 gpd

Notes:
BODrem - five-day biochemical oxygen demand removed (in biological process); MDDL - maximum day design mass load.

Recommendations for Improvements

Sludge Pumping equipment should last for 10 to 15 years depending on the amount of grit and wear and tear they experience. Pumps should be repaired and replaced as needed. No recommendations for any WAS pumping equipment are made at this time.

1. There is only one RDT for WAS thickening. The RDT has been in service for more than 10 years. The previous GSP recommended adding a second RDT for redundancy and reliability. During the 2025 Condition Assessment walkthrough, a concern with the existing Digester Complex electrical room was raised, which is that it shares walls with process areas. As such, it may not meet the hazardous area

classification of the area per NFPA 820. It is therefore proposed that a new electrical building be constructed to the west of the Digester complex serving all the digester equipment as shown in Figure 4. This will allow space to relocate and add the second RDT for reliability and redundancy.

7.9.3 Anaerobic Digestion and Waste Gas Flare

The WWTF currently has two anaerobic digesters and one digested sludge holding tank. Each digester is a cylindrical concrete tank, 32 feet diameter with 29.5 feet SWD and a volume of 177,000 gallons. The digesters have fixed steel cover and a top mounted draft tube mixer. Gas produced by the digester is used as fuel for the hot water boiler while remaining gas is also used for the sludge dryer. There is a gas flare for flaring excess gas. There are three digester recirculation rotary lobe pumps, each with a capacity of 200 gpm (1 for each digester with a common standby pump). These pumps recirculate the digester sludge through a spiral heat exchanger.

The digested sludge holding tank is also a cylindrical concrete tank, 32 feet diameter, 14 feet SWD and volume of 84,000 gallons.

The digesters receive thickened primary and waste activated sludge and primary and secondary scum. The digesters are operated in a mesophilic temperature range to produce minimum Class B biosolids with a minimum volatile solids reduction of 38 percent or by achieving a geometric mean of 7 fecal coliform samples ≤ 2,000,000 most probable number or CFU per gram total solids (dry weight basis) by operating the digesters at a minimum mean cell residence time (MCRT) of 15 days at 35°C.

Table 27 provides the design criteria for Anaerobic Digesters for 2045 GSP. 2045 Design Criteria are projected loadings.

Table 27 Anaerobic Digestion System Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	MDDL (BOD_5 loading)
2045 Average Day Primary Sludge	3,600 ppd
2045 Maximum Day Primary Sludge	4,200 ppd
2045 Average Day Thickened Primary Sludge	13,500 gpd
2045 Maximum Day Thickened Primary Sludge	9,700 gpd
2045 Average Day Thickened WAS	2,900 ppd
2045 Maximum Day Thickened WAS	4,500 ppd
2045 Average Day Thickened WAS	6,900 gpd
2045 Maximum Day Thickened WAS(1)	10,500 gpd
2045 Average Day Combined (Thickened Primary Sludge +WAS)	6,300 ppd
2045 Maximum Day Combined (Thickened Primary Sludge +WAS)	8,400 ppd
2045 Average Day Combined (Thickened Primary Sludge +WAS)	15,000 gpd
2045 Maximum Day Combined (Thickened Primary Sludge +WAS)	20,200 gpd
Volume of each Anaerobic Digester	177,000 gallons
Total Volume of Anaerobic Digesters	354,000 gallons
MCRT 2045 Average Day Condition	23.6 days
MCRT 2045 Maximum Day Condition	17.5 days

Notes:
(1) Maximum day waste activated sludge production estimated from steady-state BioWin simulation using 2045 design maximum week biological nutrient removal influent mass loads.

Recommendations for Improvements

Digester equipment should last for 20 to 25 years depending on the amount of grit and wear and tear they experience. Pumps should be repaired and replaced as needed. The digester tanks should last for 50 years. No recommendations for the Anaerobic Digestion system are made at this time.

7.9.4 Dewatering Centrifuge

The WWTF currently has one dewatering centrifuge. The centrifuge has a hydraulic capacity of 160 gpm (230,400 gpd) to process digested sludge with a feed concentration range of 2.0 to 2.5 percent solids. The centrifuge is designed to produce a dewatered cake with a minimum 20 percent total solids and at 90 percent solids capture ratio. Polymer solution is added to the sludge for chemical conditioning and help with dewatering.

Table 28 provides the design criteria for dewatering centrifuges for 2045 GSP.

Table 28 Centrifuge Dewatering Design Criteria

WWTF Component and Parameter	2045 Design Criteria
Design Requirement (Table G2-1, *Criteria for Sewage Design Works, August 2008*)	MDDL (BOD_5 loading)
2045 Average Day Combined (Thickened Primary Sludge +WAS)	6,300 ppd
2045 Maximum Day Combined (Thickened Primary Sludge +WAS)	8,400 ppd
VSS:TSS ratio	0.75
Minimum VSR in Digester No. 6	38%
2045 Average Day Digested Sludge	3,000 ppd
2045 Maximum Day Digested Sludge	4,300 ppd
Digested sludge minimum % solids	2.5%
2045 Average Day Digested sludge	14,100 gpd
2045 Maximum Day Digested sludge	20,600 gpd
Centrifuge hydraulic capacity	160 gpm
2045 Average Day Centrifuge operation	1.5 hours
2045 Maximum Day Centrifuge operation	3.6 hours
Dewatered Cake	20%
2045 Average Day Dewatered Cake	6.3 wet tons per day
2045 Maximum Day Dewatered Cake	10.8 wet tons per day
2045 Average Day Dewatered Cake(1)	200 cf/d
2045 Maximum Day Dewatered Cake(1)	300 cf/d

Notes:
(1) Assumes 60 lb/cf for density of dewatered cake.
VSR - volatile solids reduction.

Recommendations for Improvements

The City is planning to add a second dewatering centrifuge as part of an ongoing project. With two dewatering centrifuges, the plant should be able to process the anaerobically digested sludge for the foreseeable future and therefore no recommendations are made at this time.

7.9.5 Biosolids Belt Dryer

The WWTF currently has one sludge belt drying system. The dryer uses the 20 percent dewatered cake to produce 92 percent dried pellets. The pellets are sold to a local farmer as fertilizer. The digester gas and natural gas are used for the drying of solids.

Table 29 provides the design criteria for dewatering centrifuges for 2045 GSP.

Table 29 Sludge Belt Dryer Design Criteria

WWTF Component and Parameter	2045 Design Criteria
2045 Average Day Sludge Production	1.3 DT/d
2045 Maximum Day Sludge Production	1.8 DT/d
2045 Average Day Sludge Production	2,500 ppd
2045 Maximum Day Sludge Production	6,100 ppd
Design Cake Dryness	20% DS
Dryer Operations	7 days per week
Hours of Operation	24 hours per day
2045 Average Day Dryer Cake Feed	930 wet lb/hr
2045 Maximum Day Dryer Cake Feed	1,200 wet lb/hr
Final Product Dryness	92% DS
2045 Average Day Final Product	200 wet lb/hr
2045 Maximum Day Final Product	270 wet lb/hr
2045 Average Day Evaporation Rate	730 lb H2O/hr
2045 Maximum Day Evaporation Rate	980 lb H2O/hr
Maximum Evaporation Rate for the existing Belt Dryer	1,100 lb H2O/hr
Dryer Capacity Utilization	89%

Notes:
DS - dry solids; DT/d - dry ton per day; lb H20/hr - pounds of water per hour; lbs/hr - pounds per hour.

Recommendations for Improvements

The sludge dryer will need to be operated 7 days a week, 24 hours a day to process the maximum day sludge produced. Alternatively, if the capacity of the dryer is exceeded, the cake can be diverted for off-site disposal. The sludge dryer was installed in 2014 and is about 10+ years old. Typical sludge drying equipment will need major overhaul in the next 10 years (20-year life). City should plan to replace the dryer in the next 10 to 15 years. However, for the 2025 GSP, a firm recommendation is not made as some of the regulations, in particular with respect to per- and polyfluoroalkyl substances (PFAS) in biosolids are still evolving.

7.9.6 Plant Drain Pump Stations

7.9.6.1 Plant Drain Pump Station No. 1

This station is in the yard between Primary Clarifier No. 1 and the Aeration Basins on the north side. It is equipped with two submersible pumps, each rated for 250 gpm, installed in a pre-cast reinforced concrete wet well. The pump station collects floor drains and process water from several treatment units including centrate from the dewatering centrifuges, gravity thickener overflow, grit classifier overflow, and effluent filter backwash.

Recommendations for Improvements

The condition assessment noted signs of concrete corrosion, and its pumps are nearing the end of useful life. As such, it is recommended that Pump Station No. 1 be rehabilitated by:

- Replacing the pumps with larger capacity pumps (500 gpm each).
- Installing a liner in the wet-well to extend the line of the existing structure.
- Replacing control panel, pump guide rails, and discharge piping within the wet well.
- Adding a totalizing flow meter and composite sampler.

7.9.6.2 Plant Drain Pump Station No. 2

This station is in the yard between the digested sludge holding tank and the headworks. It is equipped with two submersible pumps, each rated for 450 gpm, installed in a pre-cast reinforced concrete wet-well. The pump station collects floor drains and process water from several treatment units including drains from the digester building, the abandoned Biofilters No. 1 and No. 2, and filtrate from the RDT.

Recommendations for Improvements

The condition assessment noted signs of concrete corrosion, and its pumps are nearing the end of useful life. As such, it is recommended that Pump Station No. 2 be rehabilitated by:

- Replacing the pumps (500 gpm each).
- Installing a liner in the wet well to extend the line of the existing structure.
- Replacing control panel, pump guide rails, and discharge piping within the wet well.
- Adding a totalizing flow meter and composite sampler

7.9.7 Non-potable Water Pumps

The non-potable water (NPW) is pumped from the compartment of the effluent wet well downstream of the UV disinfection and are located in the UV Disinfection Building. Three vertical turbine pumps, each with a capacity of 200 gpm at 185 feet TDH (80 pounds per square inch) lift the disinfected effluent out of the wet well to a NPW distribution system. The combined pump discharge line to the surge tank is equipped with a duplex-type strainer, flow meter, and a pressure switch.

Recommendations for Improvements

The City is planning to install new VFDs for each of the three NPW pumps and a new motorized strainer as part of an ongoing project. No recommendations are made at this time.

7.9.8 WWTF Electrical System Upgrades

The plant operates with two separate utility feeds. The first, a 500 kVA service ("UT1"), is located on the southwest side of the UV Building and supplies power to the main distribution switchboard MDS-UV and MCC-A in the Old Controls Building. The second, a 1000 kVA service ("UT2"), is located on the north side of the Equipment/Blower Building and feeds the second main distribution switchboard, MDS-EB. Each switchboard has its own 250 kW standby generator, which provides backup power for most—but not all—connected loads. MCC-A, MCC-D3, SWBD-F, and SWBD-G are not currently supported by generator backup.

The plant was originally built in 1972, with major electrical upgrades completed in 1992, 2002, and 2012. MDS-UV distributes power to MCC-D1, MCC-D2, MCC-D3, and the UV systems serving the secondary and tertiary treatment areas on the east side. MDS-EB supplies power to blowers, MCC-C1, MCC-C2, SWBD-F, and SWBD-G, which support influent, aeration, digester, and solids processes on the west side. The 2002 upgrades included installation of MDS-UV, MDS-EB, the standby generators, MCC-D1, MCC-D2, MCC-D3, MCC-C1, and MCC-C2, while the 2012 upgrades included SWBD-F, MCC-F, SWBD-G, and MCC-G.

MCC-A appears to be the only remaining major electrical gear from before the 2002 upgrade, likely from the 1992 installation. It currently serves two WAS pumps, one general-purpose sludge pump, a compressor, two heaters, and a hoist. Carollo recommends removing MCC-A from the plant's distribution system and refeeding its remaining loads from nearby sources. Also, the Old Controls building houses MCC-A, which is also likely controlling the loads fed from MCC-A. Carollo recommends removing PLC-A, and controlling the current PLC-A loads from another nearby PLC. This would allow the Old Controls Building to be fully repurposed as a maintenance and workshop area, which reflects its current use. The electrical equipment installed in 2002 remains in generally good condition and does not require immediate replacement; upgrades should instead coincide with future plant process improvement projects to minimize repeated modifications. However, when replacing gear in the UV or Equipment Building electrical rooms, updated layouts will likely be required to meet current National Electrical Code working clearance standards. Electrical gear from 2012 remains in excellent condition and does not need replacement in the near term.

During the site visit, it was also noted that the water utility has no in-house electrician or instrumentation technician and no on-call agreements with outside specialists. Carollo recommends establishing either internal staffing or on-call contracts with qualified electricians and system integrators to ensure prompt response to electrical and controls issues.

No arc flash labels were found on the plant's distribution equipment, and the owner confirmed that an Electrical System Study is not maintained. Carollo recommends completing this study as soon as possible and applying arc flash labels in accordance with Occupational Safety and Health Administration requirements to ensure worker safety.

The owner also reported that the last major flood affecting the plant occurred in 1997. Carollo recommends a comprehensive flood risk analysis for all major electrical and control systems to assess vulnerabilities and strengthen flood resilience.

Electrical rooms from the 2002 upgrade were found to be dusty, poorly ventilated, and not fully sealed from adjacent areas. These conditions can accelerate equipment degradation and lead to premature failures of PLCs, VFDs, and network components. Carollo recommends installing dedicated ventilation

systems, sealing the rooms from process and generator areas, and performing heating, ventilation, and air conditioning load calculations to determine whether air-handling units or cooling systems are needed to manage internal temperatures.

Throughout the plant, exposed network hardware, wiring, and cables were also observed, leaving them at risk of accidental damage. Carollo recommends installing dedicated, wall-mounted network enclosures and routing all cables through conduits for better protection and organization.

To ensure regulatory compliance, and safety, Carollo further recommends conducting a hazardous area classification study per NFPA 820 and upgrading any areas that do not meet code.

Lastly, extensive corrosion was noted on outdoor conduits and equipment enclosures at several locations, including the influent/screens structure and biological basins. Carollo recommends replacing these components with PVC-coated or corrosion-resistant materials to enhance reliability and reduce any potential disruptions to plant operations due to power or control failures.

7.9.9 Facility Control Systems, Including the PLC and Central SCADA

Multiple network switches are currently installed in operational areas where they are exposed to environmental conditions. To mitigate risks associated with dust, moisture, and physical damage, it is strongly recommended that these switches be relocated into protective enclosures, consistent with best practices already implemented elsewhere on site. As a short term fix to minimize the risks to the network switches, it is recommended that dust filter foam be placed over vents on the switches to reduce the intrusion of dust. Additionally, placing tape over unused network ports on the face of the switch is recommended until an enclosure is provided for the switches.

It was observed that the centrifuge cannot initiate operations when the system is in Automatic mode. Manual intervention is required to start the centrifuge, after which the system can be returned to Automatic. This behavior indicated a controls problem and should be investigated and resolved.

The Magnesium Oxide tank level sensors are ultrasonic instruments. These are highly susceptible to condensate in the tank and will provide false readings. This sensor should be replaced with a Guided Wave Radar level instrument to eliminate the noise caused by condensate.

APPENDIX A

REASONABLE POTENTIONAL ANALYSIS

PROJECT MEMORANDUM

CITY OF CAMAS

General Sewer Plan Update

Project No.: 203710
Date: January 7, 2026
Prepared By: Y. Yerbich-Louman
Reviewed By: Matt Huang
Subject: Reasonable Potential Analysis

The Washington State Department of Ecology (DOE) drafted a proposed National Pollutant Discharge Elimination System (NPDES) Permit WA0020249 for the City of Camas wastewater treatment plant (WWTP) with an effective date of August 1, 2025. As a part of these efforts, DOE conducted a reasonable potential analysis (RPA) for the predicted WWTP discharge in 2045 using a maximum daily discharge value of 10.04 million gallons per day (mgd).

The maximum daily discharge in planning year 2045 is projected to be 10.70 mgd. The DOE-developed *Spreadsheets for Water Quality-Based NPDES Permit Calculations* was used to generate an updated RPA with the projected maximum daily discharge and no other changes compared to the original RPA prepared for the draft permit. The updated RPA was conducted to identify any new reasonable potentials as a result of the updated maximum daily discharge value that would require infrastructure or process modifications to be addressed in capital improvement planning.

The updated RPA indicated that no new reasonable potentials were identified. The updated RPA results are provided in the following pages.

Dilution Factor Calculations and Receiving Water Critical Conditions

Step 1: Enter Waterbody Type

Water Body Type	Freshwater

Facility Name	Camas WWTP
Receiving Water	Columbia River

Step 2: Enter Dilution Factors -OR- Calculate DFs by entering Facility/Receiving Water Flow Data

Do you want to enter dilution factors -or- flow data?	Flow Data

	Annual Average	Max Monthly Average	Daily Max
Facility Flow, MGD	5.36	7.5	10.7
Facility Flow, cfs (calculated)	8.29	11.60	16.55

	Condition	Receiving Water Flow, cfs	Allowable % of river flow	Max Dilution Factor Allowed
Aquatic Life - Acute	7Q10	81400	0.0042	**21.7**
Aquatic Life - Chronic	7Q10	81400	0.0229	**113.6**
HH-Non-Carcinogen	30Q5	113960	0.02508	**173.7**
HH-Carcinogen	Harmonic Mean	244200	0.0117	**173.6**
Whole river at 7Q10	7Q10	81400		

Step 3: Enter Critical Data

	Effluent	Receiving Water
Temp, °C	25.7	23.2
pH, s.u.	7.3	7.7
Alkalinity, mg/L as CaCO3	100	66.2
Hardness, mg/L CaCO3	168	74
Salinity, psu		
Receiving water TSS, mg/L (leave blank if unknown)		
If TSS is annual data, enter 'A'; if from critical period, enter 'S'; If no TSS, leave blank		

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Reasonable Potential Calculation

Facility	Camas WWTP
Water Body Type	Freshwater
Rec. Water Hardness	74 mg/L

Dilution Factors:	Acute	Chronic
Aquatic Life	21.7	113.6
Human Health Carcinogenic		173.7
Human Health Non-Carcinogenic		173.6

10

			1	2	3	4	5	6	7	8	9	
Pollutant, CAS No. & NPDES Application Ref. No.			AMMONIA, Criteria as Total NH3	ANTIMONY (INORGANIC) 7440360 1M	ARSENIC (dissolved) 7440382 2M	BUTYLBENZYL PHTHALATE 85687 15B	CADMIUM - 7440439 4M Hardness dependent	CHLOROFORM 67663 11V	CHROMIUM(TRI) -16065831 5M Hardness dependent	CHROMIUM(HEX) 18540299 - Dissolved	COPPER - 744058 6M Hardness dependent	CYANIDE 57125 14M	DIETHYLPHTHALATE 84662 24B
Effluent Data	# of Samples (n)		1156	20	20	3	20	4	20	20	20	20	3
	Coeff of Variation (Cv)		2.02	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		1,455		0.95	**0.27**	**0.22**	0.71	0.97	420	8.3	20	1.1
	Calculated 50th percentile Effluent Conc. (when n>10)			0.237							5.47	7.5	
Receiving Water Data	90th Percentile Conc., ug/L		183	0	0	**0**	**0.015**	0	0.416	0.086	1.43	0	
	Geo Mean, ug/L			0		**0**		0		0	0	0	0
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	#REF!	-	360	-	**2.67143**	-	428.811	**15**	12.813	22	-
		Chronic	#REF!	-	190	-	**0.82523**	-	139.102	**10**	8.7758	5.2	-
	WQ Criteria for Protection of Human Health, ug/L		-	6	-	**0.013**	-	100	-	-	1300	9	200
	Metal Criteria Translator, decimal	Acute	-	-	1	-	0.943	-	0.316	-	0.996	-	-
		Chronic	-	-	1	-	0.943	-	0.86	-	0.996	-	-
	Carcinogen?		N	N	Y	N	N	Y	N	N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950	0.950	0.950	0.950	0.950	0.950	
s	$s^2=\ln(CV^2+1)$	1.275	0.555	0.555	0.555	0.555	0.555	0.555	
Pn	Pn=(1-confidence level)$^{1/n}$	0.997	0.861	0.861	0.861	0.861	0.861	0.861	
Multiplier		1.00	1.36	1.36	1.36	1.36	1.36	1.36	
Max concentration (ug/L) at edge of…	Acute	242	0.060	0.027	0.416	26.549	1.885	1.260	
	Chronic	194	0.011	0.017	0.422	5.130	1.517	0.240	
Reasonable Potential? Limit Required?		**#REF!**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month						4			
LTA Coeff. Var. (CV), decimal						0.6			
Permit Limit Coeff. Var. (CV), decimal						0.6			
Waste Load Allocations, ug/L	Acute					323.030515			
	Chronic					1126.43826			
Long Term Averages, ug/L	Acute					103.719676			
	Chronic					594.12121			
Limiting LTA, ug/L						103.719676			
Metal Translator or 1?						1.00			
Average Monthly Limit (AML), ug/L						**161.0**			
Maximum Daily Limit (MDL), ug/L						**323.0**			

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.554513029	0.55451303	0.55451		0.5545	0.5545	0.5545
Pn	Pn=(1-confidence level)1/n	0.861	0.368	0.473		0.861	0.861	0.368
Multiplier		0.548111032	1.20486058	1.03846		0.5481	0.5481	1.2049
Dilution Factor		173.6066127	173.606613	173.666		173.61	173.61	173.61
Max Conc. at edge of Chronic Zone, ug/L		0.001365155	0.00187385	4.2E-03		0.0315	0.0432	0.0076
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**		**NO**	**NO**	**NO**

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Reasonable Potential Calculation - Page 2

Facility	Camas WWTP
Water Body Type	Freshwater
Rec. Water Hardness	74 mg/L

Dilution Factors:
Aquatic Life
Human Health Carcinogenic
Human Health Non-Carcinoge

			11	12	13	14	15	16	17	18
Pollutant, CAS No. & NPDES Application Ref. No.			LEAD - 7439921 7M Dependent on hardness	MERCURY 7439976 8M	NAPHTHALENE 91203 39B	NICKEL - 7440020 9M - Dependent on hardness	PHENOL 108952 10A	SELENIUM 7782492 10M	SILVER - 7740224 11M dependent on hardness.	ZINC- 7440666 13M hardness dependent
Effluent Data	# of Samples (n)		20	20	3	20	3	20	20	20
	Coeff of Variation (Cv)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		0.15	0.0009	2.07	2.02	5.5	1	0.02	26.4
	Calculated 50th percentile Effluent Conc. (when n>10)			0.0007		2		1		20.9
Receiving Water Data	90th Percentile Conc., ug/L		0.064	0.0009	0	0.604		0.274	0.025	1.25
	Geo Mean, ug/L			0	0	0	0	0		0
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	46.461	2.1	-	1097.1	-	20	2.05541	88.676
		Chronic	1.8105	0.012	-	121.84	-	5	-	80.975
	WQ Criteria for Protection of Human Health, ug/L		-	0.14	-	80	9000	60	-	1000
	Metal Criteria Translator, decimal	Acute	0.466	0.85	-	0.998	-	-	0.85	0.996
		Chronic	0.466	-	-	0.997	-	-	-	0.996
	Carcinogen?		N	N	N	N	N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950	0.950	0.950	0.950	0.950	
s	$s^2=\ln(CV^2+1)$	0.555	0.555	0.555	0.555	0.555	0.555	
Pn	Pn=(1-confidence level)$^{1/n}$	0.861	0.861	0.861	0.861	0.861	0.861	
Multiplier		1.36	1.36	1.36	1.36	1.36	1.36	
Max concentration (ug/L) at edge of…	Acute	0.065	0.001	0.703	0.324	0.025	2.849	
	Chronic	0.064	0.001	0.623	0.284	0.025	1.555	
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Aquatic Life Limit Calculation

# of Compliance Samples Expected per month		
LTA Coeff. Var. (CV), decimal		
Permit Limit Coeff. Var. (CV), decimal		
Waste Load Allocations, ug/L	Acute	
	Chronic	
Long Term Averages, ug/L	Acute	
	Chronic	
Limiting LTA, ug/L		
Metal Translator or 1?		
Average Monthly Limit (AML), ug/L		
Maximum Daily Limit (MDL), ug/L		

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.5545	0.5545	0.55451	0.55451		0.5545	
Pn	Pn=(1-confidence level)1/n	0.861	0.861	0.368	0.861		0.861	
Multiplier		0.5481	0.5481	1.20486	0.54811		0.5481	
Dilution Factor		173.61	173.61	173.607	173.607		173.61	
Max Conc. at edge of Chronic Zone, ug/L		4E-06	0.0115	0.03817	5.8E-03		0.1204	
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**		**NO**	

Calculation of Fecal Coliform at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	113.6
Receiving Water Fecal Coliform, #/100 ml	
Effluent Fecal Coliform - worst case, #/100 ml	400
Surface Water Criteria, #/100 ml	*14*
OUTPUT	
Fecal Coliform at Mixing Zone Boundary, #/100 ml	**4**
Difference between mixed and ambient, #/100 ml	4

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for fecal coliform.

Calculation of Dissolved Oxygen at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	113.6
Receiving Water DO Concentration, mg/L	8.1
Effluent DO Concentration, mg/L	5.1
Effluent Immediate DO Demand (IDOD), mg/L	2
Surface Water Criteria, mg/L	*8*
OUTPUT	
DO at Mixing Zone Boundary, mg/L	**8.06**
DO decrease caused by effluent at chronic boundary, mg/L	**0.04**

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for dissolved oxygen.

References: EPA/600/6-85/002b and EPA/430/9-82-011

Freshwater Temperature Reasonable Potential and Limit Calculation

Based on WAC 173-201A-200(1)(c)(i)--(ii) and the Water Quality Program Guidance. All data inputs must meet WQ guidelines. The Water Quality temperature guidance document may be found at: https://fortress.wa.gov/ecy/publications/summarypages/0610100.html

	Core Summer Critera	Supplemental Criteria
INPUT	**July 1-Sept 14**	**Sept 15-July 1**
1. Chronic Dilution Factor at Mixing Zone Boundary	113.6	113.6
2. 7DADMax Ambient Temperature (T) (Upstream Background 90th percentile)	21.5 °C	12.6 °C
3. 7DADMax Effluent Temperature (95th percentile)	22.0 °C	16.0 °C
4. Aquatic Life Temperature WQ Criterion in Fresh Water	22.0 °C	
OUTPUT		
5. Temperature at Chronic Mixing Zone Boundary:	21.5 °C	12.6 °C
6. Incremental Temperature Increase or decrease:	0.0 °C	0.0 °C
7. Maximum Allowable Incremental Temperature Increase:	1.0 °C	0.3 °C
8. Maximum Allowable Temperature at Mixing Zone Boundary:	22.0 °C	12.9 °C
A. If ambient temp is warmer than WQ criterion		
9. Does temp fall within this warmer temp range?	NO	YES
10. Temperature Limit if Required:	---	NO LIMIT
B. If ambient temp is cooler than WQ criterion but within 28/(T_{amb}+7) and within 0.3 °C of the criterion		
11. Does temp fall within this incremental temp. range?	NO	---
12. Temp increase allowed at mixing zone boundary, if required:	---	---
C. If ambient temp is cooler than (WQ criterion-0.3) but within 28/(T_{amb}+7) of the criterion		
13. Does temp fall within this Incremental temp. range?	YES	---
14. Temp increase allowed at mixing zone boundary, if required:	NO LIMIT	---
D. If ambient temp is cooler than (WQ criterion - 28/(T_{amb}+7))		
15. Does temp fall within this Incremental temp. range?	NO	---
16. Temp increase allowed at mixing zone boundary, if required:	---	---
RESULTS		
17. Do any of the above cells show a temp increase?	**NO**	**NO**
18. Temperature Limit if Required?	**NO LIMIT**	**NO LIMIT**

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream
USEPA Office of Water, Washington D.C.)

INPUT	
	@ Acute Boundary
1. Dilution Factor at Mixing Zone Boundary	121.0
2. Ambient/Upstream/Background Conditions	
Temperature (deg C):	23.20
pH:	8.10
Alkalinity (mg CaCO3/L):	74.00
3. Effluent Characteristics	
Temperature (deg C):	25.70
pH:	6.00
Alkalinity (mg CaCO3/L):	100.00
4. Aquatic Life Use Designation	Other species (salmonid/redb
OUTPUT	
1. Ionization Constants	
Upstream/Background pKa:	6.36
Effluent pKa:	6.35
2. Ionization Fractions	
Upstream/Background Ionization Fraction:	0.98
Effluent Ionization Fraction:	0.31
3. Total Inorganic Carbon	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	75
Effluent Total Inorganic Carbon (mg CaCO3/L):	322
4. Condtions at Mixing Zone Boundary	
Temperature (deg C):	23.22
Alkalinity (mg CaCO3/L):	74.21
Total Inorganic Carbon (mg CaCO3/L):	77.39
pKa:	6.36
5. Allowable pH change	0.50
RESULTS	
pH at Mixing Zone Boundary:	**7.73**
pH change at Mixing Zone Boundary:	0.37
Is permit limit needed?	NO

Streeter-Phelps Analysis of Critical Dissolved Oxygen Sag

INPUT			
1. EFFLUENT CHARACTERISTICS			
Discharge (cfs):			9.44
$CBOD_5$ (mg/L):			5
NBOD (mg/L):			3
Dissolved Oxygen (mg/L):			5
Temperature (deg C):			24
2. RECEIVING WATER CHARACTERISTICS			
Upstream Discharge (cfs):			81400
Upstream $CBOD_5$ (mg/L):			1.5
Upstream NBOD (mg/L):			0.2
Upstream Dissolved Oxygen (mg/L):			9
Upstream Temperature (deg C):			23
Elevation (ft NGVD):			75
Downstream Average Channel Slope (ft/ft):			0.00088
Downstream Average Channel Depth (ft):			21
Downstream Average Channel Velocity (fps):			0.98
3. REAERATION RATE (Base e) at 20 deg C (day^{-1}):			0.13
Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	0.07
O'Connor and Dobbins	0.1 - 1.5	2 - 50	0.13
Owens	0.1 - 6	1 - 2	0.08
Tsivoglou-Wallace	0.1 - 6	0.1 - 2	1.99
4. BOD DECAY RATE (Base e) AT 20 deg C (day^{-1}):			0.07
(or use *Wright and McDonnell eqn, 1979, for small rivers.) Enter this value -->*			0.04

OUTPUT	
1. INITIAL MIXED RIVER CONDITION	
$CBOD_5$ (mg/L):	1.5
NBOD (mg/L):	0.2
Dissolved Oxygen (mg/L):	9.0
Temperature (deg C):	23.0
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day^-1):	0.14
BOD Decay (day^-1):	0.08
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	2.2
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	2.4
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	8.555
Initial Deficit (mg/L):	-0.44
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	11.48
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):	184.06
7. CRITICAL DO DEFICIT (mg/L):	0.55
8. CRITICAL DO CONCENTRATION (mg/L):	**8.00**

APPENDIX B

STATE POINT ANALYSIS

STATE POINT ANALYSES

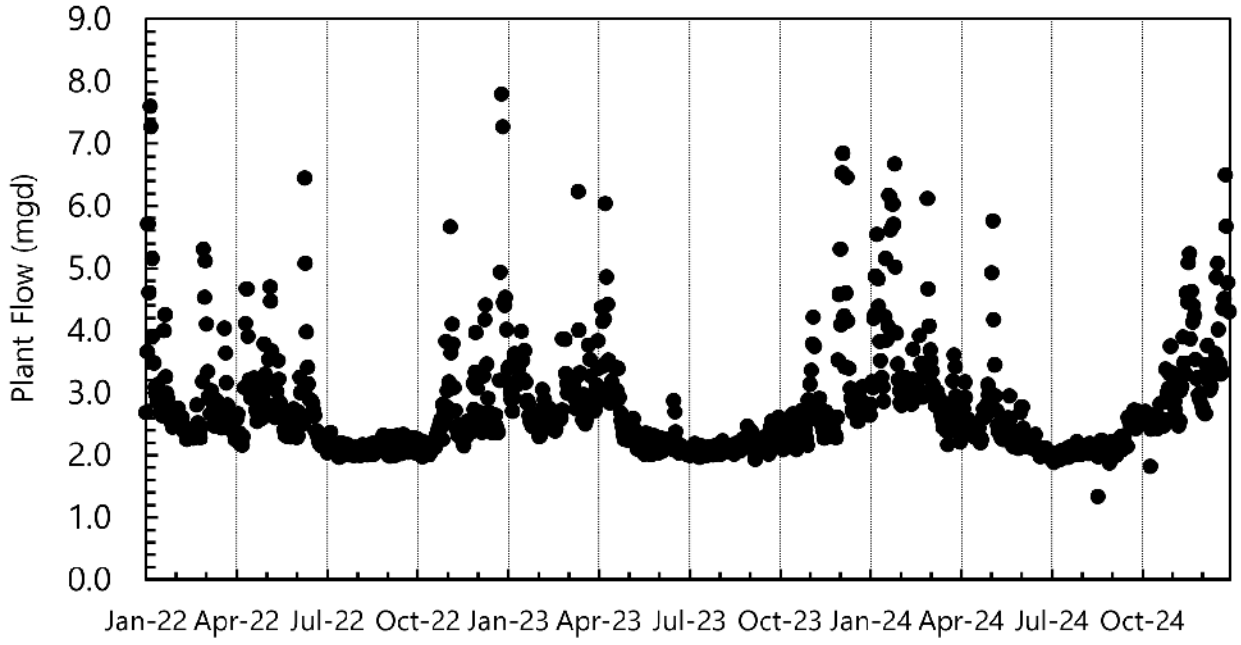


Figure B.1 Chronological Daily Influent Flow, January 2022 to December 2024

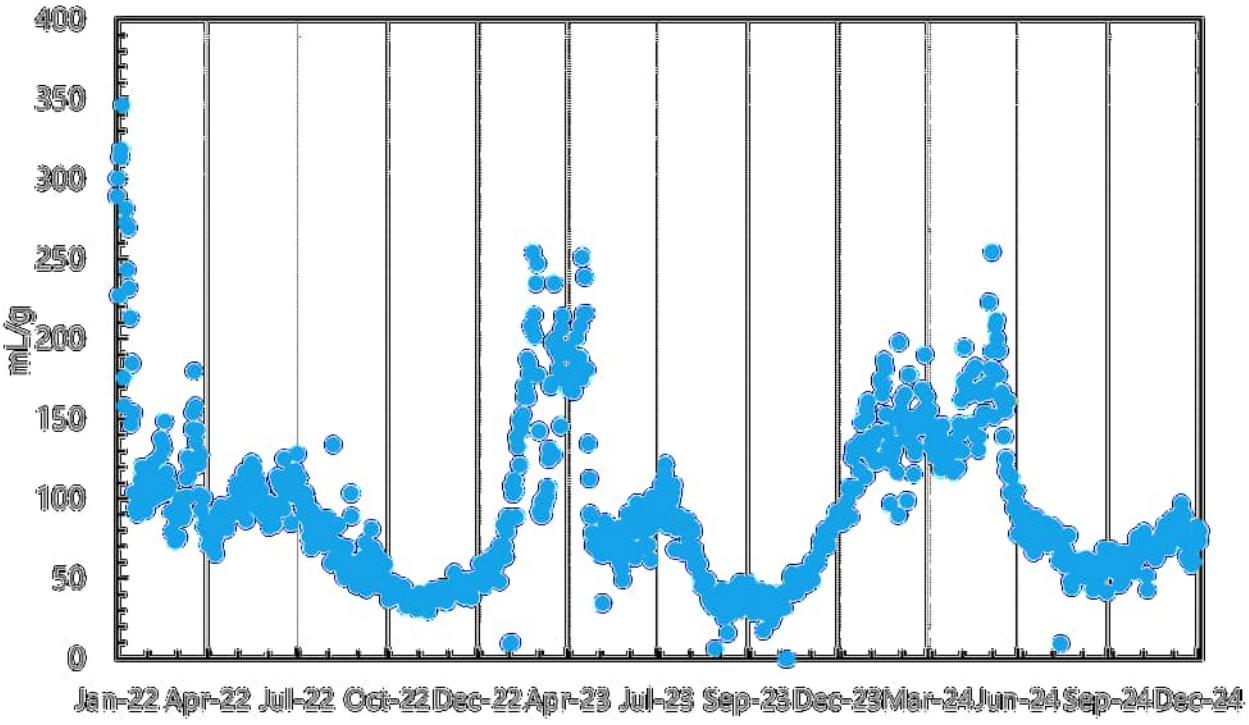


Figure B.2 Chronological SVI, January 2022 to December 2024

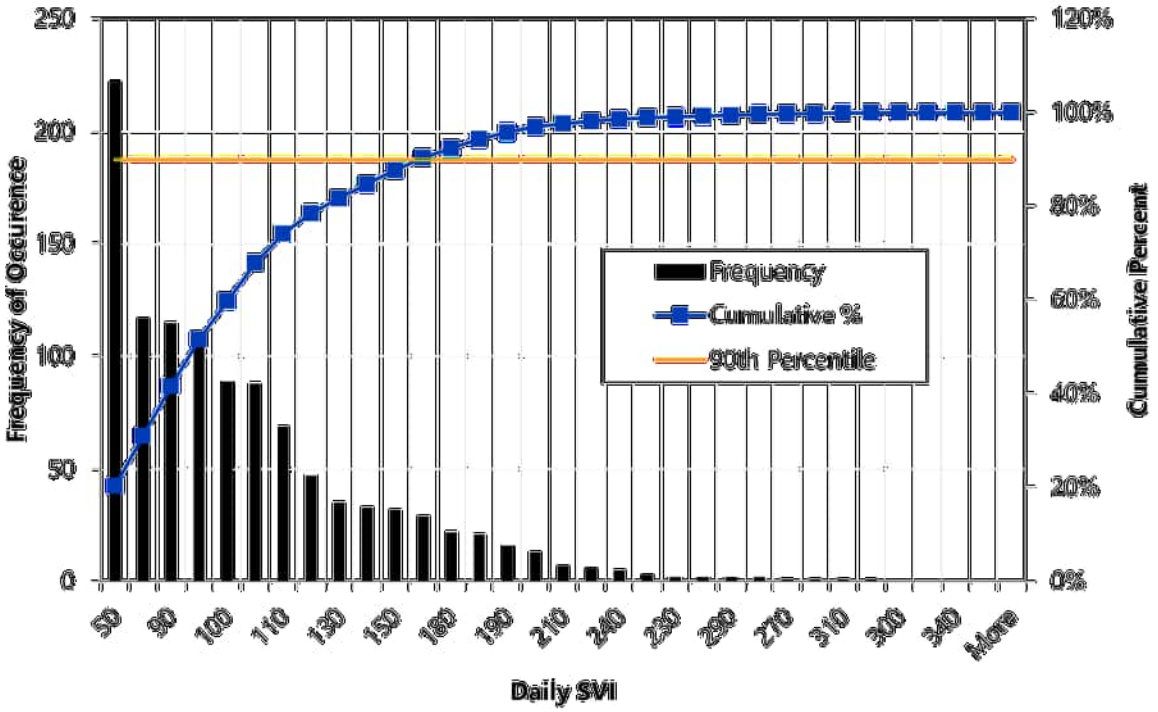


Figure B.3 Histogram of SVI Values (Frequency of occurrence and cumulative percent) from January 2022 to December 2024

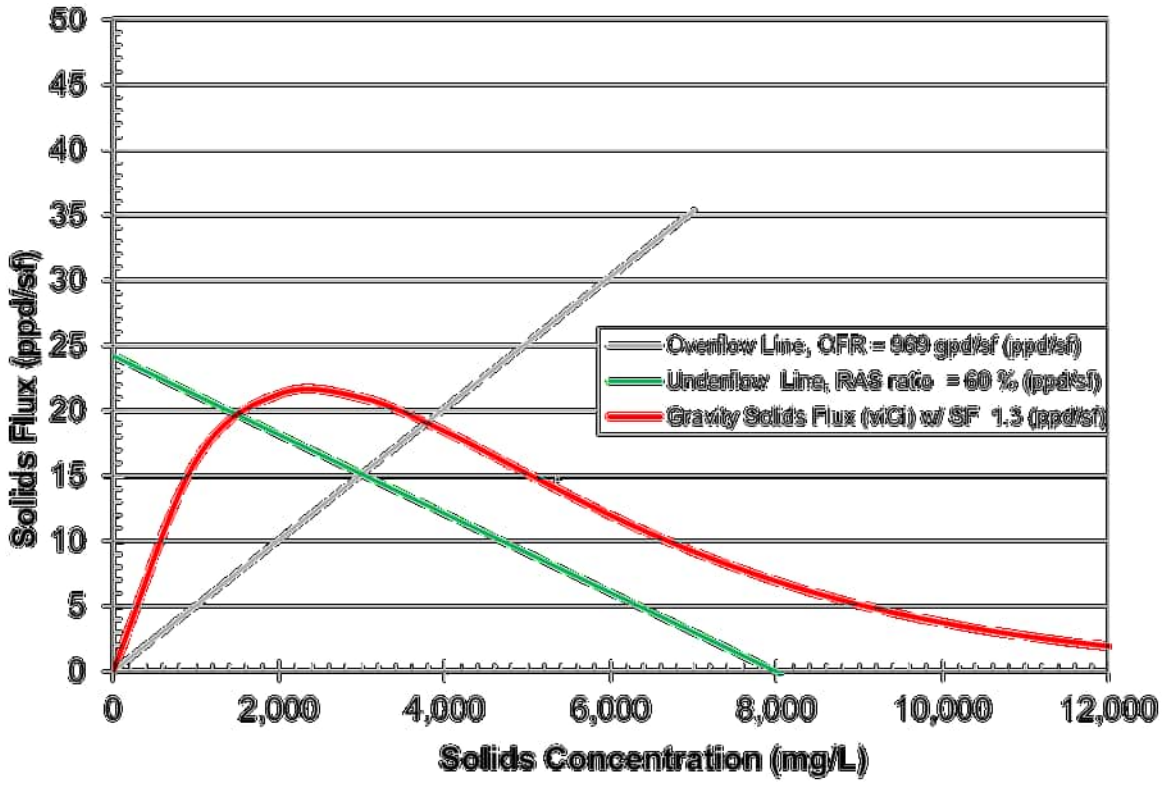


Figure B.4 State Point Analysis at Maximum Day Conditions

Notes: Four Secondary clarifiers, Flow = 10.7 mgd, MLSS = 3,000 mg/L, SVI = 160, Safety Factor = 1.3

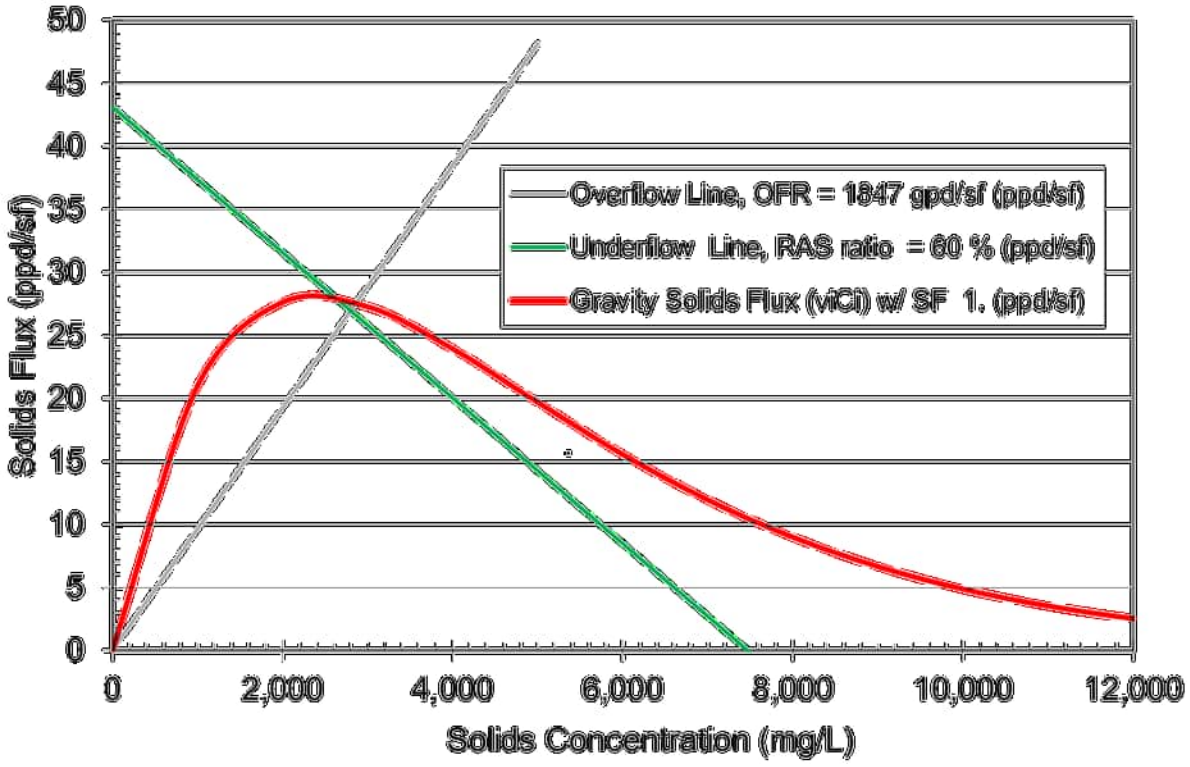


Figure B.5 State Point Analysis at Peak Hour Conditions

Notes: Four Secondary clarifiers, Flow = 20.4 mgd, MLSS = 2,800 mg/L, SVI = 160, Safety Factor = 1.0

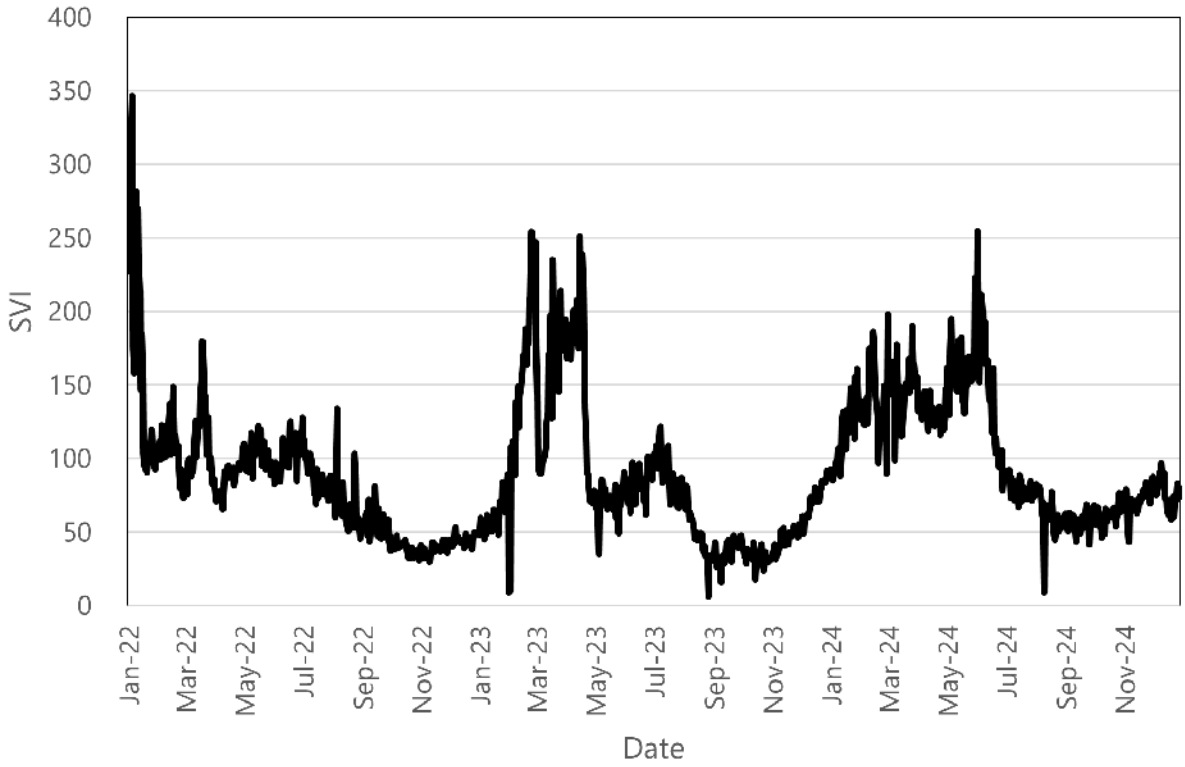


Figure B.6 Chronological Plot of Daily SVIs at the WWTF from January 2022 through December 2024

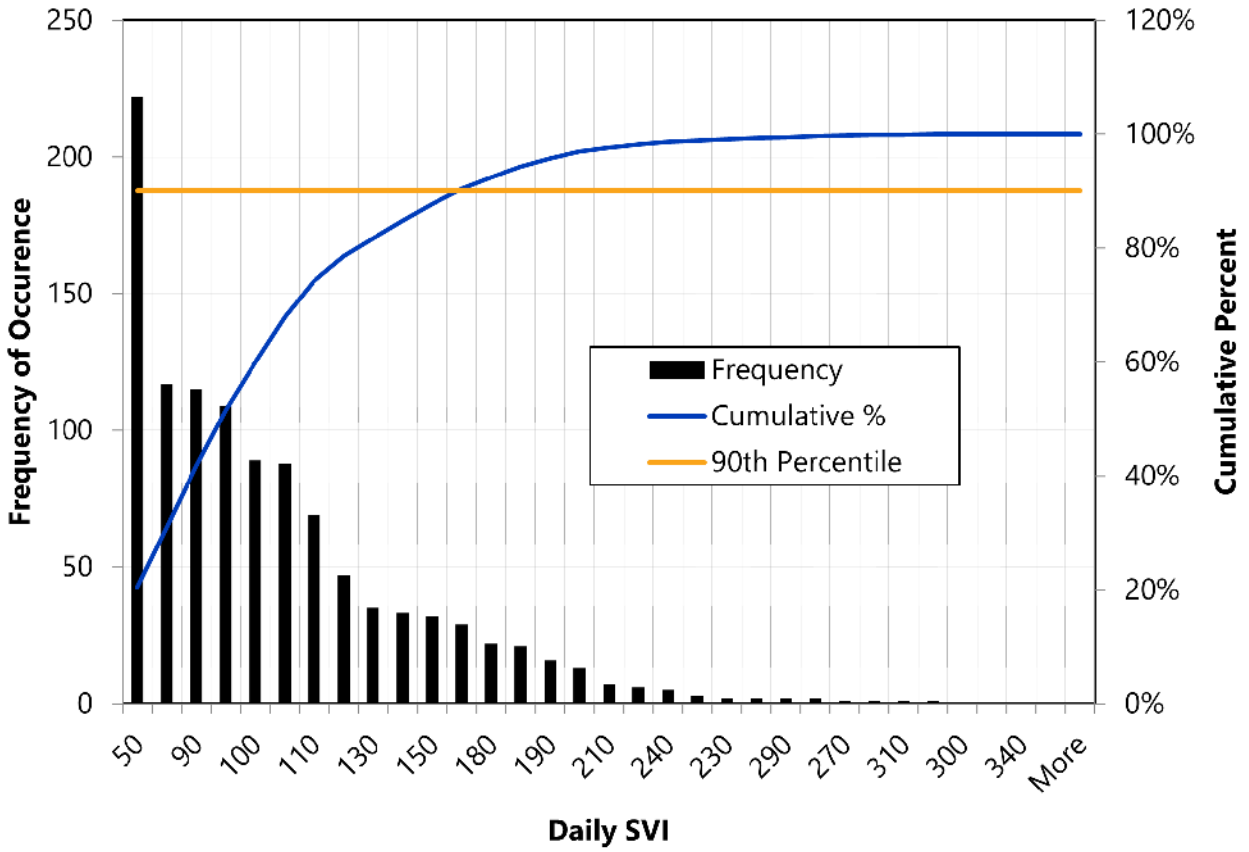


Figure B.7 Frequency of Occurrence Plot of Daily SVIs at the WWTF from January 2022 through December 2024

APPENDIX C

BIOWIN DATA

BIOWIN DATA

Geometry

Table C.1 Biowin Process Geometry

Tank/Zone	No.	Length	Width	Depth	Diameter	Unit Area	Total Area	Unit Volume	Total Volume
Primary Clarifiers	2			10.00	60.00	2,827	5,655	0.211	0.423
Selector Zones									
Zone 1	3	10.00	7.00	21.00		70	210	0.011	0.033
Zone 2	3	10.00	7.00	21.00		70	210	0.011	0.033
Zone 3	3	20.00	7.00	21.00		140	420	0.022	0.066
Subtotal		40.00				280	840	0.044	0.132
Anoxic Zones									
Zone 1	3	21.50	40.00	21.00		860	2,580	0.135	0.405
Zone 2	0					0	0	0.000	0.000
Subtotal		21.50				860	2,580	0.135	0.405
Total							3,420		0.537
Aeration Zones									
Zone 2 Anoxic	3	21.50	40.00	21.00		860	2,580	0.135	0.405
Zone 1	3	23.33	40.00	21.00		933	2,800	0.147	0.440
Zone 2	3	23.33	40.00	21.00		933	2,800	0.147	0.440
Zone 3	3	23.33	40.00	21.00		933	2,800	0.147	0.440
Subtotal		91.49				3,660	10,979	0.575	1.725
Total BNR						4,800	14,399	0.754	2.262
Secondary Clarifiers									
SC No. 1	1			17.00	75.00	4,418	4,418	0.562	0.562
SC No. 2	1			17.00	75.00	4,418	4,418	0.562	0.562
SC No. 3	1			14.00	75.00	4,418	4,418	0.463	0.463
SC No. 4	1			17.00	75.00	4,418	4,418	0.562	0.562
Subtotal							17,671		2.148

Notes:
BNR - biological nutrient removal; SC - secondary clarifier.

Table C.2 Tank Geometry in Process Simulation Model

Element name	Volume (MG)	Area (sf)	Depth (feet)	Aeration
PC	0.423	5,655	10.00	---
Selector 1	0.022	140	21.00	Mixed
Selector 2	0.022	140	21.00	Mixed
Selector 3	0.044	280	21.00	Mixed
Anoxic 1	0.41	2,610	21.00	Mixed
Anoxic 2	0.27	1,679	21.00	Mixed
Oxic 1	0.293	1,865	21.00	Aerated
Oxic 2	0.293	1,865	21.00	Aerated
Oxic 3	0.293	1,865	21.00	Aerated
SST	0.859	8,834	13.00	---
GST	5.283	540	13.12	---
MAD1	0.355	1,609	29.50	Mixed
MAD2	0.355	1,609	29.50	Mixed
DSHT	0.084	802	14.00	----

Notes:
DSHT - digested sludge holding tank; GST - gravity sludge thickener; MAD - mesophilic anaerobic digester; PC - primary clarifier; sf - square feet; SST - secondary settling tank.

APPENDIX D

WASHINGTON DEPARTMENT OF ECOLOGY AND USEPA DESIGN AND RELIABLITY CRITERIA

WASHINGTON DEPARTMENT OF ECOLOGY AND USEPA DESIGN AND RELIABLITY CRITERIA

Table D.1 Design Condition Summary(1)

Unit Processes	Flow (F)	Organic or Solids Loading (L)
All plant pumping, conveyance channels, pipes, and flow structures	PIDF	N/A
Primary and secondary clarifiers	PHDF + recirculation flow for overflow rate and weir loading rate.	PHDL (TSS loading rate to clarifiers)(2)
Biological reactor	MWDF	MWDL (BOD_5 loading to reactor(s))(2)
	MDDF	MDDL (BOD_5 loading to reactors)(2)
Aeration equipment for substrate removal	N/A	PHDL (BOD_5 and for nitrifying systems, TKN loading rate to biological reactor(s))(2)
Plant liquid stream pumping equipment	PIDF	N/A
Filters used for secondary effluent polishing	Pass all flows requiring tertiary treatment	N/A
Primary and secondary sludge wasting equipment	N/A	MDDL (BOD_5 and TSS loading to primary clarifiers and/or biological reactor(s))(2)
Sludge digestion and dewatering equipment	N/A	MDDL (BOD_5 loading to reactor(s))(2)
Disinfection (non-reuse and non-reliability Class I plants)	MDDF (for disinfection requirements, PHDF (for hydraulic considerations)	N/A
Disinfection (reuse and reliability Class I plants)	All flows	N/A

Notes:
(1) Source: Department of Ecology, State of Washington. August 2008 (Revised May 2023). Criteria for Sewage Works Design. Publication # 98-37 WQ. Olympia, Washington.
(2) Organic or solids loading parameters are to be computed with the same time intervals as hydraulic loadings.
(3) Continuous flow routing analysis to ensure the discharge from the equalization basin does not exceed the hydraulic design limit for the downstream unit processes.

BOD_5 - 5-day biological oxygen demand; MDDF - maximum day design flow; MDDL - maximum day design load; MWDF - maximum week design flow; MWDL - maximum week design load; N/A - not applicable; PHDF - peak hour design flow; PHDL - peak hour design load; PIDF - peak instantaneous design flow; TKN - total Kjeldahl nitrogen; TSS - total suspended solids.

Table D.2 General Requirements for Each Reliability Classification(1)

Reliability Class	General Requirements
I	For components included in the design of Reliability Class I works, the following backup requirements apply: ▪ **Mechanically Cleaned Bar Screens**. A backup bar screen, designed for mechanical or manual cleaning, shall be provided. Facilities with only two bar screens shall have at least one bar screen designed to permit manual cleaning. ▪ **Pumps**. A backup pump shall be provided for each set of pumps performing the same function. The capacity of the pumps shall be such that, with any one pump out of service, the remaining pumps will have the capacity to handle the peak flow. ▪ **Comminution Facility**. If comminution of the total wastewater flow is provided, an overflow bypass with a manually-installed or mechanically-cleaned bar screen shall be provided. The hydraulic capacity of the comminutor overflow bypass should be sufficient to pass the peak flow with all comminution units out of service. ▪ **Primary Sedimentation Basins**. The units should be sufficient in number and size so that, with the largest-flow-capacity unit out of service, the remaining units should have a design flow capacity of at least 50% of the total design flow. ▪ **Final Sedimentation Basins and Trickling Filters**. The units shall be sufficient in number and size so that, with the largest-flow-capacity unit out of service, the remaining units shall have a design flow capacity of at least 75% of the total design flow. ▪ **Activated Sludge Process Components**: » **Aeration Basin**. A backup basin will not be required; however, at least two equal-volume basins shall be provided. (For the purpose of this criterion, the two zones of a contact stabilization process are considered as only one basin.) » **Aeration Blowers or Mechanical Aerators**. There shall be a sufficient number of blowers or mechanical aerators to enable the design oxygen transfer to be maintained with the largest-capacity-unit out of service. It is permissible for the backup unit to be an uninstalled unit, provided that the installed units can be easily removed and replaced. However, at least two units shall be installed. » **Air Diffusers**. The air diffusion system for each aeration basin shall be designed so that the largest section of diffusers can be isolated without measurably impairing the oxygen transfer capability of the system. ▪ **Disinfectant Contact Basins**. The units shall be sufficient in number and size so that, with the largest-flow-capacity unit out of service, the remaining units shall have a design flow capacity of at least 50 percent of the total design flow.
II	The Reliability Class I requirements shall apply except as modified below: ▪ D/E. **Primary and Final Sedimentation Basins and Trickling Filters**. The units shall be sufficient in number and size so that, with the largest-flow-capacity unit out of service, the remaining units shall have a design flow capacity of at least 50 percent of the design basin flow.
III	The Reliability Class I requirements shall apply except as modified below: ▪ D/E. Primary and Final Sedimentation Basins. There shall be at least two sedimentation basins. » Activated Sludge Process Components. » Aeration Basin. A single basin is permissible. **Aeration Blowers/Mechanical Aerators or Rotors**. There shall be at least two blowers, mechanical aerators, or rotors available for service. It is permissible for one of the units to be uninstalled, provided that the installed unit can be easily removed and replaced. Aeration must be provided to maintain sufficient DO in the tanks to maintain the biota.

Notes:
(1) Source: From Department of Ecology, State of Washington. August 2008 (Revised May 2023). Criteria for Sewage Works Design. Publication # 98-37 WQ. Olympia, Washington.

Table D.3 Summary of Class I Reliability Criteria for Wastewater Treatment Facilities(1)

Plant Component	Class I Reliability (2)	Design Flow/Load(3)
Hydraulic Elements	Peak flow with largest unit out of service.	Peak hour
Primary Sedimentation	50% design flow with largest unit out of service.	Average day / peak hour
Aeration System	Design transfer with largest unit out; backup may be uninstalled; minimum 2 installed units.	Maximum day / maximum week
Biological Treatment Systems	Minimum 2 equal volumes; no backup required.	Annual average / maximum month
Secondary Clarifiers	75% design flow with largest unit out of service.	Maximum day / peak hour
Disinfection	50% design flow with largest unit out of service.	Average day / peak hour
Filtration	75% design flow with largest unit out of service.	Average day / peak hour
Sludge Facilities		
Digestion	Minimum 2 tanks.	Maximum month
Mixing	Design capacity with one unit out.	
Dewatering	Design capacity with one unit out.	

Notes:
(1) Source: U.S. Environmental Protection Agency. 1974. Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability. Publication No. EPA-430-99-74-001, Washington, D.C.
(2) Reliability - A measurement of the ability of a component or system to perform its designated function without failure. In the referenced Technical Bulletin, reliability pertains to mechanical, electric, and fluid systems and components only and includes the maintainability of those systems and components. Reliability of biological processes, operator training, process design, or structural design is not within the scope of the referenced publication.
(3) Fluid System - A system within the treatment works which contains liquid or gaseous fluids. This includes the main wastewater treatment system, parts of the sludge handling and disposal system, and auxiliary systems.
(4) Design Flow – That flow used as the basis of design of a component and/or system.
(5) Peak Wastewater Flow - The maximum wastewater flow expected during the design period of the treatment works.
(6) Hydraulic Capacity - The maximum flow capacity of a component which does not result in flooding or overflowing.
(7) Reliability Class I – Works which discharge into navigable waters that could be permanently or unacceptably damaged by effluent which was degraded in quality for only a few hours. Examples of Class I Works might be those discharging near drinking water reservoirs, into shellfish waters, or in close proximity to areas used for water contact sports.

APPENDIX E

DESIGN INFLUENT PARAMETERS

DESIGN INFLUENT PARAMETERS

Table E.1 Existing Influent Flows

Flow Condition	Units	May 2025	2045
AADF	mgd	2.56	5.36
MMADF	mgd	___	7.5
MWADF	mgd	___	8.6
Max Day Flow	mgd	3.11	10.7
Peak Hour Flow	mgd	----	20.4
	gpm		14,200

Notes:
AADF - annual average day flow; MMADF - maximum month average day flow; MWADF - maximum week average day flow.

Table E.2 Historical Influent and Primary Effluent Concentrations (mg/L)

Parameter	Flow	BOD_5	TSS	NH3
	(mgd)	(mg/L)	(mg/L)	(mg/L)
Influent				
Average	2.73	121.49	133.82	40.33
Minimum	1.33	48.80	39.00	9.74
Maximum	7.80	313.90	380.00	59.30
Standard deviation	0.85	29.92	46.49	8.63
No. of data points (n)	1,095	722	726	725
Coefficient of variation	0.31	0.25	0.35	0.21
Primary Effluent				
Average		72.09	43.03	
Minimum		17.70	10.00	
Maximum		801.10	201.00	
Standard deviation		36.06	17.65	
No. of data points (n)		540	599	
Coefficient of variation		0.50	0.41	

Table E.3 Historical Influent and Primary Effluent Mass Loads (ppd)

Parameter	2022	2023	2024
Influent			
Flow	2.71	2.64	2.85
BOD_5	2,498.30	2,773.30	2,771.85
TSS	2,872.54	3,153.41	2,911.42
TKN	1,322.18	1,237.17	1,209.36

Parameter	2022	2023	2024
Primary Effluent			
BOD_5	2,094.96	1,551.04	1,550.93
TSS	1,380.04	920.99	828.93
TKN	-	-	-

Notes:
BOD_5 - 5-day biological oxygen demand; TSS - total suspended solids; TKN - total Kjeldahl nitrogen.

Table E.4 Historical Effluent Concentrations (mg/L)

Parameter	2022	2023	2024
Final Effluent			
BOD_5	4.05	4.01	3.20
TSS	4.05	3.47	3.20
NH3	0.29	0.32	0.31

Table E.5 BioWin Model Influent Mass Loads by Average Period

Averaging Period	Units	Flow	BOD_5	TSS	TKN	TP
AAD	ppd	5.36	5,932	5,643	2,460	134
MMAD	ppd	6.80	7,525	7,158	3,121	170
MWAD	ppd	7.60	8,410	8,001	3,488	190
MD	ppd	13.3	14,718	14,001	6,105	333

Notes:
AAD - annual average day; MMAD - maximum month average day; MWAD - maximum week average day; MD - maximum day.

Table E.6 Predicted BNR Influent Flow and Mass Loads

Averaging Period	Units	PC Effluent	PS 1	PS 2	Total	Total Sidestream	Sidestream Concentration
Flow							
AADF	mgd	5.29	0.18	0.08	5.55	0.26	
MMADF	mgd	6.71	0.23	0.08	7.01	0.30	
MWADF	mgd	7.49	0.27	0.07	7.83	0.35	
MDF	mgd	10.56	0.36	0.13	11.06	0.50	
cBOD5							
AAD	ppd	3,866	194	182	4,243	376	176
MMAD	ppd	4,714	272	221	5,207	493	194
MWAD	ppd	5,369	346	256	5,971	602	209
MD	ppd	8,321	634	466	9,421	1,100	266
TSS							
AAD	ppd	2,596	765	682	4,043	1,448	676
MMAD	ppd	3,007	859	992	4,858	1,851	730
MWAD	ppd	3,520	1,239	940	5,699	2,179	756
MD	ppd	6,083	2,102	1,490	9,674	3,592	868

Averaging Period	Units	PC Effluent	PS 1	PS 2	Total	Total Sidestream	Sidestream Concentration
TKN							
AAD	ppd	2,370	173	56	2,600	229	107
MMAD	ppd	3,002	213	78	3,293	291	115
MWAD	ppd	3,351	253	78	3,682	331	115
MD	ppd	4,750	395	123	5,268	518	125

Table E.7 Plant Sludge Production Predicted by the BioWin Model

Averaging Period	Units	Primary Sludge	Thickened PS	Waste Activated Sludge	Thickened WAS	Total TPS + TWAS	Digested Sludge	Dewatered Sludge Cake	Dried Sludge
AAD	ppd	3,555	3,377	3,388	2,880	6,256	2,946	2,504	2,379
MMAD	ppd	4,009	3,808	4,519	3,842	7,650	3,655	3,290	2,961
MWAD	ppd	4,160	3,952	5,273	4,482	8,434	4,303	3,658	3,475
MD	ppd	3,920	3,724	10,093	8,579	12,304	7,157	6,083	5,779

APPENDIX F

BIOWIN MODEL INFLUENT WASTEWATER FRACTIONS

BIOWIN MODEL INFLUENT WASTEWATER FRACTIONS

Table F.1 Design Influent Wastewater Fractions

Wastewater Fraction	Units	Default	May 2025	2045 MMAD
Readily biodegradable (including Acetate)	g COD/g of total COD	0.16	0.1346	0.10
Volatile fatty acids	g VFA COD/g rbCOD	0.15	0.1429	0.13
Acetate	g COD/g of readily biodegradable COD	1.00	1.00	1.00
Non-colloidal slowly biodegradable	g COD/g of slowly degradable COD	0.75	0.7162	0.75
Unbiodegradable soluble	g COD/g of total COD	0.05	0.0577	0.14
Unbiodegradable particulate	g COD/g of total COD	0.13	0.0546	0.11
Cellulose fraction of unbiodegradable particulate	g COD/g COD	0.5	0.5	0.50
Ammonia	g NH_3-N TKN	0.66	0.6667	0.92
Particulate organic nitrogen	g N Organic N	0.5	0.5	0.50
Soluble unbiodegradable TKN	g N TKN	0.02	0.02	0.02
N:COD ratio for unbiodegradable part. COD	g N COD	0.07	0.07	0.07
Phosphate	g PO4-P/TP	0.5	0.4889	0.81
P:COD ratio for unbiodegradable part. COD	g P COD	0.022	0.022	0.02
Reduced sulfur (H2S)	g S S	0.15	0.15	0.20
Ordinary heterotrophic COD fraction	g COD/g of total COD	0.02	0.02	0.02
Methylotrophic COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Ammonia oxidizing COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Nitrite oxidizing COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Anaerobic ammonia oxidizing COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Phosphorus accumulating COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Propionic acetogenic COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Acetoclastic methanogenic COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04

Wastewater Fraction	Units	Default	May 2025	2045 MMAD
Hydrogenotrophic methanogenic COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Sulfur oxidizing COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Sulfur reducing propionic acetogenic COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	1.00E-04
Sulfur reducing acetotrophic COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	0.00
Sulfur reducing hydrogenotrophic COD fraction	g COD/g of total COD	1.00E-04	1.00E-04	0.00
Endogenous products COD fraction	g COD/g of total COD	0	0	0.00

Notes:
COD - chemical oxygen demand; g - grams; MMAD - maximum month average day; N - nitrogen; P - phosphate; S - sulfur; TKN - total Kjeldahl nitrogen; VFA - volatile fatty acids.

APPENDIX G

MODEL SIMULATION RESULTS

MODEL SIMULATION RESULTS

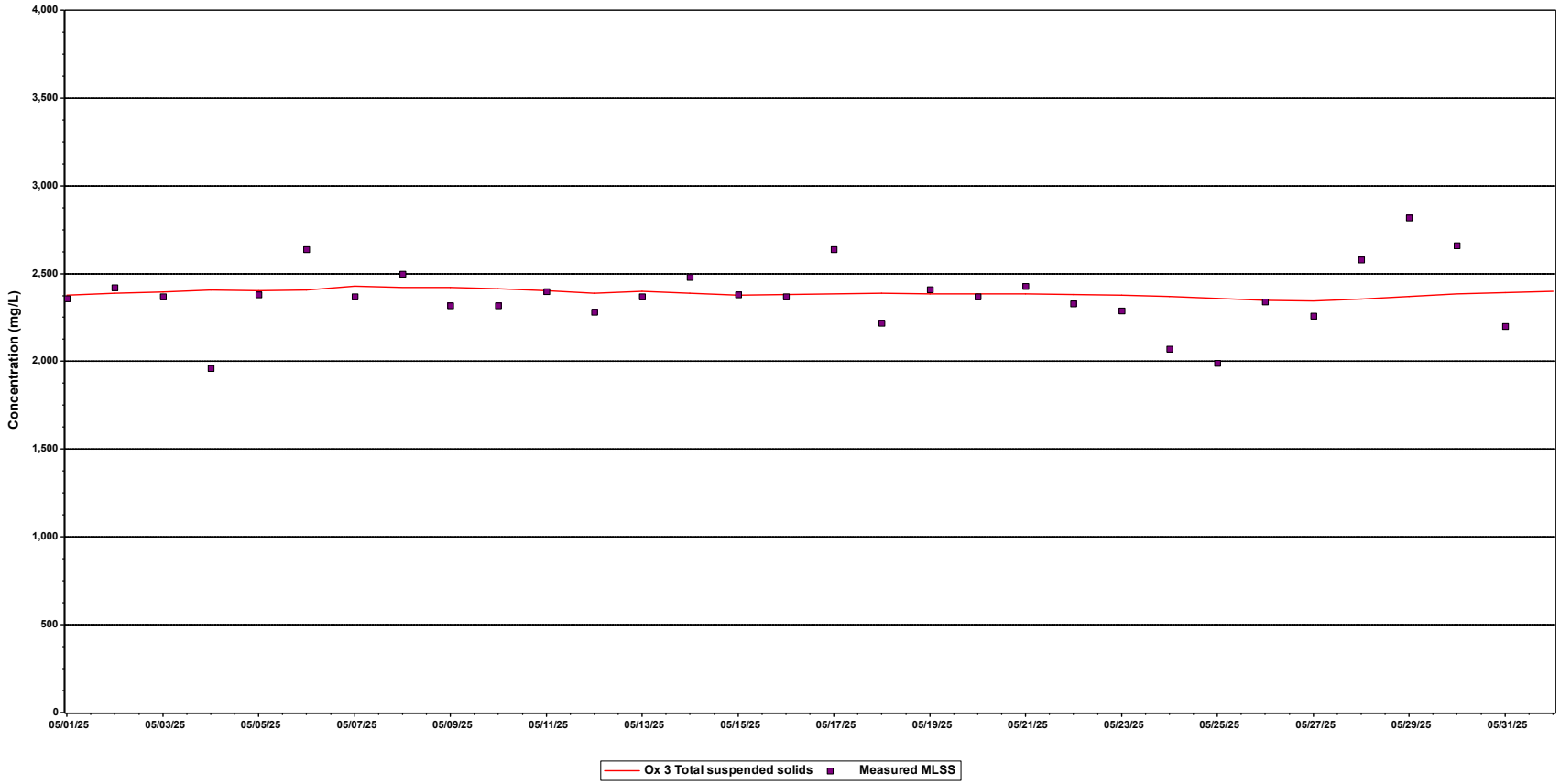


Figure G.1 Predicted Mixed Liquor Suspended Solids Versus Measured Concentrations for the Wastewater Treatment Facility for May 2025

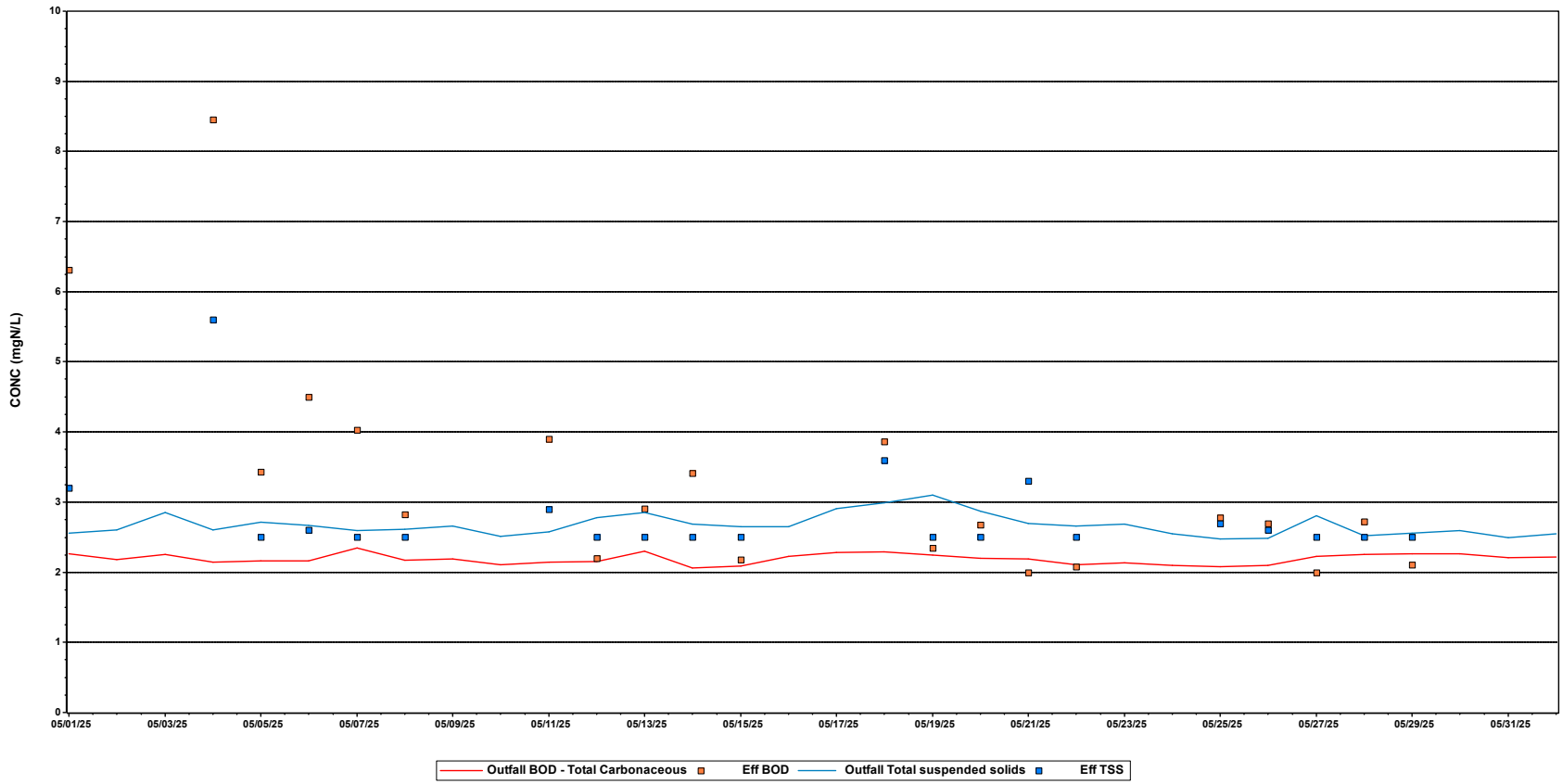


Figure G.2 Predicted versus Measured Effluent $cBOD_5$ and Total Suspended Solids Concentrations for May 2025

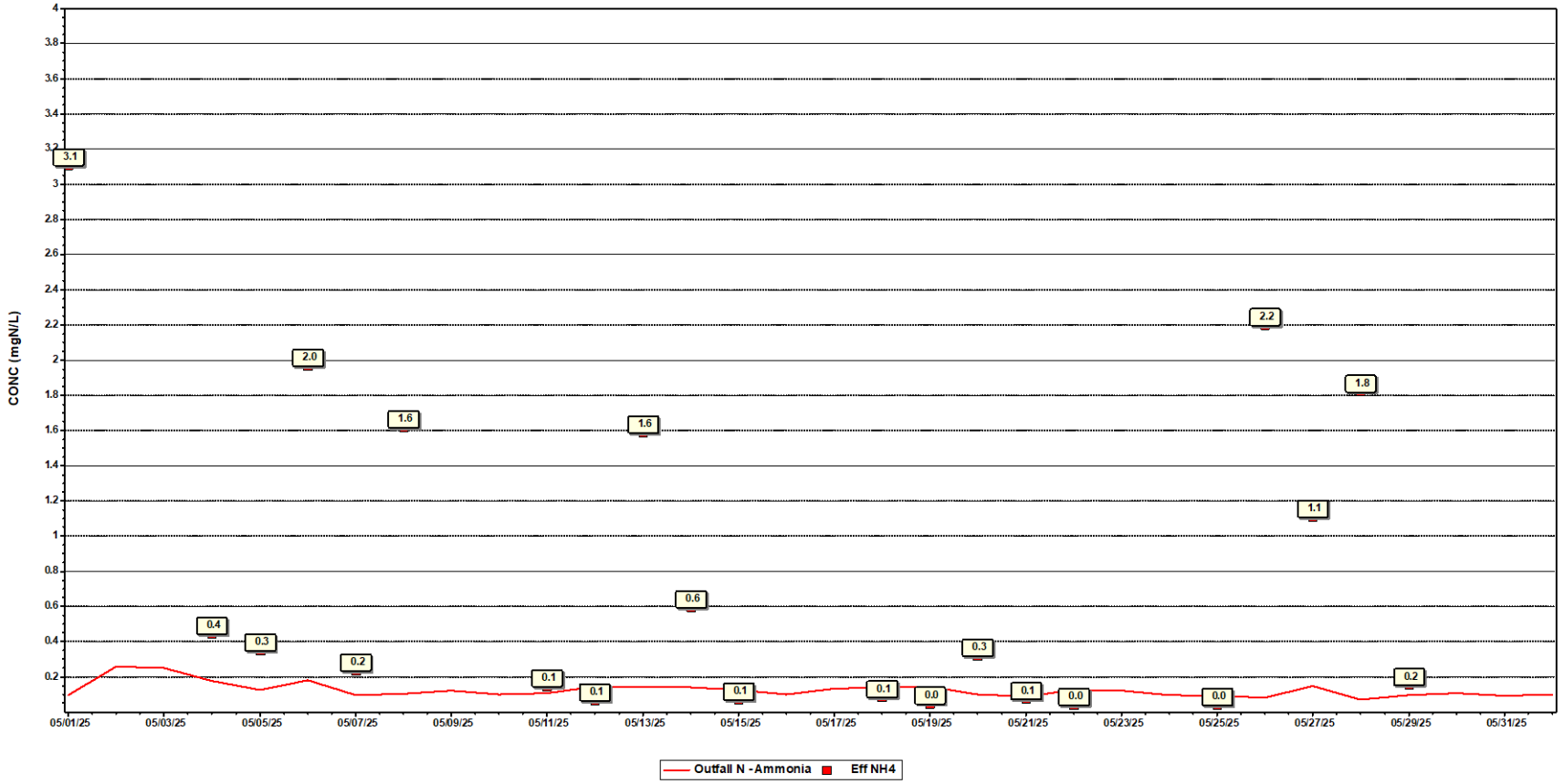


Figure G.3 Predicted versus Measured Effluent Ammonium Concentrations for May 2025

APPENDIX J

REASONABLE POTENTIAL ANALYSIS PROJECT MEMORANDUM

PROJECT MEMORANDUM

CITY OF CAMAS

General Sewer Plan Update

Project No.: 203710
Date: January 7, 2026
Prepared By: Y. Yerbich-Louman
Reviewed By: Matt Huang
Subject: Reasonable Potential Analysis

The Washington State Department of Ecology (DOE) drafted a proposed National Pollutant Discharge Elimination System (NPDES) Permit WA0020249 for the City of Camas wastewater treatment plant (WWTP) with an effective date of August 1, 2025. As a part of these efforts, DOE conducted a reasonable potential analysis (RPA) for the predicted WWTP discharge in 2045 using a maximum daily discharge value of 10.04 million gallons per day (mgd).

The maximum daily discharge in planning year 2045 is projected to be 10.70 mgd. The DOE-developed *Spreadsheets for Water Quality-Based NPDES Permit Calculations* was used to generate an updated RPA with the projected maximum daily discharge and no other changes compared to the original RPA prepared for the draft permit. The updated RPA was conducted to identify any new reasonable potentials as a result of the updated maximum daily discharge value that would require infrastructure or process modifications to be addressed in capital improvement planning.

The updated RPA indicated that no new reasonable potentials were identified. The updated RPA results are provided in the following pages.

Dilution Factor Calculations and Receiving Water Critical Conditions

Step 1: Enter Waterbody Type

Water Body Type	Freshwater

Facility Name	Camas WWTP
Receiving Water	Columbia River

Step 2: Enter Dilution Factors -OR- Calculate DFs by entering Facility/Receiving Water Flow Data

Do you want to enter dilution factors -or- flow data?	Flow Data

	Annual Average	Max Monthly Average	Daily Max
Facility Flow, MGD	5.36	7.5	10.7
Facility Flow, cfs (calculated)	8.29	11.60	16.55

	Condition	Receiving Water Flow, cfs	Allowable % of river flow	Max Dilution Factor Allowed
Aquatic Life - Acute	7Q10	81400	0.0042	**21.7**
Aquatic Life - Chronic	7Q10	81400	0.0229	**113.6**
HH-Non-Carcinogen	30Q5	113960	0.02508	**173.7**
HH-Carcinogen	Harmonic Mean	244200	0.0117	**173.6**
Whole river at 7Q10	7Q10	81400		

Step 3: Enter Critical Data

	Effluent	Receiving Water
Temp, °C	25.7	23.2
pH, s.u.	7.3	7.7
Alkalinity, mg/L as CaCO3	100	66.2
Hardness, mg/L CaCO3	168	74
Salinity, psu		
Receiving water TSS, mg/L (leave blank if unknown)		
If TSS is annual data, enter 'A'; if from critical period, enter 'S'; If no TSS, leave blank		

Instructions

Reasonable Potential Calculation

Facility	Camas WWTP
Water Body Type	Freshwater
Rec. Water Hardness	74 mg/L

Dilution Factors:	Acute	Chronic
Aquatic Life	21.7	113.6
Human Health Carcinogenic		173.7
Human Health Non-Carcinogenic		173.6

10

Pollutant, CAS No. & NPDES Application Ref. No.			1 AMMONIA, Criteria as Total NH3	2 ANTIMONY (INORGANIC) 7440360 1M	3 ARSENIC (dissolved) 7440382 2M	4 BUTYLBENZYL PHTHALATE 85687 15B	5 CADMIUM - 7440439 4M Hardness dependent	6 CHLOROFORM 67663 11V	7 CHROMIUM(TRI) -16065831 5M Hardness dependent	8 CHROMIUM(HEX) 18540299 - Dissolved	9 COPPER - 744058 6M Hardness dependent	CYANIDE 57125 14M	DIETHYLPHTHALATE 84662 24B
Effluent Data	# of Samples (n)		1156	20	20	3	20	4	20	20	20	20	3
	Coeff of Variation (Cv)		2.02	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		1,455		0.95	**0.27**	**0.22**	0.71	0.97	420	8.3	20	1.1
	Calculated 50th percentile Effluent Conc. (when n>10)			0.237							5.47	7.5	
Receiving Water Data	90th Percentile Conc., ug/L		183	0	0	**0**	**0.015**	0	0.416	0.086	1.43	0	
	Geo Mean, ug/L			0		**0**		0		0	0	0	0
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	#REF!	-	360	-	**2.67143**	-	428.811	**15**	12.813	22	-
		Chronic	#REF!	-	190	-	**0.82523**	-	139.102	**10**	8.7758	5.2	-
	WQ Criteria for Protection of Human Health, ug/L		-	6	-	**0.013**	-	100	-	-	1300	9	200
	Metal Criteria Translator, decimal	Acute	-	-	1	-	0.943	-	0.316	-	0.996	-	-
		Chronic	-	-	1	-	0.943	-	0.86	-	0.996	-	-
	Carcinogen?		N	N	Y	N	N	Y	N	N	N	N	N

Aquatic Life Reasonable Potential										
Effluent percentile value			0.950	0.950	0.950	0.950	0.950	0.950	0.950	
s	$s^2=\ln(CV^2+1)$		1.275	0.555	0.555	0.555	0.555	0.555	0.555	
Pn	Pn=(1-confidence level)$^{1/n}$		0.997	0.861	0.861	0.861	0.861	0.861	0.861	
Multiplier			1.00	1.36	1.36	1.36	1.36	1.36	1.36	
Max concentration (ug/L) at edge of…		Acute	242	0.060	0.027	0.416	26.549	1.885	1.260	
		Chronic	194	0.011	0.017	0.422	5.130	1.517	0.240	
Reasonable Potential? Limit Required?			**#REF!**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	

Aquatic Life Limit Calculation			
# of Compliance Samples Expected per month			4
LTA Coeff. Var. (CV), decimal			0.6
Permit Limit Coeff. Var. (CV), decimal			0.6
Waste Load Allocations, ug/L		Acute	323.030515
		Chronic	1126.43826
Long Term Averages, ug/L		Acute	103.719676
		Chronic	594.12121
Limiting LTA, ug/L			103.719676
Metal Translator or 1?			1.00
Average Monthly Limit (AML), ug/L			**161.0**
Maximum Daily Limit (MDL), ug/L			**323.0**

Human Health Reasonable Potential								
s	$s^2=\ln(CV^2+1)$	0.554513029	0.55451303	0.55451	0.5545	0.5545	0.5545	
Pn	Pn=(1-confidence level)1/n	0.861	0.368	0.473	0.861	0.861	0.368	
Multiplier		0.548111032	1.20486058	1.03846	0.5481	0.5481	1.2049	
Dilution Factor		173.6066127	173.606613	173.666	173.61	173.61	173.61	
Max Conc. at edge of Chronic Zone, ug/L		0.001365155	0.00187385	4.2E-03	0.0315	0.0432	0.0076	
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Instructions

Reasonable Potential Calculation - Page 2

Facility	Camas WWTP
Water Body Type	Freshwater
Rec. Water Hardness	74 mg/L

Dilution Factors:
Aquatic Life
Human Health Carcinogenic
Human Health Non-Carcinoge

Pollutant, CAS No. & NPDES Application Ref. No.			11 LEAD - 7439921 7M Dependent on hardness	12 MERCURY 7439976 8M	13 NAPHTHALENE 91203 39B	14 NICKEL - 7440020 9M - Dependent on hardness	15 PHENOL 108952 10A	16 SELENIUM 7782492 10M	17 SILVER - 7740224 11M dependent on hardness.	18 ZINC- 7440666 13M hardness dependent
Effluent Data	# of Samples (n)		20	20	3	20	3	20	20	20
	Coeff of Variation (Cv)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		0.15	0.0009	2.07	2.02	5.5	1	0.02	26.4
	Calculated 50th percentile Effluent Conc. (when n>10)			0.0007		2		1		20.9
Receiving Water Data	90th Percentile Conc., ug/L		0.064	0.0009	0	0.604		0.274	0.025	1.25
	Geo Mean, ug/L			0	0	0	0	0		0
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	46.461	2.1	-	1097.1	-	20	2.05541	88.676
		Chronic	1.8105	0.012	-	121.84	-	5	-	80.975
	WQ Criteria for Protection of Human Health, ug/L		-	0.14	-	80	9000	60	-	1000
	Metal Criteria Translator, decimal	Acute	0.466	0.85	-	0.998	-	-	0.85	0.996
		Chronic	0.466	-	-	0.997	-	-	-	0.996
	Carcinogen?		N	N	N	N	N	N	N	N

Aquatic Life Reasonable Potential									
Effluent percentile value			0.950	0.950	0.950	0.950	0.950	0.950	0.950
s	$s^2=\ln(CV^2+1)$		0.555	0.555	0.555	0.555	0.555	0.555	0.555
Pn	Pn=(1-confidence level)$^{1/n}$		0.861	0.861	0.861	0.861	0.861	0.861	0.861
Multiplier			1.36	1.36	1.36	1.36	1.36	1.36	1.36
Max concentration (ug/L) at edge of…		Acute	0.065	0.001	0.703	0.324	0.025	2.849	
		Chronic	0.064	0.001	0.623	0.284	0.025	1.555	
Reasonable Potential? Limit Required?			**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	

Aquatic Life Limit Calculation		
# of Compliance Samples Expected per month		
LTA Coeff. Var. (CV), decimal		
Permit Limit Coeff. Var. (CV), decimal		
Waste Load Allocations, ug/L	Acute	
	Chronic	
Long Term Averages, ug/L	Acute	
	Chronic	
Limiting LTA, ug/L		
Metal Translator or 1?		
Average Monthly Limit (AML), ug/L		
Maximum Daily Limit (MDL), ug/L		

Human Health Reasonable Potential								
s	$s^2=\ln(CV^2+1)$	0.5545	0.5545	0.55451	0.55451		0.5545	
Pn	Pn=(1-confidence level)1/n	0.861	0.861	0.368	0.861		0.861	
Multiplier		0.5481	0.5481	1.20486	0.54811		0.5481	
Dilution Factor		173.61	173.61	173.607	173.607		173.61	
Max Conc. at edge of Chronic Zone, ug/L		4E-06	0.0115	0.03817	5.8E-03		0.1204	
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**		**NO**	

Calculation of Fecal Coliform at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	113.6
Receiving Water Fecal Coliform, #/100 ml	
Effluent Fecal Coliform - worst case, #/100 ml	400
Surface Water Criteria, #/100 ml	*14*
OUTPUT	
Fecal Coliform at Mixing Zone Boundary, #/100 ml	**4**
Difference between mixed and ambient, #/100 ml	4

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for fecal coliform.

Calculation of Dissolved Oxygen at Chronic Mixing Zone

INPUT	
Chronic Dilution Factor	113.6
Receiving Water DO Concentration, mg/L	8.1
Effluent DO Concentration, mg/L	5.1
Effluent Immediate DO Demand (IDOD), mg/L	2
Surface Water Criteria, mg/L	*8*
OUTPUT	
DO at Mixing Zone Boundary, mg/L	**8.06**
DO decrease caused by effluent at chronic boundary, mg/L	**0.04**

Conclusion: At design flow, the discharge has no reasonable potential to violate water quality standards for dissolved oxygen.

References: EPA/600/6-85/002b and EPA/430/9-82-011

Freshwater Temperature Reasonable Potential and Limit Calculation

Based on WAC 173-201A-200(1)(c)(i)--(ii) and the Water Quality Program Guidance. All data inputs must meet WQ guidelines. The Water Quality temperature guidance document may be found at: https://fortress.wa.gov/ecy/publications/summarypages/0610100.html

	Core Summer Critera	Supplemental Criteria
INPUT	**July 1-Sept 14**	**Sept 15-July 1**
1. Chronic Dilution Factor at Mixing Zone Boundary	113.6	113.6
2. 7DADMax Ambient Temperature (T) (Upstream Background 90th percentile)	21.5 °C	12.6 °C
3. 7DADMax Effluent Temperature (95th percentile)	22.0 °C	16.0 °C
4. Aquatic Life Temperature WQ Criterion in Fresh Water	22.0 °C	
OUTPUT		
5. Temperature at Chronic Mixing Zone Boundary:	21.5 °C	12.6 °C
6. Incremental Temperature Increase or decrease:	0.0 °C	0.0 °C
7. Maximum Allowable Incremental Temperature Increase:	1.0 °C	0.3 °C
8. Maximum Allowable Temperature at Mixing Zone Boundary:	22.0 °C	12.9 °C
A. If ambient temp is warmer than WQ criterion		
9. Does temp fall within this warmer temp range?	NO	YES
10. Temperature Limit if Required:	---	NO LIMIT
B. If ambient temp is cooler than WQ criterion but within 28/(T_{amb}+7) and within 0.3 °C of the criterion		
11. Does temp fall within this incremental temp. range?	NO	---
12. Temp increase allowed at mixing zone boundary, if required:	---	---
C. If ambient temp is cooler than (WQ criterion-0.3) but within 28/(T_{amb}+7) of the criterion		
13. Does temp fall within this Incremental temp. range?	YES	---
14. Temp increase allowed at mixing zone boundary, if required:	NO LIMIT	---
D. If ambient temp is cooler than (WQ criterion - 28/(T_{amb}+7))		
15. Does temp fall within this Incremental temp. range?	NO	---
16. Temp increase allowed at mixing zone boundary, if required:	---	---
RESULTS		
17. Do any of the above cells show a temp increase?	**NO**	**NO**
18. Temperature Limit if Required?	**NO LIMIT**	**NO LIMIT**

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream
USEPA Office of Water, Washington D.C.)

INPUT	
	@ Acute Boundary
1. Dilution Factor at Mixing Zone Boundary	121.0
2. Ambient/Upstream/Background Conditions	
Temperature (deg C):	23.20
pH:	8.10
Alkalinity (mg CaCO3/L):	74.00
3. Effluent Characteristics	
Temperature (deg C):	25.70
pH:	6.00
Alkalinity (mg CaCO3/L):	100.00
4. Aquatic Life Use Designation	Other species (salmonid/redb
OUTPUT	
1. Ionization Constants	
Upstream/Background pKa:	6.36
Effluent pKa:	6.35
2. Ionization Fractions	
Upstream/Background Ionization Fraction:	0.98
Effluent Ionization Fraction:	0.31
3. Total Inorganic Carbon	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	75
Effluent Total Inorganic Carbon (mg CaCO3/L):	322
4. Condtions at Mixing Zone Boundary	
Temperature (deg C):	23.22
Alkalinity (mg CaCO3/L):	74.21
Total Inorganic Carbon (mg CaCO3/L):	77.39
pKa:	6.36
5. Allowable pH change	0.50
RESULTS	
pH at Mixing Zone Boundary:	**7.73**
pH change at Mixing Zone Boundary:	0.37
Is permit limit needed?	NO

Streeter-Phelps Analysis of Critical Dissolved Oxygen Sag

INPUT			
1. EFFLUENT CHARACTERISTICS			
Discharge (cfs):			9.44
$CBOD_5$ (mg/L):			5
NBOD (mg/L):			3
Dissolved Oxygen (mg/L):			5
Temperature (deg C):			24
2. RECEIVING WATER CHARACTERISTICS			
Upstream Discharge (cfs):			81400
Upstream $CBOD_5$ (mg/L):			1.5
Upstream NBOD (mg/L):			0.2
Upstream Dissolved Oxygen (mg/L):			9
Upstream Temperature (deg C):			23
Elevation (ft NGVD):			75
Downstream Average Channel Slope (ft/ft):			0.00088
Downstream Average Channel Depth (ft):			21
Downstream Average Channel Velocity (fps):			0.98
3. REAERATION RATE (Base e) at 20 deg C (day^{-1}):			0.13
	Applic.	Applic.	Suggested
Reference	Vel (fps)	Dep (ft)	Values
Churchill	1.5 - 6	2 - 50	0.07
O'Connor and Dobbins	0.1 - 1.5	2 - 50	0.13
Owens	0.1 - 6	1 - 2	0.08
Tsivoglou-Wallace	0.1 - 6	0.1 - 2	1.99
4. BOD DECAY RATE (Base e) AT 20 deg C (day^{-1}):			0.07
(or use *Wright and McDonnell eqn, 1979, for small rivers.) Enter this value -->*			0.04

OUTPUT	
1. INITIAL MIXED RIVER CONDITION	
$CBOD_5$ (mg/L):	1.5
NBOD (mg/L):	0.2
Dissolved Oxygen (mg/L):	9.0
Temperature (deg C):	23.0
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day^-1):	0.14
BOD Decay (day^-1):	0.08
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	2.2
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	2.4
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	8.555
Initial Deficit (mg/L):	-0.44
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	11.48
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):	184.06
7. CRITICAL DO DEFICIT (mg/L):	0.55
8. CRITICAL DO CONCENTRATION (mg/L):	**8.00**

APPENDIX K

CONDITION ASSESSMENT OF CAMAS WASTEWATER TREATMENT FACILITY PROJECT MEMORANDUM

PROJECT MEMORANDUM

CITY OF CAMAS

General Sewer Plan Update

Project No.:	203710
Date:	7/17/2025
Prepared By:	Sudhan Paranjape, Sanjit Khanal, Dennis Clinefelter (Carollo Engineers), Ron Reardon (Reardon Engineering LLC)
Reviewed By:	Kate Bandettini, Matt Huang
Subject:	Condition Assessment of Camas Wastewater Treatment Plant

This document is released for the purpose of information exchange review and planning only under the authority of Matthew M. Huang, July 21, 2025, Washington PE# 54002.

1.0 PROCESS ASSESSMENT

1.1 Summary

A plant condition assessment of the Camas Wastewater Treatment Plant (WWTP) was conducted on June 11 and 12.

On June 11, Sudhan Paranjape, Kate Bandettini, and Ron Reardon toured the entire plant with Jacob Taylor, the current Plant Operations Supervisor, to learn more about the facility, including current operating protocols and the condition of the plant's mechanical equipment and processes. On June 12, Sanjit Khanal (electrical engineer) and Dennis Clinefelter (instrumentation and controls specialist) also joined. Sanjit and Dennis inspected the electrical and instrumentation and controls (I&C) equipment while Sudhan, Kate, and Ron spent the day doing more detailed assessments of selected areas of the plant. During the second day they concentrated on areas on the plant site that could be used or modified to achieve the projected capacity requirements for the current planning period. The visit was successful as far as gaining an understanding of the plant capabilities and potential modifications that could be made to expand plant treatment capacity in the future.

1.2 Notes on Condition Assessment

1. All influent raw wastewater is pumped to the plant from either the Main Pump Station (PS) or the Oak Park PS. The Main PS has variable frequency drives, and the pumping rate ramps up and down with the flow. The Oak Park PS has constant speed pumps that operate off wetwell level. This results in surges in the flow received at the WWTP.
2. In 2023 the average daily flow was 2.7 mgd while the peak flow was roughly three times the average flow. The detailed statistical analysis that has been completed on the plant's historical data is available on the project folder on ProjectWise.

3. The septic tanks connected to the City of Camas's (City) wastewater collection system are pumped out about once every five to eight years and the septage hauled to the WWTP. This includes both the septic tank effluent pumping (STEP, operates with pumps) and septic tank effluent filter (STEF, which operates by gravity) installations. Plant staff estimated Camas has about 6,000 STEP and STEF tanks. Septic tank pumping is now done by contract and only during the summer months. During the summer, the plant receives about 10 to 11 tanker truckloads per day but only on weekdays. This imposes an additional dynamic load on the activated sludge process. The influent total suspended solids (TSS) concentrations are less than 100 milligrams per liter (mg/L) without STEP pumping and in the range of 150 to 300 mg/L with STEP pumping.
4. Parts of the plant flooded in the 1997 Columbia River flood. During the 1997 flood, the river crested at an elevation of 22.5 feet on January 3 at the Port of Vancouver. See https://clark.wa.gov/public-works/columbia-river-and-flooding. The grade elevation is about 30 feet in much of the plant site. The top of wall (TOW) elevation for the aeration tanks is 37.00 feet. The plant has no flood protection.
5. The City of Vancouver, Washington and Church & Dwight (C&W), a local industry located in Vancouver, have approached the City of Camas about the potential for Church & Dwight to truck their wastewater to the Camas WWTP instead of discharging it to the Vancouver WWTP as it does now. The driver behind this is to make more treatment capacity at the Vancouver plant available for domestic wastewater and would decrease their industrial client load by about 3 percent. The discharge was said to come from the manufacture of chewable vitamins for children (Li'l Critters); https://www.lilcritters.com/).

   The C&W wastewater was said to have a five-day carbonaceous biochemical oxygen demand (cBOD5) concentration of about 15,000 mg/L and a volume of about 30,000 gallons per day (gpd). The mass load associated with the Church & Dwight wastewater (about 3,800 pounds per day) would be a substantial increase to the CWWTP's current loading, but the additional carbon could be beneficial for both improved liquid treatment (enhanced denitrification) and biosolids treatment (increased digester gas production). A chemical analysis of the waste should be done to determine the chemical oxygen demand (COD), cBOD5, total Kjeldahl nitrogen (TKN), total phosphorus (TP), pH, alkalinity and cations, and total dissolved solids (TDS).
6. The paper mill in Camas (Georgia Pacific) treats its own wastewater although it may send its sanitary wastes to the Camas WWTP.
7. The plant headworks structure has two Kusters perforated plate screens with 3/8-inch (approximately 9 millimeter [mm]) openings as reported by plant staff. The 2012 O&M manual states the opening size is 6 mm. One of the influent screens needs a bearing replacement, and the plant is planning on performing this repair in-house. One of the screen nameplates shows the screen installation date of 2007, while the other screen installation date is 2010. Each screen has a washer/compactor to reduce volume and weight of screenings before dumping into a dumpster beneath at grade level.
8. The plant has four automatic samplers:
   a. Influent (flow proportional).
   b. Effluent (flow proportional).
   c. Primary effluent (timed composite; grab samples once per hour).
   d. Waste sludge (timed composite; grab samples once per hour).

9. The plant struggled in the past with finding a satisfactory seed source for their cBOD5 tests. Now they make their own glucose and glutamic acid (GGA), 500 milliliters (mL) per week, seed from the primary effluent composite sample.
10. The plant is currently operating with one primary clarifier, two aeration tanks and one final clarifier. During the winter wet season, the plant will put both primary clarifiers and one more final clarifier in service. Final Clarifier #1 is out of service, so the plant relies on Final Clarifiers #2 and #3 during the winter month. Final Clarifier #1 has a flat bottom, and therefore, sludge is not appropriately scrapped to the center sump. In the future, if this clarifier needs to be used, it may require either adding a slope to the bottom for proper sludge collection or demolish and build a new slopped bottom clarifier in its place.
11. The primary sludge pumps operate 24 hours a day at an estimated flow of 250 gallons per minute (gpm). During the assessment, Primary Sludge Pump #3 was experiencing a motor issue and making excessive noise. The primary sludge is thin, and they do not typically carry a blanket. The sludge is degritted using hydrocyclones, which are near their useful life. Degritted sludge flows to the gravity thickener. The hydrocyclones will be replaced with new equipment as part of an ongoing plant improvements project (HDR Task Order #4).
12. The influent splitter box has an unbalanced flow split. A computational fluid dynamics (CFD) study is recommended to understand the mixing of the recycle streams and influent in this chamber.
13. Overall, there is not a lot of elevation drop through the primary liquid treatment train, raising overflow concerns. During high rain events in the winter, launder troughs in the primaries have reportedly backed up to the weirs in the influent splitter box.
14. The plant adds about 375 gpd of magnesium hydroxide ($Mg(OH)_2$) to the aeration tank influent splitter box to supplement the alkalinity in the influent wastewater. The pH of the activated sludge process is monitored at the aeration tank effluent. This introduces a lag in making changes in the Mg(OH)2 feed to respond to changes in the pH. To counter this, the plant has set a low pH alarm of 6.7. This gives the operating staff sufficient time to increase Mg(OH)2 addition to avoid effluent pH violations. This is important if the pH drops at night.
15. The activated sludge process currently reduces the influent ammonia ($NH4^+$) from about 45 mg/L down to less than 0.1 mg/L. Both WaferTech and Analog Devices discharge wastewater to the Camas wastewater system that contain appreciable amounts of ammonia. Plant staff report they receive about 2,800-gallon loads every other day from WaferTech.
16. The plant has problems with struvite (NH_4MgPO_4) scaling in the digesters and the sludge processes downstream of the digesters. This scaling could be exacerbated by using $Mg(OH)_2$ and by enhanced biological phosphorus removal (EBPR) if it is occurring in the activated sludge process. Struvite buildup occurs in the condenser and the solids drying system (operators must take the doors off and clean once per week) and blockages in the centrate piping to plant drain Pump Station #1.
17. The plant cannot operate with just one aeration basin. The reason for this was not immediately clear.
18. The activated sludge process is controlled primarily by use of the aerobic mean cell residence time (aMCRT). This is approximated by the detention time of volatile suspended solids (VSS) in the aerated portion of the activated sludge process. The mixed liquor volatile suspended solids (MLVSS) concentration is measured once per week. The target aMCRT is 10 days in winter and 11 days in summer. The plant uses an Excel spreadsheet to calculate and track the aMCRT.

19. The plant occasionally experiences minor bulking and scum formation. The bulking occurs periodically and may be related to seasonal changes or STEP pumping. The bulking is controlled by dosing sodium hypochlorite to the return activated sludge (RAS). Chlorination for about a week is typically sufficient to control the problem. When chlorinating the RAS, they add about 55 gpd of 12 percent hypochlorite.
20. The RAS pumps have variable frequency drives (VFD) and are paced from the influent flow measurement. The rate is typically 50 percent of influent flow when operating one clarifier and 30 percent (per clarifier?) when operating two clarifiers.
21. The aeration tanks have membrane disc diffusers and luminescent dissolved oxygen (LDO)-type dissolved oxygen (DO) probes. The plant wants to look at adding ammonia-based aeration control (ABAC).
22. Clarifier No. 1 is no longer used. Clarifier No. 2 is used in the winter, but it does not have sludge wasting capabilities. Final Clarifier No. 3 operates year-round and is the only location from which sludge is wasted.
23. The WAS pumps operate on a 180-minute cycle (eight cycles per day). The wasting rate is varied by changing the pump runtime. The WAS pump is currently on for 44 minutes and off for 136 minutes.
24. The effluent filters are Veolia/Hydrotech inside-out disc filters. The filters work well, and the plant staff is happy with them. They were originally installed to combat high TSS in the clarifier effluent that was caused by bulking.
25. The plant has only one waste activated sludge (WAS) thickener and needs a redundant unit as operation of the sludge process is dependent on it. The WAS concentration ranges from 4,000 to 6,000 mg/L. The rotary drum thickener (RDT) increases this to about 7 percent (70,000 mg/L).
26. Thickener feed pump in the downstairs of the equipment building appeared to have seal issues and had accumulation of dropping underneath the pump head.
27. Staff reported that an internal mixed liquor suspended solids (MLSS) recycle pump had unintentionally tripped recently. The pump's structure is severely corroded, and the operators do not have accessibility for easily repairing these pumps.
28. The dewatering centrifuge increases the digested sludge concentration to about 22 percent to 25 percent total solids. The centrifuge runs about every other day.
29. The plant has an Andritz belt-type sludge drier. It operates from eight to ten hours every day. The dried sludge solids have a concentration of about 95 percent to 98 percent total solids.
30. The plant will soon be undergoing an upgrade project, designed by HDR (Task Order No. 4). Bids were recently received for this project. The bid prices were between about $9.1 million and $10.4 million. It was unknown if an award had been made at the time of the condition assessment. This project includes the following:
    a. Replacement of the grit classifiers.
    b. Install a second dewatering centrifuge. The City has already purchased the centrifuge.
    c. Increase in the septage receiving capacity.
    d. Replacement of two of the multi-stage centrifugal blowers (Hoffman) with high-speed turbo blowers (Neuros) and associated controls modification to have two turbo blowers operate in tandem with two centrifugal blowers.

e. Replacement of the internal mechanisms in the primary clarifiers with all 316 stainless steel (SS).
f. Replacing the ultraviolet (UV) disinfection system with new UV equipment and controls.
g. Moving the electrical generator out of the Equipment Building.

31. The plant recently had the channels in the headworks structure rehabilitated (recoated) due to extensive damage to the concrete from hydrogen sulfide (H2S). The splitter box upstream of the Aeration Basins is suffering from the same deterioration from sulfide (H2S) as the influent channel.
32. The plant uses biofilter beds for odor control, but it is reported that they do not function well. The plant also has a chemical scrubber system for some of the plant's foul air.
33. The plant's new National Pollutant Discharge Elimination System (NPDES) permit has a requirement for monitoring the effluent temperature. Washington State Department of Ecology (WDOE) requires temperature sensors be accurate to 0.2 degrees Celsius. The temperature measurement in pH probes is only accurate to 0.5 degrees Celsius.
34. The plant uses a computerized maintenance management system (CMMS) called FIIX.
35. The plant staffing is currently staffed as follows:
    a. One lead operator.
    b. Two mechanics.
    c. One lab tech.
    d. One biosolids operator.
    e. One ?.
36. The plant currently has two open operator positions. An operations supervisor is anticipated to start in August 2025.
37. The plant is staffed from 5:00 a.m. to 3:30 p.m. and 7:00 a.m. to 3:30 p.m. on weekdays, plus one operator works 7:00 a.m. to 3:30 p.m. on weekends.
38. The plant operation and maintenance (O&M) manuals are not kept updated.

1.3 Future Alternatives

Several concepts were considered during the condition assessment that could be used to facilitate expansion of plant capacity. They include the following:

1. Three overall conceptual alternatives are available for increasing treatment capacity as follows:
    a. Expand capacity using traditional methods - likely the preferred alternative if sufficient land is available and the costs are competitive.
    b. Expand capacity using innovative methods - technologies like step-feed biological nutrient removal (BNR), membrane bioreactor (MBR), integrated fixed-film activated sludge (IFAS), and aerobic granular sludge (AGS) can provide more treatment capacity in a smaller footprint.
    c. Construct a new treatment facility - this is an unlikely alternative but might be an option if there is insufficient area available on the existing site, or the costs for expansion would be higher than a new facility.
2. The process could be modified to include step-feed for peak flows. This would increase the capacity of the final clarifiers by allowing the plant to operate at a higher MLSS concentration during dry weather thus increasing the overall treatment capacity.

3. Clarifier No. 1 no longer functions adequately and is never used. It could be demolished and a new final clarifier constructed at the same location.
4. Space is available between the existing plant process tanks and the access road along the river. This area could be sufficient for one or two more aeration tanks, and a third primary clarifier.
5. The existing centrate/septage/WAS storage tank could be replaced with a fourth secondary clarifier, and the storage volume provided elsewhere on the site.
6. The primary clarifiers could be abandoned or converted to anaerobic and anoxic tanks. This would improve influent carbon management and provide nutrient removal in the activated sludge process, while reducing or potentially eliminating the MgOH feed. Demolishing primary clarifiers and building new anaerobic tanks in their place can make sufficient head available to either modify or replace the aeration tank influent splitter box to provide a more accurate flow split to the aeration basins.
7. The land to the west of the existing plant is reported to be owned by the City; however, the ground elevation is significantly lower than the existing plant site and is in the flood plain. Because of the lower elevation, the land to the west of the existing plant would require significant fill, or a dike or another method of flood protection.
8. The electrical equipment in the digester building could be removed and relocated on the site, and another thickener could be added in this area. There are hazardous occupancy concerns about the electrical equipment located directly next to the digester wall in the digester building.
9. The City would like to make modifications to the sludge cake conveyor system from the dewatering centrifuge to allow diversion of the cake to a truck unloading station to dispose of dewatered cake, should the dryer be out of service, as a contingency plan.
10. It is understood that the City of Vancouver is investigating alternatives to phase out the aging sludge incinerator at its Westside Wastewater Treatment Facility (WTF). City of Vancouver staff have shown interest in visiting the Camus belt dryer. Since the belt dryer is also nearing its useful life, Camas could partner with Vancouver to build a regional biosolids handling plant using thermal drying technology. If per- and polyfluoroalkyl substances (PFAS) turn out to be a concern in the future to limit the beneficial use of the dried pellets, thermal drying can be appended with pyrolysis treatment for PFAS treatment.

2.0 ELECTRICAL ASSESSMENT

2.1 Introduction

The City mentioned that the WWTP was first constructed in 1972, but the current general layout is from upgrades done in 1992 and 2002. A large portion of the electrical distribution equipment is from the 2002 plant upgrades retrofitted in subsequent plant upgrades. The WWTP is fed from two utility transformers: a 500-kilovolt amp (kVA) "UT1" located on the southwest side of UV Building, and a 1,000-kVA "UT2" located on the north side of Equipment/Blower Building.

2.2 Condition Assessment

The City was asked about the major electrical issues seen at the WWTP and noted that there are no major issues with electrical system, other than occasional power blips from the electrical utility feed. The City

noted that the existing two 250-kilowatt (kW) generators have been able to back up the WWTP during such electrical utility outages.

It was noted during the site visit that the water utility does not have a dedicated electrician or instrumentation technician in their team. The City also noted that they do not have any on-call contracts with an independent electrician or system integrator. Carollo recommends having an in-house electrician and controls technician or maintaining on-call contracts with independent electricians (electrical contractors) and systems integrators. It is likely that since there has not been a major electrical or controls failure at the WWTP this has not been an issue, but if that were to happen, the electrician and system integrator could help solve the problem sooner with their dedicated expertise in those particular fields.

Furthermore, it was noted during the site visit that none of the electrical distribution equipment had an arc flash labels on them. The City noted that they do not maintain an electrical system study for the plant. The Occupational Safety and Health Administration (OSHA) recommends an electrical system study after five years or after a major plant upgrade for the safety of electricians who work on this distribution equipment. Carollo recommends having an electrical system study done immediately and arc flash labels applied to all electrical distribution equipment.

The City noted during the condition assessment site visit that the last major flood that put most of the WWTP underwater was in 1997. Carollo recommends doing a flood risk analysis of all major electrical distribution equipment and control panels to assess the risks.

2.2.1 Utility Transformer "UT1", 500kVA

The first utility transformer "UT1" 500-kVA, located on the southwest side of the UV Building, has two separate feeders, one feed going to MDS-UV located in the UV Building electrical room, and the second feed going to MCC-A located in the Old Controls Building, as shown on Figure 1 and Figure 2.

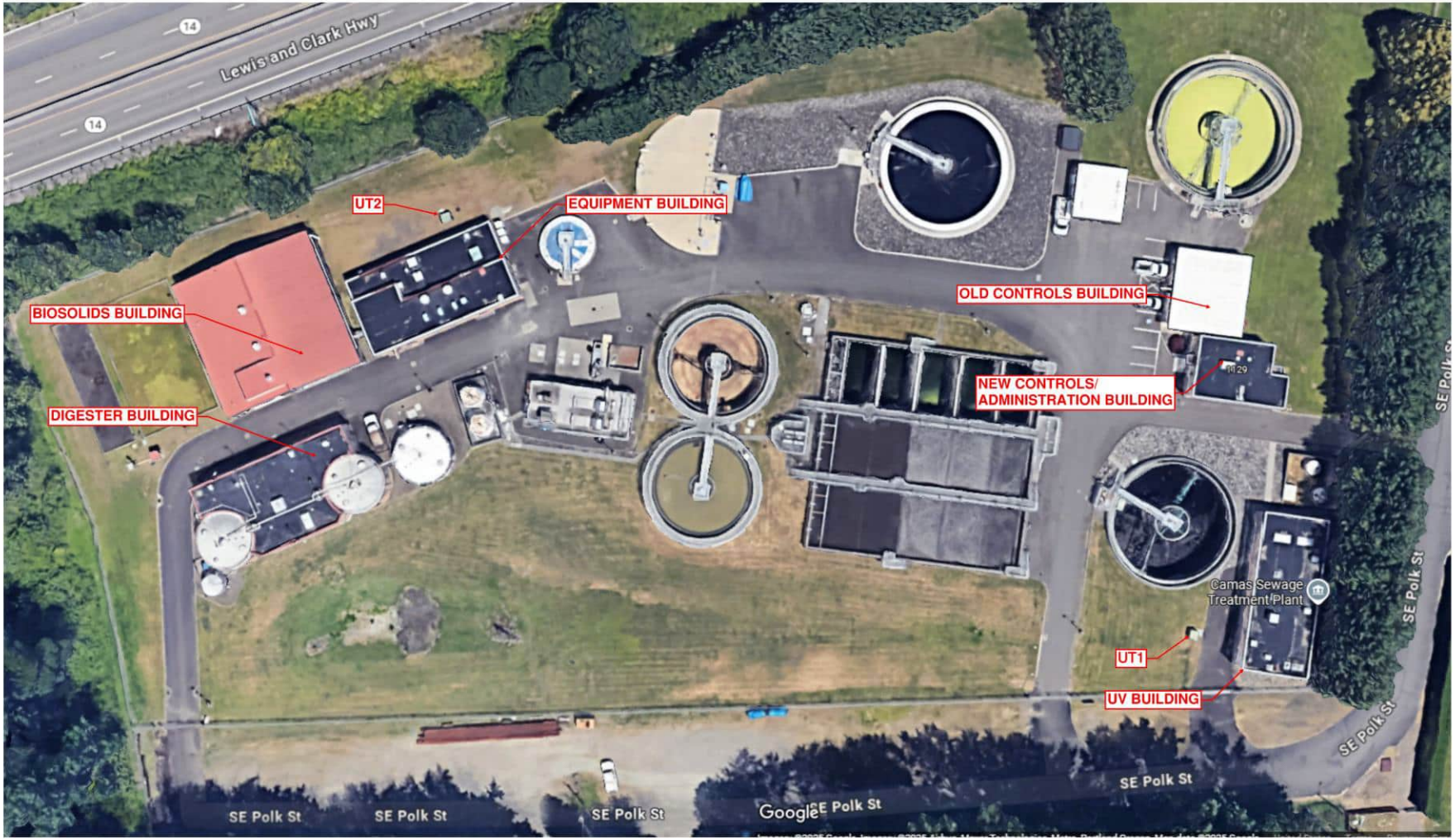


Figure 1 Site Layout

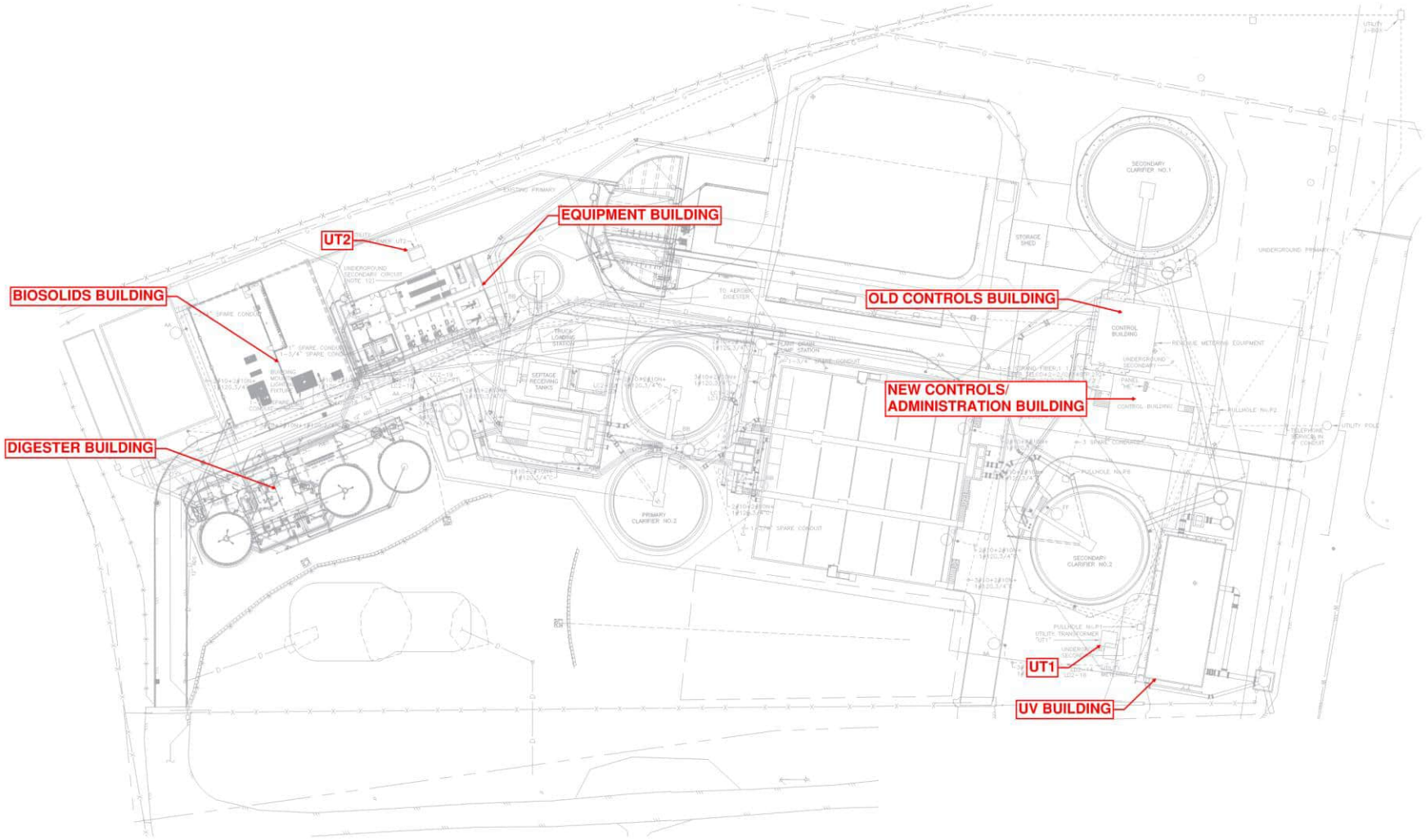


Figure 2 Simplified Site Plan

3.0 INSTRUMENTATION AND CONTROLS ASSESSMENT

The previous report called out needed upgrades for programmable logic controllers (PLC) and the supervisory control and data acquisition (SCADA) system. There has been some limited progress with the PLC upgrades. However, the risk remains, as evidenced in a cabinet fire during the 2023-2023 timeframe to PLC D1, to all PLC hardware that has not been upgraded. This applies to both the general plant PLCs as well as vendor-provided equipment with PLCs. For example, the Biosolids Dryer PLCs use the Rockwell Automation 1756-L6x series processor, which has been discontinued since 2017. Additionally, the continued usage of ControlNet upgrade options exist for just the processor. However, the version of the chassis for the PLC must be investigated to determine which path for upgrades is available.

The WWTP's existing Wonderware SCADA application is still installed on just a single computer. Only one operator can use the system at a time. While observing the historian with the operator, an operator in the field needed to interact with the SCADA system and took over control, without any notification to the operator in the control room. The move to a server-based system with redundancy should be prioritized to ensure multi-user operations of the plant.

The following upgrades are still recommended:

1. Replace the existing SCADA server with matching redundant SCADA servers.
2. Upgrade the SCADA human-machine interface (HMI) application to a redundant configuration.
3. Add a SCADA reporting application.
4. Rebuild HMI graphics to take advantage of increased system functionality, correct existing errors with data collection and display, and provide robust communications with the upgraded PLC hardware.
5. Integrate the existing Hach Water Information Management System (WIMS) data with the SCADA historian and reporting applications.

Additional upgrades for SCADA server:

1. Add an alarm historian to allow monitoring of specific alarms to understand if alarms are being repeated and should be addressed, or a one-time alarm that requires immediate action.
2. Add individual user logins to identify who did what and when to facilitate training when the incorrect action had been taken. Additionally, this improves site security as only individuals allowed to log in can make changes to system operations.
3. Follow International Society of Automation (ISA) 101.01 Human Machine Interfaces for Process Automation Systems recommendations for graphics used on SCADA screens.

During the walk around the site, several housekeeping items were identified that will affect equipment lifespans:

1. Network equipment enclosures are located in a couple of rooms. Comparing the switches located within enclosures to those not within enclosures shows a dramatic increase in dirt and dust on the switches. Dirt and dust accumulating within the network equipment will cause overheating conditions and failure of the equipment.
2. Loose network cables could be trip hazards.

3. The pH and flowmeter above the influent are in a highly corrosive environment with no protection for cables or transmitters.
4. Sunshields are highly recommended for all outdoor instrument transmitters not facing north. On one flowmeter, the sunshield was broken off and sitting on the pipe nearby.

The magnesium oxide tank utilizes an ultrasonic level probe that has generated false positive alarms due to condensation buildup on probe head. It is recommended to replace the ultrasonic in locations where there is condensation due to the incorrect readings that occur.

The centrifuge was unable to start in Automatic. Instead, it was started by using a switch installed inline as a workaround, and then after the centrifuge was started, flipping the system back to Auto.

Equipment tagging outside of the biosolids dryer was nonexistent. A site-wide tagging of equipment/instruments/valves is recommended to reduce human errors when an operator is manually operating equipment.

There is a lack of maintenance/storage facility, resulting in insufficient clearance in front of electrical panels. An accumulation of materials exists within the generator room. The generator is moving outdoors, but until such time the room should not be used for storage, nor should flammable materials be stored within the generator rooms.

APPENDIX L

CIP PROJECT SHEET

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-01
Project Title: NW 6th Place West Improvements
Facility Type: Gravity Main
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: This system has a deficiency from MH 10-1-8 and 10-1-6 which must be improved. Model surcharging and manhole flooding at manholes 10-1-8 and 10-1-6 revealed the need for upsizing. To alleviate surcharging, 422 LF of pipe between manholes 10-6-1 and 10-1-11 should be upsized from 8- to 12-inch, 809 LF of pipes from manhole 10-1-11 to 10-1-7 should be upsized from 8-inch to 15-inch, 472 LF of pipes between 10-1-7 to Lower/South Prune Hills wet well should be upsized from 12-inch to 18-inch. This project is a gravity pipeline along NW 6th Place, just upstream of Lower/South Prune Hills Lift Station. This project is primarily driven by existing capacity deficiency during peak wet weather however some infill development provides additional flow at buildout. Therefore, cost has been distributed 25% to future gorwth and 75% existing and matches the split for the South Prune Hill LS capacity project.

Reasoning Capacity Upgrade Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
12-inch diameter	422	LF	$ 300	$ 126,500	$ 38,000	$ 91,500		$256,000
15-inch diameter	809	LF	$ 378	$ 306,000	$ 92,000	$ 222,000		$620,000
18-inch diameter	472	LF	$ 442	$ 208,500	$ 62,500	$ 151,000		$422,000

Total Anticipated Project	$ 1,298,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

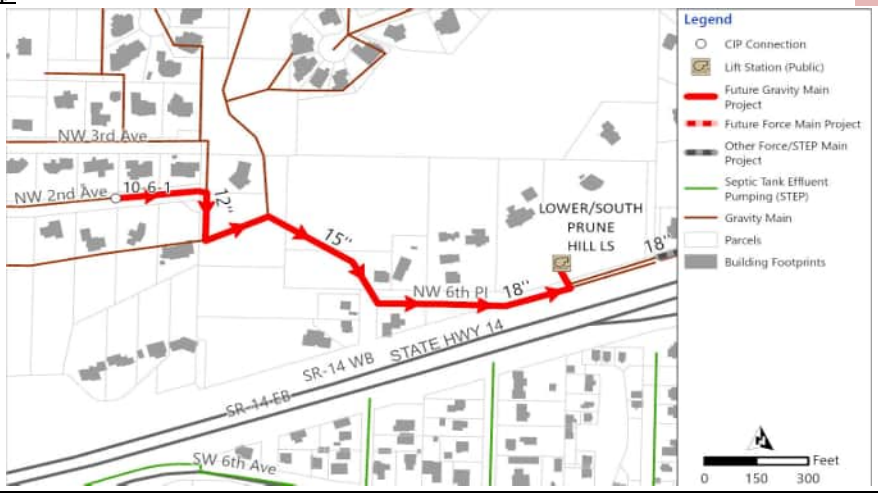
Project Type	Percent	Cost
Growth:	25%	$ 324,500
Upgrade:	75%	$ 973,500
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 1,298,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2034	$ 1,298,000
Total		$ 1,298,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: P-02
Project Title: NW 6th Place East Improvements
Facility Type: Gravity Main
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: This system has a deficiency from MH 10-1-3 and 10-1-1 which must be improved. Model surcharging and manhole flooding at manholes 10-1-3 and 10-1-1 revealed the need for upsizing. To alleviate surcharging, 682 LF of pipe between manhole 10-1-3 to manhole West Camas wet well should be upsized from 8-inch to 21-inch. This project is a gravity pipeline along NW 6th Place between Lower/South Prune Hills PS and West Camas PS, at an approximate depth of 5 to 10 feet.

Reasoning Capacity Upgrades

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
21-inch diameter	682	LF	$ 504	$ 343,500	$ 103,000	$ 248,500		$695,000

Total Anticipated Project Cost	$ 695,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

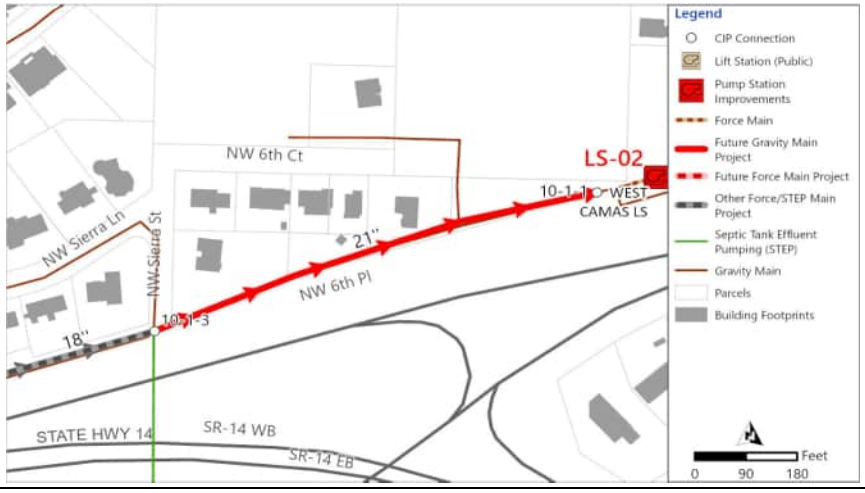
Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 695,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 695,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2032	$ 695,000
Total		$ 695,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-03
Facility Type: Gravity Main
Project Title: NW 6th Place Avenue West Improvements
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: There is a deficiency present and the existing gravity main must be upsized to accommodate growth and stop flooding. Model surcharging and manhole flooding at manholes 1-1-10, 1-1-6, and 1-1-4 revealed the need for upsizing. To alleviate surcharging, 1,943 LF of pipe between manholes 1-1-10 and 2-1-11 should be upsized from 12- to 24-inch, and 592 LF of pipe between manholes 2-1-11 and 2-1-9 should be upsized from 12- to 21-inch. This project is a gravity pipeline along NW 6th Avenue, downstream of the West Camas PS and through Forest Home Park, at an approximate depth of five feet.

Reasoning Capacity Upgrades

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
24-inch diameter	1,943	LF	$ 576	$ 1,119,000	$ 335,500	$ 810,500		$2,265,000
21-inch diameter	592	LF	$ 504	$ 298,500	$ 89,500	$ 216,000		$604,000

Total Anticipated Project	$ 2,869,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 2,869,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 2,869,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2031	$ 2,869,000
Total		$ 2,869,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-04
Project Title: NW 6th Place Avenue East Improvements
Facility Type: Gravity Main
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: Once upstream deficiency areas were improved in NW 6th Place Avenue West Upsize, model surcharging occurred between manholes 2-1-2B and 2-1-2 along NW 6th Avenue. To alleviate surcharging, the proposed pipeline profile between manholes 5-1-5 and 5-1-1 was modified to provide a steeper slope and improve hydraulic conveyance through the relatively flat portion of the existing alignment. The shallow manhole at 5-1-6 should also be evaluated during future project planning and design to determine whether an adjustment to the pipeline profile or manhole invert could provide additional hydraulic benefit. The recommended improvements include upsizing 446 LF of pipe between manhole 3-1-1 and 5-8-1 from 18- to 27-inch, 260 LF of pipe between manhole 5-8-1 and 5-1-12 from 21- to 30-inch, 402 LF of pipe between manhole 2-1-1 and 5-1-12 from 12- to 30-inch, 545 LF between manhole 5-1-12 and manhole 5-1-11 from 21- to 36-inch, 947 LF between manhole 5-1-10 and manhole 5-1-7 from 24- to 36-inch, 1,126 LF of pipe between manhole 5-1-7 and manhole 5-1-2 from 21- to 36-inch, and 34 LF between manhole 5-1-2 and manhole 5-1-1 from 24- to 36-inch. This project is a gravity pipeline along NW 6th Avenue to SE 3rd Avenue upstream of Main Lift Station, at an approximate depth of five feet. Portions of the proposed improvements are located beneath an existing building, and a portion of the proposed alignment crosses an existing railroad. The proposed improvements may also be affected by an existing bridge along the alignment. An alternative alignment analysis was not performed as part of this GSP because future redevelopment and land use changes may affect the presence of the existing building and the feasibility of potential alternative alignments. Additional evaluation should be completed during the future project planning and design phase to determine the feasibility of constructing the proposed pipeline through or adjacent to the existing building, railroad, and bridge. Depending on the condition and structural constraints of the existing bridge, replacement or modification of the bridge may be required to accommodate the proposed improvements. This project is driven by existing capacity deficiency and exacerbated by future growth in the North Shore Area. The cost has been split 50% existing upgrade and 50% future growth similar to Main LS.

Reasoning Capacity Upgrade / Growth

Anticipated Project Cost:

Project Element		Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
27-inch diameter		446	LF	$ 736	$ 328,500	$ 98,500	$ 238,000		$665,000
30-inch diameter		260	LF	$ 896	$ 233,000	$ 70,000	$ 169,000		$472,000
30-inch diameter		402	LF	$ 896	$ 360,000	$ 108,000	$ 261,000		$729,000
36-inch diameter		545	LF	$ 1,204	$ 656,000	$ 197,000	$ 475,000		$1,328,000
36-inch diameter		947	LF	$ 1,204	$ 1,140,000	$ 342,000	$ 826,000		$2,308,000
36-inch diameter		1126	LF	$ 1,204	$ 1,355,500	$ 406,500	$ 982,000		$2,744,000
36-inch diameter		34	LF	$ 1,204	$ 40,900	$ 12,500	$ 29,600		$83,000

Total Anticipated Project Cost	$ 8,329,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	50%	$ 4,164,500
Upgrade:	50%	$ 4,164,500
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 8,329,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 8,329,000
Total		$ 8,329,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-05 **Facility Type:** Gravity Main

Project Title: NW Fargo St, NW 18th Loop, and NW 18th Ave Improvements

Go to CIP Summary Table

Priority: 0-10 years **Project Status (Completed?):** N

Project Description:

Project Description: Model surcharging and manhole flooding between manholes 3-1-33 to 3-1-25 revealed the need for upsizing. To alleviate surcharging, 2,744 LF of pipe between manholes 3-1-26 to 3-1-14 should be upsized from 8- to 15-inch. This project is at a depth of approximately 10 feet.

Reasoning Capacity Upgrades

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
15-inch diameter	2,744	LF	$ 378	$ 1,037,000	$ 311,000	$ 751,000		$2,099,000

Total Anticipated Project Cost	$ 2,099,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 2,099,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 2,099,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2028	$ 2,099,000
Total		$ 2,099,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-06 **Facility Type:** Gravity Main

Project Title: NE Garfield St to NE 15th Ave to NE Franklin St to along the Mill Ditch Improvements

Go to CIP Summary Table

Priority: 10-20 years **Project Status (Completed?):** N

Project Description:

Project Description: There is a deficiency present at manholes 4-2A-1, 4-2-1, 4-1-2, 4-1-1, and 3-2-2, which has revealed the need for upsizing. To alleviate surcharging, 282 LF of pipe between manholes 4-2A-2 to 4-2A-Q should be upsized from 8- to 12-inch, 115 LF of pipe between manholes 4-2A-Q and 4-2A-1 from 8- to 15-inch, 795 LF of pipe between manholes 4-2A-1 and 4-2-2 from 8- to 18-inch, 427 LF of pipe between manhole 4-2-2 and 4-2-1 from 8- to 24-inch, 256 LF of pipe between manholes 4-2-1 and 4-1-2 from 8- to 27-inch, 254 LF of pipe between manholes 4-1-2 and 4-1-1 from 21- to 30-inch, 158 LF of pipe between manholes 4-1-1 and 3-2-6 from 21- to 30-inch, and 347 LF of pipe between manholes 4-1-1 and 3-2-4 from 15- to 36-inch. This project is a gravity pipeline along Division Street between NW 18th and 11th Avenue, at an approximate depth of 10 feet.

Reasoning Capacity Upgrades

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
12-inch diameter	282	LF	$ 300	$ 84,600	$ 25,500	$ 60,900		$171,000
15-inch diameter	115	LF	$ 378	$ 43,500	$ 13,000	$ 31,500		$88,000
18-inch diameter	795	LF	$ 442	$ 351,500	$ 105,500	$ 255,000		$712,000
24-inch diameter	427	LF	$ 576	$ 246,000	$ 74,000	$ 178,000		$498,000
27-inch diameter	256	LF	$ 736	$ 188,500	$ 56,500	$ 137,000		$382,000
30-inch diameter	254	LF	$ 896	$ 227,500	$ 68,500	$ 165,000		$461,000
36-inch diameter	158	LF	$ 1,204	$ 190,000	$ 57,000	$ 138,000		$385,000

Total Anticipated Project Cost	$ 2,697,000

Notes on Cost Estimation:

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Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 2,697,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 2,697,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2037	$ 2,697,000
Total		$ 2,697,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-07
Project Title: Lower/South Prune Hill Force Main Improvements
Facility Type: Gravity Main
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The Lower/South Prune Hill Lift Station captures flows from the eastern side of the City's gravity collection system. Based on the modeled flows to the Lift Station wet well, the existing force main diameter is unable to convey flows, producing velocities that exceed the 8 feet per second criteria under both existing and 20-year conditions. To address this deficiency, upsizing 925 LF of the force main from South Prune Hill wet well to manhole 10-1-3 must occur to reduce velocity below the criteria. This project is split 25% future growth and 75% existing upgrade similar to the South Prune Hill LS.

Reasoning Capacity Upgrade / Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
18-inch diameter	925	inch-dia	$ 442	$ 409,000	$ 122,500	$ 296,500		$828,000

Total Anticipated Project Cost	$ 828,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	25%	$ 207,000
Upgrade:	75%	$ 621,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 828,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2033	$ 828,000
Total		$ 828,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-08
Project Title: West Camas Lift Station Force Main Improvements
Facility Type: Gravity Main
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The West Camas Force Main faces a deficiency between West Camas Wet Well and manhole 1-1-10. To address this deficiency, approximaely 574 LF of the existing 6-inch asbestos cement force main should be removed and replaced with a 15-inch force main.

Reasoning Capacity Upgrades

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
15-inch diameter	574	inch-dia	$ 478	$ 274,500	$ 82,500	$ 199,000		$556,000

Total Anticipated Project Cost	$ 556,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 556,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 556,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2031	$ 556,000
Total		$ 556,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-09 **Facility Type:** Gravity Main

Project Title: Main Lift Station Dual Force Main Improvements

Priority: 0-10 years **Project Status (Completed?):** N

Go to CIP Summary Table

Project Description:

Project Description: The Main Lift Station captures flows from the majority of the system, except the STEP Basin and Flow Meter 8-1-2. Based on the modeled flows to the Lift Station wet well, the existing force main is unable to convey flows under both existing and 20-year conditions, resulting in velocities that exceed the 8 feet per second criterion. To address this deficiency, approximately 2,348 LF of the proposed 21-inch force main should be installed between the Main Lift Station wet well and the WWTF. The replacement force main will require a river crossing as part of the installation. This project is split 50% future growth and 50% existing capacity deficiency to match the Main LS capacity project.

Reasoning Capacity Upgrades / Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
21-inch diameter	448	inch-dia	$ 504	$ 226,000	$ 68,000	$ 164,000		$458,000

Total Anticipated Project	$ 458,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	50%	$ 229,000
Upgrade:	50%	$ 229,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 458,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 458,000
Total		$ 458,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-10
Facility Type: Gravity Main
Project Title: Leadbetter Rd Lift Station Dual Force Main Improvements
Priority: 10-20 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The Leadbetter Rd Lift Station captures all the flows from the North Shore area. Based on the modeled flows to the Lift Station wet well, the existing single 8-inch force main diameter is too small to convey these flows, producing velocities that exceed the 8 feet per second criteria under 20-year system conditions. Installing a 6,500 LF parallel 10-inch force main between Node_161 and Node_27 is needed to reduce velocity below the criteria. The proposed force main alignment follows NE Everett St. and will cross an existing bridge along the route. The bridge crossing and existing roadway conditions may present construction challenges and should be further evaluated during the project planning and design phase. The project cost estimate includes the cost associated with installing the proposed force main across the existing bridge.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
10-inch diameter	6,500	inch-dia	$ 268	$ 1,742,000	$ 522,500	$ 1,261,500		$3,526,000

Total Anticipated Project Cost	$ 3,526,000

Notes on Cost Estimation:

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Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 3,526,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 3,526,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2041	$ 3,526,000
Total		$ 3,526,000

Project Location Map:

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City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: P-11
Project Title: Division Street Improvements
Facility Type: Gravity Main
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: Model surcharging and manhole flooding between manholes 3-1-11 to 3-1-10, and 3-1-6 revealed the need for upsizing. To alleviate surcharging, 827 LF of pipe between manholes 3-1-14 and 3-1-11 from 8- to 15-inch, 505 LF of pipe between manholes 3-1-11 and 3-1-9 from 8- to 21-inch, and 1,526 LF of pipe between manhole 3-1-9 and 3-1-2 from 8- to 18-inch. This project is at a depth of approximately 10 feet.

Reasoning Capacity Upgrades

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
15-inch diameter	827	LF	$ 378	$ 312,500	$ 94,000	$ 226,500		$633,000
21-inch diameter	505	LF	$ 504	$ 254,500	$ 76,500	$ 184,000		$515,000
18-inch diameter	1,526	LF	$ 442	$ 674,500	$ 202,500	$ 489,000		$1,366,000

Total Anticipated Project	$ 2,514,000

Notes on Cost Estimation:

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Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 2,514,000
General:	0%	$ -
R&R:	0%	$ -

Total Anticipated Project	100%	$ 2,514,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2032	$ 2,514,000

Total	$ 2,514,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: P-12
Project Title: SE Everett Rd to Leadbetter Rd Extension
Facility Type: Gravity Main
Priority: 10-20 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: Extend the existing sanitary sewer system to serve planned development within the project area. The project will provide sewer infrastructure and capacity necessary to accommodate future development and connect the proposed development to the existing public sewer system. Project timing and implementation will be driven by development needs and coordinated with the developer.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
8-inch diameter	2,031	LF	$ 236	$ 479,500	$ 144,000	$ 347,500		$971,000
12-inch diameter	692	LF	$ 300	$ 207,500	$ 62,500	$ 150,000		$420,000
18-inch diameter	6,036	LF	$ 442	$ 2,668,000	$ 800,500	$ 1,932,500		$5,401,000

Total Anticipated Project	$ 6,792,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 6,792,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 6,792,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2045	$ 6,792,000
Total		$ 6,792,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: P-13
Project Title: SE 283rd Ave to NE Woodburn Dr Extension
Facility Type: Gravity Main
Priority: 10-20 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: Extend the existing sanitary sewer system to serve planned development within the project area. The project will provide sewer infrastructure and capacity necessary to accommodate future development and connect the proposed development to the existing public sewer system. Project timing and implementation will be driven by development needs and coordinated with the developer.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
12-inch diameter	6,782	LF	$ 300	$ 2,034,500	$ 610,500	$ 1,474,000		$4,119,000

Total Anticipated Project	$ 4,119,000

Notes on Cost Estimation:

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Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 4,119,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 4,119,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2045	$ 4,119,000
Total		$ 4,119,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: S-01 **Facility Type:** STEP Main
Project Title: NW Parker St to NW Lake Rd STEP Main Improvements

Go to CIP Summary Table

Priority: 10-20 years **Project Status (Completed?):** N

Project Description:

Project Description: The NW Parker St to NW Lake Rd STEP Main captures all the flows in STEP Basin areas from NW Parker St and NW Lake Rd . Based on the modeled flows and velocity results, the existing 21- and 24-inch STEP main diameters are unable to convey these flows, producing higher hydraulic grade line under the 20-year system conditions. To address these deficiencies, a parallel STEP main will be installed. The proposed improvement consist of installing approximately 14,002 LF of 30-inch pipe from Node 9 to Node J176 and 4,061 LF of 30-inch pipe from Node 13 to Node 15. The STEP Main is reaching the end of it's useful life and the City is beginning to construct new segments to address age. The new pipe will be sized to accomodate future growth. Therefore, this project is assigned 50% future growth and 50% age and condition based replacement.

Reasoning Growth and Age/Condition

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
30-inch diameter	14,002	LF	$ 896	$ 12,546,000	$ 3,764,000	$ 9,088,000		$25,398,000
30-inch diameter	4,061	LF	$ 896	$ 3,638,500	$ 1,091,500	$ 2,636,000		$7,366,000

Total Anticipated Project	$ 32,764,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

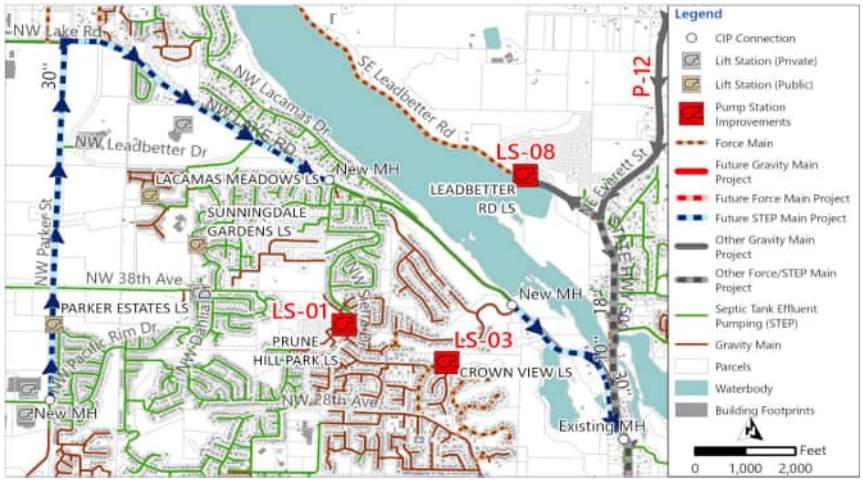
Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 32,764,000
General:		
R&R:	0%	$ -
Total Anticipated Project	100%	$ 32,764,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2038	$ 32,764,000
Total		$ 32,764,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: LS-01 **Facility Type:** Lift Station
Project Title: Lower/South Prune Hill Lift Station Improvements

Go to CIP Summary Table

Priority: 0-10 years **Project Status (Completed?):** N

Project Description:

Project Description: The existing lift station is right off of NW 6th Pl. in a residential area and directly west of the entrance to NW Sierra Ln. The current station connects to a 10-inch force main.The Lower/South Prune Hills Lift Station captures flows from the Southwest portion of the system. Based on the modeled flows to the lift station wet well, the lift station receives more peak wet weather flow (PWWF) than its firm capacity during

Reasoning Capacity Upgrade / Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Lower/South Prune Hill Lift Station	3.00	MGD	$ 2,425,167	$ 2,425,167	$ 727,500	$ 1,914,333		$5,067,000
Odor Control	1.00	EA	$ 150,000	$ 150,000	$ 45,000	$ 119,000		$314,000

Total Anticipated Project	$ 5,381,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	25%	$ 1,345,250
Upgrade:	75%	$ 4,035,750
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 5,381,000

Project Timing:

Project Element	Timing	Cost
Partial Project	2033	$ 2,690,500
Partial Project	2033	$ 2,690,500
Total		$ 5,381,000

Go to Maps Tab

Project Location Map:



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: LS-02
Project Title: West Camas Lift Station Improvements
Facility Type: Lift Station
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The existing lift station is next to a roundabout and sits along NW 6th place. The existing inrastrucutre PWWF's are constricted. The current system connects to a 6-inch force main. The West Camas Lift Station captures flows from the Southwest portion of the system and is just downstream of the Lower/South Prune Hills LS. Based on the modeled flows to the lift station wet well, the lift station receives more PWWF

Reasoning Capacity Upgrade

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
West Camas Lift Station Improvements	3.30	MGD	$ 2,490,700	$ 2,490,700	$ 747,000	$ 1,966,300		$5,204,000

Total Anticipated Project	$ 5,204,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

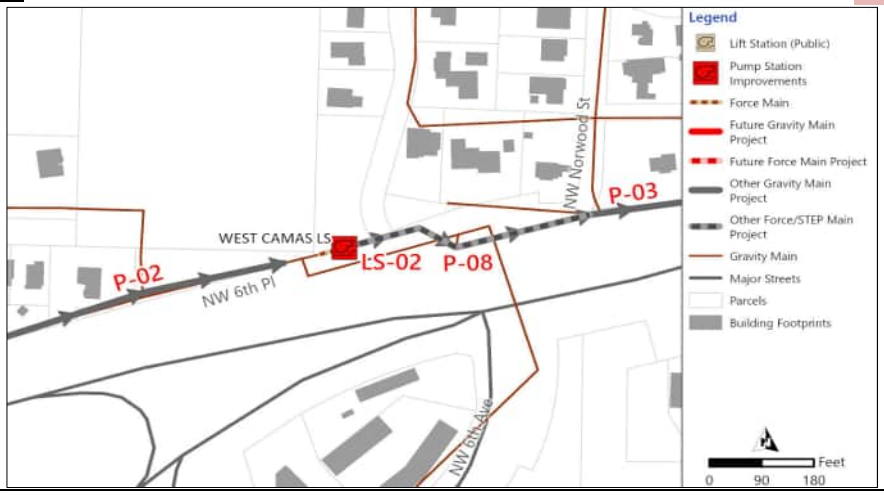
Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 5,204,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 5,204,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2031	$ 5,204,000
Total		$ 5,204,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: LS-03 **Facility Type:** Lift Station
Project Title: Crown View Lift Station Improvements

Go to CIP Summary Table

Priority: 0-10 years **Project Status (Completed?):** N

Project Description:

Project Description: Crown View Lift Station currently has 2 pumps and connects to a 6-inch force main. It is not able to serve existing system PWWF and will not be able to serve 20-year and buildout PWWF. This system is located right next to intersection of NW 32nd St and NW Kent St at the end of a cul de sac. Based on the modeled flows to the lift station wet well, the lift station receives more PWWF than its firm capacity during existing and 20-

Reasoning Capacity Upgrade

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Crown View Lift Station Improvements	1.00	MGD	$ 2,053,000	$ 2,053,000	$ 616,000	$ 1,621,000		$4,290,000

Total Anticipated Project	$ 4,290,000

Notes on Cost Estimation:

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Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 4,290,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 4,290,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2034	$ 4,290,000
Total		$ 4,290,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: LS-04
Project Title: Lacamas Creek Lift Station Improvements
Facility Type: Lift Station
Priority: 10-20 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The Lacamas Creek Lift Station captures the flow from the Hills at Round Lake Lift Station and a small portion of the eastern portion of the system. Based on the modeled flows to the Lift Station wet well, the lift station receives more PWWF than its firm capacity during 20-year and build-out conditions. The station's firm capacity needs to convey more than its current firm capacity from 1.37 MGD to 2.13 MGD. Replacing its

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Lacamas Creek Lift Station Improvements	2.1	MGD	$ 584,525	$ 584,525	$ 175,500	$ 461,975		$1,222,000
Total Anticipated Project								$ 1,222,000

Notes on Cost Estimation:

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Cost Allocation:

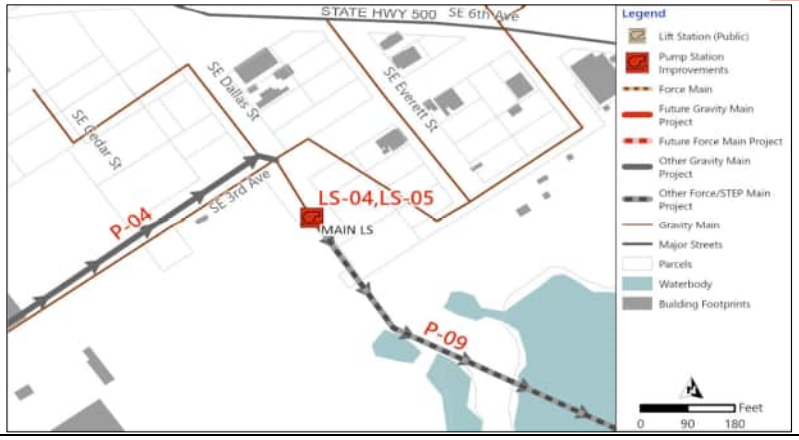
Project Type	Percent	Cost
Growth:	100%	$ 1,222,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 1,222,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2045	$ 1,222,000
Total		$ 1,222,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: LS-05
Project Title: Main Lift Station Improvements
Facility Type: Lift Station
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The existing Main Lift Station has three pumps and is connected to an existing 18-inch force main. The station receives flows from the majority of the system, with the exception of Flow Monitoring Basin 8-1-2 and the STEP/WWTF, and is located immediately upstream of the WWTF. Existing infrastructure PWWF capacity is constrained. While the existing and 20-year PWWF are below the existing firm capacity, the station does not

Reasoning Capacity Upgrade / Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Main Lift Station Improvements	21.0	MGD	$ 4,942,444	$ 4,942,444	$ 1,482,500	$ 3,901,056		$10,326,000

Total Anticipated Project	$ 10,326,000

Notes on Cost Estimation:

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Cost Allocation:

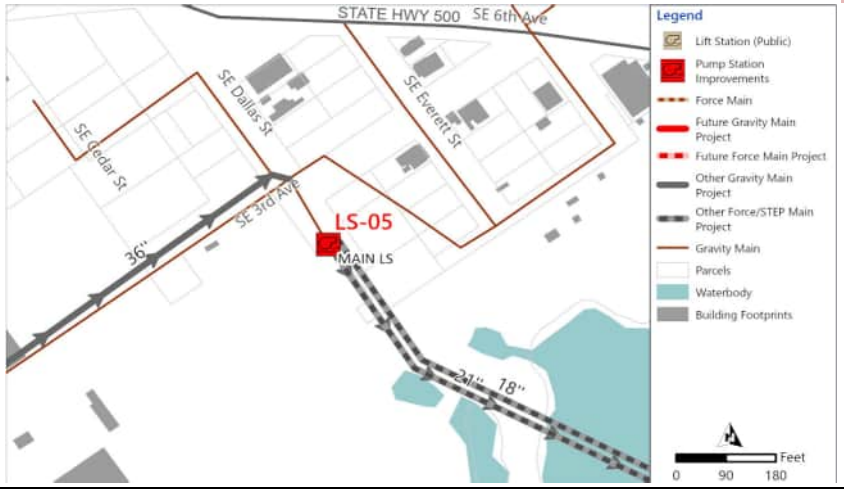
Project Type	Percent	Cost
Growth:	50%	$ 5,163,000
Upgrade:	50%	$ 5,163,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 10,326,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2029	$ 10,326,000
Total		$ 10,326,000

Project Location Map:

Go to Maps Tab



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: LS-06
Project Title: Goodwin Rd Lift Station Improvements
Facility Type: Lift Station
Priority: 10-20 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The Goodwin Lift Station captures flows from the northern portion of the North Shore area of the system. Based on the modeled flows to the Lift Station wet well, the lift station receives more PWWF than its firm capacity during the 20-year conditions. The station's firm capacity needs to convey more than its current firm capacity from 0.49 MGD to 0.71 MGD. Adding an additional 3rd pump to the station are recommended in the

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Goodwin Rd Lift Station Improvements	0.49	MGD	$ 240,000	$ 240,000	$ 72,000	$ 190,000		$502,000
Total Anticipated Project								$ 502,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

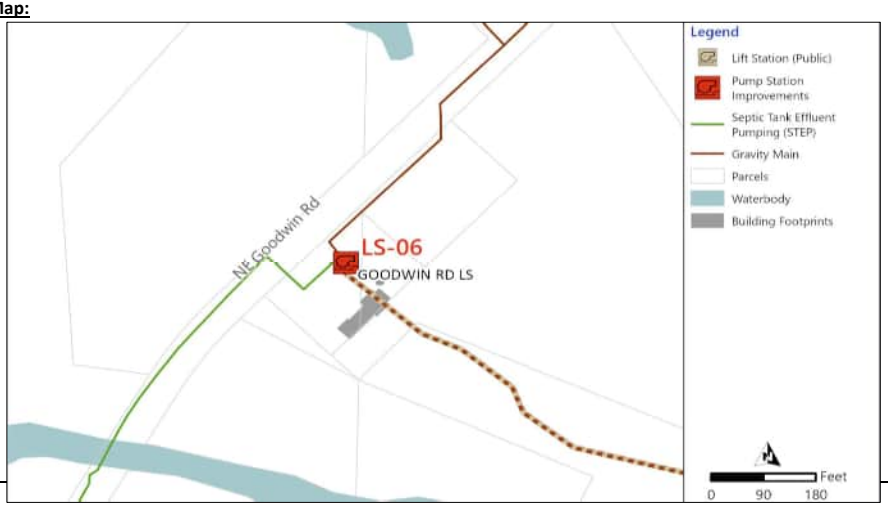
Project Type	Percent	Cost
Growth:	100%	$ 502,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 502,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2043	$ 502,000
Total		$ 502,000

Go to Maps Tab

Project Location Map:



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: LS-07
Project Title: 232nd Ave Lift Station Improvements
Facility Type: Lift Station
Priority: 10-20 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The existing lift station infrastructure is constricted. There are currently two pumps but there is room for a third pump. Demand is expected to grow and Lift Station capacity will need to be increased. The 232nd Ave Lift Station captures flows from the Goodwin Lift Station. Based on the modeled flows to the Lift Station wet well, the Lift Station receives more PWWF than its firm capacity during existing and 20-year conditions.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
232nd Ave Lift Station	0.53	MGD	$ 240,000	$ 240,000	$ 72,000	$ 190,000		$502,000

Total Anticipated Project	$ 502,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 502,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 502,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2042	$ 502,000
Total		$ 502,000

Go to Maps Tab

Project Location Map:



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: LS-08
Project Title: Leadbetter Rd Lift Station Improvements
Facility Type: Lift Station
Priority: 10-20 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The lift station does not have sufficient capacity for existing system PWWF and will remain capacity-constrained under 20-year and buildout PWWF conditions. The current station has two pumps, with space available for a third pump and a dual force main. The Leadbetter Rd Lift Station captures flows from the 232nd Ave Lift Station. Based on modeled flows to the lift station wet well, the station receives more PWWF than its firm

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Leadbetter Rd Lift Station Improvements	0.87	MGD	$ 240,000	$ 240,000	$ 72,000	$ 190,000		$502,000
Leadbetter Rd Lift Station Improvements	1.82	MGD	$ 898,350	$ 898,350	$ 269,500	$ 709,150		$1,877,000

Total Anticipated Project	$ 2,379,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

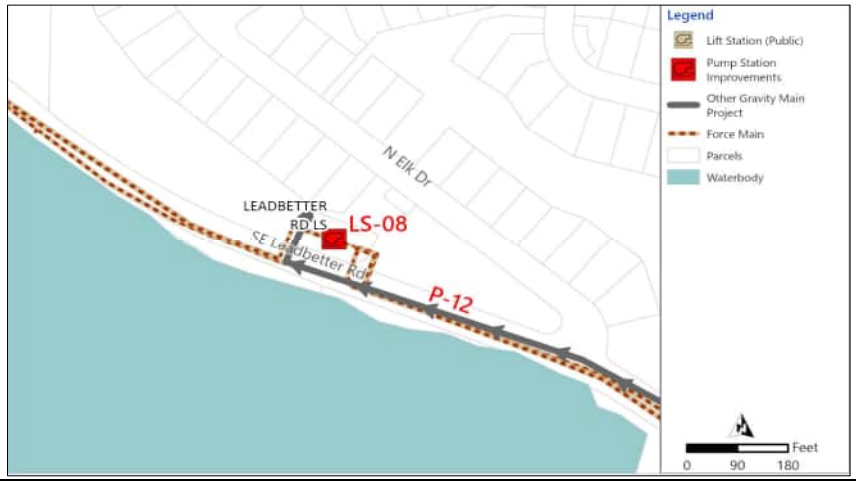
Project Type	Percent	Cost
Growth:	100%	$ 2,379,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 2,379,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2041	$ 2,379,000
Total		$ 2,379,000

Go to Maps Tab

Project Location Map:



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: LS-09 **Facility Type:** Lift Station
Project Title: Hills at Round Lake Lift Station Improvements

Go to CIP Summary Table

Priority: 10-20 years **Project Status (Completed?):** N

Project Description:

Project Description: The Hills at Round Lake Lift Station captures flows from the northeastern portion of the system. Based on the modeled flows to the Lift Station wet well, the lift station receives more PWWF than its firm capacity during 20-year and build-out conditions. The station's firm capacity needs to convey more than its current firm capacity from 0.96 MGD to 1.21 MGD. Replacing its pumps in this station are recommended in the long-term.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Hills at Round Lake Lift Station Improvements	1	MGD	$ 720,000	$ 720,000	$ 216,000	$ 568,000		$1,504,000

Total Anticipated Project	$ 1,504,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

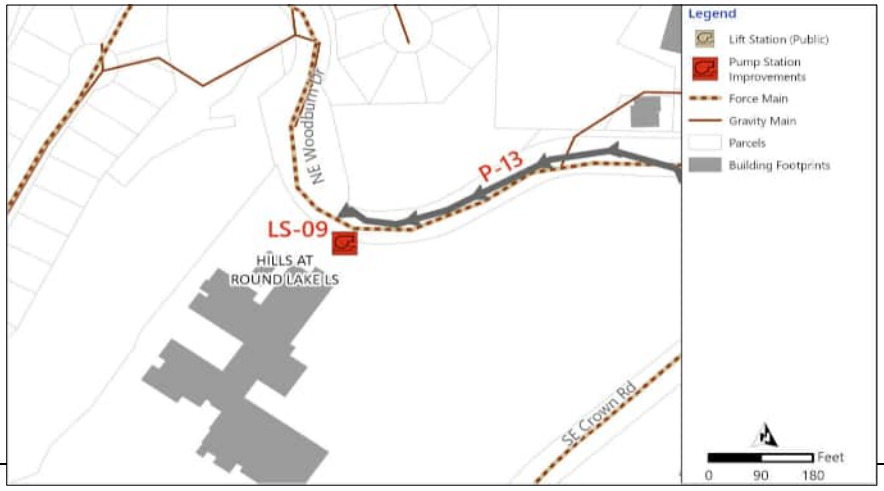
Project Type	Percent	Cost
Growth:	100%	$ 1,504,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 1,504,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2044	$ 1,504,000
Total		$ 1,504,000

Go to Maps Tab

Project Location Map:



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: G-01
Project Title: Basin 4-1-3 Pilot I/I Study
Facility Type: General
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: This program will investigate the source and magnitude of inflow and infiltration (I&I) of storm and groundwater into the wastewater system at locations where suspected high I&I is currently or is forecast to exceed conveyance and/or Lift Station capacity. Identifying and removing non-sewage flow where that would reduce surcharging such that costly capacity improvements might be avoided.

Reasoning Study

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Basin 4-1-3 Pilot I/I Study	1	ea	$ 200,000	$ 200,000	-	-		$200,000

Total Anticipated Project Cost	$ 200,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

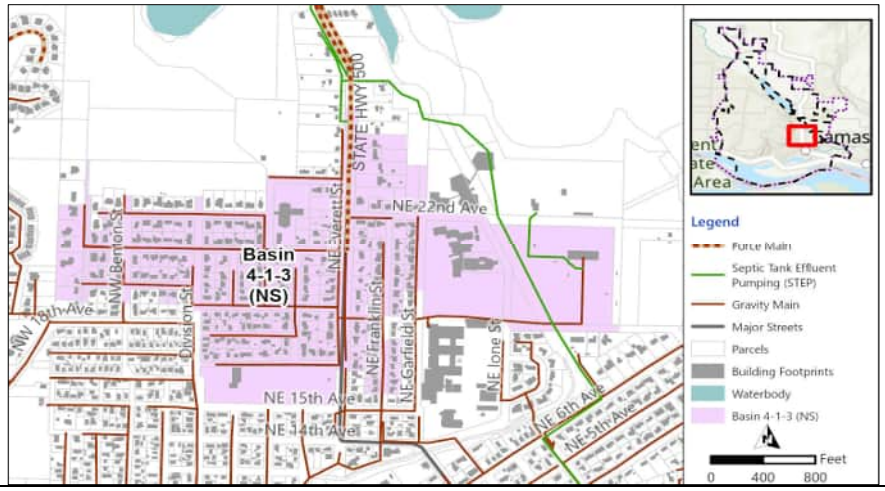
Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	100%	$ 200,000
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 200,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2027	$ 200,000
Total		$ 200,000

Go to Maps Tab

Project Location Map:



City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: G-02
Project Title: Basin 5-1-2 Flow Monitoring
Facility Type: General
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: This project is to install temporary flow meters in Basin 5-1-2 to capture flows from the Camas LS and Upper Prune Hill contributing areas separately. Both areas have pipe and LS capacity deficiencies and additional flow monitoring within this basin would help to understand if part of the basin is contributing a greater portion of I&I. This study should evaluate if projects within the basin have the potential to reduce I&I such that projects to increase hydraulic capacity within

Reasoning Study

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Basin 5-1-2 Flow Monitoring	1	ea	$ 250,000	-	-	-		$250,000

Total Anticipated Project Cost	$ 250,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	100%	$ 250,000
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 250,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2027	$ 250,000
Total		$ 250,000

Go to Maps Tab

Project Location Map:



City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: G-03
Project Title: Geographic Information System (GIS)
Facility Type: General
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: This program will implement ongoing enhancements to the Geographic Information System (GIS), including asset mapping, data collection, database maintenance, and integration with utility management systems. Maintaining accurate and up-to-date spatial information will improve infrastructure planning, field operations, emergency response, and asset management while supporting informed decision-making and efficient delivery of utility services.

Reasoning General

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Geographic Information System (GIS)	1	ea	$ 200,000	$ 200,000	-	-		$200,000

Total Anticipated Project Cost	$ 200,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	100%	$ 200,000
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 200,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2027	$ 200,000
Total		$ 200,000

Go to Maps Tab

Project Location Map:
N/A - Systemwide

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: G-04
Project Title: Hydraulic Modeling
Facility Type: General
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: The City's collection system model is heavily skeletonized, only 28 percent of the City's collection system pipes are included. A full pipe or less skeletonized model is needed for a more robust evaluation of the system. In order to expand the model, accurate and updated GIS for the collection system should be developed.

Reasoning Study

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Hydraulic Modeling	1	ea	$ 75,000	$ 75,000	-	-		$75,000
Total Anticipated Project Cost								$ 75,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	100%	$ 75,000
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 75,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2029	$ 75,000
Total		$ 75,000

Go to Maps Tab

Project Location Map:
N/A - Treatment Plant

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: G-05
Project Title: Electrical System Arc Flash Study
Facility Type: General
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: No arc flash labels were found on the plant's distribution equipment, and the owner confirmed that an Electrical System Study is not maintained. Carollo recommends completing this study as soon as possible and applying arc flash labels in accordance with Occupational Safety and Health Administration requirements to ensure worker safety.

Reasoning Study

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Electrical System Arc Flash Study	1	ea	$ 50,000	$ 50,000	-	-		$50,000

Total Anticipated Project Cost	$ 50,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	100%	$ 50,000
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 50,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2027	$ 50,000
Total		$ 50,000

Go to Maps Tab

Project Location Map:
N/A - Treatment Plant

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: G-06
Project Title: Hazardous Area Classification Study

Facility Type: General

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: To ensure regulatory compliance, and safety, Carollo recommends conducting a hazardous area classification study per NFPA 820 and upgrading any areas that do not meet code.

Reasoning Study

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
2034 Hazardous Area Classification Study	-	1	$ 700,000	$ 700,000	-	-		$700,000
2044 Hazardous Area Classification Study	-	1	$ 700,000	$ 700,000	-	-		$700,000

Total Anticipated Project Cost	$ 1,400,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	100%	$ 1,400,000
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 1,400,000

Project Timing:

Project Element	Timing	Cost
First General Sewer Plan	2027	$ 700,000
Second General Sewer Plan	2045	$ 700,000
Total		$ 1,400,000

Go to Maps Tab

Project Location Map:

N/A - Systemwide

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: G-07
Project Title: Flood Risk Assessment
Facility Type: General
Priority: 0-10 years
Project Status (Completed?):

Go to CIP Summary Table

Project Description:

Project Description: This project is a comprehensive flood risk analysis for all major electrical and control systems to assess vulnerabilities and strengthen flood resilience at the WWTF.

Reasoning Study

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
2034 Flood Risk Assessment	-	1	$ 700,000	$ 700,000	-	-		$700,000
2044 Flood Risk Assessment	-	1	$ 700,000	$ 700,000	-	-		$700,000

Total Anticipated Project Cost	$ 1,400,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	100%	$ 1,400,000
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 1,400,000

Project Timing:

Project Element	Timing	Cost
First General Sewer Plan	2027	$ 700,000
Second General Sewer Plan	2045	$ 700,000
Total		$ 1,400,000

Go to Maps Tab

Project Location Map:

N/A - Systemwide

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: G-08
Project Title: General Sewer Plan
Facility Type: General
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: Occurs two times over the 20-year planning horizon, with each occurrence assumed to take place approximately 10 years apart. For the purposes of this GSP, the occurrences are assumed to occur in 2035 and 2045.

Reasoning General

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
2035 General Sewer Plan	-	1	$ 700,000	$ 700,000	-	-		$700,000
2045 General Sewer Plan	-	1	$ 700,000	$ 700,000	-	-		$700,000

Total Anticipated Project Cost	$ 1,400,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	100%	$ 1,400,000
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 1,400,000

Project Timing:

Project Element	Timing	Cost
First General Sewer Plan	2035	$ 700,000
Second General Sewer Plan	2045	$ 700,000
Total		$ 1,400,000

Go to Maps Tab

Project Location Map:
N/A - Systemwide

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-01
Project Title: Parshall Flume Replacement

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: Replace existing Parshall Flume with new Parshall Flume (higher capacity) and structural modification to prevent spraying of the influent wastewater during peak flow events. Cost is split between growth and upgrade because the parshall flume needs to be modified to address existing process issues and it needs to be a larger size to accomodate growth-driven future peak wet weather.

Reasoning Existing and future growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Top Slab Demolition	2.1	CY	$ 560.00	$ 1,200.00	$ 400.00	$ 1,000		$2,600
Wall Demolition	9.4	CY	$ 560.00	$ 5,300.00	$ 1,600.00	$ 4,100		$11,000
Foundation Slab	1.7	CY	$ 560.00	$ 1,000.00	$ 300.00	$ 800		$2,100
Influent Channel Wall	2.5	CY	$ 3,000.00	$ 7,500.00	$ 2,300.00	$ 6,200		$16,000
Influent Channel Walls	6.5	CY	$ 1,800.00	$ 11,500.00	$ 3,500.00	$ 9,000		$24,000
Influent Channel	9.5	CY	$ 3,000.00	$ 28,500.00	$ 8,600.00	$ 22,900		$60,000
Excavation and Backfill	95.0	CY	$ 225.00	$ 21,500.00	$ 6,500.00	$ 17,000		$45,000
Guardrail Demolition	8.0	LF	$ 110.00	$ 900.00	$ 300.00	$ 800		$2,000
New Guardrail	8.0	LF	$ 225.00	$ 1,800.00	$ 500.00	$ 1,400		$3,700
Parshall Flume Shoring Elevated Slab	1.0	LS	$ 22,500.00	$ 22,500.00	$ 6,800.00	$ 17,700		$47,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 30,500.00	$ 9,200.00	$ 24,300		$64,000
Total Anticipated Project								$ 277,400

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	50%	$ 138,700
Upgrade:	50%	$ 138,700
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project	100%	$ 277,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2029	$ 277,400
Total		$ 277,400

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-02
Project Title: Primary Clarifier Bypass
Facility Type: Treatment Plant
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: Add a Bypass around Existing Primary Clarifiers. Add a weir, dropbox, and piping as needed to construct a bypass around the primary clarifiers. This bypass will direct all flows greater than the maximum day flows around the primary clarifiers. The driver for this project is growth, predominantly occuring from development in the North Shore area.

Reasoning Future PWWF driven

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Install a new 30-inch bypass around the Primary Clarifiers No. 1 and 2	220.0	LF	$ 897	$ 200,000	$ 60,000	$ 158,000		$418,000
Structural modifications and installation of weir gates at Plant Headworks Effluent	1.0	LS	$ 112,500	$ 112,500	$ 34,000	$ 88,500		$235,000
Additional Site Work	25.0	%	N/A	$ 78,100	$ 23,500	$ 61,400		$163,000
Total Anticipated Project Cost								$ 816,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 816,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 816,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 816,000
Total		$ 816,000

Project Location Map:
N/A

Go to Maps Tab

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-03
Project Title: Aeration Basin Flow Splitter Box

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: Construct new Aeration Basin Influent Flow Splitter Box.This is a new structure to provide adequate mixing and even split of flow to the aeration basins. It should also be designed to address the issue of very little head available between the primary clarifier and aeration basins. The improvements include an 18-inch foundation slab, 12-inch-thick walls, new guardrails and aluminum grating, and associated excavation and backfill. New 60-inch by 30-inch and 24-inch by 24-inch stainless steel slide gates will be provided to control flows through the splitter box. The project also includes demolition of the existing Aeration Basin Flow Splitter Box, temporary pumping and piping during construction, installation of piping to and from the new splitter box, and additional site work as needed to complete the improvements. This project is timed to align with TP-02.

Reasoning Addresses existing peak event capacity issues and issues with mixing

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
18" Floundation Slab	32.0	CY	$ 975	$ 31,000	$ 9,300	$ 24,700		$ 65,000
12" Thick Wall	61.0	CY	$ 1,800	$ 110,000	$ 33,000	$ 87,000		$ 230,000
New Guardrail	116.0	LF	$ 225	$ 26,000	$ 7,800	$ 20,200		$ 54,000
Aluminum Grating	777.0	SF	$ 113	$ 88,000	$ 26,500	$ 69,500		$ 184,000
Excavation and Backfill	167.0	CY	$ 225	$ 37,500	$ 11,500	$ 30,000		$ 79,000
60" x 30" SS Slide Gate	4.0	LS	$ 32,799	$ 131,000	$ 39,500	$ 103,500		$ 274,000
24" x 24" SS Slide Gate	3.0	LS	$ 16,183	$ 48,500	$ 14,500	$ 39,000		$ 102,000
Demolition of Existing Aeration Basin Flow Splitter Box	1.0	LS	$ 75,000	$ 75,000	$ 22,500	$ 59,500		$ 157,000
Temporary Pumping/Piping during construction	1.0	LS	$ 112,500	$ 112,500	$ 34,000	$ 88,500		$ 235,000
Piping to New Aeration Basin Flow Splitter Box	200.0	LF	$ 897	$ 179,500	$ 54,000	$ 142,500		$ 376,000
Piping From New Aeration Basin Flow Splitter Box	400.0	LF	$ 897	$ 358,500	$ 107,500	$ 283,000		$ 749,000
Installation	25.0	%	N/A	$ 299,400	$ 90,000	$ 236,600		$ 626,000
Additional Site Work	15.0	%	N/A	$ 179,600	$ 54,000	$ 142,400		$ 376,000
Total Anticipated Project Cost								$ 3,507,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 3,507,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 3,507,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 3,507,000
Total		$ 3,507,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-04
Project Title: Replace Screens and Slide Gates

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes replacement of the existing screens and slide gates at the WWTF Headworks to improve the reliability and operation of the screening process. The improvements include replacement of the existing screens/washer compactors with new units and installation of new 66-inch by 48-inch, 66-inch by 36-inch, and 72-inch by 36-inch stainless steel slide gates. The project also includes associated installation, electrical, instrumentation, and controls improvements, as well as additional site work required to complete the improvements. This project is split between growth and R&R becuase componensts of the plant headworks should be replaced because it is near the end of it's useful life and capacity increased to address growth-driven future peak flows to the plant.

Reasoning Growth driven capacity issues and age/condition

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Replace existing screens/washer compactors with new	1.0	LS	$ 568,000	$ 570,000	$ 171,000	$ 450,000		$1,191,000
66" x 48" SS Slide Gate	2.0	LS	$ 26,161	$ 52,300	$ 15,500	$ 41,200		$109,000
66" x 36" SS Slide Gate	2.0	LS	$ 24,652	$ 49,300	$ 15,000	$ 38,700		$103,000
72" x 36" SS Slide Gate	3.0	LS	$ 37,022	$ 111,000	$ 33,500	$ 87,500		$232,000
Installation	25.0	%	N/A	$ 195,700	$ 58,500	$ 153,800		$408,000
Electrical, Instrumentation, and Controls	15.0	%	N/A	$ 117,400	$ 35,000	$ 92,600		$245,000
Additional Site Work	25.0	%	N/A	$ 195,700	$ 58,500	$ 153,800		$408,000

Total Anticipated Project Cost	$ 2,696,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	50%	$ 1,348,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	50%	$ 1,348,000
Total Anticipated Project Cost	100%	$ 2,696,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2029	$ 2,696,000
Total		$ 2,696,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-05
Project Title: Relocate the Internal Recycle Piping

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: Relocate the IR piping to the beginning of the Anoxic Selector. Relocate the internal recycle piping such that the recycle is introduced just upstream of the first of the two anoxic zones and not in the last anerobic zone for the three existing aeration basins. The project also includes associated electrical, instrumentation, and controls improvements, as well as additional site work required to complete the improvements. The City currently has two options for where recycled flow is discharged to: one from the splitter box (currently used) and the other at the end of the selector zone. It is recommended that the City use switch to discharge at the end of the selector zone and to monitor and test before and after the switch to assess improvement in treatment performance from this change to see if it is sufficient. TP-05 could potentially be completed in-house.

Reasoning Existing process upgrade

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Relocate IR piping	1.0	LS	$ -	$ -	$ -	$ -		$0
Electrical, Instrumentation, and Controls	15.0	%	$ -	$ -	$ -	$ -		$0
Additional Site Work	10.0	%	$ -	$ -	$ -	$ -		$0

Total Anticipated Project Cost	$ -

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ -

Project Timing:

Project Element	Timing	Cost
Entire Project	2027	$ -
Total		$ -

Project Location Map:
N/A

Go to Maps Tab

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-06
Project Title: Modifying Anaerobic Selectors Baffle Wall

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: Modifications to the Baffle wall separating the Anaerobic Selectors. The baffle walls that divide the zones within the existing aeration basins' should be repoured to a smooth level. Plywood baffle walls in the anaerobic selector zone should be removed and replaced with 316 stainless steel baffle plates for rigidity. The project also includes associated electrical, instrumentation, and controls improvements.

Reasoning Existing process upgrade

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Modify baffle walls	1.0	LS	$ 29,000	$ 29,000	$ 8,700	$ 23,300		$61,000
Electrical, Instrumentation, and Controls	15.0	%	N/A	$ 4,400	$ 1,300	$ 3,500		$9,200

Total Anticipated Project Cost	$ 70,200

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 70,200
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 70,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2027	$ 70,200
Total		$ 70,200

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-07
Project Title: Replace Secondary Clarifier No. 1
Facility Type: Treatment Plant
Priority: 0-10 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: This project includes demolition and replacement of Secondary Clarifier No. 1 to improve the reliability and performance of the secondary treatment process. The new clarifier will be constructed as a 75-foot-diameter clarifier with a 15-foot SWD, matching the size, slope, and other design criteria of Secondary Clarifier No. 3. The improvements include a new concrete foundation slab and walls, sludge collection box, launder and effluent structures, aluminum grating, stairs, platforms, and railings, as well as new internal clarifier mechanisms. New RAS and WAS pumps will also be installed to match the size of those serving Secondary Clarifier No. 3. The project also includes associated demolition, installation, electrical, instrumentation, and controls improvements, and additional site work required to complete the improvements. The City is currently evaluating this project.

Reasoning Existing process upgrade

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
12" Conc Wall, 16'-0" ht.	142.0	CY	$ 1,800	$ 255,500	$ 76,500	$ 202,000		$534,000
18" Fdn Slab	281.0	CY	$ 975	$ 274,000	$ 82,000	$ 216,000		$572,000
Sludge Collection Box	23.0	CY	$ 975	$ 22,500	$ 6,800	$ 17,700		$47,000
Launder Slab	19.0	CY	$ 1,200	$ 23,000	$ 6,900	$ 18,100		$48,000
Launder Wall	9.1	CY	$ 2,400	$ 22,000	$ 6,600	$ 17,400		$46,000
Grout	27.0	CY	$ 750	$ 20,500	$ 6,200	$ 16,300		$43,000
Effluent Box Walls	19.0	CY	$ 1,800	$ 34,000	$ 10,000	$ 27,000		$71,000
Effluent Box Fdn Slab	5.0	CY	$ 975	$ 4,900	$ 1,500	$ 3,600		$10,000
Aluminum Grating	63.0	SF	$ 113	$ 7,100	$ 2,100	$ 5,800		$15,000
Alum. Stairs	12.0	RSR	$ 1,050	$ 12,500	$ 3,800	$ 9,700		$26,000
Small Platform	1.0	LS	$ 7,500	$ 7,500	$ 2,300	$ 6,200		$16,000
Alum. Railing	75.0	LF	$ 150	$ 11,500	$ 3,500	$ 9,000		$24,000
Demolitish existing clarifier	1.0	LS	$ 150,000	$ 150,000	$ 45,000	$ 119,000		$314,000
Construct a new 75-feet diameter, 15-feet SWD Secondary Clarifier No. 1 (Internal Mechanisms)	1.0	LS	$ 536,750	$ 537,000	$ 161,000	$ 424,000		$1,122,000
New RAS and WAS pumps	1.0	LS	$ 75,000	$ 75,000	$ 22,500	$ 59,500		$157,000
Electrical, Instrumentation, and	30.0	%	N/A	$ 437,100	$ 131,000	$ 344,900		$913,000
Installation	25.0	%	N/A	$ 364,300	$ 109,500	$ 288,200		$762,000
Additional Site Work	20.0	%	N/A	$ 291,400	$ 87,500	$ 230,100		$609,000
Total Anticipated Project Cost								$ 5,329,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 5,329,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 5,329,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2027	$ 5,329,000
Total		$ 5,329,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-08
Project Title: Replace RAS Pumps for SC No. 2

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes replacement of the return activated sludge (RAS) pumps serving Secondary Clarifier No. 2 to improve pumping capacity and maintain consistency with the existing Secondary Clarifier No. 3 facilities. Two new non-clog submersible RAS pumps, each rated at 1,400 gpm, will be installed to match the pump capacity serving Secondary Clarifier No. 3. The project also includes associated installation, electrical, instrumentation, and controls improvements. This project is driven by growth, predominantly development in the North Shore area.

Reasoning Aging infrastructure

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
RAS Pumps (2) for SC No. 2 (1,400 gpm, non-clog submersible pumps)	2.0	LS	$ 68,000	$ 136,000	$ 41,000	$ 108,000		$285,000
Installation	25.0	%	N/A	$ 34,000	$ 10,000	$ 27,000		$71,000
Electrical, Instrumentation, and Controls	N/A	30	N/A	$ 40,800	$ 12,000	$ 31,200		$84,000

Total Anticipated Project Cost	$ 440,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	100%	$ 440,000
Total Anticipated Project Cost	100%	$ 440,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 440,000
Total		$ 440,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-09
Project Title: Replace Plant Drain PS No. 1

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: The condition assessment noted signs of concrete corrosion, and its pumps are nearing the end of useful life. As such, it is recommended that Lift Station No. 1 be rehabilitated by:

1. Replacing the pumps (500 gpm each).
2. Installing a liner in the wet well to extend the line of the existing structure.
3. Replacing control panel, pump guide rails, and discharge piping within the wet well.
4. Adding a totalizing flow meter and composite sampler.

The project includes associated demolition and temporary piping, electrical, instrumentation, and controls improvements, installation, and additional site work required to complete the rehabilitation. The City may consider constructing a single Plant Drain Pump Station to replace No. 1 and 2. This project is timed to align with TP-02.

Reasoning Aging infrastructure and condition

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Demolition and Temporary Piping	1.0	LS	$ 60,000	$ 60,000	$ 18,000	$ 47,000		$125,000
Plant Drain Pumps and Piping	1.0	LS	$ 85,000	$ 85,000	$ 25,500	$ 66,500		$177,000
Wet Well Liner	1.0	LS	$ 135,000	$ 135,000	$ 40,500	$ 106,500		$282,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 84,000	$ 25,000	$ 67,000		$176,000
Installation	25.0	%	N/A	$ 70,000	$ 21,000	$ 56,000		$147,000
Additional Site Work	10.0	%	N/A	$ 28,000	$ 8,400	$ 21,600		$58,000
Total Anticipated Project Cost								$ 965,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	100%	$ 965,000
Total Anticipated Project Cost	100%	$ 965,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 965,000
Total		$ 965,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-10
Project Title: Replace Plant Drain PS No. 2

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: The condition assessment noted signs of concrete corrosion, and its pumps are nearing the end of useful life. As such, it is recommended that Lift Station No. 2 be rehabilitated by:

1. Replacing the pumps (500 gpm each).
2. Installing a liner in the wet well to extend the line of the existing structure.
3. Replacing control panel, pump guide rails, and discharge piping within the wet well.
4. Adding a totalizing flow meter and composite sampler.

The project includes associated demolition and temporary piping, electrical, instrumentation, and controls improvements, installation, and additional site work required to complete the rehabilitation. The City may consider constructing a single Plant Drain Pump Station to replace No. 1 and 2. This project is timed to align with TP-02.

Reasoning Aging infrastructure and condition

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Demolition and Temporary Piping	1.0	LS	$ 60,000	$ 60,000	$ 18,000	$ 47,000		$125,000
Plant Drain Pumps and Piping	1.0	LS	$ 85,000	$ 85,000	$ 25,500	$ 66,500		$177,000
Wet Well Liner	1.0	LS	$ 135,000	$ 135,000	$ 40,500	$ 106,500		$282,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 84,000	$ 25,000	$ 67,000		$176,000
Installation	25.0	%	N/A	$ 70,000	$ 21,000	$ 56,000		$147,000
Additional Site Work	10.0	%	N/A	$ 28,000	$ 8,400	$ 21,600		$58,000

Total Anticipated Project Cost	$ 965,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	100%	$ 965,000
Total Anticipated Project Cost	100%	$ 965,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 965,000
Total		$ 965,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-10
Project Title: Replace Plant Drain PS No. 2

Facility Type: Treatment Plant

Go to CIP Summary Table

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-11
Project Title: PLANTWIDE: Electrical Conduit & Stand Replace

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: The project includes plantwide replacement of existing electrical conduit and support stands to improve the reliability and condition of the plant electrical infrastructure. Existing conduit and support stands will be demolished, with existing conductors protected for reuse where feasible. New electrical conduit and support stands will be installed throughout the plant as needed.

Reasoning Aging infrastructure

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
DEMO Conduit & Support Stand - Protect Conductors for Reuse	1.0	LS	$ 55,000	$ 55,000	$ 16,500	$ 43,500		$115,000
Electrical Conduit & Support Stand Replacement	500.0	Units	$ 204	$ 102,000	$ 30,500	$ 80,500		$213,000
Total Anticipated Project Cost								$ 328,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	100%	$ 328,000
Total Anticipated Project Cost	100%	$ 328,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 328,000
Total		$ 328,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-12 **Facility Type:** Treatment Plant
Project Title: NETWORK: Equipment Enclosure & Cabled Protect Upgrade
Priority: 0-10 years **Project Status (Completed?):** N

Go to CIP Summary Table

Project Description:

Project Description: This project includes plantwide improvements to equipment enclosures and cable protection to improve the reliability and protection of the instrumentation and control system. Improvements include installation of new instrumentation and control cabinets, de-termination and re-termination of existing conductors, and installation of conduit to provide additional protection for cables and conductors. Cost is split between upgrade and R&R becuase it addresses aging infrastructure and upgrades to more modern equipment.

Reasoning Aging infrastructure and upgrade

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Instrumentation and Control Cabinet	2.0	LS	$ 6,000	$ 12,000	$ 3,600	$ 9,400		$25,000
DE-Terminate Conduit (Assumed 30 LF)	1.0	LS	$ 9,000	$ 9,000	$ 2,700	$ 7,300		$19,000

Total Anticipated Project Cost	$ 44,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	50%	$ 22,000
General:	0%	$ -
R&R:	50%	$ 22,000
Total Anticipated Project Cost	100%	$ 44,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 44,000
Total		$ 44,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-13
Project Title: Replace MCC-A & Relocate Electric Equipment
Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years
Project Status (Completed?): N

Project Description:

Project Description: Reference section 7.9.8 of the WWTF Evaluation Report in Appendix I for more information on the current electrical system and background on previous upgrades.
This project includes replacement of MCC-A and relocation of associated electrical equipment to improve the reliability and maintainability of the plant electrical system. MCC-A currently serves two WAS pumps, one general-purpose sludge pump, a compressor, two heaters, and a hoist. MCC-A will be removed from the plant distribution system, and its remaining loads will be re-fed from nearby electrical sources. PLC-A will also be removed from the Old Controls Building, with its current loads transferred to another nearby PLC. This will allow the Old Controls Building to be fully utilized as a maintenance and workshop area, consistent with its current use. The project includes replacement of MCC-A and relocation of electrical equipment from the Old Controls Building, along with associated electrical, instrumentation, and controls work. The City is currently evaluating this project.

Reasoning Upgrade equipment

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
MCC To Replace MCC-A	1.0	LS	$ 63,000	$ 63,000	$ 19,000	$ 50,000		$132,000
Relocate Electrical Equipment from Old Controls Bldg	1.0	LS	$ 172,000	$ 172,000	$ 51,500	$ 135,500		$359,000

Total Anticipated Project Cost	$ 491,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 491,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 491,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 491,000
Total		$ 491,000

Project Location Map:
N/A

Go to Maps Tab

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-14
Project Title: Replace and Add Diffusers in the Aeration Basins

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes replacement of the existing diffusers in the three aeration basins and installation of additional diffusers in the second of the two anoxic zones within each basin. The additional diffusers will allow the anoxic zones to function as swing zones, providing greater operational flexibility and treatment capacity. New diffuser supports within the swing zones will be designed to withstand the forces exerted by the existing submersible mixers.

Reasoning Process upgrade

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Replace existing diffusers in the Aeration Basins and add diffusers to one of the Anoxic Zones	1.0	LS	$ 425,000	$ 425,000	$ 127,500	$ 335,500		$888,000

Total Anticipated Project Cost	$ 888,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 888,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 888,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2032	$ 888,000
Total		$ 888,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-15
Project Title: Replace Disk Filtration Units

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: Replace the two existing Disk Filtration Units with new Units (6.0 mgd). Plant staff indicated the filters are backwashing 30% of the time, which is higher than the anticipated 20% or less.

This project includes replacement of the two existing disk filtration units with new units to improve filtration performance and operational reliability. The new disk filtration units will be sized for a capacity of 6.0 mgd. Plant staff indicated that the existing filters are currently backwashing approximately 30 percent of the time, which is higher than the anticipated 20 percent or less. The project includes removal of the existing disk filtration units, installation of the new units, and associated electrical, instrumentation, and controls improvements. The City will assess the need for the disk filters, which are currently not run all the time, prior to completing this project. This project is assigned to 75% growth and 25% to upgrade. It is primarily driven by growth but will also address existing issues reported by staff.

Reasoning Growth driven capacity issue and existing process improvement

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Disk Filter Unit	1.0	LS	$ 705,484	$ 705,500	$ 211,500	$ 557,000		$1,474,000
Remove existing Disk Filtration Units	1.0	LS	$ 75,000	$ 75,000	$ 22,500	$ 59,500		$157,000
Installation	25.0	%	N/A	$ 195,100	$ 58,500	$ 154,400		$408,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 234,200	$ 70,500	$ 184,300		$489,000

Total Anticipated Project Cost	$ 2,528,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	75%	$ 1,896,000
Upgrade:	25%	$ 632,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 2,528,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2032	$ 2,528,000
Total		$ 2,528,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-16
Project Title: Second UV Channel

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: This City recently constructed a second UV disinfection channel which will be used going forward while the existing channel will serve as bypass. This project is to rehabilitate the existing channel and put back into service for UV disinfection to provide sufficient disinfection capacity for the entire plant effluent at peak hour flow conditions of 22.2 mgd. The project includes installation of the new UV equipment and associated electrical, instrumentation, and controls improvements will also be included.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
UV Equipment	1.0	LS	$ 1,507,286	$ 1,507,500	$ 452,500	$ 1,190,000		$3,150,000
Aluminum Grating	1.0	LS	$ 113	$ 100	$ -	$ -		$100
Installation	30.0	%	N/A	$ 452,300	$ 135,500	$ 357,200		$945,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 452,300	$ 135,500	$ 357,200		$945,000

Total Anticipated Project Cost	$ 5,040,100

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 5,040,100
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 5,040,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2032	$ 5,040,100
Total		$ 5,040,100

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-16
Project Title: Second UV Channel

Facility Type: Treatment Plant

Go to CIP Summary Table

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-17
Project Title: Replace Effluent Transfer Pumps

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: Replace the existing Effluent Transfer Pumps with larger impeller, motor, and associated VFDs to allow pumping of the entire plant effluent (22.2 mgd). Under high river water level conditions, when the headloss is too great for gravity flow to the Columbia River, the effluent is pumped using three vertical propeller effluent pumps, located in the second compartment of the effluent wet well. Each pump has a capacity of 4,550 gpm (6.54 mgd). The total capacity of the effluent transfer Lift Station is 19.6 mgd with a firm capacity of 13.09 mgd. The process implications of exceeding the effluent pumps' capacity are catastrophic, under the high river level conditions. Such conditions could quickly submerge upstream plant processes.
The replacement pumps will be rated at approximately 4,700 gpm and will include associated structural and mechanical modifications, installation, and electrical, instrumentation, and controls improvements. This project is driven by future growth and is timed to align with TP-18.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
4700 gpm centrfugal pumps	3.0	LS	$ 230,000	$ 690,000	$ 207,000	$ 545,000		$1,442,000
Structural and Mechanical Modifications	1.0	LS	$ 15,500	$ 15,500	$ 4,700	$ 12,800		$33,000
Installation	25.0	%	N/A	$ 176,400	$ 53,000	$ 139,600		$369,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 211,700	$ 63,500	$ 167,800		$443,000

Total Anticipated Project Cost	$ 2,287,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 2,287,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 2,287,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2035	$ 2,287,000
Total		$ 2,287,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-18
Project Title: Construct a New Plant Outfall

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes construction of a second plant outfall to the Columbia River to provide additional discharge capacity and improve the reliability and flexibility of the plant effluent discharge system. The new outfall will consist of approximately 36-inch corrugated metal pipe with a 16-port, 160-foot diffuser. The project includes mobilization, cleanup, and demobilization; erosion control; additional pipe fittings; trench safety; excavation and backfill; and installation of the new outfall. Associated electrical, instrumentation, and controls improvements will also be included. This project is timed to align with TP-17.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
36-in corrugated metal pipe	850.0	LF	$ 3,245	$ 2,758,500	$ 827,500	$ 2,177,000		$5,763,000
16-port, 160 ft diffuser	1.0	LS	$ 500,000	$ 500,000	$ 150,000	$ 395,000		$1,045,000
Mobilization, cleanup, and demobilization	1.0	LS	$ 1,120,000	$ 1,120,000	$ 336,000	$ 884,000		$2,340,000
Erosion control	1.0	LS	$ 133,800	$ 134,000	$ 40,000	$ 106,000		$280,000
Additional pipe fittings	20000.0	LB	$ 16	$ 320,000	$ 96,000	$ 253,000		$669,000
Trench safety programs	1.0	LS	$ 145,000	$ 145,000	$ 43,500	$ 114,500		$303,000
Excavation and Backfill	10000.0	CY	$ 225	$ 2,250,000	$ 675,000	$ 1,777,000		$4,702,000
Installation	30.0	%	N/A	$ 2,168,300	$ 650,500	$ 1,711,200		$4,530,000
Electrical, Instrumentation, and Controls	5.0	%	N/A	$ 361,400	$ 108,500	$ 285,100		$755,000

Total Anticipated Project Cost	$ 20,387,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 20,387,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 20,387,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2035	$ 20,387,000
Total		$ 20,387,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-19
Project Title: Construct a New Electrical Building

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes construction of a new electrical building west of the Digester complex to house electrical equipment serving the digester facilities. The new CMU block electrical building will be designed to meet the hazardous area classification requirements of NFPA 820 and provide a suitable location for electrical equipment serving the digester process. The project includes construction of the new building, electrical equipment and installation, and associated electrical, instrumentation, and controls improvements. This project is timed to align with TP-09 and TP-10. This project is driven by the need to move the existing electrical equipment to make room for the new digester and it will also address code issues, therefore it reiceves a 75%/25% split for future and existing cost, respectively.

Reasoning Code/Growth - secondary gravity thickener driven by growth, which drives electrical upgrade (can do both at same time)

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
CMU Block Electrical Building	1.0	LS	$ 306,000	$ 306,000	$ 92,000	$ 242,000		$640,000
Electrical Equipment and Installation	1.0	LS	$ 300,000	$ 300,000	$ 90,000	$ 237,000		$627,000
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		#N/A

Total Anticipated Project Cost	#N/A

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	75%	#N/A
Upgrade:	25%	#N/A
General:	0%	#N/A
R&R:	0%	#N/A
Total Anticipated Project Cost	100%	#N/A

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	#N/A
Total		#N/A

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-20 **Facility Type:** Treatment Plant
Project Title: Construct a Second Rotary Drum Thickener for WAS Thickening

Go to CIP Summary Table

Priority: 0-10 years **Project Status (Completed?):** N

Project Description:

Project Description: This project includes construction of a second Rotary Drum Thickener (RDT) for waste activated sludge (WAS) thickening to provide redundancy and improve the reliability of the thickening process. The existing RDT has been in service for more than 10 years, and a second unit is recommended to provide additional operational flexibility and backup capacity. The project includes a new RDT, associated polymer blending unit, thickened sludge pump, access platform, stairs, and supporting structures. The project also includes installation, additional site work, and associated electrical, instrumentation, and controls improvements. This project is timed to align with TP-09 and TP-10.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
New RDT (2nd unit) for redundancy	1.0	LS	$ 300,000	$ 300,000	$ 90,000	$ 237,000		$627,000
Associated polymer blending unit	1.0	LS	$ 75,000	$ 75,000	$ 22,500	$ 59,500		$157,000
Thickened Sludge Pump	1.0	LS	$ 75,000	$ 75,000	$ 22,500	$ 59,500		$157,000
Access platform, stairs, supporting structure etc.	10.0	%	N/A	$ 45,000	$ 13,500	$ 35,500		$94,000
Installation	25.0	%	N/A	$ 112,500	$ 34,000	$ 88,500		$235,000
Additional Site Work	15.0	%	N/A	$ 67,500	$ 20,500	$ 53,000		$141,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 135,000	$ 40,500	$ 106,500		$282,000

Total Anticipated Project Cost	$ 1,693,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 1,693,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 1,693,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2030	$ 1,693,000
Total		$ 1,693,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-21
Project Title: Construct a New Primary Clarifier

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 10-20 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes construction of a new Primary Clarifier No. 3 to improve primary treatment performance and provide additional process capacity. The additional clarifier will help maintain high BOD_5 and TSS removals during normal flow conditions, allow the aeration basins to operate at lower MLSS concentrations during maximum month organic loadings, and reduce oxygen demands in the BNR process while increasing gas production in the digesters. The new clarifier will be approximately 60 feet in diameter with a 10-foot SWD and will include new internal mechanisms, sludge collection box, concrete foundation and walls, launder structure, aluminum stairs, catwalk framing, grating, and railing. The project also includes new LS pumps, excavation and backfill, installation, additional site work, and associated electrical, instrumentation, and controls improvements.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
12" Conc Wall, 12'-6" ht.	89.0	CY	$ 1,800	$ 160,000	$ 48,000	$ 126,000		$334,000
18" Fdn Slab	175.0	CY	$ 975	$ 170,500	$ 51,000	$ 134,500		$356,000
Sludge Collection Box	15.0	CY	$ 975	$ 14,500	$ 4,400	$ 11,100		$30,000
Launder Slab	12.0	CY	$ 1,200	$ 14,500	$ 4,400	$ 11,100		$30,000
Launder Wall	6.6	CY	$ 2,400	$ 16,000	$ 4,800	$ 12,200		$33,000
Grout	17.4	CY	$ 750	$ 13,000	$ 3,900	$ 10,100		$27,000
Alum. Stairs	15.0	RSR	$ 1,050	$ 16,000	$ 4,800	$ 12,200		$33,000
Alum. Catwalk Framing	10306.0	LB	$ 11	$ 108,000	$ 32,500	$ 85,500		$226,000
Alum. Grating	720.0	SF	$ 113	$ 81,500	$ 24,500	$ 64,000		$170,000
Alum. Railing	409.0	LF	$ 150	$ 61,500	$ 18,500	$ 49,000		$129,000
Excavation and Backfill	1902.0	CY	$ 225	$ 428,000	$ 128,500	$ 337,500		$894,000
Construct a new 60-feet diameter, 10-feet SWD Primary Clarifier No. 3 (Internal Mechanisms and other items)	1.0	LS	$ 541,250	$ 541,500	$ 162,500	$ 428,000		$1,132,000
New PS pumps	1.0	LS	$ 58,000	$ 58,000	$ 17,500	$ 46,500		$122,000
Additional Site Work	25.0	%	N/A	$ 420,800	$ 126,000	$ 331,200		$878,000
Installation	25.0	%	N/A	$ 420,800	$ 126,000	$ 331,200		$878,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 504,900	$ 151,500	$ 398,600		$1,055,000

Total Anticipated Project Cost	$ 6,327,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 6,327,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 6,327,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2039	$ 6,327,000
Total		$ 6,327,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-22
Project Title: Construct a New Secondary Clarifier
Facility Type: Treatment Plant
Priority: 10-20 years
Project Status (Completed?): N

Go to CIP Summary Table

Project Description:

Project Description: This project includes construction of a new Secondary Clarifier No. 4 to provide additional secondary treatment capacity and accommodate future growth. The new clarifier will be approximately 75 feet in diameter with a 15-foot SWD and will include new internal mechanisms, sludge collection box, effluent box, launder structure, concrete foundation and walls, aluminum grating, stairs, platforms, and railings. The project also includes new RAS and WAS pumps and approximately 36-inch piping to connect the new clarifier to the existing system. Associated excavation and backfill, installation, additional site work, and electrical, instrumentation, and controls improvements will also be included.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
12" Conc Wall, 16'-0" ht.	142.0	CY	$ 1,800	$ 255,500	$ 76,500	$ 202,000		$534,000
18" Fdn Slab	281.0	CY	$ 975	$ 274,000	$ 82,000	$ 216,000		$572,000
Sludge Collection Box	23.0	CY	$ 975	$ 22,400	$ 6,700	$ 17,900		$47,000
Launder Slab	18.0	CY	$ 1,200	$ 21,600	$ 6,500	$ 16,900		$45,000
Launder Wall	9.1	CY	$ 2,400	$ 21,800	$ 6,500	$ 16,700		$45,000
Grout	27.0	CY	$ 750	$ 20,300	$ 6,100	$ 15,600		$42,000
Effluent Box Walls	19.0	CY	$ 1,800	$ 34,200	$ 10,500	$ 27,300		$72,000
Effluent Box Fdn Slab	5.0	CY	$ 975	$ 4,900	$ 1,500	$ 3,600		$10,000
Aluminum Grating	63.0	SF	$ 113	$ 7,100	$ 2,100	$ 5,800		$15,000
Alum. Stairs	12.0	RSR	$ 1,050	$ 12,600	$ 3,800	$ 9,600		$26,000
Small Platform	1.0	LS	$ 7,500	$ 7,500	$ 2,300	$ 6,200		$16,000
Alum. Railing	75.0	LF	$ 150	$ 11,300	$ 3,400	$ 8,300		$23,000
Excavation and Backfill	5200.0	CY	$ 225	$ 1,170,000	$ 351,000	$ 924,000		$2,445,000
Construct a new 75-feet diameter, 15-feet SWD Secondary Clarifier No. 4 (Internal Mechanisms)	1.0	LS	$ 536,750	$ 537,000	$ 161,000	$ 424,000		$1,122,000
New RAS and WAS pumps	1.0	LS	$ 75,000	$ 75,000	$ 22,500	$ 59,500		$157,000
New 36-inch pipe to new Secondary Clarifier No. 4	36.0	in	$ 1,203	$ 722,000	$ 216,500	$ 569,500		$1,508,000
Installation	25.0	%	N/A	$ 799,300	$ 240,000	$ 631,700		$1,671,000
Additional Site Work	20.0	%	N/A	$ 639,400	$ 192,000	$ 505,600		$1,337,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 959,200	$ 288,000	$ 757,800		$2,005,000
Total Anticipated Project Cost								$ 11,692,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 11,692,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 11,692,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2039	$ 11,692,000
Total		$ 11,692,000

Project Location Map:
N/A

Go to Maps Tab

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-23
Project Title: Replace Centrifugal Blowers

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 0-10 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes replacement of the two existing 150-hp multistage centrifugal blowers with two new 150-hp HST blowers to provide sufficient aeration capacity for future peak oxygen demands. The existing centrifugal blowers will be removed and replaced with two HST blowers (Model HST 10-3600-1-U150-48). It is assumed that all four blowers will need to operate simultaneously to meet the projected 2045 peak oxygen demand. The project also includes associated installation and electrical, instrumentation, and controls improvements. The City is currently working on a project to increase capacity of blowers 3 and 4.

Reasoning Existing capacity and process upgrade

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
Two new HST Blowers (Model - HST 10-3600-1-U150-48)	1.0	LS	$ 416,000	$ 416,000	$ 125,000	$ 329,000		$870,000
Installation	15.0	%	N/A	$ 62,400	$ 18,500	$ 49,100		$130,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 124,800	$ 37,500	$ 98,700		$261,000

Total Anticipated Project Cost	$ 1,261,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	0%	$ -
Upgrade:	100%	$ 1,261,000
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 1,261,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2027	$ 1,261,000
Total		$ 1,261,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

Project ID: TP-24
Project Title: Replace Sludge Dryer

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 10-20 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes replacement of the existing sludge dryer with new sludge drying equipment to maintain reliable biosolids processing as the existing equipment approaches the end of its useful life. The existing sludge dryer was installed in 2014 and is more than 10 years old. Typical sludge drying equipment may require a major overhaul within approximately 10 years, and the City should plan for potential replacement within the next 10 to 15 years. However, a firm recommendation for replacement is not made as part of this 2025 GSP, because regulations related to biosolids, particularly per- and polyfluoroalkyl substances (PFAS), continue to evolve and may affect future biosolids management requirements. The project includes new sludge belt drying equipment (BDS-10) and associated components, partial demolition and expansion of the existing building, additional site work, installation, and associated electrical, instrumentation, and controls improvements. The City has contracted for an evaluation of the dryer and alternatives for solids handling.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
New Sludge Belt Drying equipment (BDS-10) and associated components	1.0	LS	$ 5,883,000	$ 5,883,000	$ 1,765,000	$ 4,644,000		$12,292,000
Demo part of existing building	1.0	LS	$ 20,000	$ 20,000	$ 6,000	$ 16,000		$42,000
Expand existing building Building	2400.0	SF	$ 130.00	$ 312,000	$ 93,500	$ 246,500		$652,000
Additional Site Work	30.0	&	N/A	$ 1,864,500	$ 559,500	$ 1,472,000		$3,896,000
Installation	15.0	%	N/A	$ 932,300	$ 279,500	$ 736,200		$1,948,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 1,864,500	$ 559,500	$ 1,472,000		$3,896,000

Total Anticipated Project Cost	$ 22,726,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 22,726,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 22,726,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2042	$ 22,726,000
Total		$ 22,726,000

Project Location Map:

Go to Maps Tab

N/A

City of Camas
General Sewer Plan
Capital Improvement Plan

carollo

Project ID: TP-25
Project Title: Replace Biofilters

Facility Type: Treatment Plant

Go to CIP Summary Table

Priority: 10-20 years

Project Status (Completed?): N

Project Description:

Project Description: This project includes replacement of the existing biofilters with new biofilters to maintain reliable odor control as the existing tertiary filters approach the end of their useful life. The new biofilter odor control system will be designed for approximately 10,000 cfm and will include associated ductwork, sump pumps, water panels, and other necessary components. The project also includes construction of a structural pad, installation, and associated electrical, instrumentation, and controls improvements. Prior to completion of this project, the City may consider replacing the biofilters with trickling filters which have a smaller footprint.

Reasoning Growth

Anticipated Project Cost:

Project Element	Quantity	Unit	Unit Cost ($/Unit)	Subtotal	Construction 30%	General 64%		Total Cost
New Biotrickling Filter Odor Control System with Ductwork, sump pumps, water panel etc. (10,000 cfm)	1.0	LS	$ 1,200,000	$ 1,200,000	$ 360,000	$ 947,000		$2,507,000
Structural pad	56.0	CY	$ 975.00	$ 54,500	$ 16,500	$ 44,000		$115,000
Installation	15.0	%	N/A	$ 188,200	$ 56,500	$ 148,300		$393,000
Electrical, Instrumentation, and Controls	30.0	%	N/A	$ 376,400	$ 113,000	$ 297,600		$787,000

Total Anticipated Project Cost	$ 3,802,000

Notes on Cost Estimation:

Go to Assumptions Tab

Cost Allocation:

Project Type	Percent	Cost
Growth:	100%	$ 3,802,000
Upgrade:	0%	$ -
General:	0%	$ -
R&R:	0%	$ -
Total Anticipated Project Cost	100%	$ 3,802,000

Project Timing:

Project Element	Timing	Cost
Entire Project	2043	$ 3,802,000
Total		$ 3,802,000

Project Location Map:

Go to Maps Tab

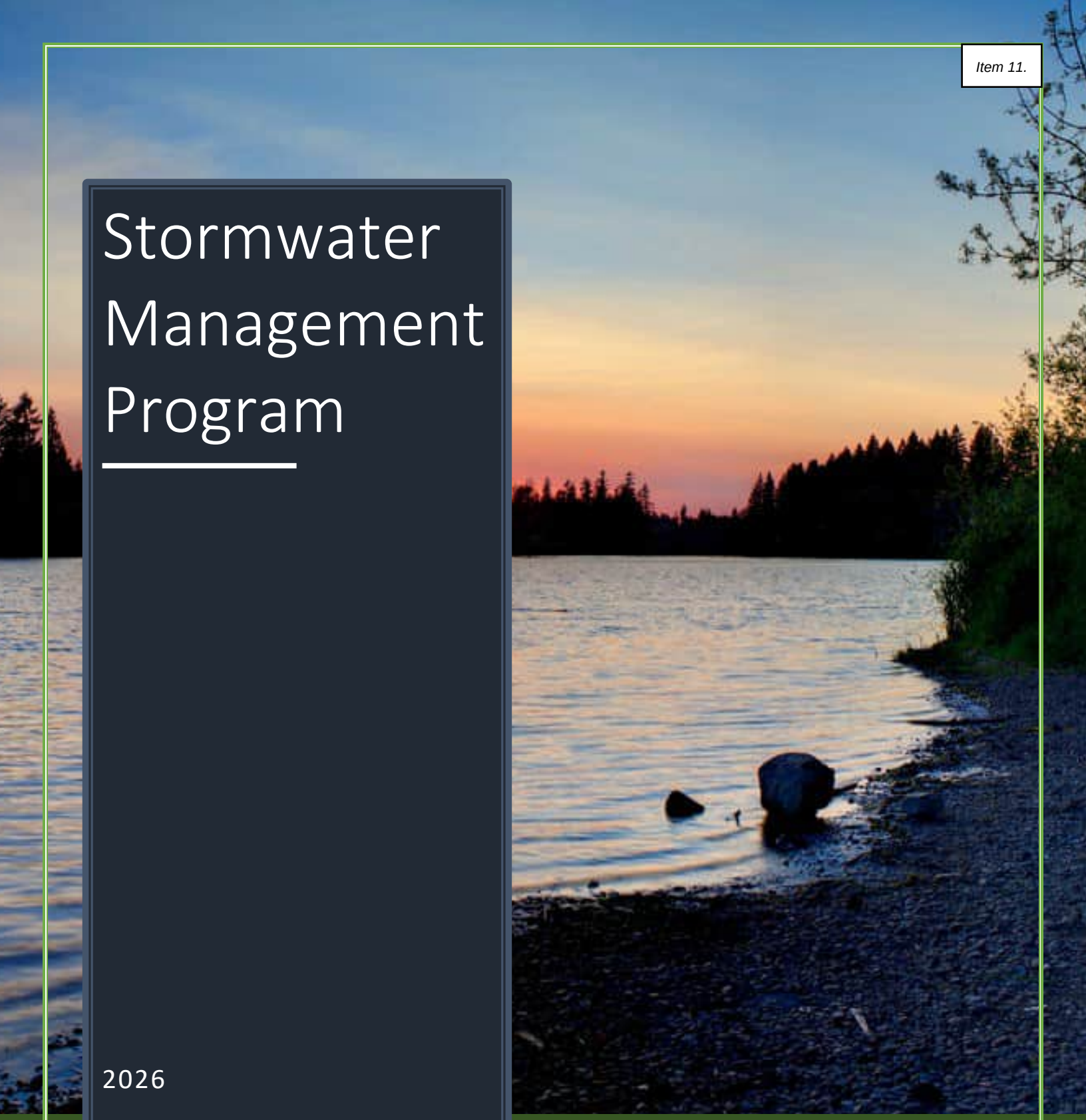
N/A

APPENDIX M

FINANCIAL BACKUP

~ To be included in a future submittal. ~

Appendix P: Camas Stormwater Management Program



Stormwater Management Program

2026

City of Camas
Stormwater Division | Public Works

City of Camas WASHINGTON

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Introduction

The National Pollutant Discharge Elimination System (NPDES) Permit addresses water pollution from point sources into surface waters, such as rivers, lakes, and streams. The U.S. Environmental Protection Agency (EPA) gave the Washington State Department of Ecology (Ecology) authority to write and issue the NPDES Permit in Washington State. The Western Washington Phase II Municipal Stormwater Permit (Permit) was first issued by Ecology in 2007.

The City of Camas (City) Municipal Separate Storm Sewer System (MS4) is regulated by the Permit. This Annual Report covers implementation of components from the 2024-2029 Permit. The 2024-2029 Permit was reissued on July 1, 2024, and became effective August 1, 2024. The Permit cycle is from August 1, 2024, to July 31, 2029. The City will continue to implement current programs and include new permit requirements as they come into effect.

The Stormwater Management Program (SWMP) is required per Section S5 of the Permit. The SWMP is organized per the program components listed in S5.C. The SWMP is updated annually and submitted to Ecology by March 31st of each year. The SWMP consists of the following components (program components, current activities and planned activities are discussed in the SWMP):

- S5.C.1 Stormwater Planning
- S5.C.2 Public Education and Outreach
- S5.C.3 Public Involvement and Participation
- S5.C.4 MS4 Mapping and Documentation
- S5.C.5 Illicit Discharge Detection and Elimination
- S5.C.6 Controlling Runoff from New Development, Redevelopment, and Construction Sites
- S5.C.7 Stormwater Management for Existing Development
- S5.C.8 Source Control Program for Existing Development
- S5.C.9 Operations and Maintenance

The SWMP is designed to protect water quality by reducing the discharge of pollutants from the regulated small MS4 to the Maximum Extent Practicable (MEP) and shall use All Known, Available, and Reasonable methods of prevention, control, and Treatment (AKART) to prevent and control pollution of waters of the State of Washington.

The City has an ongoing program for gathering, tracking, maintaining and using information to evaluate SWMP development, implementation, permit compliance, and to set priorities.

The SWMP is a planning and implementation document. The program has three separate objectives depending on the intended audience:

- Ecology – Provide written documentation on how the City will meet the permit requirements for the SWMP.
- The Public – Solicit input and build local support for the City's SWMP.
- City Staff and Officials – Build support and understanding for the SWMP.

S5.C.1 Stormwater Planning

The City has three distinct watersheds: the Lacamas Lake Basin, the Columbia River Basin and the Washougal River Basin. The three watersheds ultimately drain into the Pacific Ocean. The City has been rapidly growing since 2015, adding a significant amount of both new people and infrastructure to the City's watersheds. A Comprehensive Stormwater Plan was developed in 2013 to plan for new stormwater regulations and future capital improvements that would help meet the City's goals and growth demands. The Stormwater Planning Program is to inform and assist in the development of policies and strategies as water quality management tools to protect receiving waters.

PERMIT REQUIREMENTS (S5.C.1):

a. Convene an inter-disciplinary team to inform and assist in the development, progress, and influence of this program.

b. Coordination with long-range plan updates:
   - Describe how stormwater management needs and protection/improvement of receiving water health are (or are not) informing the planning update processes and influencing policies and implementation strategies. Annual reports shall describe the water quality and watershed protection policies, strategies, codes, and other measures intended to protect and improve local receiving water health through planning, considering stormwater management needs or limitations.

c. Low impact development (LID) code-related requirements:
   - Continue to require LID Principles and LID Best Management Practices (BMPs) when updating, revising, and developing new local development-related codes, rules, standards, or other enforceable documents, as needed. The intent shall be to make LID the preferred and commonly used approach to site development.
   - Annually, assess and document any newly identified administrative or regulatory barriers to implementation of LID Principles or LID BMPs since local codes were updated in accordance with the 2013 Permit, and the measures developed to address the barriers. If applicable, the report shall describe mechanisms adopted to encourage or require implementation of LID principles or LID BMPs.
   - No later than December 31, 2028, adopt and implement tree canopy goals and policies to support stormwater management.
   - Establish a long term (e.g. 5, 10 year or longer) goal of canopy, existing or future projection, to be used for stormwater management.
   - Specific considerations for canopy for stormwater management on Permittee-owned or operated lands shall include:
     - Maintaining or increasing canopy in overburdened communities.
     - Maintaining existing mature canopy.
     - Document considerations, reasoning, and rationale for goals and polices.

d. Stormwater Management Action Planning (SMAP):
   No later than March 31, 2027, develop a SMAP for at least one new high priority catchment area, or additional actions for an existing SMAP, that identifies all the following:
   - A description of the stormwater facility retrofits needed for the area, including the BMP types and preferred locations. Include

projects that address transportation-related runoff from high traffic areas.

- Land management/development strategies and/or actions identified for water quality management.
- Focused, enhanced, or customized implementation of stormwater management actions related to permit sections within S5, including: IDDE field screening, Prioritization of Source Control inspections, O&M inspections or enhanced maintenance, Public Education and Outreach behavior change programs. Identified actions shall support other specifically identified stormwater management strategies and actions for the basin overall, or for the catchment area in particular.
- If applicable, identification of changes needed to local long-range plans, to address SMAP priorities.
- A proposed implementation schedule and budget sources for: short-term actions (accomplished within six years), long-term actions (accomplished within seven to 20 years).
- Actions in the SMAP that may benefit overburdened communities, including specifically vulnerable populations and highly impacted Communities.
- A process and schedule to provide future assessment and feedback to improve the planning process and implementation of procedures or projects.

CURRENT ACTIVITIES (S5.C.1):

The City's Stormwater Control Ordinance (CMC 14.02) will maintain the requirements for LID Principles and LID BMPs in all developments within city limits.

Presented Camas City Council on NPDES Phase II Permit updates and upcoming requirements of 2024-2029 Permit term.

The City's interdisciplinary team will continue to collaborate in the stormwater planning process. The core team members include the Public Works Director, Utilities Manager, Operations Supervisor and Stormwater Permit Coordinator. Other departments may be involved, as needed. City Council and stakeholders will be notified and part of the decision-making process as planning progresses.

The Department of Ecology awarded the City two Water Quality Combined Funding Grants; the City of Camas Downtown Regional Stormwater Retrofit Project and the City of Camas Crown Park Regional Stormwater Retrofit Project. These projects were identified in the previous SMAP process. The grant funds will help the City complete the planning and design phases of the two projects. The projects will provide treatment of stormwater from 216 acres of largely untreated area. Both projects are in the planning and design phase.

PLANNED ACTIVITIES (S5.C.1):

The City's short-term actions in support of stormwater facility retrofits will be detailed feasibility reviews to identify and prioritize retrofit projects for the long-term planning of the SMAP.

The City is working to adopt and implement tree canopy goals and policies to support stormwater management, and will establish long -term goals of canopy, existing or future projection for City owned or operated lands. Goals and policies will be adopted no later than December 31, 2028.

The City will complete and submit a SMAP for one new high priority catchment area, or additional actions for the Upper Camas Slough priority catchment area. A new SMAP or additional actions to existing SMAP will be completed no later than March 31, 2027.

S5.C.2 Public Education & Outreach

The City continues to implement an education and outreach program for the area served by the MS4. The Education and Outreach Program is designed to build general awareness about methods to address and reduce impacts from stormwater runoff, effect behavior change to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts, and create stewardship opportunities that encourage community engagement in addressing the impacts from stormwater runoff.

PERMIT REQUIREMENTS (S5.C.2):

Implement an education and outreach program for the area served by the MS4. The program design shall be based on local or regional water quality information and priority audience characteristics to identify high priority audiences, subject areas, and/or BMPs.

a. General Awareness: Annually select, at a minimum, one priority audience and one subject:

- *Priority audience*: General Public (including overburden communities, school age children, college/university, or trade students), or Businesses (including home-based and mobile businesses).
  Subject areas:
  1) General impacts of stormwater on surface waters, including impacts from impervious surfaces.
  2) Low impact development (LID) principles and LID BMPs.
- *Priority audience:* Engineers, contractors, developers, property owners/managers, or Land-use Planners.
  Subject areas:
  1) Technical standards for stormwater site and erosion control plans.
  2) LID principles and LID BMPs.
  3) Stormwater treatment and flow control BMPs/facilities.
  4) Source control BMPs for building materials to reduce pollution to stormwater, including but not limited to stormwater pollution from PCB-containing materials.
- Provide subject area information to the target audience on an ongoing or strategic schedule.

b. Behavior Change: To affect behavior change, Permittees shall select, at a minimum, one priority audience and one BMP.

- *Priority audience*; Residents, landscapers, property managers/owners, developers, school age children, college/university, trade students, or businesses (including home-based or mobile businesses).
  BMPs:
  1) Use and storage of: pesticides, fertilizers, and/or other household chemicals.
  2) Use and storage of: automotive chemicals, hazardous cleaning supplies, carwash soaps, and/or other hazardous materials.
  3) Prevention of illicit discharges.
  4) Yard care techniques protective of water quality.
  5) Carpet cleaning.
  6) Repair and maintenance BMPs for: vehicles, equipment, and/or home/building.
  7) Pet waste management and disposal.
  8) LID Principles and LID BMPs.
  9) Stormwater facility maintenance, include LID facilities.
  10) Dumpster and trash compactor maintenance.
  11) Litter and debris prevention.

12) Sediment and erosion control.
13) Source Control BMPs.
14) Locally-important, municipal stormwater-related subject area.

- Social marketing campaign development. No later than July 1, 2025, each Permittee shall follow social marketing practices and methods and develop a campaign that is tailored to the community, including development of a program evaluation plan.
- Behavior change campaign implementation. No later than September 1, 2025, begin to implement the developed strategy.
- Behavior change campaign evaluation. No later than March 31, 2029, evaluate and submit a report on the changes in understanding and adoption of behaviors resulting from the implementation of the strategy; and any planned or recommended changes to the campaign to be more effective; describe the strategies and process to achieve the results.
- Behavior change campaign adaptive management. Permittees shall use results of the evaluation to continue to direct effective methods and implementation of the ongoing behavior change program.

c. Stewardship: Provide and advertise stewardship opportunities and/or partner with existing organizations (including non-permittees) to encourage residents to participate in activities or events planned and organized within the community.

CURRENT ACTIVITIES (S5.C.2):

General Awareness – General Public:

- Contribute to Stormwater Partners (Partners) for regional education and outreach efforts.
- Participated in tree planting events along Everett Street corridor.
- Don't wait to inflate.
- Maintain stormwater website.
- Pet waste management and disposal.
- Provided pet waste signs.
- Proper disposal of household hazardous waste.
- Prohibit illegal dumping and littering in stormwater facilities.
- Illicit discharge hotline and flyer.



- KPTV 'Clean Water' public service announcement campaign.
- Neighborhood meetings for non-HOA neighborhoods to educate property owners on stormwater facility ownership, responsibilities and maintenance.
- Frequent stormwater social media post.
- Tabeling events at Camas Farmers Market to spread the word on Private Stormwater Facilities, IDDE, Poop Smart, Don't Drip and Drive and other stormwater program activities.

General Awareness – School age children

- Poop toss game to educate children on proper pet waste disposal.





- Student Video Contest for grades 6-12.
- Met with Girl Scouts to discuss stormwater and the surrounding environment.

General Awareness – college/university and trade students

- Educational presentations at local colleges.

General Awareness – Engineers, contractors, developers, property managers land use planners:

- City staff assist teaching Vegetated Stormwater Facilities Maintenance course at Clackamas Community College.
- City staff assisted in leading Private/Public Facility Inspection workshop at MuniCon 2025.

Behavior Change:

Pet Waste

Pet waste is an ongoing issue in the City. The City evaluated the existing pet waste program and decided to continue to tackle the pet waste issue. The City has joined forces with Clark County and neighboring cities to promote pet waste management with the Canines for Clean Water Campaign. The team developed a behavior change campaign strategy and schedule. The City continues to implement the strategy developed for the pet waste management campaign. The City hands out "There is no poop fairy" signs to residents and HOA's that experience excessive dog poop on lawns and in public spaces.

Dumpster Maintenance Campaign

The City, as a collaborator and contributor to Stormwater Partners (Partners), have selected Dumpster Maintenance as our new behavior change campaign. The Partners selected Point North Consulting to help implement the new Dumpster Maintenance Program. Social marketing campaign development started in the fall of 2024, where the team developed a strategy and schedule for a new priority audience and BMP behavior change campaign. The behavior change campaign strategy implementation began in July 2025. Phase I work included toolkit refinement and strategic planning. Phase II included pilot campaign implementation and evaluation. The campaign is currently in evaluation and strategy refinement.



Stewardships:

- Doody Pledge



- Backyard Habitat Certification Program
- Ivy League
- Lacamas Lake Clean-up
- Watershed Stewards Program
- Student Video Contest





- Adopt a Drain



PLANNED ACTIVITIES (S5.C.2):

The City will continue to implement the Current Activities.

The City, in partnership with the Student Watershed Monitoring Network, are starting the Students Offer Runoff Mitigation Program (STORM) with selected Camas 5th grade classes. The program will continue watershed education in classes with an emphasis on watershed health and stormwater and how they can be improved by catch basin cleaning.

The City and Partners will continue to develop and implement the Dumpster Maintenance Campaign throughout Clark County.

The City and Partners are developing and hosting informational workshops to bring awareness of source control BMPs for building materials to reduce stormwater pollution from PCB-containing materials. The workshops will be offered in 2026 to municipal staff, contractors and building owners. Meetings will be both virtual and in person.





C5.C.3 Public Involvement & Participation

The City continues to provide ongoing opportunities for public involvement and participation through advisory councils, public hearings, watershed committees and other similar activities. The City complies with applicable state and local public notice requirements when developing elements of the SWMP and SMAP.

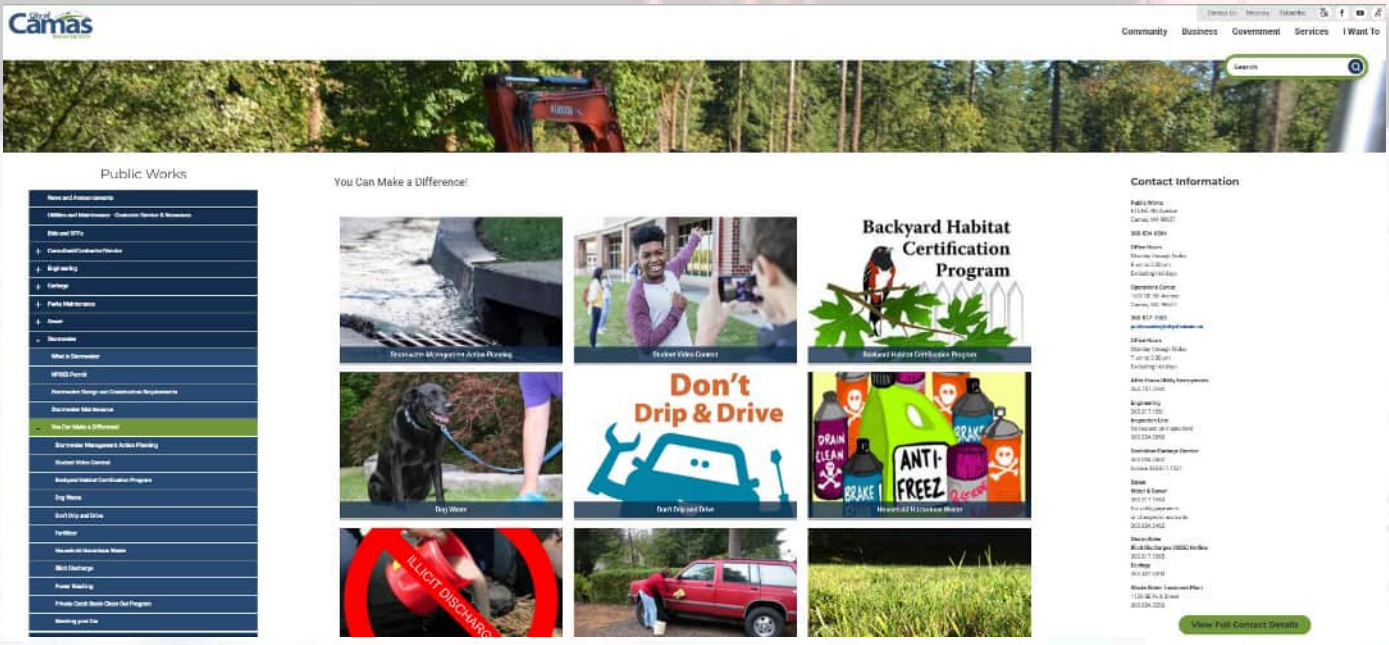
I. Annually, document specific public involvement and participation opportunities provided to overburdened communities and specifically highly impacted communities.

II. No later than December 31, 2026, document methods used to identify overburdened communities.

PERMIT REQUIREMENTS (S5.C.3):

a. Create opportunities for the public, including overburdened communities, to participate in the decision-making processes involving the development, implementing and update of the SMAP and SWAP. Specific outreach measures shall be documented for overburdened communities.

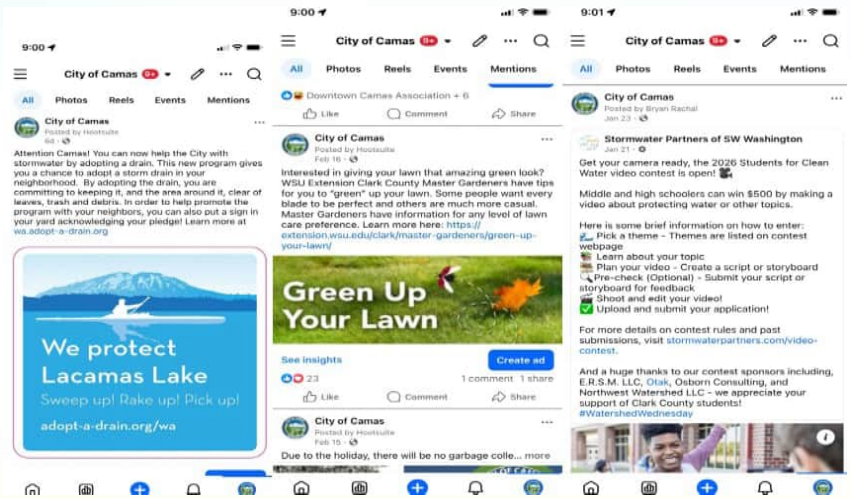
b. The City shall post the SWMP Plan and the annual report on the website, no later than May 31st of each year. All other submittals shall be available to the public upon request.



CURRENT ACTIVITIES (S5.C.3)

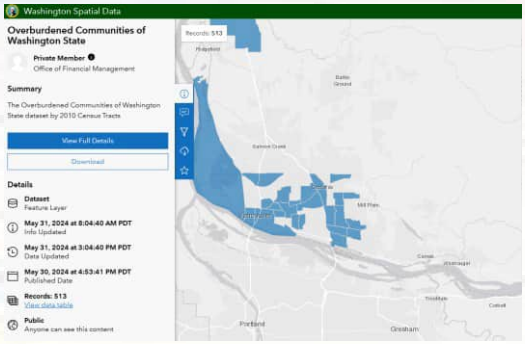
The City utilizes various communication mediums to convey involvement and participation events to the public, such as: social media, City website, newspaper articles and other web-based channels. The City posts the latest annual report and Stormwater Management Program (SWMP) on the website by March 31st each year. When the updated SWMP is posted on the City's website, a newsfeed is generated to notify the public and request for comments on the SWMP.

The City generates monthly to quarterly stormwater related topics and posts on City's social media to promote education and awareness. A link to the SWMP and SMAP are included in the post to help generate awareness and opportunity for the public to provide comments.
The City released 15 stormwater related posts on Facebook, Instagram and NextDoor in 2025.



PLANNED ACTIVITIES (S5.C.3):

The City will continue to implement the Current Activities and explore other means of public involvement opportunities. The public was a key stakeholder that we asked for input during the first SMAP process. Environmental justice data was incorporated in the development of the SMAP.



The City will continue to incorporate feedback from stakeholders in SMAP developments and decision making processes.

The City will document specific public involvement and participation opportunities provided to overburdened communities and specifically highly impacted communities.

The City will document methods used to identify overburdened communities no later than December 31, 2026.

S5.C.4 MS4 Mapping and Documentation

The City has an ongoing program for mapping and documentation of the MS4.

PERMIT REQUIREMENTS (S5.C.4):

a. Ongoing Mapping of MS4:
   - Known MS4 outfalls and known MS4 discharge points, including outfall size and material where known.
   - Receiving waters, other than groundwater.
   - Public stormwater treatment and flow control BMPs/facilities.
   - Geographic areas that do not discharge stormwater to the surface waters.
   - Tributary conveyance to all known outfalls and discharge points with a 24 inch diameter or larger, or an equivalent cross-sectional

area for non-pipe system (tributary conveyance type, material, size, associated drainage areas, land use).

- Connections between the MS4 owned or operated by the other municipalities or public entities.
- All connections to the MS4 authorized or allowed by the City after February 16, 2007.
- New Mapping requirements:
- No later than March 31, 2026, submit locations of all known MS4 outfalls according to the standard templates and format provided in the Annual Report. Report size and material of outfalls, where known.
- No later than December 31, 2026, using available, existing data, map tree canopy to support stormwater management on Permittee-owned or operated properties. Permittees shall develop and follow a methodology to intentionally identify canopy for stormwater management proposes, which may be updated annually or as needed.
- No later than March 31, 2028, implement a methodology to map and assess acreage of MS4 tributary basins to outfalls with a 24-inch nominal diameter or larger, or an equivalent cross-sectional area for non-pipe systems that have stormwater treatment and flow control BMPs/facilities owned or operated by the permittee.
- Submit with the March 31, 2028, Annual Report a map(s) (.pdf) and table (.xlsx) with a breakdown of the MS4 tributary basins quantifying estimated acres managed or unmanaged by stormwater treatment and flow control BMPs/facilities owned or operated by the Permittee.
- No later than December 31, 2028, using available, existing data map overburdened communities in relation to stormwater treatment and flow control BMPs/facilities, outfalls, discharge points, and tree canopy on Permittee-owned or operated properties.

b. The required format for mapping is electronic (e.g. Geographic Information System (GIS), CAD drawings, or other software that can map and store points, lines, polygons, and associated attributes), with fully described mapping standards.
c. Upon request, make maps available to Ecology.
d. Upon request, and to the extent appropriate, provide mapping information to federally recognized Indian Tribes, municipalities, and other Permittees. The Permit does not preclude the City from recovering reasonable costs associated with fulfilling mapping information requests by federally recognized Indian Tribes, municipalities and other Permittees.



CURRENT ACTIVITIES (S5.C.4):

The City maintains the MS4 mapping by incorporating record drawing information from new developments and correcting existing features as needed. All known MS4 outfalls (size and material) have been added to the MS4 mapping, update as needed. All known connections from the MS4 to privately owned stormwater system have been mapped. Staff are using GPS to add and adjust assets to correct locations. Desktop data entry using as-builts is being conducted to clean up the City's GIS layer. The City MS4 mapping is performed in ArcGIS.

The City will submit locations of all known MS4 outfalls according to the standard templates and format provided by Ecology.

The City is working with various mapping programs to map tree canopy to support stormwater management on Permittee-owned or operated properties.

PLANNED ACTIVITIES (S5.C.4):

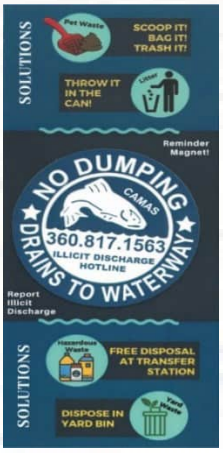
The City will continue to update and maintain MS4 mapping within ArcGIS and associated applications.

The City will implement GIS capabilities on the television pipe line inspection vehicle for detailed pipe information and asset locations.

S5.C.5 Illicit Discharge and Elimination (IDDE)

Discharges from cities often include waste and wastewater from sources other than stormwater. Illicit discharges are those that enter the public storm system in two ways, (1) by direct connection of wastewater piping to storm lines; or (2) through indirect connections, such as infiltration from cracked wastewater piping, dumping of illicit material into storm drains, or accidental spills that result in wastewater flowing into storm drains.





PERMIT REQUIREMENTS (S5.C.5):

a. The program shall include procedures for reporting and correcting or removing illicit connections, spills and other illicit discharges when they are suspected or identified. The program shall also include procedures for addressing pollutants entering the MS4 from an interconnected, adjoining MS4.
   - Illicit connections and illicit discharges must be identified through, but not limited to: field screening, inspections, complaints/report, construction inspections, maintenance inspections, source control inspections, and/or monitoring information, as appropriate.

b. Inform public employees, businesses, and the public of hazards associated with illicit discharges and improper disposal of waste.

c. Implement an ordinance or other regulatory mechanism to effectively prohibit non-stormwater, illicit discharges into the MS4 to the maximum extent allowable under state and federal law.
   - The ordinance or other regulator mechanism in effect as of the effective date of this Permit shall be revised if necessary to meet the requirements of this Section no later than July 1, 2027.
   - External washdown of buildings with potential PCB containing materials shall not discharge washdown water to the MS4.

d. Implement an ongoing program designed to detect and identify non-stormwater discharges and illicit discharges and illicit connections into the MS4.
   - Implement a field screening methodology appropriate to the characteristics of the

MS4 and water quality concerns. Complete field screening for an average of 12% of the MS4 each year.

- Provide a publicly listed and publicized hotline or other telephone number for public reporting of spills and other illicit discharges.
- Ongoing training program for all municipal field staff on identification of an illicit discharge and/or connection, and on proper procedures for reporting and responding to the illicit discharge and/or connection. Provide follow-up training as needed to address changes in procedures, techniques, requirements, or staffing. Document and maintain records of the trainings provided and the staff trained.

e. Implement an ongoing program designed to address illicit discharges, including spills and illicit connections, into the MS4.

- Procedures for characterizing the nature of, and potential public or environmental threat posed by, any illicit discharges found by or reported to the City. Procedures shall address the evaluation of whether the discharge must be immediately contained and steps to be taken for containment of the discharge.



- Procedures for post-emergency clean-up following firefighting activities:
  - No later than December 31, 2026, the City shall coordinate with firefighting agencies/departments that serve the areas that discharge to the MS4 to be notified when PFAS-containing AFFFs are used during emergency firefighting activities.
  - No later than January 1, 2027, the City shall update and implement procedures to minimize discharges to the MS4 during post-emergency clean-up and disposal activities including, but not limited to, the immediate clean-up in all situations where PFAS-containing AFFFs have been used, diversions, and other measures that prevent discharges to the MS4. The City is not expected to deploy measures during an emergency.
- Procedures for tracing the source of an illicit discharge.
- Procedures for eliminating the discharge, including notification of appropriate authorities and property owners.

f. Ensure municipal staff who are responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills, and illicit connections are trained to conduct these activities. Provide follow-up training as needed to address changes in procedures, techniques, requirements, or staffing. Document and maintain records of the training provided and the staff trained.

g. Recordkeeping: Track and maintain records of the activities conducted. In the Annual Report, submit data for the illicit discharges, spills and illicit connections including those that were found by, reported to, or investigated by the City during the previous calendar year.



CURRENT ACTIVITIES (S5.C.5):

The City's Illicit Detection and Discharge Elimination Ordinance (CMC 14.04) incorporates the various aspects of the Permit requirements.

The ongoing IDDE program includes procedures for addressing illicit discharges, source tracing, and eliminating the discharge.

The IDDE program continues to educate the public on the harmfulness of improper disposal of waste. An educational IDDE flyer with the hotline number is available to the public at City Hall, the Operations Center, and at tabling events at the Camas Farmers Market. The same information is available on the City's website where the public can access all year round.

The City maintains a hotline and mobile application (CamasConnect 24/7) that allows citizens to report illicit discharges/connections. Calls/complaints are routed to the appropriate staff. All reports are investigated immediately upon submission.

Outfall inspections are the chosen method for field screening assessment. The City tracks the total percentage of outfalls screened annually since the issuance of the 2019-2024 Permit.

The City inspected 21 outfalls for the IDDE screening and documented the inspections in Survey 123. Staff also completed GPS mapping of all known public outfalls and screened for illicit discharges when mapping.

Field staff are trained when first hired and then annually. Records of staff training is documented.

All inspections, investigations, illicit discharges and spill-related activities are tracked in excel spreadsheets and Customer Relationship Management (CRM) Software.

The City completed IDDE reporting data in accordance with the format provided in Appendix 12. The IDDE reporting data will be submitted with the Annual Report.

PLANNED ACTIVITIES (S5.C.5):

The City will continue to implement the Current Activities.

The City no longer uses PFAS-containing AFFFs during firefighting activities.

The City will update procedures to minimize discharges to the MS4 during post-emergency clean up and disposal activities by January 1, 2027.



S5.C.6 Controlling Runoff from Development & Construction

The City will implement, and enforce a program to reduce pollutants in stormwater runoff from new development, redevelopment, and construction site activities. The program shall apply to private and public development, including transportation projects.

PERMIT REQUIREMENTS (S5.C.6):

a. Implement an ordinance or other enforceable mechanism that addresses runoff from new development, redevelopment, and construction site projects.
   - Adopt and make effective a local program, no later than June 30, 2027, that meets the requirements of Section S5.C.6.b(i) through (iii), below, and shall apply to applications submitted:
     i. On or after July 1, 2027
     ii. Prior to January 1, 2017, that have not started construction by January 1, 2022
     iii. Prior to July 1, 2022, that have not started construction by July 1, 2027
     iv. Prior to July 1, 2027, that have not started construction by July 1, 2032

b. The ordinance shall include, at a minimum:
   - The Minimum Requirements, thresholds, and definitions in Appendix 1, or the 2019 Appendix 1 amended to include the changes identified in Appendix 10, or Phase I program approved by Ecology and amended to include Appendix 10, for new development, redevelopment, and construction sites. Adjustment and exceptions criteria equivalent to those in Appendix 1 shall be included. Such local requirements and thresholds shall provide equal protection of receiving waters and equal levels of pollutant control to those provided in Appendix 1.
   - The local requirements shall include the following requirements, limitations, and criteria that, when used to implement the minimum requirements in Appendix 1 will protect water quality, reduce the discharge of pollutants to the MEP, and satisfy the State requirements under chapter 90.48 RCW to apply AKART prior to discharge:
     i. Site planning requirements
     ii. BMP selection criteria
     iii. BMP design criteria
     iv. BMP infeasibility criteria
     v. LID competing needs criteria
     vi. BMP limitations
   - The legal authority, through the approval process for new development and redevelopment, to inspect and enforce maintenance standards for private stormwater facilities that discharge to the MS4.

c. The program shall include a permitting process with plan review, inspection and enforcement capability to meet the standards listed below, for both private and public projects, using qualified personnel. At a minimum, the program shall be applied to all sites that that meet the minimum thresholds adopted pursuant to S5.C.6.b.i.
   - Review all stormwater site plans for proposed development activities.
   - Inspect, prior to clearing and construction, all permitted development sites that have a high potential for sediment transport.
   - Inspect all permitted development sites during construction to verify proper installation and maintenance of required

erosion and sediment controls. Enforce as necessary based on the inspection.

- Inspect all stormwater treatment and flow control BMPs/facilities, and catch basins, in new residential developments at least twice per 12-month period with no less than 4 months between inspections, until 90% of the lots are constructed (or when construction has stopped and the site is fully stabilized), to identify maintenance needs and enforce compliance with maintenance standards as needed.
- Inspect all permitted development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater facilities. Verify that a maintenance plan is completed and responsibility for maintenance is assigned for stormwater treatment and flow control BMPs/facilities. Enforce as necessary based on the inspection.
- Compliance by achieving at least 80% of scheduled inspections.
- Include a procedure for keeping records of inspections and enforcement actions by staff, including inspection reports, warning letters, notices of violations, and other enforcement records. Records of maintenance inspections and maintenance activities shall be maintained.
- An enforcement strategy shall be developed and implemented to respond to issues of non-compliance.

d. Make available the link to the electronic Construction Stormwater General Permit Notice of Intent (NOI) form and Industrial Stormwater General Permit NOI form. Continue to enforce local ordinances controlling runoff from sites that are also covered by stormwater permits issued by Ecology.

e. Ensure that municipal staff whose primary job duties are implementing the program to control stormwater runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. Follow-up training must be provided as needed to address changes in procedures and techniques or staffing. Document and maintain records of the training provided and the staff trained.

CURRENT ACTIVITIES (S5.C.6):

The City has an ongoing program for the permit process with plan review, inspections and enforcement capabilities. All inspections are documented.

The City's Stormwater Control Ordinance (CMC 14.02) was adopted on February 1, 2010 and revised November 21, 2016, and incorporates the various Permit requirements.

The City adopted (CMC 14.02.050) the latest Stormwater Management Manual for Western Washington (SWMMWW) to help control runoff from developments and construction sites. The requirements, limitations, and criteria of the 2024 SWMMWW will protect water quality, reduce the discharge of pollutants to the MEP, and satisfy State AKART.

All applicable field staff are trained in erosion control inspection and have a Certified Erosion and Sediment Control Lead (CESCL) certification.





The City continues to refine the tracking mechanism for inspections and enforcements, development inspection procedures and site plan review standards.

The City inspects all stormwater treatment and flow control BMPs/facilities, and catch basins, in new residential developments at least twice per 12-month period with no less than 4 months inspections, until 90% of the lots are constructed (or when construction has stopped and the site is fully stabilized), to identify maintenance needs and enforce compliance with maintenance standards as needed.

PLANNED ACTIVITIES (S5.C.6):

The City will continue to implement the Current Activities.

S5.C.7 Stormwater Management for Existing Development

The City will implement a Program to control or reduce stormwater discharges to waters of the State from areas of existing development. The Program shall aim to focus on strategic stormwater investments over longer planning timeframes.

PERMIT REQUIREMENTS (S5.C.7):

a. Implement stormwater facility retrofits, or tailored SWMP actions that meet the criteria described in Appendix 12, using one or a combination of the following:
   i. Strategic stormwater investments identified in Stormwater Management Action Plan(s) (SMAP) or similar stormwater planning process and/or
   ii. Opportunistic stormwater investments identified by leveraging projects outside of SMAP areas to improve stormwater management infrastructure
b. With each Annual Report, the City shall provide a list of planned individual projects scheduled for funding or implementation during this Permit term for the purpose of meeting the assigned equivalent acreage in Appendix 12. Equivalent acreage for the City of Camas is 4.4 acres.
c. No later than March 31, 2028, Permittees shall fully fund, start construction, or completely implement project(s) that meet the assigned equivalent acreage and submit documentation with the Annual Report, due March 31, 2028.
d. Permittees may collaborate to meet regional goals.
e. The City shall report the amount of estimated or projected equivalent acres managed by stormwater facility retrofits for the next Permit term (2029-2032) by March 31, 2028.



CURRENT ACTIVITIES (S5.C.7):

The City has been awarded two Water Quality Combined Financial Assistance Grants from the Department of Ecology. The grants fund the City of Camas Crown Park Regional Stormwater Retrofit Project and the City of Camas Downtown Regional Stormwater Retrofit Project. The grants are to help fund planning and design of the two projects. The projects will capture and treat over 200 acres of minimally treated stormwater.

Due to timing of grant applications and the current timeline for the planning and design phase of the identified SMAP projects, it is undetermined if the grant funded projects identified in the SMAP process will count towards this current permit terms equivalent acres.

The City is working on prioritizing rehabilitation and retrofit projects on public stormwater facilities.

The city is currently implementing street sweeping, conveyance line cleaning and focused source control inspections in the priority catchment area to contribute towards the City's 4.4 acres.

PLANNED ACTIVITIES (S5.C.7):

The City will look for opportunities to meet the assigned equivalent acreage requirements.

S5.C.8 Source Control Program for Existing Development

The City shall implement a program to prevent and reduce pollutants in runoff from areas of existing development that discharge to the MS4. The program shall include application of source control BMPs, inspections, and enforcement.

PERMIT REQUIREMENTS (S5.C.8):

a) Enforce ordinance(s), or other enforceable documents, requiring the application of source control BMPs for pollutant generating sources associated with existing land uses and activities.
   - The City shall update and make effective the ordinance(s), or other enforceable documents, as necessary to meet the requirements of S5.C.8 by August 1, 2027.

b) Implement a program to identify publicly and privately owned institutional, commercial, and industrial sites which have the potential to generate pollutants to the MS4. Permittees shall update the inventory at least once every 5 years. The inventory shall include:
   i. Businesses and/or sites identified based on the presence of activities that are pollutant generating and;
   ii. Other pollutant generating sources, based on complaint response, such as: home-based businesses and multifamily sites.

c) Implement an inspection program, performed by qualified personnel, for sites identified in the inventory.

i. All identified sites with a business address shall be provided information about activities that may generate pollutants and the source control requirements applicable to those activities. This information shall be provided by mail, telephone, electronic communications, or in person. This information may be provided all at one time or spread out over the permit term to allow for tailoring and distribution of the information during site inspections.

ii. Annually complete the number of inspections equal to 20% of the businesses and/or site listed in their source control inventory to assess BMP effectiveness and compliance with source control.

iii. Inspect 100% of sites identified through credible complaints.

d) Implement a progressive enforcement policy that requires sites to comply with stormwater requirements within a reasonable time period.

e) Ensure municipal staff who are responsible for implementing the source control program are trained to conduct these activities. The ongoing training program shall cover the legal authority for source control, source control BMPs and their proper application, inspection protocols, lessons learned, typical cases, and enforcement procedures. Provide follow-up training as needed to address changes in procedures, techniques, requirements, or staff. Document and maintain records of the training provided and the staff trained.

CURRENT ACTIVITIES (S5.C.8):

The City has created a Business Inventory List of publicly and privately owned institutional, commercial, and industrial sites in accordance with Appendix 8 of the Permit. The City has adopted a Water Resources Protection ordinance CMC14.04.

The City has entered an Interlocal Agreement with Clark County Public Health, Ecology, and Washougal to fund a full-time employee to assist with City source control inspections. Postcards explaining the Source Control Program and a link to the Source Control webpage on City's website were sent to all businesses on the Business Inventory List in 2023.

At least 20% of businesses are inspected annually, with an emphasis on businesses within the priority catchment area.

All credible complaints are inspected immediately by City staff.

PLANNED ACTIVITIES (S5.C.8):

The City has implemented a business inspection program. City staff will follow up on all public requests for source control issues as well as any follow up issues during initial source control inspections.

Source Control inventory was updated in February 2025. New outreach materials will be produced for businesses and/or sites for specific types of job functions.

Review City ordinances and other enforceable documents by August 1, 2027.

Staff will continue to participate in trainings.

S5.C.9 Operations & Maintenance

The City developed and implemented an Operations and Maintenance (O&M) program to regulate and conduct maintenance activities to prevent or reduce stormwater impacts.

PERMIT REQUIREMENTS (S5.C.9):

a) Implement maintenance standards that are as protective, or more protective, of facility function than those specified in the SWMMWW. Maintenance standards shall be developed for facilities that do not have maintenance standards. No later than June 30, 2027, maintenance standards shall be updated to meet Permit requirements.
   i. Unless there are circumstances beyond the City's control, when an inspection identifies an exceedance of the maintenance standards, maintenance shall be performed:
      - Within 1 year for typical maintenance of facilities, except catch basins.
      - Within 6 months for catch basins.
      - Within 2 years for maintenance that requires capital construction of less than $25,000.
   ii. For each exceedance of the required timeframe, the Permittee shall document the circumstances and how they were beyond their control.

b) Implement a stormwater facility maintenance program for facilities regulated by the City.
   i. The program should include provisions to verify adequate long-term O&M of stormwater treatment and flow control BMPs/facilities that are permitted and constructed pursuant to S5.C.6.c and shall be maintained in accordance with S5.C.9.a.
      - Implementation of an ordinance or other enforceable mechanism that clearly identifies the party responsible for maintenance, requires inspection of facilities, and establishes enforcement procedures.
      - Annual inspections of all private stormwater treatment and flow control BMPs/facilities that discharges to the MS4 and were permitted by the City, including those permitted in accordance with requirements adopted pursuant to the 2007-2019 Permits.
   ii. Compliance with the inspection requirements by achieving at least 80% of required inspections.
   iii. The program shall include a procedure for keeping records, warning letters, notices of violations, and other enforcement records. Records of maintenance inspections and maintenance activities shall be maintained.

c) Implement a stormwater facility maintenance program for facilities owned or operated by the City.
   i. Annual inspection of all municipally owned or operated stormwater treatment and flow control BMPs/facilities and taking appropriate maintenance actions.
   ii. Spot check potentially damaged stormwater treatment and flow control BMPs/facilities after major storm events. Conduct repairs or take appropriate maintenance action in accordance with maintenance standards.
   iii. Inspect all catch basins and inlets owned or operated by the City every two years. Clean catch basins if the inspection indicates cleaning is needed to comply with maintenance standards established in the SWMMWW.

iv. Compliance by achieving 95% of required inspections.

d) No later than December 31, 2027, implement practices, policies, and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the City, and road maintenance activities under the functional control of the City. Lands owned or maintained by the City include, but are not limited to: streets, parking lots, roads, highways, buildings, parks, open spaces, road rights-of-way, maintenance yards, and stormwater treatment and flow control BMPs/facilities.



Program shall address the following activities:

- Pipe cleaning
- Cleaning of culverts that convey stormwater in ditch systems
- Ditch maintenance
- Street cleaning
- Road repair and resurfacing, including pavement grinding
- Snow and ice control
- Utility installation
- Pavement striping maintenance
- Maintaining roadside areas, including vegetation management
- Dust control
- Application of fertilizers, pesticides, and herbicides
- Sediment and erosion control
- Landscape maintenance and vegetation disposal
- Trash and pet waste management
- Building exterior cleaning and maintenance
    - For City owned buildings built or renovated between 1950-1980, update policies, practices, or procedures to include Source Control BMPs to minimize PCBs from entering the MS4. The City shall not discharge washdown water to the MS4 if the building is confirmed or suspected to have PCB-containing materials.
- Preparing City owned buildings for renovation or demolition
    - Update policies, practices, or procedures to include Source Control BMPs for building materials to prevent PCBs from entering the MS4 in preparation for and during demolition and renovations.

e) No later than July 1, 2027, develop and implement a municipal street sweeping program to focus on priority areas and times during the year that would reasonably be expected to result in the maximum water quality benefits to receiving waters. The following program elements shall be included:

- Priority areas: curbed municipal streets that discharge to outfalls and meet either/both of high traffic streets, such as arterials or collectors and/or streets that serve commercial or industrial land use areas.
- Program timing: sweep priority areas at least once between July and September of each year and at least two additional times a year.

    - Compliance is sweeping at least 90% of priority areas each sweeping event.
- Operational Procedures: follow equipment design and performance specifications.
- Street waste disposal: dispose of sweeper waste in accordance with Appendix 6 – Street Waste Disposal.
- Reporting: no later than March 31, 2028 submit with the annual report:
    - Priority areas swept identified on a map
    - Sweeping dates
    - Sweeping frequency
    - Type of sweeper
    - Total curb miles of priority areas and curb miles swept
    - Approximation of debris removed

f) Implement a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards and material storage facilities. SWPPPs shall include the following information at a minimum:
- A detailed description of the operational and structural BMPs in use at the facility and a schedule for implementation of additional BMPs when needed.
- At a minimum, annual inspections of the facility, including visual observations of discharges, to evaluate the effectiveness of the BMPs, identify maintenance needs, and determine of additional or different BMPs are needed.
- Inventory of materials and equipment stored on-site.
- A site map showing facility stormwater drainage, discharge points, and areas of potential pollutant exposure.
- A plan for preventing and responding to spills at the facility which would results in an illicit discharge.

g) Implement an on-going training program for staff whose primary construction, operations, or maintenance job functions may impact stormwater quality. The training program should address the importance of protecting water quality, operation and maintenance standards, inspection procedures, relevant SWPPPs, selecting appropriate BMPs, street sweeper operation, ways to perform their job activities to prevent or minimize impacts to water quality and procedures for reporting water quality concerns. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staffing. Document and maintain records of training provided and staff trained.

h) Maintain records of activities conducted by the City to meet the requirements of this section.

CURRENT ACTIVITIES (S5.C.7):

The Operations storm maintenance crew has an ongoing program to inspect and clean catch basins, and to inspect and maintain public stormwater facilities. Street sweeping is done on a regular basis. There is a list of 'Hot Spots' that are checked after all major storm events.

The City has an ongoing program to inspect private stormwater facilities and coordinate with private owners for maintenance.

The City has an ongoing training program for employees, who encounter stormwater on a regular basis, to learn the importance of protecting water quality.

A SWPPP was developed for the City Operations Center to comply with permit requirements. This is a dynamic document; contents are updated as needed. The SWPPP was updated in December 2022.

The City updated the maintenance standards in June 2022.

The City has partnered with other local jurisdictions to support a Catch Basin Cleaning Assistance Program which allows private owners to pay only $50 per catch basin cleaning. The program is presented to HOA's and businesses during stormwater facility inspections, Camas Farmers Market and Source Control Inspections.



PLANNED ACTIVITIES (S5.C.7):

The City will continue to implement current activities.

The City will continue to inspect and maintain every public catch basin annually.

The City will continue to review the inventory of legacy stormwater facilities for rehabilitation and retrofit opportunities.

The City will continue to implement ESRI applications for more efficient and streamlined field operations and inspections.

The City will update policies, practices and procedures to include source control BMPs for building materials to prevent PCBs from entering the MS4.

Complete a new SWPPP for the Buma property, home of the stormwater maintenance crew.

The city will adjust and improve the street sweeping program to meet the requirements of S5.C.9 no late than July 1, 2027.

The City will review and update, if necessary, any maintenance standards identified in the SWMMWW no later than June 30, 2027.

S8 Monitoring & Assessment

During the 2019-2024 Permit term, the City chose S8.A.2 Regional Status and Trends Monitoring Option in which the City made a one-time payment into the Stormwater Action Monitoring (SAM) collective fund to implement regional small streams and marine nearshore areas status and trends monitoring in urban streams in the Lower Columbia River basin.

The City chose to continue this commitment during the current Permit term. The annual payments into the collective fund are due on or before August 15 each year beginning in 2025.

During the 2019-2024 Permit term, the City chose S8.B Effectiveness Studies Option in which the City made a one-time payment into the collective fund for Stormwater Action Monitoring (SAM) to

implement effectiveness studies and source identification studies.

The City chose to continue this commitment during the current Permit term. The annual payments into the collective fund are due on or before August 15 each year beginning in 2025.

The City's 2025 contribution for Regional Status and Trends Monitoring was $8,993 and for Stormwater Management Program (SWMP) Effectiveness and Source Identification Studies was $10,083.

S9 Reporting Requirements

a) An annual report is required to be submitted no later than March 31st of each year of the Permit, beginning in 2025. The report covers the reporting period from January 1st through December 31st unless otherwise specified. Annual Reports shall be submitted electronically using Ecology's Water Quality Permitting Portal (WQWebPortal) available on Ecology's website.

b) The City is required to keep all records related to the Permit and the SWMP for at least five (5) years.

c) All records related to this permit and the City's SWMP shall be available to the public at reasonable times during business hours. A copy of the most recent annual report will be provided to any individual or entity, upon request.
   - A reasonable charge may be assessed for making photocopies of records.
   - City may require reasonable advance notice of intent to review records related to this permit.

d) The annual report shall include the following:
   - The current Stormwater Management Plan (SWMP);
   - Submittal of the annual report form as provided by Ecology pursuant to S9.A, describing the status of implementation of the requirements of this permit during the reporting period.
   - Attachments to the annual report form including summaries, descriptions, reports, and other information as required, or as applicable, to the requirements of this permit during the reporting period.
   - If applicable, notice that MS4 is relying on another entity to satisfy any of the obligations under this permit.
   - Certification and signature pursuant to G19.D, and notification of any changes to authorization pursuant to G19.C.
   - A notification of any annexations, incorporations or jurisdictional boundary changes resulting in an increase or decrease in the Permittee's geographic area of permit coverage during the reporting period.

e) No later than March 31st of each year, the new annual report and the updated SWMP will be available to the public on the City's webpage at https://www.cityofcamas.us/publicworks/page/npdes-permit

Appendix Q: 2025-2026 Capital Improvement Project List

Capital Improvement Plan

General Government

Major Building Maintenance

Total Project Costs:	Ongoing
Funded:	General Fund/REET1/Debt
Area:	City-Wide

Project Description:
To replace or repair building central systems, structural problems and/or mechanical problems

		Buildings			Total
	Prior Years	$ 372,825			$ 372,825
	2021	$ 88,658			$ 88,658
	2022	$ 233,195			$ 233,195
	2023	$ 91,991			$ 91,991
	2024	$ 2,381,087			$ 2,381,087
Budget	FY 2025-2026	$ 4,759,092			$ 4,759,092
Capital Plan	FY 2027-2028	$ 1,000,000			$ 1,000,000
	FY 2029-2030	$ 1,000,000			$ 1,000,000
	Total	$ 9,926,849	$ -	$ -	$ 9,926,849

Technology Projects

Total Project Costs:	Ongoing
Funded:	All Funds/ARPA
Area:	City-Wide

Project Description:
To replace a twenty-year-old financial system with new generation software, phone systems, cybersecurity and network improvements

		Technology			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ 1,149,964			$ 1,149,964
	2023	$ 504,658			$ 504,658
	2024	$ 282,247			$ 282,247
Budget	FY 2025-2026	$ 990,000			$ 990,000
Capital Plan	FY 2027-2028	$ 1,564,424			$ 1,564,424
	FY 2029-2030	$ 808,268			$ 808,268
	Total	$ 5,299,561	$ -	$ -	$ 5,299,561

General Government (continued)

Library Improvements

Total Project Costs:	$ 3,019,765
Funded:	GF/REET 1/Debt/Grants
Area:	Downtown

Project Description:
Improvements, repairs and upgrades to the Library

		Repairs/Maint.			Total
	Prior Years	$ 126,457			$ 126,457
	2021	$ 153,423			$ 153,423
	2022	$ 67,970			$ 67,970
	2023	$ 271,174			$ 271,174
	2024	$ 1,009,263			$ 1,009,263
Budget	FY 2025-2026	$ 1,391,478			$ 1,391,478
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 3,019,765	$ -	$ -	$ 3,019,765

Streets

ADA Accessibility

Total Project Costs:	Ongoing
Funded:	Real Estate Excise Tax 1
Area:	City-Wide

Project Description:
This project is for upgrading sidewalks to ADA standards for the elderly and disabled.

		Improvements			Total
	Prior Years	$ 70,944			$ 70,944
	2021	$ 181,637			$ 181,637
	2022	$ 234,907			$ 234,907
	2023	$ -			$ -
	2024	$ -			$ -
Budget	FY 2025-2026	$ 150,000			$ 150,000
Capital Plan	FY 2027-2028	$ 150,000			$ 150,000
	FY 2029-2030	$ 150,000			$ 150,000
	Total	$ 937,487	$ -	$ -	$ 937,487

Streets (continued)

Street Preservation

Total Project Costs:	Ongoing
Funded:	Property Tax/ Sales Tax/ Tab Fees
Area:	City-Wide

Project Description:
This is a sustainable street maintenance program to be funded annually with the use of property taxes and Transportation Benefit District Funds from Sales Tax and Vehicle License Fees (Tab Fees)

		Preservation			Total
	Prior Years	$ 4,771,772			$ 4,771,772
	2021	$ 370,565			$ 370,565
	2022	$ 1,684,402			$ 1,684,402
	2023	$ 989,255			$ 989,255
	2024	$ 137,032			$ 137,032
Budget	FY 2025-2026	$ 4,324,307			$ 4,324,307
Capital Plan	FY 2027-2028	$ 4,454,036			$ 4,454,036
	FY 2029-2030	$ 4,587,657			$ 4,587,657
	Total	$ 21,319,027	$ -	$ -	$ 21,319,027

Lake & Sierra Improvements

Total Project Costs:	$ 653,788
Funded:	Transportation Impact Fees
Area:	Northwest

Project Description:
This project will add traffic control changes to the Lake and Everett Intersection. This improvement is due to increase traffic from residential growth in the area.

		Construction			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ 84,543			$ 84,543
	2024	$ 131,495			$ 131,495
Budget	FY 2025-2026	$ 437,750			$ 437,750
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 653,788	$ -	$ -	$ 653,788

Streets (continued)

SR-500/Everett Improvements

Total Project Costs:	$ 1,711,635
Funded:	TIF, Federal and State Grants
Area:	Northeast

Project Description:
This project will be completed in a series of phases over several years. The project is to improve the safety of the corridor with complete street improvements.

		ROW/Design	Total
	Prior Years	$ -	$ -
	2021	$ -	$ -
	2022	$ -	$ -
	2023	$ -	$ -
	2024	$ 11,635	$ 11,635
Budget	FY 2025-2026	$ 1,700,000	$ 1,700,000
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ -	$ -
	Total	$ 1,711,635 $ - $ -	$ 1,711,635

38th Ave Ph. 3 Improvements

Total Project Costs:	$ 19,989,820
Funded:	Federal & State Funding/ Debt
Area:	Northwest

Project Description:
This project is design, permit, acquire right-of-way, and construct a street from 192nd to Parker and improvements from Parker to Grass Valley

		ROW/Services	Total
	Prior Years	$ 8,453,296	$ 8,453,296
	2021	$ 416,801	$ 416,801
	2022	$ 165,543	$ 165,543
	2023	$ 185,208	$ 185,208
	2024	$ 2,993,772	$ 2,993,772
Budget	FY 2025-2026	$ 7,775,200	$ 7,775,200
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ -	$ -
	Total	$ 19,989,820 $ - $ -	$ 19,989,820

Streets (continued)

CDBG Projects

Total Project Costs:	$ 415,000
Funded:	CDBG/Gen Fund/Water Rates
Area:	Central

Project Description:

Community Development Block Grant projects are in federal qualified neighborhoods to Improve streets, sidewalks, curbing and utility infrastructure. The City has limited qualified neighborhoods.

		Construction			Total
	Prior Years	$ 1,024,280			$ 1,024,280
	2021	$ 241,357			$ 241,357
	2022	$ 397,614			$ 397,614
	2023	$ 246,676			$ 246,676
	2024	$ 6,538			$ 6,538
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 1,916,464	$ -	$ -	$ 1,916,464

Camas-Washougal Fire and EMS

Fire/EMS Equipment

Total Project Costs:	Ongoing
Funded:	Fire Inter-local Agreement
Area:	City-Wide & City of Washougal

Project Description:

The City funds replacement and new equipment for the CWFD such as replacements for the breathing apparatus and refilling station, vehicle extraction tools, and gurney lift systems.

		Equipment			Total
	Prior Years	$ 368,275			$ 368,275
	2021	$ 181,637			$ 181,637
	2022	$ 234,907			$ 234,907
	2023	$ -			$ -
	2024	$ 153,939			$ 153,939
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ 200,000			$ 200,000
	FY 2029-2030	$ 200,000			$ 200,000
	Total	$ 1,338,758	$ -	$ -	$ 1,338,758

Camas-Washougal Fire and EMS (continued)

Vehicles

Total Project Costs:	Ongoing
Funded:	Fire Inter-local Agreement
Area:	City-Wide & City of Washougal

Project Description:
The City replaces ambulances every three years and brush trucks as needed

		Vehicles			Total
	Prior Years	$ 750,789			$ 750,789
	2021	$ 214,309			$ 214,309
	2022	$ 85,277			$ 85,277
	2023	$ 294,231			$ 294,231
	2024	$ 63,193			$ 63,193
Budget	FY 2025-2026	$ 410,510			$ 410,510
Capital Plan	FY 2027-2028	$ 268,428			$ 268,428
	FY 2029-2030	$ 154,500			$ 154,500
	Total	$ 2,241,237	$ -	$ -	$ 2,241,237

Fire Engines

Total Project Costs:	Ongoing
Funded:	Debt
Area:	City-Wide & City of Washougal

Project Description:
The City replaces fire engines as needed but is scheduling a new replacement plan.

		Engines			Total
	Prior Years	$ 503,000			$ 503,000
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ 830,546			$ 830,546
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 1,333,546	$ -	$ -	$ 1,333,546

Camas-Washougal Fire and EMS (continued)

Fire Stations

Total Project Costs:	$ 38,300,000
Funded:	Voted (ULTGO Bond) Debt
Area:	Downtown/North

Project Description:
Fire Facilities Plan identified the need to replace the Headquarter Station and the Washougal Fire Station. In addition, a satellite station will be needed in the North Shore area.

		Construction	Total
	Prior Years	$ -	$ -
	2021	$ -	$ -
	2022	$ -	$ -
	2023	$ -	$ -
	2024	$ -	$ -
Budget	FY 2025-2026	$ 23,300,000	$ 23,300,000
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ 15,000,000	$ 15,000,000
	Total	$ 38,300,000 $ - $ -	$ 38,300,000

Parks and Recreation

Open Space, Trails, and Park Upgrades

Total Project Costs:	Ongoing
Funded:	Real Estate Excise Tax 2
Area:	City-Wide

Project Description:
This project is a placeholder for projects in the Parks Master Plan.

		Open Space	Trails	Parks	Total
	Prior Years	$ 481,082	$ 317,462	$ 103,810	$ 902,354
	2021	$ 69,469	$ -	$ -	$ 69,469
	2022	$ -	$ -	$ -	$ -
	2023	$ -	$ -	$ -	$ -
	2024	$ -	$ -	$ -	$ -
Budget	FY 2025-2026	$ 200,000	$ 150,000	$ 150,000	$ 500,000
Capital Plan	FY 2027-2028	$ 100,000	$ 275,000	$ 375,000	$ 750,000
	FY 2029-2030	$ 100,000	$ 275,000	$ 375,000	$ 750,000
	Total	$ 950,551	$ 1,017,462	$ 1,003,810	$ 2,971,823

Parks and Recreation (continued)

Crown Park Improvements

Total Project Costs:	$ 6,941,033
Funded:	REET 2 / Debt / Grants
Area:	Central

Project Description:
The City is planning to build restrooms and a sport court at Crown Park.

		Upgrades			Total
	Prior Years	$ 415,775			$ 415,775
	2021	$ -			$ -
	2022	$ 95,032			$ 95,032
	2023	$ 288,674			$ 288,674
	2024	$ 1,619,552			$ 1,619,552
Budget	FY 2025-2026	$ 4,522,000			$ 4,522,000
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 6,941,033	$ -	$ -	$ 6,941,033

Downtown Trail

Total Project Costs:	$ 1,000,000
Funded:	Real Estate Excise Tax 2
Area:	Central

Project Description:
This budget is anticipating a possible land donation for a downtown trail. The budget will fund improvements to upgrade the trail to City standards.

		Improvements			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ -			$ -
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ 1,000,000			$ 1,000,000
	FY 2029-2030	$ -			$ -
	Total	$ 1,000,000	$ -	$ -	$ 1,000,000

Parks and Recreation (continued)

NE 3rd Ave Trail
S. Lacamas Creek Trailhead

Total Project Costs:	$ 970,078
Funded:	REET 2/ Park Impact/ RCO Grant
Area:	Southeast

Project Description:
This project is to build a restroom and improve the parking lot at the Lacamas Creek Trailhead on 3rd Ave.

		Design/Permit/Constr.			Total
	Prior Years	$ 29,614			$ 29,614
	2021	$ 50,314			$ 50,314
	2022	$ 28,535			$ 28,535
	2023	$ 523,934			$ 523,934
	2024	$ 337,681			$ 337,681
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 970,078	$ -	$ -	$ 970,078

T3 / Eastlake Trail

Total Project Costs:	$ 513,860
Funded:	Park Impact Fees
Area:	Northeast

Project Description:
This project is the next phase to complete a trail around Lacamas Lake

		Design/Permit/Constr.			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ 8,368			$ 8,368
	2023	$ 5,492			$ 5,492
	2024	$ 500,000			$ 500,000
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 513,860	$ -	$ -	$ 513,860

Parks and Recreation (continued)

Bike Park

Total Project Costs:	$ 325,000
Funded:	Real Estate Excise Tax 2
Area:	Northeast

Project Description:
This project is to build a bike park for trail bikes

		Design/Permit/Constr.			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ -			$ -
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ 325,000			$ 325,000
	FY 2029-2030	$ -			$ -
	Total	$ 325,000	$ -	$ -	$ 325,000

Forest Home Park

Total Project Costs:	$ 350,000
Funded:	Real Estate Excise Tax 2
Area:	Southwest

Project Description:
This project is for upgrading improvements to the baseball fields

		Design/Permit/Constr.			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ -			$ -
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ 350,000			$ 350,000
	FY 2029-2030	$ -			$ -
	Total	$ 350,000	$ -	$ -	$ 350,000

Parks and Recreation (continued)

Park Maint. Equipment

Total Project Costs:	Ongoing
Funded:	General Fund
Area:	City-Wide

Project Description:
This ongoing to fund new or upsized replacement equipment for the growing park system.

		Equipment			Total
	Prior Years	$ 324,436			$ 324,436
	2021	$ -			$ -
	2022	$ 28,601			$ 28,601
	2023	$ 83,217			$ 83,217
	2024	$ -			$ -
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ 120,000			$ 120,000
	FY 2029-2030	$ -			$ -
	Total	$ 556,254	$ -	$ -	$ 556,254

Fallen Leaf Lake

Total Project Costs:	$ 1,614,711
Funded:	Real Estate Excise Tax 2
Area:	Northeast

Project Description:
This project is to improve accessibility to the park, including ADA access.

		Improvements			Total
	Prior Years	$ 39,711			$ 39,711
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ -			$ -
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ 1,575,000			$ 1,575,000
	Total	$ 1,614,711	$ -	$ -	$ 1,614,711

Stormwater

Stormwater Treatment

Total Project Costs:	$ 1,781,613
Funded:	Stormwater Rates
Area:	City-Wide

Project Description:
These projects are for designing and constructing storm treatment facilities

		Design/Permit/Constr.			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ 54,116			$ 54,116
Budget	FY 2025-2026	$ 1,727,497			$ 1,727,497
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 1,781,613	$ -	$ -	$ 1,781,613

Vehicles

Total Project Costs:	$ 939,632
Funded:	Stormwater Rates
Area:	City-Wide

Project Description:
This funds vehicles for a growing program

		Vehicles			Total
	Prior Years	$ 168,199			$ 168,199
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ 585,469			$ 585,469
Budget	FY 2025-2026	$ 85,964			$ 85,964
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ 100,000			$ 100,000
	Total	$ 939,632	$ -	$ -	$ 939,632

Stormwater (continued)

Lake Dam Improvements

Total Project Costs:	$ 677,946
Funded:	Stormwater Rates
Area:	Northwest

Project Description:
Mechanical upgrade improvements to the Lacamas Lake Dams, removal of unnecessary equipment and hydraulic analysis.

		Improvements			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ 85,780			$ 85,780
	2023	$ 35,350			$ 35,350
	2024	$ 6,816			$ 6,816
Budget	FY 2025-2026	$ 550,000			$ 550,000
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 677,946	$ -	$ -	$ 677,946

Lake Water Quality

Total Project Costs:	$ 2,345,607
Funded:	Stormwater Rates
Area:	Northwest

Project Description:
Provide funding for staff to work with Clark County, State and Federal agencies, and develop a short-term and long-term strategy to improve and manage water quality of Lacamas, Fallen Leaf, and Round Lakes.

		Professional Services			Total
	Prior Years	$ -			$ -
	2021	$ 130,653			$ 130,653
	2022	$ 301,558			$ 301,558
	2023	$ -			$ -
	2024	$ 43,992			$ 43,992
Budget	FY 2025-2026	$ 869,404			$ 869,404
Capital Plan	FY 2027-2028	$ 500,000			$ 500,000
	FY 2029-2030	$ 500,000			$ 500,000
	Total	$ 2,345,607	$ -	$ -	$ 2,345,607

Water

Boulder Parallel Intake Lines

Total Project Costs:	$ 308,810
Funded:	System Development Charges
Area:	North

Project Description:
This project will design a secondary intake along Boulder Creek for the Sand Filter Plant. The existing intake line gets blocked due to upstream boulders. This line would allow for plant operation to continue during blockages.

		Construction			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ 3,973			$ 3,973
	2024	$ 59,837			$ 59,837
Budget	FY 2025-2026	$ 245,000			$ 245,000
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 308,810	$ -	$ -	$ 308,810

Crown Road Booster Station Upgrades

Total Project Costs:	$ 1,431,640
Funded:	System Development Charges
Area:	Southeast

Project Description:
This new booster station will serve the North Shore and better meet domestic and fire flow needs.

		Design/Permit/Constr.			Total
	Prior Years	$ -			$ -
	2021	$ 87,623			$ 87,623
	2022	$ -			$ -
	2023	$ 124,780			$ 124,780
	2024	$ 94,237			$ 94,237
Budget	FY 2025-2026	$ 1,125,000			$ 1,125,000
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 1,431,640	$ -	$ -	$ 1,431,640

Water (continued)

Well and Reservoir Security Upgrades

Total Project Costs:	Ongoing
Funded:	System Development Charges
Area:	City-Wide

Project Description:
This package provides for fencing, cameras and other security devices at sites to deter or eliminate access by the public into buildings and reservoirs.

		Upgrades	Total
	Prior Years	$ -	$ -
	2021	$ -	$ -
	2022	$ -	$ -
	2023	$ -	$ -
	2024	$ -	$ -
Budget	FY 2025-2026	$ 300,000	$ 300,000
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ -	$ -
	Total	$ 300,000 $ - $ -	$ 300,000

North Shore Water Transmission Main

Total Project Costs:	$ 4,003,435
Funded:	System Development Charges
Area:	North

Project Description:
This project completes the connection along 232nd Street which will create a loop around Lacamas Lake. The Sand Filter plant will provide water to NW portion of the City and minimize the need to utilize the south waterlines.

		Construction	Total
	Prior Years	$ -	$ -
	2021	$ -	$ -
	2022	$ -	$ -
	2023	$ 48,528	$ 48,528
	2024	$ 2,051,159	$ 2,051,159
Budget	FY 2025-2026	$ 1,903,748	$ 1,903,748
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ -	$ -
	Total	$ 4,003,435 $ - $ -	$ 4,003,435

Water (continued)

PFAS Evaluation and Mitigation

Total Project Costs:	$ 13,939,246
Funded:	Water Rates / Debt / Grant Funds
Area:	City-Wide

Project Description:
This project is to address the PFAS in the water at Well 13

		Construction			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ 939,246			$ 939,246
Budget	FY 2025-2026	$ 13,000,000			$ 13,000,000
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 13,939,246	$ -	$ -	$ 13,939,246

Vehicles

Total Project Costs:	$ 217,184
Funded:	Water Rates
Area:	City-Wide

Project Description:
Vehicles will be purchased when new staff is hired and when the replacement model is inadequate for the utility

		Vehicles			Total
	Prior Years	$ 181,013			$ 181,013
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ -			$ -
	2024	$ 36,171			$ 36,171
Budget	FY 2025-2026	$ -			$ -
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 217,184	$ -	$ -	$ 217,184

Water (continued)

Washougal River Wellfield

Total Project Costs:	$ 400,000
Funded:	Water Rates
Area:	Southeast

Project Description:
This project is to maximize the amount of water pulled from existing Washougal River wellfield. This package funds repair, replacement, upgrades and capacity related needs within the City's primary wellfield.

		Construction	Total
	Prior Years	$ -	$ -
	2021	$ -	$ -
	2022	$ -	$ -
	2023	$ -	$ -
	2024	$ -	$ -
Budget	FY 2025-2026	$ 400,000	$ 400,000
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ -	$ -
	Total	$ 400,000 $ - $ -	$ 400,000

New Operations Center

Total Project Costs:	$ 6,075,000
Funded:	Water Rates
Area:	Northeast

Project Description:
This project is to acquire land, design and construct a new centrally located Operations Center

		Acquisition	Total
	Prior Years	$ -	$ -
	2021	$ -	$ -
	2022	$ -	$ -
	2023	$ -	$ -
	2024	$ 75,000	$ 75,000
Budget	FY 2025-2026	$ 6,000,000	$ 6,000,000
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ -	$ -
	Total	$ 6,075,000 $ - $ -	$ 6,075,000

Water (continued)

SE 6th Ave Bridge Waterline

Total Project Costs:	$ 2,183,631
Funded:	Water Rates
Area:	Central

Project Description:
This package replaces an existing waterline on the SE 6th Ave. bridge due to the existing steel line's deterioration and leakage.

		Construction			Total
	Prior Years	$ -			$ -
	2021	$ -			$ -
	2022	$ -			$ -
	2023	$ 7,332			$ 7,332
	2024	$ 679,719			$ 679,719
Budget	FY 2025-2026	$ 1,496,580			$ 1,496,580
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 2,183,631	$ -	$ -	$ 2,183,631

Repairs and Replacements

Total Project Costs:	Ongoing
Funded:	Water Rates
Area:	City-Wide

Project Description:
The City's 2019 Water Plan Update identified a number of repair and replacement related needs. This placeholder budget will allow for planned and unplanned water system projects to be completed in the biennium.

		Construction			Total
	Prior Years	$ 36,121			$ 36,121
	2021	$ 331,433			$ 331,433
	2022	$ 171,808			$ 171,808
	2023	$ 177,361			$ 177,361
	2024	$ 10,453			$ 10,453
Budget	FY 2025-2026	$ 1,000,000			$ 1,000,000
Capital Plan	FY 2027-2028	$ 1,000,000			$ 1,000,000
	FY 2029-2030	$ 1,000,000			$ 1,000,000
	Total	$ 3,727,176	$ -	$ -	$ 3,727,176

Sewer

Pump Station Telemetry Upgrades

Total Project Costs:	$ 1,800,000
Funded:	System Development Charges
Area:	City-Wide

Project Description:
This project provides more reliable communications with pump stations.

		Upgrades	Total
	Prior Years	$ -	$ -
	2021	$ -	$ -
	2022	$ -	$ -
	2023	$ -	$ -
	2024	$ -	$ -
Budget	FY 2025-2026	$ 1,800,000	$ 1,800,000
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ -	$ -
	Total	$ 1,800,000 $ - $ -	$ 1,800,000

Wastewater Treatment Plant Upgrades

Total Project Costs:	$ 21,516,841
Funded:	System Development Charges
Area:	South

Project Description:
This placeholder is for projects identified in General Sewer Plan and WWTP Facilities Plan for upgrades, repairs, replacements, and maintenance.

		Construction	Total
	Prior Years	$ 74,925	$ 74,925
	2021	$ 164,391	$ 164,391
	2022	$ 158,587	$ 158,587
	2023	$ 231,579	$ 231,579
	2024	$ 2,887,359	$ 2,887,359
Budget	FY 2025-2026	$ 18,000,000	$ 18,000,000
Capital Plan	FY 2027-2028	$ -	$ -
	FY 2029-2030	$ -	$ -
	Total	$ 21,516,841 $ - $ -	$ 21,516,841

Sewer (continued)

Gravity Sewer Upgrades

Total Project Costs:	$ 1,772,553
Funded:	System Development Charges
Area:	Southeast

Project Description:
This placeholder is for projects identified in General Sewer Plan and WWTP Facilities Plan for upgrades, repairs, replacements, and maintenance.

		Construction			Total
	Prior Years	$ -			$ -
	2021	$ 39,277			$ 39,277
	2022	$ 134,476			$ 134,476
	2023	$ 7,567			$ 7,567
	2024	$ 291,233			$ 291,233
Budget	FY 2025-2026	$ 1,300,000			$ 1,300,000
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 1,772,553	$ -	$ -	$ 1,772,553

Pump Station Repairs and Replacements

Total Project Costs:	$ 5,351,065
Funded:	Sewer Rates
Area:	City-Wide

Project Description:
This placeholder is for projects identified in General Sewer Plan and WWTP Facilities Plan for upgrades, repairs, replacements, and maintenance.

		Construction			Total
	Prior Years	$ -			$ -
	2021	$ 98,678			$ 98,678
	2022	$ 781,883			$ 781,883
	2023	$ 273,638			$ 273,638
	2024	$ 196,866			$ 196,866
Budget	FY 2025-2026	$ 4,000,000			$ 4,000,000
Capital Plan	FY 2027-2028	$ -			$ -
	FY 2029-2030	$ -			$ -
	Total	$ 5,351,065	$ -	$ -	$ 5,351,065

Appendix R: Economic Opportunities Analysis (2024)

Date:	May 6, 2024
To:	Nicole McDermott, WSP
From:	Tyler Bump, Jennifer Cannon, and Mary Chase, ECOnorthwest
Subject:	DRAFT Economic Conditions and Opportunities Analysis, City of Camas Comprehensive Plan Update

Section 1. Economic Profile Analysis

Introduction

The City of Camas Comprehensive Plan update offers an opportunity to refine **the Economic Development Element** vision, goals, and policies for the next two decades from 2025 to 2045 (current plan was adopted in 2015). The Comprehensive Plan is a foundational document that provides a vision and policy direction for managing growth and development while considering effects on the built and natural environment and public facilities. This guiding document provides clear linkages with future investments, priorities, land use changes, and can lead to revisions of codes and regulations. The updated plan must be responsive to changing community dynamics, the strategic vision established by the City Council and include focused goals to address social inequities and climate change.

The current Economic Development Element aims to include goals and policies that help ensure the economic development in the City of Camas provides a range of employment opportunities throughout the City. The economic health and well-being of the City are tied to commitments to promote a wide range of employment opportunities for the citizens of the community and to provide a setting and quality of life that attracts businesses and residents.

The approach for updating the Economic Development Element will be informed by community input, state legislation requirements, priorities for the city, a comprehensive housing inventory and analysis based on the best available existing data. This Economic Profile Analysis integrates the best available information from public and private data sources to assess the city's economic trajectory, opportunities, challenges, and economic conditions and competitiveness. The insights from this analysis help build a factual basis for the economic development goal and policy updates.

Planning Context

Growth Management Act Requirements

Comprehensive planning in Washington is guided by the Growth Management Act (GMA), a series of statutes first adopted in 1990 which requires cities and towns within eighteen of the state's most populous counties to fully plan for future growth (RCW 36.70A). Given Clark County and the City of Camas population size, both jurisdictions must address all the mandatory comprehensive plan elements, including land use, housing, capital facilities, utilities, and transportation. Economic development is included as a mandatory element (RCW 36.70A.070(7-8)), but since no state funds have been allocated to assist jurisdictions in creating these plans, they are currently optional.

Economic Development Planning in Washington

The City of Camas is including an Economic Development Element as part of the current comprehensive plan update process, following the GMA Goal 5 to:

> *"Encourage economic development throughout the state that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons, promote the retention and expansion of existing businesses and recruitment of new businesses, recognize regional differences impacting economic development opportunities, and encourage growth in areas experiencing insufficient economic growth, all within the capacities of the state's natural resources, public services, and public facilities[1]." (RCW.36.70A.070(7))*

In Washington, state provisions set limits on what actions cities and counties can take to support economic development, which often guides the strategies, goals, objectives, and policies that jurisdictions establish in economic development comprehensive plan elements. Article 8, Section 7 of the state constitution specifies that "No county, city, town or other municipal corporation shall hereafter give any money, property, or loan its money, or credit to or in aid of any individual, association, company or corporation, except for the necessary support of the poor and infirm."2 Given this limitation, cities generally cannot directly use public funds to attract private development and instead target policies that facilitate economic growth through land use, infrastructure, tourism, marketing, and partnerships with nonprofit community-based organizations.

[1] In 2023, E2SHB 1181 updated the language of Comprehensive Plan goals (including economic development) to reflect climate change and resiliency goals.

[2] RCW 35.21.703 does allow cities to contract with nonprofit corporations to advance economic development.

The City of Camas's first Comprehensive Growth Management Plan was adopted in 1994, which was replaced by the current Comprehensive Plan in June 2016 to fulfill the requirements of Washington State's Growth Management Act (GMA). The GMA is a series of state statutes first adopted in 1990 aimed at managing population growth, particularly in the state's fast-growing areas. In Clark County, RCW 36.70A.040 requires all cities to "fully plan" for the elements of a Comprehensive Plan, including land use, housing, capital facilities, utilities, transportation, and climate change.3 The current update process is part of a period update also required by the GMA, as part of an established schedule by County.

Regional Economic Development Planning

Cities in Washington also coordinate with county-level Associate Development Organizations (ADOs) that represent each of Washington's counties, funded in part by the state Department of Commerce. The Columbia River Economic Development Council (CREDC) represents Clark County and presents a baseline of goals and objectives for the region. Their current 2018-2023 Comprehensive Economic Development Plan outlines goals and actions based on a vision and set of values and guiding principles identified through extensive engagement with local partners.

Exhibit 1. Goals and Objectives from 2018-2023 CREDC Comprehensive Economic Development Plan
Source: CREDC

1. Expand the Existing Base	2. Support People	3. Create Place
• Become Industry Experts • Strategically Market Industry Clusters • Build a Startup Ecosystem	• Foster Skills Development • Prepare Youth for Economic Opportunity • Launch a Brain Gain Initiative • Promote an Ethical and Socially Just Society through an Intentional Commitment to Inclusion, Equity, and Diversity	• Each Community Creates a Placemaking Strategy • Embrace Economic Opportunity in our Urban Center • CREDC Tells the Story of Place • Make Employment Areas Desired by Industry Clusters Shovel Ready • Determine all Transportation Needs on a Regional Level Specifically to Support Economic Development

CREDC is now in the process of updating its 2018-2023 priorities and identifying new strategic actions to respond to Clark County's quickly changing demographic and economic profile, with a new plan anticipated to provide further guidance in 2024.

Implications for Growth Management

While economic development elements are currently optional under the GMA, aspects of the required land use and housing elements are linked to economic development and the associated

[3] The GMA includes other optional elements for economic development, parks and recreation, conservation, energy, sub areas, and ports.

current conditions within jurisdictions. Cities fully planning for adequate land capacity to meet the needs of the community must understand their current employment base, development trends, workforce housing availability, income segments of the population, and future projections.

State statute requires that land use elements must *"[designate] the proposed general distribution and general location and extent of the uses of land, where appropriate, for agriculture, timber production, housing, commerce, industry, recreation, open spaces and green spaces, urban and community forests within the urban growth area." (36.70A.070(1)) This includes population densities, building intensities, and estimates of future population growth. RCW 36.70A.070(2)(d) requires that a housing element "Makes adequate provisions for existing and projected needs of all economic segments of the community, including... consideration of housing locations in relation to employment location."*

To fully plan for growth and meet community needs in compliance with state provisions, more suburban cities like Camas that are growing in terms of employment must understand the dynamics of the local and regional economy, consider where employment is concentrated and how residents and workers access employment opportunities, what industries are growing or declining, and whether there is sufficient space to fulfill anticipated employment land needs alongside other uses.

Buildable Land Capacity and Employment Capacity

In 1997, Washington's Review and Evaluation Program, also known as the "Buildable Lands Program," was added to the GMA (RCW 36.70A.215). It requires some counties and cities within them to establish their own buildable lands programs (including Clark County) and produce a report every eight years. In 2017, the Washington legislature passed E2SSB 5254 which amended the buildable lands statute and required counties to *"determine whether [its] cities are achieving urban densities within urban growth areas by comparing growth and development assumptions, targets, and objectives contained in the countywide planning policies and the county and city comprehensive plans with actual growth and development that has occurred"* (RCW 36.70A.215).

RCW 36.70A.215 also includes provisions about determining the development capacity of land and identifying sufficient land for employment. Specifically, jurisdictions should identify the "*amount of land developed for commercial and industrial uses within the urban growth area since the adoption of a comprehensive plan... [and] the amount of land needed for commercial, industrial, and housing for the remaining portion of the twenty-year planning period.*"[4]

[4] The state's methodology used to evaluate employment land does not differentiate land by any market criteria such as size, infrastructure presence, cost, ownership, or availability.

In the last Comprehensive Plan update in 2016, Clark County adopted two planning assumptions (Resolution 2016-03-01) anticipating 100,200 new jobs in the County and a jobs-to-housing ratio of 1:1. The County's 2015-2035 Comprehensive Plan projected that based on the Vacant Buildable Lands Model (VBLM) this would include:

- 75,847 new jobs from vacant buildable lands;
- 16,775 jobs accommodated through redevelopment; and
- 7,400 public sector jobs on publicly owned parcels not included in the VBLM.

Clark County is now updating its VBLM as a part of their 2025 periodic update of their Comprehensive Plan. Exhibit 2 below shows the County's current allocation of jobs for the Camas Urban Growth Area (UGA) and land capacity in the interim planning analysis. This has been slightly modified since the County's 2020 Buildable Lands Report, which identified 963 net buildable acres (296 on commercial land, 667 on industrial land) in the Camas UGA (Exhibit 3).

Exhibit 2. Employment Capacity and Allocation by UGA, Clark County[5]
Source: Clark County Population, Housing and Employment Allocation. Vacant Buildable Lands Model (VBLM). Urban Growth Area (UGA).

Clark County's Buildable Lands Report, 2022, Key Findings:

Clark County's Buildable Lands Report was adopted in June 2022 to update the methodology and Vacant Buildable Lands Model (VBLM). The report found that:

Based on employment growth through 2020, redevelopment, and public sector job assumptions, the Clark County Buildable Lands Report indicates that there is sufficient employment capacity for employment growth in the county through 2035.

Clark County added 12,700 jobs in 2016-2020 out of its target from the 2015-2035 Plan of adding 100,200 jobs by 2035. **Therefore anticipating 87,500 more jobs to be added by 2035 in Clark County**.[6] Of this total, 72,878 jobs are expected to be accommodated on vacant buildable lands and the remainder through redevelopment or public sector employment.

The Camas UGA has the second largest share of total projected jobs in Clark County after the City of Vancouver and the Vancouver Unincorporated Urban Area (U). The City's UGA is expected to accommodate 11,921 jobs, with half of new employment on industrial land and half on commercial.

There are 963 total net buildable acres of employment lands identified in the Camas UGA; 30% (296 net acres) are commercial land, and 70% (667 net acres) are industrial land.

JURISDICTION	2023-2045 EMPLOYMENT ALLOCATION	2023 VBLM CAPACITY
Camas UGA	11,528	11,363
UGA TOTAL	65,071	65,091

[5] The County total estimate is 88,100 jobs accounting for government, construction, rural, and work from home jobs.

[6] Clark County Community Development, "Clark County Buildable Lands Report," June 2022. The Buildable Lands Report must meet the Washington State requirements described under RCW 36.70A.215.

Exhibit 3. Commercial and Industrial Land Capacity and Employment Capacity Estimates, by Clark County Jurisdiction, UGA, or Unincorporated Urban Area, 2020
Source: Clark County Buildable Lands Report.
Note: The calculation from gross to net acres involves several factors, including infrastructure and land constraints

Jurisdiction	Commercial			Industrial			Total Jobs
	Gross Acres	Net Acres	Jobs	Gross Acres	Net Acres	Jobs	
Battle Ground UGA	643	395	7,881	157	71	643	8,524
Camas UGA	452	296	5,920	1,398	667	6,001	11,921
La Center UGA	115	79	1,573	64	34	308	1,881
Ridgefield UGA	374	252	5,031	806	418	3,762	8,793
Vancouver	433	304	6,089	2,758	1,470	13,225	19,314
Vancouver (U)	638	444	8,886	1,710	953	8,579	17,465
Washougal UGA	165	114	2,281	509	262	2,362	4,643
Woodland UGA	-	-	-	-	-	-	-
Yacolt UGA	5	4	81	49	29	256	337
Urban Total	**2,825**	**1,888**	**37,742**	**7,451**	**3,904**	**35,136**	**72,878**

Source: Clark County GIS, Vacant Buildable Lands Model, June 2022; Council Resolution 2022-06-01
Notes: A – Employment growth target for 2035 set by Clark County Council Resolution 2016-03-01.
B – Urban Total includes capacity in incorporated cities/towns and their unincorporated urban areas.
C – Unincorporated urban area is designated with a (U).

Clark Countywide Planning Policies

The Clark Countywide Planning Policies provide guidance on economic development across incorporated and unincorporated areas of the County (the County also distinguishes policies specifically for unincorporated areas, but not for jurisdictions and their UGAs). These policies (adopted in 2015) are currently being updated. The updated version will be reviewed as a part of the policy and goal development stage of the Comprehensive Plan update.

City of Camas Profile

More than 10,000 years ago, Native Americans occupied the Columbia River Valley in the area where Camas is now situated. Before Camas was incorporated, a paper mill owned by the LaCamas Colony Company was established in 1883 to help supply newsprint for The Oregonian. Shortly thereafter, the City of Camas became an incorporated city in 1906. The City is named after the camas lily, a deep blue flowered plant with edible onion-like bulbs valued by various Columbia river Native American Tribes.[7] The paper mill expanded in the early 20th Century

[7] City of Camas history: https://www.cityofcamas.us/community/page/camas-history

playing an important role in the local economy and grew to become Clark County's largest manufacturing company with 2,700 employees by 1971.[8] Located in the western edge of Downtown Camas along the Columbia River, the mill then experienced a downturn beginning in the 1980s that continued into the 21st Century, resulting in a reduced workforce. More recently, in 2018, the mill now owned by Georgia-Pacific, shut down facilities and all but one of its paper machines and downsized its workforce to roughly 150 workers.

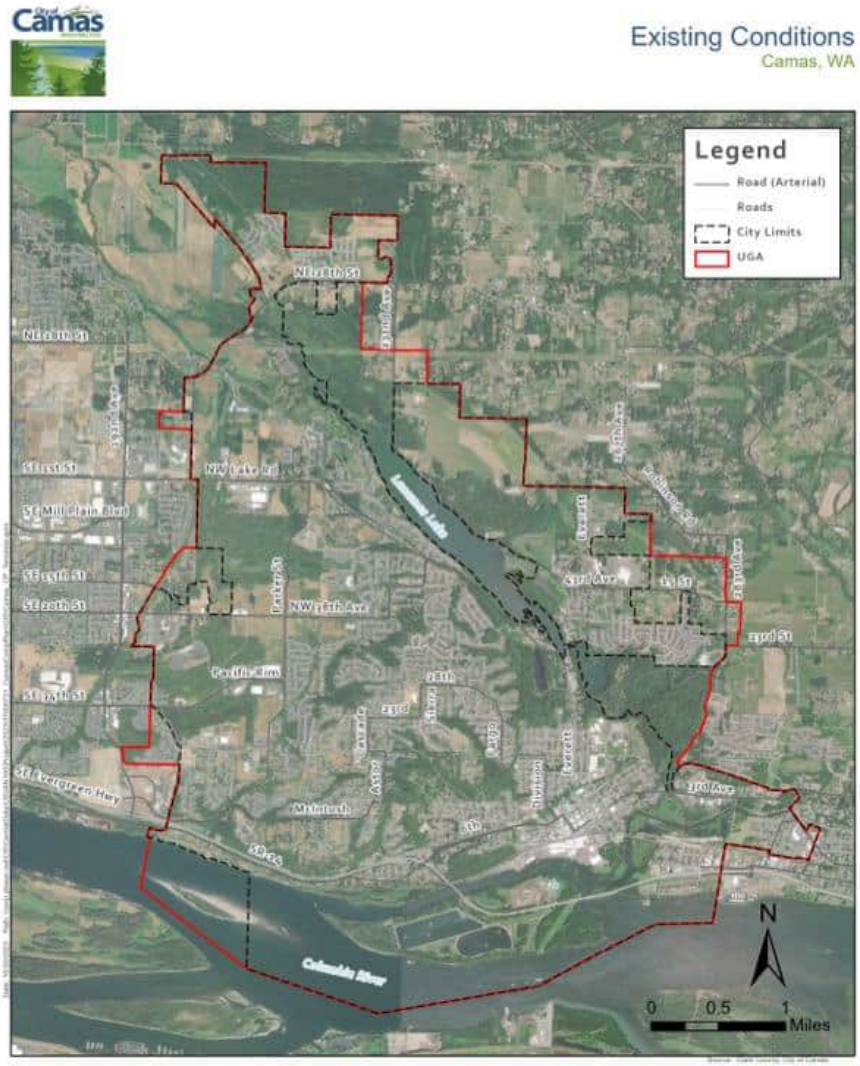
The early economy in Camas was at first dominated by manufacturing but has shifted and diversified over time. The 2015 Comp Plan describes a transition where the City's past economic health was closely tied to the paper mill and then shifted to become more diversified supporting many technology and manufacturing firms, as well as a growing school system and professional offices. In the last four decades, the family-friendly City with close ties to the Portland Metropolitan Region has continued to attract more residents especially from 1990 to 2000 by almost doubling in size to almost 13,000 people, increasing to a little over 19,000 people in 2010, and then reaching 27,420 people by 2023. Similar to the City of Vancouver, Camas has experienced high population growth over the last two decades, with an average annual growth rate of 5.2% which is double the rate in Clark County and Washington State.

Today, the City of Camas is a highly desirable place to live, offering a prime location nearby the growing cities and employment centers of Vancouver and Portland, and the smaller cities of Washougal and Battle Ground in south Clark County. The City of Camas is sandwiched between the City of Vancouver (sharing a border on the west side of Camas) to the west and the City of Washougal to the east. At a regional level, the City is interconnected to the Portland Metropolitan region, located northeast of Portland (see map below).

Camas has been working to advance its economic development goals in recent years while investing in quality-of-life amenities that make it as competitive location for attracting workers and residents. The Port of Camas-Washougal is currently working towards a catalytic new project on the waterfront which broke ground in 2023; once completed this effort will bring new mixed-use residential development with apartments, retail, restaurants, and recreational space to the area to contribute to a growing sense of local identity. The City has also been expanding its inventory of parks space by leveraging the County's Legacy Lands program to expand its offerings of natural areas and recreation facilities. As larger economic trends increase locational flexibility (especially for professional services and traditionally office-based jobs), these types of investments will be critical for cities in the region to continue drawing in and retaining a residential base and workforce.

[8] Source: https://www.camaspostrecord.com/news/2023/sep/07/camas-mill-celebrates-its-140th-birthday/#:~:text=An%20entire%20wall%20of%20photos,built%20the%20mill%20to%20produce

Exhibit 4. Site Location Map, City of Camas
Source: WSP, City of Camas



The following economic focused analysis helps build up the understanding of the city's economy, real estate market and demographics, and serves as a tool that can be leveraged to shape the city's economic development vision. Cities fully planning for adequate land capacity to meet the needs of the community must understand their current base of employment, development trends, workforce housing availability, income segments of the population, and future projections.

Summary of Demographic and Economic Trends

A summary of key findings from this Economic Development Element analysis is provided below to help describe key insights regarding the economic context, economic opportunities and

challenges, and to inform Comprehensive Plan policy updates. The next section provides the full results and detail regarding these findings.

Community Demographic Trends

- **Camas had a median age of 40 years in 2022, with a growing share of residents aged 60 years and over.** This group typically represents late-career workers or retirees. Median age in Camas is higher than Clark County overall and quickly growing since 2012, likely indicating a combination of natural growth and in-migration of older adults.
- **Camas has a higher share of residents 25 and over with bachelor's degrees and higher compared to Clark County or Washington State,** with 79% of residents holding these degrees in 2022. This share of residents with bachelor's degrees or higher rose quickly from only 37% in 2012. Likewise, the City has a shrinking share of residents 25 and over with a high school degree or less.
- **Median household income for all households in Camas was $133,000 in 2022, higher than Clark County or Washington State.** Since 2012, median income for residents of Camas increased by about 30% (in nominal dollars, not adjusted for inflation), more than either the County or State (both of which increased by about 20%).
- **The share of residents living below the poverty threshold determined by the US Census was lower in Camas compared to Clark County and Washington in 2022**. The share of residents living below poverty in the City decreased by 8 percentage points since 2012, which likely reflects new growth in high-income households earning $150,000 or more.

Economic Context

- **The City of Camas has seen generally positive trends in employment growth over the last two decades,** with notable increases in the number of workers in 2005, 2010, and 2016. Comparatively, Clark County overall had fluctuations in employment growth in the wake of the 2008 recession and at the onset of the COVID-19 in 2020. The County has also seen a fast rebound from pandemic trends, seeing roughly 6% positive growth between 2020 and 2021.
- **The current employment to housing ratio in Camas was 1.0 in 2021, meaning that there is about one employee working in the City for every housing unit.** This ratio indicates that Camas has well balanced housing stock to accommodate workers in the City that will be important to maintain as it grows in the coming years.
- **In 2021, the top five industries by employment in Camas were Finance and Insurance; Manufacturing; Educational Services; Professional, Scientific, and Technical Services; and Wholesale Trade.** In the County overall in 2021, four of these five top industries paid above average wages (all except Educational Services paid below average wages). Finance and Insurance was the City's fastest growing industry (with an average annual growth rate of about 33%). Other top industries saw more moderate increases except for Manufacturing, which remained among the City's top sectors but lost over 350 employees (or about 15% of workers) between 2011 and 2021.

- **Top employers also reflect many of the County's largest industries, including professional services like finance and insurance, technology, manufacturing, and health care. Four of the City's top ten employers were in the manufacturing industry as of 2020.** Within Camas, employment is concentrated at two nodes, including the Downtown area to the southeast and corporate campuses on the northwest side along the border with the City of Vancouver.

- **Camas is part of an interconnected region, with more residents commuting out of Camas for work than employees commuting in as of 2021.** Top commuting destinations for Camas residents are primarily nearby, larger cities with employment hubs like Vancouver and Portland, while only 10% remained in the City. The fourth most common destination for residents was Seattle, likely indicating remote workers at companies based in the Puget Sound area. Workers in Camas commuted from similar destinations, with one quarter coming from Vancouver.

- **Washington State Employment Security Department projections for future employment growth estimated that the Southwest Washington region will grow by about 19% overall by 2031.** The sectors expected to see the greatest increase in their share of employment are Professional and Business Services, Leisure and Hospitality, Education and Health Services, Information, and Other Services.

- **Camas has a larger share of remote workers compared with Clark County and Washington State. In 2022 one in four workers in Camas was a remote employee,** compared to 15% in both the County and State overall. The share of remote workers in Camas has grown since 2008-2012 with the onset and long-term implications of the COVID-19 pandemic likely driving this trend.

- **Since 2020, the City has issued 8,652 new business permits,** with the largest volume of new permits in 2020 and a decreasing amount annual since. General business establishments accounted for the largest portion of these permits (74%), followed by home occupations (25%), and nonprofits (1%). Regionally, 6,241 new business applications were filed in Clark County in 2022, with the annual number of applications rising steadily since 2012. Business applications in Clark County accounted for approximately 26% of all new firms started within the four-county metro area (including Clark, Clackamas, Multnomah, and Washington Counties) in 2022.

- **Camas's taxable retail sales were higher than those in most comparable jurisdictions in Clark County over the past decade,** competing primarily with the City of Battle Ground for the highest annual sales. In 2022, total taxable retail sales reached an all-time high of over $600 million in Camas.

Real Estate Market Trends

- **Office space in the City of Camas makes up only a small share of Clark County's overall office stock (6.5%), with slightly lower rents and higher vacancies in 2024 year-to-date (YTD).** Rents per square foot (PSF) grew steadily for office space grew Clark County since 2014, while fluctuating above and below County averages in Camas. Vacancy rates in Camas also fluctuated over the last ten years but fell from a high of nearly 16% in 2015 to 6.5 % in 2024 YTD. In comparison, Clark County's office vacancy rates steadily fell in general since 2014. The City and the County have generally had positive net absorption of office space since 2014, with the largest delivery of new office space in Camas in 2020 (132,000 new square feet).

- **Like office real estate, Camas's square footage of retail space made up a small part of Clark County's overall inventory (4.2%) in 2024 YTD. However, retail trends tracked closely with the County in terms of rent and vacancies.** Retail rents in both Camas and the County had slight upward growth since 2014, with rents in the City slightly lower than the County average. Vacancies in retail have fluctuated in Camas and Clark County over the past decade, with a general downward trend since 2014. Rising rents PSF coupled with falling vacancy rates indicate increasing demand for retail in both areas. However, some level of vacancy is indicative of a healthy market with natural turnover. In Camas, there have been some years with small spikes of new retail construction in the last decade, with the largest increase of about 27,000 SF in 2018 and 15,000 SF in 2023.

- **Industrial real estate in the City of Camas is performing well compared to Clark County in 2024 YTD.** The City is home to only about 3.9 % of Clark County's industrial real estate in square footage but saw a sharp increase of industrial rents PSF in 2022, growing by over 200% year-over-year (YOY) to $23. Vacancy rates for industrial real estate were also extremely low in Camas in 2024 YTD at 1.7%, indicating high demand in the industrial market locally. In comparison, industrial vacancies in Clark County have been generally low and steady, standing at 5.2% in 2024. Camas had its largest amount of new industrial square footage added in 2020 (75,000 SF).

Community Demographic Trends

Population growth, demographic composition, and income distribution can all have important implications for a city's economic development. Key characteristics such as population growth over time, age of residents, median income, and disparities by race and ethnicity provide useful context about Camas's households and recent trends. The purpose of this analysis is to evaluate the socioeconomic conditions that will influence demand for different land uses and shape the economic opportunities in the city over the current comprehensive plan horizon. This information can also help to identify which communities in Camas are not benefiting from current efforts and inform the City's work to address current gaps for equitable economic development as part of the comprehensive plan update.

This section provides an overview of key socioeconomic conditions in Camas that are useful for evaluating economic opportunities and challenges. To better understand the City's standing within the region, the analysis also includes comparisons to Clark County and other geographies such as Washington State and surrounding cities as needed to contextualize conditions in Camas.

Population Growth, Age, Race and Ethnicity

As cities grow, planning for economic development is important to help ensure opportunities for economic prosperity to all residents. See the **Camas Housing Inventory Analysis** for details about projected population and household growth.

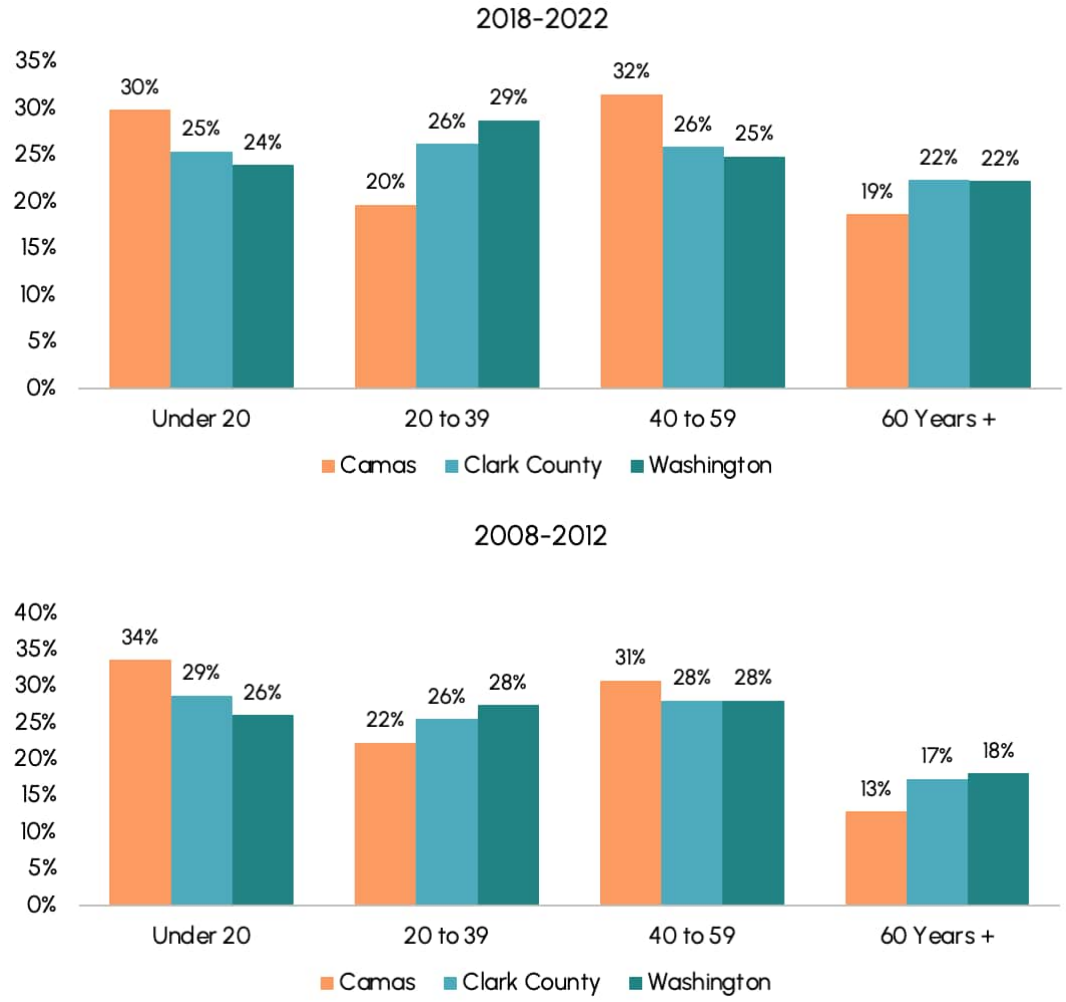
Camas had a median age of 40 in 2022, higher than Clark County and quickly growing since 2012, likely indicating a combination of natural growth from the 40- to 59-year-old age group as well as in-migration of older adults.

Exhibit 5. Median Age, Camas, Clark County, Washington, and Comparison Geographies 2012 -2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates

JURISDICTION	2008-2012	2018-2022	CHANGE
City of Camas	**36 years**	**40 years**	**+4.3**
Clark County	37 years	39 years	+2.0
State of Washington	37 years	38 years	+0.8

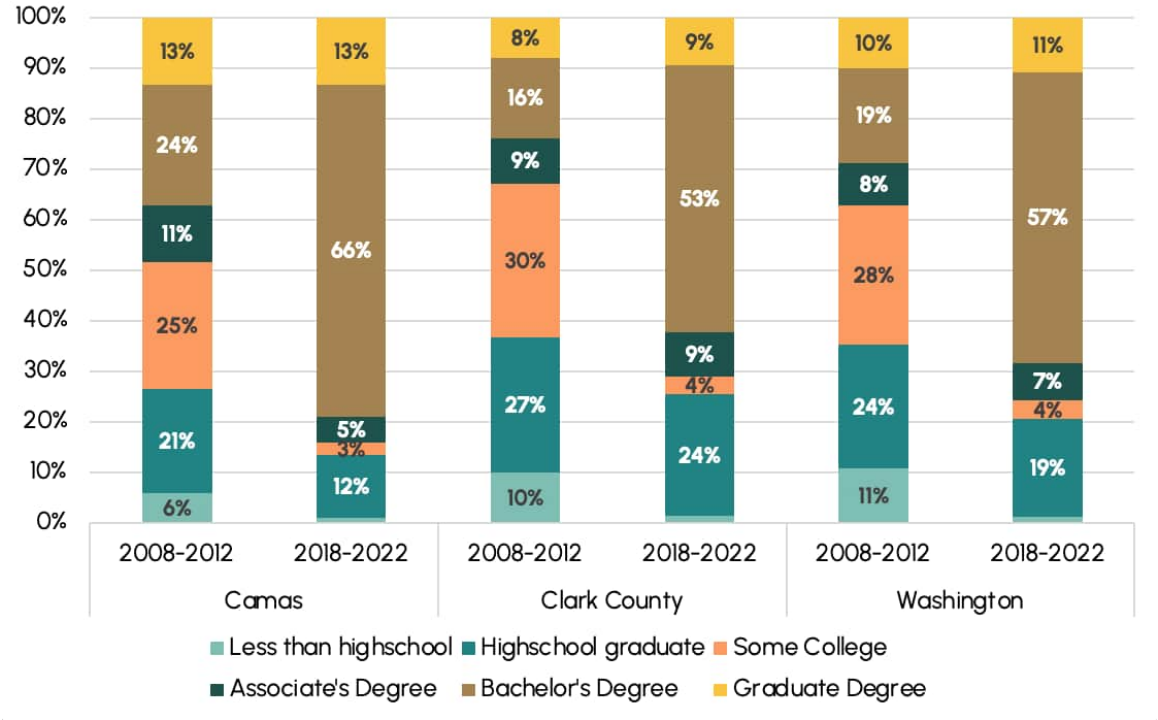
The distribution of age categories in the City shows that it has a growing share of residents aged 60 years and over (typically either late-career workers or retirees), although still lower compared to the County and the State (Exhibit 6).

Exhibit 6. Age Distribution, Camas, Clark County, and Washington, 2012 -2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates.



Educational attainment is an important indicator for economic opportunities and the type of available workforce in an area. Economic development strategies may target different types of skill development, industry pipelines, or training programs depending on the existing level of education among residents. Between 2012 and 2022, Camas saw a sharp increase in residents with bachelor's degrees and higher, as well as a quick decrease in those with some college, a high school degree, or less than a high school degree. Educational attainment in the City is generally higher than the County as a whole, as well as Washington State.

Exhibit 7. Educational Attainment, Camas, Clark County, and Washington, 2012 -2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates.
Note: Values less than or equal to 1% not shown on chart.



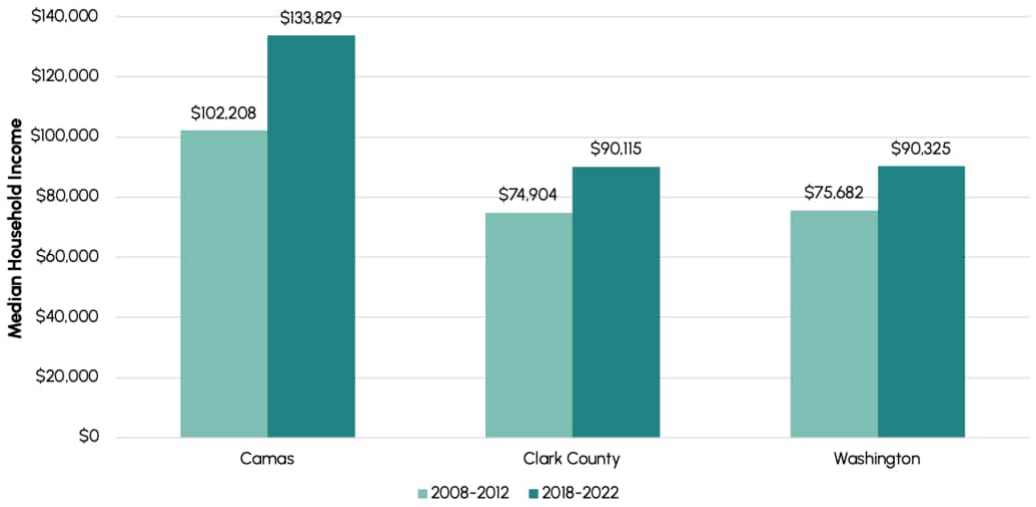
Economic Context

A number of factors can indicate changes in economic conditions for cities, their residents, and their workforce. This section provides context about current conditions and recent trends in Camas related to household income, employment, commuting, and wages.

Income

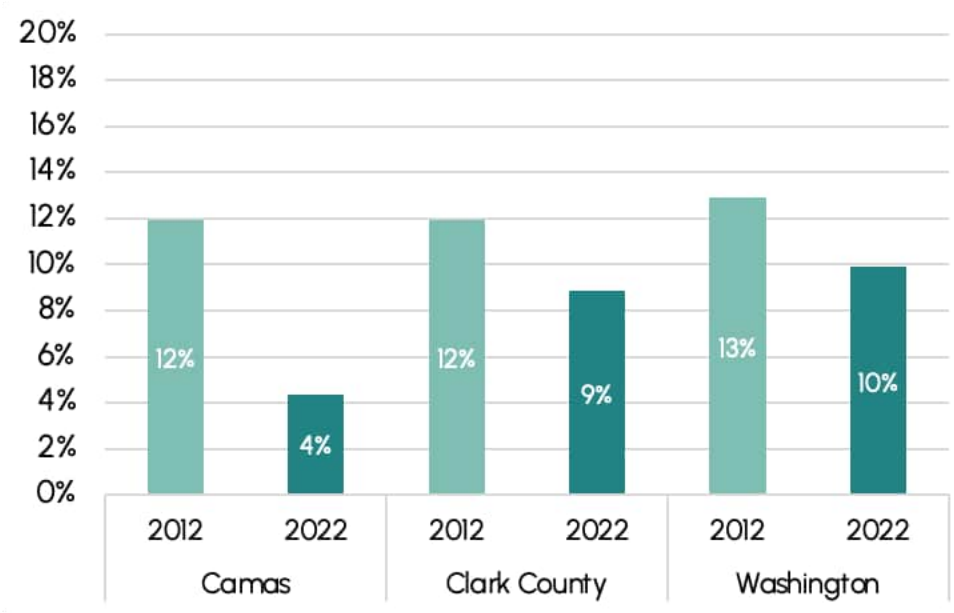
Overall income levels and distribution are critical indicators of economic prosperity for cities. Income levels directly reflect the purchasing power and standard of living of individuals and households; higher incomes generally enable people to afford better education, healthcare, and access to essential goods and services, contributing to overall well-being and productivity. The distribution of income and disparities between demographic groups are also critical considerations for addressing economic inequality and reducing concentrations of poverty. **Median household income in Camas is higher than both Clark County overall and the state of Washington at $133,000 in 2022. Adjusting for inflation, median income in the City still increased by 31% since 2008-2012. This increase is primarily due to grown in households earning over $100,000 per year (Exhibit 8).**

Exhibit 8. Median Household Income, Camas, Clark County, and Washington (2022$)
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates
Note: 2008-2012 values are adjusted for inflation



The share of residents living below the poverty was also about the same in the City of Camas compared to Clark County and Washington in 2008-2012 at 12 % but decreased by 8 %age points by 2018-2022. This change likely reflects new growth in high-income households earning $150,000 or more during this period (indicated in the Camas Housing Inventory Analysis).

Exhibit 9. Percent of Population with Income Below Poverty Level in the Last 12 Months, 2012 -2022
Source: U.S. Census Bureau, 2008-2012 and 2018-2022 ACS 5-Year Estimates



Employment Trends

Clark County overall has seen fluctuations in employment change since 2000, with the most notable decreases in employment in the wake of the 2008 recession and at the onset of the COVID-19 in 2020. However, the County has also seen a fast rebound from pandemic trends, seeing roughly 6 % positive growth between 2020 and 2021. The City of Camas has generally seen positive growth in employment over the last two decades, with notable increases in the number of workers in 2005, 2010, and 2016. The City also saw less of a decrease during 2020 than Clark County overall, which may reflect Camas's growth in remote workers during this period (Exhibit 21).

Exhibit 10. Total Covered Employment Change YOY, Clark County (2001-2022)
Source: Washington Employment Security Department

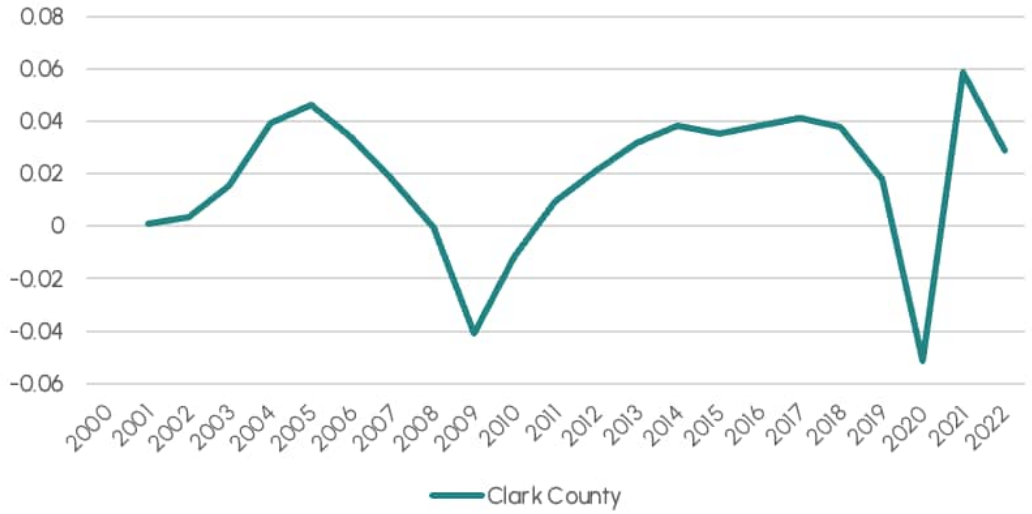
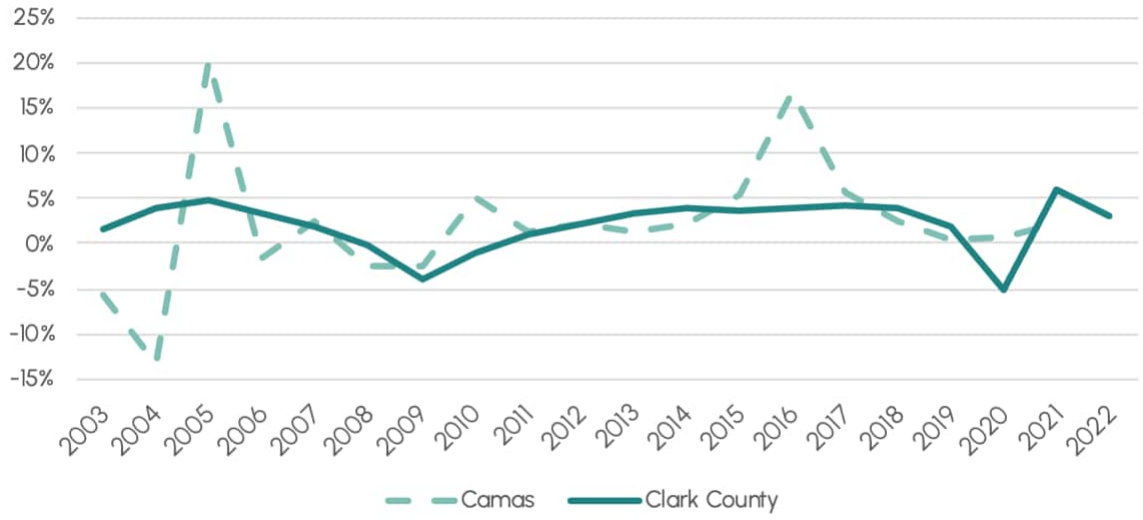


Exhibit 11. Total Employment Change YOY (Primary Jobs), Camas Clark County (2011-2022)
Source: Washington Employment Security Department, LEHD-LODES
Note: LEHD-LODES data for the City of Camas only available through 2021



Growth in employment, population, and housing are interconnected. In general, communities with a high ratio of population to employment can be characterized as "bedroom" or commuter communities, where there are fewer jobs than residents in the city. **In Camas, this ratio has changed only slightly since 2010, with the number of persons per job decreasing from 3.0 in 2010 to 2.8 in 2021.** In the same period, the ratio of jobs to housing has slightly increased from 0.9 to 1.0, indicating a healthy balance of housing units in comparison with employment. As the City grows, maintaining this trend can help to ensure that there is adequate housing for those who work in Camas.

Exhibit 12. Population, Employment, and Jobs Comparison Ratios, Camas, 2010-2021
Source: OFM, LEHD-LODES
Note: Employment data is currently only available at the City level through 2021.

	TRENDS			RATIOS	
	POPULATION	EMPLOYMENT	HOUSING UNITS	POPULATION : JOBS	JOBS : HOUSING
2010	19,355	6,508	7,072	3.0	0.9
2021	26,870	9,558	9,586	2.8	1.0

In Camas, top employers reflect many of the County's largest industries, including professional services like finance and insurance and technology, manufacturing, and health care. **Four of the City's top ten employers were in the manufacturing industry as of 2020.**

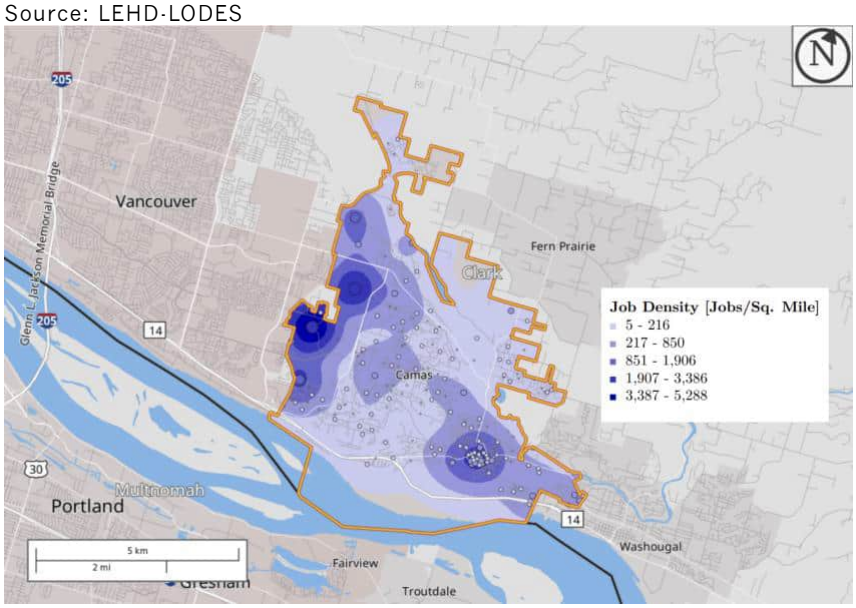
Exhibit 13. Top 10 Employers, Camas, 2020
Source: Camas Housing Action Plan, Washington Employment Security Department, Columbian Newspaper

EMPLOYER	EMPLOYEES	PERCENT OF TOTAL CITY EMPLOYMENT	INDUSTRY
Fisher Investments	1,725	20.2%	Finance and Insurance
Wafertech	1,000	11.7%	Manufacturing
Camas School District	800	9.4%	Education
Linear Technology (Analog)	340	4.0%	Manufacturing
Sigma Design	273	3.2%	Technology
City of Camas	226	2.6%	Government
Georgia Pacific	150	1.8%	Manufacturing
Fuel Medical	150	1.8%	Health Care
Plexys	91	1.1%	Technology
Bodycote	50	0.6%	Manufacturing

Employment locations plays an important role in where people live and vice versa it can influence where people choose to relocate. Within Camas, employment is concentrated at two nodes, including the Downtown area to the southeast and corporate campuses on the northwest side along the border with the City of Vancouver (Exhibit 14).

Exhibit 14. Employment Density, Camas, 2021

Source: LEHD-LODES



Top commuting destinations for Camas residents are primarily nearby, larger cities with employment hubs like Vancouver and Portland, while only 10 % remained in the City. The fourth most common destination for residents was Seattle, likely indicating remote workers at companies based in the Puget Sound area. Workers in Camas commuted from similar destinations, with one quarter coming from Vancouver, as well as shares coming from Portland (8%) and Washougal (6%).

Exhibit 15. Top Destinations Where Camas Residents Worked, 2021

Source: LEHD-LODES

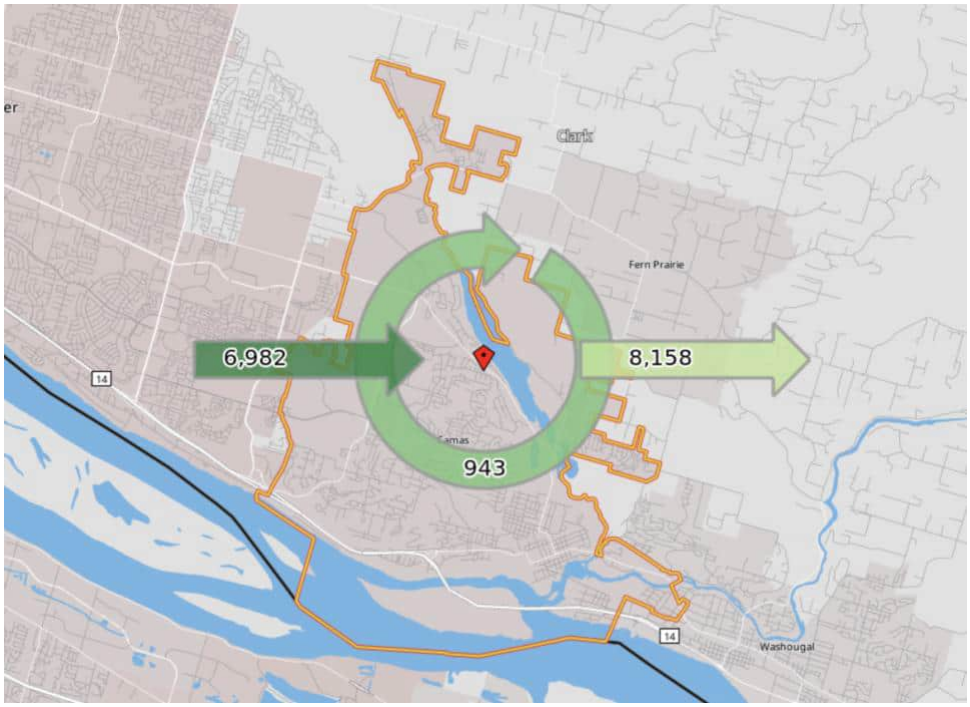
2,411 (26%)	1,592 (17%)	943 (10%)	319 (3%)
Vancouver	Portland	Camas	Seattle

Exhibit 16. Top Locations Where Camas Workers Lived, 2021

Source: LEHD-LODES

1,995 (25%)	943 (12%)	629 (8%)	593 (6%)
Vancouver	Camas	Portland	Washougal

Exhibit 17. Camas Commuting Inflow and Outflow, 2021
Source: LEHD-LODES. Disclaimer Note: The arrows are conceptual graphics showing employees commuting into and outside of the City of Camas generally and are not representing the exact direction of commuting.



Industry data from the Washington Employment Security Division (ESD) is not available at the City level but given the City's interconnected relationship with surrounding jurisdictions a County and regional perspective provides relevant insights on industry grow and wage trends.

In Clark County, the industries with the largest employment in 2022 were **Healthcare and Social Assistance; Government; Retail Trade; Construction; and Accommodation and Food Services**. Of these industries, Government and Construction had average wages per employee above the average wage for all covered employment across the county, while Retail and Accommodation and Food Services paid below average wages. Healthcare and Social Assistance paid roughly equivalent wages with the county average.

Exhibit 18. Covered Employment Change, Clark County, 2012-2022
Source: Washington Employment Security Division
Note: The top five industries with the highest share of covered employment in 2022 are shown in **bold** and those paying above the county average wage in 2022 are highlighted in green

Sector	2012	2022	Share of Total Jobs (2022)	Average Wage (2022)	Change 2012 to 2022		
					Difference	Percent	AAGR
Management of Companies and Enterprises	1,193	3,576	2.0%	$111,725	2,383	200%	11.6%
Construction	**7,964**	**16,986**	**9.7%**	**$71,499**	**9,022**	**113%**	**7.9%**
Finance and Insurance	3,781	6,451	3.7%	$112,277	2,670	71%	5.5%
Educational Services	951	1,613	0.9%	$38,791	662	70%	5.4%
Health Care and Social Assistance	**18,074**	**27,639**	**15.7%**	**$64,412**	**9,565**	**53%**	**4.3%**
Professional, Scientific, and Technical Services	6,692	10,169	5.8%	$99,988	3,477	52%	4.3%
Information	2,540	3,856	2.2%	$107,469	1,316	52%	4.3%
Accommodation and Food Services	**10,241**	**14,831**	**8.4%**	**$27,491**	**4,590**	**45%**	**3.8%**
Administrative and Waste Services	6,777	9,719	5.5%	$58,585	2,942	43%	3.7%
Real Estate and Rental and Leasing	2,158	3,078	1.8%	$59,398	920	43%	3.6%
Retail Trade	**14,646**	**19,139**	**10.9%**	**$42,261**	**4,493**	**31%**	**2.7%**
Transportation and Warehousing	2,917	3,548	2.0%	$72,086	631	22%	2.0%
Manufacturing	12,072	14,333	8.2%	$71,970	2,261	19%	1.7%
Wholesale Trade	6,042	6,953	4.0%	$92,968	911	15%	1.4%
Government	**23,026**	**25,856**	**14.7%**	**$71,555**	**2,830**	**12%**	**1.2%**
Agriculture, Forestry, Fishing and Hunting	631	594	0.3%	$48,781	-37	-6%	-0.6%
Arts, Entertainment, and Recreation	2,268	2,001	1.1%	$32,835	-267	-12%	-1.2%
Other services, Except Public Administration	7,760	5,374	3.1%	$49,730	-2,386	-31%	-3.6%
Not Elsewhere Classified	109	136	0.1%	$178,803	27	25%	2.2%
Total	**129,842**	**175,852**	**100%**	**$66,824**	**46,010**	**35%**	**3.1%**

At the City level, data is not available from ESD about employment and wages. However, the US Census provides estimates through its Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics (LEHD-LODES) data. This data is generated by merging previously collected survey and administrative data on jobs, businesses, and workers to understand commuting.[9] It provides an approximate picture of employment by industry locally but does not include information about wages.

In 2021, the top five industries by employment in Camas were **Finance and Insurance; Manufacturing; Educational Services; Professional, Scientific, and Technical Services; and Wholesale Trade**. In the County overall in 2021, four of these five top industries paid above average wages (only Educational Services paid below average wages). Finance and Insurance was the City's fastest growing industry, gaining over 2,000 new employees over the last decade (with an average annual growth rate of about 33%). Other top industries saw more moderate increases except for Manufacturing, which remained among the City's top sectors but lost over 350 employees (or about 15% of workers) between 2011 and 2021. Despite low overall employment in Camas, Real Estate and Rental and Leasing as well as Construction had high growth rates between 2011 and 2021, more than doubling the number of employees in that time period.

[9] US Census Bureau, 'LEHD Data,' https://www.census.gov/programs-surveys/ces/data/restricted-use-data/lehd-data.html, November 7, 2022.

Exhibit 19. Primary Jobs Change, Camas, 2011-2021

Source: LEHD-LODES

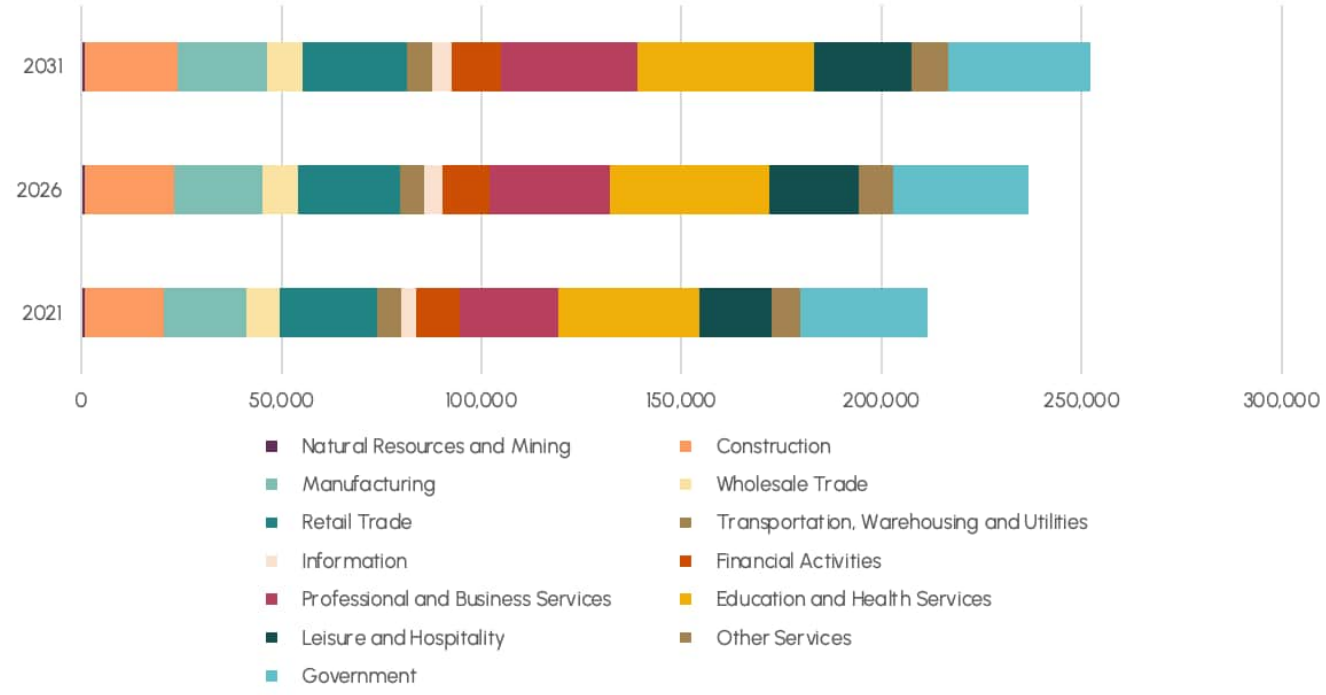
Note: The top five industries with the highest share of covered employment in 2021 are shown in **bold** and those paying above the county average wage in 2021 are highlighted in green.

Timelines for LEHD-LODES data releases are different than the Quarterly Census of Employment and Wages (QCEW) data used by ESD for County-level data. 2021 is the most recent year currently available. Due to confidentiality restrictions in QCEW data some points on County wages and employment are not available.

Sector	2011	2021	Share of Total Jobs (2021)	Average County Wage (2021)	Change 2011 to 2021		
					Difference	Percent	AAGR
Management of Companies and Enterprises	55	11	0.1%	$111,912	-44	-80%	-14.9%
Utilities	1	2	0.0%	*Not available*	1	100%	7.2%
Construction	112	276	3.0%	$68,866	164	146%	9.4%
Finance and Insurance	**126**	**2,259**	**24.4%**	**$123,062**	**2,133**	**1693%**	**33.5%**
Educational Services	**1,003**	**1,325**	**14.3%**	**$34,372**	**322**	**32%**	**2.8%**
Health Care and Social Assistance	222	329	3.6%	$60,878	107	48%	4.0%
Professional, Scientific, and Technical Services	**709**	**1,142**	**12.3%**	**$99,125**	**433**	**61%**	**4.9%**
Information	83	89	1.0%	**$102,172**	6	7%	0.7%
Accommodation and Food Services	257	364	3.9%	$25,734	107	42%	3.5%
Administrative and Waste Services	107	130	1.4%	$51,277	23	21%	2.0%
Real Estate and Rental and Leasing	19	95	1.0%	$55,215	76	400%	17.5%
Retail Trade	622	330	3.6%	$40,032	-292	-47%	-6.1%
Transportation and Warehousing	65	31	0.3%	$65,184	-34	-52%	-7.1%
Manufacturing	**2,341**	**1,987**	**21.5%**	**$69,195**	**-354**	**-15%**	**-1.6%**
Wholesale Trade	**187**	**478**	**5.2%**	**$96,010**	**291**	**156%**	**9.8%**
Agriculture, Forestry, Fishing and Hunting	2	0	0.0%	$46,736	-2	-100%	-100.0%
Arts, Entertainment, and Recreation	78	78	0.8%	$28,010	0	0%	0.0%
Other services, Except Public Administration	115	115	1.2%	$47,881	0	0%	0.0%
Public Administration	187	213	2.3%	$70,893	26	14%	1.3%
Total	**6,291**	**9,254**	**100%**	**$65,009**	**2,963**	**47%**	**3.9%**

Regionally, the Washington State Employment Security Department provides projections for future employment growth. In 2021, ESD estimated that Southwest Washington was expected to grow by about 19 % overall by 2031 (Exhibit 18). The sectors expected to see the greatest increase in their share of employment were Professional and Business Services, Leisure and Hospitality, Education and Health Services, Information, and Other Services. This increasing share of many service businesses aligns with high-wage opportunities in Clark County (such as Professional, Scientific, and Technical Services and Information). However, both Education Services and Accommodation and Food Services paid well below the County average as of 2022.

Exhibit 20. Growth Target by Sector, Southwest Washington, 2021-2031
Source: Washington State Employment Security Department



Remote Workers

Camas has a larger share of remote workers compared with the County and State, which has grown since 2008-2012 with the onset of the COVID-19 pandemic influencing this trend in many industries nationwide. In 2018-2022, one in four workers in Camas was a remote employee, compared to 15 % in the County and State overall (Exhibit 21). **Median wages for remote workers were about on par with the workforce as a whole in Camas** in 2018-2022, despite larger gaps between remote and non-remote workers in the County and State (Exhibit 21).

Exhibit 21. Share of Remote Workers, Camas, Clark County, and Washington, 2012-2022
Source: ACS, 2008-2012, 2018-2022

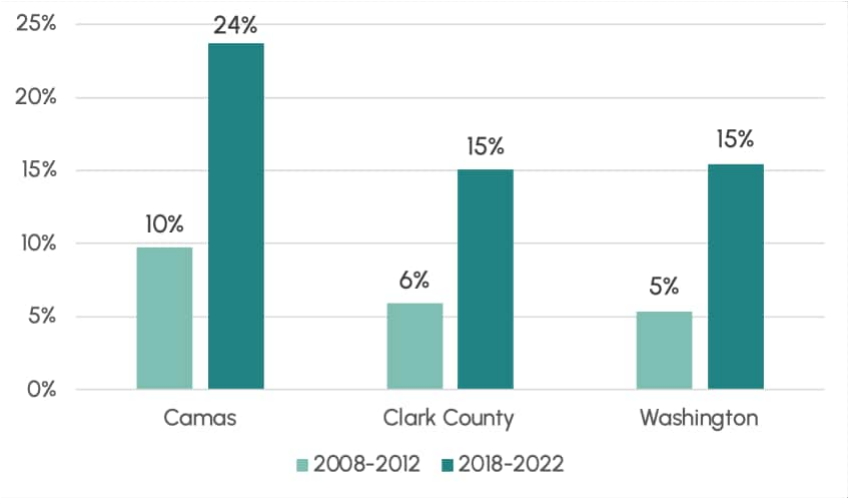


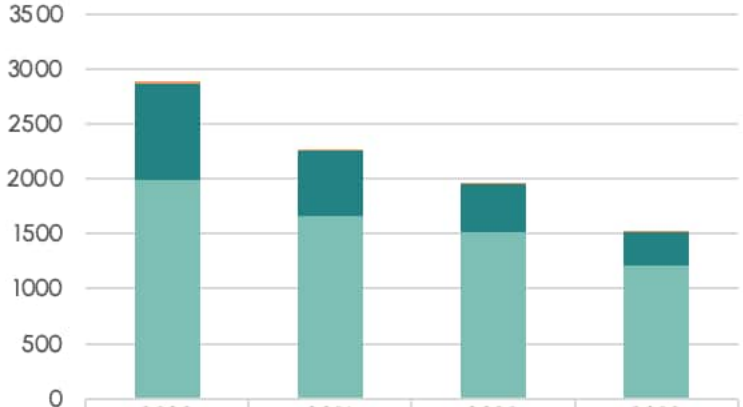
Exhibit 22. Annual Median Earnings for Remote and Non-Remote Workers, Camas, Clark County, and Washington, 2012-2022
Source: ACS, 2008-2012, 2018-2022



Business Changes

The City of Camas began requiring business licenses in 2019, so while local data does not have a long history it does help to capture post-pandemic trends in new establishments**. Since 2020, the City has issued 8,652 new business permits, with the largest volume of new permits in 2020 and a decreasing amount annual since.** General business establishments accounted for the largest portion of these permits (74%), followed by home occupations (25%). Nonprofit organizations were a very small share of new establishments (less than 1%).

Exhibit 23. Business Permits, City of Camas, 2020–2023
Source: City of Camas

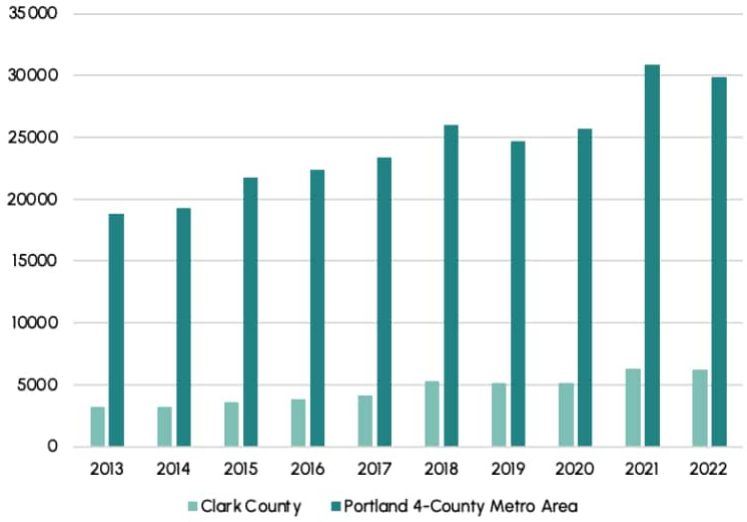


	2020	2021	2022	2023
Nonprofit	17	16	18	15
Home Occupation Business	872	591	429	302
General Business	1997	1664	1520	1211

In a regional context, 6,241 new business applications were filed in Clark County in 2022, growing steadily by more than double (106%) from the 3,031 business applications filed in 2012. The growth rate for the four-county area over this time period was only 58%, potentially indicating that Clark County has been successfully growing in their ability to attract new firms relative to the region.

Applications in Clark County accounted for approximately 26% of all new firms started within the four-county metro area (including Clark, Clackamas, Multnomah, and Washington Counties) in 2022.

Exhibit 24. Annual Business Applications, Clark County and 4-County Portland Metro (Clark, Multnomah, Washington, and Clackamas Counties), 2012–2022
Source: US Census Bureau, Business Formation Statistics. Note: This data is only available at the county level.



Fiscal Conditions

Fiscal conditions are critical indicators for economic development, which have implications for jurisdictions' capacity to invest in essential services and growth. In Washington state, the lack of income tax makes sales and other tax trends particularly important for understanding economic trends and impact on local budgets.

The City of Camas's taxable retail sales were higher than those in most comparable jurisdictions in Clark County over the past decade, competing primarily with the City of Battle Ground for the highest annual amounts. On a per capita basis, Camas had higher taxable retail sales than unincorporated areas of the County, but slightly lower sales than the Cities of Battle Ground or Washougal. In 2022, total taxable retail sales reached an all-time high of over $600 million (

Exhibit 26). In Clark County overall, the City of Vancouver and unincorporated areas had by far the highest volume of taxable retail sales, with Vancouver reaching over $6.3 billion in 2022 (

Exhibit 27).

Exhibit 25. Per Capita Taxable Retail Sales by Clark County Jurisdictions, 2012-2022 (in 2022$)
Source: WA Dep. of Commerce, US Bureau of Labor Statistics Inflation Calculator. Average Annual Growth Rate (AAGR).

JURISDICTION	2012 (IN 2022$)	2022	% CHANGE 2012-2022 (ADJ.)	AAGR
City of Camas	**$12,986**	**$19,214**	**48.0%**	**4.8%**
Unincorporated Clark County	$8,333	$13,860	66.3%	6.6%
City of Battle Ground	$13,241	$27,629	108.7%	10.9%
City of Washougal	$9,845	$20,295	106.1%	10.6%

Exhibit 26. Total Taxable Retail Sales for City of Camas and Comparison Geographies, 2012-2022

Source: Washington Department of Commerce
Note: Total amounts for by year are in nominal dollars (not adjusted for inflation).

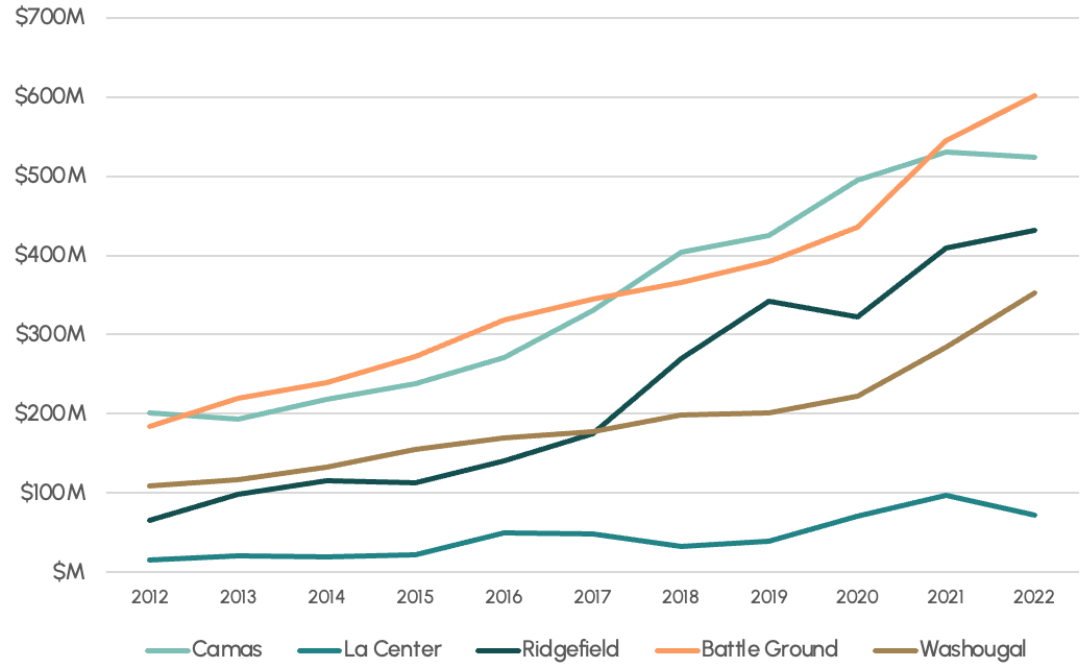
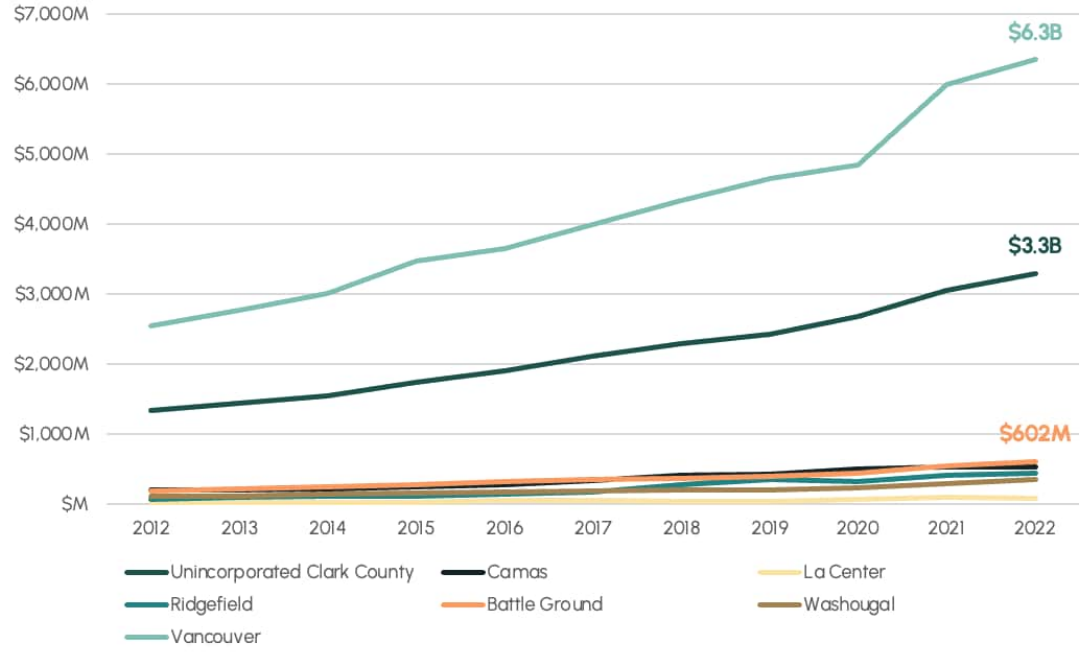


Exhibit 27. Total Taxable Retail Sales for City of Camas and Clark County, 2012-2022

Source: Washington Department of Commerce
Note: Total amounts for by year are in nominal dollars (not adjusted for inflation).



Economic Opportunities

Real Estate Market Conditions and Trends

Understanding Camas's real estate market opportunities can indicate what industries might locate and grow in the City, based on historic and current demand patterns across different real estate types. This section details Camas's commercial real estate conditions and identifies market drivers and trends that will influence the market appeal and viability of commercial uses in the area.

This report primarily covers nonresidential commercial real estate including office, industrial, and retail building types, as well as multifamily trends to illustrate opportunities for mixed-use development. The Housing Needs Assessment portion of this Comprehensive Plan Update covers the residential real estate market in greater depth. The exhibits in the section below show historical trends in the average effective rent rates and average annual vacancy rates for the analysis. In general, the analysis shows trends in Triple-Net (NNN) rents, vacancy rates, and deliveries (these are described below). This section also looks back to trends in the past decade years, capturing a longer cycle of real estate trends.

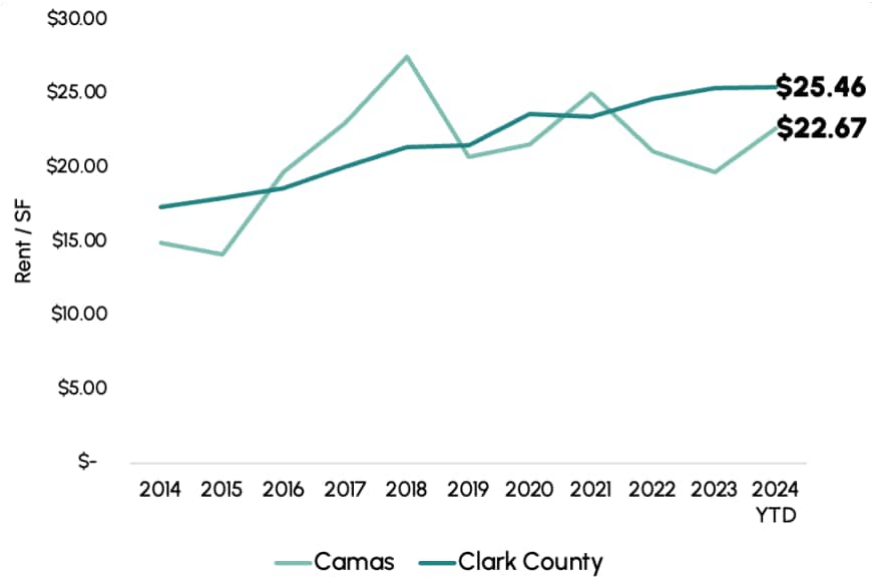
- **Triple-Net (NNN):** Represents annual rents on a per-square-foot (PSF) basis, not including any pass-through expenses such as taxes, insurance, and utilities or maintenance costs.
- **Vacancy Rates:** Represents how much space per-square-foot (PSF) is vacant in a submarket.
- **Deliveries:** Represent the total amount of new square feet of each product type that has been added to the market on an annual basis.
- **Net Absorption:** Represent annual net square feet of new occupancy or vacancy of space accounting for deliveries.

Office Market

Office space in the City of Camas made up about 6.5% of Clark County's overall office stock in 2023.

Rents PSF for office space grew in both the City and the County since 2014. The average rent in Camas fluctuated over the past ten years and were slightly below the County average in 2024 year-to-date (YTD) at $22.67 and $25.46 PSF respectively.

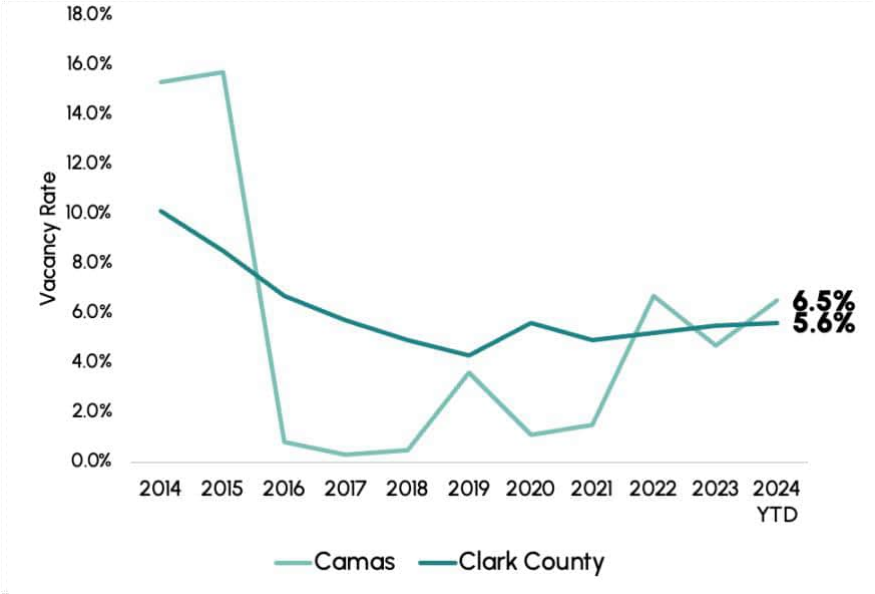
Exhibit 28. Average Office Rent per Square Foot, Camas and Clark County, 2014-2024 YTD
Source: CoStar



Vacancy rates in Camas also fluctuated over the last ten years, falling from a high of nearly 16% in 2015. In comparison, Clark County's office vacancy rates steadily fell in general since 2014, with a slight increase in 2020.

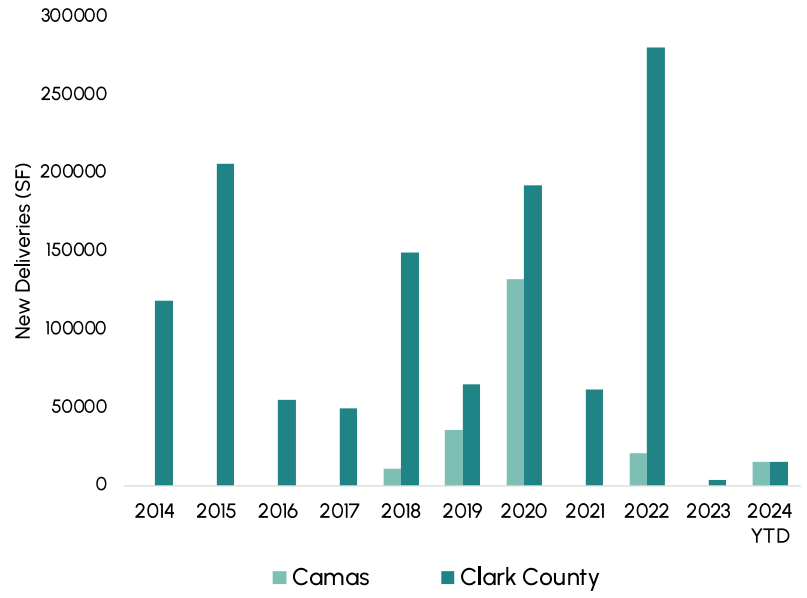
While many places throughout the United States saw spiking office vacancies in 2020 with, the City and County avoided this trend.

Exhibit 29. Average Office Vacancy Rate, Camas and Clark County, 2014-2024 YTD
Source: CoStar



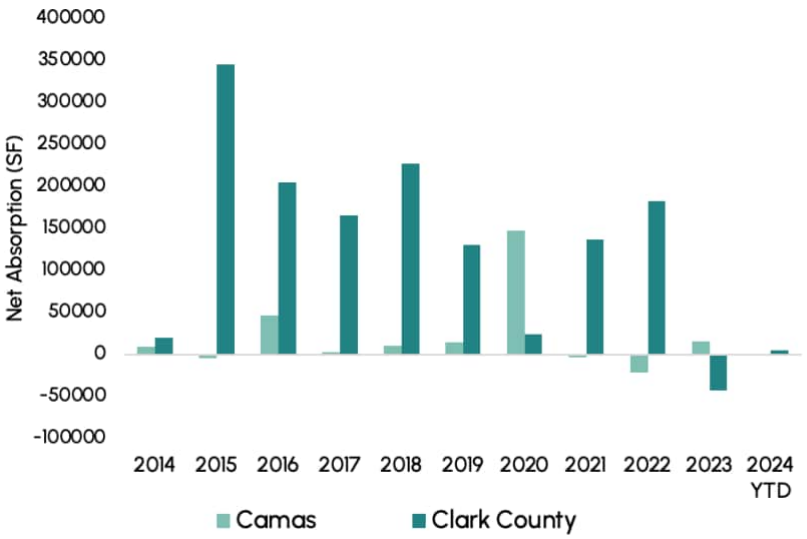
The City of Camas had its largest delivery of new office space in the last decade in 2020, adding approximately 132,000 new square feet to the market. Other areas of Clark County saw larger deliveries in 2022 and 2015.

Exhibit 30. Office Deliveries, Camas and Clark County, 2014-2024 YTD
Source: CoStar



The City and the County have generally had positive net absorption of office space since 2014, with some negative absorption in the City in 2022 (approximately 21,000 SF).

Exhibit 31. Office Net Absorption, Camas and Clark County, 2014-2024 YTD
Source: CoStar

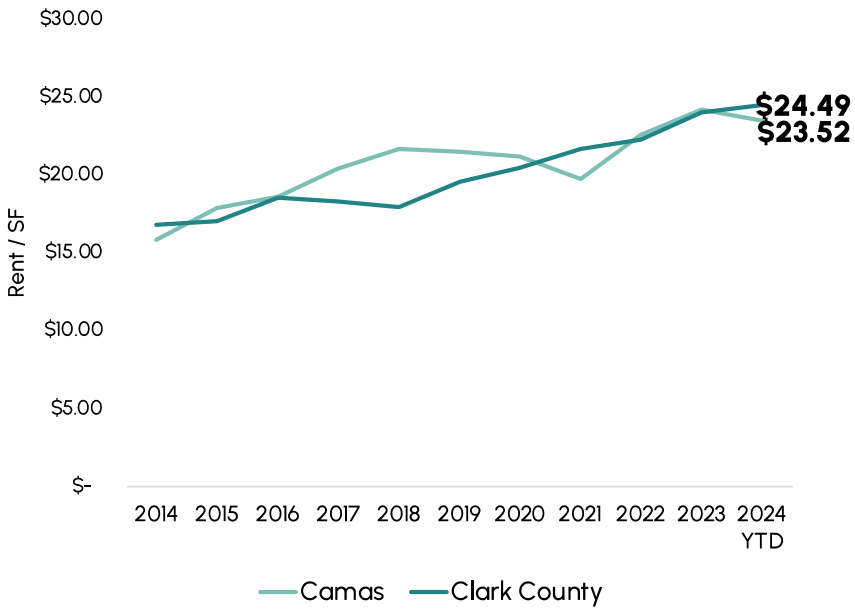


Retail Market

Camas's square footage of retail space made up about 4.2% of Clark County's overall inventory.

Retail rents PSF in Camas generally tracked closely with Clark County trends since 2014, showing slight upward growth. Rents in the City were slightly lower than the County in 2024 YTD at $23.52 PSF compared to $24.49.

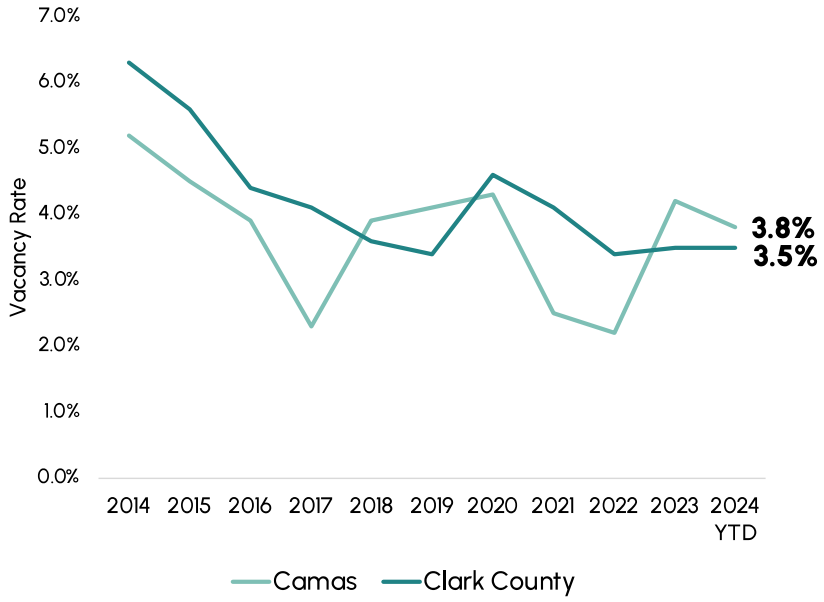
Exhibit 32. Average Retail Rent per Square Foot, Camas and Clark County, 2014-2024 YTD
Source: CoStar



Retail vacancies have fluctuated in Camas and Clark County over the past decade, with a general downward trend since 2014. Retail vacancies were slightly higher in Camas than Clark County in 2024 YTD at 3.8% compared to 3.5%.

Rising rents PSF coupled with falling vacancy rates indicate increasing demand for retail in both areas. However, some level of vacancy is indicative of a healthy market with natural turnover.

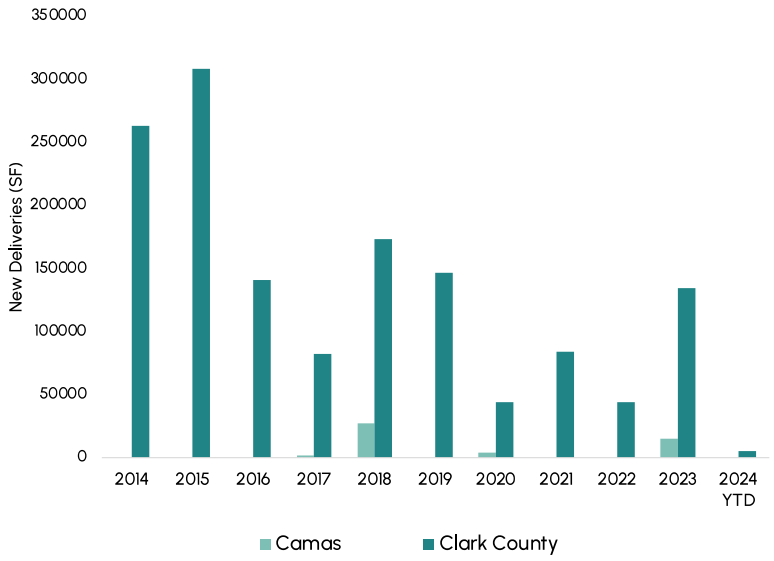
Exhibit 33. Average Retail Vacancy Rate, Camas and Clark County, 2014-2024 YTD
Source: CoStar



Clark County has seen large deliveries of new retail space primarily in 2014 and 2015, as well as additions of square footage in 2018 and more recently in 2023.

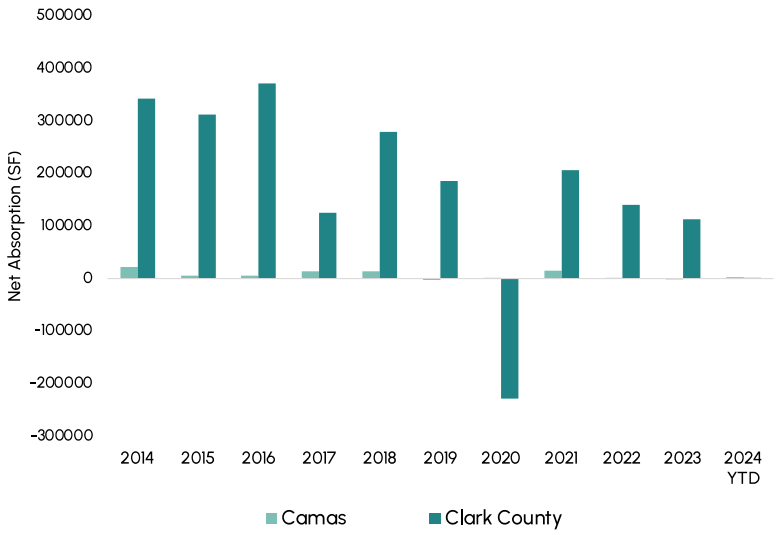
In Camas, there have been some years with small spikes of deliveries in the last decade, with the largest increase of about 27,000 SF in 2018 and 15,000 SF in 2023.

Exhibit 34. Retail Deliveries, Camas and Clark County, 2014-2024 YTD
Source: CoStar



Retail absorption has also been generally positive since 2014 in both the City and County, with the notable exception of about 229,000 square feet of negative absorption in Clark County in 2020. This is likely due to challenges in the wake of the 2020 pandemic.

Exhibit 35. Retail Net Absorption, Camas and Clark County, 2014-2024 YTD
Source: CoStar



Industrial and Manufacturing Market

The City of Camas is home to about 3.9% of Clark County's industrial real estate in square footage.

Since 2014, the County has generally had slow growth in industrial rents PSF, with an increase in 2022 and an average of $11.04 PSF in 2024 YTD.

The City of Camas saw a sharp increase of industrial rents PSF in 2022, growing by over 200% year-over-year (YOY). In 2024 YTD, industrial rent in Cams was $23.00 PSF.

Vacancy rates for industrial real estate were extremely low in Camas in 2024 YTD at 1.7%, indicating high demand in the industrial market locally. Since 2015, industrial vacancies have generally been very low in the City with the exception of 2021.

In comparison, industrial vacancies in Clark County have been generally low and steady, standing at 5.2% in 2024 YTD.

Exhibit 36. Average Industrial Rent per Square Foot, Camas and Clark County, 2014-2024 YTD
Source: CoStar

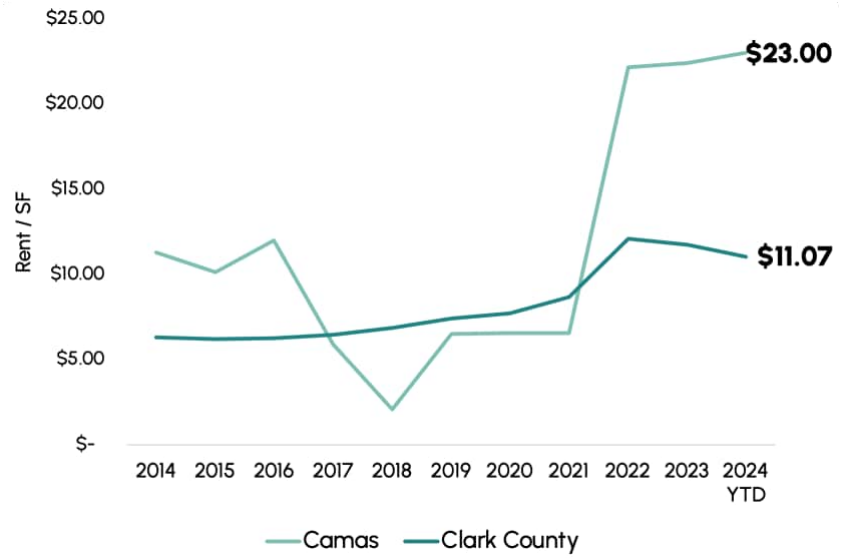
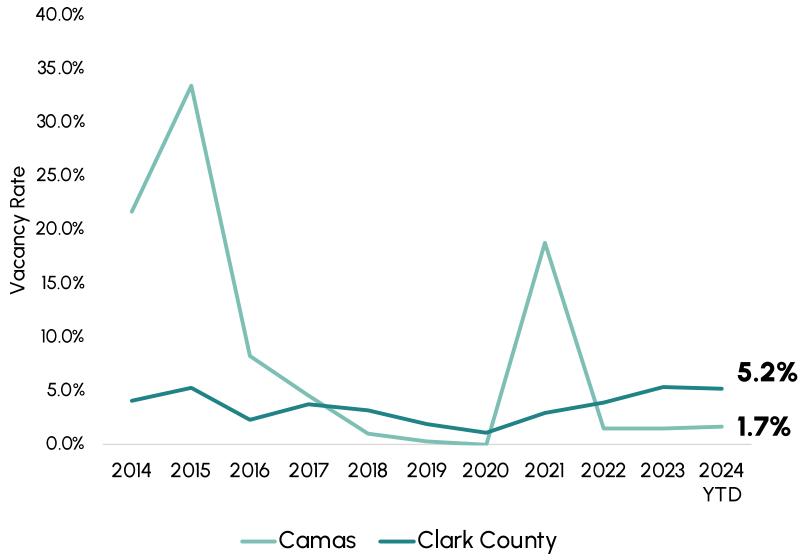


Exhibit 37. Average Industrial Vacancy Rate, Camas and Clark County, 2014-2024 YTD
Source: CoStar

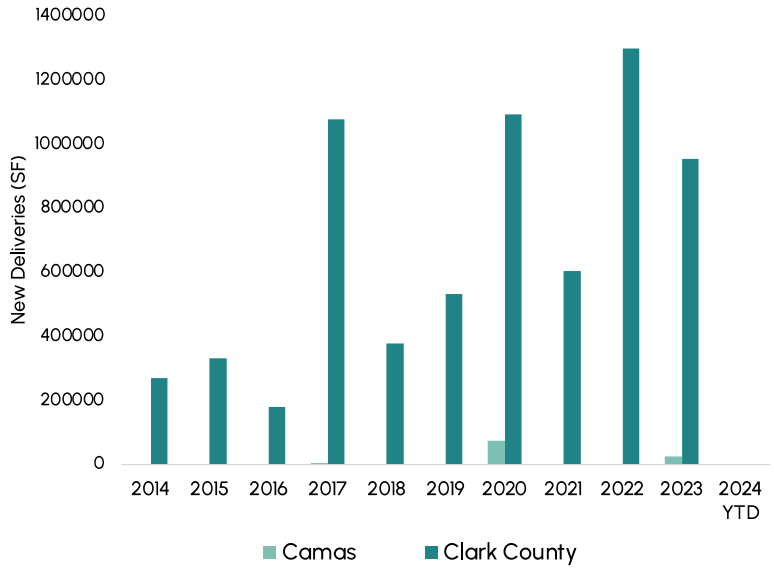


Clark County has seen growing industrial deliveries in the latter half of the 2010s and early 2020's, with large additions of new industrial space in 2017, 2020, and 2022.

Camas has seen fewer new deliveries but had its largest amount of new square footage added in 2020 (75,000 SF).

Exhibit 38. Industrial Deliveries, Camas and Clark County, 2014-2024 YTD

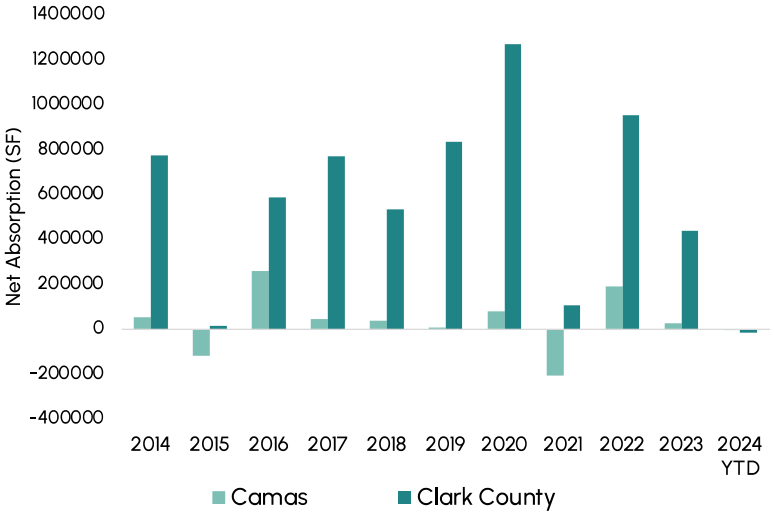
Source: CoStar



New industrial space has also generally had positive absorption in the City and County, although new deliveries from 2020 had negative absorption initially in 2021.

Exhibit 39. Industrial Net Absorption, Camas and Clark County, 2014-2024 YTD

Source: CoStar



Mixed Use Development Opportunities

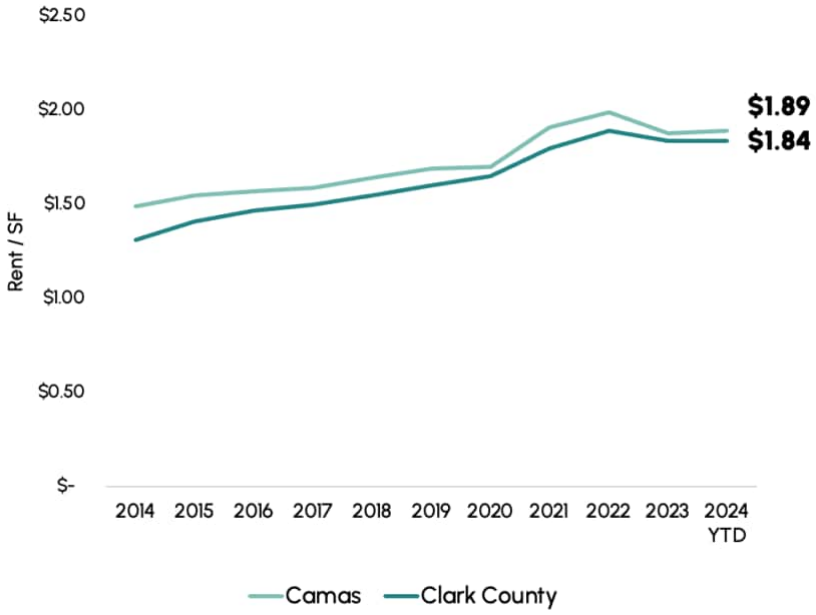
Mixed-use development with commercial and residential retail has seen growing demand nationally in recent years, as demand grows for dense, walkable areas. Trends in multifamily real estate in Camas show potential for combining demand for rental units with increases in the City's office or retail inventory.

Multifamily Residential Market

Camas's multifamily units make up about 4 % of units in the County.

Camas's multifamily rents PSF have closely followed Clark County overall, remaining slightly lower over the past decade. In 2024 YTD, multifamily rents in the City were $1.84 PSF compared to $1.89 PSF in the County.

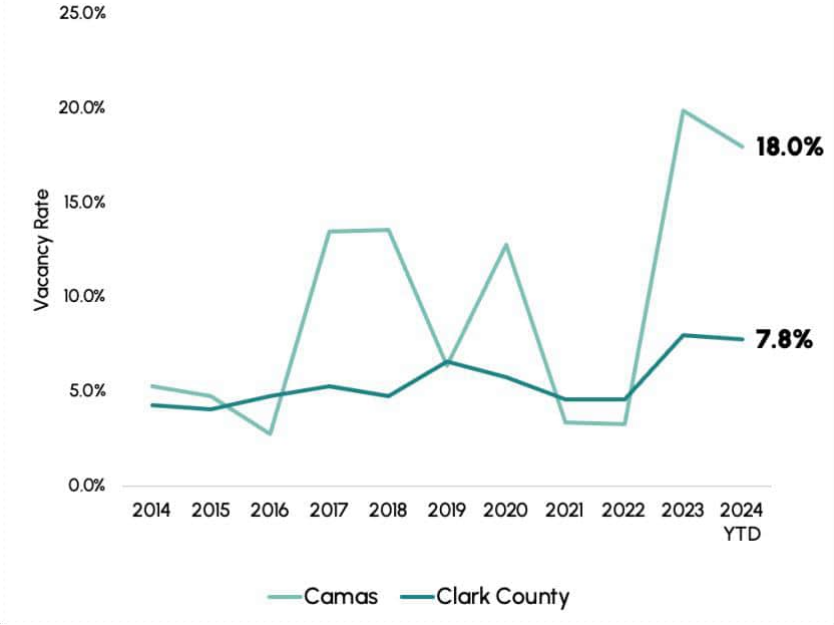
Exhibit 40. Average Multifamily Rent per Square Foot, Camas and Clark County, 2014-2024 YTD
Source: CoStar



Multifamily rents were high in 2023 and 2024 YTD in Camas County, although this spike corresponds with a recent delivery of 389 units in 2023 (the largest annual number of units delivered in the past ten years). Increasing vacancies in 2017 and 2020 also track with new multifamily units delivered.

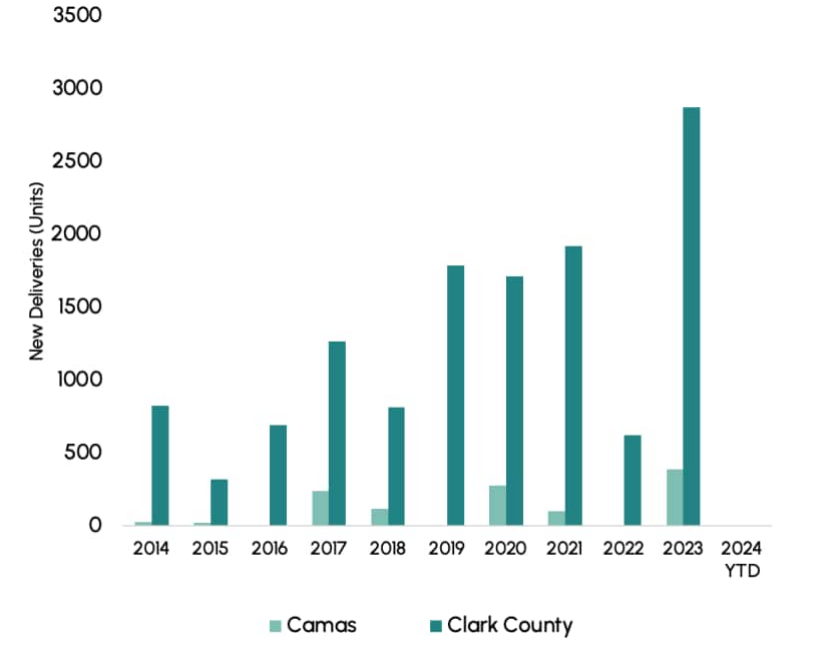
Multifamily vacancies were 7.8% in Clark County overall in 2024 YTD, also indicating increasing vacancies over time.

Exhibit 41. Average Multifamily Vacancy Rate, Camas and Clark County, 2014-2024 YTD
Source: CoStar



Clark County has seen an increase in multifamily deliveries in the past ten years, with the largest number of new units in 2023 (2,872 units).

Exhibit 42. Multifamily Deliveries, Camas and Clark County, 2014-2024 YTD
Source: CoStar



Downtown Camas Analysis

The following charts measure visitation by visitors, employees, and residents in Downtown Camas from 2017 to 2024. Visitation trends help in providing insights into how the city is rebounding after the COVID-19 pandemic, using Placer.ai's foot traffic analytics platform integrating proprietary artificial intelligence to estimate the number of visits based on GPS data.10 Visitor and employee visits have increased to pre-pandemic levels and visitation by residents has been trending upward in recent years. Overall, this indicates a healthy level of foot traffic in the Downtown area showing an upward trajectory with visitors, employees, and residents coming to the Downtown area for shopping, work, or other purposes. Market analysis of retail activity in Downtown Camas shows retail rents increasing rapidly from approximately $15 per square foot in 2022 to almost $35 per square foot in 2024, the highest rate measured from 2017 to 2024. In addition, the vacancy rates for retail have remained very low below 1.5% since 2014 which is lower than the retail vacancy rates in both the City of Vancouver (3.7%) and Clark County (3.7%) in 2023, likely indicating increased demand for retail space above the available supply.

[10] Placer.ai uses anonymous mobile phone location data to estimate visitation. A "visit" is triggered in Placer.ai's database when a cell phone seeks two Wi-Fi signals five to fifteen minutes apart (this range differs by cell phone operating system; e.g., an Android phone scans for Wi-Fi every three to seven minutes). While this means that visitors may be counted multiple times, this data is useful to provide a relative picture of trends over time.

Exhibit 43. Downtown Camas

Source: ECOnorthwest, SERA Architects



Exhibit 44. Downtown Camas Visitor Visits, 2017-2024

Source: Placer.ai

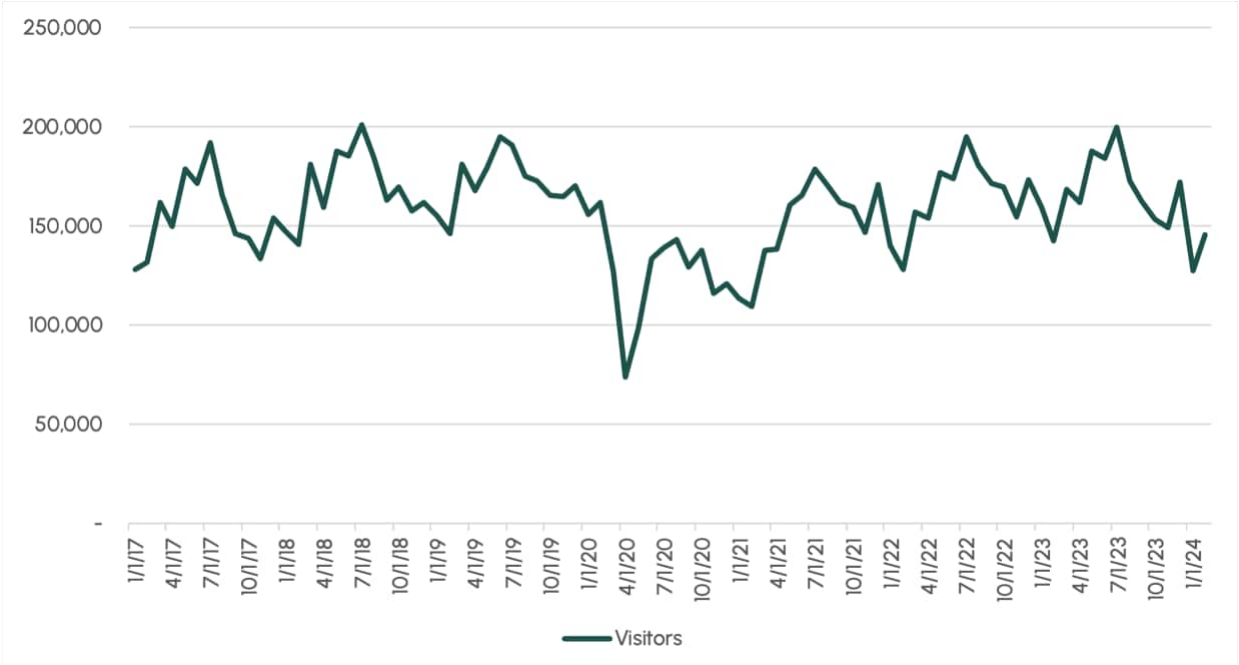


Exhibit 45. Downtown Camas Employee Visits, 2017-2024
Source: Placer.ai

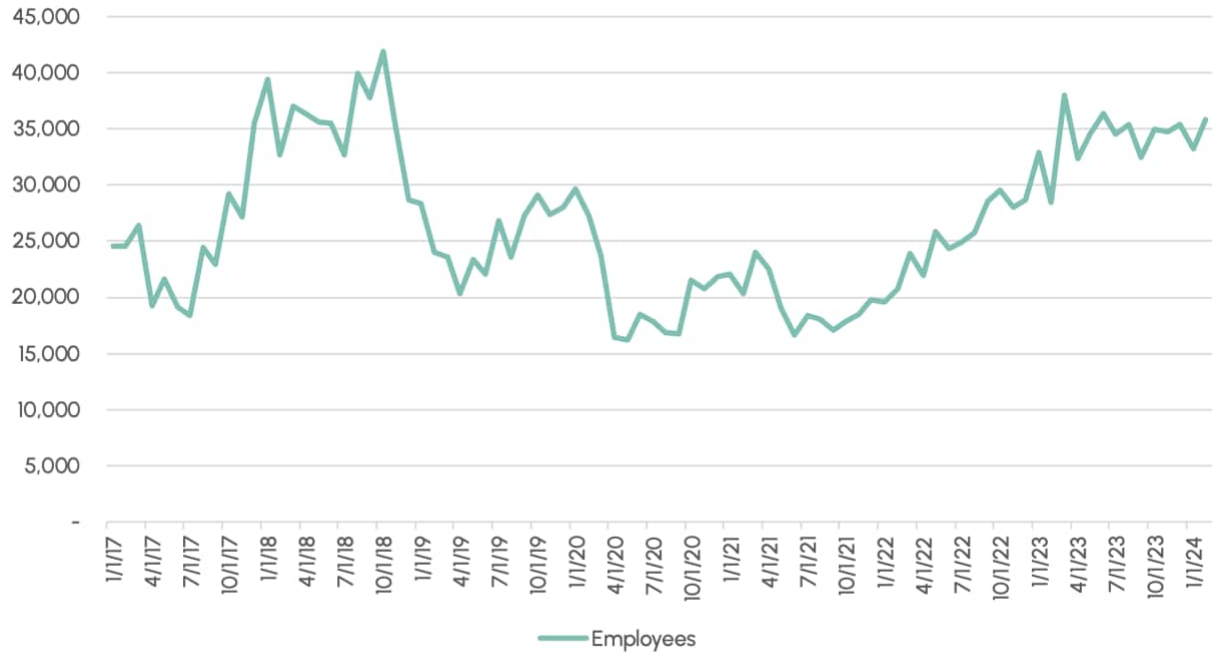


Exhibit 46. Downtown Camas Resident Visits, 2017-2024
Source: Placer.ai

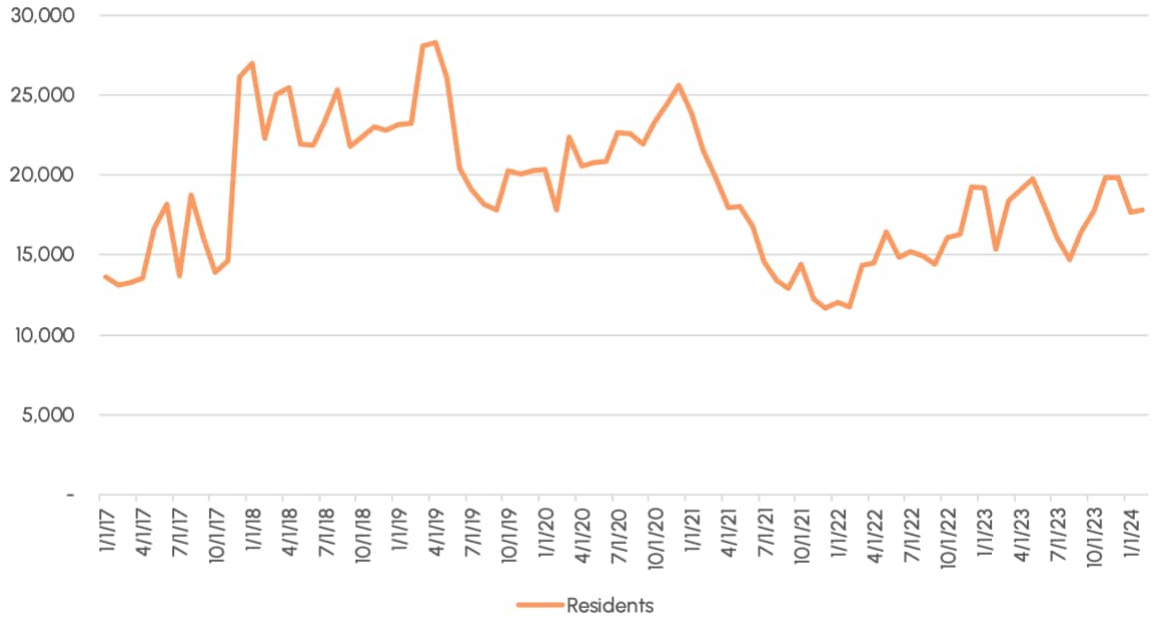
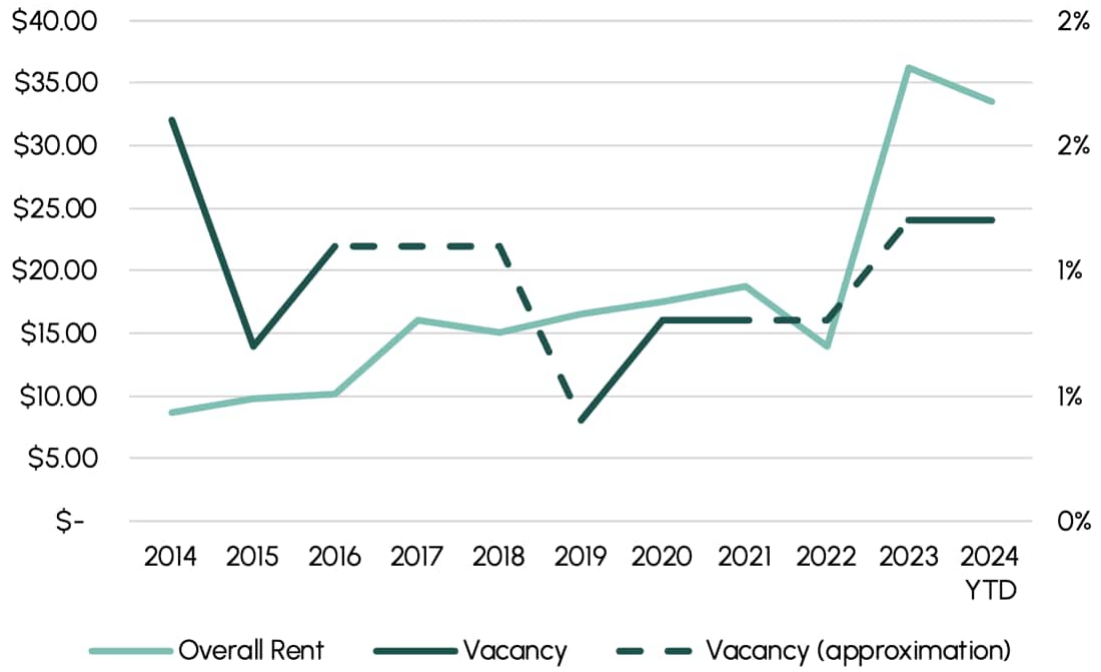


Exhibit 47. Average Retail Rent per Square Foot and Average Retail Vacancy Rate (%) in Downtown Camas, 2014-2024 Year to Date (YTD)

Source: CoStar



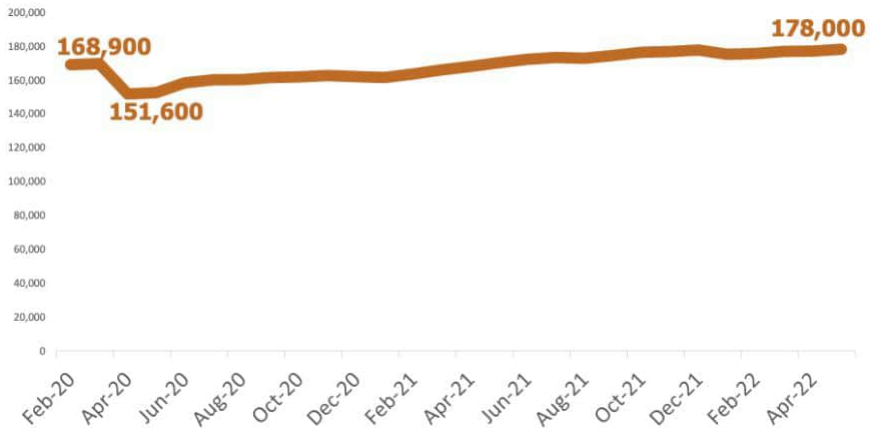
Competitive Position

As part of Clark County and the Portland Metro Area, Camas is interconnected with the regional economy. This section provides an overview of regional context and Camas's competitive position within the area to provide a basis for economic development policies.

Clark County overall has demonstrated considerable economic resilience and growth coming out of the COVID-19 pandemic. The county has recovered nearly all pandemic job losses, adding over 15,000 workers since early 2020, while many communities in the region and across the nation have experienced unpredictable changes in employment patterns.

Exhibit 48. Clark County Nonfarm Employment: February 2020 – May 2022

Source: Washington Employment Security Department, Nonfarm Employment, CREDC analysis



While the County's total population has also grown quickly in recent years, smaller communities like Camas are outpacing Vancouver with fast growth in population.

Like other smaller cities in Clark County, Camas has seen a higher rate of growth compared with Vancouver or unincorporated Clark County, more than doubling its number of residents since 2000.

Investment in quality-of-life amenities as well as new housing development and land annexations have contributed to this growth for Camas.

Camas shows some characteristics of a "bedroom community," but is expected to expand its local employment in coming decades. In 2020, the share of workers commuting to Vancouver from Camas increased and was the sixth largest group of workers in Vancouver. However, the County's projections for employment indicate that Camas will add more jobs than any city outside of Vancouver by 2045, primarily on its industrial lands.

Exhibit 49. Population % Change by Clark County Jurisdiction, 2000-2022
Source: Office of Financial Management Population Estimates

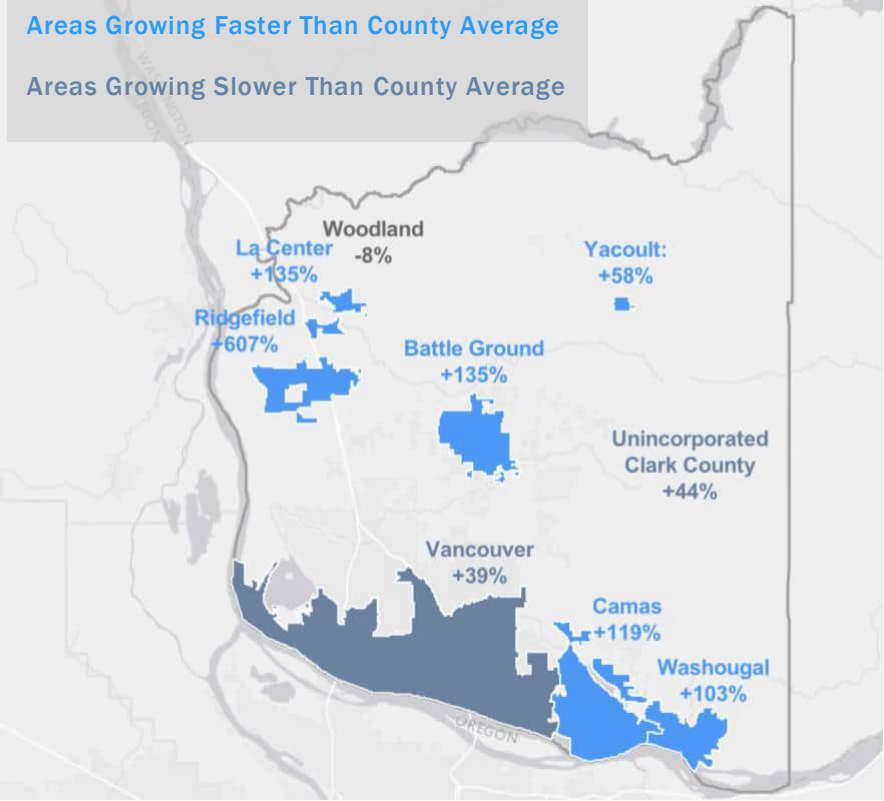
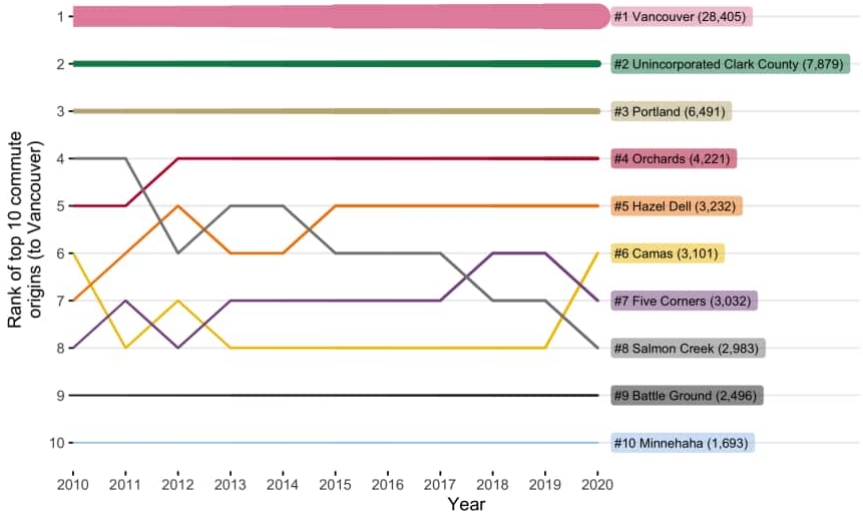


Exhibit 50. Top Commute Origins to Vancouver, 2010-2020
Source: LEHD-LODES, 2010-2020



Initial SWOT Analysis (to be updated after engagement)

SWOT analysis refers to an assessment of Strengths, Weaknesses, Opportunities, and Threats (SWOT). These represent internal and external factors that can have positive or negative impacts on economic outcomes in Camas. Exhibit 51 below outlines key findings for these factors in Camas when considering potential economic growth and development in the city.

Exhibit 51. SWOT Summary Analysis

CATEGORY	POSITIVE	NEGATIVE
INTERNAL	**Strengths:** • High quality of life amenities like parks and recreation opportunities. • Plans for place-based investments like waterfront development with Port of Camas-Washougal. • Downtown experiencing high visitation and high demand for retail spaces (increasing rents, low vacancy).	**Weaknesses:** • Rising housing costs, purchasing a home is unaffordable for those under 120% AMI. • High industrial rents and very low industrial real estate vacancies.
EXTERNAL	**Opportunities:** • Attract highly skilled workers with locational flexibility. • Develop pathways for youth to gain skills and seek jobs in Camas. • Identify target industries for managing land capacity and expected growth.	**Threats:** • Unequal rates of homeownership by race and ethnicity indicating unequal economic opportunities. • Disparities between remote and non-remote workers.

Appendix S: 6-Year Street Plan

Washington State Department of Transportation

Six Year Transportation Improvement Prog

Agency: City of Camas
Co. No.: 06 Co. Name: Clark Co.
City No.: 0145 MPO/RTPO: RTC

FROM: **2027** **TO:** **2032**
Hearing Date: 6/1/2026 Adoption Date: 6/15/2026
Amend Date: Resolution No: 26-008

Funetional Class	Priority Number	Project Identification A. Pin/Project No. B. STIP ID C. Project Title D. Road Name or Number E. Begin & End Termini F. Project Description G. Structure ID	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars Project Phase	Phase Start (yyyy)	Fund Source Information Federal Fund Code	Federal Funds	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule *(Local Agency)* 1st	2nd	3rd	4th thru 6th	Federally Funded Projects Only Envir. Type	R/W Required
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	1	***SR-500 (Everett St)*** NE 35th Ave to NE 43rd Ave from: to: Widen with multi-use paths, illumination, roundabouts	03	P	0.50		RW	1/1/2028	STBG	1000			381			1381				
							CN	1/1/2030					21200	21200				21200	CE	Yes
							Totals			1000		0	21581	21200	0	1381	0	21200		
16	2	***NW Lake Road*** @ NW Sierra St. from: to: Intersection improvements	24	P	00		CN	3/1/2027					3400	3400	3000	400				
							Totals			0		0	3400	3400	3000	400	0			
16	3	***SR-500 (Everett St)*** NE Lake Rd to NE 35th Ave from: to: Widen with multimodal, illumination, bridge replacement, roundabout	03	P	0.13		ALL	1/1/2029					26400	26400			1000	25400		
							Totals			0		0	26400	26400	0	0	1000	25400		
16	4	***North Shore Blvd.*** 400 Feet West of N Benton Drive to SR-500/Everett Rd from: to: New construction Includes Complete Streets, Bridge	01	P	0.40		CN	6/1/2028					25000	25000		20000	5000	25000		
							Totals			0		0	25000	25000	0	20000	5000	25000		
16	5	***North Shore Blvd*** 23700 Block to 400feet west of N. Benton Dr. from: to: New Construction Includes Complete Streets, Roundabouts	01	P	1.60		ALL	6/1/2028					22700	22700		14000	8700			
							Totals			0		0	22700	22700	0	14000	8700	0		
16	6	***NW Lake Road*** NW Lacamas Lane to Lacamas Lake Lodge from: to: Widening, sidewalk	03	P	0.45		ALL	6/1/2029					3870	3870			1000	2870		
							Totals			0		0	3870	3870	0	0	1000	2870		

Agency: City of Camas
Co. No.: 06 Co. Name: Clark Co.
City No.: 0145 MPO/RTPO: RTC

FROM: 2027 **TO:** 2032
Hearing Date: 6/1/2026 Adoption Date: 6/15/2026
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Funetional Class	Priority Number	Project Identification A. Pin/Project No. B. STIP ID C. Project Title D. Road Name or Number E. Begin & End Termini F. Project Description G. Structure ID	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars Project Phase	Phase Start (yyyy)	Fund Source Information Federal Fund Code	Federal Funds	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency) 1st	2nd	3rd	4th thru 6th	Federally Funded Projects Only Envir. Type	R/W Required
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
14	7	***ADA Access Upgrades*** from: Citywide to: (Ongoing)	28	P	0.00		ALL	1/1/2027					720	720	120	120	120	360		
							Totals			0		0	720	720	120	120	120	360		
16	8	***SR-500 (Everett St)*** NE 43rd Ave to N City Limits from: to: Widen with bike lanes, sidewalks two-way turn lane, illumination, roundabouts	03	P	0.83		PE	1/1/2032					1000	1000				1000		
							Totals			0		0	1000	1000	0	0	0	1000		
16	9	***Crown Road*** from: SE 23rd St. to NE 3rd Ave. Multimodal, turn lanes and intersection improvements	04	P	1.3		ALL	1/1/2030						13000				13000	CE	Yes
							Totals			0		0	0	13000	0	0	0	13000		
12	10	***SR-14 West Camas Slough Bridge*** from: to: Widen to 4 lanes NOTE: PE phase began 1/2006	03	P	0.55		ALL	1/1/2030			WSDOT	80000		80000				80000		
							Totals			0		80000	0	80000	0	0	0	80000		
17	11	***NE Goodwin Road/28th Street*** NW Camas Meadows Dr. to NE 232nd Ave. from: to: Widen to 5 lanes with bike lanes, sidewalk west of Ingle Widen to 3 lanes with bike lanes, sidewalk east of Ingle	15	P	1.72		ALL	1/1/2030						29300				29300		
							Totals			0		0	0	29300	0	0	0	29300		
00	12	***North Shore Blvd.*** NE 232nd Ave. to 23700 Block from: to: New construction Includes Critical Areas and Alignment Investigation	15	P	0.50		ALL	6/1/2030						2200				2200		
							Totals			0		0	0	2200	0	0	0	2200		
14	13	***NW/NE 6th Avenue Corridor Improvements*** NW Norwood to NE Adams from: to: Access and multimodal upgrades	04	P	1.70		PE	1/1/2029						250				250		
							Totals			0		0	0	250	0	0	0	250		

Agency: City of Camas
Co. No.: 06 Co. Name: Clark Co.
City No.: 0145 MPO/RTPO: RTC

FROM: 2027 **TO:** 2032
Hearing Date: 6/1/2026 Adoption Date: 6/15/2026
Amend Date: Resolution No: 26-008

Functional Class	Priority Number	Project Identification A. Pin/Project No. B. STIP ID C. Project Title D. Road Name or Number E. Begin & End Termini F. Project Description G. Structure ID	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars Project Phase	Phase Start (yyyy)	Fund Source Information Federal Fund Code	Federal Funds	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency) 1st	2nd	3rd	4th thru 6th	Federally Funded Projects Only Envir. Type	R/W Required
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	14	***NW Brady Road*** NW McIntosh Road to West City Limits from: to: Road, Bike & Pedestrian Improvements	04	P	.50		PE	1/1/2030						5				5		
							Totals			0		0	0	5	0	0	0	5		
17	15	***NW McIntosh Road*** NW Brady Rd. to NW 11th Ave. from: to: Widening, bike lanes, sidewalk	15	P	1.2		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
17	16	***NE 43rd Avenue*** from: SR-500 to: East City Limits Widen to 3 lanes with bike lanes, sidewalk	03	P	0.36		ALL	1/1/2031						6480				6480		
							Totals			0		0	0	6480	0	0	0	6480		
00	17	***Downtown Infrastructure*** NE 3rd to NE 7th, NE Adams to NE Garfield from: to: Pavement and sidewalk Rehab, ADA upgrades	06	P	0	SWPO	ALL	1/1/2030						1735				1735		
							Totals			0		0	0	1735	0	0	0	1735		
00	18	***North Dwyer Creek Master Plan Street "B"*** NW Friberg St./Strunk to NW Larkspur St. from: to: New construction	15	P	0.90		PE	1/1/2032						5				5		
							Totals			0		0	0	5	0	0	0	5		
19	19	***NW Payne Street*** NW Lake Rd. to NW Camas Meadows Dr. from: to: Widening, bike lanes, sidewalk	03	P	0.40		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
17	20	***NW 23rd Avenue*** NW Astor to NW Sierra from: to: Widening, sidewalk	04	P	0.23		ALL	1/1/2030						650				650		
							Totals			0		0	0	650	0	0	0	650		

Agency: City of Camas
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FROM: 2027 **TO:** 2032
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Funetional Class	Priority Number	Project Identification A. Pin/Project No. B. STIP ID C. Project Title D. Road Name or Number E. Begin & End Termini F. Project Description G. Structure ID	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars Project Phase	Phase Start (yyyy)	Fund Source Information Federal Fund Code	Federal Funds	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency) 1st	2nd	3rd	4th thru 6th	Federally Funded Projects Only Envir. Type	R/W Required
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
00	21	***North Dwyer Creek Master Plan Street "A"*** NW Lake Rd. to NW Camas Meadows Dr. from: to: New construction	15	P	0.64		PE	1/1/2027						5	5					
							Totals			0		0	0	5	5	0	0	0		
17	22	***NW Leadbetter Drive*** NW Lake Rd. to NW Fremont St. from: to: Sidewalk / path	28	P	0.15		CN	1/1/2030						250				250		
							Totals			0		0	0	250	0	0	0	250		
17	23	***NE 28th Street & NE 232nd Avenue*** from: to: Intersection improvements	04	P	0.00		ALL	6/1/2030						600				600		
							Totals			0		0	0	600	0	0	0	600		
17	24	***NW Astor Street/NW 11th Avenue*** NW 16th Ave. to McIntosh Rd. from: to: Widening, bike lanes, sidewalk	03	P	0.62		PE	1/1/2030						5				5		
							Totals			0		0	0	5	0	0	0	5		
16	25	***NW 18th Avenue, et al*** NW Astor to NW 16th, include NW Hood from: to: Widen curb, sidewalk	03	P	0.51		PE	1/1/2029						5				5		
							Totals			0		0	0	5	0	0	0	5		
19	26	***NW 20th Ave Extension*** NW Sage St to NW 18th Ave from: to: New Construction with multimodal	01	P	0.18		PE	1/1/2030						5				5		
							Totals			0		0	0	5	0	0	0	5		
16	27	***NW 18th Avenue*** NW Tidland St. to NW Brady Rd. from: to: Sidewalk / path	01	P	0.26		PE	1/1/2029						5				5		
							Totals			0		0	0	5	0	0	0	5		

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							Project Phase	Phase Start (yyyy)	Fund Source Information Federal Fund Code	Federal Funds	State Fund Code	State Funds	Local Funds	Total Funds	1st	2nd	3rd	4th thru 6th	Envir. Type	R/W Required
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	28	**NW 18th Avenue** NW 20th Extension to West City Limits from: to: Widening, bike lanes	03	P	0.50		PE	1/1/2030						5				5		
							Totals			0		0	0	5	0	0	0	5		
16	29	***NW 43rd/NW Astor - NW Sierra to NW 38th Impr.*** from: to: Widening, bike lanes, sidewalk	03	P	0.31		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
17	30	***NE 232nd Avenue*** NE 28th to NE North Shore Blvd. from: to: Widen to 3 lanes with bike lanes, sidewalk	15	P	0.97		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
00	31	***NE Woodburn Drive*** SE 283rd Ave. to SE 15th St. from: to: New construction Includes 23rd St. realignment	01	P	.70		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
07	32	***SE 15th Street/Nourse Road*** from: Camas High School to: NE 283rd Ave. Widen to 3 lanes with bike lanes, sidewalk	15	P	0.59		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
00	33	***NE 18th Street*** NE 192nd Ave. to NE Goodwin Rd. from: to: New construction (potential alternate alignment)	15	P	0.67		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
17	34	***NE 28th Street*** NE 232nd Ave. to NE 242nd Ave. from: to: Widen to 3 lanes with bike lanes	15	P	0.50		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	35	***NW Camas Meadows Drive*** NE 13th St. to NE 18th St. from: to: New construction (potential alternate alignment)	15	P	0.20		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
00	36	***NE 242nd Avenue*** NE 28th St. to NE North Shore Blvd. from: to: Widen to 3 lanes with bike lanes, sidewalk	15	P	0.70		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
19	37	***NW Maryland Street*** NW 19th to NW 24th from: to: New construction	01	P	0.25		PE	6/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
16	38	***NW Pacific Rim @ Parker Street*** from: to: Traffic signal	15	P	00		PE	6/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
17	39	***NE Ingle Road-NE Goodwin to N City Limits*** Goodwin to N City Limits from: to: widen to 3 lanes with bike lanes, sidewalk	03	P	1.30		PE	6/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
09	40	***SE 8th St / 271st Ave*** from: SR-500 to: 15th St	01	P	0.80		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
16	41	***SR500 (Everett St) @ NE Everett Dr*** from: to: Roundabout	01	P	00		ALL	1/1/2027					5450	5450	5000	450				
							Totals			0		0	5450	5450	5000	450	0	0		

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	42	***North Shore Blvd @ 24800 BLK*** from: to: Roundabout	01	P	00		ALL	1/1/2028					3175	3175		2700	475			
							Totals			0		0	3175	3175	0	2700	475	0		
16	43	***North Shore Blvd @ NE 252nd Ave*** from: to: Roundabout	01	P	00		ALL	1/1/2028					3175	3175		3000	175			
							Totals			0		0	3175	3175	0	3000	175	0		
16	44	***NE 28th Street @ 242nd Avenue*** from: to: Intersection improvements	15	P	00		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
16	45	***SR-500*** @ NE 14th Ave. from: to: Controlled Access	04	P	00		PE	1/1/2031						5				5		
							Totals			0		0	0	5	0	0	0	5		
00	46	***Pavement Treatments (maintenance & preservation)*** from: Overlays, surface treatmer to:	47	P	00		CN	6/1/2027					9000	9000	1500	1500	1500	4500		
							Totals			0		0	9000	9000	1500	1500	1500	4500		
00	47	***Reconstructs*** from: Citywide to:	04	P	00		ALL	1/1/2027						1500	250	250	250	750		
							Totals			0		0	0	1500	250	250	250	750		
00	48	***Sidewalk Projects*** from: Sidewalk installations City to:	28	P	00		ALL	1/1/2027					300	300	50	50	50	150		
							Totals			0		0	300	300	50	50	50	150		

Agency: City of Camas
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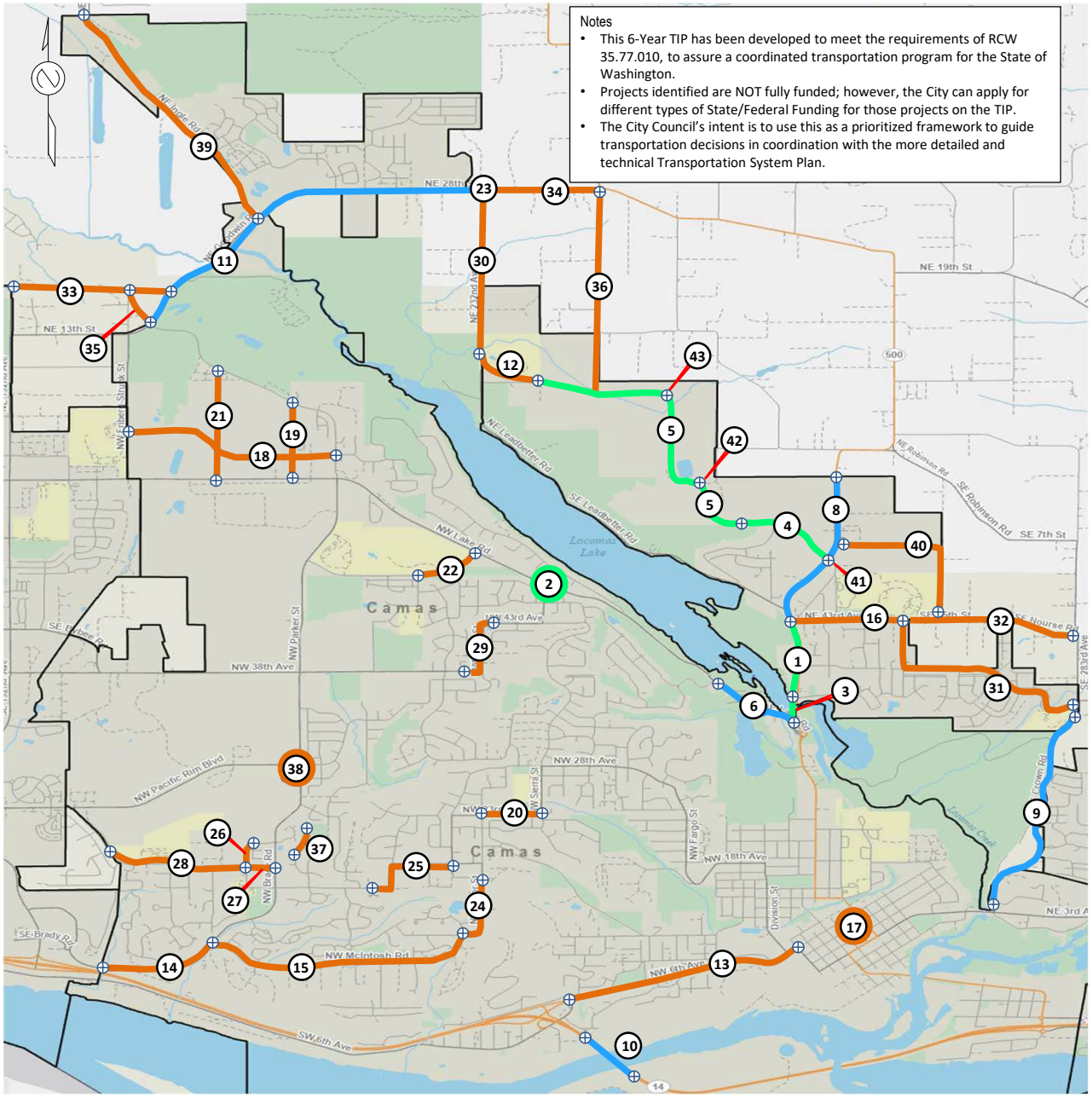
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
00	49	***Shared Path Improvements*** Citywide Includes NW Norwood Dr	28	P	00		ALL	1/1/2028						250		50	50	150		
							Totals			0		0	0	250	0	50	50	150		
00	50	***Safety Projects*** Future safety projects Includes traffic revisions, NW Lake Rd Safety Improvements	21	S	00		CN	4/1/2027	HSIP	930				930	930	20	20	60		
							Totals			930		0	0	930	930	20	20	60		



City of Camas
2027 – 2032
Six Year Street Priorities

1 SR 500 (Everett St)
2 Lake Rd. & NW Sierra St. Roundabout
3 SR 500 (Everett St)
4 North Shore Blvd.
5 North Shore Blvd.

6 NW Lake Rd
7 ADA Access Upgrades Citywide
8 SR 500 (Everett St/Rd)
9 SE Crown Rd
10 SR 14 – West Camas Slough Bridge
11 NE Goodwin Rd/28th St

12 North Shore Blvd.
13 NW/NE 6th Ave Corridor Imp
14 NW Brady Rd
15 NW McIntosh Rd
16 NE 43rd Ave
17 Downtown Infrastructure
18 Street "B" (North Dwyer Creek Area)
19 NW Payne St.
20 NW 23rd Ave
21 Street "A" (North Dwyer Creek Area)
22 NW Leadbetter Dr Path
23 NE 28th St & NE 232nd Ave Intersection Imp.
24 NW Astor St.
25 NW 16th Ave/Hood/18th Ave
26 NW 20th Ave. Extension
27 NW 18th Ave Pedestrian Path
28 NW 18th Ave/Payne Rd
29 NW Astor St. /43rd Ave
30 NE 232nd Ave
31 NE Woodburn Dr.
32 SE 15th St./Norse Rd
33 NE 18th St (192nd to Goodwin)
34 NE 28th St (232nd to 242nd)
35 NW Camas Meadows Dr (West)
36 NE 242nd Ave
37 NW Maryland St
38 NW Pacific Rim / Parker St. Signal
39 NE Ingle Rd to N City Limits
40 SE 8th St / 271st Ave
41 SR500 & Everett Dr Roundabout
42 North Shore Blvd & 24800 Blk Roundabout
43 North Shore Blvd & 252nd Roundabout

See List for Additional Priorities
Six Year Street Plan Map 2026-2031 (File 2027-2032 (STIP)

City of Camas WASHINGTON

Appendix T: Camas School District Capital Facilities Plan

CAMAS SCHOOL DISTRICT
CAPITAL FACILITIES PLAN
2022 – 2028



Board of Directors

District I	**Corey McEnry**
District II	**Erika Cox**
District III	**Connie Hennessey**
District IV	**Doug Quinn**
District V	**Tracey Malone**

Interim Superintendent
Doug Hood

Adopted by the Camas School District Board of Directors

May 23, 2022

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Appendix A – School Impact Fee Calculations
Appendix B – Population and Enrollment Data

I. EXECUTIVE SUMMARY

The Washington State Growth Management Act (the "GMA") includes schools in the category of public facilities and services. The Camas School District ("District") is required by Clark County ("County") and the Cities of Camas, Washougal, and Vancouver ("Cities") to adopt a capital facilities plan to satisfy the requirements of the GMA and to identify school facilities necessary to meet the educational needs of current and projected enrollment growth for a six-year period. Due to the uncertainty of the impact of COVID-19 pandemic on student enrollment and public education and at the request of several school districts, including the District, Clark County suspended until 2022, their four-year update requirement.

The District has prepared a 2022 Capital Facilities Plan ("CFP") to provide the County and the Cities with a schedule and financing program for capital improvement needs over the next six years (2022-2028) to ensure that adequate facilities are available to serve new growth and development. The 2022 CFP includes the following elements:

- A description of standard of service and space requirements for educational programs (Section II)
- An inventory of existing capital facilities owned by the District (Section III)
- Future enrollment projections for each grade span (Section IV)
- A forecast of proposed capacities of expanded or new capital facilities over the next six years based on the inventory of existing facilities and the standard of service (Section V)
- A six-year plan for financing capital facilities within projected funding capacities, which identifies sources of public funds for such purposes. The financing plan separates projects and portions of projects which add capacity from those which do not, since the latter are generally not appropriate for impact fee funding (Section VI)
- A calculation of impact fees based on the formula in the County and City impact fee ordinances and supporting data substantiating such fees (Section VII)

In developing this CFP, the District used the following guidelines:

- The District will use information from recognized sources, such as professional demographers and planners, County and City adopted land use plans and County GIS data.
- The District will use data it generates from reasonable methodologies.
- The CFP and the methodology to calculate the impact fees will comply with the GMA and County and City codes.
- The six-year facility needs are based on an enrollment forecast that takes local development trends into account.
- The District plans to construct permanent/bricks and mortar facilities for its students and will develop a CFP to accomplish that objective. At the same time, the District expects there will be a time period when some of the students that the District serves will be housed in portables. Housing students in portables, temporarily, is necessary to qualify for state funds that are needed to build new schools.

Camas is a financially and academically sound school district. The 57 square mile Camas School District serves the majority of the Camas Urban Growth Area, a large section of the Washougal Urban Growth

Area, and a smaller portion of the Vancouver Urban Growth Area and rural Clark County. The District serves residents from the Cities of Camas, Washougal, Vancouver and unincorporated rural Clark County. It is bordered by Evergreen School District to the west, Hockinson School District to the north, Washougal School District to the east, and the Columbia River and the state line to the south.

The District served a population of 7,412 students in 2019 (October 1, 2019 enrollment). Due to the statewide closure of schools during the COVID-19 pandemic, and associated loss of public school enrollment, the District served a population of 7,055 students in 2020 (October 1, 2020 enrollment) and 7,045 students in 2021 (October 1, 2021 enrollment). The District expects no further enrollment loss and a recovery over 4-5 years to pre-pandemic enrollment.

For purposes of facility planning, the CFP considers grades K-5 as an elementary school, grades 6-8 as a middle school, and grades 9-12 as a high school. The District has six elementary schools; two standard middle schools and a third, smaller, application-based middle school; and a large comprehensive and two, smaller application-based high schools. In addition, the District serves Camas Connect Academy students in grades K-12 in an online platform, pre-school special needs students at the Heights Learning Center and Camas High School, and students aged 18-21 in the Transition Program.

In February 2016, voters approved a bond measure which included the funding for the projects noted below. Construction of the replacement Lacamas Lake Elementary School, the purchase of a 38.2 acre site and the associated remodel of a commercial building to house the new Odyssey Middle School, and the construction of the new Discovery High School on the same site have increased capacity to serve forecast growth.

School facility and student capacity needs are dictated by a complex matrix of regulatory mandates, educational program components, collective bargaining agreements, and community expectations, more fully described in Section II. The District's existing capital facilities are summarized in Section III. In addition, the District owns 32 portable classrooms located at school facilities – 24 of which currently house approximately 9.6%, or 680 students; and 8 additional portable classrooms that are available to accommodate enrollment growth.

Between 2014 and 2019, enrollment growth within the District grew an average 3.1% per year, compared to the countywide rate of 2.0%. A total of 847 students were added to Camas School District during that time. The District expects to continue to see an increase in enrollment over time, although at a slower rate. Much of the land within the District and urban growth boundaries has yet to be developed, and there continues to be market interest in housing development in Camas and Washougal. Future K-12 enrollment is projected to increase by an average 1.3% per year, or 688 students over the next 7 years (see Section IV). Thanks to the 2016 Bond, which provided an increase in educational facility capacity of 192 students at the elementary level, 360 students in middle school, and 600 students in high school, many of the projected number of students by 2028 can be accommodated in the District's existing educational facilities and portable classrooms, except that there will be a need to increase capacity at the middle school level, and slightly at elementary school level.

The calculated maximum allowable impact fees for the District are $6,652.48 per single family residence and $29,713.38 per multi-family residence (**Appendix A**).

II. DISTRICT EDUCATIONAL PROGRAMS AND STANDARDS OF SERVICE

School facility and student capacity needs are dictated by the types and amounts of space required to accommodate the District's adopted educational program. Quality education plays a vital role in growing a strong local economy. To provide quality education, the District must have quality facilities to serve as the supporting space for developing the whole child within a community to prepare them for a competitive world. The educational program components which typically drive facility space needs include grade configuration, optimum facility size, class size, educational program offerings, classroom utilization and scheduling requirements.

Student enrollment is determined by population growth, birth rates, and housing and demographic characteristics of the District. Individual schools within the District may or may not follow the overall District pattern shared in this report. For example, the majority of the new housing in the past decade has been in the central and western portion of the District and the schools in these areas saw the most enrollment growth. As these areas have built out, future housing is proposed more in the outer ring of the District, predominantly to the north and east. This affects the balance of student enrollment and individual school facility capacity in ways that are not reflected in the overall summary.

In addition to student enrollment, other factors such as collective bargaining agreements, government mandates, and community expectations also affect classroom space requirements. Basic education programs are augmented by other programs such as special education, physical education, and art and music. These programs can have a significant impact on the available student capacity of school facilities.

The District's current programs and educational standards are summarized below. The program and educational standards may vary during the six-year CFP planning horizon. Absent significant changes in factors that are beyond the District's control, the District will provide the following programs and standards of service in 2022 through 2028. If significant changes occur that require new facilities or improvements beyond what is identified in this CFP, the District will prepare and submit an updated CFP.

A. Elementary Educational Standards

- Elementary school capacity is calculated utilizing classroom spaces containing a basic education teacher and his/her complement of students. All students are integrated at some time during the day in a basic education classroom and are included in the total enrollment count. All students are pulled out to attend additional programs (which may also be held in classrooms, if there is no designated space available). Building capacity calculations do not include pull-out program areas such as special education learning support centers, resource rooms, technology labs, music instruction spaces, and gymnasiums.
- Class sizes for grades K-5 are targeted not to exceed 24 students per class.
- When feasible K-3 class sizes are reduced to maximize enhanced funding from the State.

B. Middle School Program Standards
    - Middle school capacity is calculated utilizing the number of basic education teaching stations. It is not possible to achieve 100% utilization of all teaching stations throughout the day due to schedule conflicts, the need for specialized rooms for certain programs and the need for teachers to have work space during their planning period. A utilization factor of 83% is used to reflect the actual use of the building. Building capacity calculations do not include pull out program areas such as special education learning support centers, resource rooms, and technology labs.
    - Class sizes for grades 6-8 are targeted not to exceed 30 students per class.
C. High School Program Standards
    - High school capacity is calculated utilizing the number of basic education teaching stations. It is not possible to achieve 100% utilization of all teaching stations throughout the day due to schedule conflicts, the need for specialized rooms for certain programs and the need for teachers to have work space during their planning period. A utilization factor of 83% is used to reflect the actual use of the building. Building capacity calculations do not include pull out program areas such as special education learning support centers, resource rooms, and technology labs.
    - Class sizes for grades 9-12 are targeted not to exceed 31 students per class.

III. CAPITAL FACILITIES INVENTORY

The facilities inventory serves to establish a baseline for determining facilities needed to accommodate future demand at acceptable levels of service. This section provides an inventory of capital facilities owned and operated by the District including schools, portables, undeveloped land, and support facilities. School capacity is based on the space requirements for the District's educational programs as outlined in Section II.

A. Elementary Schools

Elementary School	Location	Year of Occupancy	Building SF	Capacity	Teaching Stations
Dorothy Fox (K-5)	2623 NW Sierra St Camas WA 98607	1982/2000/ 2011	62,237	552	23
Grass Valley (K-5)	3000 NW Grass Valley Dr Camas WA 98607	2009	70,023	624	26
Helen Baller (K-5)	1954 NE Garfield St Camas WA 98607	2009	64,417	576	24
Lacamas Lake (K-5)	4825 North Shore Blvd Camas WA 98607	2018	74,330	600	25
Prune Hill (K-5)	1602 NW Tidland St Camas WA 98607	2001	59,130	504	21
Woodburn (K-5)	2400 NE Woodburn Dr Camas WA 98607	2013	72,857	648	27
TOTALS:			**402,994**	**3,504**	**146**

B. Middle Schools

Middle School	Location	Year of Occupancy	Building SF	Capacity	Teaching Stations
Liberty (6-8)	1612 NE Garfield St Camas WA 98607	1937/1952/1969/ 1985/1995/2006	121,047	875	35
Odyssey (6-8)	5001 NW Nan Henriksen Way Camas WA 98607	2016 (built in 1996)	54,140	350	14
Skyridge (6-8)	5220 NW Parker St Camas WA 98607	1996	112,133	825	33
TOTALS:			**287,320**	**2,050**	**82**

C. High Schools

High School	Location	Year of Occupancy	Building SF	Capacity	Teaching Stations
Camas (9-12)	26900 SE 15th St Camas WA 98607	2003/2011	241,621	1,834	71
Discovery (9-12)	5125 NW Nan Henriksen Way Camas WA 98607	2018	92,000	600	24
Hayes Freedom (9-12)	1919 NE Ione St Camas WA 98607	2010	20,500	207	8
TOTALS:			**354,121**	**2,641**	**103**

D. Portables Inventory

Facility Type	Available Portable Classrooms	Capacity
Elementary Schools	14	336
Middle Schools	6	150
High Schools	12	310
TOTALS:	**32**	**796**

E. Support Facilities

Type	Location
Grounds Shop, Bus Maintenance and Warehouse (1963/2001)	1707 NE Ione St Camas WA 98607
Transportation Center (2001/2012)	1125 NE 22nd Ave Camas WA 98607
JD Zellerbach Administration Center (1967/1974/1985/1998/2010)	841 NE 22nd Ave Camas WA 98607
Doc Harris Stadium (2010)	1125 NE 22nd Ave Camas WA 98607
The Heights Learning Center (1963, 1984, 1998, 2008, 2018)	4600 NE Garfield Street Camas WA 98607
Jack, Will & Rob Family Resource Center (2002, 2017)	2033 NE Ione St Camas WA 98607
Transition House (remodeled 2009)	612 NE 2nd Ave Camas WA 98607

F. Land Inventory

The district owns the following under- and undeveloped sites:

- 57.6 acres located at 2815 NW Leadbetter Drive, Camas, WA 98607 – site includes a commercial office building
- 79.9 acres located at the northeast corner of NE 28th Street and NE 232nd Ave
- 19.6 acres located northwest of the intersection of NW Pacific Rim Blvd and NW Parker Street

IV. STUDENT ENROLLMENT PROJECTIONS

The District's six-year enrollment projection is based on a forecast prepared by Eric Hovee of E.D. Hovee & Company, LLC in February 6, 2020 and updated in December, 2021.

The approach used in making the updated enrollment forecast included the following:

- Kindergarten (K) enrollment is forecast based on the population of each school area (and expected population growth) together with birth rate data from five years previous using an age-cohort

methodology. Data required for the K-level forecast includes projections of population growth, women of childbearing age and age-specific fertility rates.

- Actual enrollment patterns from prior years are used as a basis for projecting future enrollment for grades 1-12. For example, the number of students in a particular grade as of October 1, 2019 are promoted into the next grade level for 2020 (adjusting for expected population growth together with gains or losses typically associated with a particular grade-to-grade change for each grade level at each individual school). The pattern for the District is for additional students to join as the grades increase, especially at the transition from elementary to middle and from middle to high school.
- The 2021/2022 school year enrollment is based on the October 1, 2021 enrollment data.
- Economic growth impacts, land use and zoning provisions, buildable lands inventory, and new residential developments are taken into account.
- The student generation rates by grade levels in the District for single family homes for the last six years is 0.237 Elementary School, 0.143 Middle School, and 0.202 High School students/new unit. Since there have been limited multi-family units constructed in the District over the last six years, the County code states that County wide averages should be used but the District is using a composite from larger districts with a significant amount of multi-family units. Accordingly, the District will apply a 6-year generation rate for the other larger school districts in Clark County (Battle Ground, Evergreen, and Vancouver). The composite weighted average for these three districts combined is a multi-family generation rate of 0.554 Elementary School, 0.344 Middle School, and 0.460 High School students/new unit.

A. Projected Enrollment 2022-2028 (Headcount)

Grade	Actual 2019	Actual 2020	Actual 2021	2022	2023	2024	2025	2026	2027	2028
K-5	3,117	2,852	2,866	2,954	2,904	3,071	3,041	3,183	3,231	3,308
6-8	1,863	1,737	1,735	1,721	1,758	1,721	1,790	1,766	1,862	1,877
9-12	2,432	2,389	2,444	2,428	2,484	2,453	2,457	2,515	2,494	2,549
TOTALS:	**7,412**	**6,978**	**7,045**	**7,103**	**7,146**	**7,245**	**7,288**	**7,464**	**7,587**	**7,734**

V. CAPITAL FACILITIES NEEDS

Facility needs for purposes of the Growth Management Act and impact fees are based on existing capacity and forecast enrollment. The 2028 Facility needs are shown in the table below and the amount of the facility need that is attributed to forecast growth is described under the table.

A. Forecast Facility Capacity Needs

- Elementary Schools: The enrollment forecast shows an increase of 442 students.
- Middle Schools: The enrollment forecast for middle school shows an increase of 142 students.
- High Schools: The enrollment forecast for high school shows an increase of 105 students.

- The projected number of students by 2028 indicate the need for an additional middle school and elementary school capacity. High school enrollment can be accommodated by the additions in our 2016 bond to our existing educational facilities.

Under the District's 2016 Bond Capital Program, the District purchased property that contained a commercial building in 2016, which was remodeled in 2017 to accommodate educational use and can serve 350 middle school students. In 2018, the District completed construction of a new high school that has a capacity to serve 600 students. In addition, the District completed construction of a replacement elementary school in 2018 to increase the capacity at the elementary level by 192 students. The District also added two double portable classrooms to the District inventory at the elementary level in 2019 and 2020 to address overcrowding at individual schools. The cost to purchase this land and build these schools and portables, which are now available to serve forecast growth are listed below as Facility Capacity Needs.

The District added capacity over the last 4-5 years that is available to serve forecast growth. New development, which places demands on schools will use the capacity that has been provided, and will contribute a small portion of the cost through the payment of school impact fees.

B. 6-Year Plan – Facility Capacity Needs

Project Description	Added Capacity	Estimated Cost	Cost for Added Capacity to Serve Growth
Woodburn Elementary Portable	48	$500,000	$500,000
Odyssey Middle School Addition	100	$15,000,000	$10,000,000
Property Acquisition		$7,000,000	0
Liberty Middle Portable	60	$500,000	$500,000
Middle School Construction	850	$100,000,000	$100,000,000
Leadbetter Campus Improvements for Educational Purpose	500	$87,000,000	0
TOTAL:	**2,158**	**$210,000,000**	**$111,000,000**

- Cost attributed to forecast growth is the proportionate share of the total cost to construct the improvement that is equal to forecast growth. Forecast growth at the elementary school level is 442 and the added capacity is 48. Because two middle schools will be at and over capacity during the 6-year period of this plan, the entire new middle school, addition, and portable are needed for growth. The estimated total cost includes all the costs to construct the improvement. Architect, engineer, professional services, furniture/fixtures/equipment, permit and owner contingency costs have been excluded from the cost allocated to serve forecast growth.
- Costs are estimates.

- The 2016 bond program also included replacement facilities and capital renewal projects that are not listed above. A detailed list of all bond improvements with project specific costs is on file with the District.
- To accommodate growth on a short term and immediate basis, the District may purchase and utilize portable classrooms, and this plan incorporates those facilities and the equipment and furniture necessary to equip these classrooms in the District's facility plan. Impact fee revenue can be available to fund portable facilities if these facilities are needed to serve growth.

VI. CAPITAL FACILITIES FINANCE PLAN

A. Six Year Financing Plan

Facility Capacity Need	Total	Estimated Impact Fees	State Construction Funds	Bonds
Secured	**$4,000,000**	$4,000,000	$0	$0
Unsecured	**$111,000,000**	$3,000,000	$13,000,000	$95,000,000

*Financing plan does not include all potential facility needs identified in table V. B. above.

The total cost for all 2016 bond projects, including facility improvements and property acquisition was $137.2 million dollars. Funding for planned improvements is typically secured from a number of sources including voter approved bonds, limited general obligation bonds, capital levies, state match funds and impact fees. The following information explains each of the funding sources in greater detail.

Capital Levies
In 2021, District voters approved a $11.5 million dollar Capital Levy to fund technology and necessary capital renewal projects; including roof replacements, HVAC replacements, fire protection upgrades, and other capital maintenance.

School Construction Assistance Program (SCAP)
The School Construction Assistance Program (SCAP) provides funding assistance to school districts that are undertaking a major new construction or modernization project. Funds primarily come from the Common School Construction Fund (the "Fund"). School districts may qualify for State construction funds for specific capital projects based on eligibility requirements and a state prioritization system. Based on the District's assessed valuation per student and the formula in the State regulations, the District is currently eligible for state construction funds for new schools at the 63.77% match level. The District received $13,065,000 for construction of the new high school.

Impact Fees
The collection of school impact fees generates partial funding for construction of public facilities needed to accommodate new development. School impact fees are collected by the cities and County on behalf of the District at the time plats are approved or building permits are issued. Impact fees are calculated based on a formula, which includes the portion of District construction resulting in increased capacity in schools.

Anticipated property acquisition and new construction is based on the enrollment forecast, capacity, the District's educational standards and the community's support of finance tools to fund improvements.

VII. SCHOOL IMPACT FEES

The Growth Management Act (GMA) authorizes jurisdictions to collect impact fees to supplement funding of additional public facilities needed to accommodate new development. Impact fees cannot be used for the operation, maintenance, repair, alteration, or replacement of existing capital facilities used to meet existing service demands.

Local jurisdictions in Clark County have adopted impact fee programs require school districts to prepare and adopt Capital Facilities Plans. Impact fees are calculated in accordance with the jurisdiction's formula, which is based on school facility costs to serve new growth. The formula allocates a portion of the cost for new facilities to a single family or multi-family residence that create the demand (or need) based on a student factor, or the average number of students that live in new single family or multi-family homes. The formula also provides a credit for SCAP funds the District receives and the projected future Bond Proceeds (or property taxes) that will be paid by the owner of the home.

The District's impact fees have been calculated utilizing the formula in the Clark County and the Cities of Camas, Washougal, and Vancouver Impact Fee Ordinances. Application of the formula is shown in Appendix A which follows on the next page.

In accordance with the school impact fee calculation in Appendix A, the District's maximum allowable school impact fees are:

$6,652.48 per single family residence
$29,713.38 per multi-family residence

The District Board of Directors, at its May 23, 2022 meeting, recommends collecting school impact fees in the following amounts:

$ 6,650.00 per single family residence
$ 6,650.00 per multi-family residence

Camas School District **APPENDIX A**

Single-Family			
Elementary	Middle School		Formula
$ 500,000.00	$ 110,500,000.00		Facility Cost
48	1010		Additional Capacity
$10,416.67	$ 109,405.94		Cost per Student (CS)
0.237	0.143		Student Factor (SF)
$2,468.75	$15,645.05		CS x SF
$246.83	$246.83		Boeck Index
90	117		OSPI Sq Ft
63.77%	63.77%		State Match Eligibility %
None available	$2,633.52		State Match Credit (SM)
$2,468.75	$13,011.53		CS x SF – SM
		$15,480.28	Cost per Single Family Residence
		LESS	Tax Credit
		0.0220	Average Interest Rate
		0.243108277	Tax Credit Numerator
		0.027348382	Tax Credit Denominator
		8.889311106	Tax Credit Multiplier (TCM)
		$543,752.00	Average Assessed Value (AAV)
		$4,833,580.69	TCM x AAV
		0.00158347	Tax Levy Rate (TLR)
		$7,653.83	TCM x AAV x TLR = (TC)
		$7,826.45	Cost per Single Family Residence - Tax Credit
		LESS	15% reduction (A)
		$6,652.48	Calculated Single Family Fee Amount
		$6,650.00	Recommended Fee Amount
Multi-Family			
Elementary	Middle School		Formula
500,000.00	$ 110,500,000.00		Facility Cost
48.00	1010		Additional Capacity
$10,416.67	$ 109,405.94		Cost per Student (CS)
0.554	0.344		Student Factor (SF)
$5,770.83	$37,635.64		CS x SF
$246.83	$246.83		Boeck Index
90	117		OSPI Sq Ft
63.77%	63.77%		State Match Eligibility %
None available	$6,335.18		State Match Credit (SM)
$5,770.83	$31,300.47		CS x SF – SM
		$37,071.30	Cost per Multi-Family Unit
		LESS	Tax Credit
		0.0220	Average Interest Rate
		0.243108277	Tax Credit Numerator
		0.027348382	Tax Credit Denominator
		8.889311106	Tax Credit Multiplier (TCM)

		$150,212.00	Average Assessed Value (AAV)
		$1,335,281.20	TCM x AAV
		0.00158347	Tax Levy Rate (TLR)
		$2,114.38	TCM x AAV x TLR = (TC)
		$34,956.92	Cost per Multi-Family Unit - Tax Credit
		LESS	15% reduction (A)
		$29,713.38	Calculated Multi-Family Unit Fee Amount
		$6,650.00	Recommended Fee Amount

Staff Report – Ordinance

November 16, 2026 Council Regular Meeting

Ordinance No. 26-009 Our Downtown Camas 2045 Subarea Plan
Presenter: Alan Peters, Community Development Director
Time Estimate: 5 minutes

Phone	Email
360.817.7254	apeters@cityofcamas.us

BACKGROUND: The Our Downtown Camas 2045 Subarea Plan was prepared in conjunction with the Our Camas 2045 Comprehensive Plan update to establish a long-range vision and more detailed planning framework for Downtown Camas. Developed through community engagement and coordination with downtown stakeholders, the plan seeks to preserve downtown's historic character while supporting future investment, housing, businesses, and public improvements. The plan addresses land use, open space, transportation, infrastructure, and implementation strategies to guide downtown's growth and evolution through 2045.

The Planning Commission held a public hearing on September 15, 2026, and voted unanimously on September 29, 2026, to recommend adoption of the Our Downtown Camas 2045 Subarea Plan. Council held a public hearing on October 19, 2026, and on November 2, 2026, moved to direct the City Attorney to prepare an ordinance for adoption of the Downtown Subarea Plan.

SUMMARY: Ordinance No. 26-009 adopts the Our Downtown Camas 2045 Subarea Plan and incorporates it into the City's Comprehensive Plan, adopted in Ordinance No. 26-008. The Downtown Design Manual and associated Municipal Code amendments prepared to implement the plan are proposed for adoption under a separate ordinance.

BENEFITS TO THE COMMUNITY: The Subarea Plan establishes a shared vision for the future of Downtown Camas and provides a more detailed framework for land use, transportation, open space, and public improvements. It supports downtown businesses and economic vitality, encourages housing and reinvestment, improves connections and public spaces, and helps preserve the historic character and sense of place that make downtown distinctive.

STRATEGIC PLAN: This item advances multiple City strategic priorities, including Economic Prosperity, Safe and Accessible Community, and Vibrant Community Amenities. The Subarea Plan supports a thriving downtown business district, opportunities for housing and private investment, walkable streets and public spaces, and improvements that reinforce downtown's identity as a community gathering place.

POTENTIAL CHALLENGES: Implementation of the Subarea Plan will require continued coordination with downtown businesses, property owners, residents, and the development community. Future transportation, infrastructure, open space, and other public improvements will depend on available resources, partnerships, and continued prioritization. Staff will need to monitor progress and recommend implementation actions as needed.

BUDGET IMPACT: Preparation of the Downtown Subarea Plan has been completed using existing City staff and previously authorized consultant resources, funded in part by grants. The amendments will facilitate future development activity, resulting in corresponding City revenues and costs.

RECOMMENDATION: Staff recommends Council adopt Ordinance No. 26-009 and it be published accordingly to law.

ORDINANCE NO. 26-009

An Ordinance adopting the Our Downtown Camas 2045 Subarea Plan pursuant to RCW 36.70A.130 and incorporating the Plan by reference into the City of Camas Comprehensive Plan.

WHEREAS, Chapter 36.70A RCW, the Washington Growth Management Act (GMA), requires the City of Camas (City) to periodically review and, as necessary, revise its comprehensive plan and development regulations to comply with state law and plan for anticipated growth; and

WHEREAS, the City undertook the Our Camas 2045 periodic update to establish a coordinated policy framework for growth through 2045; and

WHEREAS, RCW 36.70A.080(2) authorizes cities to adopt subarea plans that are consistent with the comprehensive plan, and RCW 36.70A.130(2)(a)(i) recognizes subarea plans as a means of clarifying, supplementing, and implementing jurisdiction-wide comprehensive plan policies; and

WHEREAS, the City has prepared the Our Downtown Camas 2045 Subarea Plan to provide more detailed land use policies and implementation strategies for Downtown Camas, consistent with the goals and policies of the Our Camas 2045 Comprehensive Plan; and

WHEREAS, beginning in December 2023, the City conducted a public visioning and planning process involving surveys, community meetings and summits, stakeholder engagement, advisory committees, and continuing review by the Planning Commission and City Council; and

WHEREAS, City Council approved the Our Camas 2045 Vision Statement in July 2024 in Resolution No. 24-012 which included, in part, a vision statement for Downtown Camas; and

WHEREAS, the City prepared the Our Downtown Camas 2045 Subarea Plan, including existing conditions, plan framework, land use concept, open space network, transportation, infrastructure, and implementation chapters; and

WHEREAS, the City conducted environmental review pursuant to Chapter 43.21C RCW and issued a Determination of Nonsignificance for the proposed Subarea Plan and related actions on September 10, 2026, under file no. SEPA26-1006; and

WHEREAS, the City provided notice to the Washington State Department of Commerce pursuant to RCW 36.70A.106 on August 14, 2026; and

WHEREAS, following public notice, the Planning Commission conducted a public hearing on September 15, 2026, and on September 29, 2026, unanimously recommended adoption of the Our Downtown Camas 2045 Subarea Plan; and

WHEREAS, following a duly noticed public hearing on October 19, 2026, and consideration of the Planning Commission recommendation, staff analysis, public testimony, and written comments, the City Council reviewed the proposed Subarea Plan and on November 2, 2026, moved to direct the City Attorney to prepare an ordinance for adoption of the Our Downtown Camas 2045 Subarea Plan;

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF CAMAS AS FOLLOWS:

I

The Council incorporates by reference the Recitals as set forth herein as findings of fact. The Council concludes that the Our Downtown Camas 2045 Subarea Plan is consistent with the

City's Comprehensive Plan and the applicable goals and requirements of the GMA, Chapter 36.70A RCW. The Council further finds that the City has satisfied applicable public participation requirements under RCW 36.70A.130(2) and completed environmental review pursuant to Chapter 43.21C RCW.

II

The City conducted a public participation program in accordance with RCW 36.70A.130(2). The City established a Public Participation Plan in February 2024 that included engagement objectives, key messages, community demographics, underserved populations, stakeholders and partners, engagement activities, communication tools, risk and mitigation for low attendance/response, and an evaluation process for meeting the engagement objectives.

The City utilized a variety of methods to reach a broad audience of community members, including in-person events, online surveys, a project website, and attendance at City Council and Planning Commission meetings. The City used various communication tools, such as social media, public notices in the Camas-Washougal Post Record, updates to the project website, flyers posted around the city, and distribution through partner agency communication channels, to advertise community events and engagement activities.

During the final adoption phase, public hearings were held by the Planning Commission and City Council. Feedback from the Planning Commission and City Council was incorporated into the final draft plan.

III

Based upon the review of the requirements of GMA, the analysis, the recommended findings on review, the recommendations of the Planning Commission, and the public comments

received, the Council finds and declares the review and adoption of the Our Downtown Camas 2045 Subarea Plan to have been prepared in conformance with applicable law. The document entitled "Our Downtown Camas 2045 Subarea Plan", a copy of which is on file with the office of the City Clerk for public inspection, is hereby adopted and shall be incorporated in the City of Camas Comprehensive Plan.

IV

This ordinance shall take force and be in effect five (5) days from and after its publication according to law.

PASSED by the Council and APPROVED by the Mayor this 16th day of November, 2026.

SIGNED:_____
Mayor

ATTEST:_____
Clerk

APPROVED as to form:

_____
City Attorney



our Downtown Camas 2045

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01
Introduction

our 2045 Downtown Camas

Purpose

Over the last decade, the City of Camas has grown substantially. Access to outdoor recreation, schools, and a strong community-feel are frequently cited as the City's strengths, and Downtown Camas has played a crucial role as the heart of the City, defining its unique identity in the region. Since initiating the modern economic and industrial history of Camas, Downtown has continued to transform into a core commercial district that attracts residents and visitors alike to its authentic Main Street experience along NE 4th Avenue.

Whether for daily shopping trips or a monthly themed event, Downtown Camas continues to be a local retail hub and a regional destination. To date, downtown has kept pace with the demands of overall growth in Camas, but recent market demands and fluctuations led the City and downtown to address future transformations over the next 20 years.

To address future growth, the City of Camas prepared to update its citywide Comprehensive Plan ("Our Camas 2045"). City leaders and local stakeholders recognized a need to place a special focus on Downtown Camas through a Subarea Plan ("Our Downtown Camas 2045"). Completing these plans with a synchronous planning process offered a chance to consider unique needs at both the city-scale and downtown-scale, while understanding the vision and goals for each plan are intertwined. The plans were developed through an iterative community engagement process, input from local stakeholders at key project milestones, and ongoing guidance and input from City staff.



Bike Parked on Curb in Downtown Camas

The Downtown Subarea Plan considers the historic character of Downtown Camas and offers a strategy for balancing history with future transformations to make downtown a place that will continue to attract residents and visitors alike. The Subarea Plan is intended to serve as a shared commitment between city and downtown stakeholders, welcoming the development and business communities to help implement the vision. It also provides discussion about future expansion to the Camas Mill Property, when timing aligns with property owners' planning processes. The vision and goals set forth in this Plan intend to achieve the following outcomes:

1. Set the **policy direction** for future implementation in Downtown.
2. Guide development in a way that **reflects the community's vision** for the area through a set of clear and objective design guidelines.
3. Establish a framework for **connecting public and private spaces and transportation networks.**
4. Lay the groundwork for the future of the Camas Mill Property by **supporting an unrestricted environmental cleanup** level.

Context & History

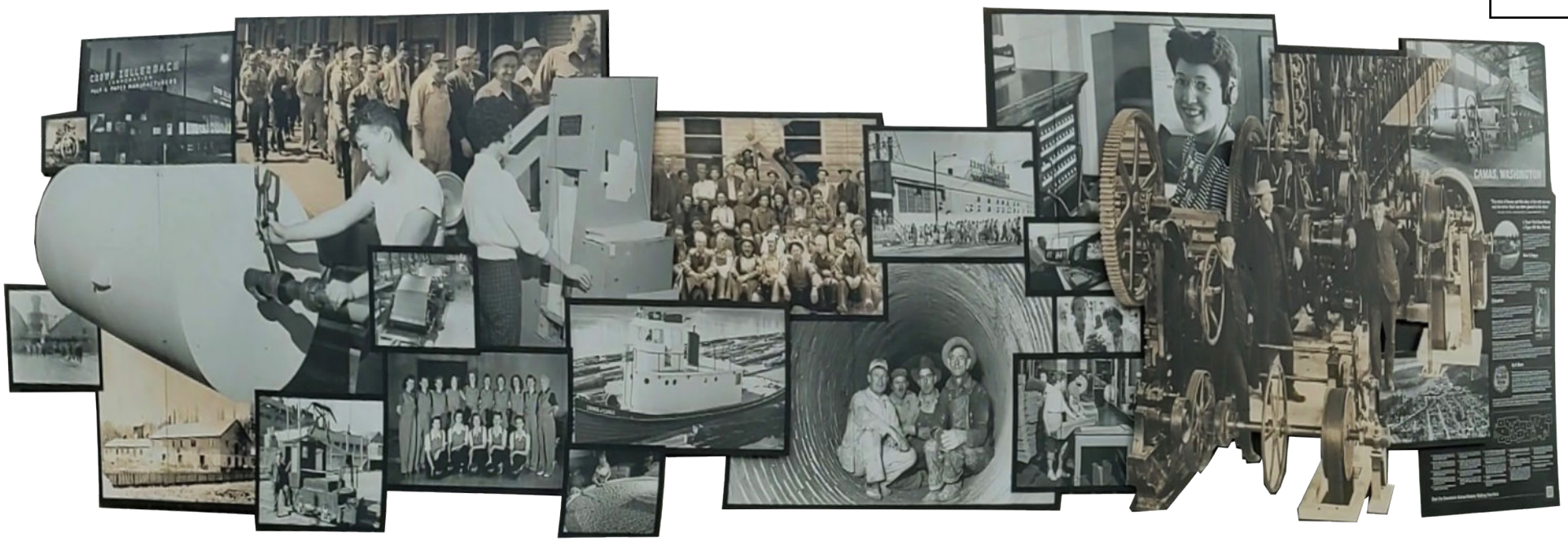


Downtown Camas has been a vital part of the city's history since its founding as the Town of Camas in *1883*. At that time, construction of the Camas Paper Mill began, which provided opportunities for the first businesses to open in downtown. These businesses served the people working at the mill and living in the town. The mill's involvement in and support of the community, as well as the standard for excellence, brought many years of civic prosperity and quality entrepreneurship to Downtown Camas.

With **increased suburban growth in the early *1960's***, anchor businesses in historic downtowns across the country were moving to shopping malls and the civic leaders of Camas grew concerned. Downtown business leaders were inspired by a transformative pedestrian shopping mall in Grand Junction, Colorado and proposed to do something similar in Downtown Camas. The effort was called "Operation 4Sight" and improvements included widened sidewalks, trees, flowers, benches, store awnings, gazebos, buried electrical and phone wires, better layout of parking spaces, outdoor telephones, and an outdoor sound system.

To communicate the potential changes to the community, civic leaders and downtown advocates temporarily redesigned NE 4th Ave with a mockup of the suggested improvements. These improvements were left in place for two months so residents could offer suggestions and get used to the changes. The community saw the benefit and the project moved forward.

Work began on the downtown mall in 1966 and was completed in *1967.* Funding came from the building owners of the downtown area, city revenues, and some federal aid. The vision of forward-thinking stakeholders at the time has created a unique experience in Camas today, including the wider pedestrian friendly sidewalks and iconic tree canopy. These efforts have helped the downtown busi



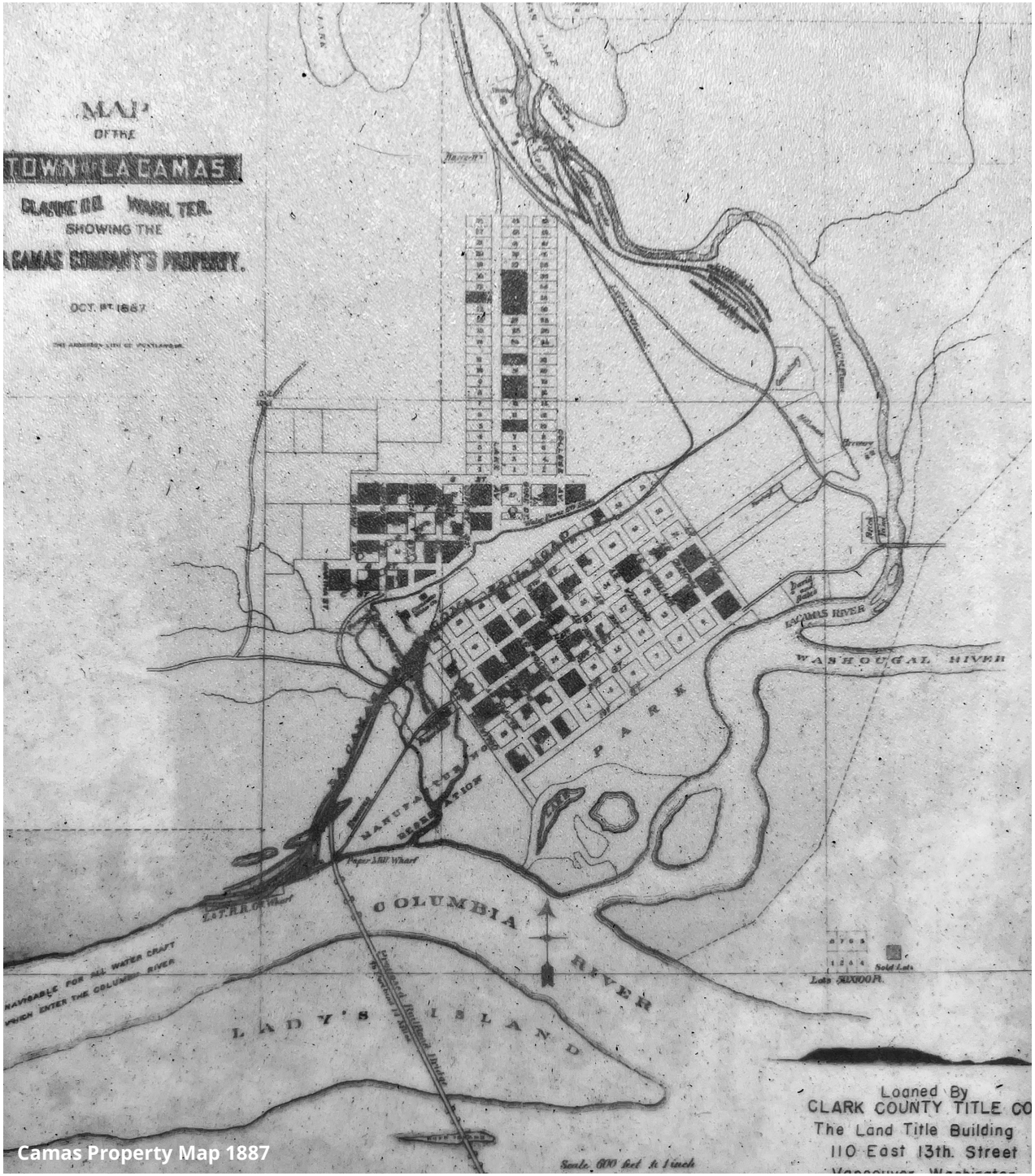
Camas Historic Mill Photo Collage at the Universal Martial Arts Building at the Corner of 4th Avenue and Adams.

district to continue to thrive.
By the *1980's* and *90's*, a steady decline was occurring in downtown as mill employment was decreasing and many anchor businesses such as JC Penney, Sears, and Sprouse Reitz were closing or relocating to the Vancouver Mall. Farrell & Eddy, an anchor retailer for 53 years in downtown, closed in 1998, along with other retailers who depended on the bigger stores to help bring people to downtown.

In the early 2000's, the City of Camas started working with business leaders and community members in a city-funded committee called the Downtown Vision Coalition *(DVC)* to create a new vision for downtown and address building vacancies and necessary improvements. Progress was slow but by 2005, new small businesses had opened in downtown, and they worked to together on events, marketing, advertising, active referrals, and camaraderie to create collective success.

The Great Recession hit in 2008 and by 2009, downtown fell to a 60% vacancy rate. The City suspended funding, but the members of the DVC looked for opportunities for continued growth. The DVC joined the Washington State Main Street Program, seeking increased expert guidance in downtown revitalization and in 2009, incorporated into the 501c3 non-profit Downtown Camas Association (DCA). The mission of the DCA, which continues today, is to create a vibrant social, cultural and economic center of the community, emphasizing preservation and a vision for the future. The DCA promotes, represents and advocates for our town locally, regionally, and nationally.

Over the years, the DCA, City, businesses, and community have all strategically worked together to bring vitality, prosperity, and quality of life to Downtown Camas. ***Today*, downtown has a vacancy rate of less than 2%**, and a variety of high-quality shops, restaurants, a preserved historic theatre, a remodeled boutique



Camas Property Map 1887

hotel, and wellness services. Business work together and have strong community support. The DCA and the City have put considerable effort into beautifying downtown with tree and ridgeline lighting, engaging public art, benches and seating areas, flower baskets, landscaping, bike racks, signage, and lamp posts that match the authentic downtown aesthetic.

Over 25 consistent and long-term community events are held each year in downtown to stimulate economic vibrancy, grow awareness of Camas, and to bring the community together. Thousands of volunteer hours have been contributed. Private investment continues to increase and new housing has begun developing. Collectively, these efforts have worked to strengthen and preserve our downtown, but increased planning efforts and improved infrastructure are required to continue to increase downtown vitality, livability, and sustainability.

The Downtown Subarea Plan presents this opportunity as another key milestone in the history of downtown through updated visioning, planning, and implementation over the next 20 years.

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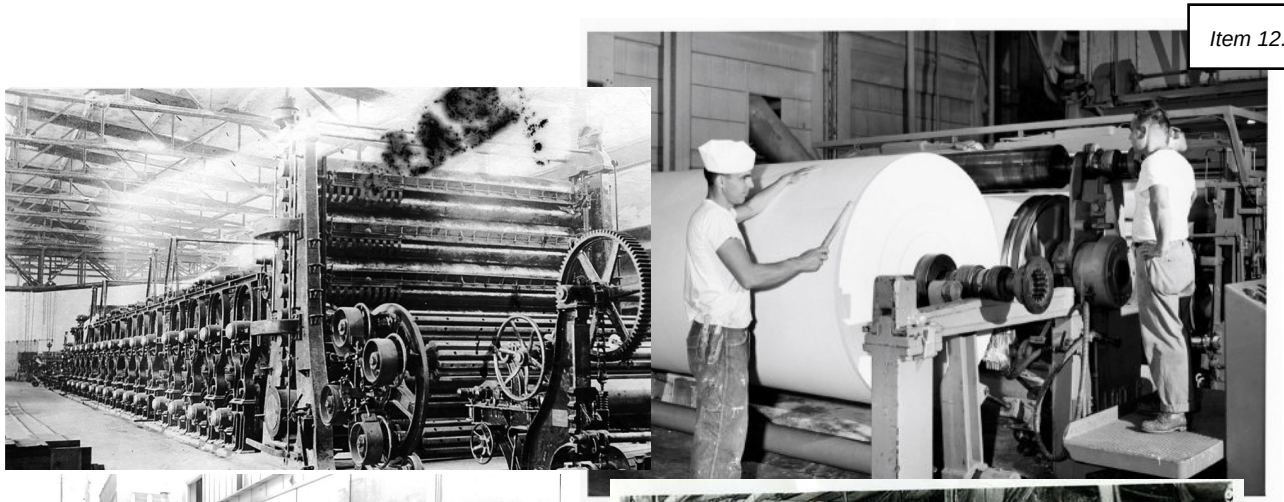
Camas Paper Mill



Camas Paper Mill Photo Collage Circa 1920 - 1950

Founded in 1883 as the LaCamas Colony Mill and later operated by Crown Zellerbach and eventually Georgia-Pacific, the Camas Paper Mill was **once one of the largest employers in the region**, shaping the economic, physical, and cultural landscape of Camas. With its iconic smokestacks and waterfront facilities, the mill not shaped Camas' identity as a mill town but also supported generations of workers and families. The mill's proximity to the Columbia River and nearby forests made Camas an ideal site for pulp and paper production, and **the downtown core emerged in tandem, serving the needs of mill workers and their families.**

In recent decades, **the role of the mill has evolved**. Significant portions of the mill's operations were shut down in 2018 and the workforce has been reduced to about 150 employees. The mill's operations and footprint have contracted in recent years and **Georgia-Pacific is currently demolishing several unused buildings**, but there is no announced plan to shut down entirely.

While r**ecognizing the role that the mill has played in Camas's history** and its significance as an economic driver, the City of Camas is working closely with the Washington Department of Ecology and Georgia-Pacific to ensure that the site is cleaned up to a high environmental standard, opening the door for potential long-term reuse. In February 2025, the City Council adopted Resolution 25-002, in support of an **unrestricted environmental cleanup level.** "Given the site's legacy and its importance to our community," the resolution states, "it is imperative to ensure the cleanup efforts are fully protective of human health and the environment and preserve future private and public redevelopment options, including the flexibility to support a broad range of **future uses from residential and commercial development to natural and recreational spaces.**

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Organization of the Plan

The Downtown Subarea Plan is intended for use by a range of stakeholders in Downtown Camas: from City decision makers setting priorities for City staff to implement, to Downtown Camas Association staff and members who continue to be champions for Downtown, to property and business owners who would like to contribute to and participate in continued growth, to community members wanting safer access to and through Downtown. This Plan reinforces the city's commitment to making downtown a safe and thriving place to live, work, and play, serving as the city's "living room" for years to come. The City welcomes the development and business community to work together to honor the foundation that the historic Downtown has set, and look for ways to transform beyond the core to create space for more opportunities.

The Plan is organized in the following sections:

01 Introduction. An explanation of the purpose, context, and history.
Why plan for Downtown now? How did we get here?

02 Existing Conditions Summary. A review of the existing physical, regulatory, and market conditions that exist in Downtown Camas today.
Where are we now?

03 Framework. A summary of the engagement process that set the priorities for the Downtown Subarea Plan; a vision statement and set of goals for Downtown Camas; and an urban design framework that illustrates the opportunities and constraints.
How did the community inform the plan? What is the vision for Downtown Camas? What are the opportunities and constraints for the future of Downtown Camas?

04 Land Use Concept. Presents how the vision and goals can be achieved through new development and redevelopment, including residential, commercial, and mixed-use development types.
What could Downtown transformation look like?

05 Open Space Network. Designs for improved and new open spaces that provide more gathering space and connected recreation opportunities Downtown.
What does this mean for park and open space?

06 Transportation Concepts. Analysis of potential effects on traffic and transportation networks Downtown, as development changes occur. *How will changes to Downtown affect traffic and transportation networks?*

07 Infrastructure Improvements. Analysis of potential effects on utilities and infrastructure.
What changes to infrastructure will need to occur over the next 20 years?

08 Implementation. A strategy that reflects the policy direction and intention for the next 20 years of Downtown set by the vision and goals in the Subarea Plan.
How will we get there?

09 Appendices. Supplemental information relevant to the Subarea Plan.


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02
Existing Conditions

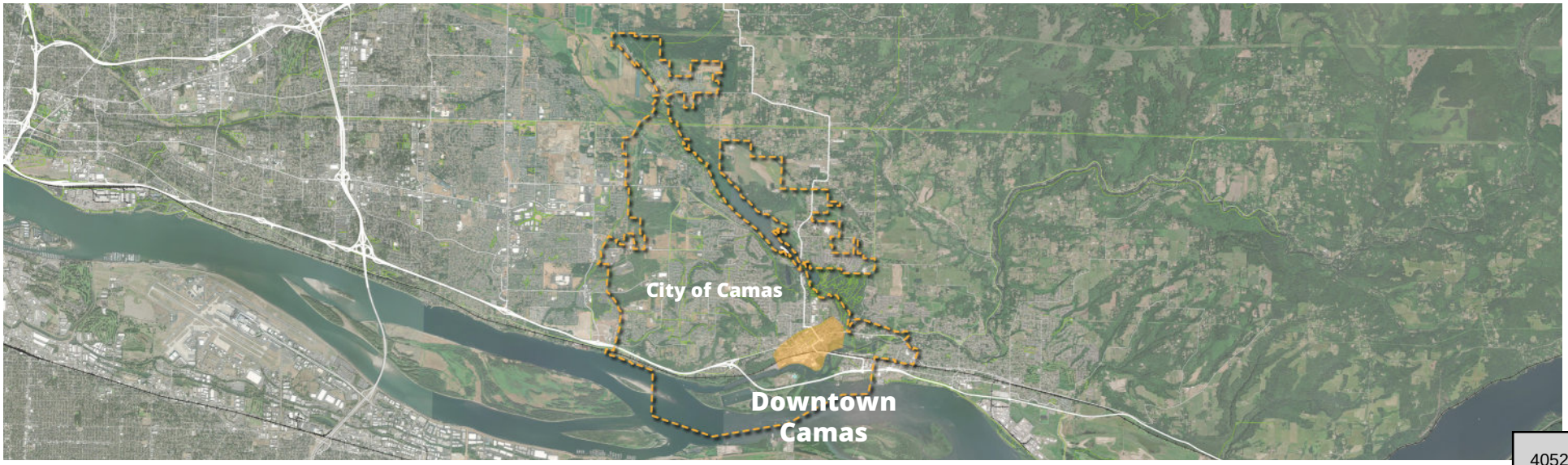
our 2045 Downtown Camas

Context

The City of Camas is well-connected to the Portland-Vancouver Metro region, located off of Washington State Route 14. Downtown Camas, the well-established, recognized core of the city, is easily accessible with a gridded street network. Its historic main street on NE 4th Avenue, with buildings fronting the sidewalk, serves as an attraction for a range of activities including retail businesses, community events, and City services. The adjacent Camas Paper Mill property helped to establish this historic character, but downtown has evolved over the years to continue to be a destination for residents and visitors, serving today's needs and offering unique community events rooted in the city's history.

The Downtown Subarea Plan considered relevant context from previous City-adopted planning efforts that encompass the downtown area including the current Comprehensive Plan "Camas 2035," the Downtown Design Manual, and the Street Tree Succession Plan. Additionally, concurrent efforts that influenced the planning process included the Our Camas 2045 Comprehensive Plan, the Parks and Open Space Management Plan, the Station 41 Replacement Project, and the Department of Ecology environmental remediation process at the Georgia-Pacific multi-year revitalization project. These projects, along with community-led efforts in Downtown, provided insight into understanding common goals and desired outcomes that affect Downtown Camas.

An early phase of planning for the future of Downtown Camas included a site assessment of existing conditions. This assessment, summarized in this section, includes findings from available data, discussions with City staff with institutional knowledge, visual assessments from site visits, and conversations with key stakeholders with lived experience in Downtown Camas.



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Physical Constraints

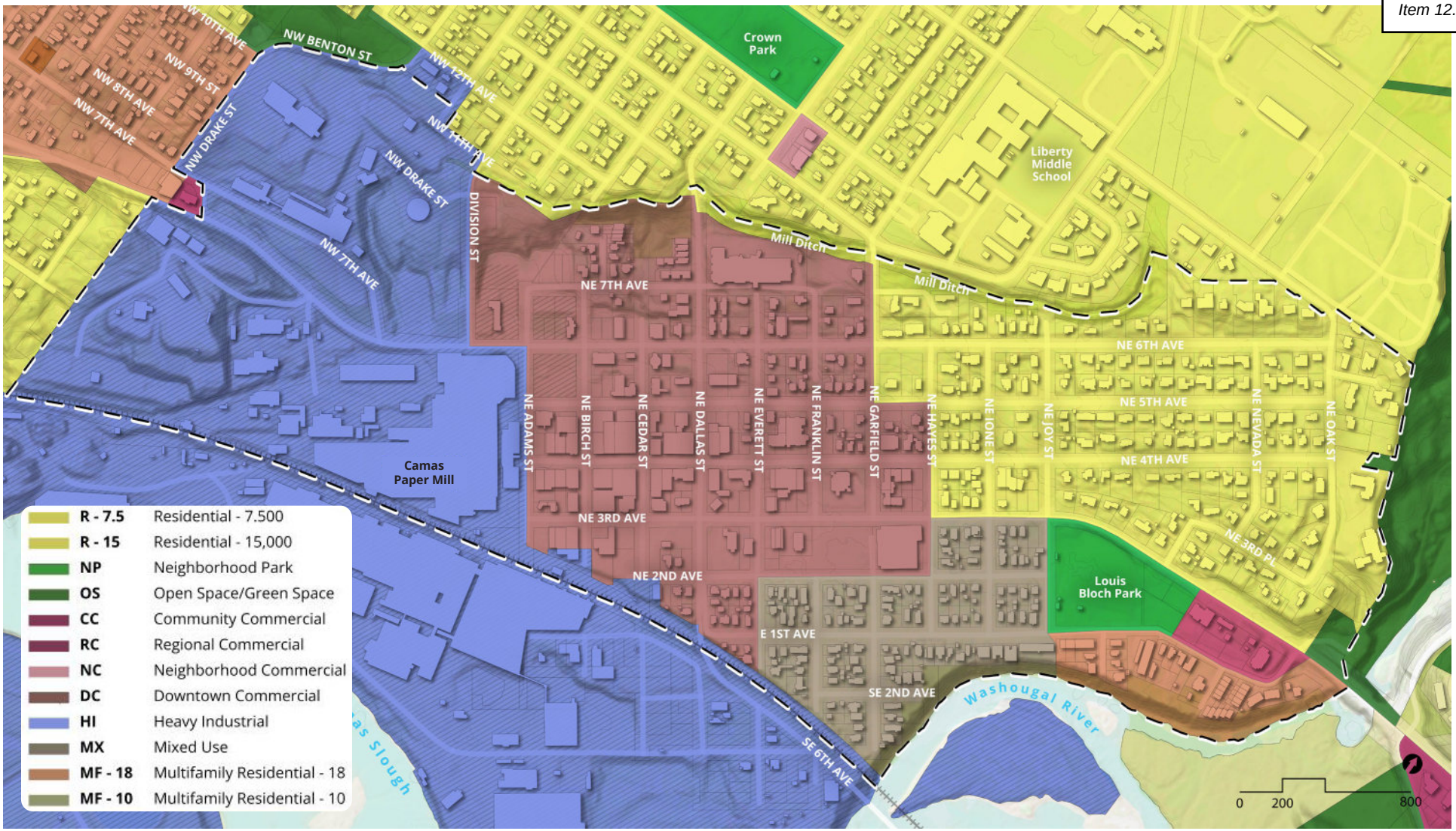
The boundary of Downtown Camas, as defined by its physical constraints, includes the Camas Paper Mill property to the west, steep slopes to the north, and the railroad tracks, Camas Slough, and Washougal River to the south and east. The downtown core is located on mostly flat land, but topography quickly changes to the north of NE 4th Ave, creating a separation of the commercial core and adjacent residential neighborhoods.

4053



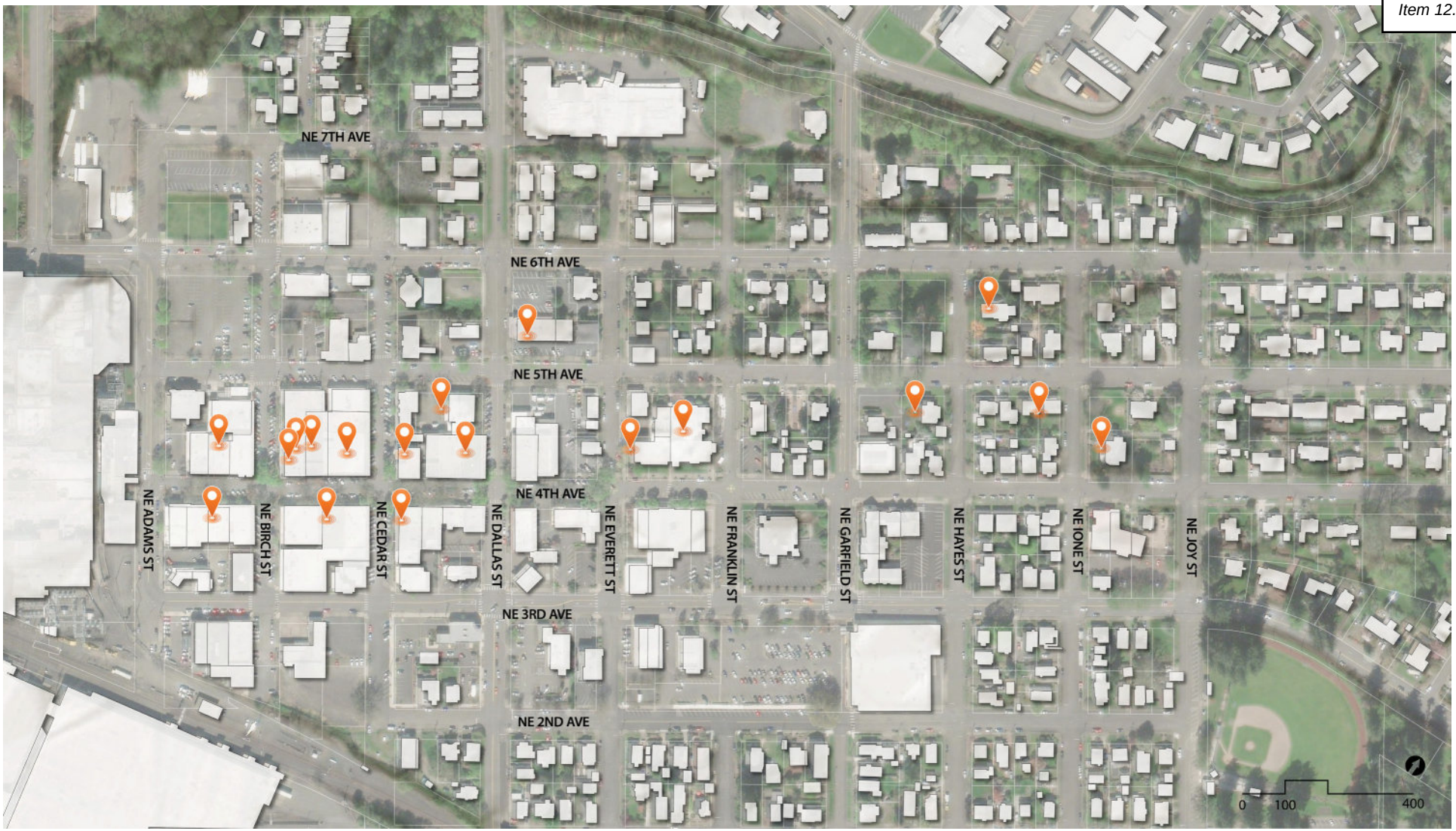
Open Space

Downtown has access to parks within a half mile including Louis Bloch Park, Crown Park, and the Mill Ditch Trail. Lacamas Creek Trail is accessible within walking distance of the eastern edge of Downtown Camas. Community stakeholders communicated a need for more recreation and gathering spaces Downtown.



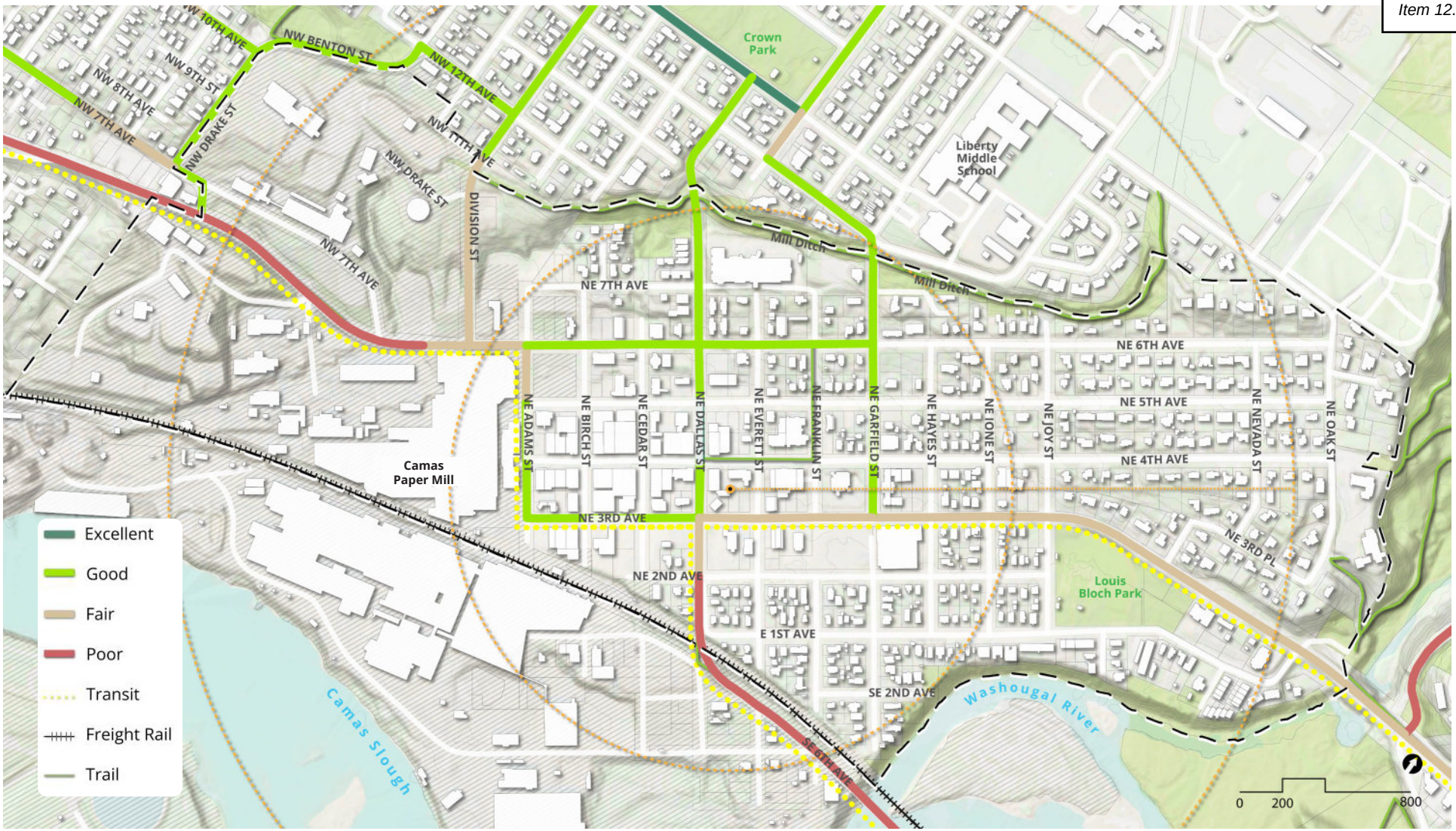
Zoning

The downtown core is zoned Downtown Commercial (DC) and Mixed Use (MX). The MX zoning district “provides for a wide range of commercial and residential uses. Compact development is encouraged that is supportive of transit and pedestrian travel.” The adjacent zones are primarily residential neighborhoods served by downtown amenities, with the exception of the Camas Paper Mill property to the west of the Downtown Core, which is zoned Heavy Industrial.



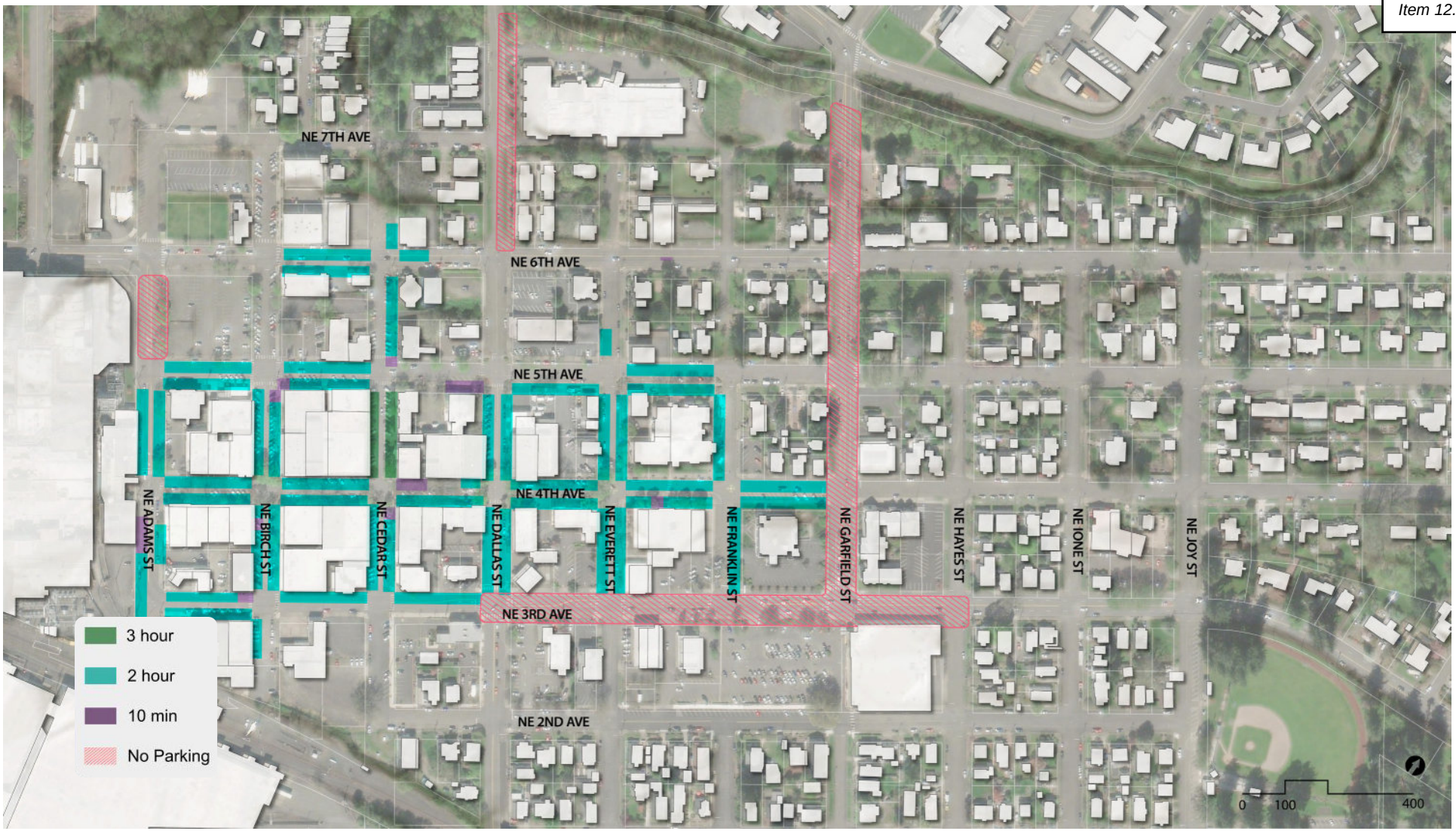
Historic Sites

Downtown includes historic sites on the National Register of Historic Places and Clark County Heritage Register, as well as those identified in the Clark County Historic Resource Inventory. Historic structures in Downtown Camas are concentrated along NE 4th Avenue, which help to define the character of 4th Avenue as Downtown's Main Street. Community members expressed a desire to preserve historic structures Downtown, seeking a balance between preservation and new transformation in the future.



Connectivity

Downtown Camas is well-connected to City services and amenities. The small block size in downtown (about 250 square feet) creates a walkable grid, and a qualitative assessment showed that the pedestrian network Downtown ranked higher than other areas of Camas. Areas along NE 3rd Avenue to NE 7th Avenue and NE Adams Street to NE Garfield Street were identified as needing sidewalk improvements. The bicycle network could also be improved, especially to the bike network along NE 6th Avenue and 3rd Avenue. These assessments were reinforced in conversations with community members who would like to see safer crossings and a better pedestrian and bicycling experience in the areas Downtown surrounding NE 4th Ave



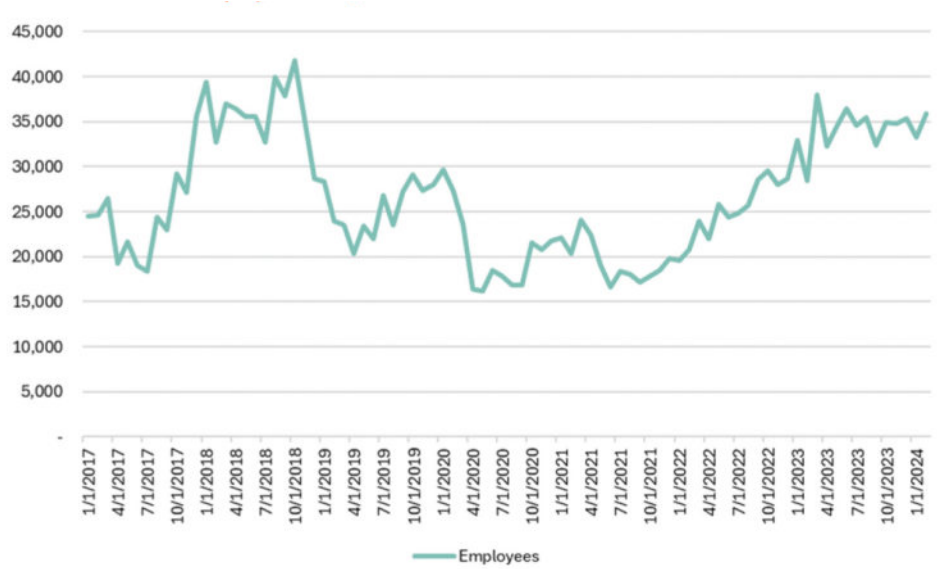
Parking

Most of the downtown core is regulated by 2-hour, non-metered parking. A few key blocks have 30-minute or 10-minute parking zones. Community members and downtown stakeholders reported a mixture of frustration and optimism related to parking downtown. Some expressed a need to reevaluate the time limits, as parking for workers at downtown businesses is difficult, given the concerns with unsafe crossings for pedestrians in areas without parking restrictions. Others offered insight that the lack of parking is a perception due to surges in demand for parking during large events. Designated off-street parking (e.g., lot or structure) was cited as a potential solution to the current parking perceptions.

Market Conditions

Visitor and employee visits to Downtown Camas increased to pre-pandemic levels and visitation by residents has been trending upward in recent years, including a healthy level of foot traffic in the downtown area. The market in Camas is on an upwards trajectory with visitors, employees, and residents coming to the downtown area for shopping, work, or other purposes.

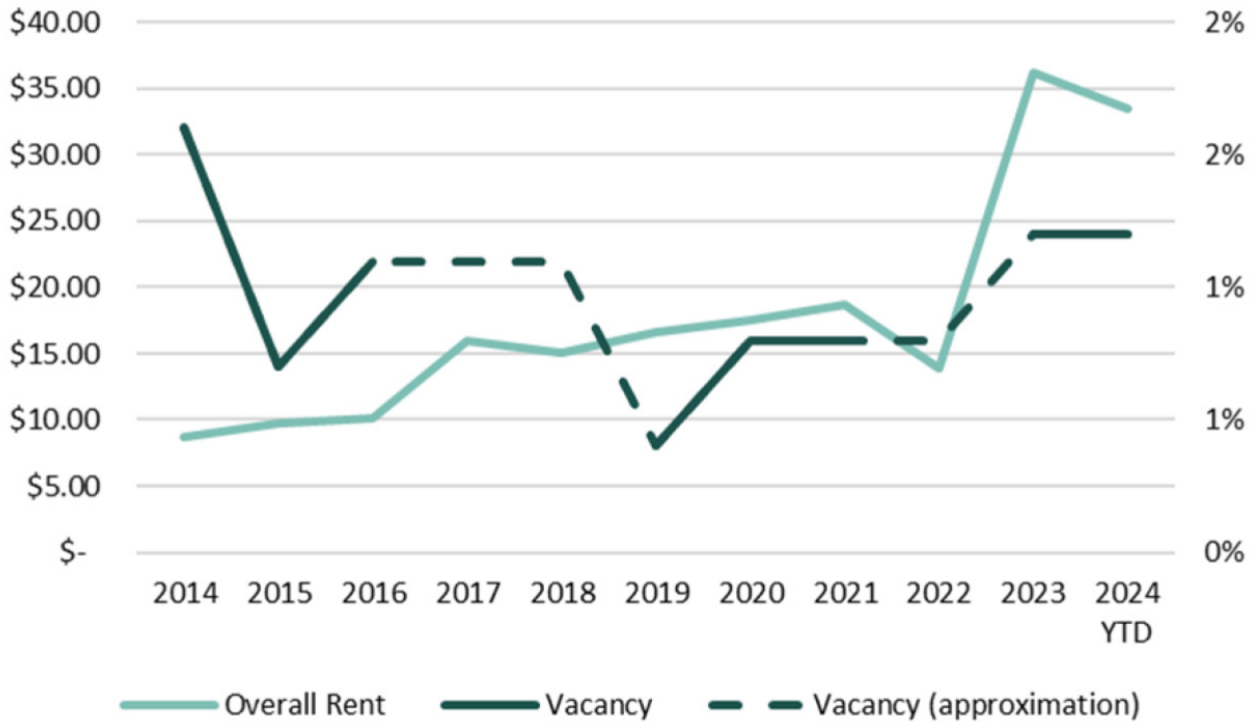






Downtown Camas Visitor, Resident, and Employee Visits, 2017-2024
Source: ECOnorthwest; placer.ai

A market analysis of retail activity in Downtown Camas showed retail rents increasing rapidly from approximately $15 per square foot in 2022 to almost $35 per square foot in 2024. Vacancy rates for retail have remained very low below 1.5 percent since 2014; lower than the retail vacancy rates in both the City of Vancouver (3.7 percent) and Clark County (3.7 percent) in 2023, which indicates increased demand for retail space above the available supply.



Average Retail Rent per Square Foot and Average Retail Vacancy Rate (Percent) in Downtown Camas, 2014-2024 Year to Date
Source: ECOnorthwest; CoStar



Retail Space for Lease - Camas

03
Framework

our 2045 Downtown Camas

Overview



Hand-drawn diagrams from opportunities and constraints exercise completed with DAC.

Through dedicated community efforts and intentional planning, Downtown Camas has remained the authentic and functional core of the City of Camas. Careful consideration of these long-term community efforts helped to craft a future vision that builds on this strong foundation. The Downtown Subarea Plan process also welcomed new ideas to create a vision and set of goals that represent the future evolution of Downtown Camas while maintaining its historic character and charm.

This section outlines the planning process of developing the Downtown Subarea Plan, including various engagement efforts. Early engagement led to a vision, set of goals, and an urban design framework that set the foundation for the Subarea Plan.

Process

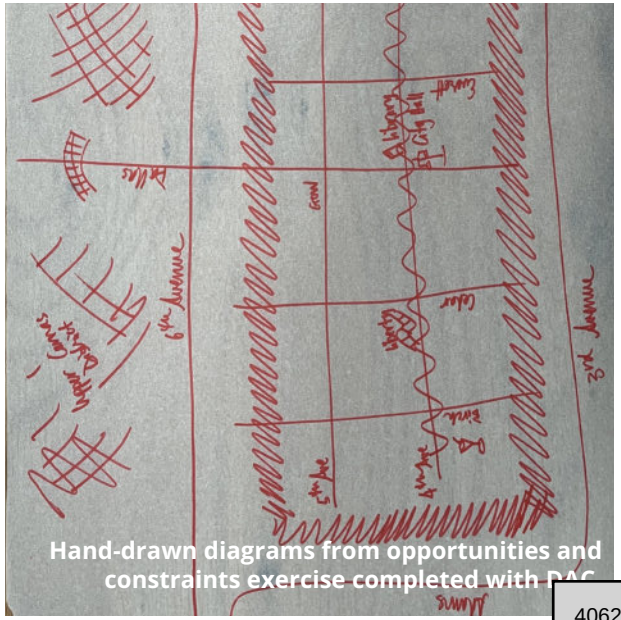
Prior to beginning the Downtown Subarea Plan, City staff met with members of the Downtown Camas Association (DCA) board, City Council members, and City staff to gain a baseline understanding of the issues and priorities to address in the plan. Shortly after the official kickoff for the work, the planning team met with key stakeholders (downtown business owners, property owners, etc.) through one-on-one interviews.

These interviews focused on opportunities and constraints in Downtown Camas, from the interviewees' perspectives. These interviews helped to both reinforce findings in the existing conditions and provide new insights to issues or opportunities in the downtown area.

Additionally, the City convened a Downtown Advisory Committee (DAC) to provide feedback and discuss issues related to the Downtown Subarea Plan throughout the planning process. The DAC included members of the DCA as well as select members of the Community Advisory Committee (CAC) from the Our Camas 2045 Comprehensive Plan process. This helped to create a holistic perspective of community input on the future of Downtown Camas and bridged the efforts of the two concurrent projects. The DAC met 8 times throughout the planning process, providing feedback on draft deliverables at key milestones.

Broader community engagement was completed as part of the Our Camas 2045 Comprehensive Plan process. The significant milestones of community engagement that provided insight for the Downtown Plan were:

- **Community conversations.** *Discussions with a range of community groups and Downtown stakeholders early in the project to gain an understanding of existing conditions and desired outcomes.*
- **Community summits.** *Held in an open-house style, the community summits provided an opportunity for members of the Camas community to provide feedback at key moments in the development of the Subarea Plan.*
- **Surveys.** *Online surveys included information that was available at the Community Summit, allowing community members an alternative way to provide feedback at their convenience.*


Hand-drawn diagrams from opportunities and constraints exercise completed with DAC

Goals

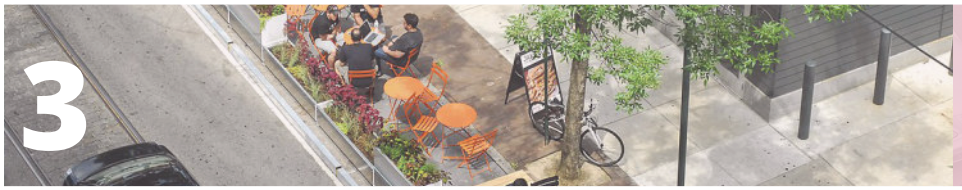
The Downtown Subarea Plan goals provide a set of themes that support the vision for Downtown Camas over the next 20 years. These themes guide the urban design framework and concepts presented in the Downtown Subarea Plan and also help set the key priorities for the implementation strategy.



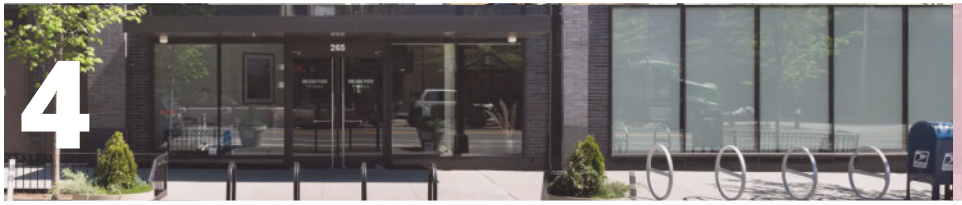
Retain Downtown's **historic character** and expand its **charm**



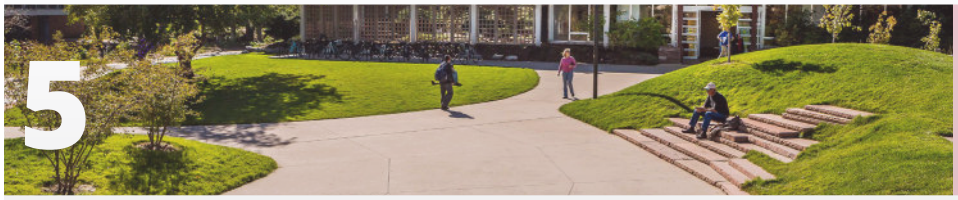
Incentivize a range of **housing** options that welcome more people to live Downtown



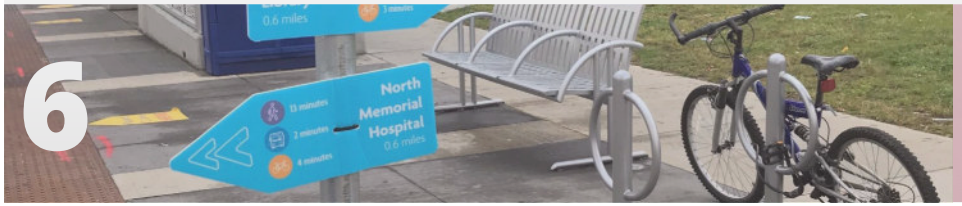
Provide the right mix of **development, services, and open spaces** that support ways for people to live, work, and play Downtown



Encourage **(re)development** to expand opportunities Downtown for retail, office, and residential



Expand on **civic life** and services Downtown through strategic use of City-owned property and vibrant community events

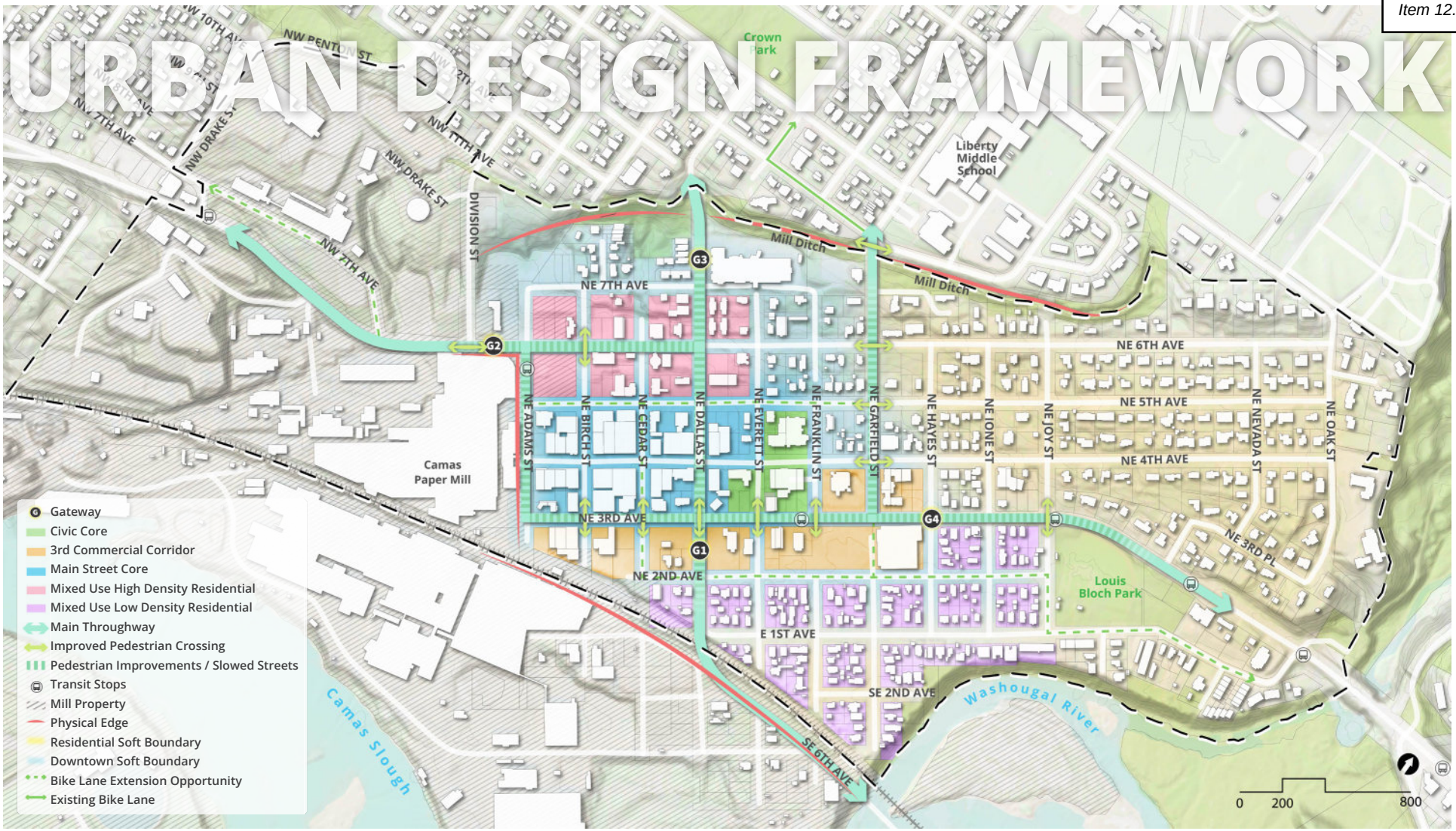


Create a **safe and connected** transportation network that makes Downtown walkable and bikeable

Vision Statement:

Charming, vibrant, and walkable, Downtown Camas is **the city's living room.** Downtown's history is complemented by new businesses and inclusive housing options. Expansion, resiliency, and a dynamic economic landscape are critical to its success. Downtown Camas **anchors the community while fostering a culture of pride, support, and connection.**

URBAN DESIGN FRAMEWORK



The urban design framework visualizes the opportunities and constraints shaping Downtown Camas' future. It highlights existing character areas that reinforce downtown's identity and potential areas for growth. The framework also highlights locations for connectivity improvements and sites for open space enhancements. As a whole, the diagram presents opportunities for expanding civic spaces, improving transportation networks, and enhancing pedestrian and bike accessibility, while also outlining existing traffic challenges and infrastructure limitations. By illustrating these elements, the framework serves as a strategic tool to guide the concepts presented in subsequent sections, ensuring downtown evolves into a more connected, vibrant, and accessible district that supports a mix of uses and community needs.



Home Converted to Business - Camas, WA


Local Non Profit in Downtown Camas - Camas, WA


Residential to Commercial Transition - Camas, WA


NE 4th Ave Historic Shopping District - Camas, WA



Office Building Adjacent to Single Family Housing - Camas, WA


Louis Bloch Park - Camas



The vision and goals for the Downtown Subarea Plan are focused on intentional growth, while preserving the unique identity that defines Downtown Camas. This begins with identifying the character areas that shape the district. The Main Street Core includes the blocks on either side of historic NE 4th Avenue, bookended by the Camas Paper Mill property to the west and the Civic Core to the east. Areas for potential growth include the Mixed-Use High Density Residential area, north of the Main Street Core, where newer apartment buildings have been constructed in recent years. South of the Main Street Core is the NE 3rd Avenue Commercial Corridor and the Mixed Use Low Density Residential, areas with existing lower density and redevelopment potential. The Land Use Concept section further defines the potential transformations of these character areas, ensuring that as downtown grows, it remains a vibrant, welcoming place that reflects the uniqueness of Camas.



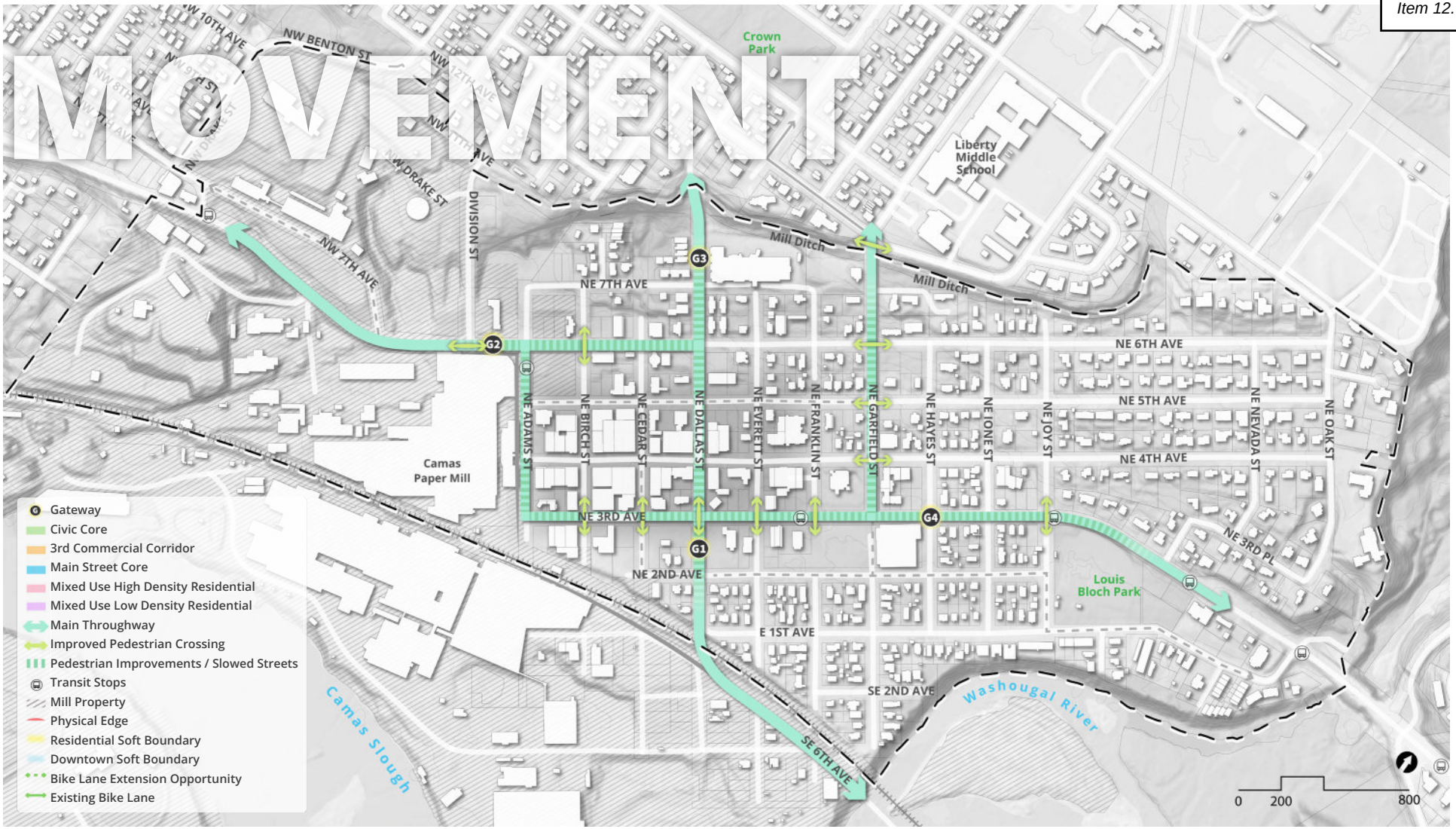
Existing Mixed-Use Building - Camas, WA



Existing Interpretive Signage along NE 4th Ave - Camas, WA


Public Library - Camas, WA


NE 4th Ave Crossing - Camas



Future growth in Downtown Camas relies on a safe transportation network that balances mobility for pedestrians, bicyclists, and cars. Key pedestrian crossing improvements are identified throughout downtown as a starting place for future crossing improvement projects. Further evaluations of additional crossings, streetscape enhancements, quick-build pedestrian safety improvement projects, and a long-term pedestrian safety strategy are addressed in implementation actions DT-1 and DT-6. The introduction of additional gateways into each access point of the downtown area can serve as wayfinding solutions and enhance its unique character. By exploring innovative design solutions, such as slowed streets, this framework also identifies corridors that create a more secure and welcoming downtown environment that encourages walking and cycling.



Integrated Bus Stop and Bike Lane - Nashville, TN



Camas Paper Mill Property - Camas, WA



NE 3rd Ave crossing at NE Dallas St - Camas, WA



Inman Square Bike Lane - Cambridge

RECREATION



Community members and local stakeholders expressed a need for expanded and enhanced recreational opportunities in Downtown Camas. The framework illustrates potential for these improvements by building upon existing open spaces like Louis Bloch Park and the Mill Ditch Trail as open space anchors on opposite ends of the Downtown boundary. Additionally, a central civic plaza or park would serve as a community gathering space. Ideally, these spaces will be connected through an improved transportation network of pedestrian and bicycle infrastructure, creating a system of accessible, active, and inviting outdoor areas for residents and visitors throughout downtown.



Wooden Parklet Structure - London, UK


Mill Ditch Trail - Camas, WA


Louis Bloch Park - Camas, WA


Terraced Park example to Connect the Mill Ditch Trail to Greater Downtown - Hudson

Our Downtown Camas: 2045

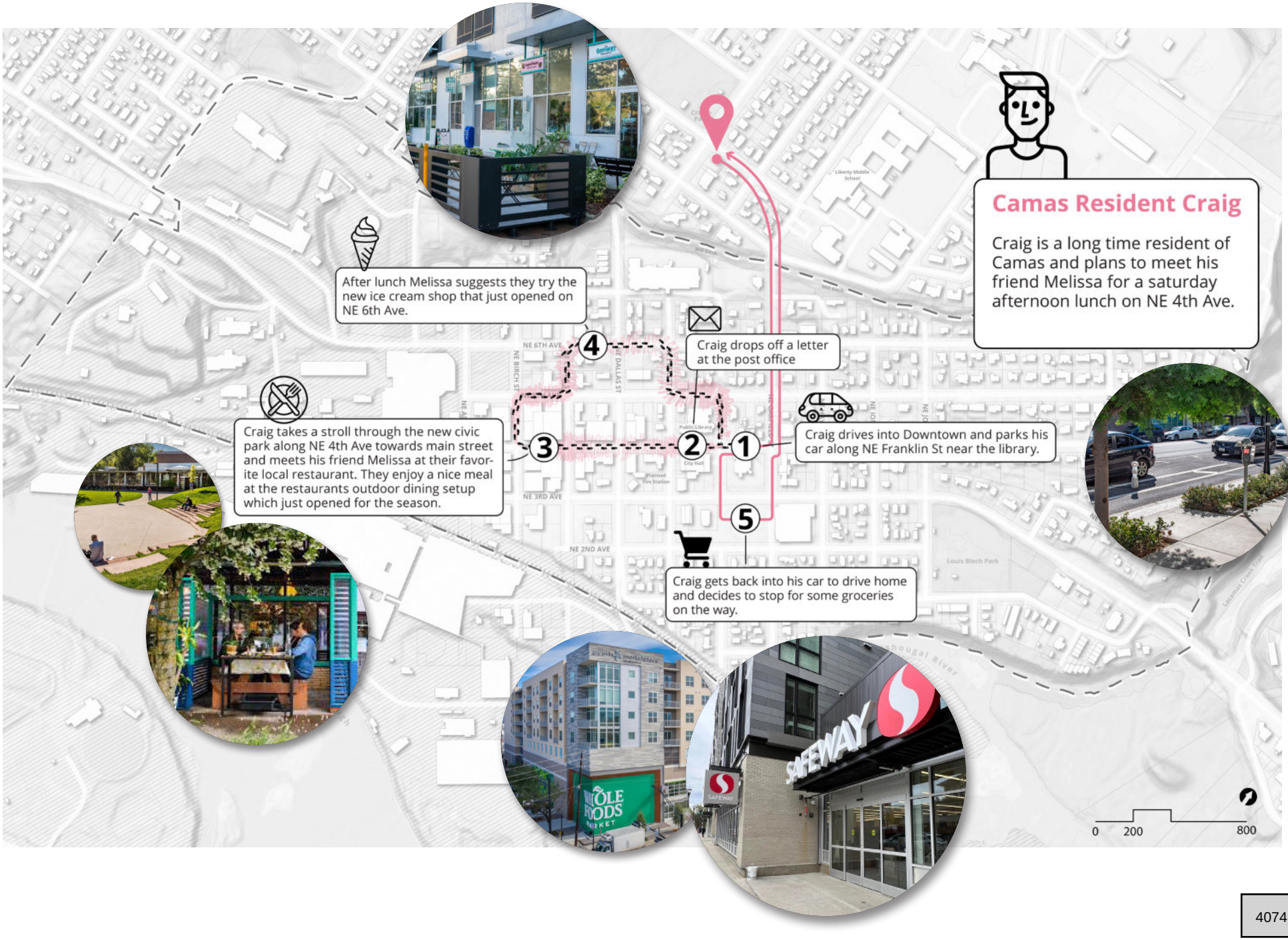
The Downtown Subarea Plan envisions a vibrant, well-connected downtown that strengthens its identity among residents and visitors alike. Expanded beyond NE 4th Ave, downtown will feature a mix of housing, retail, and office spaces, fostering a dynamic, walkable environment.

The urban design framework illustrates potential enhancements that would help achieve this improved experience of navigating Downtown Camas, but it does not highlight how different visitors may interact with these enhancements. The following pages explore a few example journeys for a future “day in the life” in Downtown Camas in 2045.

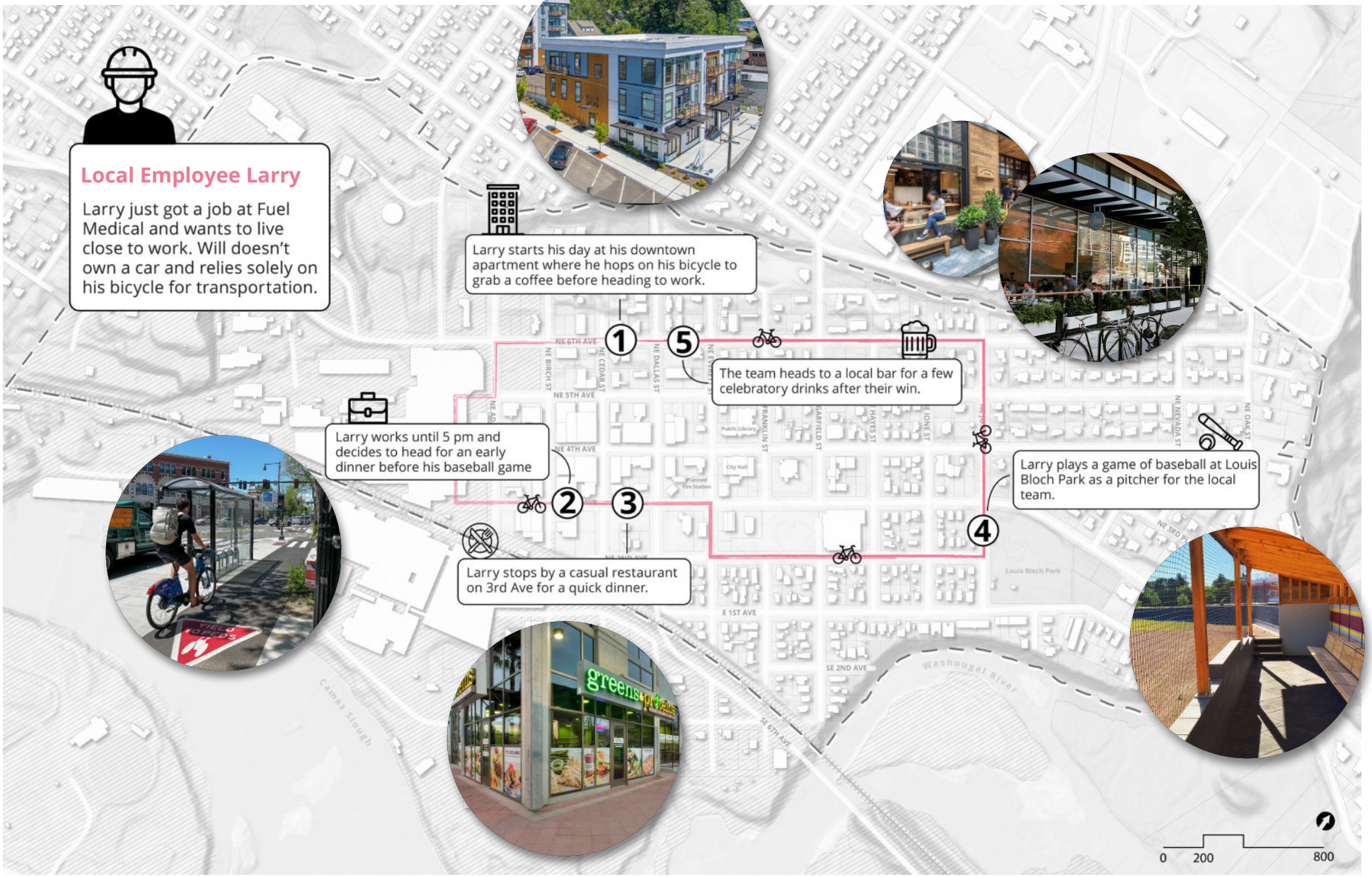


Parkelts Help Liven Downtown and Introduce More Greenery Fast and at Little Cost - Philadelphia

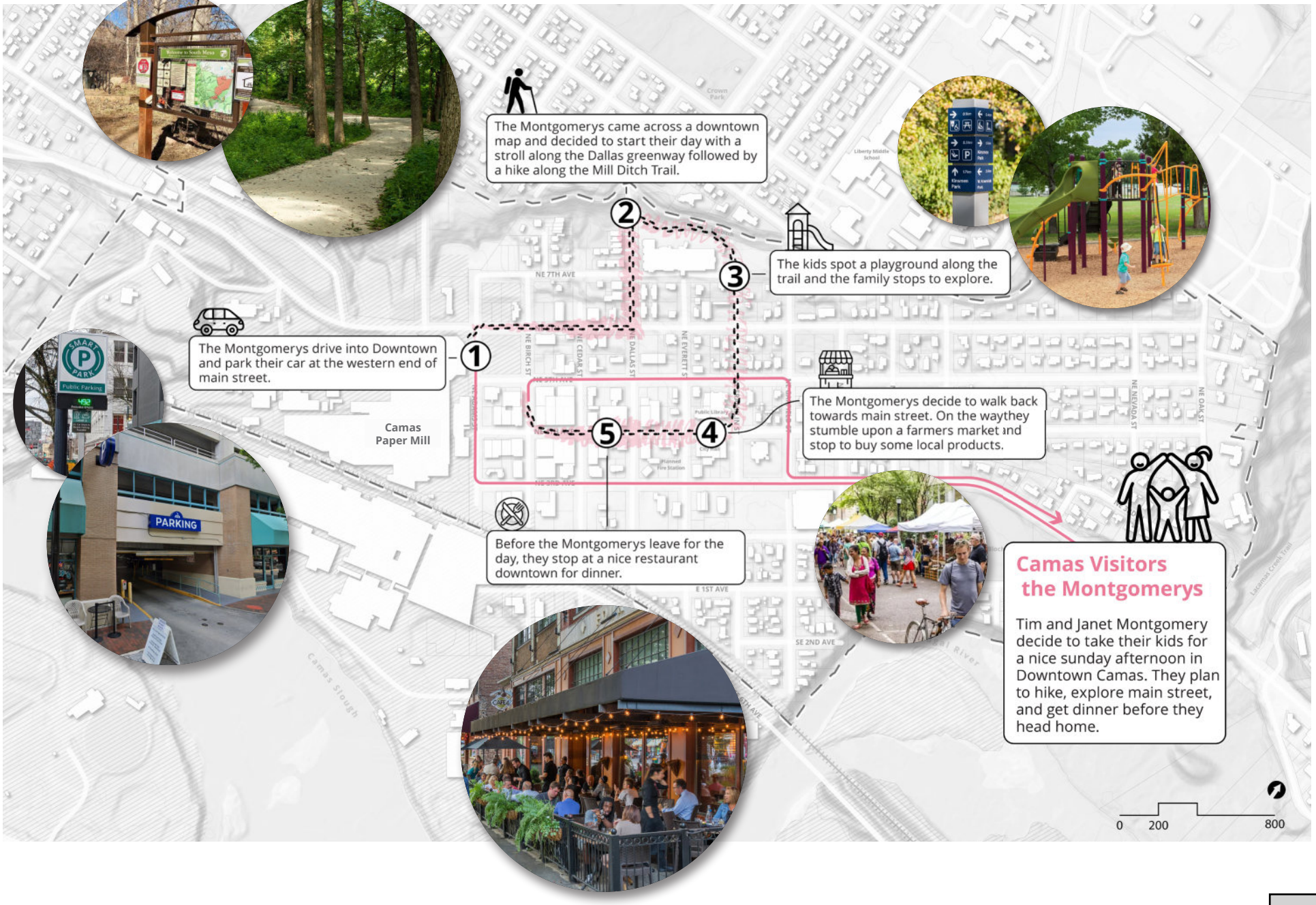
A Day in the Life: Resident



A Day in the Life: Local Employee



A Day in the Life: Visitor



04
Land Use Concept



our 2045 Downtown Camas


Clara Apartments - Camas, WA

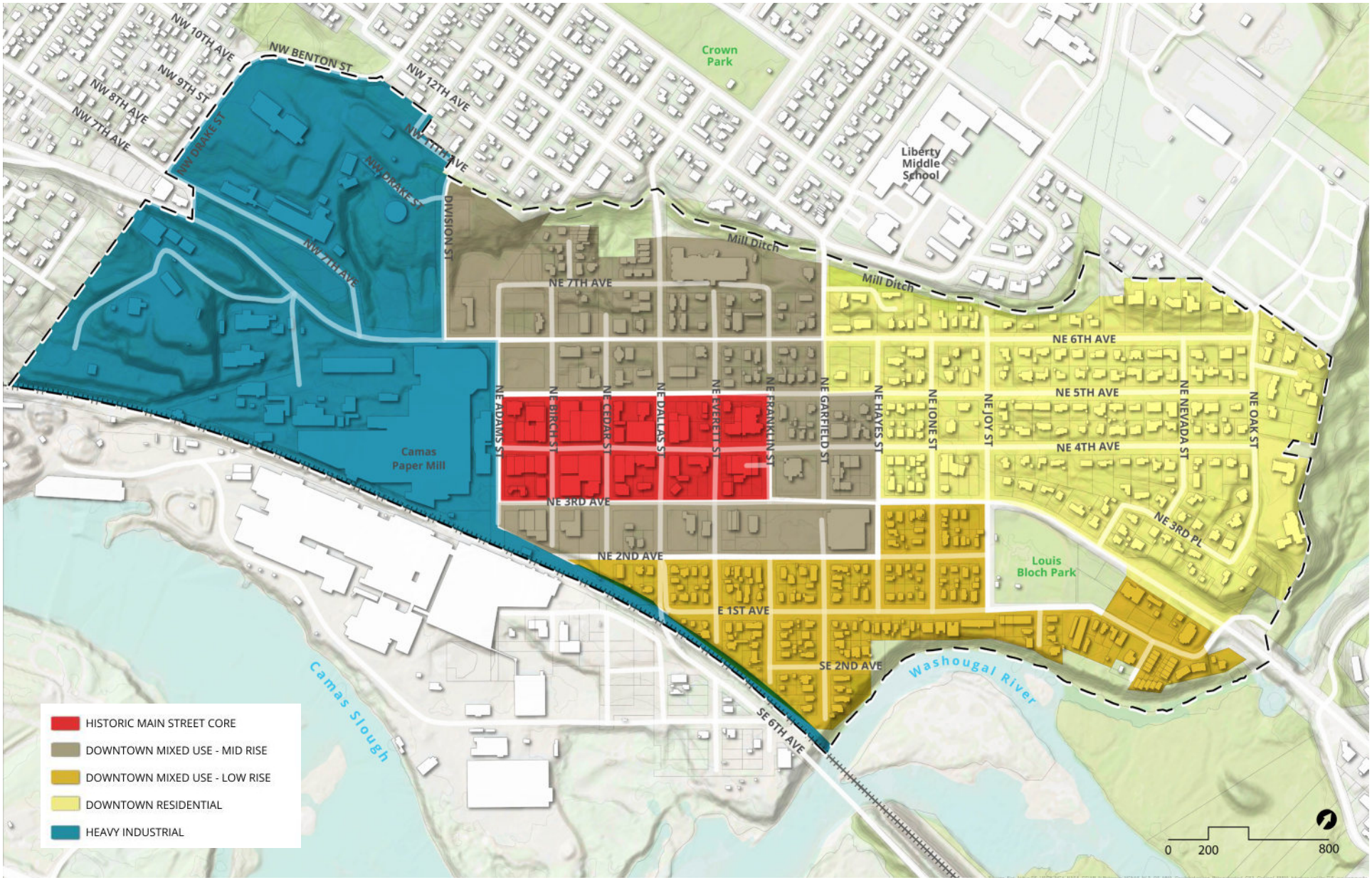
Overview

The land use concept is the result of iterative work with the Downtown Advisory Committee (DAC), City staff, and the broader community to illustrate the types of development that are appropriate for Downtown over the next 20 years. The planning team considered early feedback from stakeholders and worked with the DAC and City staff to identify potential opportunity areas.

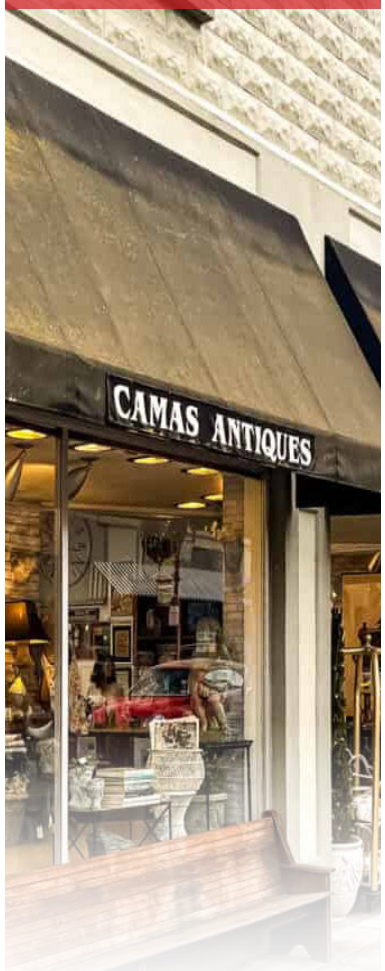
Through evaluation of potential land use types, supplemented by market feasibility analysis, the planning team drafted three land use concepts that aligned with these potential areas of growth. Community members had an opportunity to review and provide comments on these concepts via both in-person and virtual engagement methods. Feedback on these initial concepts led to a refined land use concept that aligns with the overall Downtown Subarea Plan vision. Additionally, while the Camas Mill area remains designated Heavy Industrial, the City will closely monitor changes in this area and look for opportunities to consider future land use planning. This zone already allows a variety of commercial and recreational uses and this plan supports residential development on sites where industrial uses have ceased.

This section discusses each land use type included in the concept, supplemented with images that illustrate what these areas could look like within the context of Downtown Camas.

Land Use Concept



Historic Main Street Core



Key Features:

- Active retail storefronts
- Maintains historic character

Downtown Mixed-Use Mid-Rise



Key Features:

- Mid-rise apartments with active ground floor
- Live/work units
- Higher densty middle housing allowed

Downtown Mixed-Use Low-Rise



Key Features:

- Mix of low-rise apartments with active ground floor
- Live/work units
- Duplexes
- Townhomes
- Triplexes

Downtown Residential



Key Features:

- Single-family homes
- Duplexes
- ADUs

Heavy Industrial



Key Features:

- Camas Paper Mill
- Industrial and Commercial uses
- Recreational and Educational uses
- Residential development

Historic Main Street Core

The Downtown Subarea Plan identifies the Historic Main Street Core as the blocks along NE 4th Avenue, between NE 5th and 6th Avenues and between NE Adams and NE Garfield Streets. The NE 4th Avenue corridor has been the heart of Downtown Camas with its historic Main Street character. Its active retail frontages in historic buildings house a thriving business community, where storefronts are in short supply as coveted locations for Camas business owners. The NE 4th Avenue corridor hosts several events throughout the year, bringing residents and visitors of Camas to this central gathering space.

As with any unique, beloved place, there is a community desire to preserve the character of NE 4th Avenue while recognizing some potential areas for change. The streetscape defines this area as much as the buildings and uses do, with wide sidewalks, bulbouts, midblock crossings, and a mature tree canopy enhancing the pedestrian experience. Priorities in this area will include preserving existing buildings that contribute to the desired look and feel of Downtown Camas, supporting active street frontages for retail businesses, and enhancing the area's status as a central gathering space, as shown in the expansion of the Civic Hub.


Corner of NE Dallas St & NE 4th Ave - Camas, WA

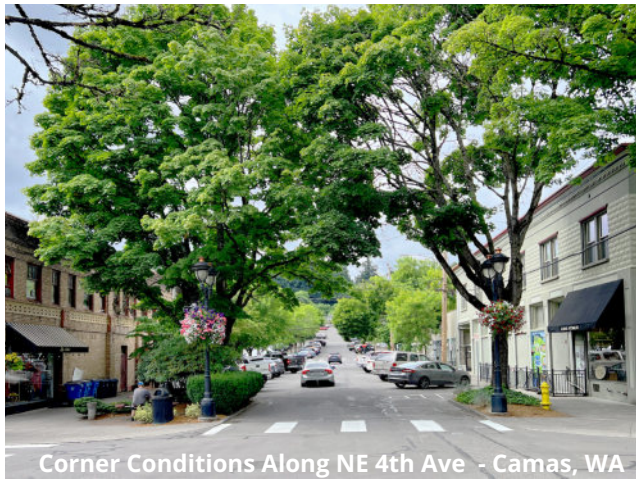


Liberty Theater - Camas, WA



Downtown Camas Gateway Signage


NE 4th Ave Street Conditions - Camas, WA


Corner Conditions Along NE 4th Ave - Camas, WA


Street Crossing Along NE 4th Ave - Camas

Streetscape



NE Dallas St & NE 4th Ave

Slowing traffic by adding wider sidewalks and curb extensions on Dallas can create a clear north-south bike / pedestrian connection through Downtown and connect outlying parklands and greensp

Civic Hub

With the Camas Paper Mill property as the southwest bookend to historic NE 4th Avenue, the Civic Hub will serve as the vibrant northeast gateway to downtown. This reimagined civic center will unite existing city services—the Library, City Hall, and the new Fire Station 41—into a cohesive and welcoming district. A new City Hall, strategically positioned near NE 3rd Avenue, will create opportunities for a dynamic public plaza and a flexible festival street that can host community events, farmers markets, and public gatherings

The planned Fire Station 41 includes a small civic space, which could seamlessly connect to a larger, multi-functional plaza between City Hall and the Library. This central gathering space will strengthen the identity of downtown Camas, offering an inviting destination where civic life, cultural activities, and daily social interactions thrive. By integrating walkable connections, green spaces, and public art, the Civic Hub will become a true anchor for the community, fostering engagement and reinforcing the historic charm and future growth of downtown.


Conceptual Rendering of the New Camas Fire Station 41



Public Art Street Corner Activation - Cedar Park, TX


12th Ave Square Park - Seattle, WA


Civic Park - Boulder, CO


Green Street Woonerf - Edmonton, CA


Belle Street Park - Seattle

Streetscape



NE Everett St & NE 4th Ave

Moving City Hall south toward NE 3rd Avenue creates a civic campus with the library and opens up a great opportunity for a public plaza on NE 4th Avenue.

Downtown Mixed-Use Mid-Rise

Surrounding the Historic Main Street Core, the Mixed-Use Mid-Rise area would allow for expanded development in the blocks beyond NE 4th Avenue. Mixed-Use Mid-Rise development, typically ranging between three and five stories, would complement the retail and commercial uses along the Historic Main Street Core, while providing more opportunities for commercial space in mixed-use buildings. Frontages along NE 3rd and 5th Avenues will include a larger concentration of commercial space and active street frontages, and new development in this area could also include residential property types, such as townhomes or apartment buildings with a mix of rental and ownership options.

The priority for this area is to extend the experience of Downtown Camas as a walkable, livable area that provides a range of housing and commercial opportunities as the City grows.


Mixed Use Development - Boulder, CO



Ground Floor Grocery Store - Seattle, WA


Mid Rise Apartments - Chicago, IL


Clara Apartments - Camas, WA


Fire Clay Lofts - Denver, CO


Mixed Use Apartments - Portland

Streetscape



NE 5th Ave & NE Birch St

Widening sidewalks and adding bike lanes and curb extensions introduces a safer and more pedestrian-focused edge to the historic commercial district, which will see
enhanced business from new medium-density mixed-use apartment buildings.

4086

Downtown Mixed-Use Low-Rise

With higher-density development in the Mixed-Use Mid-Rise area, there is potential for existing underutilized areas south of NE 3rd Avenue to redevelop as Mixed-Use Low-Rise. This area would remain predominantly residential, with redevelopment focusing on middle housing types such as townhomes, duplexes, triplexes, and quadplexes, while commercial development would occur in mixed-use buildings along key corridors or corner lots. As this area was previously zoned Mixed Use with several in-home businesses, the City will continue to encourage live-work land uses and development.

Streetscape improvements and enhanced crossings along NE 3rd Avenue will strengthen connections between this district and the downtown core, making it easier for residents and visitors to engage with downtown businesses, services, and public spaces.


Low Rise Apartments with Garage Space - Reno, NV



Low Rise Ground Floor Corner Market - Seattle, WA


Modern Duplex - Denver, CO


Low Rise Apartments with Ground Floor Entry - Denver, CO


3 Story Townhomes - Ottawa, ON



Low Rise Ground Floor Retail - Oklahoma City

Streetscape



NE 2nd Ave & NE Everett St

As an important multimodal connector between the downtown historic district and Louis Bloch park, NE 2nd Ave provides pedestrians and cyclists an active but quieter thoroughfare away from the traffic of NE 3rd Ave.

Downtown Residential

The transition out of the commercial core of Downtown to the northeast leads to a lower-density existing residential area, Evergreen Terrace. Updated requirements to residential zoning codes citywide will apply to this zone. The area will remain residential, with potential for infill development as ADUs or middle housing in specific areas.

Streetscape improvements and an expanded tree canopy will enhance the neighborhood's character and walkability, while improved pedestrian crossings across Garfield Street will strengthen connections to the downtown core, making it safer and more accessible for residents.


Cottage Cluster Housing - Portland, OR


Accessory Dwelling Unit (ADU) Garage Conversion - Portland, OR


Accessory Dwelling Unit (ADU) - Portland, OR


Cottage Cluster Housing - Auburn, CA


Middle Housing Example - Shell Cove, NSW


Single Family Lots - Portland

Streetscape



NE 6th Ave & NE Joy St

Our example residential street, NE 6th at NE Joy St, is currently 50-ft wide with curb-tight sidewalks. This street can be enhanced with curb extensions to slow traffic, improve safety and walkability, and provide planting areas for many new street trees.



05
Open Space

our 2045 Downtown Camas

Open Space Improvements

The City of Camas provides access to a range of high-quality recreation areas and open spaces, which are a major draw for residents. Many choose to live in Camas because of these exceptional parks and recreation opportunities. However, while NE 4th Avenue features wide sidewalks and a few seating areas, there is no dedicated city park or open space in the downtown core. During engagement for the Downtown Subarea Plan, community members and stakeholders expressed interest in more public spaces, community gathering areas, and stronger open space connections downtown.

This section outlines potential enhancements to existing open spaces as well as new opportunities to introduce open space into the heart of Downtown.



Local Community Garden - Vancouver



Connected Network of Open Space

The urban design framework envisions a connected network of trails, parks, plazas, and parklets to enhance outdoor recreation and green space throughout Downtown Camas. By linking existing and new open spaces, this network will provide accessible, inviting areas for relaxation, social gatherings, and community events. Strategically placed plazas and parklets will complement larger parks and trails, creating a seamless flow of outdoor spaces that encourage walking, biking, and recreation. This approach aims to integrate more greenery into downtown while fostering a vibrant, active, and connected community environment.



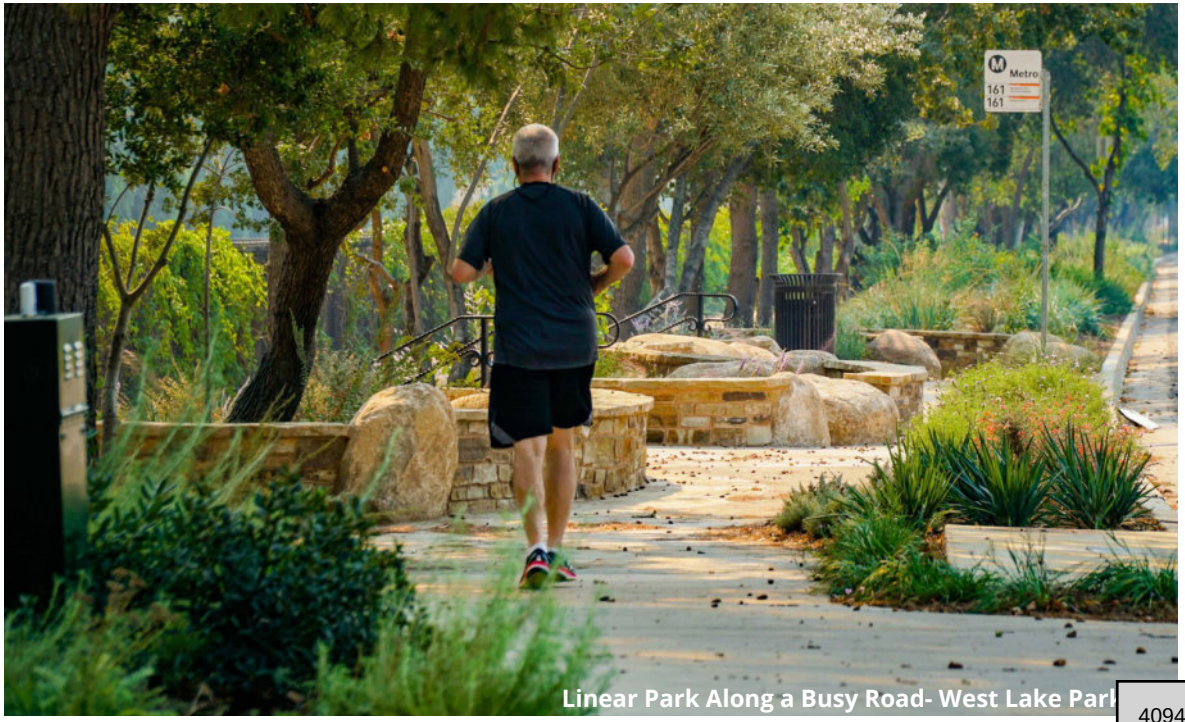
Gravel Trail Through the Woods - DuPage County, IL



Wooden Parklet Structure - London, UK



SIdewalk Landscaping Upgrades - Seattle, WA



Linear Park Along a Busy Road- West Lake Park

4094

Louis Bloch Park Enhancements

Planned enhancements for Louis Bloch Park aim to create a more dynamic and community-focused space. Proposed improvements include developing a designated area for programmed events and providing a flexible venue for gatherings, performances, and activities.

Upgrades to the sports facilities will enhance recreational opportunities, ensuring the park remains a hub for local athletics. Additionally, the addition of a play park for children will create a welcoming, family-friendly environment.

To support these improvements, the plan also emphasizes better connectivity between the park and the downtown core, encouraging more seamless access for pedestrians and cyclists. These enhancements will transform Louis Bloch Park into a more versatile and engaging space for residents and visitors.



A Community Event Space

The programmed event space at Louis Bloch Park will provide a dedicated area for community gatherings, performances, and seasonal events. Designed for flexibility, it will accommodate a variety of activities, from concerts to markets, fostering a lively, engaging environment that strengthens community connections and enhances downtown's cultural and social offerings.


Covered Picnic Pavillion - Hillsborough NC


Outdoor Ampitheater for Public Events - Seattle, WA

B Sports Fields Improvements

Sports field improvements at Louis Bloch Park will enhance playability and accessibility for local athletes and recreational users. Upgrades may include improved turf, lighting, and seating, ensuring a better experience for players and spectators. These enhancements will support year-round use and strengthen the park's role as a key community sports hub.


Sand Volleyball Court - Central Park, NYC


Baseball Field Dugout Improvements - Ames, IA

C Play Park

The children's play park at Louis Bloch Park will provide a safe, engaging space for families. Featuring modern play structures, seating areas, and shaded spots, it will offer opportunities for active play and social interaction. This addition will make the park more family-friendly, enhancing its role as a community gathering space.


Immersive Childrens Playscape - San Francisco, CA


Playground in Local Park - Carme

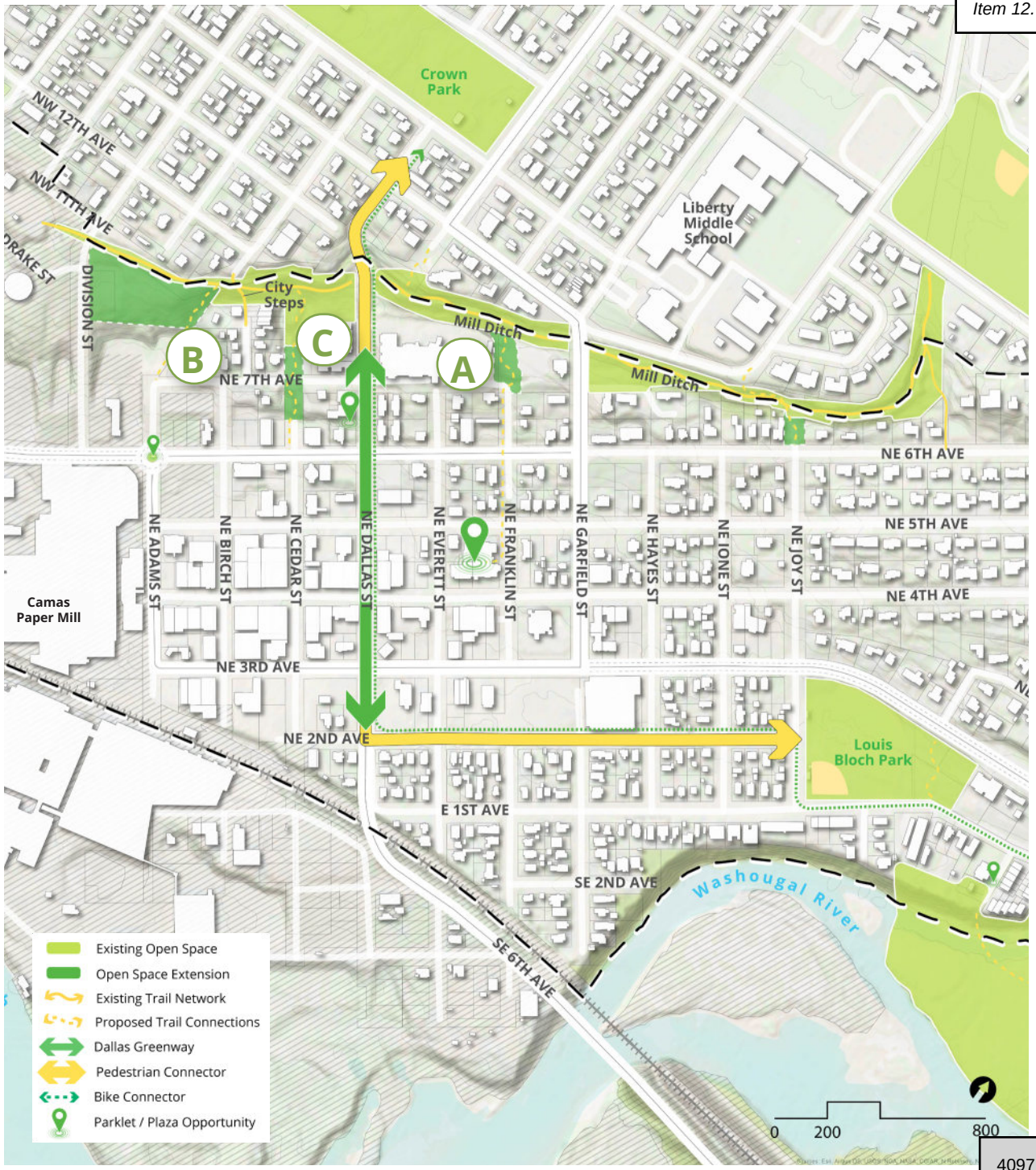
Mill Ditch Trail Improvements



Example Sketch of a Multi-Use Trail Through the Woods

The urban design framework identifies potential improvements to the Mill Ditch Trail that would enhance its accessibility and connection to Downtown Camas. Key improvements include adding wayfinding signage to better guide users to and from the trail, as well as establishing a trailhead to create a welcoming entry point.

As a historic, mostly flat, unpaved route following the former Camas Paper Mill water ditch, the 2.6-mile trail offers a unique recreational experience. Enhancing its visibility and access will encourage more use, strengthening its role as a key outdoor asset for the community.



A Trail Connections to Downtown Camas

Improvements to the Mill Ditch Trail will enhance connections to Downtown Camas through wayfinding signage and strategic access points. Strengthening links at key streets like NE Dallas and NE Garfield will make the trail more accessible, encouraging walking and biking between downtown, surrounding neighborhoods, and recreational areas.





Trailhead Signage - Boulder, CO

B Neighborhood Park Opportunities

Neighborhood park opportunities along the Mill Ditch Trail focus on transforming adjacent lots into accessible green spaces. These parks would provide seating, play areas, and natural landscaping, creating inviting community gathering spots. Strategically placed along the trail, they would enhance recreation, strengthen neighborhood connections, and improve access to Downtown Camas.


Small Park Along Trailhead - Cascade, MI


Example of a Hillside Park to Potentially Connect the Mill DitchTrail to Greater Downtown Camas

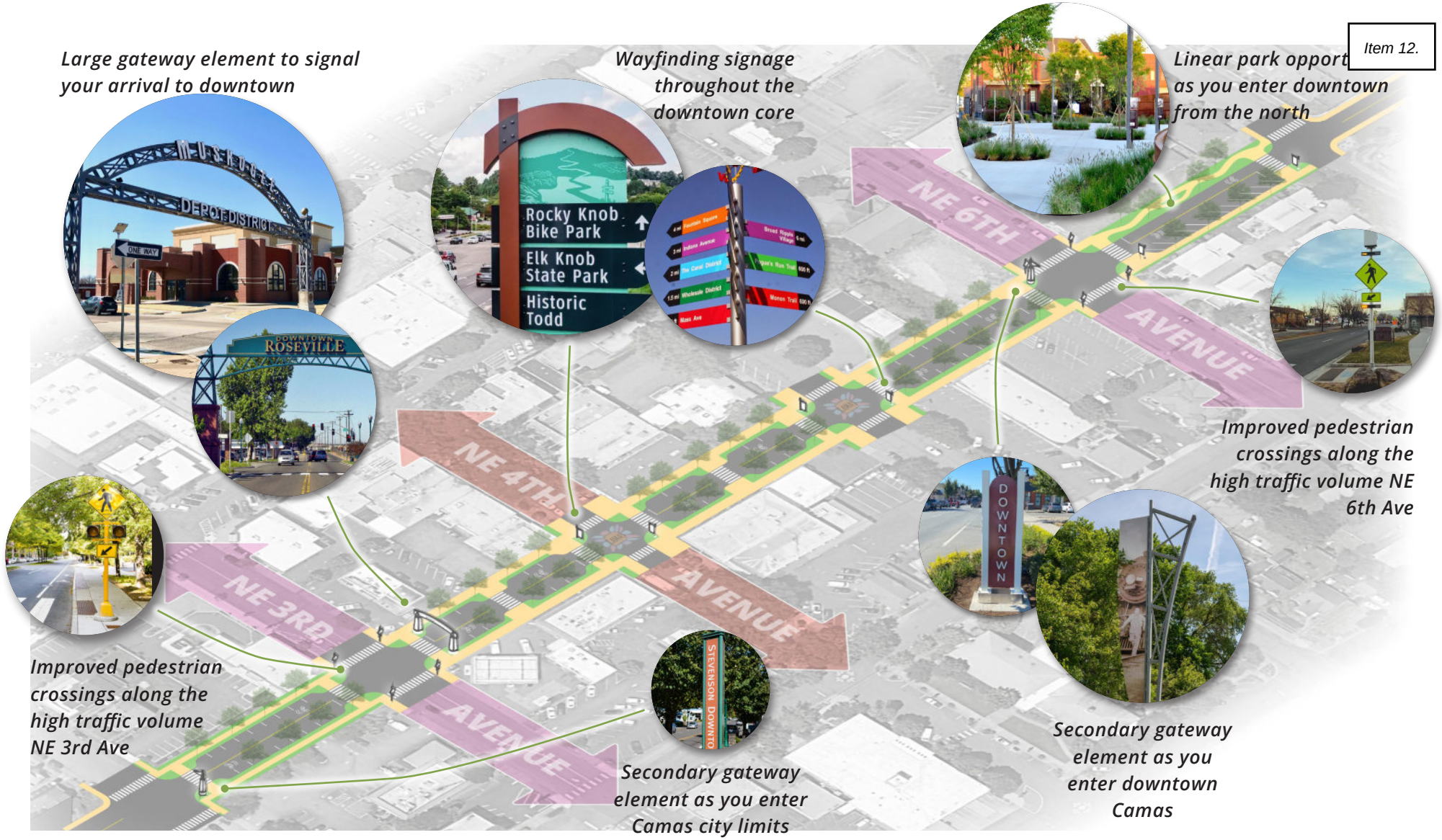
C Community Garden Sites

The plan explores opportunities for small community gardens along the Mill Ditch Trail to enhance its appeal and engage the community. These gardens would activate underutilized spaces, adding greenery and seasonal plantings while fostering community involvement. Strategically placed, they would create inviting, interactive spaces that complement the trail's natural character.


Low Impact Community Garden Site - Moraga, CA



Small Urban Farm Example - Seattle



Dallas Linear Park

The Dallas Linear Greenway would transform NE Dallas Street into a safer, more inviting corridor for pedestrians and cyclists while maintaining vehicle access. Wider sidewalks, curb extensions, and mid-block crossings will enhance walkability and outdoor gathering spaces. The plan also introduces more on-street parking and increased street trees to improve both accessibility and aesthetics. A linear park between NE 6th and 7th Avenues will provide a welcoming green space for those arriving downtown from the north, strengthening connections to neighborhoods and surrounding parklands.

Wayfinding Elements

The wayfinding elements along the Dallas Linear Greenway will include directional signage and maps to guide pedestrians and cyclists. These features will not only improve navigation between downtown and surrounding parks but also help establish a strong downtown identity, enhancing the area's sense of place and making it more welcoming.



Park Network Wayfinding Signage - Edmonton, CA



Historic Map - Washington, DC

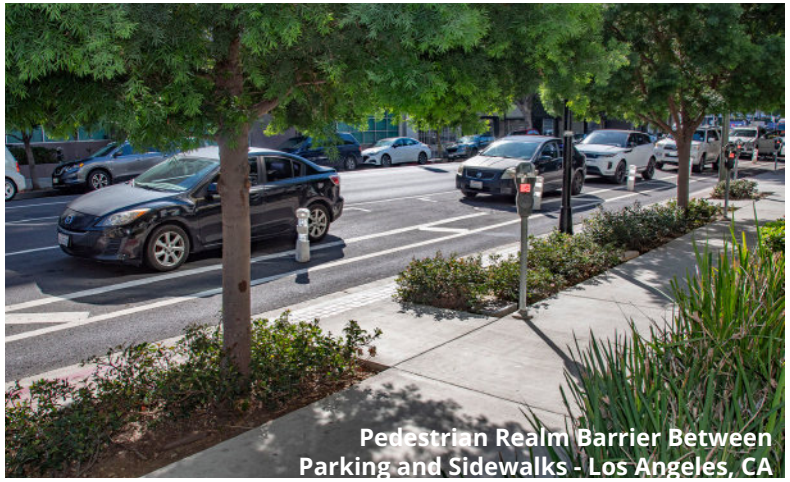


Urban Trail Network Map - Austin, TX

On-Street Parking Improvements

The Dallas Linear Greenway will enhance on-street parking by making existing spaces more pronounced and identifying new areas for additional parking. These improvements will provide more convenient parking options for visitors, support local businesses, and improve the overall functionality and accessibility of Downtown Camas.


On Street Parking Nestled Amongst Landscaping - Nashville, TN


Pedestrian Realm Barrier Between Parking and Sidewalks - Los Angeles, CA

Street Tree Enhancements

The Dallas Linear Greenway will incorporate additional street trees along NE Dallas Street to enhance the pedestrian experience and improve aesthetics. These tree plantings will provide shade, create a more inviting environment, and contribute to the overall greenery of the area, helping to beautify and soften the streetscape.


Green Infrastructure Streetscaping - Nashville, TN


Increased Planter Beds for Street Trees - Paramount



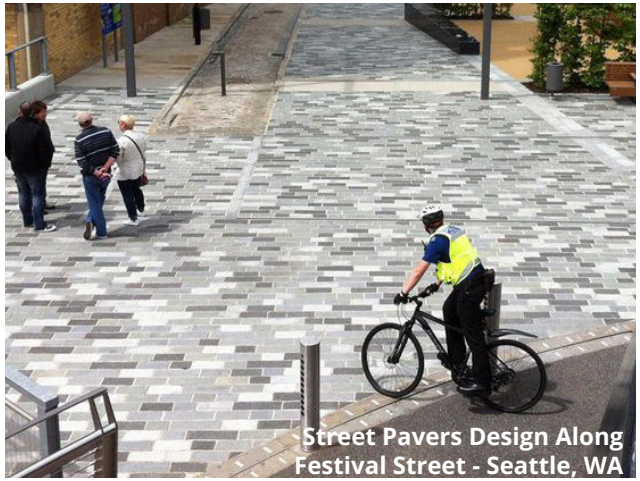
High Level Conceptual Rendering

Civic Plaza

The proposed civic plaza aims to create a vibrant public space as the heart of a potential civic campus encompassing a relocated City Hall, existing library, and new fire station. This allows for a flexible plaza on NE 4th Ave, accessible to cars but easily closed for events like the farmer's market. The plaza will anchor NE 4th Ave, strengthening connections to the downtown historic core while providing a much-needed space for community gatherings and activities.

Festival Street

The new civic plaza will serve as a central gathering space for the community, hosting events like the farmer's market and other public activities. Its flexible design will enhance downtown's social life, providing a venue for cultural events and fostering a greater sense of community.


Street Pavers Design Along Festival Street - Seattle, WA


Shared Car and Pedestrian Street - Seattle, WA

Downtown Anchor

The civic plaza will anchor downtown by providing a central, vibrant space for community events and gatherings. Its strategic location at the eastern end of the historic NE 4th Ave will draw activity, create a focal point for the area, and enhance downtown's sense of place, making it a key destination within the district.



Farmers Market - Boulder, CO


Community Event - Cleveland, OH

Center for Civic Life

The new civic campus will bring essential community services together in one area, making it easier for residents to access services. The integrated plaza will provide space for both civic activities and recreational use, offering opportunities for public events, play, and social interaction, fostering a stronger sense of community.


Encourage Residents to Stop and Hangout


Public Art Installations - Melbourne, Austi

Development Feasibility Study

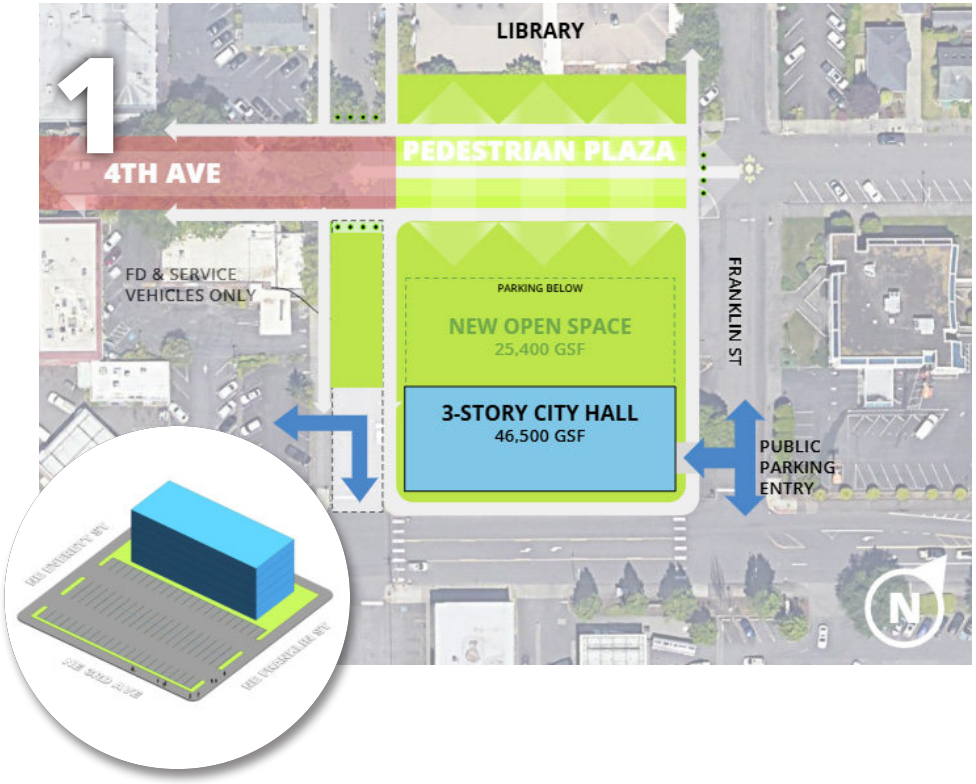
A development feasibility study focused on two possible scenarios for the civic plaza, considering market trends and regulatory factors. The study assessed how rising development costs, including materials, labor, and parking requirements, affect the plaza's feasibility. The study aimed to balance the need for a vibrant public space with current economic conditions, ensuring the plaza remains a practical and valuable addition to Downtown Camas.



Civic Plaza Conceptual Site Plan - Camas

4103

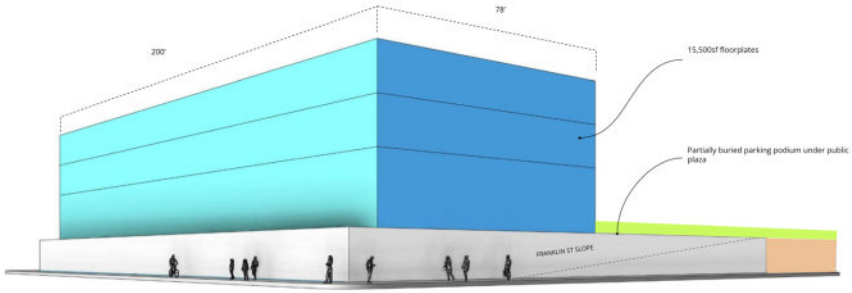
Development Scenarios

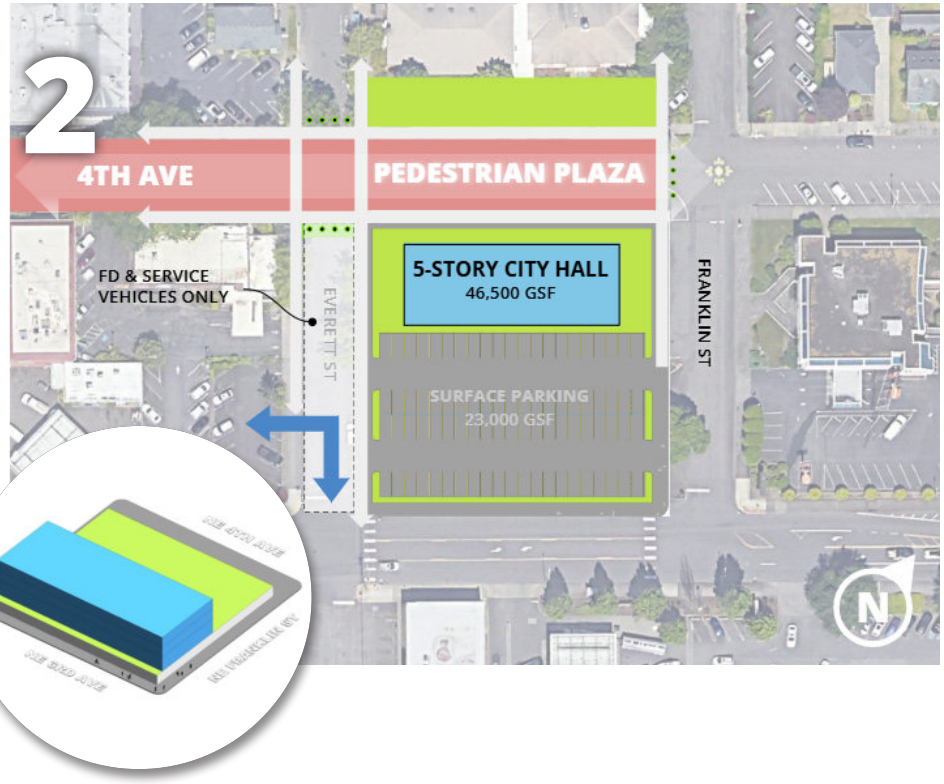


Move City Hall south to create a civic quad (public open space that stretches across 4th Ave to the Library) while simultaneously reinforcing taller construction and higher density on NE 3rd Avenue.

3-story, 46,500 sf new building = *~150% of current gsf*

36,000 SF parking podium = *116 of 117+ required off-street parking spaces*

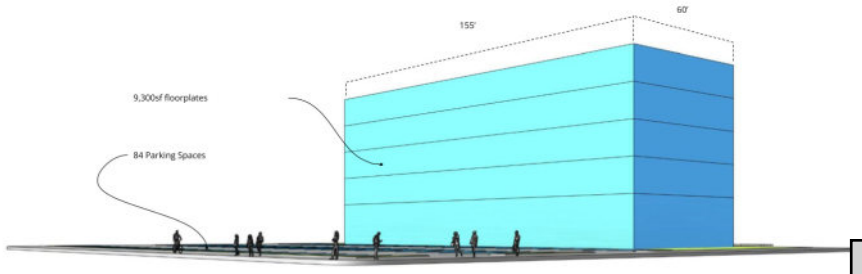




Provide surface parking off the main auto thoroughfare of NE 3rd Avenue. Maintain City Hall's intimacy with NE 4th Ave while building up to increase density. No new open space.

5-story, 46,500 sf new building = *~150% of current gsf*

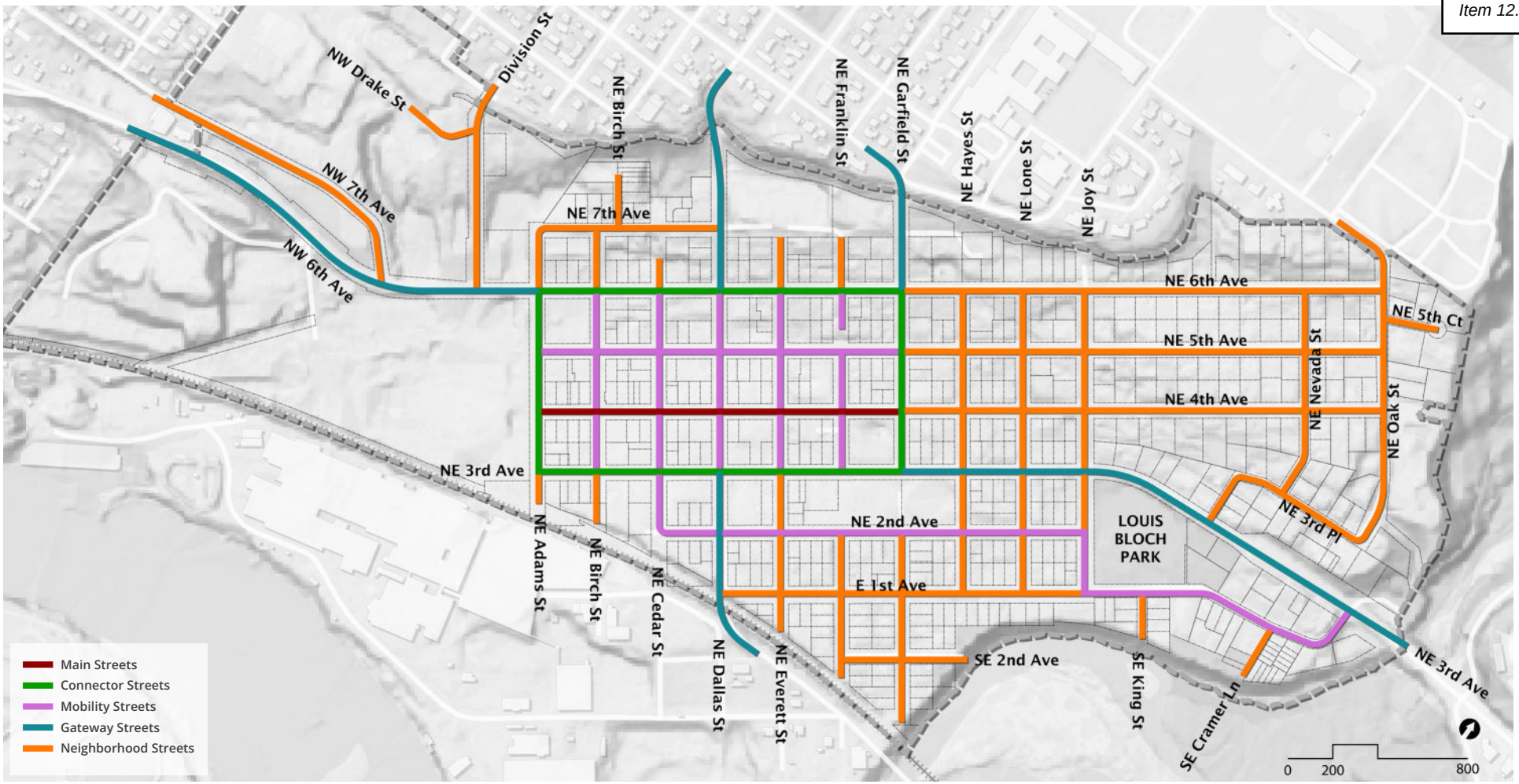
23,000 SF parking podium = *84 of 117+ required off-street parking spaces*



4104



06 Transportation



Street Network Overview

The street network of Downtown Camas supports a range of uses and needs that have evolved over time, as presented in this Plan. The core of Downtown Camas, NE 4th Avenue, is distinctive not only in its range of shops, restaurants, and other services that bring residents and visitors to Downtown, but also in its unique street type and public realm elements. Streets surrounding NE 4th Avenue support connectivity through Downtown and provide access to neighboring residential and commercial areas in the vicinity. These streets serve multiple modes of transportation, and planning for future development (as described in the Subarea Plan) will require coordination on the evolution of the street network. This section defines the street network according to five street types—Main Streets, Connector Streets, Mobility Streets, Gateway Streets, and Neighborhood Streets. These street types align with the definitions for regulation of the public realm in the Downtown Design Manual that accompanies the Downtown Subarea Plan.

Main Streets

Historic NE 4th Avenue, between NE Adam Street and NE Garfield Street, alone defines the Main Street type in Downtown Camas. It is intersected by a network of Mobility Streets and surrounded by a ring of Connector Streets. NE 4th Avenue sets the foundation for the public realm for the Historic Main Street Core land use type. NE 4th Avenue supports a range of active, ground-floor retail and service-based businesses. It creates an inviting atmosphere for pedestrians and cyclists along a curated streetscape.

Future planning for Downtown Camas will continue to consider NE 4th Avenue as a core feature of Downtown's character. This includes preserving the existing functions of the public realm and maintaining key elements including street trees, lighting, and other amenities.





Main Streets Cross Section

4107

Connector Streets

The Connector Streets in Downtown Camas create a buffer around the Main Street Core, with NE Adams Street to the west, NE 3rd Avenue to the south, NE Garfield Street to the east, and NE 6th Avenue to the north. These streets, as the name implies, provide key connection points to NE 4th Avenue as well as provide a link to future development in the Mixed-Use Mid-Rise area. As new residents move into these areas of Downtown, improvements to pedestrian and bicycle facilities will create more walkable and bikeable access to and through Downtown.

Connector Streets will continue to be thoroughfares for vehicles to move efficiently through Downtown Camas, while considering opportunities to create safe routes for increased pedestrian and bicycle traffic, especially at key intersections along NE 6th Avenue and NE Garfield Street. Improvements may include larger curb extensions at intersections or mid-block crossings, designated and / or protected bike routes, and efficient parking facilities.





Connector Streets Cross Section

4108

Mobility Streets

Mobility Streets weave into the core of Downtown Camas, allowing the highly walkable and bikeable nature of the Main Street Core to permeate through newly developed areas of Downtown. NE Dallas Street (also a Gateway Street near the periphery of Downtown), will transform into a greenway that provides an intersection between mobility and recreation in Downtown Camas. Similar to Connector Streets, the Mobility Streets balance multimodal transportation, providing adequate traffic flow (and parking) for vehicles, while focusing on safety and upgraded facilities for pedestrians and bicycles. The pathway along NE 2nd Avenue provides an alternative route to busier NE 3rd Avenue for pedestrians and bicycles, and connects Louis Bloch Park to the rest of Downtown.

Similar to future planning for the Connector Streets, Mobility Streets will see improvements to curb extensions at intersections and mid-block crossings, as well as bicycle facility improvements and wayfinding.



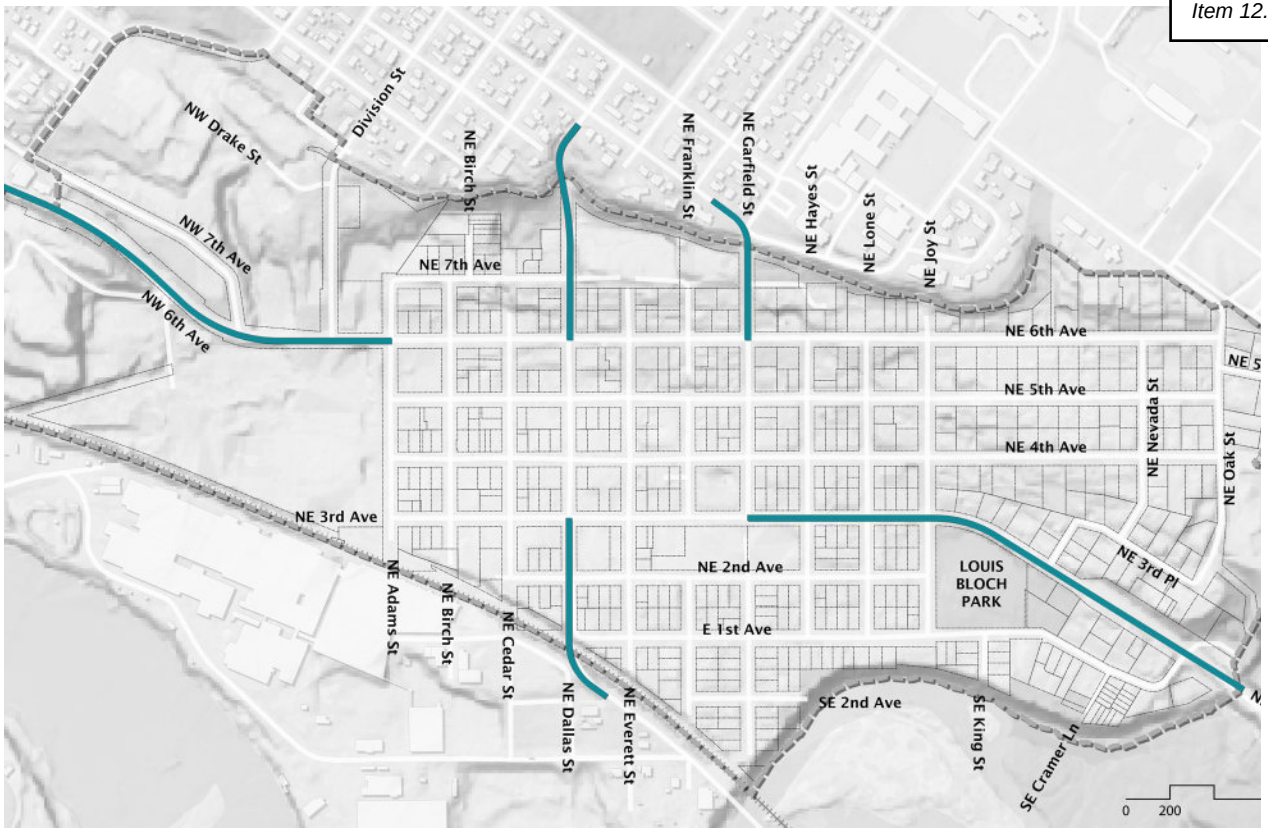


Mobility Streets Cross Section

Gateway Streets

Gateway Streets serve as the entry point that defines Downtown Camas from the rest of the city. While the land uses and landmarks surrounding the Gateway Streets (e.g., the Camas Mill) also help to signify Downtown, the street network is what helps visitors arrive in a logical and efficient manner. The Gateway Street at NE 6th Avenue allows access to Downtown from the west side of Camas, and is currently the most prominent entrance to Downtown with its proximity to the Mill. Existing signage also welcomes visitors to the area. NE Dallas Street connects the northern and southern neighborhoods and future improvements as a greenway will offer a recreation-based attraction to Downtown. NE Garfield Street is a secondary gateway street connecting neighborhoods to the north of Downtown. NE 3rd Avenue is the primary gateway for vehicles arriving from the east side of Camas or the surrounding communities.

Future planning for Gateway Streets will consider traffic flow and speed as vehicles arrive Downtown to make crossings at key intersections safer and more inviting for multi-modal travel. Improved access for pedestrians and bicycles will include protected and marked facilities as well as wayfinding.





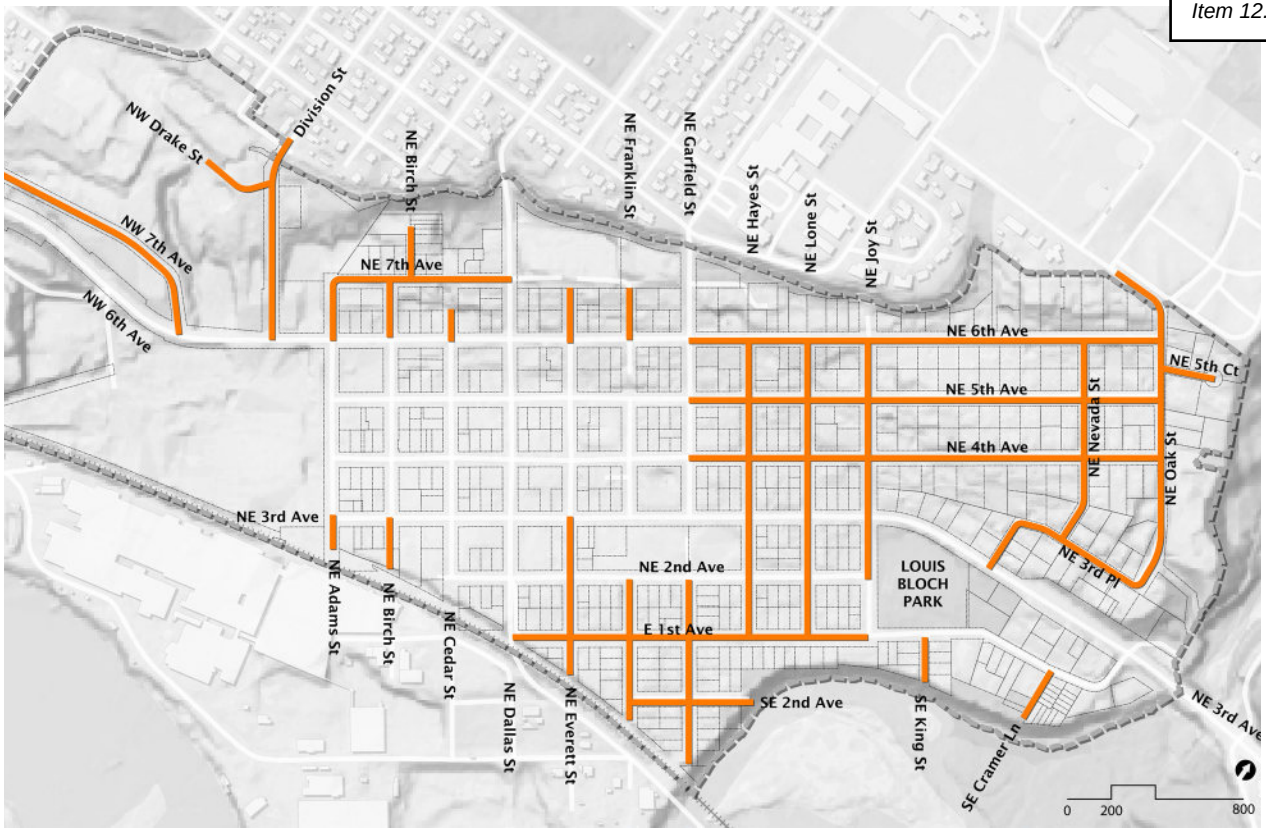
Gateway Streets Cross Section

4110

Neighborhood Streets

The Neighborhood Streets provide all remaining intermittent connections to the street network within the lower-density residential areas of Downtown Camas. These streets will continue to primarily serve local residents within these neighborhoods, providing vehicular access at residential speeds, on-street parking, and sidewalks with improved crossing access for pedestrians.

The Neighborhood Streets also connect Downtown with adjacent open spaces, including Louis Bloch Park and the Mill Ditch Trail. The Open Space section identifies potential trail connections to Neighborhood Streets, and future intersection improvements at key intersections (along NE 6th Avenue and NE Garfield Street) will allow for safer opportunities to connect recreation and Downtown activities.





Neighborhood Streets Cross Section

Traffic Analysis

The updates to the Camas Transportation System Plan (TSP) for a planning horizon through 2045 included a traffic analysis for the Downtown Subarea Plan boundary. The analysis considered two land use scenarios, a Baseline alternative and an alternative based on the Downtown Subarea Plan's preferred land use concept. The results of this analysis are provided in Appendix A of the Downtown Subarea Plan.







Existing Conditions of Downtown Camas Streets

4112

07 Infrastructure

Overview

The proposed land use concept defined in section 4 will create different needs for infrastructure in future development of Downtown Camas. This section summarizes the high-level review of the existing stormwater system and the potential impacts to the system under the proposed changes. (The full results and methodology used for this analysis is provided in Appendix B.) The analysis includes (1) stormwater runoff calculations and (2) a catch basin investigation.



Stormwater Drain - Downtown Camas

Stormwater Runoff

The stormwater runoff analysis includes calculations for the amount of stormwater runoff generated in both the existing and proposed scenarios, using a commonly used method (Rational Method) to determine peak runoff rates for largely impervious areas. The full methodology and formulas used in this method are provided in Appendix B. The summary results of the runoff calculations are shown in the table below.

The key variables used for this analysis included land use (existing and proposed); coverage area (acres); runoff coefficient (C) based on land use and approximate overland flow paths or slope; rainfall intensity (I); and rainfall concentration (Tc). Peak flow rates for a modeled 10-year event were then calculated as 384 and 339 cubic feet per second (cfs) for the existing and proposed scenarios, respectively.

Although these flow rate values may not reflect the exact peak flows in the real-world, they demonstrate that the changes in land usage over the next 20 years should not result in an increase in runoff. Rather, these numbers illustrate a decrease in the peak flowrate between the existing and proposed conditions.

While this analysis does not anticipate worsening flood impacts, it is recommended that the City of Camas produce detailed stormwater models of the downtown area to simulate realistic flows. More intensive modeling efforts will also allow for the identification of specific capacity issues and simulation of alternative methods for reducing flood risk.

Basin	**Sum of Acres x Runoff Coefficient** (by Land Use) (∑CA)	**Concentration** (Tc) (min)	**Intensity** (I) (in/hr)	**Peak Flowrate** (Q) (cfs)
Downtown Existing	176.34	5.00	2.18	**384.26**
Downtown Proposed	155.48	5.00	2.18	**338.81**

Catch Basin Investigation

The existing catch basins along NE 4th Avenue regularly experience ponding issues. Many of these inlets are placed in low points next to planters with full curb heights surrounding two or three sides of the catch basins. The city has observed water overflow onto the curb and sidewalk. Examples of the curbs in question are shown below.



To avoid future flooding at these catch basins, it is recommended that the city consider the following improvements. It should be noted that these are recommended from a conceptual view without knowing exactly how the storm water system is connected or how individual catch basins impact each other. Detailed as-built review, stormwater modeling, and geotechnical investigations would be required to confirm the feasibility and efficacy of each option.

- Regularly maintain all catch basins to remove any debris that may be blocking flow into the inlet and eliminate solids trapped in the sump.
- Reconstruct the curbs around the catch basins to allow for street sweeper vehicle access.

A Install curb cuts and regrade the existing planters to allow water to overflow into the planter, rather than onto the sidewalk.

B Incorporate additional planters, rain gardens, bioswales, or other stormwater best management practices (BMPs) into the new land use zones. This will have the added benefit of maintaining the towns' beauty.

C Install permeable pavement in the parking areas.

- Regrade 4th Ave. to reduce the transverse slope and avoid significant low points in the gutters. Place catch basins at the low point and connect new catch basins to the existing storm system to reduce the distance between inlets.
- Increase the number of inlets along 4th Ave between Nevada St and Joy St specifically. Current conditions reflect approximately 950 feet between inlets. The inlets at the bottom of the hill (at 4th Ave & Joy St) may become overwhelmed during extreme storms, which could lead to potential flooding downstream.
- Replace grates with larger grates that have increased spacing between bars.
- Replace catch basins with units that have sumps if the existing structures do not have sumps.

D Install slotted drains along the parking area curb.

- Create underground infiltration trenches and/or drywells that could contain water from extreme storm events and slowly release it into the surrounding soil.
- Determine if the existing pipe system is undersized through stormwater modeling. Replace pipe infrastructure if capacity is found to be the issue.
- Perform CCTV storm sewer inspection to locate any breaks or blockages in the existing storm pipe network. Repair and/or replace pipes depending on the CCTV evaluation.

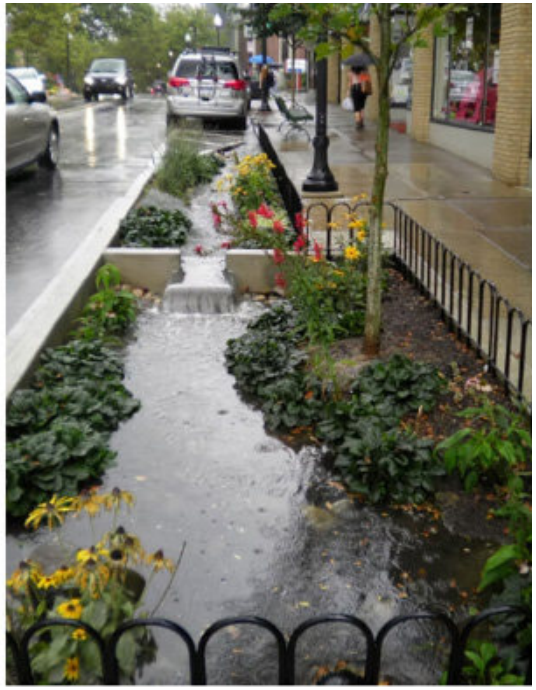
4115

A Planter with Curb Cuts



B Bioswale

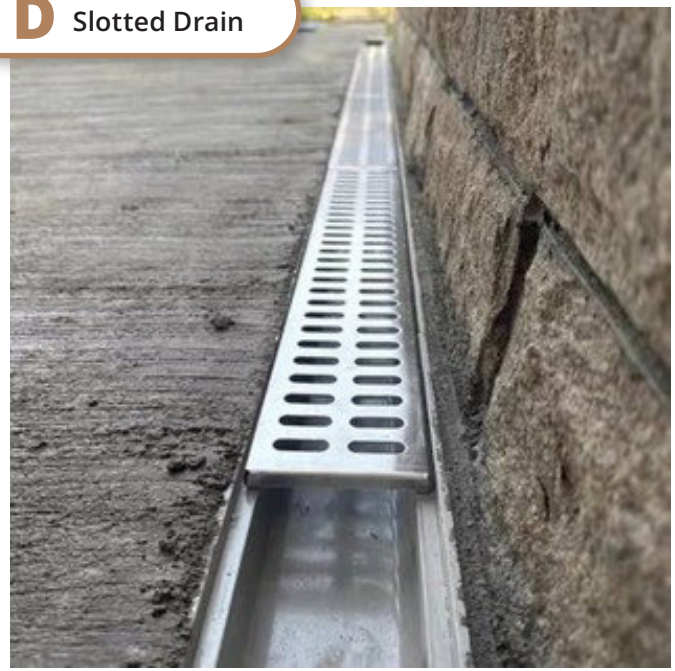




C Permeable Pavement



D Slotted Drain



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08
Goals, Policies, & Implementation

our Downtown Camas
Hometown. Downtown. Our Town. 2045



Overview

Over the next 20 years, City staff and community partners will work to bring the Downtown Subarea Plan's concepts and recommendations to life. The goals and policies presented in this section align with the vision statement of the Subarea Plan and set the policy direction for decision makers when reviewing priorities for City-led actions.

The implementation plan further supports the goals and policies by outlining specific strategies and actions that will lead to the desired outcomes of the Subarea Plan. The implementation plan provides guidance on the estimated timing, leadership and partnership roles, and level of priority for each implementation action. Many actions will be City-led through various City Departments, while others will require partnership with community groups or regional agencies. Over the planning period, City staff and decision makers, in coordination with key stakeholders, may reevaluate the goals, policies, and implementation actions to respond to changes in priorities or other City planning efforts that affect the Downtown area.

Goal DT-1: Architecture and Design

Retain Downtown's historic design and expand its charm.

DT-1.1: Protect and enhance downtown's design, including the integrity of the Historic Main Street Core, through clear and objective zoning standards and design guidelines.

DT-1.2: Explore improvements to public spaces that reinforce downtown's character through a streetscape plan and investments in community amenities.

DT-1.3: Ensure downtown design standards are up-to-date and reflect the goals and policies of the Downtown Subarea Plan.

DT-1.4: Promote the addition of street trees, landscape planters, green walls, and other landscaping elements that improve aesthetics, provide shade, and enhance the pedestrian experience.

DT-1.5: Incorporate public art, murals, and interactive elements to create a unique sense of place.

DT-1.6: Require new buildings to complement the existing architectural character while allowing for contemporary design elements.

DT-1.7: Encourage pedestrian-scale building design and street lighting to highlight building facades and architectural features and enhance safety and visibility.





Patrons Enjoy a Meal Outdoors at Natalia's Cafe in Downtown Camas

Goal DT-2: Downtown Housing

Provide a range of housing options that welcome more people to live Downtown.

DT-2.1: Allow development of a range of housing types, including both rental and ownership options, for a wide range of income levels within the zoning districts in the Downtown Subarea Plan boundary.

DT-2.2: Explore incentives to increase housing capacity and encourage the development of diverse housing types, ADUs, affordable housing, senior housing, and mixed-use or live/work units within Downtown.

DT-2.3: Develop design standards for new housing to complement the existing downtown development and ensure clear and objective regulations and permitting processes.

DT-2.4: Implement housing affordability strategies that meet the needs of downtown households and preserve existing affordable housing.

DT-2.5: Encourage housing downtown to provide features that foster healthy living such as community gardens, open spaces, and recreation areas.





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Cottage Cluster Housing in Portland, OR

Goal DT-3: Urban Amenities

Provide the right mix of development, services, and public spaces that support ways for people to live, work, and play Downtown.

DT-3.1: Require active ground floor uses and engaging street level design in the Historic Main Street Core zoning district.

DT-3.2: Support parks and open space improvements and connectivity to Mill Ditch Trail and Louis Bloch Park, as illustrated in the Downtown Subarea Plan.

DT-3.3: Evaluate regulations that support visitor lodging and tourism activities in downtown.

DT-3.4: Explore opportunities for additional public spaces, including public plazas, pocket parks, pedestrian-only streets, and community gardens.

DT-3.5: Create a parklet program that converts downtown curbside parking spaces into community seating spaces for businesses and residents

DT-3.6: Establish a policy to require new public and private projects to provide public art, including murals, sculptures, or interactive elements within public spaces

DT-3.7: Support and incentivize business and property owners to incorporate outdoor patios, seating areas, planters, and other landscape features that contribute to an inviting and dynamic streetscape.





Green Loop Pop-up Park in Salt Lake City Utah

Goal DT-4: Economic Development

Encourage (re)development to expand opportunities Downtown for retail, office, and residential.

DT-4.1: Support partnerships with community groups focused on advocating for the future of Downtown Camas, such as the Downtown Camas Association.

DT-4.2: Evaluate the Camas Municipal Code and permitting procedures to identify ways to increase flexibility to allow businesses to expand, grow, or redevelop at existing locations.

DT-4.3: Collaborate with public agencies, private parties, and non-profits in marketing and outreach efforts that attract visitors, sustain existing local businesses, attract new development/redevelopment, and maintain the historic character of downtown.

DT-4.4: Partner with the Downtown Camas Association, Camas-Washougal Chamber of Commerce, and other similar organizations to expand incentives available to small local businesses such as credit improvement programs.

DT-4.5: Prioritize City investments that capitalize on nearby redevelopment efforts to reinforce economic and physical connections to downtown.

DT-4.6: Evaluate financing tools to help investments in community infrastructure and encourage redevelopment of key areas.

DT-4.7: Address infrastructure improvements necessary for redevelopment projects.

DT-4.8: Encourage development and redevelopment that reinforces the role of public spaces in Downtown Camas as a vibrant center of activity, particularly for vulnerable populations.

DT-4.9: Develop strategies to mitigate displacement of existing businesses downtown, particularly in areas of increased investment and redevelopment.

DT-4.10: Work to achieve a diverse set of local businesses downtown that are complementary and economically resilient, balancing needs of residents, workers, and visitors.

DT-4.11 Actively participate in the Washington Department of Ecology cleanup process for the Camas Mill and support an unrestricted cleanup level to provide for the greatest flexibility for future land use.



Downtown Camas Associations 2025 Volunteer & Community Engagement Summit

Goal DT-5: Civic Life

Expand on civic life and services Downtown through strategic use of City-owned property and vibrant community events.

DT-5.1: Ensure that City Hall and primary services remain downtown.

DT-5.2: Develop a Civic Hub as a central gathering place and include a civic plaza to support existing and new community events.

DT-5.3: Support flexibility and provide infrastructure investments at the Civic Hub along NE 4th Ave to create shared spaces and accommodate pedestrian-friendly events.

DT-5.4: Develop guidelines and permitting procedures for seasonal or temporary use of public spaces for outdoor dining, retail displays, community events, and allow for pedestrian flow and safety.





Camas Plant & Garden Fair 2024

Goal DT-6: Multimodal Connectivity

Create a safe and connected transportation network Downtown for pedestrians, bicyclists and vehicles.

DT-6.1: Encourage placemaking and wayfinding efforts downtown to develop a distinct identity and attract visitors.

DT-6.2: Ensure downtown sidewalks are wide, unobstructed, and well-maintained to accommodate all users.

DT-6.3: Implement traffic-calming measures such as curb extensions, raised crosswalks and intersections, and unique pavement treatments that improve pedestrian safety and enhance downtown design.

DT-6.4: Improve bicycle infrastructure with new dedicated bike lanes, sharrows, intersection improvements, and bicycle parking. Encourage the use of priority bicycle parking for community events.

DT-6.5: Enhance connections between the historic Main Street core and downtown residential neighborhoods, including Evergreen Terrace and south of NE 3rd Ave.

DT-6.6: Install benches, shade structures, and public seating along pedestrian routes to create a more comfortable walking environment.

DT-6.7: Ensure adequate parking downtown for continued business growth and consider developing a parking management plan. Seek out opportunities for shared use parking on the edges of the downtown district, which could also serve as a park and ride transit facility.





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Two Way Protected Bike Lane - Ann Arbor, MI

Implementation Plan

The implementation plan for Downtown Camas provides specific actions for the City and key stakeholders to realize the vision and goals set forth in the Subarea Plan over the next 20 years. It is organized according to the policies previously defined in this section, identifies potential timing, project champions, and an initial prioritization, which may shift based on future City needs.

Action	Policy Alignment	Timing	Champion (Support)
DT-1 Architecture and Design			
Update and adopt design guideline manual to align with goals and policies of Downtown Subarea Plan.	DT-1.1, 1.3, 1.6, 1.7, 2.3	0-5 years	City – Community Dev.
Update and adopt zoning code to reflect updated zoning districts and intent defined in Downtown Subarea Plan.	DT-1.1, 1.7, 2.2, 3.1, 3.3, 5.4	0-5 years	City – Community Dev.
Prepare a comprehensive Downtown Infrastructure and Capital Improvement Study to identify streetscape plans, priority projects, implementation strategies, trail connections, and funding opportunities.	DT-1.2, 1.4, 1.5, 6.2, 6.3, 6.6	5-10 years	City – Public Works (Community Dev. and Parks)
DT-2 Housing			
Develop incentives for new housing development downtown.	DT-2.2	5-10 years	City – Community Dev.
Evaluate permitting processes to identify ways to streamline new residential development.	DT-2.2, 2.3, 2.5	0-5 years	City – Community Dev.
DT-3 Urban Amenities			
Explore options for improving downtown's connectivity to Louis Bloch Park.	DT-3.2	5-10 years	City – Parks (Community Dev. and Public Works)
Complete improvements to Mill Ditch Trail.	DT-3.2	5-15 years	City – Parks (Community Dev.)
Amend Parks and Recreation plans as needed to look for opportunities for parks and open space downtown.	DT-3.4	0-5 years	City – Parks (Community Dev.)
Develop code requirements for temporary and enhanced use of the public right-of-way and public spaces.	DT-3.5	0-5 years	City – Public Works (Community Dev. and Parks)
Review public art program guidelines and align with downtown goals.	DT-1.5, 3.6	0-5 years	City – Community Dev. (Parks and Public Works)
Explore options for useable open space requirements in new development.	DT-3.7	5-10 years	City – Parks (Community Dev.)

Action	Policy Alignment	Timing	Champion (Support)
Explore funding opportunities for urban amenities in the public realm to address ongoing operations and maintenance costs.	DT-1.2, DT-3.2, DT-3.4, DT-3.6, DT-5.3	5-10 years	City – Community Dev. (Public Works and Parks)
DT-4 Economic Development			
Work with downtown advocacy groups on refinements to façade improvement programs.	DT-4.1	5-10 years	City – Community Dev.
Review additional changes to municipal code to support business retention / attraction.	DT-4.2, 3.3, 5.4	0-5 years	City – Community Dev.
Develop strategy for retaining existing businesses.	DT-4.7	5-15 years	City – Community Dev.
Explore programs to assist business owners / downtown building owners for space improvements.	DT-4.3, 4.4, 4.6, 4.7, 4.8	0-5 years	City – Community Dev.
Work to attract employers that provide living-wage jobs through target industries research and site selection exercises.	DT-4.9	0-15 years	City – Community Dev.
Adopt code amendments that allow future residential and mixed-use redevelopment of the Camas Mill property, and actively participate in the Department of Ecology agreed order process to advocate for cleanup standards that support unrestricted future land use.	DT-4.11	0-5 years	City – Community Dev.
DT-5 Civic Life			
Advance planning and feasibility analysis for the Civic Plaza concept.	DT-5.1, 5.2, 5.3	5-15 years	City – Community Dev. (Public Works, Parks)
Evaluate public realm improvements that better support community events and seasonal activities, including opportunities to improve comfort, accessibility, infrastructure, and flexibility of use.	DT-5.3, 5.4, 6.6	5-10 years	City – Community Dev. (Public Works, Parks)
DT-6 Multimodal Connectivity			
Identify, prioritize, and implement quick-build pedestrian safety improvements downtown using low-cost, interim treatments that can be evaluated and refined over time as part of a long-term pedestrian safety strategy.	DT-6.3	0-10 years	City –Public Works (Community Dev.)
Develop a placemaking and wayfinding strategy.	DT-6.1	5-10 years	City – Community Dev. (Public Works)
Prioritize construction of the Transportation System Plan's recommended pedestrian and bicycle facilities in downtown area.	DT-6.4, 6.5	5-15 years	City – Public Works (Community Dev.)
Develop a comprehensive parking strategy addressing off-street parking requirements and management of on-street spaces.	DT-6.7	0-10 years	City – Community Dev. (Public Works)

Appendix A – Transportation Analysis

Planning Horizon and Land Use Alternatives

The traffic analysis for the Downtown Subarea Plan uses a planning horizon throughthe year 2045, which aligns with the planning horizon used for the Camas Transportation System Plan (TSP). Future 2045 traffic forecasts were prepared for two land use alternatives, one of which is consistent with the growth projections in the Camas TSP and one that is based on the Downtown Subarea Plan preferred land use concept that projects how the areas of Downtown could develop differently from the assumptions in the Camas TSP.

The two land use alternatives shown below include the assumptions from Table 1:

- **2045 TSP Baseline Land Use Alternative:** this assumes the land use and transportation network included in the Southwest Washington Regional Transportation Council (RTC) 2045 Preferred Network Regional Travel Demand Model. This scenario includes 527 households and 1,217 jobs in the Downtown Subarea Plan **boundary**, and is assumed to match the forecast from the Camas TSP.
- **2045 Downtown Plan Preferred Land Use Alternative:** this assumes the preferred levels of potential development within the Downtown Subarea Plan **boundary** including 955 households and 1,693 jobs, which is 428 more households and 476 more jobs in the Downtown Subarea Plan **boundary** when compared to the TSP Baseline land use alternative.

Future Motor Vehicle Volumes

To determine future year intersection traffic operations, year 2045 motor vehicle traffic volumes were forecasted at the study intersections in the Camas TSP. These volumes were forecasted by applying each alternatives land use assumptions to a disaggregated version of RTC's 2020 and 2045 Travel Demand Models.

As shown in Table 1, the 2045 TSP Baseline Land Use Alternative includes 527 households and 1,217 employees, while the 2045 Downtown Subarea Plan Preferred Land Use Alternative includes 955 households and 1,693 employees. Land use from TAZ 1796, which is located at the west end and partially within the Downtown Subarea Plan boundary, was excluded from these totals in both Land Use Alternatives. This area was excluded from this analysis because it is unlikely to redevelop within the planning horizon, given the current use in the majority of the area. Given these existing conditions, this areamaintains a Heavy Industrial zoning in both the 2045 Baseline Land Use and 2045 Downtown Preferred Land Use Concept.

Vehicle trips that would be generated by these two land use alternatives were estimated by applying travel demand model trip generation rates by land use type, which are based on trip patterns in the 2045 Travel Demand Model and a local factor based on the predicted trip generation and model trips.

Overall, the 2045 Downtown Subarea Plan Preferred Land Use Alternative is expected to generate about 1,265 motor vehicle trips during the weekday peak hour, or up to 391 more than what was assumed in the 2045 TSP Baseline Land Use Alternative. This total includes 1,356 more motor vehicle trips for the RT 2.0 West sub-area and 798 more motor vehicle trips for the RT 2.0 South sub-area.

Table 1: Downtown Subarea Plan Area Land Use Assumptions and Estimated Motor Vehicle Trips

ALTERNATIVE	HOUSING UNITS	JOBS	WEEKDAY PEAK HOUR TRIP ENDS
2045 TSP Baseline Land Use *	527	1217	873
2045 Downtown Preferred Land Use Concept **	955	1693	1,265
Change	**428**	**476**	**391**

Note: These locations are based on boundaries approximated by the model TAZ boundaries and may not completely match the Downtown Subarea Plan boundary.
* Based on the 2040 Camas disaggregated RTC Model for TAZs 1795, 1797 and 1798. The 2040 data was projected to 2045.
** Based on the 2045 RTC Preferred Model for TAZs 1795, 1797 and 1798. This excludes TAZ 1796 which maintains its Heavy Industrial zoning in both the 2045 Baseline Land Use and 2045 Downtown Preferred Land Use Concept.

Appendix B – Stormwater Analysis

MEMO

TO: Rob Charles, PE, City of Camas Interim Public Works Director

FROM: Sarah Merrill, PE

SUBJECT: **Downtown Camas Stormwater Analysis**

DATE: **10/08/2025**

OVERVIEW AND EXISTING SITE DESCRIPTION

The City of Camas is currently working to produce a long-term comprehensive plan update. While updating the comprehensive plan for the entire City, Camas is also developing a subarea plan that focuses solely on downtown Camas. This plan will create a vision for the future of downtown that considers various policies, goals, and the visions of the community. As part of this update, the City is revising the downtown zoning districts and delineating new use and design standards. The existing and proposed land use designations are shown in Figures 1 and 2, respectively.

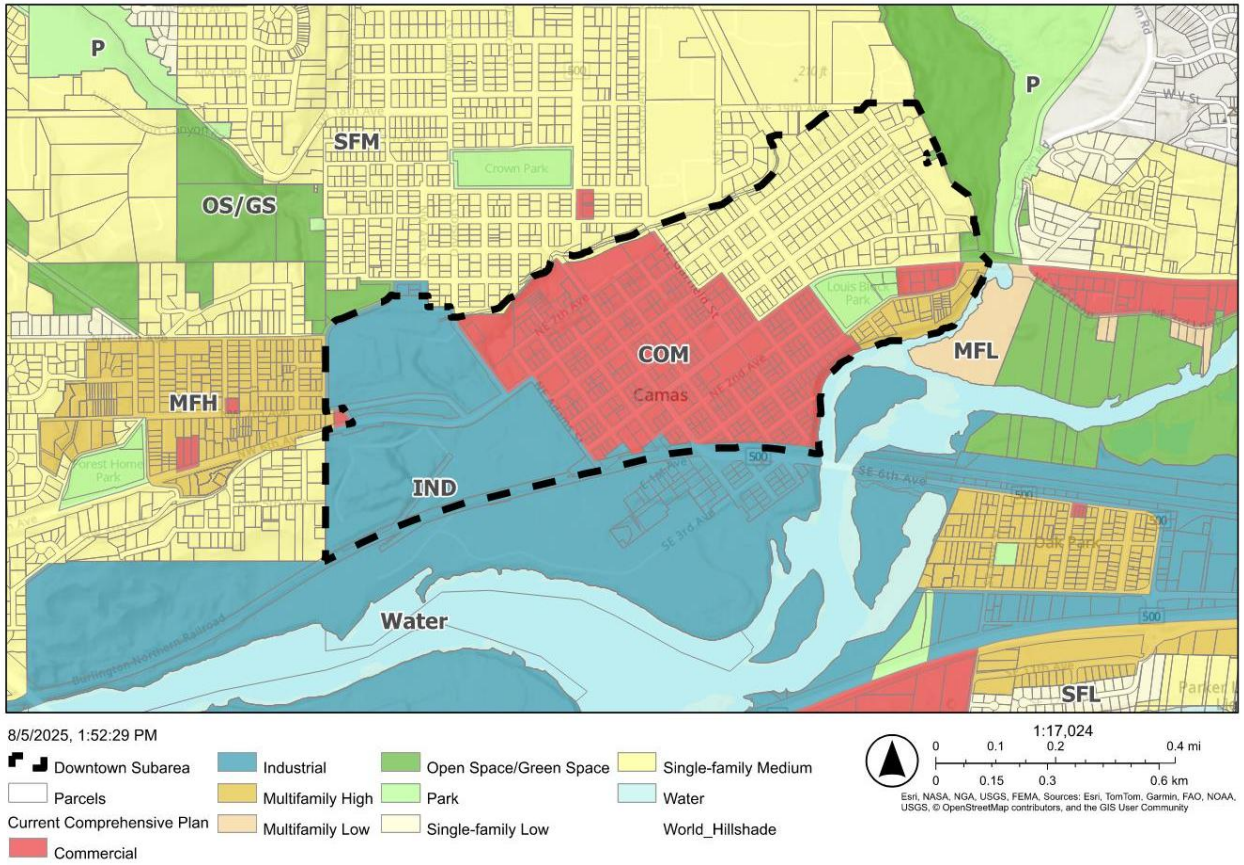

Figure 1: Existing Land Use

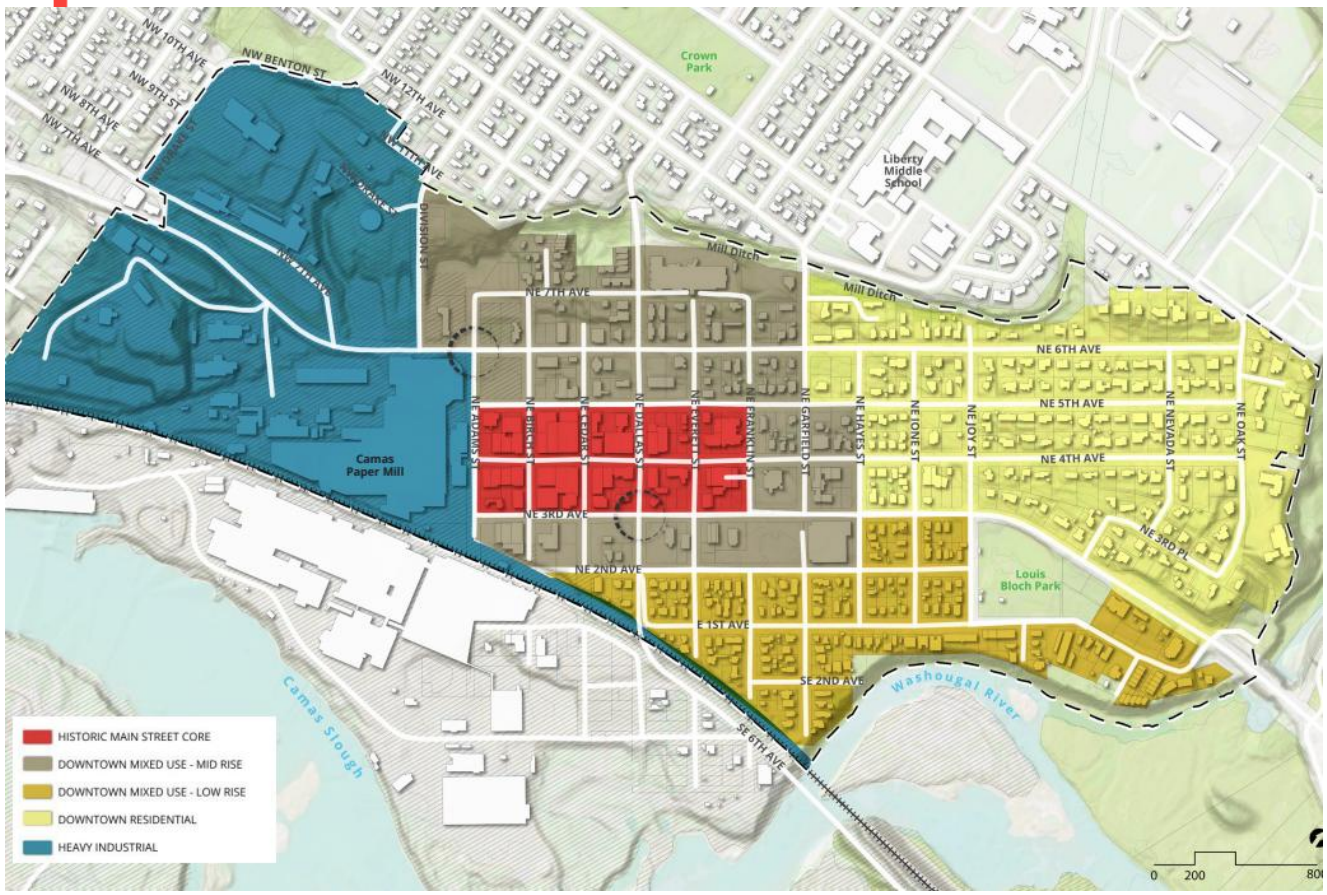

Figure 2: Proposed Downtown Zoning

The city aims to confirm that these shifts in land use do not create unforeseen adverse impacts on the existing stormwater system. As a result, the City contracted WSP to develop general stormwater calculations to compare the amount of runoff in existing and proposed scenarios. The following section describes the calculations that WSP performed during this high-level analysis.

RATIONAL METHOD CALCULATIONS

In order to determine the amount of stormwater runoff generated in both the existing and proposed scenarios, the rational method was selected. This method was chosen due to its simplicity and the fact that it is commonly used to determine peak runoff rates for largely impervious areas. The rational method calculations performed as part of this project followed the Washington State Department of Transportation (WSDOT) Hydraulics Manual. This manual lists the following formula for the rational method:

$$Q = \frac{I\Sigma CA}{K_c}$$

Where:

Q = runoff in cubic feet per second (cfs)

C = runoff coefficient in dimensionless units

I = rainfall intensity in inches per hour

A = drainage area in acres

K_c = conversion factor of 1 for English units

The variables that were of greatest importance for these calculations were C and A since the only change between existing and proposed conditions is the land use type, which impacts the C and A variables.

The runoff coefficient C value is developed based on the type of land cover and the slope. C values were selected from Table 2-2 in the WSDOT Hydraulics Manual, seen below.

Table 1: WSDOT Runoff Coefficients

Table 2-2 Runoff Coefficients for the Rational Method: 10-Year Return Frequency

Cover Type	Flat	Rolling (2%–10%)	Hilly (Over 10%)
Pavement and roofs	0.90	0.90	0.90
Earth shoulders	0.50	0.50	0.50
Drives and walks	0.75	0.80	0.85
Gravel pavement	0.50	0.55	0.60
City business areas	0.80	0.85	0.85
Suburban residential	0.25	0.35	0.40
Single-family residential	0.30	0.40	0.50
Multi units, detached	0.40	0.50	0.60
Multi units, attached	0.60	0.65	0.70
Lawns, very sandy soil	0.05	0.07	0.10
Lawns, sandy soil	0.10	0.15	0.20
Lawns, heavy soil	0.17	0.22	0.35
Grass shoulders	0.25	0.25	0.25
Side slopes, earth	0.60	0.60	0.60
Side slopes, turf	0.30	0.30	0.30
Median areas, turf	0.25	0.30	0.30
Cultivated land, clay, and loam	0.50	0.55	0.60
Cultivated land, sand, and gravel	0.25	0.30	0.35
Industrial areas, light	0.50	0.70	0.80
Industrial areas, heavy	0.60	0.80	0.90
Parks and cemeteries	0.10	0.15	0.25
Playgrounds	0.20	0.25	0.30
Woodland and forests	0.10	0.15	0.20
Meadows and pasture land	0.25	0.30	0.35
Pasture with frozen ground	0.40	0.45	0.50
Unimproved areas	0.10	0.20	0.30

The WSDOT land cover type for each area was assumed based on the City's naming convention for land use zones. Table 2 below summarizes the existing and proposed types of land use, along with their selected C values. Approximate overland flow paths were delineated throughout the downtown basin, using contours

provided by the city. The slopes of these paths ranged between 2-8%. Due to the slope percentage, each C value was selected from the "Rolling" column. It should be noted that the areas with changing land use types in the downtown region are changing from one form of primarily impervious area to another form of primarily impervious area.

Table 2: Runoff Coefficients - Existing vs. Proposed

Basin	City Landuse	WSDOT Landuse	Area (acres)	C
Downtown Existing	Commercial	City Business Areas	96.48	0.85
	Single-Family Medium	Single-Family Residential	66.02	0.40
	Multi-Family High	Multi Units, Attached	5.94	0.65
	Heavy Industrial	Industrial Areas, Heavy	78.80	0.80
	Park/Open Space	Parks and Cemeteries	6.78	0.15
Downtown Proposed	Historic Main Street Core	City Business Areas	16.87	0.85
	Downtown Residential	Single-Family Residential	66.02	0.40
	Mixed Use - Low Rise	Multi Units, Detached	32.97	0.50
	Mixed Use - Mid Rise	Multi Units, Attached	52.61	0.65
	Heavy Industrial	Industrial Areas, Heavy	78.80	0.80
	Park/Open Space	Parks and Cemeteries	6.78	0.15

The next variable that was calculated was the rainfall intensity "I", which represents the severity of rainfall for a given duration and design storm. For these calculations, "I" was determined for a ten-year storm and an assumed time of concentration of 5 minutes. The equation for "I" is as follows:

$$I = \frac{m}{(T_c)^n}$$

where:

I = rainfall intensity in inches per hour

T_c = time of concentration in minutes

m and n = coefficients in dimensionless units.

To obtain the most conservative estimate, WSP assumed a minimum time of concentration of 5 minutes. Shorter amounts of time produce unrealistic results when determining the rainfall intensity. Additionally, runoff takes time to generate, and a time of concentration less than 5 minutes is not likely to be observed. Given highly detailed information regarding the existing stormwater infrastructure and outfalls, a more accurate time of concentration could be determined in a

future study. Since the time of concentration in this downtown area would largely be based on the existing pipe routes (which are not changing between the existing and proposed scenarios), the time of concentration would remain the same. Therefore, although the selected time of concentration may not result in realistic flowrate values for downtown Camas, keeping this variable constant between conditions will still allow for meaningful comparison between existing and proposed conditions.

Rainfall coefficients are listed in Table 2-4 of the WSDOT hydraulic manual for large cities throughout Washington. The specific coefficients used in this analysis were selected from the Vancouver values for the 10-year mean recurrence interval (MRI).

Table 3: WSDOT Rainfall Coefficients

Table 2-4 Index to Rainfall Coefficients

Location	2-Year MRI		5-Year MRI		10-Year MRI		25-Year MRI		50-Year MRI		100-Year MRI	
	m	n	m	n	m	n	m	n	m	n	m	n
Aberdeen and Hoquiam	5.10	0.488	6.22	0.488	7.06	0.487	8.17	0.487	9.02	0.487	9.86	0.487
Bellingham	4.29	0.549	5.59	0.555	6.59	0.559	7.90	0.562	8.89	0.563	9.88	0.565
Bremerton	3.79	0.480	4.84	0.487	5.63	0.490	6.68	0.494	7.47	0.496	8.26	0.498
Centralia and Chehalis	3.63	0.506	4.85	0.518	5.76	0.524	7.00	0.530	7.92	0.533	8.86	0.537
Clarkston and Colfax	5.02	0.628	6.84	0.633	8.24	0.635	10.07	0.638	11.45	0.639	12.81	0.639
Colville	3.48	0.558	5.44	0.593	6.98	0.610	9.07	0.626	10.65	0.635	12.26	0.642
Ellensburg	2.89	0.590	5.18	0.631	7.00	0.649	9.43	0.664	11.30	0.672	13.18	0.678
Everett	3.69	0.556	5.20	0.570	6.31	0.575	7.83	0.582	8.96	0.585	10.07	0.586
Forks	4.19	0.410	5.12	0.412	5.84	0.413	6.76	0.414	7.47	0.415	8.18	0.416
Hoffstadt Cr. (SR 504)	3.96	0.448	5.21	0.462	6.16	0.469	7.44	0.476	8.41	0.480	9.38	0.484
Hoodsport	4.47	0.428	5.44	0.428	6.17	0.427	7.15	0.428	7.88	0.428	8.62	0.428
Kelso and Longview	4.25	0.507	5.50	0.515	6.45	0.509	7.74	0.524	8.70	0.526	9.67	0.529
Leavenworth	3.04	0.530	4.12	0.542	5.62	0.575	7.94	0.594	9.75	0.606	11.08	0.611
Metaline Falls	3.36	0.527	4.90	0.553	6.09	0.566	7.45	0.570	9.29	0.592	10.45	0.591
Moses Lake	2.61	0.583	5.05	0.634	6.99	0.655	9.58	0.671	11.61	0.681	13.63	0.688
Mt. Vernon	3.92	0.542	5.25	0.552	6.26	0.557	7.59	0.561	8.60	0.564	9.63	0.567
Naselle	4.57	0.432	5.67	0.441	6.14	0.432	7.47	0.443	8.05	0.440	8.91	0.436
Olympia	3.82	0.466	4.86	0.472	5.62	0.474	6.63	0.477	7.40	0.478	8.17	0.480
Omak	3.04	0.583	5.06	0.618	6.63	0.633	8.74	0.647	10.35	0.654	11.97	0.660
Pasco and Kennewick	2.89	0.590	5.18	0.631	7.00	0.649	9.43	0.664	11.30	0.672	13.18	0.678
Port Angeles	4.31	0.530	5.42	0.531	6.25	0.531	7.37	0.532	8.19	0.532	9.03	0.532
Poulsbo	3.83	0.506	4.98	0.513	5.85	0.516	7.00	0.519	7.86	0.521	8.74	0.523
Queets	4.26	0.422	5.18	0.423	5.87	0.423	6.79	0.423	7.48	0.423	8.18	0.424
Seattle	3.56	0.515	4.83	0.531	5.62	0.530	6.89	0.539	7.88	0.545	8.75	0.5454
Sequim	3.50	0.551	5.01	0.569	6.16	0.577	7.69	0.585	8.88	0.590	10.04	0.593
Snoqualmie Pass	3.61	0.417	4.81	0.435	6.56	0.459	7.72	0.459	8.78	0.461	10.21	0.476
Spokane	3.41	0.556	5.43	0.591	6.98	0.609	9.09	0.626	10.68	0.635	12.33	0.643
Stevens Pass	4.73	0.462	6.09	0.470	8.19	0.500	8.53	0.484	10.61	0.499	12.45	0.513
Tacoma	3.57	0.516	4.78	0.527	5.70	0.533	6.93	0.539	7.86	0.542	8.79	0.545
Vancouver	2.92	0.477	4.05	0.496	4.92	0.506	6.06	0.515	6.95	0.520	7.82	0.525
Walla Walla	3.33	0.569	5.54	0.609	7.30	0.627	9.67	0.645	11.45	0.653	13.28	0.660
Wenatchee	3.15	0.535	4.88	0.566	6.19	0.579	7.94	0.592	9.32	0.600	10.68	0.605
Yakima	3.86	0.608	5.86	0.633	7.37	0.644	9.40	0.654	10.93	0.659	12.47	0.663

This resulted in an intensity of 2.18 in/hr for a 10-year design storm. Peak flowrates for the 10-year event were then calculated as 384 and 339 cfs for the existing and proposed scenarios, respectively. A summary of the rational method variables and results can be seen in Table 4.

Although these flow rate values may not reflect the exact peak flows in the real-world, they demonstrate that the changes in land usage over the next 20 years should not result in an increase in runoff. Rather, these numbers illustrate a decrease in the peak flowrate between the existing and proposed conditions. While

WSP therefore does not anticipate worsening flood impacts, it is recommended that the City of Camas produce detailed stormwater models of their downtown area to simulate realistic flows. More intensive modeling efforts will also allow for the identification of specific capacity issues and simulation of alternative methods for reducing flood risk.

Table 4: Rational Method Summary

Basin	City Landuse	Area (acres)	C	∑CA	Tc (min)	Intensity (in/hr)	Q (cfs)
Downtown Existing	Commercial	96.48	0.85	176.34	5.00	2.18	384.26
	Single-Family Medium	66.02	0.40				
	Multi-Family High	5.94	0.65				
	Heavy Industrial	78.80	0.80				
	Park/Open Space	6.78	0.15				
Downtown Proposed	Historic Main Street Core	16.87	0.85	155.48	5.00	2.18	338.81
	Downtown Residential	66.02	0.40				
	Mixed Use - Low Rise	32.97	0.50				
	Mixed Use - Mid Rise	52.61	0.65				
	Heavy Industrial	78.80	0.80				
	Park/Open Space	6.78	0.15				

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CATCH BASIN

INVESTIGATION

The city also requested that WSP investigate existing catch basins along 4th Avenue which regularly experience ponding issues. Many of these inlets are placed in low points next to planters with full curb heights surrounding two or three sides of the catch basins. The city has observed water overflow onto the curb and sidewalk. Examples of the curbs in question are shown below in Figure 3.



Figure 3: 4th Avenue Catch Basins

To avoid future flooding at these catch basins, WSP recommends that the city consider the following improvements. It should be noted that these are recommended from a conceptual view without knowing exactly how the storm water system is connected or how individual catch basins impact each other. Detailed as-built review, stormwater modeling, and geotechnical investigations would be required to confirm the feasibility and efficacy of each option.

- Regularly maintain all catch basins to remove any debris that may be blocking flow into the inlet and eliminate solids trapped in the sump.
- Reconstruct the curbs around the catch basins to allow for street sweeper vehicle access.
- Install curb cuts and regrade the existing planters to allow water to overflow into the planter, rather than onto the sidewalk. See Figure 4 for a planter utilizing a similar curb cut.



Figure 4: Planter with Curb Cuts

- Incorporate additional planters, rain gardens, bioswales, or other stormwater best management practices (BMPs) into the new land use zones. This will have the added benefit of maintaining the towns' beauty.



Figure 5: Bioswale Examples

- Install permeable pavement in the parking areas.

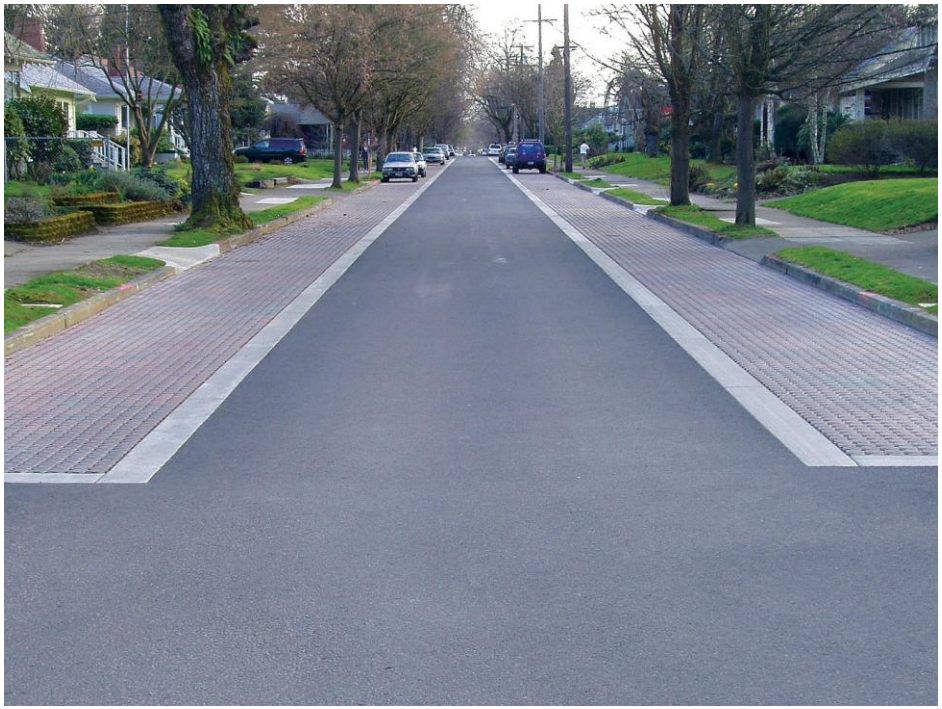

Figure 6: Permeable Parking

- Regrade 4th Ave. to reduce the transverse slope and avoid significant low points in the gutters. Place catch basins at the low point and connect new catch basins to the existing storm system to reduce the distance between inlets.
- Increase the number of inlets along 4th Ave between Nevada St and Joy St specifically. Current conditions reflect approximately 950 feet between inlets. The inlets at the bottom of the hill (at 4th Ave & Joy St) may become overwhelmed during extreme storms, which could lead to potential flooding downstream.
- Replace grates with larger grates that have increased spacing between bars.
- Replace catch basins with units that have sumps if the existing structures do not have sumps.
- Install slotted drains along the parking area curb, like the drain shown in Figure 5.



Figure 7: Slotted Drain Example

- Create underground infiltration trenches and/or drywells that could contain water from extreme storm events and slowly release it into the surrounding soil.
- Determine if the existing pipe system is undersized through stormwater modeling. Replace pipe infrastructure if capacity is found to be the issue.
- Perform CCTV storm sewer inspection to locate any breaks or blockages in the existing storm pipe network. Repair and/or replace pipes depending on the CCTV evaluation.

Staff Report – Ordinance

November 16, 2026 Council Regular Meeting

Ordinance No. 26-010 Amendments to Titles 17 and 18 of the Camas Municipal Code, Downtown Design Manual, and Zoning Map
Presenter: Alan Peters, Community Development Director
Time Estimate: 5 minutes

Phone	Email
360.817.7254	apeters@cityofcamas.us

BACKGROUND: The City has prepared updates to its development regulations in conjunction with the Our Camas 2045 Comprehensive Plan and Our Downtown Camas 2045 Subarea Plan. The proposal includes amendments to Titles 17 and 18 of the Camas Municipal Code, a new Downtown Design Manual, and an updated Zoning Map that is consistent with the adopted Comprehensive Plan and Downtown Subarea Plan. Together, these implement the land use designations, goals, and policies of the newly adopted plans.

The Planning Commission held a public hearing on September 15, 2026, and voted unanimously on September 29, 2026, to recommend adoption of the proposed code amendments and Downtown Design Manual. Council held a public hearing on October 19, 2026, and on November 2, 2026, moved to direct the City Attorney to prepare an ordinance for adoption.

SUMMARY: Ordinance No. 26-010 adopts amendments to Titles 17 and 18 of the Camas Municipal Code, an updated Downtown Design Manual, and a new official Zoning Map. Together, these actions implement the Our Camas 2045 Comprehensive Plan and Our Downtown Camas 2045 Subarea Plan, adopted through Ordinance Nos. 26-008 and 26-009.

BENEFITS TO THE COMMUNITY: The proposed updates align the City's development regulations and zoning with the Our Camas 2045 Comprehensive Plan and Our Downtown Camas 2045 Subarea Plan.

STRATEGIC PLAN: This item advances multiple City strategic priorities, including Economic Prosperity, Safe and Accessible Community, and Vibrant Community Amenities. The proposed regulations support a diverse local economy, provide a more predictable framework for development and investment, expand opportunities for housing and mixed-use development, and help preserve community character through updated design and development standards.

POTENTIAL CHALLENGES: Implementation of the updated regulations and design standards will require adjustments by City staff, applicants, property owners, and the

development community. Staff will need to provide guidance on the new requirements, monitor their effectiveness, and recommend further amendments as needed. Individual development proposals will continue to be reviewed for compliance with applicable regulations and infrastructure requirements.

BUDGET IMPACT: Preparation of the proposed updates has been completed using existing City staff and previously authorized consultant resources, funded in part by grants. Implementation will involve ongoing staff administration and development review. Future development activity may result in corresponding City revenues and costs.

RECOMMENDATION: Staff recommends Council adopt Ordinance No. 26-010 and it be published accordingly to law.

ORDINANCE NO. 26-010

An Ordinance adopting amendments to Titles 17 and 18 of the Camas Municipal Code, the Downtown Design Manual, and an updated Zoning Map consistent with the Our Camas 2045 Comprehensive Plan.

WHEREAS, pursuant to Chapter 36.70A RCW, the Washington Growth Management Act (GMA), the City of Camas (City) is required to periodically review and, as necessary, revise its comprehensive plan and development regulations to comply with state law and plan for anticipated growth; and

WHEREAS, the City has adopted the Our Camas 2045 Comprehensive Plan by Ordinance No. 26-008 and the Our Downtown Camas 2045 Subarea Plan by Ordinance No. 26-009; and

WHEREAS, RCW 36.70A.130(1)(e) requires amendments to development regulations to be consistent with and implement the comprehensive plan; and

WHEREAS, the City prepared amendments to Titles 17 and 18 of the Camas Municipal Code (CMC) to implement the goals, policies, and land use designations of the adopted plans and to address applicable state planning requirements; and

WHEREAS, the City prepared an updated Downtown Design Manual to implement the Our Downtown Camas 2045 Subarea Plan and to guide development within the Downtown Subarea; and

WHEREAS, the City prepared an updated Zoning Map to implement the land use designations and policies of the Our Camas 2045 Comprehensive Plan; and

WHEREAS, beginning in December 2023, the City conducted a public visioning and planning process involving surveys, community meetings and summits, stakeholder engagement, advisory committees, and continuing review by the Planning Commission and City Council; and

WHEREAS, the City conducted environmental review pursuant to Chapter 43.21C RCW and issued a Determination of Nonsignificance for the proposed municipal code amendments and Downtown Design Manual on September 10, 2026, under file no. SEPA26-1006; and

WHEREAS, the City provided notice to the Washington State Department of Commerce pursuant to RCW 36.70A.106 on August 14, 2026; and

WHEREAS, following public notice, the Planning Commission conducted a public hearing on September 15, 2026, and on September 29, 2026, unanimously recommended adoption of the proposed municipal code amendments and Downtown Design Manual; and

WHEREAS, following a duly noticed public hearing on October 19, 2026, and consideration of the Planning Commission recommendation, staff analysis, public testimony, and written comments, the City Council reviewed the municipal code amendments and Downtown Design Manual and on November 2, 2026, moved to direct the City Attorney to prepare an ordinance for adoption;

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF CAMAS AS FOLLOWS:

I

The Council incorporates by reference the Recitals as set forth herein as findings of fact. The Council finds that the City has reviewed its development regulations in connection with the

Our Camas 2045 periodic update pursuant to RCW 36.70A.130. The amendments to Titles 17 and 18 of the Camas Municipal Code, the updated Downtown Design Manual, and the updated Zoning Map are consistent with and implement the Our Camas 2045 Comprehensive Plan and the Our Downtown Camas 2045 Subarea Plan. The Council further finds that the amendments have been prepared in conformance with applicable law, including Chapter 36.70A RCW, Chapter 43.21C RCW, and the applicable provisions of the Camas Municipal Code.

II

CMC Chapter 17.09 is hereby amended as set forth in Exhibit A.

III

CMC Chapter 18.03 is hereby repealed in its entirety and replaced as set forth in Exhibit B.

IV

CMC Chapter 18.05 is hereby amended as set forth in Exhibit C.

V

CMC Chapter 18.07 is hereby amended as set forth in Exhibit D.

VI

CMC Chapter 18.09 is hereby amended as set forth in Exhibit E.

VII

CMC Chapter 18.11 is hereby amended as set forth in Exhibit F.

VIII

CMC Chapter 18.13 is hereby amended as set forth in Exhibit G.

IX

CMC Chapter 18.15 is hereby amended as set forth in Exhibit H.

X

CMC Chapter 18.18 is hereby amended as set forth in Exhibit I.

XI

CMC Chapter 18.19 is hereby amended as set forth in Exhibit J.

XII

CMC Title 18 is hereby amended to add a new Chapter 18.20, as set forth in Exhibit K.

XIII

CMC Chapter 18.21 is hereby repealed.

XIV

CMC Title 18 is hereby amended to add a new Chapter 18.22, as set forth in Exhibit L.

XV

CMC Chapter 18.23 is hereby amended as set forth in Exhibit M.

XVI

CMC Chapter 18.24 is hereby amended as set forth in Exhibit N.

XVII

CMC Chapter 18.26 is hereby amended as set forth in Exhibit O.

XVIII

CMC Title 18 is hereby amended to add a new Chapter 18.28, as set forth in Exhibit P.

XIX

CMC Chapter 18.32 is hereby amended as set forth in Exhibit Q.

XX

CMC Chapter 18.37 is hereby repealed.

XXI

CMC Chapter 18.43 is hereby amended as set forth in Exhibit R.

XXII

CMC Chapter 18.45 is hereby amended as set forth in Exhibit S.

XXIII

CMC Chapter 18.51 is hereby amended as set forth in Exhibit T.

XXIV

The updated Downtown Design Manual, attached hereto as Exhibit U, is hereby adopted and shall supersede the prior Downtown Design Manual.

XXV

The updated City of Camas Zoning Map, attached hereto as Exhibit V, is hereby adopted as the official Zoning Map of the City and shall supersede the previously adopted Zoning Map.

XXVI

This ordinance shall take force and be in effect five (5) days from and after its publication according to law.

PASSED by the Council and APPROVED by the Mayor this 16th day of November, 2026.

SIGNED:_____
Mayor

ATTEST:_____
Clerk

APPROVED as to form:

_____
City Attorney

EXHIBIT A

Chapter 17.09 SHORT SUBDIVISIONS[1]

17.09.080 Administrative Lot Split.

Pursuant to RCW 58.17.145, an existing residential lot may be split into two lots for the purpose of sale, lease, or transfer of ownership pursuant to this section.

A. Applicability. Administrative lot splits are permitted only within residential zones. A lot is not eligible for an administrative lot split if the proposed lot split would result in a lot that is not buildable under applicable locally adopted development regulations, including, but not limited to, critical areas, shorelines, stormwater, setbacks, impervious surface area, and building coverage standards.

B. Process. Except as provided for in this section, administrative lot splits shall follow the application, review, and approval procedures for a short subdivision.

C. General Requirements.

1. An administrative lot split must only create one additional lot.
2. The parent lot must not have been created by an administrative lot split authorized by this section.
3. Both the parent lot and the proposed new lot must meet the minimum lot size of the zone in which the administrative lot split is located. The newly created lot is not subject to any maximum lot size requirement.
4. Access and utility rights must be granted or conveyed as necessary on or before recording of the lot split survey to provide access for the maximum number of dwelling units that could be developed on the newly created lot, provided such access rights may be reduced through review of a subsequent application for a building permit, short plat, unit lot subdivision, or subdivision if less than the maximum number of dwelling units are built on the newly created lot.
5. If a lot split results in a newly created lot of a size that would allow for further land division, subsequent lot splits are not allowed but the newly created lot may be divided under other applicable land subdivision processes.
6. If the lot split would require demolition or alteration of any existing housing that would displace a renter, the applicant must recommend a displacement mitigation strategy that may include, but is not limited to, relocation assistance.

D. Right-of-way dedication, frontage requirements, and improvements.

1. A proposed lot split may be conditioned upon dedication of right-of-way on the parent lot to the extent such dedication would otherwise be required for the development, short plat, or subdivision of the parent lot absent an administrative lot split.
2. Development of dwelling units on the newly created lot or further subdivision of the newly created lot may be conditioned upon construction of frontage improvements to a right-of-way adjacent to either the parent lot or the newly created lot.

[1]Prior ordinance history: Ords. 2443 and 2455.

E. Administrative lot split survey.

A lot split survey must be recorded with the Clark County Auditor's Office and shall include, as notes, and comply with the following requirements, as applicable:

1. Further administrative lot splits are not permitted on either the parent lot or newly created lot;
2. The city is immune from any liability, loss, or other damage suffered by another that is related to the city's approval of the lot split, including if the lot split creates a lot that is later determined unbuildable, RCW 58.17.145;
3. If applicable, indicate whether future development will require frontage improvements;
4. If applicable, indicate whether dedication of right-of-way is required and note the location of the right-of-way to be dedicated; and
5. If applicable, note the location of all required access and utility rights granted or conveyed.

EXHIBIT B

Chapter 18.03 DEFINITIONS

18.03.010 Purpose.

The purpose of the definitions chapter is to carry out the intent of the city's development regulations. The terms defined in this chapter are the minimum necessary to resolve questions of interpretation. Terms not defined shall hold their common and generally accepted meaning, unless specifically defined otherwise in this code.

18.03.020 Interpretation of terms.

A. Terms in this title that are not defined in this chapter hold their common and accepted meaning.

B. The following terms shall be interpreted as follows:

1. Words used in the present tense include the future;
2. The plural includes the singular and vice-versa;
3. The words "will" and "shall" are mandatory;
4. The word "may" indicates that discretion is allowed;
5. The word "used" includes designed, intended, or arranged to be used;
6. The masculine gender includes the feminine and vice-versa;
7. The word "person" may be taken for persons;
8. The word "building" includes a portion of a building or a portion of the lot on which it stands;
9. Distances shall be measured horizontally unless otherwise specified;
10. The word "occupied" includes designed or intended to be used.

18.03.030 Definitions.

For the purposes of this title, the following definitions shall apply:

"Accessory residential storage lot" means a designated lot within a North Shore residential zone (LD-NS, HD-NS) for the use as a storage facility for recreational vehicles, boats, and/or other watercraft. A Homeowner's Association (HOA) shall operate and maintain the storage facility. Only residents within the established HOA may use the facility. The HOA will establish rules and regulations for the storage facility to be recorded within the Covenants, Conditions & Restrictions for the HOA during the subdivision application period. Lots created for use as accessory residential storage facilities shall meet the dimensional requirements of the designated North Shore land use designation they are in. The North Shore Design Manual defines additional development requirements for accessory residential storage lots.

"Abutting" means adjoining.

“Access easement.” See "Street."

“Access panhandle.” See "Flag lot."

"Accessory dwelling unit" means a dwelling unit located on the same lot as a single-family housing unit, duplex, triplex, townhome, or other housing unit. Refer to Chapter 18.27 Accessory Dwelling Units.

"Accessory structure or accessory use" means a structure or use incidental and subordinate to the principal use or structure and located on the same lot or tract.

"Adult entertainment facility." See CMC Chapter 5.36 Sexually Oriented Business.

"Adult family home" means a dwelling, licensed by the State of Washington Department of Social and Health Services, in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services. An existing adult family home may provide services to up to eight adults upon approval from the Department of Social and Health Services in accordance with RCW 70.128.066. Adult family homes are a permitted use in all areas zoned for residential use.

"Adverse environmental impact" means an impact caused by vegetation removal which creates a risk of landslide or erosion, or which alters or damages wetlands, wetland buffers, wildlife habitat, streams, or watercourses.

"Affordable housing" means residential housing whose monthly costs, including utilities other than telephone, do not exceed 30 percent of the monthly income of a household whose income is: (a) For rental housing, 60 percent of the median household income adjusted for household size, for Clark County, as reported by the United States Department of Housing and Urban Development; or (b) For owner-occupied housing, 80 percent of the median household income adjusted for household size, for Clark County, as reported by the United States Department of Housing and Urban Development.

"Alley" means a narrow street primarily for vehicular service access to the rear or side of properties otherwise abutting on another street.

"Alteration of watercourse" is any action that will change the location of the channel occupied by water within the banks of any portion of a riverine waterbody.

“Animal kennel.” See "Kennel."

"Annexation" means the legal process in which a parcel or contiguous group of parcels in an unincorporated area become part of the city taking the action of incorporation.

"Antique shop" means an establishment engaged in the sale of collectibles, relics or objects of an earlier period than the present.

"Appliance sales and incidental service" means an establishment engaged in the sale and repair of household or office tools or devices operated by gas or electric current. Such tools or devices may include stoves, fans, refrigerators, etc.

“Approval authority” means the person or decision-making body authorized by this title to approve, approve with conditions, or deny an application or other request. Depending on the applicable review procedure, the approval authority may include the community development director or designee, hearing examiner, city council, or other decision-making body designated by this title.

"Area of shallow flooding" means a designated zone AO, AH, AR/AO or AR/AH (or VO) on a community's Flood Insurance Rate Map (FIRM) with a one percent or greater annual chance of flooding to an average depth of one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow. Also referred to as the sheet flow area.

"Area of special flood hazard" means the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. It is shown on the Flood Insurance Rate Map (FIRM) as zone A, AO, AH, A1-30, AE, A99, AR (V, VO, V1-30, VE). "Special flood hazard area" is synonymous in meaning with the phrase "area of special flood hazard".

“Arterial.” See "Street."

"Assessment project" means the assessment may be a local improvement district (LID) or equitable reimbursement method.

"Assisted living" means any group residential program that provides personal care and support services to people who need help with daily living activities as a result of physical or cognitive disability. Assisted living communities usually offer help with bathing, dressing, meals and housekeeping. The amount of help provided depends on individual needs, however, full-time (twenty-four hours a day) care is not needed. Assisted living communities go by a variety of names: adult homes, personal care homes, retirement residences, etc.

"Automobile repair garage" means a building designed and used for the storage, care repair, or refinishing of motor vehicles including both minor and major mechanical overhauling, paint and body work.

"Automobile sales, new or used" means an establishment that provides for the sale of motorized vehicles as its primary use.

"Automobile service station" means any premises used primarily for supplying motor fuel, oil, minor servicing, excluding body and fender repair, and for sale of accessories as a secondary service for automobiles at retail direct to the customer.

"Automobile wrecking" means the dismantling or wrecking of used motor vehicles or trailers, or the storage, sale or dumping of dismantled, partially dismantled, obsolete or wrecked vehicles or their parts when screened from view from a public roadway and adjoining properties.

“Bakery (retail),” or "retail bakery," means an establishment where the majority of retail sale is of products such as breads, cakes, pies, pastries, etc., which are baked or produced and for sale to the general public.

“Bakery (wholesale),” or "wholesale bakery," means an establishment where breads, cakes, pies, pastries, etc. are baked or produced primarily for wholesale rather than retail sale.

“Bar.” See "Tavern."

"Base flood elevation (BFE)" means the elevation to which floodwater is anticipated to rise during the base flood.

"Base flood" means the flood having a one percent chance of being equaled or exceeded in any given year (also referred to as the "one hundred-year flood").

"Basement" means any area of the building having its floor subgrade (below ground level) on all sides.

"Bed and breakfast inn" means a dwelling or portion thereof, where short-term lodging rooms and meals are provided. The operator of the inn shall live on the premises or in adjacent premises. A bed and breakfast which includes six or more guest rooms shall be classified and defined as a hotel.

"Best available information" means, in the absence of official flood insurance rate map data, communities can use data from other federal, state, or other sources; provided this data has either been generated using technically defensible methods or is based on reasonable historical analysis and experience. Flood data from existing flood events may be used where flood events are considered more accurate indicators of past base flood conditions. Any variance from adopted flood insurance rate maps must be of a more restrictive nature.

"Binding site plan" means a drawing to scale which: (1) identifies and shows the areas and locations of all streets, roads, improvements, utilities, open spaces, and any other matters specified by local regulations; (2) contains inscriptions or attachments setting forth limitations and conditions for the use of the land; and (3) contains provisions making any development be in conformity with the site plan.

"Boat sales, and repair" means a business primarily engaged in sales and repair of new and used motorboats, sailboats, and other watercraft. Also includes businesses primarily engaged in the sale of supplies for boating.

"Book, stationery and art supply store" means an establishment engaged in the retail sale of books and magazines, stationery, record and tapes, video and art supplies, including uses.

"Boundary line adjustment" means an adjustment of boundary lines between platted or unplatted lots or both, which does not create any additional lot, tract, parcel, site or division.

"Breakaway wall" means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

"Breezeway" means a structure for the principal purpose of connecting the main building or buildings on a property with other main buildings or accessory buildings.

“Brew pub.” See "specialty goods production."

"Buffer" means either: (i) an area adjacent to hillsides which provides the margin of safety through protection of slope stability, attenuation of surface water flows, and landslide, seismic, and erosion hazards reasonably, necessary to minimize risk to the public from loss of life, well-being, or property damage resulting from natural disasters; or (ii) an area adjacent to a stream or wetland which is an integral part of the stream or wetland ecosystem, providing shade; input of organic debris and coarse sediments; room for variation in stream or wetland boundaries; habitat for wildlife; impeding the volume and rate of runoff; reducing the amount of sediment, nutrients, and toxic materials entering the stream or wetland; and protection from harmful intrusion to protect the public from losses suffered when the functions and values of stream and wetland resources are degraded.

"Building and hardware and garden supply store" means an establishment engaged in selling lumber and other building materials such as paint, glass, wallpaper, tools, seeds and fertilizer.

"Building envelope" means a delineated area identifying where a primary building may be established. See Figure 18.03-3.

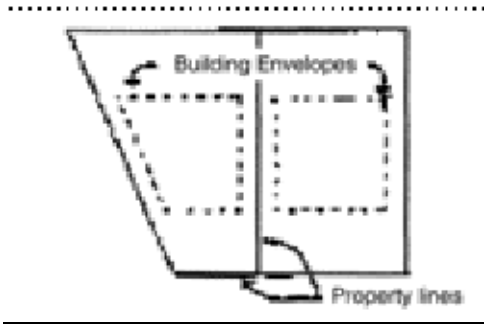

Figure 18.03-3
Building Envelopes

"Building height" means the vertical distance above a reference datum measured to the highest point of the coping of a flat roof or to the deck line of a mansard roof or to the average height of the highest gable of a pitched or hipped roof. The reference datum shall be selected by either of the following, whichever yields a greater building height: (a) the elevation of the highest adjoining sidewalk or ground surface within a five-foot horizontal distance or the exterior wall of the building when such sidewalk or ground surface is not more than ten feet above the lowest grade; (b) an elevation ten feet higher than the lowest grade when the sidewalk or ground surface described in subsection (a) of this definition is more than ten feet above the lowest grade. The height of a stepped or terraced building is the maximum height of segment of the building. See Figure 18.03-4.

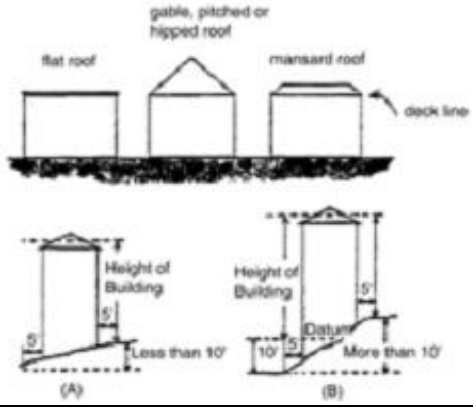

Figure 18.03-4 Building Height

"Building line" means a line on a plat indicating the limit beyond which primary buildings or structures may not be erected.

"Building" means any structure used or intended for supporting or sheltering any use or occupancy.

"Bus station" means an establishment for the storage, dispatching, repair and maintenance of coaches and vehicles of a transit system.

“Child care.” See "Day care."

"Church" means a permanently located building commonly used for religious worship, fully enclosed with walls and roof. A memorial chapel is similar to a church, with the exception that no funeral home activities, such as embalming or casket display are permitted.

"City" means the City of Camas.

"Clinic" means a building or portion of a building containing offices and facilities for providing medical, dental and psychiatric services for outpatients only.

"Co-living housing" means a residential development with sleeping units that are independently rented and lockable and provide living and sleeping space, and residents share kitchen facilities with other sleeping units in the building.

“Collector.” See "Street."

"Commission" means the Planning Commission of the City of Camas.

"Community center" means a facility owned and operated by a public agency or nonprofit corporation; provided, that the principal use of the facility is for public assistance, recreation, community improvement, or public assembly.

"Comprehensive plan" means the comprehensive plan for the City of Camas, comprising plans, maps or reports, or any combination thereof relating to the future economic and physical growth and development of the city.

"Contractor" means the person/firm hired by the applicant to perform work.

“Convenience store.” See "Grocery, neighborhood."

"Convention center" means an establishment developed primarily as a meeting facility; including facilities for recreation and related activities provided for convention participants, excluding overnight lodging.

"Cottage housing" means residential units on a lot with a common open space that either: (a) is owned in common; or (b) has units owned as condominium units with property owned in common and a minimum of 20 percent of the lot size as open space.

"Council" means the Council of the City of Camas.

"Court" means a space open and unobstructed to the sky, located at or above grade level on a lot and bounded on three or more sides by walls of a building.

"Courtyard apartments" means up to four attached dwelling units arranged on two or three sides of a yard or court.

"Critical facility" means a facility for which even a slight chance of flooding might be too great. Critical facilities include (but are not limited to) schools, nursing homes, hospitals, police, fire and emergency response installations, and installations which produce, use, or store hazardous materials or hazardous waste.

"Critical root zone" is the area of soil around a tree trunk where roots are located that provide stability and uptake of water and minerals required for tree survival.

“Cul-de-sac.” See "Street."

“Data Center” means a facility or portion of a facility housing networked computer systems and telecommunications equipment used for remote storage, processing, and distribution of data. This definition does not include server rooms or information technology infrastructure that is accessory to the principal use of the site.

"Day care center" means a state-licensed entity regularly providing care for thirteen or more children for periods of less than twenty-four hours. A day care center is not located in a private family residence unless the portion of the residence to which the children have access is used exclusively for the children during the hours the center is open or is separate from the usual quarters of the family.

“Day care, family home<” or "family home day care," means an entity regularly providing care during part of the twenty-four hour day to six or fewer children in the family abode of the person(s) under whose direction the children are placed; or, a state licensed entity regularly providing care during part of the twenty-four hour day to between six and twelve children in the family abode of the person(s) under whose direction the children are placed.

“Day care, mini-center,” or "mini-center day care," means a state licensed entity providing care during part of the twenty-four hour day period for twelve or fewer children in a facility other than the family abode of the person or persons under whose direct care the children are placed, or for the care of seven through twelve children in the family abode of such person or persons.

"Dedication" means the deliberate appropriation of land by an owner for any general and public uses, reserving to the owner no other rights than such as are compatible with the full exercise and enjoyment of the public uses to which the property has been devoted.

"Delicatessen (deli)" means retail food stores selling ready-to-eat food products such as cooked meats, prepared salads or other specialty food items. This definition includes seafood, health food and other specialty foods.

"Density transfer" means a transfer of dwelling units located on a site identified as sensitive lands or open space to the developable portion of land on the site. (Refer to Section 18.09.060 Density Transfers)

"Developed/net acreage" means the total acreage of a land use development exclusive of open space and critical areas.

"Development" within the area of special flood hazard means any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading,

paving, excavation, or drilling operations, or storage of equipment or materials located within the area of special flood hazard.

"Diameter at breast height (DBH)" means the diameter of the tree measured at four feet six inches above soil grade.

"Director" means community development director or designee.

"Drainage facility" means the system of collecting and storing surface and stormwater runoff. Drainage facilities shall include but not be limited to all surface and stormwater runoff conveyance and containment facilities including streams, pipelines, channels, ditches, wetlands, closed depressions, infiltration facilities, retention/detention facilities, and other drainage structures and appurtenances, both natural and man-made.

"Driveway" means the required traveled path to or through a parking lot for three or more vehicles. A "driveway" also refers to the vehicular access for single-family dwelling.

"Drug store" means an establishment engaged in the retail sale of prescription drugs, nonprescription medicines, cosmetics and related supplies.

"Duplex or two-family dwelling" means a residential building with two attached dwelling units.

"Dwelling unit" means an independent living unit within a dwelling structure designed and intended for occupancy by not more than one family and having its own housekeeping and kitchen facilities. Hotel, motel, and bed and breakfast that are primarily for transient tenancy are not considered dwelling units.

“Dwelling unit, Accessory,” or "accessory dwelling unit," means an additional, smaller, subordinate dwelling unit on a lot or attached to an existing or new house. Refer to Chapter 18.27 Accessory Dwelling Units.

“Dwelling, condominium,” or "condominium dwelling," means two or more units where the interior space of which are individually owned; but the balance of the property (both land and/or building) is owned in common by the collective owners of the building.

“Dwelling, cottage cluster,” or "cottage-style home," or "cottage cluster" means a grouping of no fewer than four detached dwelling units with a maximum footprint of one thousand square feet each and that includes a common courtyard. Cottage clusters may be located on a single lot or parcel or on individual lots or parcels. Cottage clusters are allowed on up to twenty-five percent of the developable acreage of a project site. Cottage cluster development standards are detailed in the North Shore Design Manual.

“Dwelling, duplex or two-family,” or "duplex or two-family dwelling," means a structure containing two dwelling units on one lot.

“Dwelling, multifamily<’ or "multifamily dwelling" or "apartment," means a building containing three or more dwelling units on a lot or parcel.

“Dwelling, single-family attached (row house),” or "single-family attached dwelling," means a single household dwelling attached to another single household dwelling by a common vertical wall, and each dwelling is owned individually and located on a separate lot. These are more commonly referred to as townhouses or rowhouses.

“Dwelling, single-family,” or "single-family dwelling," means a detached building containing one dwelling unit.

"Easement" means a grant of the right to use land for specific purposes.

"E-cigarette" means any electronically actuated device or inhaler meant to simulate cigarette smoking that uses a heating element to vaporize a liquid solution, popularly referred to as "juice," and that causes the user to exhale any smoke, vapor, or substance other than that produced by unenhanced human exhalation. The juice used in e-cigarettes typically contains nicotine, and for this reason e-cigarettes and their juice fall under the classification of tobacco products and tobacco paraphernalia.

"Electric vehicle battery charging station" and "rapid charging station" mean an electric component assembly, or cluster of component assemblies designed specifically to charge batteries within electric vehicles, which meet or exceed any standards, codes, and regulations set forth by RCW Chapter 19.28.

"Electric vehicle infrastructure" means structures, machinery, and equipment to support electric vehicles such as a battery exchange station or facility, and which may be subject to site plan permits.

"Elevated building" means for insurance purposes, a non-basement building that has its lowest elevated floor raised above ground level by foundation walls, shear walls, post, piers, pilings, or columns.

"Emergency housing" means temporary indoor accommodations for individuals or families who are homeless or at imminent risk of becoming homeless that is intended to address the basic health, food, clothing, and personal hygiene needs of individuals or families. Emergency housing may or may not require occupants to enter into a lease or an occupancy agreement.

"Emergency shelter" means a facility that provides a temporary shelter for individuals or families who are currently homeless. Emergency shelter may not require occupants to enter into a lease or an occupancy agreement. Emergency shelter facilities may include day and warming centers that do not provide overnight accommodations.

"Environmentally sensitive area(s)" or "sensitive lands" means areas within the city that are characterized by, or support unique, fragile or valuable natural resources, or that are subject to natural hazards. Sensitive areas include wetlands and wetland buffers, streams and watercourses, steep slopes, and areas with potentially unstable soils, as those areas are defined and identified pursuant to this title and Title 16.

"Erosion control bond" insures the satisfactory installation, maintenance, and operation of erosion control measures within an approved development. The developer/owner is the principle and the city is the obligee. The bond shall remain in full force and effect until released by the city.

"Established grade" means the curb line grade established by the city.

"Event center" means a building or property used by groups for celebratory events (e.g. weddings, parties, reunions, etc.), meetings and other events. Occupancy must be less than two hundred persons otherwise it shall be regulated as a convention center. Events may occur outdoors. Typically food service and alcohol are associated with this use.

“Facility, essential public,” or "essential public facility," means and includes those facilities that are typically difficult to site, such as airports, state education facilities and state or regional transportation facilities, state and local correctional facilities including substance abuse facilities, mental health facilities, and group homes.

"Facility, public," "public facility," means streets, roads, highways, sidewalks, street and road lighting systems, traffic signals, domestic water systems, water towers, storm and sanitary sewer systems, parks and recreation facilities, and schools that are open to the general public and owned by or in trust for a government entity.

"Family" means an individual, or two or more persons related by blood or marriage, or two persons with functional disabilities as defined in this chapter, or a group of not more than five unrelated persons (excluding servants), living together in the same dwelling unit.

"Fence" means a structure, other than a building, designed, constructed and intended to serve as a barrier or as a means of enclosing a yard or other structure; or to serve as a boundary feature separating two or more properties. Landscaping plantings do not fall within this definition.

“Fence, sight-obstructing,” or "sight-obstructing fence," means a fence so arranged as to obstruct vision.

"Final acceptance" means city council approval of the complete public improvements and acceptance of the warranty for the public improvements. The end of the warranty period signifies the city responsibility for maintenance and repair of any public improvements.

"Final plat" means the final drawing of the subdivision or short subdivision and dedication, prepared for filing for record with the county auditor and containing all elements and requirements set forth in this chapter and in state law.

"Fitness center/sports club" means an establishment engaged in operating physical fitness facilities, sports and recreation clubs.

"Flag lot" means a lot that does not have full frontage on a public street and the "pole" of the flag lot is less than half the width of the average lot width. Flag poles shall be a minimum of twenty feet wide, provide a minimum of twelve feet wide pavement and extend no longer than three hundred feet.

"Flood elevation study" means an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation, and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards. Also known as a flood insurance study (FIS).

"Flood insurance rate map (FIRM)" means the official map of a community, on which the Federal Insurance Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a digital flood insurance rate map (DFIRM).

"Flood insurance study (FIS)" means the official report provided by the Federal Insurance Administration that includes flood profiles, the flood insurance rate maps, and the water surface elevation of the base flood.

"Flood," or "Flooding" means:

A. A general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters.

2. The unusual and rapid accumulation or runoff of surface waters from any source.

3. Mudslides (i.e., mudflows) which are proximately caused by flooding as defined in paragraph [B.] of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

B. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph [A.] of this definition.

"Flood proofing" means any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate risk of flood damage to real estate or improved real property, water and sanitary facilities, structures, and their contents. Flood proofed structures are those that have the structural integrity and design to be impervious to floodwater below the base flood elevation.

"Floodplain administrator" means the community official designated by title to administer and enforce the floodplain management regulations.

"Floodplain or flood prone area" means any land area susceptible to being inundated by water from any source. See "flood or flooding."

"Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Also referred to as "regulatory floodway."

"Floor area" means the area included within the surrounding exterior walls of a building or portion thereof, exclusive of vent shafts and courts. The floor area of a building, or portion thereof, not provided with surrounding

exterior walls shall be the usable area under the horizontal projection of the roof or floor above. For retrofits of existing buildings to be used for residential housing, dross floor area must be measured from the interior face of the exterior walls, which includes drywall, as typically depicted on the architectural floor plans.

"Florist shop" means establishments engaged in the retail sale of flowers and plants.

"Food carts/food trucks/food delivery business" means a business in which food is primarily prepared and sold from a vehicle or trailer. Restaurants or fast food restaurants in a permanent building are not included in this definition. Food carts are generally not allowed to conduct business within the public right-of-way and must be located on leased or owned property. For more information refer to zoning structure setbacks, uses allowed in the zone, and siting requirements at CMC Chapter 18.18 Site Plan Review.

"Fourplex" means a residential building with four attached dwelling units.

“Fulfillment centers" means a building or facility that is principally used for receiving, picking, packing, and shipping goods and orders directly to customers, and relies on optimizing speed and efficiency over longer-term inventory storage.

"Functionally dependent use" means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, and does not include long term storage or related manufacturing facilities.

"Funeral home" means a building where services and/or ceremonies are held in conjunction with human burial or cremation. Crematories may be an accessory use to a funeral home.

"Furniture store" means establishments engaged in the retail sale of household furniture and furnishings for the home.

"Gas/fuel station with mini market" means establishments engaged in the sale of gasoline or other auto fuel together with a minor incidental building in which incidental items including snack foods and beverages are sold.

"Gas/fuel station" means establishments engaged primarily in the sale of automobile gasoline or other auto fuel to the general public.

"Golf course" means a recreational facility, under public or private ownership, designed and developed for uses including, but not limited to a golf course, driving range, putt-putt golf, and other auxiliary facilities such as a pro shop, caddy shack building, restaurant, meeting rooms, and storage facilities.

"Grade (adjacent ground elevation)" means the lowest point of elevation of the finished surface of the ground paving or sidewalk within the area between the building and the property line or, when the property line is more than five feet from the building, between the building and a line five feet from the building.

“Grocery, large scale,” or "large scale grocery," means a retail business enclosed within a structure greater than thirty thousand square feet with the majority of sales relating to food for the consumption off-premises.

“Grocery, neighborhood,” or "neighborhood grocery," means a retail business enclosed within a structure less than six thousand square feet with the majority of sales relating to food and associated items. Limited outdoor storage may be permitted; provided it complies with screening requirements. Where outdoor storage occurs, the use shall be defined as a small scale grocery.

“Grocery, small scale,” or "small scale grocery," means a retail business enclosed within a structure between six thousand square feet and thirty thousand square feet with the majority of sales relating to food for the consumption off-premises.

"Gross area" means the total usable area including accessory and common space dedication to such things as streets, easements and uses out of character with the principal use but within a unit of area being measured.

"Guest house" means an accessory, detached dwelling without kitchen facilities, designed for and used to house transient visitors or guests of the occupants of the main building without compensation.

"Half street." See "Street."

"Hammerhead" means a term used to describe a particular style of turnaround for emergency vehicles designed in accordance with guidelines in the Camas Design Standard Manual.

"Hardware store." See "Building, hardware and garden supply store."

"Hazard tree," means any tree with a combination of structural defect and/or disease, which makes it subject to a high probability of failure and a proximity to persons or property which makes it an imminent threat.

"Hazardous waste storage" means the holding of dangerous waste for a temporary period, as regulated by state dangerous waste regulations, Chapter 173-303, Washington Administrative Code.

"Hazardous waste treatment and storage facility, off-site," or "off-site hazardous waste treatment and storage facility," means treatment and storage facilities of hazardous wastes generated on properties other than those on which the off-site facility is located.

"Hazardous waste treatment and storage facility, on-site," or "on-site hazardous waste treatment and storage facility," means treatment and storage of hazardous wastes generated on-site.

"Hazardous waste treatment" means the physical, chemical or biological processing of dangerous waste to make waste nondangerous or less dangerous, safer for transport, amenable for energy or material resource recovery, amenable for storage, or reduced in volume.

"Hazardous waste" means all dangerous and extremely hazardous, as defined in RCW 70.105.010, except for moderate-risk waste.

"Hearings examiner" conducts quasi-judicial public hearings for land development applications and renders decisions based on regulations and policies as provided in Camas Municipal Code and other ordinances. See CMC Chapter 2.15 Hearing Examiner System.

"Height of building." See "Building height."

"Highest adjacent grade" means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

"Hillsides" means geological features of the landscape having slopes of fifteen percent or greater. To differentiate between levels of hillside protection and the application of development standards, the city categorizes hillsides into four groups: hillsides of at least fifteen percent but less than forty percent; hillsides with unstable slopes; hillsides of forty percent slope and greater; hillsides which are ravine sidewalls or bluffs.

"Historic structure" means any structure that is:

A. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

B. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the secretary to qualify as a registered historic district;

C. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or

D. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

1. By an approved state program as determined by the Secretary of the Interior, or

2. Directly by the Secretary of the Interior in states without approved programs.

"Home occupation." See CMC Chapter 18.39 Home Occupations.

"Home, designated manufactured" means a manufactured home which:

(a) is comprised of at least two fully enclosed parallel sections each not less than twelve (12) feet wide by thirty-six feet long;

(b) was originally constructed with and now has composition or wood shake or shingle, coated metal, or similar roof, or not less than 3:12 pitch;

(c) has exterior siding similar in appearance to siding materials commonly used on conventional site-built IBC single-family residences; and

(d) is placed upon a permanent foundation.

"Home, manufactured" means a single-family residence constructed after June 15, 1976, in accordance with the U.S. Department of Housing and Urban Development (HUD) requirements for manufactured housing, and bearing the appropriate insignia indicating such compliance.

"Home, mobile" means a single-family residence transportable in one or more sections that are eight feet or more in width and thirty-two feet or more in length, built on a permanent chassis, designed to be used as a permanent dwelling and constructed before June 15, 1976. Such home shall be installed in accordance with applicable WAC rules and regulations.

"Home, modular" means a structure constructed in a factory in accordance with the International Building Code and bearing the appropriate insignia indicating such compliance. This definition includes "prefabricated," "panelized," and "factory built" units. Such home shall be installed in accordance with applicable WAC rules and regulations.

"Homeowner's association" means an incorporated, nonprofit organization operating under recorded land agreements through which: (a) each lot owner is automatically a member; and (b) each lot is automatically subject to a charge for a proportionate share of the expenses for the organization's activities, such as maintaining a common property.

"Hospital" means an establishment that provides sleeping and eating facilities to persons receiving medical, obstetrical or surgical care and nursing service on a continuous basis.

"Hotel" means a building or buildings in which short-term lodging is provided for a fee for up to thirty consecutive nights. The facility may provide such things as restaurants, meeting rooms, self-service kitchens, and/or other auxiliary facilities and services. This definition is interchangeable with "motel," "hostel," and "inn."

"IBC" means the International Building Code as adopted by city council.

"IFC" means the International Fire Code as adopted by the city council.

"Infrastructure acreage" means the total area of public improvements including any utility or private road outside of the lot area, street right-of-way, and storm drainage facilities.

"IRC" means the International Residential Code as adopted by the city council.

“Junkyard.” See "Wrecking yard."

"Kennel/boarding (incidental use)" means any premises or building in which four or more dogs or cats at least four months of age are kept commercially for training or board. Propagation and sale of pets may not occur as an incidental use. Facilities for the boarding of animals may occupy no more than 30 percent of the gross floor

area of the primary building and must be indoors. Excessive barking may be considered cause for revocation of permit in accordance with CMC Section 9.32.050 Public disturbance noises.

"Kennel/commercial boarding (primary use)" means any premises or building in which four or more dogs or cats at least four months of age kept commercially for board, propagation or sale. Facilities for kennels/boarding must be entirely indoors, unless otherwise approved with a Type III permit.

"Land development" means any project subject to review under Title 16, 17 or 18.

“Laundry, self-service,” or "self-service laundry," means a business providing coin-operated machines for home type washing, drying, and/or ironing to be performed primarily by customers.

“Laundry/dry cleaning (industrial),” or "industrial laundry/dry cleaning," means a business supplying bulk laundry services, such as linen and uniform services on a rental or contract basis. May also include cleaning used carpets and upholstery.

“Laundry/dry cleaning (retail),” or "retail laundry/dry cleaning," means a business providing drop-off and pick-up services of laundry and dry cleaning (except coin- operated); and providing specialty cleaning services for specific types of garments and other textile items (except carpets and upholstery), such as fur, leather, or suede garments; wedding gowns; hats; draperies; and pillows.

“Live work unit,” or "live-work," means a type of residential mixed-use development that combines a nonresidential use with a residential use in the same unit, and where a resident uses the workspace. The living space may be located in front or behind the workspace on the same floor or on a separate floor.

"Lot area" means the total square footage of a lot.

"Lot coverage" means the portion of a lot that is occupied by the principal and accessory buildings, including all projections except eaves, expressed as a percentage of the total lot area.

"Lot depth" means the horizontal distance from the midpoint of the front lot line to the midpoint of the rear lot line.

"Lot line" means the property line bounding a lot.

“Lot line, front,” or "front lot line," means, in the case of an interior lot, the lot line separating the lot from a street other than an alley, and in the case of a corner lot, the shortest lot line separating the lot from a street other than an alley.

“Lot line, rear,” or "rear lot line," means a lot line which is opposite and most distant from the front lot line. In the case of an irregular shaped lot, a line ten feet in length within the lot parallel to and most distant from the front lot line shall be considered the rear lot line for purposes of determining required setbacks. See Figure 18.03-6.

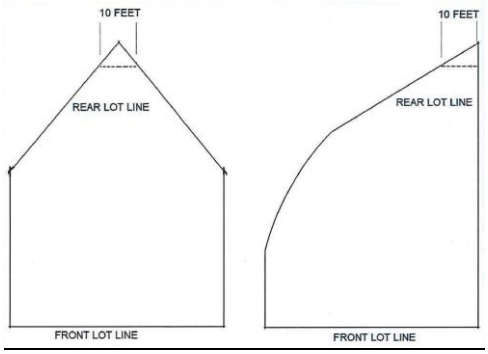

Figure 18.03-6 Rear Lot Line in the Case of an Irregular Lot

"Lot line, side," or "side lot line," means any lot line not a front or rear lot line. See Figure 18.03-8.

"Lot width" means the horizontal distance between the side lot lines at a point midway between the front and rear property lines.

"Lot width" means the horizontal distance between the side lot lines at a point midway between the front and rear property lines.

"Lot" means a fractional part of divided lands having fixed boundaries, being of sufficient area and dimension to meet minimum zoning requirements for width and area. The term shall include parcels.

"Lot, corner," or "corner lot," means a lot abutting on two intersecting streets other than an alley provided that the streets do not intersect at an angle greater than one hundred thirty-five degrees. See Figure 18.03-7.

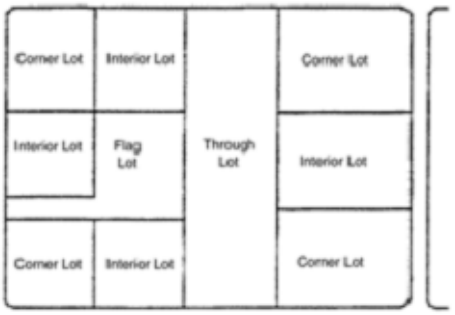

Figure 18.03-7
Lot Configuration

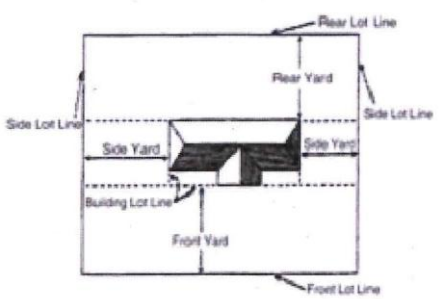

Figure 18.03-8
Yard and Lot Lines

"Lot, interior," or "interior lot," means a lot other than a corner lot. See Figure 18.03-7.

"Lot, parent" means a lot which is subdivided into unit lots through the unit lot subdivision process; or a lot that is subjected to the administrative lot split process

"Lot, through," or "through lot," means a lot having frontage on two parallel or approximately parallel streets. See Figure 18.03-7.

"Lot, unit" means a lot created from a parent lot and approved through the unit lot subdivision process.

"Lowest floor" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements found in CMC Chapter 16.57.

"Major transit stop" means a stop on a high capacity transportation system funded or expanded under the provisions of chapter 81.104 RCW, commuter rail stops, stops on rail or fixed guideway systems, and stops on bus rapid transit routes.

"Manufactured home park" means any property meeting the minimum standards established in CMC Chapter 18.29 "Manufactured home parks," which would be divided into individual spaces for sale, lease or rent for the accommodation of occupied manufactured/mobile homes.

“Marginal access street.” See "Street."

"Marijuana processor" means a facility licensed by the Washington Liquor Control Board to transform marijuana into usable marijuana and marijuana-infused products into useable marijuana and marijuana-infused products, package and label useable marijuana and marijuana-infused products for sale in retail outlets, and sell usable marijuana and marijuana-infused products at wholesale to marijuana retailers. Processors are classified as follows:

Processor I, a facility limited to drying, curing, trimming, and packaging; and

Processor II, a facility that extracts concentrates, infuses products, or involves mechanical and/or chemical processing in addition to drying, curing, trimming, and packaging.

"Marijuana producer" means a facility licensed by the Washington State Liquor Control Board for the growing and sale at wholesale of marijuana to marijuana processors and other marijuana producers.

"Marijuana retailer" means a facility licensed by the Washington State Liquor Control Board for the sale to consumers of usable marijuana and marijuana-infused products.

“Mass timber construction” means a building with structural components primarily made of mass timber products as defined in RCW 19.27.570.

"Mean sea level" for purposes of the National Flood Insurance Program, the vertical datum to which base flood elevations shown on a community's flood insurance rate map are referenced.

"Meeting facility" means a primary or secondary use in which a room or series of rooms are available for businesses purposes on an hourly or daily rate.

"Middle housing" means buildings that are compatible in scale, form, and character with single-family houses and contain two or more attached, stacked, or clustered homes including duplexes, triplexes, fourplexes, townhouses, stacked flats, courtyard apartments, and cottage housing.

"Mini-storage facility" means a building consisting of individual, small, self-contained units that are leased or owned for the storage of business and household goods or contractor's supplies. May also include an accessory residential use, which will not exceed nine hundred square feet of floor area or forty percent of the primary building size, whichever is lesser. This singular, accessory dwelling is intended solely as living quarters for security staff or for the manager, and shall not be leased to non-employees of the facility.

“Minor street.” See "Street."

"Mitigation" means the use of any combination of, or all of the following actions:

A. Avoid impacts to environmentally sensitive areas by not taking a certain action, or parts of an action;

B. Minimize impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

C. Rectifying the impact by repairing, rehabilitating, or restoring the affected environmentally sensitive area;

D. Reducing or eliminating the impact over time by reservation and maintenance operations during the life of the development proposal;

E. Compensating for the impact by replacing or enhancing environmentally sensitive areas, or providing substitute resources.

"Modular construction" means a multistory residential or commercial building constructed of standardized components produced off-site, which are transported and assembled at a final location.

"New construction" for the purposes of determining insurance rates, means structures for which the "start of construction" commenced on or after the effective date of an initial flood insurance rate map or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, "new construction" means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

"Newspaper printing plant" means a building housing a business to include the writing, layout, editing, and publishing of a newspaper.

"Nonconforming building or use." See CMC Chapter 18.41 Nonconforming Uses.

“Non-residential use” means a use, building, or structure that is intended for something other than residential living, including commercial, retail, office, and personal services use, but excluding storage or warehousing of any kind.

“Nursery, plant,” or "plant nursery," means an enterprise, establishment, or portion thereof that conducts the retailing or wholesaling of plants grown on the site, as well as accessory items (but not farm implements). The accessory items normally sold include items such as clay pots, potting soil, fertilizers, insecticides, hanging baskets, rakes and shovels.

"Nursing, rest or convalescent home" means an establishment which provides full-time care for three or more chronically ill or infirm persons. Such care shall not include surgical, drug or alcohol treatment services, or obstetrical or acute illness services. See residential treatment facility (RTF) definition for drug and alcohol treatment services.

"Office supply store" means stores selling office products such as stationery, legal forms, writing implements, typewriters, computers, copiers, office furniture, and the like.

"Open space connectors" means tracts of land with typically no sensitive lands that connect parcels of land to form the open space network.

"Open space network" means a network of open space composed of mostly wooded areas, steep slopes, ravines, streams and waterways, as areas identified in the comprehensive parks, recreation, and open space plan.

"Open space" means land set aside and maintained in a natural state, providing air, light, and habitat for wildlife, and/or containing significant trees and vegetation. Open space may contain environmentally sensitive lands, which include but are not limited to steep slopes and areas with unstable soils, wetlands, and streams and watercourses. Open space may also provide for active and passive recreation use. There are two general categories of open space, which are as follows:

A. "Natural open space" means land devoted to protecting environmentally sensitive lands as defined in this title and CMC Title 16. Natural open space generally has no developed areas, with the exception of trails as identified in the comprehensive parks, recreation, open space plan, or by a condition of development approval.

B. "Recreational open space" means land set aside for recreational opportunities, which may contain trails, sports fields, playgrounds, swimming pools, tennis courts, and picnic areas. Recreational open space is generally limited in size and intensity, proportionate to the development, and is intended for the enjoyment of the residents of the development.

"Owner" means the persons/organization who hold legal right to the property. The owner may also serve as applicant, developer and contractor.

"Passive house requirements" means the criteria for certification as a passive house by Phius or the international passive house institute.

"Pawnshop" means establishments who lend money on goods deposited until redeemed.

"Pawnshop" means establishments who lend money on goods deposited until redeemed.

"Pedestrian way" means a right-of-way for pedestrian traffic connecting two streets other than at an intersection.

"People with functional disabilities" means a person who, because of a recognized chronic physical or mental condition or disease, is functionally disabled to the extent of:

1. Needing care, supervision or monitoring to perform activities of daily or instrumental activities of daily living;
2. Needing supports to ameliorate or compensate for the effects of the functional disability so as to lead as independent a life as possible;
3. Having a physical or mental impairment which substantially limits one or more of such person's major life activities; or
4. Having a record of having such an impairment, but such term does not include current, illegal use of or active addiction to a controlled substance.

"Performance bond" means a pledge, guarantee or bond, usually to back the performance of an individual or company. The bond guarantees the contractor's performance. A performance bond is generally used to ensure that a particular obligation will be completed at a certain date or that a contract will be performed as stated. It has no end date, but terminates upon successful completion of obligation.

"Permanent supportive housing" means subsidized, leased housing with no limit on of stay, that prioritizes people who need comprehensive support services to retain tenancy and utilizes admissions practices designed to use lower barriers to entry than would be typical for other subsidized or unsubsidized rental housing, especially related to rental history, criminal history, and personal behaviors. Permanent supportive housing is paired with on-site or off-site voluntary services designed to support a person living with a complex and disabling behavioral health or physical health condition who was experiencing homelessness or was at imminent risk of homelessness prior to moving into housing to retain their housing and be a successful tenant in a housing arrangement, improve the residents' health status, and connect the resident of the housing with community-based health care, treatment, or employment services. Permanent supportive housing is subject to all of the rights and responsibilities defined in chapter 59.18 RCW.

"Person" means an individual, firm, partnership, corporation, company, association, syndicate or any legal entity, including any trustee, receiver, assignee or other similar representative thereof.

"Pet shop" means establishments engaged in the retail sale of pets, pet food, supplies and the grooming of pets and other small animals.

“Pharmacy.” See "Drug store."

"Phase" means a group of lots, tracts or parcels within well identified and fixed boundaries. The term shall include blocks. Phases shall be consecutively numbered.

"Photographic store" and "electronic store" mean establishments engaged in the retail sale of camera and photographic supplies and a variety of household electronic equipment.

"Planned residential development (PRD)." See CMC Chapter 18.23 Planned Residential Development.

"Planning commission" means the planning commission of the City of Camas.

"Planning control area" means an area in a state of incomplete development within which special control is to be exercised over land partitioning.

"Plat" means a map or representation of a subdivision, showing thereon the division for a tract or parcel of land into lots, blocks, streets and alleys, or other divisions and dedications.

"Preliminary plat" means a neat and approximate drawing of a proposed subdivision showing the general layout of streets and alleys, lots, blocks, tracts and other elements of a land division consistent with the requirements of this chapter. The preliminary plat shall be the basis of the approval or disapproval of the general layout of the land division.

“Principal use” means the primary or predominant use of a lot, building, structure, or tenant space, as distinguished from an accessory use.

"Print shop" means a retail establishment that provides duplicating services using photocopy, blueprint, and offset printing equipment, including collating of booklets and reports.

"Professional offices" means an office containing activities such as those offered by a physician, surgeon, dentist, lawyer, architect, engineer, accountant, artist or teacher, real estate or insurance sales.

"Protective mechanism" means a method of providing permanent protection to open space, and shall include conservation easements, dedication to the city, conveyance to a public or private land trust, conveyance to a homeowner's association, restrictive covenants, or any combination of such mechanisms.

"Public agency" means any agency office for the administration of any governmental activity or program.

"Punch list" means a term used by the engineering department to designate items still to be completed per conditions of approval and city standards for the land use to reach final acceptance phase of the approval process.

"Ravine sidewall" means a steep slope which abuts and rises from the valley floor of a stream, and which was created by the wearing action of the stream. Ravine sidewalls contain slopes predominantly in excess of forty percent, although portions may be less than forty percent. The toe of a ravine sidewall is the stream valley floor. The top of a ravine sidewall is typically a distinct line where the slope abruptly levels out. Where there is no distinct break in slope, the top is where the slope diminishes to less than fifteen percent. Minor natural or man-made breaks in the slope of ravine sidewalls shall not be considered as the top. Benches with slopes less than fifteen percent, and containing developable areas, shall be considered as the top.

"Recreational vehicle (RV) park" means any lot of land upon which two or more recreational vehicle sites are located, established, or maintained for occupancy by recreational vehicles of the general public as temporary living quarters for recreation or vacation purposes.

"Recreational vehicle" means a vehicle which is: a) built on a single chassis; b) four hundred square feet or less when measured at the largest horizontal projection; c) designed to be self-propelled or permanently towable by a light duty truck; and d) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

"Recycling center" means a building in which used material is separated and processed prior to shipment to others who will use those materials to manufacture new products.

"Recycling collection point" means a collection point for recoverable resources, such as newspapers, glassware, and metal cans, with processing of items occurring off-site. See Figure 18.03-1.

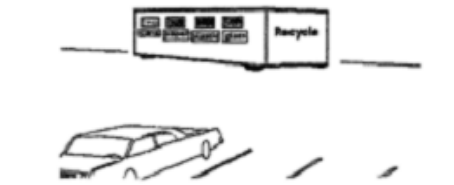

Figure 18.03-1 Recycling Collection Point

"Recycling plant" means a facility that is not a junkyard and in which recoverable resources, such as newspapers, glass, metal cans and other products are reprocessed and treated to return such products to a condition in which they may again be used for production.

"Religious organization" means the federally protected practice of a recognized religious assembly, school, or institution that owns or controls real property.

"Residential care facility" means a facility, licensed by the state of Washington, that cares for at least five but not more than fifteen people with functional disabilities, and that has not been licensed as an adult family home pursuant to RCW 70.128.175.

"Residential treatment facility (RTF)" means a facility meeting applicable state and federal standards that provides support services including, but not limited to, counseling, rehabilitation and medical supervision for the need of drug or alcohol treatment. An RTF may function as a residence, day-treatment facility, or a combination thereof. An RTF may be staffed by resident or nonresident staff and may include more than eight unrelated individuals. An RTF shall not be located within one thousand feet of public and private schools, public parks, public libraries, other RTFs, or similar uses.

"Restaurant" means an establishment that serves food and beverages primarily to persons seated within the building. This includes cafes, coffee shops, tearooms, and outdoor cafes.

“Restaurant, fast food,” or a "fast food restaurant," means an establishment that offers quick food service, which is accomplished through a limited menu of items already prepared and held for service, or prepared, fried, or grilled quickly, or heated in a device such as a microwave oven. Orders are not generally taken at the customer's table, and food is generally served in disposable wrapping of containers. The establishment may also offer drive-up or drive-through service.

“Retail, active” means street-facing, ground-floor uses that encourage walkability and activate sidewalks, such as shops, cafés, restaurants, and other active, customer-oriented

“Retail, passive” refers to commercial activities that primarily serve building occupants or a smaller customer base – such as boutique offices, lobby kiosks, or specialty shops – which typically generate less foot traffic and require less window visibility.

"Right-of-way" (commonly referred to as ROW) means the area between boundary lines of a street or other easement.

"Roadside produce stand" means an establishment engaged in the retail sale of local fresh fruits and vegetables and having permanent or semi-permanent structures associated with such use.

"Roadway" means the portion of a street right-of-way developed for vehicular traffic.

"Rowhouse." See "Dwelling, single-family attached."

"Second-hand/consignment store" means an establishment engaged in the retail sale of used clothing, sports equipment, appliances and other merchandise.

"Sensitive area(s) map(s)" means those maps adopted, and/or incorporated by reference, by the city to identify the general location of environmentally sensitive or valuable areas. In case of questions as to map boundaries or mapping errors, the presence or absence of a sensitive area shall be determined in the field by a qualified professional, experienced in a discipline appropriate to evaluation of the appropriate feature, and shall determine the applicability of this chapter.

"Sensitive areas and open space." For related definitions see CMC Section 18.03.050 Environmental definitions.

"Setback." See "Yard."

"Shorelines." For related definitions see CMC Section 18.88.030 Definitions in Chapter 18.88 Shoreline Management.

"Short plat" means a map or representation of a short subdivision.

"Short subdivision" means the division of land into nine or fewer lots, sites or divisions for the purpose of sale or lease.

"Sidewalk area" means the portion of a street right-of-way between proposed curb line and adjacent lot line.

"Sidewalk" means a pedestrian walkway with permanent surfacing to city standards.

"Significant trees" means evergreen trees eight inches DBH, and deciduous trees twelve inches DBH. Does not include hazard trees or invasive species.

"Signs." For related definitions see Chapter 18.15 Signs.

"Single-family attached dwelling" means a single household dwelling attached to another single household dwelling by a common vertical wall, and each dwelling is owned individually and located on a separate lot. See also "townhouses".

"Smoke shop/head shop" means any premises where the primary use (fifty percent or more of the net floor area of a business) is dedicated to the display, sale, distributions, delivery, offerings, furnishing, or marketing of tobacco, tobacco products or tobacco paraphernalia.

"Sober living homes" means a home-like environment that promotes healthy recovery from a substance use disorder and supports persons recovering from a substance use disorder through the use of peer recovery support. Sober living homes are limited to no more than eight unrelated individuals.

"Social gathering hall" means a building used primarily by community groups and organizations for meetings, celebrations, bingo and other events.

"Specialty goods production" means small-scale businesses that manufacture artisan goods or specialty foods. Small manufacturing production aims at direct sales rather than the wholesale market. This use may include public viewing, tasting area for consumption on site, restaurant or café, and other customer service space. This use category includes the following: Microbreweries (a.k.a. Brew pub), microdistilleries, and wineries; fruit and vegetable preserving and specialty foods; and artisan leather, glass, cutlery, hand tools, wood, paper, ceramic, textile and yarn products.

"Stacked flat" means dwelling units in a residential building of no more than three stories on a residential zoned lot in which each floor may be separately rented or owned.

"Start of construction" means and includes substantial improvement, and means the date the building permit was issued, provided that the actual start of construction, repair, reconstruction, placement, or other improvement was within one hundred eighty days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the state of excavation; of the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as

clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers or foundation, or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

"Steep slopes" or "area with potential unstable soils" means any land potentially subject to landslides, severe erosion, or seismic activity (earthquake faults). Steep slopes are generally characterized by slopes of fifteen percent or greater, impermeable subsurface material (sometimes interbedded with permeable subsurface material), and/or springs or seeping groundwater during the wet season. Seismic areas are those lying along or adjacent to identified earthquakes faults.

"Stock broker, brokerage firm" means a qualified and regulated professional or company that oversees financial assets, buys and sells (trades) shares or stocks, and other securities through market makers on behalf of investors.

"Story" means the space between two successive floors in a building. The top floor shall be the space between the floor surface and the underside of the roof framing. A basement shall be counted as a story if over fifty percent of its ceiling is over six feet above the average finished grade of the adjoining ground surface.

"Story, first," or "first story," means the lowest story in a building which qualifies as a story, as defined in this chapter, except that a floor level in a building having only one floor level shall be classified as a first story, provided such floor level is not more than eight feet below grade, as defined in this chapter, at any point.

"Story, half," or "half-story," means a space under a roof which has the line of intersection of roof decking and exterior wall face not more than four feet above the top floor level. A half-story containing one or more dwellings shall be counted as a full story.

"Stream" or "watercourse" means those areas where surface waters produce a defined channel or bed. The channel or bed need not contain water year-round. This definition does not include irrigation ditches, canals, storm or surface water conveyance devices, or other entirely artificial watercourses. Streams are further categorized as Class 1 through 5 in accordance with the classifications used by WAC 222-16-030.

"Street" means the entire width between the boundary of property or lot lines, for the purpose of vehicular and pedestrian traffic. See Table 17.19-1.

1. "Access easement" refers to "private road."
2. "Alley" means a narrow street primarily for vehicular service access to the back or side of properties otherwise abutting on another street.
3. "Arterial" means a street of considerable continuity that is primarily a traffic artery for intercommunication among large areas. There are usually three to five lanes of traffic.
4. "Collector" means a street supplementary to the arterial street system and a means of intercommunication between this system and smaller areas; used to some extent for through traffic and to some extent for access to abutting properties. There are usually two to three lanes of traffic.
5. "Cul-de-sac (dead-end street)" means a short street having one end open to traffic and being terminated by a vehicle turnaround. See Design Standards Manual for required right-of-way, pavement, curb and gutters.
6. "Driveway" see "Private road."
7. "Half street" means a portion of the width of a street usually along the edge of a subdivision where the remaining portion of the street could be provided in another subdivision.

8. "Marginal access street" means those streets whose primary function is the circulation of through traffic and shall include all major and secondary arterials and all collector streets identified in the city comprehensive plan.

9. "Minor street" means a street intended exclusively for access to abutting properties. Also referred to as a neighborhood street. This type of street has only two lanes of traffic.

10. "Private road" means a strip of land that provides access to a lot, tract or parcel. This road is privately maintained but is designed and installed per Table 17.19-1 and with approval of the engineering manager.

"Structural alteration" means any change to the supporting members of a building including foundations, bearing walls or partitions, columns, beams or gliders, or any structural change in the roof.

"Structure" for floodplain management purposes, means a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

"Structure" means that which is built or constructed. An edifice or building of any kind or any piece of work artificially built up or composed of parts joined together in some definite manner.

"Subdivision improvement bond" means a guarantee that improvements to an approved residential development will be completed in accordance with city standards, and code as stated in conditions of approval. The owner is the principle and the city is the obligee. There is no expiration date on this type of bond but it terminates upon acceptance of improvements by the city. The bond is issued in the amount equal to one hundred five percent of the cost of all public improvements and any improvements required as part of the conditions of approval per CMC Section 17.21.050 Bonds and other financial agreements.

"Subdivision" means a division or redivision of land into ten or more lots, tracts, sites or divisions for the purpose of sales, lease or transfer of ownership.

"Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed fifty percent of the market value of the structure before the damage occurred.

"Substantial improvement" for the purposes of CMC 16.57 Frequently Flooded Areas, means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds fifty percent of the market value of the structure either:

1) Before the improvement or repair is started; or

2) If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term can exclude:

1) Any project for improvement of a structure to correct pre-cited existing violations of state or local health, sanitary, or safety code specifications which have been previously identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or

2) Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

"Supported living arrangement" means a living unit owned or rented by one or more persons with functional disabilities who receive assistance with activities of daily living, instrumental activities of daily living, and/or medical care from an individual or agency licensed and/or reimbursed by a public agency to provide such assistance.

"Tavern" means an establishment primarily serving alcoholic beverages for consumption on-site. Secondary activities may include dining, music, bottling, and sale of bottled beverages prepared on-site.

"Telecommunications." See Section 18.35.030 Definitions in Chapter 18.35 Telecommunications Ordinance.

"Tiny house communities" means real property rented or held out for rent to others for the placement of tiny houses with wheels or tiny houses as approved through site plan review (Chapter 18.18).

"Tiny house" and "Tiny house with wheels" mean a dwelling to be used as permanent housing with permanent provisions for living, sleeping, eating, cooking, and sanitation built in accordance with state building code.

"Tobacco paraphernalia" means any paraphernalia, equipment, device, or instrument that is primarily designed or manufactured for the smoking, chewing, absorbing, dissolving, inhaling, snorting, sniffing, or ingesting by any other means into the body of tobacco, tobacco, tobacco products, marijuana, marijuana products, or other controlled substances as defined by the state of Washington. Items or devices classified as tobacco paraphernalia include but are not limited to the following: pipes, punctured metal bowls, bongs, water bongs, electric pipes, e-cigarettes, e-cigarette juice, buzz bombs, vaporizers, hookahs, and devices for holding burning material. Lighters and matches shall be excluded from the definition of tobacco paraphernalia.

"Tobacco product" means any product in leaf, flake, plug, liquid, or any other form, containing nicotine derived from the tobacco plant, or otherwise derived, which is intended to enable human consumption of the tobacco or nicotine in the produce, whether smoked, chewed, absorbed, dissolved, inhaled, snorted, sniffed, or ingested by any other means. For the purposes of this chapter, the term "tobacco product" excludes any product that has been specifically approved by the United States Food and Drug Administration (FDA) for sale as tobacco/smoking cessation product or for other medical purposes, where such product is marketed and sold solely for such an approved purpose.

"Townhouses" means buildings that contain three or more attached single-family dwelling units that extend from foundation to roof and that have a yard or public way on not less than two sides.

"Tract" means an area dedicated to such things as streets, easements and uses out of character with the principal use, but within a unit of area being measured. Tracts may include critical areas, storm ponds, and forestlands, parkland and other open space. Tracts shall not be considered lots for the purpose of determining short plat or subdivision status. Tracts shall not be considered buildable lots of record.

"Transitional housing" means a project that provides housing and supportive services to homeless persons or families for up to two years and that has as its purpose facilitating the movement of homeless persons and families into independent living.

"Tree protection zone" is an arborist-defined area surrounding the trunk intended to protect roots and soil within the critical root zone and beyond, to ensure future tree health and stability. Tree protection zones may be calculated based on multiplying the tree's DBH by a factor of twelve depending on the tree's species and tolerance of root disturbance.

"Triplex" means a residential building with three attached dwelling units.

"Turn-arounds" are any location identified by the city engineering manager as necessary to be improved for emergency and other vehicles to turn around.

"UBC." See "IBC" or "IRC."

"Unit density" means the number of dwelling units (including accessory dwelling units) allowed on a lot, regardless of lot size.

"Unit lot subdivision" means the division of a parent lot into two or more unit lots within a development and approved through the unit lot subdivision process.

"Usable Open Space" means areas planned and improved to provide opportunities for active recreation, passive relaxation, or community interaction, and that are accessible to the public or to residents, employees, or customers in common. Examples include plazas, courtyards, private parks, sport fields and courts, and viewpoints overlooking natural resource areas. Usable Open Space does not include public parks unless the parks were approved as Usable Open Space and conveyed to the City.

"Use" means an activity or a purpose for which land or a structure is designed, arranged or intended, or for which it is occupied or maintained.

“Utility facilities, minor,” or "minor utility facilities," means those facilities which have a local impact on surrounding properties and are necessary to provide essential services such as:

1. Substations (transmission and distribution);
2. Pump stations;
3. Outfalls;
4. Water towers and reservoirs;
5. Public wells;
6. Cable television receiver and transmission facilities, excluding wireless communications facilities as defined in CMC Section 18.35.030 Definitions;
7. Catch basins, retention ponds, etc.;
8. Water treatment facilities.

"Variance" means a grant of relief by a community from the terms of a floodplain management regulation.

"Veterinarian clinic" means a facility established to provide examination, diagnostic, and health maintenance services for medical and services for medical and surgical treatment of companion animals on an outpatient basis. A veterinarian clinic operates during regular business hours and discharges all patients prior to closing time.

"Veterinarian hospital" means a facility established to provide examination, diagnostic and health maintenance services for medical and surgical treatment of companion animals and equipped to provide housing and nursing care for them during illness or convalescence.

"Vision clearance area" means a triangular area on a lot at the intersection of two streets, or a street and an alley, or a street and a railroad, two sides of which are lot lines measured from their corner intersection for a distance specified in the code. The third side of the triangle is a line across the corner of the lot adjoining the ends of the other two sides. Where the lot lines at intersections have rounded corners, the lot lines will be extended in a straight line to a point of intersection. See Section 18.17.030 [Corner lot vision clearance area,] along with Figures 18.17-030-1 and 18.17-030-2.

"Vision clearance hazard," means an object that interferes with vision near intersections of roadways and motor vehicle access points where a clear field of vision is required for traffic safety and to maintain adequate sight distance. See also ["Corner lot vision clearance area"] design provisions at Section 18.17.030.

“Warehouse, bulk retail,” or "bulk retail warehouse," means a building primarily used for the storage and retail sale of large quantities of goods and materials.

“Warehouse, wholesale and distribution,” or "wholesale and distribution warehouse," means a use engaged in storage, wholesale, and distribution of manufactured products, supplies, and equipment, but excluding bulk storage of materials that are inflammable or explosive or that create hazardous or commonly recognized offensive conditions.

"Warranty bond" means and is referred to as a function and maintenance bond, it is generally used to insure the satisfactory operation to public improvements within an approved development. The developer is the principal

and the city is the obligee. The warranty bond has a beginning and ending date in amount specified per CMC Section 17.21.040(B)(1). At the end of the warranty period, the city will assume responsibility for the maintenance and repair of the public improvement.

"Water dependent" means a use or portion of a use that cannot exist in a location which is not adjacent to the water, and which is dependent on the water by reason of the intrinsic nature of it operations. Examples include, but are not limited to: aquaculture, marinas, or float plane facilities.

"Wetland bond" insures the satisfactory installation, maintenance, and monitoring of wetland creation or enhancement as may be required as part of the SEPA or wetland mitigation plans. The bond has a beginning and ending date, and shall be in the amount as specified in CMC Section 17.21.050(B)(3).

"Wetland buffer" means a naturally vegetated and undisturbed, enhanced or revegetated area surrounding wetland that is part of a wetland ecosystem and protect a wetland from adverse impacts to its function, integrity, and value. Wetland buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; and protect wetland resources from human activities.

"Wetlands" means areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities. However, wetlands include those artificial wetlands intentionally created to mitigate conversions of wetlands.

"Wildlife habitat" means areas that provide food, protective cover, nesting, breeding, or movement for threatened, endangered, sensitive, monitor, or priority species of wildlife, or other wildlife species of special concern. "Wildlife habitat" shall also mean areas that are the location of threatened, endangered, sensitive, monitor, or priority species of plants, or other plant species of special concern.

"Wireless." See Chapter 18.35 Telecommunication Ordinance.

"Yard" means an open space, other than a court or accessory structure, unobstructed from the ground to the sky, except where specifically provided by this code, on the lot on which a building is situated. See Figure 18.03-8.

"Yard, front," or "front yard," means an open space between the side lot lines and measured horizontally, from the front lot line at right angles to the front lot line, to the nearest point of the building. See Figures 18.03-8 and 18.03-6.

"Yard, rear," or "rear yard," means an open space between side lot lines and measured horizontally, at right angles from the rear lot line, to the nearest point of the main building. See Figures 18.03-8 and 18.03-6.

"Yard, sde," or "side yard," means an open space between a building and the side lot line measured horizontally, at right angles from the side lot line, to the nearest point of the main building. See Figure 18.03-8.

EXHIBIT C

Chapter 18.05 ZONING MAP AND DISTRICTS

18.05.010 Zoning maps administration.

A. This title shall consist of the text titled the "City of Camas Zoning Code," and that certain map or books of maps identified by the approving signatures of the mayor and the city clerk, and marked and designated as "The Zoning Map of the City of Camas," which map or book of maps shall be placed on file in the offices of the city clerk, county auditor, and other city departments. This title, and each and all of its terms and map details, is to be interpreted in light of the context of the book of maps in relationship to the comprehensive plan. In any conflict between the maps and the text of this code the text shall prevail.

B. Zoning Text and Map Amendments. Amendments may be proposed by city council or by the planning commission on its own motion, or such an amendment may be proposed by an applicant or city staff pursuant to CMC Chapter 18.51 Comprehensive Plan and Zoning Amendments.

C. Administration and Procedures. A correct copy of each amendment to the text or to the map established by this title shall be maintained on file in the offices of the city clerk and the planning official.

D. Site Specific Rezones. A site specific rezone involves an application of an owner of a specific parcel or set of contiguous parcels that does not require modification of the comprehensive plan. Site specific rezones are decided by the hearing officer after a public hearing. The criteria for reviewing and approving a site specific rezone are as follows:

1. The use or change in zoning requested shall be in conformity with the adopted comprehensive plan, the provisions of this title, and the public interest.

2. The proposed zone change shall be compatible with the existing established development pattern of the surrounding area in terms of lot sizes, densities and uses.

E. Timing and Responsibility for Updating Official Zoning Map. All amendments hereafter made to the zoning map by ordinance shall be shown on such map(s), and it shall be the responsibility of the planning official to keep the maps up to date at all times. Any amendments to the zoning map shall be made in accordance with the comprehensive plan map, as amended.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 17-013, § I(Exh. A), 10-2-2017)

18.05.020 Districts designated.

For the purposes of the Code, the city is divided into zoning districts designated as follows:

District	Symbol	Comprehensive Plan Designation
Residential-6	R-6	Residential - Low
Residential-7.5	R-7.5	Residential - Low
Residential-10	R-10	Residential - Low
Residential-12	R-12	Residential - Low

Residential-15	R-15	Residential - Low
Multifamily 10	MF-10	Residential - Medium
Multifamily 18	MF-18	Residential - High
Multifamily 24	MF-24	Residential - High
Mixed Use	MX	Mixed Use
Neighborhood Commercial	NC	Commercial
Community Commercial	CC	Commercial
Regional Commercial	RC	Commercial
Mixed Employment	ME	Mixed Employment
Heavy Industrial	HI	Industrial
Parks and Open Space	POS	Parks and Open Space
Cottage Overlay	COT	Residential - High
North Shore Lower Density Residential	LD-NS	Residential - Low
North Shore Higher Density Residential	HD-NS	Residential - High
North Shore Mixed Use	MX-NS	Mixed Use
North Shore Commercial	C-NS	Commercial
North Shore Mixed Employment	ME-NS	Mixed Employment
Downtown Residential	DT-R	Residential - Low
Downtown Mixed Use - Low Rise	DT-MXL	Mixed Use
Downtown Mixed Use - Mid Rise	DT-MXM	Mixed Use
Downtown Historic Main Street Core	DT-HMSC	Mixed Use

~~District~~	~~Symbol~~	~~Comprehensive Plan Designation~~
~~Residential 15,000~~	~~R-15~~	~~Single-family Low~~
~~North Shore Lower Density Residential~~	~~LD-NS~~	~~NS Single-Family Low~~
~~Residential 12,000~~	~~R-12~~	~~Single-family Medium~~
~~Residential 10,000~~	~~R-10~~	~~Single-family Medium~~
~~Residential 7,500~~	~~R-7.5~~	~~Single-family Medium~~
~~Residential 6,000~~	~~R-6~~	~~Single-family High~~
~~Multifamily-10~~	~~MF-10~~	~~Multifamily Low~~
~~Multifamily-18~~	~~MF-18~~	~~Multifamily High~~
~~North Shore Higher Density Residential~~	~~HD-NS~~	~~NS-Multifamily High~~
~~Multifamily Cottage~~	~~MF-C~~	~~Overlay~~
~~Neighborhood Commercial~~	~~NC~~	~~Commercial~~
~~Community Commercial~~	~~CC~~	~~Commercial~~
~~Regional Commercial~~	~~RC~~	~~Commercial~~
~~North Shore Commercial~~	~~C-NS~~	~~NS-Commercial~~
~~Mixed Use~~	~~MX~~	~~Commercial~~
~~North Shore Mixed Use~~	~~MX-NS~~	~~NS-Commercial~~
~~Downtown Commercial~~	~~DC~~	~~Commercial~~

~~North Shore Mixed Employment~~	~~ME-NS~~	~~NS-Industrial~~
~~Light Industrial~~	~~LI~~	~~Industrial~~
~~Heavy Industrial~~	~~HI~~	~~Industrial~~
~~Business Park~~	~~BP~~	~~Industrial~~
~~Light Industrial/Business Park~~	~~LI/BP~~	~~Industrial~~
~~Neighborhood Park~~	~~NP~~	~~Park~~
~~Special Use Park~~	~~SU~~	~~Park~~
~~Open space/Green space~~	~~OS~~	~~Open space I Green space~~
~~North Shore Parks/Open Space~~	~~P/O-NS~~	~~NS-Parks/Open Space~~

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2547, § II(Exh. B), 5-18-2009; Ord. No. 2667, § I, 12-17-2012; Ord. No. 2672, § I(Exh. A), 1-22-2013; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 2694, § I, 2-3-2014; Ord. No. 17-013, § I(Exh. A), 10-2-2017; Ord. No. 23-010, Exh. A, 8-7-2023)

18.05.030 Boundary determination.

Unless otherwise specified or shown on the zoning map, district boundaries are lot lines or the centerlines of streets, alleys, railroad, and other rights-of-way:

A. Where boundaries are other than lot lines or centerlines of streets, alleys, railroad, and other rights-of-way, they shall be determined by dimensions shown on the zoning map;

B. Where actual streets or other features on the ground vary from those shown on the zoning map, interpretations or adjustments shall be made by the planning commission;

C. Where a district boundary line, as shown on the zoning map, divides a lot in single ownership at the time of passage of the code, the property owner may elect to apply the zoning district classification that has been applied to greater than fifty percent of such lot to the entire lot or to utilize the zoning district classifications as they apply to each portion of the lot, consistent with the zoning map.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 25-025, § I (Exh. A), 12-15-2025)

18.05.040 Residential ~~and multifamily~~ zones.

A. R-15 Residential-15~~,000~~. This zone is intended for single-family and middle housing dwellings with a minimum density of two to three ~~dwellings~~lots per acre. This zone will permit the rural character of a number of existing neighborhoods to be maintained. The average lot size is fifteen thousand square feet.

B. R-12 Residential-12~~,000~~. This zone is intended for single-family and middle housing dwellings with densities of three to four dwelling ~~units~~lots per acre. This zone is designated for areas with steep topography for greater flexibility in site layout, and where potential hazards do not exist. The average lot size is twelve thousand square feet.

C. R-10 Residential-10~~,000~~. This zone is intended for single-family and middle housing dwellings with densities of four to five ~~dwellings~~lots per acre. This zone is intended to be zoned near low density residential districts, and where potential natural hazards do not exist. The average lot size is ten thousand square feet.

D. R-7.5 Residential-75~~7,500~~. This zone is intended for single-family and middle housing dwellings with densities of five to six ~~dwellings~~lots per acre. This zone should have less slope than lower density zones, and be adjacent to existing high density residential districts. The average lot size is seven thousand five hundred square feet.

E. R-6 Residential-6~~,000~~. This zone is intended for for single-family and middle housing dwellings with densities of six to seven ~~dwellings~~lots per acre. The slope of property is less than other lower density residential zones. This zone serves a transition to multifamily or commercial zones. The average lot size is six thousand square feet.

F. LD-NS North Shore Lower Density Residential. This zone is intended for residential dwellings in the North Shore subarea with a minimum density of four dwellings per acre and a maximum density of five and eight tenths dwellings per acre. This zone will reflect the rural character of a number of existing residences and can support transitions from existing uses to more dense zones.

G. MF-10 Multifamily Residential. This zone provides for a diversity of dwellings such as duplexes, triplexes, fourplexes, rowhouses, and apartment complexes, with a density of up to ten units per acre. It is desirable for this zone to be adjacent to parks and multi-modal transportation systems. This zone can also serve as a transition between commercial and residential zones.

H. MF-18 Multifamily Residential. These zones are intended to provide for dwellings such as rowhouses and apartment complexes. It is desirable for these zones to be adjacent to parks and multi-modal transportation systems. These zones also serve as a transition between commercial and residential zones.

I. MF-24 Multifamily Residential. These zones are intended to provide for dwellings such as rowhouses and apartment complexes. It is desirable for these zones to be adjacent to parks and multi-modal transportation systems. These zones also serve as a transition between commercial and residential zones.

~~I~~J. HD-NS North Shore Higher Density Residential. This zone is intended for residential dwellings in the North Shore subarea with a minimum density of ten dwellings per acre and a maximum density of eighteen dwelling units per acre. This zone provides for a diversity of dwellings and serves as a transition between commercial areas and residential uses.

~~J. MF-C Cottage. This is an overlay zone, which is intended to increase the housing supply and style choices for smaller, single-level dwellings. It is desirable that cottages are designed to include unique architectural elements such as a front porch, steep-pitch gable roof, and a recessed garage; and to accommodate those with mobility impairments. This overlay zone may be utilized within multi-family zones only, and upon approval of a zoning district change. This overlay zone is not required for cottage dwellings in the North Shore District. See 18.07.030 and 18.07.040 for allowed uses in the North Shore.~~

K. DT-R Downtown Residential. A primarily residential area defined by smaller-scale housing types—such as cottages, duplexes, triplexes, fourplexes, and accessory dwelling units—often on existing single-family lots. The district maintains a lower-density character while allowing incremental infill that respects existing neighborhood patterns and historic scale.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2691, § I(Exh. A), 1-21-2014;Ord. No. 2694, § II, 2-3-2014; Ord. No. 17-013, § I(Exh. A), 10-2-2017; Ord. No. 23-010, Exh. A, 8-7-2023)

18.05.050 Commercial, mixed use, and industrial zones.

The purpose of the commercial, mixed use and industrial, ~~and high technology~~ zones are to provide services and employment primarily to residents. These areas are zoned according to the services they provide. As a result, each zone has different characteristics as summarized below:

A. NC Neighborhood Commercial. This zone provides for the day-to-day needs of the immediate neighborhood. This zone is intended to be small, but fairly numerous throughout the city. Typical uses include, but are not limited to ~~C~~convenience goods (e.g., food, drugs and sundries), along with personal services (e.g., dry cleaning, barbershop or beauty shop), are common goods and services offered.

B. CC Community Commercial. This zone provides for the goods and services of longer-term consumption, and tend to be higher-priced items than the neighborhood commercial zone district. Typical goods include clothing, hardware and appliance sales. Some professional services are offered, e.g., real estate office or bank. Eating and drinking establishments may also be provided. This zone tends to vary in size, but is larger than the neighborhood commercial zone.

C. RC Regional Commercial. This zone provides apparel, home furnishings, and general merchandise in depth and variety, as well as providing services for food clusters and some recreational activities. Regional commercial is the largest of the commercial zones and is designed to serve the region or a significant portion of the region's population.

~~D. DC Downtown Commercial. This zone is designated as a large community commercial area, providing a large range of goods and services. This area is designed to promote commercial diversification to serve the immediate residential and office uses in the surrounding areas. Compact development is encouraged that is supportive of transit and pedestrian travel, through higher building heights and floor area ratios than those found in other commercial districts.~~

D. DT-HMSC Historic Main Street Core. The most compact and walkable district, featuring continuous street facing buildings with minimal setbacks and active ground floors. Uses include retail, dining, civic, and upper-story office or residential. Architecture emphasizes preservation, human scale, and a fine-grain frontage pattern typically up to four (4) stories tall.

E. DT-MXM Downtown Mixed-Use: Mid Rise. A vibrant, higher-density urban zone with buildings ranging up to six (6) stories. Supports a mix of residential, commercial, and civic uses with structured parking and active ground-floor frontages. Streets are multimodal, with wide sidewalks, trees, and transit access.

F. DT-MXL Downtown Mixed-Use: Low Rise. A transitional zone with up to four (4) story buildings and a mix of neighborhood-serving retail, offices, and housing, including a range of missing middle housing. Slightly deeper setbacks and increased landscaping support a softer urban edge while maintaining pedestrian orientation and urban form.

G. ME Mixed Employment. This zone is designated to recognize and accommodate certain areas that may have typically developed with light industrial or business park uses but are transitioning from an exclusively industrial orientation to a broad mix of light industrial, artisan/craft industrial, commercial, office, and personal service uses, within a more amenity rich environment. Retail uses are generally seen as secondary uses. The ME districts encourage innovation and a business environment that flourishes through adaptation and resiliency.

~~E~~H. C-NS North Shore Commercial. This zone is designated as a commercial area in the North Shore subarea, meaning a range of goods and services are available.

~~F~~I. ME-NS North Shore Mixed Employment. This zone allows a wide variety of employment uses in the North Shore subarea, including retail, office space, warehouse, manufacturing, and other employment uses.

~~G. LI Light Industrial. This zone provides for uses that are more compatible with commercial, residential, or multifamily uses. Typical uses in this zone include assembly and manufacturing of electronic and precision instruments. More intensive industry, e.g., metal fabrication, is excluded.~~

~~H. BP Business Park. This zone provides for employment growth in the city by protecting industrial areas for future employment. Design of business park facilities in this district will be campus-style, with landscaped buffers, and architectural features compatible with surrounding areas.~~

~~I. LI/BP Light Industrial/Business Park. This zone provides for uses such as, offices related to industrial usage, research and development, limited commercial, and associated warehousing uses, including the provision of employee recreation opportunities. Development in campus-like setting with generous landscaping, well-designed buildings and near major traffic corridors is anticipated.~~

J. HI Heavy Industrial. This zone provides for a wide range of industrial and manufacturing uses. Types of activities in this zone include assembly, manufacturing, fabrication, processing, bulk handling and storage, research facilities, associated warehousing, and heavy trucking. West of Lacamas Creek/Washougal River, residential uses may be allowed as a conditional use as part of a mixed-use development.

K. MX Mixed Use. This zone provides for a wide range of commercial and residential uses. Compact development is encouraged that is supportive of transit and pedestrian travel.

L. MX-NS North Shore Mixed Use. This zone provides for a wide range of commercial and residential uses in the North Shore subarea. Compact development that supports transit and pedestrian travel is encouraged. Mixed-use areas should create spaces for community gathering, waiting, discussion, and outdoor commercial activities. Horizontal and vertical mixed-use developments are allowed. Mixed-use development should include multiple entries and windows on the ground floor to facilitate business access, create visual interest, and promote safety. For the residential uses, this zone allows a maximum density of twenty-four dwellings per acre and minimum density of ten dwelling units per acre. Each horizontal mixed-use development should have no more than seventy percent of the total acreage of the development dedicated to residential uses. Each vertical mixed-use development shall, at a minimum, dedicate the ground floor to commercial uses (up to fifty percent of the ground floor may be used for indoor parking). Residential multifamily is allowed only on the second floor or above or in the back of commercial buildings as a live-work unit (only twenty-five percent of the required thirty percent can be live-work units).

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006; Ord. No. 23-010, Exh. A, 8-7-2023)

(Ord. No. 2547, § III(Exh. C), 5-18-2009; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 19-001, § I(Att. A), 1-22-2019; Ord. No. 23-010, Exh. A, 8-7-2023)

18.05.060 Overlay zones/special planning areas.

Overlay zones implement the goals and values expressed in the comprehensive plan. Uses within this area may be subject to standards which deviate from those in the primary zone.

A. COT Cottage Overlay. This is an overlay zone, which is intended to increase the housing supply and style choices for smaller, single-level dwellings. It is desirable that cottages are designed to include unique architectural elements such as a front porch, steep-pitch gable roof, and a recessed garage; and to accommodate those with mobility impairments. This overlay zone may be utilized within multi-family zones only, and upon approval of a zoning district change. This overlay zone is not required for cottage dwellings in the North Shore District. See 18.07.030 and 18.07.040 for allowed uses in the North Shore.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 17-013, § I(Exh. A), 10-2-2017)

18.05.070 Park and open space zoning.

~~The park zoning districts provide recreation and open space functions for the long-term benefit and enjoyment of city residents, adjacent neighborhoods and visitors. These districts apply only to land held in public trust.~~ The park and open spaces zone supports the preservation, development, and use of public and private parks, open spaces, and natural areas that contribute to community health, environmental protection, recreation, and quality of life.

(Ord. No. 2667, § II, 12-17-2012; Ord. No. 2691, § I(Exh. A), 1-21-2014)

EXHIBIT D

Chapter 18.07 USE AUTHORIZATION

18.07.010 Establishment of uses.

The use of a property is defined by the activity for which the building or lot is intended, designed, arranged, occupied or maintained. The use is considered permanently established when that use will, or has been, in continuous operation for a period exceeding sixty days. A use which will operate for less than one hundred eighty days is considered a temporary use, and shall be governed by Chapter 18.47 "Temporary Use Permits." All applicable requirements of this code, or other applicable state or federal requirements, shall govern a use located in the city.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.07.020 Interpretation of land use tables.

The land use tables in this chapter determine whether a specific use is allowed in a zone district. The zone district is located on the vertical column and the specific use is located on the horizontal rows of these tables.

A. If the letter "X" appears in the box at the intersection of the column and the row, the use is not allowed in that district, except for certain temporary uses.

B. If the letter "P" appears in the box at the intersection of the column and the row, the use is allowed in that district subject to review procedures in accordance with CMC Chapter 18.55 "Administration and Procedures."

C. If the letter "C" appears in the box at the intersection of the column and the row, the use is allowed subject to the conditional use review procedures specified in Chapter 18.43 "Conditional Use Permits," and the general requirements of the Camas Municipal Code.

D. If the letter "T" appears in the box at the intersection of the row, the use is temporarily permitted under the procedures of Chapter 18.47 "Temporary Use Permits." Other temporary uses not listed may be authorized as provided in Chapter 18.47.

E. If a number appears in a box at the intersection of the column and the row, the use is subject to the requirements specified in the note corresponding with the number immediately following the table.

F. Uses accessory to a use permitted or conditionally permitted in any zone may be authorized subject only to those criteria and/or processes deemed applicable by the head of the planning department.

G. If a use is not listed under either Section 18.07.030 Table 1 or 18.07.040 Table 2, and is not an accessory or temporary use, then the use shall be subject to a zoning code text amendment. Notwithstanding a zoning code text amendment, the community development director may determine whether a proposed land use not specifically listed in a land use table is allowed in a zone. The director shall take into consideration the following when making a determination:

   1. Whether or not the proposed use in a particular zone is similar impact to other permitted or conditional uses or is compatible with other uses; and

   2. Whether or not the proposed use is consistent with the zone's purpose.

   A use listed in one table but not the other shall be considered a prohibited use in the latter.

H. For the Downtown Zoning Districts in CMC Chapter 18.07.060, use authorization appearing as "G / U" refers to "G = ground floor / U = upper floor" uses specifically.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 17-013, § I(Exh. A), 10-2-2017)

18.07.030 Table 1—Commercial and industrial land uses.

KEY: P = Permitted Use
C = Conditional Use
X = Prohibited Use
T = Temporary Use

Zoning Districts	NC	~~DC~~	CC	RC	MX	ME	~~BP~~	~~LI/ BP~~	~~LI~~	HI	C-NS	MX-NS	ME-NS
Commercial Uses													
Animal kennel, commercial boarding[6]	X	~~X~~	X	P~~11~~ 5	X	P~~11~~ 5	~~P~~11	~~X~~	~~P~~11	P~~11~~ 5	X	X	P~~11~~ 5
Animal shelter[6]	X	~~X~~	X	C	X	C	~~C~~	~~X~~	~~C~~	P	X	X	C
Antique shop[6]	P	~~P~~	P	P	P	P	~~C~~	~~X~~	~~X~~	P	P	P	P
Appliance sales and service[6]	X	~~P~~	P	P	P	P	~~P~~	~~X~~	~~C~~	P	P	P	P
Automobile repair (garage)[6]	X	~~P~~	C	P	X	P	~~P~~	~~X~~	~~P~~	P	C	X/P[7]	P
Automobile sales, new or used[6]	X	~~P~~	X	P	X	P	~~P~~	~~X~~	~~P~~	P	X	X	P
Automobile service station[6]	X	~~P~~	C	P	X	P	~~P~~	~~X~~	~~P~~	P	C	X	P
Automobile wrecking[6]	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	C	X	X	X
Bakery (wholesale)[6]	X	~~X~~	X	P	X	P	~~P~~	~~P~~[5]	~~P~~	P	C	C	P
Bakery (retail)[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Banks, savings and loan	X	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Barber and beauty shops[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Boat building[6]	X	~~X~~	X	C	X	C	~~C~~	~~X~~	~~C~~	P	X	X	C
Boat repair and sales[6]	X	~~P~~	X	P	X	P	~~P~~	~~X~~	~~P~~	P	X	X	P
Book store[6]	C	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Bowling alley/billiards[6]	X	~~P~~	X	P	P	P	~~P~~	~~X~~	~~P~~	P	X	P	P
Building, hardware and garden supply store[6]	X	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	P	C	P	P
Bus station[6]	X	~~C~~	C	P	C	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Cabinet and carpentry shop[6]	X	~~P~~	C	P	C	P	~~P~~	~~P~~[5]	~~P~~	P	C	C	P
Candy; confectionery store[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Cemetery[6]	X	~~X~~	X	C	X	C	~~X~~	~~X~~	~~C~~	P	X	X	C
Clothing store[6]	C	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P

Coffee shop, cafe[6] or kiosk	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Convention center[6]	X	~~P~~	X	C	C	C	~~P~~	~~P~~	~~C~~	X	X	C	C
Data center	X	X	X	X	X	X	X	X	X	X	X	X	X
Day care center[6]	~~C~~P	~~P~~	P	~~C~~P	P	~~C~~P	~~C~~	~~P~~[5]	~~C~~	C	P	P	~~C~~P
Day care, adult	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Day care, family home[6]	P	~~P~~	P	P	P	P	~~X~~	~~P~~[5]	~~P~~	~~X~~C	P	P	P
Day care, mini-center[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	~~X~~C	P	P	P
Delicatessen (deli)[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Department store[6]	X	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	X	C	C	P
Electric vehicle battery charging station and rapid charging stations	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Equipment rental[6]	C	~~P~~	C	C	C	C	~~P~~	~~P~~[5]	~~P~~	P	C	P	C
Event center	X	~~P~~	C	P	C	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Feed store[6]	X	~~X~~	X	P	X	P	~~C~~	~~X~~	~~P~~	P	X	X	P
Fitness center/sports club[6]	X	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Florist shop[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	X	P	P	P
Food cart/food truck/food delivery business[6]	C	~~P~~	C	P	C	P	~~P~~	~~C~~	~~P~~	X	C	C	P
Furniture repair; upholstery[6]	X	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	P	C	P	P
Furniture store[6]	X	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	X	C	P	P
Funeral home[6]	X	~~P~~	C	P	P	P	~~X~~	~~X~~	~~X~~	X	C	C	P
Gas/fuel station[6]	X	~~P~~	C	P	X	P	~~P~~	~~X~~	~~P~~	P	C	X	P
Gas/fuel station with mini market[6]	X	~~P~~	C	P	X	P	~~P~~	~~X~~	~~P~~	P	C	X	P
Gas/fuel station with large scale grocery	X		C	P	P	P				P	C	C	P
Grocery, large scale[6]	X	~~P~~	C	P	P	P	~~C~~[8]	~~X~~	~~P~~	P	C	C	P
Grocery, small scale[6]	P	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Grocery, neighborhood scale[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	X	P	P	P
Hospital, emergency care[6]	X	~~C~~	P	P	P	P	~~P~~	~~X~~	~~P~~	X	C	C	P
Hotel, motel[6]	X	~~C~~	C	P	P	C	~~P~~	~~X~~	~~P~~	X	C	C	C
Household appliance repair[6]	X	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	P	C	P	P
Industrial supplies store[6]	X	~~P~~	X	C	C	C	~~C~~	~~X~~	~~C~~	P	X	C	C
Laundry/dry cleaning (industrial)	X	~~X~~	X	P	X	P	~~X~~	~~X~~	~~P~~	P	X	X	P
Laundry/dry cleaning (retail)[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Laundry (self-serve)	P	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P

Liquor store[6]	X	~~P~~	C	P	C	P	~~C~~	~~X~~	~~C~~	C	P	P	P
Machine shop[6]	X	~~X~~	C	C	C	P	~~C~~	~~P~~[5]	~~C~~	P	C	C	C
Marijuana processor	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	X	X	X	X
Marijuana producer	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	X	X	X	X
Marijuana retailer	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	X	X	X	X
Medical or dental clinics (outpatient)[6]	C	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Mini-storage/vehicular storage[6]	X	~~X~~	X	X	X	C	~~X~~	~~X~~	~~P~~	P	X	X	X
Manufactured home sales lot[6]	X	~~X~~	X	P	X	P	~~X~~	~~X~~	~~P~~	P	X	X	P
Newspaper printing plant[6]	X	~~P~~	C	C	X	C	~~X~~	~~X~~	~~P~~	P	C	X	C
Nursery, plant[6]	X	~~P~~	C	C	C	P	~~C~~	~~X~~	~~C~~	P	C	C	P
Nursing, rest, convalescent, retirement home[6]	C	~~P~~	P	P	P	P	~~X~~	~~X~~	~~X~~	X	P	P	P
Office supply store[6]	X	~~P~~	P	P	P	P	~~X~~	~~P~~[5]	~~P~~	P	P	P	P
Pawnshop[6]	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~C~~	C	X	X	X
Parcel freight depots[6]	X	~~P~~	X	P	X	P	~~P~~	~~P~~[5]	~~P~~	P	X	X	P
Permanent supportive housing	C	~~P~~	X /~~P~~[10] [4]	X /~~P~~[10] [4]	P	X /~~P~~[10] [4]	~~X~~	~~X~~	~~X~~	X	X /~~P~~[10] [4]	P	X /~~P~~[10] [4]
Pet shops[6]	X	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	C	P	P	P
Pharmacy[6]	X	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Photographic/electronics store[6]	X	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Plumbing, or mechanical service[6]	X	~~X~~	X	P	C	P	~~P~~	~~X~~	~~P~~	P	X	C	P
Printing, binding, blue printing[6]	C	~~P~~	P	P	P	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Professional office(s)[6]	C	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Public agency[6]	C	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Real estate office[6]	C	~~P~~	P	P	P	P	~~P~~	~~T~~	~~P~~	P	P	P	P
Recycling center[6]	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~P~~	P	X	X	X
Recycling collection point[6]	T or C	~~P~~	T or C	T or C	C	X	~~C~~	~~P~~[5]	~~P~~	P	T or C	C	X
Recycling plant[6]	X	~~X~~	X	X	X	C	~~X~~	~~X~~	~~C~~	P	X	X	C
Research facility[6]	X	~~P~~	C	C	X	P	~~P~~	~~P~~	~~P~~	P	C	C	C
Restaurant[6]	C	~~P~~	P	P	C	P	~~P~~	~~P~~[5]	~~P~~	P	P	P	P
Restaurant, fast food[6]	X	~~P~~	C	P	C	P	~~P~~	~~P~~[5]	~~P~~	P	C	C	P
Roadside produce stand[6]	T	~~T~~	T	T	C	T	~~X~~	~~T~~	~~T~~	T	T	C	T
Sand, soil, gravel sales and storage[6]	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~C~~	P	X	X	X
Second-hand/consignment store[6]	C	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P

Sexually oriented business[1,5]	X	~~X~~	X	X	X	X	~~X~~	~~P~~	~~X~~	X	X	X	X
Shoe repair and sales[6]	P	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Smoke shop/head shop[9] [3]	X	~~X~~	P	P	X	C	~~X~~	~~X~~	~~X~~	X	P	X	P
Stock broker, brokerage firm	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Specialty goods production (e.g. brew pub)	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Taverns[6]	X	~~P~~	C	P	C	P	~~P~~	~~X~~	~~P~~	P	C	C	P
Theater, except drive-in[6]	X	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Truck terminals[6]	X	~~C~~	X	C	X	C	~~X~~	~~X~~	~~C~~	P	X	X	C
Veterinary clinic[6]	X	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Warehousing, wholesale and trade[6]	X	~~X~~	X	C	C	P	~~P~~	~~P~~[5]	~~P~~	P	X	X	P
Warehousing, bulk retail[6]	X	~~X~~	X	C	C	P	~~X~~	~~X~~	~~P~~	P	X	X	P
Manufacturing and/or processing of the following:													
Cotton, wool, other fibrous material	X	~~X~~	X	X	X	X	~~P~~	~~X~~	~~P~~	P	X	X	X
Food production or treatment	X	~~X~~	X	C	C	C	~~P~~	~~X~~	~~P~~	C	X	C	C
Foundry	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~C~~	C	X	X	X
Furniture manufacturing	X	~~P~~	X	X	C	P	~~C~~	~~X~~	~~P~~	P	X	C	X
Gas, all kinds (natural, liquefied)	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	C	X	X	X
Gravel pits/rock quarries	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~C~~	P	X	X	X
Hazardous waste treatment—Off-site	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	P	X	X	X
Hazardous waste treatment—On-site	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	P	X	X	X
Junkyard/wrecking yard	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	C	X	X	X
Metal fabrication and assembly	X	~~X~~	X	X	X	C	~~C~~	~~X~~	~~X~~	P	X	X	C
Hazardous waste treatment—On-site	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	P	X	X	X
Paper, pulp or related products	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	P	X	X	X
Signs or other advertising structures	X	~~X~~	X	C	C	P	~~C~~	~~P~~	~~C~~	P	X	C	C
Electronic equipment	X	~~P~~	X	X	X	X	~~X~~	~~P~~	~~P~~	P	X	X	X
Industrial Uses													
High-tech industry	X	~~P~~	X	X	P	P	~~P~~	~~P~~[2]	~~X~~	X	X	P	P
Manufacturing of miscellaneous goods (e.g. musical	X	~~X~~	X	X	C	P	~~X~~	~~X~~	~~P~~	P	X	C	P

instruments, toys, vehicle parts)													
Optical goods	X	~~C~~	C	C	C	P	~~P~~	~~P~~[5]	~~P~~	P	C	C	C
Packaging of prepared materials	X	~~X~~	C	P	C	P	~~C~~	~~P~~[5]	~~C~~	P	C	C	P
Scientific and precision instruments	X	~~P~~	X	X	X	P	~~P~~	~~P~~	~~P~~	P	X	X	P
Recreational, Religious, Cultural Uses													
Auditorium[6]	C	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Community club[6]	C	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Church[6]	P	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Golf course/driving range[6]	P	~~X~~	P	P	X	P	~~P~~	~~P~~[5]	~~P~~	P	X	X	P
Library[6]	C	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Museum[6]	C	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Recreational vehicle park[6]	X	~~X~~	X	C	X	C	~~X~~	~~X~~	~~P~~	P	X	X	C
Open space[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Park or playground	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Sports fields[6]	C	~~X~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Trails	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Educational Uses													
College/university[6]	P	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Elementary school[6]	P	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Junior or senior high school[6]	P	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Private, public or parochial school[6]	P	~~P~~	P	P	P	P	~~P~~	~~X~~	~~P~~	P	P	P	P
Trade, technical or business college[6]	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Residential Uses													
Adult family home	C	~~P~~	P	X	P	X	~~X~~	~~X~~	~~X~~	X/C[8]	P	P	X
Assisted living	C	~~P~~	P	X /P[~~10~~ 4]	P	X /P[~~10~~ 4]	~~X~~	~~X~~	~~X~~	X/C[8]	P	P	X /P[~~10~~ 4]
Bed and breakfast	P	~~P~~	P	X	P	X	~~X~~	~~X~~	~~X~~	X	P	P	X
Designated manufactured home	X	~~X~~	X	X	P	X	~~X~~	~~X~~	~~X~~	X	X	X	X
Duplex or two-family dwelling	X	~~C/P~~[7]	X	X	P	X	~~X~~	~~X~~	~~X~~	X/C[8]	X	P	X
Emergency housing and shelters	X		X	P	P	X				X	X	X	X
Group home	C	~~P~~	P	X	P	X	~~X~~	~~X~~	~~X~~	X/C[8]	P	P	X
Home occupation	P	~~P~~	P	X /P[~~10~~ 4]	P	X /P[~~10~~ 4]	~~X~~	~~X~~	~~X~~	X/C[8]	P	P	X /P[~~10~~ 4]

Housing for the disabled	P	~~P~~	P	X /P~~10~~ 4	P	X /P~~10~~ 4	~~X~~	~~X~~	~~X~~	X/C 8	P	P	X /P~~10~~ 4
Apartment, multifamily development, row houses	X	~~C/P 7~~	X /P~~10~~ 4	X/P~~1 0~~ 4	C	X	~~X~~	~~X~~	~~X~~	X/C 8	X	P	X
Residence accessory to and connected with a business	P	~~P~~	P	X /P~~10~~ 4	P	X /P~~10~~ 4	~~X~~	~~X~~	~~X~~	X/C 8	P	P	X /P~~10~~ 4
Residential Treatment Facility~~12~~ 6	C	~~P~~	P	P	P	P	~~X~~	~~X~~	~~X~~	X/C 8	P	P	P
Single-family Cottage-style homes	X	~~X~~	X	X	X	X	~~X~~	~~X~~	~~X~~	X/C 8	X	P	X
Single-family dwelling	X	~~X~~	X	X	P	X	~~X~~	~~X~~	~~X~~	X/C 8	X	X	X
Sober Living Homes	C	~~P~~	P	X	P	X	~~X~~	~~X~~	~~X~~	X/C 8	P	P	X
Transitional Housing	C	~~P~~	C	P	P	P	~~P~~	~~X~~	~~P~~	X/C 8	C	P	P
Communication, Utilities and Facilities													
Electrical vehicle infrastructure	P	~~P~~	P	P	P	P	~~P~~	~~P~~	~~P~~	P	P	P	P
Wireless communications facility (Refer to Ch. 18.35)													
Facilities, minor public	P	~~P~~	P	P	C	P	~~P~~	~~P~~	~~C~~	P	P	C	P
Facility, essential~~6~~	X	~~X~~	C	C	C	C	~~C~~	~~P~~	~~C~~	C	C	C	C
Railroad tracks and facilities~~6~~	C	~~X~~	C	C	C	C	~~X~~	~~X~~	~~C~~	C	C	C	C
Temporary Uses													
Temporary sales office for a development~~4~~ 2	T	~~T~~	T	T	T	T	~~T~~	~~T~~	~~T~~	T	T	T	T

Notes:

1. See CMC Chapter 5.36 Sexually Oriented Businesses for additional regulations for siting sexually oriented business facilities.

~~2. Similar uses are permitted in the zone district only at the discretion of the community development director or designee.~~

~~3. Reserved.~~

~~4~~2.See CMC Chapter 18.47 "Temporary Uses" for additional regulations.

~~5. See secondary use provisions of LI/BP zone.~~

~~6. See CMC Chapter 18.19 "Design Review" for additional regulations. CMC Chapter 18.19 is not applicable to development in the LI/BP zone.~~

~~7. Residential uses may be outright permitted if part of a mixed use building, where residential use is not located on the ground level; otherwise it shall be a conditional use.~~

~~8. If grocery store is less than one hundred thousand square feet then use is outright permitted. If one hundred thousand square feet or over then a conditional use permit is required.~~

~~9~~3. A. Must be sited a minimum one thousand feet of the perimeter of the grounds of any elementary or secondary school, playground, recreation center or facility, child care center, public park, public transit center, or library, or game arcade to which is not restricted to persons twenty-one years or older as defined in WAC 314-55-010 on June 20, 2015;

B. The business shall post clear signage in a conspicuous location near each public entrance stating no person under the age of twenty-one may enter the premises; and

C. No smoke shop/head shop subject to this note shall be located within five miles of an existing lawfully established smoke shop/head shop. All measurements under (A) and (C) shall be measured from the nearest property line of the property on which the use is proposed to the nearest property line of an existing business utilizing Clark County GIS.

~~10~~4. On tracts ten acres or more, subject to approval by city council of a master plan and development agreement, a mixed use development may be approved provided no less than fifty-one percent of the net developable acreage is committed to commercial uses.

~~11~~5. Conditional use permit is required if facilities for kennels are proposed outdoors.

~~12~~6. A Residential Treatment Facility shall not be located within one thousand feet of public and private schools, public parks, public libraries, other RTFs or similar uses.

~~13~~7. Permitted only on sites where automobile repair was previously established and where the existing site or building design, configuration, layout, or access makes it particularly suited for this use.

8. West of Lacamas Creek/Washougal River, residential uses may be allowed as a conditional use only when part of a mixed-use development project. Heavy industrial uses must have ceased on the portion of the site proposed for residential development and the applicant must demonstrate that the proposed residential development will not interfere with any continuing industrial operations on adjoining properties in a manner that cannot be reasonably mitigated through conditions of approval.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § IV(Exh. D), 5-18-2009; Ord. No. 2584, § II, 5-3-2010; Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2656, § I(Exh. A), 7-16-2012; Ord. No. 2667, § III, 12-17-2012; Ord. No. 2672, § II(Exh. B), 1-22-2013; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 2712, § 2, 10-20-2014; Ord. No. 2720, § I(Exh. A), 12-15-2014; Ord. No. 15-012, § II(Exh. B), 8-17-2015; Ord. No. 15-023, § II, 11-16-2015; Ord. No. 15-024, § II, 11-16-2015; Ord. No. 17-013, § I(Exh. A), 10-2-2017; Ord. No. 19-012, § II(Exh. A), 11-4-2019; Ord. No. 21-004, § II(Exh. A), 3-15-2021; Ord. No. 22-007, § I, 5-16-2022; Ord. No. 23-010, Exh. A, 8-7-2023; Ord. No. 25-025, § I (Exh. A), 12-15-2025)

18.07.040 Table 2—Residential ~~and multifamily~~ land uses.

KEY: P = Permitted Use
C = Conditional Use
X = Prohibited Use
T = Temporary Use

Authorized Uses in Residential ~~and Multifamily~~ Zones

Zoning Districts	R	MF
Residential Uses		
Adult family home, residential care facility, supported living arrangement, or housing for the disabled[1]	P	P
Apartments	P[2]	P
Assisted living[1], retirement home[1]	C	P
Co-living housing	X	P
Cottage housing	P[2]	P
Designated manufactured homes	P	P
Duplex	P[2]	P[2]
Fourplex	P[2]	P[2]
Manufactured home	X	X
Manufactured home park	X	C
Nursing, rest, convalescent home[1]	C	P

Permanent Supportive Housing	C/P[2]	P
Residential Treatment Facility[5]	X	C
Single-family dwelling (detached)	P	P
Sober Living Homes	P	P
Stacked flat	P[2]	P[2]
Townhouses	P[2]	P[2]
Transitional Housing	P	P
Triplex	P[2]	P[2]
Incidental Uses		
Accessory dwelling unit	P	P
Animal training, kennel, boarding	X	C
Day care center[1]	~~C~~P	P
Day care, family home	P	P
Day care, minicenter[1]	~~C~~P	P
Electric vehicle battery charging station and rapid charging stations	P	P
Gardening and horticulture activities	P	P
Home occupation	P	P
Bed and breakfast[1]	C	C
Limited neighborhood commercial[7]	P	P
Recreation/Religious/Cultural		
Church[1]	C	C
Community clubs, private or public[1]	C	C
Library[1]	C	C
Museum[1]	C	C
Open space[1]	P	P
Public or semi-public building[1]	C	C
Park or playground	P	P
Sports fields[1]	C	C
Trails	P	P
Event center[6]	C	C
Educational Uses		
Private, public or parochial school[1]	P	C
Trade, technical, business college[1]	X	C
College/university[1]	X	X
Communication and Utilities		
Wireless communication facility	Refer to Chapter 18.35	
Facilities, minor public	C	C
Public utilities, minor	C	C
Pumping station[1]	C	C
Railroad tracks and facilities 1	C	C
Temporary Uses		
Sales office for a development in a dwelling[1, 4]	T	T
Sales office for a development in a trailer[3, 4]	T	T

Notes:

1. See Chapter 18.19 "Design Review" for additional regulations.
2. Permitted pursuant to Chapter 18.25, Middle Housing and in the LD-NS zone.
3. Site plan review required per CMC Section 18.18.020(A)(1).
4. Notwithstanding the time limitations of a temporary use, a sales office proposed and approved through a Type III application may be approved with a longer time frame than one hundred eighty days.
5. A Residential Treatment Facility shall not be located within one thousand feet of public and private schools, public parks, public libraries, other RTFs, or similar uses.
6. Permitted in the LD-NS and HD-NS zones only.

7. Those Neighborhood Commercial uses listed as permitted (P) are allowed within residential zones along design overlay corridors on corner lots at intersections with collector or arterial streets, pursuant to Chapter 18.20. The neighborhood commercial use must be pedestrian oriented with access to a public sidewalk or walkway and may have a maximum building footprint of 2,500 square feet and no more than five (5) off-street parking spaces, which can be satisfied by on-street parking provided they are along the frontage of the subject parcel.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2481 § 1 (Exh. A (part)), 2007; Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 17-013, § I(Exh. A), 10-2-2017; Ord. No. 21-004, § II(Exh. A), 3-15-2021; Ord. No. 21-005, § I(Exh. A), 3-15-2021; Ord. No. 22-007, § I, 5-16-2022; Ord. No. 23-010, Exh. A, 8-7-2023; Ord. No. 25-025, § I (Exh. A), 12-15-2025)

18.07.050 Table 3 - Park and open space land uses.

KEY: P = Permitted Use
C = Conditional Use
X = Prohibited Use
T = Temporary Use
~~NP = Neighborhood Park~~
~~SU = Special Use~~
~~OS = Open space~~

Authorized Uses in Park and Open Space Zones

	~~NP~~	~~SU~~	~~OS~~	~~P/OS-NS~~	POS
General Uses					
1. City-approved festivals, community events, and event center	~~P~~	~~P~~	~~X~~	~~P~~	P
2. Community and recreation centers	~~P~~	~~P~~	~~X~~	~~P~~	P
3. Community gardens	~~P~~	~~P~~	~~C~~	~~P~~	P
4. Concession stands	~~P~~	~~P~~	~~X~~	~~P~~	P
5. Open Spaces	~~P~~	~~P~~	~~P~~	~~P~~	P
6. Other buildings and structures to support park use	~~P~~	~~P~~	~~P~~	~~P~~	P
7. Other uses identified through the Park, Recreation and Open Space Comprehensive Plan	~~P~~	~~P~~	~~P~~	~~P~~	P
8. Parking areas/lots to serve park use	~~P~~	~~P~~	~~P~~	~~P~~	P
9. Pedestrian and multi-use trails	~~P~~	~~P~~	~~P~~	~~P~~	P
10. Public administrative facilities					P
~~10.~~11. Recreation areas and facilities	~~P~~	~~P~~	~~C~~	~~P~~	P
~~11.~~12. Residence for park caretaker and accessory structures	~~C~~	~~P~~	~~P~~	~~C~~	P
~~12.~~13. Restrooms	~~P~~	~~P~~	~~P~~	~~P~~	P

~~13.~~14. Stages and band shells	~~P~~	~~P~~	~~X~~	~~P~~	P
~~14.~~15. Temporary Use	~~T~~	~~T~~	~~T~~	~~T~~	T
Utility Uses					
~~15.~~16. Public utilities, minor	~~P~~	~~P~~	~~P~~	~~P~~	P
~~16.~~17. Pumping station	~~C~~	~~P~~	~~P~~	~~C~~	P
~~17.~~18. Railroad tracks and facilities	~~X~~	~~X~~	~~X~~	~~X~~	X
~~18.~~19. Communication facilities, minor	~~C~~	~~C~~	~~X~~	~~C~~	C
~~19.~~20. Communication facilities, major	~~X~~	~~X~~	~~X~~	~~X~~	X

(Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 23-010, Exh. A, 8-7-2023)

18.07.060 Table 4 - Downtown Zoning Districts

KEY: P = Permitted Use
C = Conditional Use
X = Prohibited Use
T = Temporary Use

Authorized Uses in Downtown Zoning Districts

Zoning Districts	DT-HMSC	DT-MXM	DT-MXL	DT-R
Active Retail Uses				
Antique shop	P[1]	P[2]	P[3]	P[4]
Appliance sales and service	P[1]	P[2]	P[3]	P[4]
Artisanal/craft/makers	P[1]	P[2]	P[3]	P[4]
Bakery (retail)	P[1]	P[2]	P[3]	P[4]
Barber and beauty shops	P[1]	P[2]	P[3]	P[4]
Book store	P[1]	P[2]	P[3]	P[4]
Bowling alley/billiards	P[1]	P[2]	P[3]	P[4]
Building, hardware and garden supply store	P[1]	P[2]	P[3]	P[4]
Candy; confectionery store	P[1]	P[2]	P[3]	P[4]
Clothing store	P[1]	P[2]	P[3]	P[4]
Coffee shop, cafe or kiosk	P[1]	P[2]	P[3]	P[4]
Day care, mini-center	P[1]	P[2]	P[3]	P[4]
Delicatessen (deli)	P[1]	P[2]	P[3]	P[4]
Department store	P[1]	P[2]	P[3]	P[4]
Feed store	P[1]	P[2]	P[3]	P[4]
Event center	P[1]	P[2]	P[3]	P[4]
Fitness center/sports club	P[1]	P[2]	P[3]	P[4]
Florist shop	P[1]	P[2]	P[3]	P[4]
Food cart/food truck/food delivery business	P[1]	P[2]	P[3]	P[4]
Furniture store	P[1]	P[2]	P[3]	P[4]
Grocery, neighborhood scale	P[1]	P[2]	P[3]	P[4]
Grocery, small scale	P[1]	P[2]	P[3]	P[4]
Hotel, motel	P[1]	P[2]	P[3]	X
Laundry/dry cleaning (retail)	P[1]	P[2]	P[3]	P[4]
Liquor store	P[1]	P[2]	P[3]	P[4]
Nursery, plant	P[1]	P[2]	P[3]	P[4]
Office supply store	P[1]	P[2]	P[3]	P[4]
Pet shops	P[1]	P[2]	P[3]	P[4]
Pharmacy	P[1]	P[2]	P[3]	P[4]
Photographic / electronics store	P[1]	P[2]	P[3]	P[4]
Restaurant	P[1]	P[2]	P[3]	P[4]
Restaurant, fast food	P[1]	P[2]	P[3]	P[4]

Zoning Districts	DT-HMSC	DT-MXM	DT-MXL	DT-R
Second-hand/consignment store	P[1]	P[2]	P[3]	P[4]
Specialty goods production (e.g. brew pub)	P[1]	P[2]	P[3]	P[4]
Taverns	P[1]	P[2]	P[3]	P[4]
Theater, except drive-in	P[1]	P[2]	P[3]	P[4]
Communication, Utilities, and Facilities Uses				
Electrical vehicle infrastructure	X	X	X	X
Wireless communications facility	(Refer to Ch. 18.35)			
Facilities, minor public	X	X	X	X
Facility, essential	X	X	X	X
Railroad tracks and facilities	X	X	X	X
Educational Uses				
College/university	P[1]	P[2]	P[3]	X
Elementary school	P[1]	P[2]	P[3]	X
Junior or senior high school	P[1]	P[2]	P[3]	X
Private, public or parochial school	P[1]	P[2]	P[3]	X
Trade, technical or business college	P[1]	P[2]	P[3]	X
Incidental Uses[9]				
Accessory Dwelling Unit	P[1]	P[2]	P[3]	P[4]
Animal Training, Kennel, Boarding	X	C[2]	C[3]	X
Day care center	P[1]	P[2]	P[3]	C
Day care, family home	P[1]	P[2]	P[3]	P[4]
Day care, minicenter	P[1]	P[2]	P[3]	P[4]
Electric vehicle battery charging station and rapid charging stations	P[1]	P[2]	P[3]	P[4]
Gardening and horticulture activities	P[1]	P[2]	P[3]	P[4]
Home occupation	P[1]	P[2]	P[3]	P[4]
Bed and breakfast	P[1]	C[2]	C[3]	C
Limited neighborhood commercial[10]	P[1]	P[2]	P[3]	P[4]
Industrial Uses				
High-tech industry	X	X	X	X
Manufacturing of miscellaneous goods (e.g. musical instruments, toys, vehicle parts)	X	X	X	X
Optical goods	X	X	X	X
Packaging of prepared materials	X	X	X	X
Scientific and precision instruments	X	X	X	X
Manufacturing and/or Processing Uses				
Cotton, wool, other fibrous material	X	X	X	X
Food production or treatment	X	X	X	X
Foundry	X	X	X	X
Furniture manufacturing	X	X	X	X
Gas, all kinds (natural, liquefied)	X	X	X	X
Gravel pits/rock quarries	X	X	X	X
Hazardous waste treatment—Off-site	X	X	X	X
Hazardous waste treatment—On-site	X	X	X	X
Junkyard/wrecking yard	X	X	X	X
Metal fabrication and assembly	X	X	X	X
Hazardous waste treatment—On-site	X	X	X	X
Paper, pulp or related products	X	X	X	X
Signs or other advertising structures	X	X	X	X
Electronic equipment	X	X	X	X
Passive Retail Uses				
Animal kennel, commercial Boarding	P[1]	P[2]	P[3]	X
Animal shelter	P[1]	P[2]	P[3]	X
Automobile repair (garage)	X	X	X	X
Automobile sales, new or used	X	X	X	X
Automobile service station	X	X	X	X
Automobile wrecking	X	X	X	X

Zoning Districts	DT-HMSC	DT-MXM	DT-MXL	DT-R
Bakery (wholesale)	P[1]	P[2]	P[3]	P[4]
Banks, savings and loan	P[1]	P[2]	P[3]	P[4]
Boat building	P[1]	P[2]	P[3]	P[4]
Boat repair and sales	P[1]	P[2]	P[3]	P[4]
Bus station	C[1]	C[2]	C[3]	C[4]
Cabinet and carpentry shop	P[1]	P[2]	P[3]	P[4]
Convention center	P[1]	P[2]	P[3]	P[4]
Day care center	P[1]	P[2]	P[3]	P[4]
Day care, adult	P[1]	P[2]	P[3]	P[4]
Day care, family home	P[1]	P[2]	P[3]	P[4]
Equipment rental	P[1]	P[2]	P[3]	P[4]
Funeral home	P[1]	P[2]	P[3]	P[4]
Furniture repair; upholstery	P[1]	P[2]	P[3]	P[4]
Gas/fuel station	X	X	X	X
Gas/fuel station with mini market	X	X	X	X
Grocery, large scale	P[1]	P[2]	P[3]	P[4]
Hospital, emergency care	C[1]	C[2]	C[3]	P[4]
Household appliance repair	P[1]	P[2]	P[3]	P[4]
Industrial supplies store	P[1]	P[2]	P[3]	P[4]
Laundry (self-serve)	P[1]	P[2]	P[3]	P[4]
Laundry/dry cleaning (industrial)	X	X	X	X
Machine shop	P[1]	P[2]	P[3]	P[4]
Marijuana processor	X	X	X	X
Marijuana producer	X	X	X	X
Marijuana retailer	X	X	X	X
Manufactured home sales lot	X	X	X	X
Medical or dental clinics (outpatient)	P[1]	P[2]	P[3]	P[4]
Mini-storage/vehicular storage	X	X	X	X
Newspaper printing plant	P[1]	P[2]	P[3]	P[4]
Nursing, rest, convalescent, retirement home	P[1]	P[2]	P[3]	P[4]
Parcel freight depots	P[1]	P[2]	P[3]	P[4]
Pawnshop	P[1]	P[2]	P[3]	P[4]
Permanent supportive housing	P[1]	P[2]	P[3]	P[4]
Plumbing, or mechanical service	P[1]	P[2]	P[3]	P[4]
Printing, binding, blue printing	P[1]	P[2]	P[3]	P[4]
Professional office(s)	P[1]	P[2]	P[3]	P[4]
Public agency	P[1]	P[2]	P[3]	P[4]
Real estate office	P[1]	P[2]	P[3]	P[4]
Recycling center	X	X	X	X
Recycling collection point	P[1]	P[2]	P[3]	P[4]
Recycling plant	X	X	X	X
Research facility	P[1]	P[2]	P[3]	P[4]
Roadside produce stand	X	P[2]	P[3]	X
Sand, soil, gravel sales and storage	X	X	X	X
Sexually oriented business	X	X	X	X
Shoe repair and sales	P[1]	P[2]	P[3]	P[4]
Smoke shop/head shop[5]	P[1]	P[2]	P[3]	X
Stock broker, brokerage firm	P[1]	P[2]	P[3]	P[4]
Truck terminals	X	C[2]	C[3]	C[4]
Veterinary clinic	P[1]	P[2]	P[3]	P[4]
Warehousing, wholesale and trade	X	X	X	X
Warehousing, bulk retail	X	X	X	X
Recreational, Religious, and Cultural Uses				
Auditorium	P[1]	P[2]	P[3]	X
Cemetery	X	X	X	X
Community club	P[1]	P[2]	P[3]	C
Church	P[1]	P[2]	P[3]	C
Golf course/driving range	X	X	X	X

Zoning Districts	DT-HMSC	DT-MXM	DT-MXL	DT-R
Library	P[1]	P[2]	P[3]	C
Municipal	P[1]	P[2]	P[3]	X
Museum	P[1]	P[2]	P[3]	C
Recreational vehicle park	X	X	X	X
Open space	P	P	P	P
Park or playground	P	P	P	P
Sports fields	X	X	X	C
Trails	P	P	P	P
Residential Uses				
Adult family home	P[1]	P[2]	P[3]	P
Apartments	P[1]	P[2]	P[3]	P[11]
Assisted living / retirement homes	P[1]	P[2]	P[3]	P
Bed and breakfast	P[1]	P[2]	P[3]	C
Cottage housing	X	P[11]	P[11]	P[11]
Designated manufactured home	P[1]	P[2]	P[3]	P
Duplex	P[1,11]	P[2,11]	P[11]	P[11]
Group home	P[1]	P[2]	P[3]	C
Emergency housing and shelters	P[1]	P[2]	P[3]	
Housing for the disabled	P[1]	P[2]	P[3]	P
Residence accessory to and connected with a business	P[1]	P[2]	P[3]	C
Residential Care Facility[6]	P[1]	P[2]	P[3]	P
Residential Treatment Facility[6]	P[1]	P[2]	P[3]	X
Single-family dwelling (detached)	X	X	X	P
Sober Living Homes	P[1]	P[2]	P[3]	P
Stacked flat	P[1,11]	P[2,11]	P[3,11]	P[11]
Townhouses	P[1,11]	P[2,11]	P[3,11]	P[11]
Transitional Housing	P[1,11]	P	P	P
Triplex	P[1,11]	P[2,11]	P[3,11]	P[11]
Temporary Uses				
Sales office for a development[7]	T	T	T	T
Sales office for a development in a dwelling[8]	T	T	T	T
Sales office for a development in a trailer[8]	T	T	T	T

Notes:

1. Pursuant to Section 3.1 of the Downtown Design Manual, at least 70% of ground floor area and frontages on Main Streets must be occupied by active retail uses. On all other street types, at least 70% of ground floor area and frontages must be occupied by active or passive retail uses. Municipal uses may occupy 100% of ground floor area and frontages on any street type east of NE Everett St between NE 3rd Ave and NE 5th Ave.

2. Pursuant to Section 3.2 of the Downtown Design Manual, at least 70% of ground floor area and frontages on Main Streets must be occupied by active retail uses. On Mobility and Gateway Steets, at least 70% of ground floor area and frontages must be occupied by active or passive retail uses. On all other street types, residential uses may not occupy more than 70% of ground floor area and frontages.

3. Pursuant to Section 3.3 of the Downtown Design Manual, at least 70% of ground floor area and frontages must be occupied by active or passive retail uses on Mobility and Gateway Steets. Residential uses may occupy 100% of ground floor area and frontages on any street, including Mobility and Gateway Streets.

4. Pursuant to Section 3.4 of the Downtown Design Manual, active or passive retail uses may occupy up to 70% of ground floor area and frontages on Gateway and Connector Steets. Residential uses may occupy 100% of ground floor area and frontages on any street.

5. A. Must be sited a minimum one thousand feet of the perimeter of the grounds of any elementary or secondary school, playground, recreation center or facility, child care center, public park, public transit center, or library, or game arcade to which is not restricted to persons twenty-one years or older as defined in WAC 314-55-010 on June 20, 2015;

   B. The business shall post clear signage in a conspicuous location near each public entrance stating no person under the age of twenty-one may enter the premises; and

   C. No smoke shop/head shop subject to this note shall be located within five miles of an existing lawfully established smoke shop/head shop. All measurements under (A) and (C) shall be measured from the nearest property line of the property on which the use is proposed to the nearest property line of an existing business utilizing Clark County GIS.

6. A Residential Treatment Facility shall not be located within one thousand feet of public and private schools, public parks, public libraries, other RTFs or similar uses.

7. See CMC Chapter 18.47 "Temporary Uses" for additional regulations.

8. Notwithstanding the time limitations of a temporary use, a sales office proposed and approved through a Type III application may be approved with a longer time frame than one hundred eighty days

9. Incidental uses are only allowed as incidental to a residential use, with exception of electric vehicle battery charging station and rapid charging stations.

10. Those Neighborhood Commercial uses listed as permitted (P) are allowed residential zones along design overlay corridors on corner lots at intersections with collector or arterial streets, pursuant to Chapter 18.20. The neighborhood commercial use must be pedestrian oriented with access to a public sidewalk or walkway and may have a maximum building footprint of 2,500 square feet and no more than five (5) off-street parking spaces, which can be satisfied by on-street parking provided they are within 500 feet of the subject parcel. See Chapter 18.20, Design Overlays, for additional provisions.

11. Permitted pursuant to Chapter 18.25, Middle Housing.

EXHIBIT E

Chapter 18.09 DENSITY AND DIMENSIONS[1]

18.09.010 Purpose.

The purpose of this chapter is to establish requirements for development relative to basic dimensional standards, as well as specific rules for general application. The standards and rules are established to provide flexibility in project design, maintain privacy between adjacent land uses, and promote public safety. Supplementary provisions are included to govern density calculations for residential districts and specific deviations from general rules.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.09.020 Interpretation of tables.

A. The Camas Municipal Code Sections 18.09.030 through ~~18.09.050~~ 18.090.055 (Tables) contain general density and dimension standards of the particular zone districts. Additional rules and exceptions are stated in Sections 18.09.060 through 18.09.180.

B. The density and dimension tables are arranged in a matrix format on ~~three~~ four separate tables, and are delineated into three general land use categories:

1. Commercial, mixed use, mixed employment and industrial;
2. ~~Single-family residential~~ Residential; ~~and~~
3. Multifamily residential; and ~~.~~
4. Downtown zones.

C. Development standards are listed down the left side of the tables, and the zones are listed across the top. Each cell contains the minimum or maximum requirement of the zone. Footnote numbers identify specific requirements found in the notes immediately following the table. Additional dimensional and density exceptions are included in Sections 18.09.060 through 18.09.180 of this chapter following the tables.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

[1]Ord. No. 17-013, § I(Exh. A), adopted Oct. 2, 2017, added a second table to § 18.09.040 pertaining to density and dimensions for single-family residential zones, and revised the table designations provided in various section catchlines. For purposes of organization and clarity, the editor has removed table designations (e.g. Table 1, Table 2, etc.) from the catchlines of §§ 18.09.030—18.09.050 and included them with the table headers, also conforming said catchlines stylistically.

18.09.030 Density and dimensions—Commercial, mixed use, mixed employment and industrial zones.

Table 1—Density and Dimensions for Commercial, Mixed Use, Mixed Employment and Industrial Zones

	NC	~~DC~~	CC	RC	MX	ME	~~LI~~	~~BP~~	HI	~~LI/BP[Note 2]~~	C-NS	MX-NS	ME-NS
Bulk Regulations													
Maximum Density (dwelling units/net acre)	n/a	~~None~~	n/a	n/a	24	n/a	~~n/a~~	~~n/a~~	n/a	~~n/a~~	n/a	24[8]	n/a
Minimum lot area (square feet)	5,000	~~None~~	None	None	1,800	None	~~10,000~~	~~½ acre~~	None	~~10 acres~~	None	1,800	None
Minimum lot width (feet)	40	~~None~~	None	None	None	None	~~100~~	~~100~~	None	~~Not specified~~	None	None	None
Minimum lot depth (feet)	40	~~None~~	None	None	None	None	~~None~~	~~100~~	None	~~Not specified~~	None	None	None
Setbacks: Commercial and industrial development setbacks shall be as follows, unless along a flanking street of a corner lot. If along flanking street, then the setback must be treated like a front, and provide safe sight distance.													
Minimum front yard (feet)	15'	~~Note 4~~	Note 4	Note 4	Note 3, Note 7	None	~~None~~	~~15~~	None	~~5' per 1 foot of building height (200' minimum)~~	15[9]	Note 3, Note 7	None
Minimum side yard (feet)	None/10'[Note 1]	~~None~~	None	None	10'	None	~~15' or 25' if abutting a~~	~~15~~	None	~~100' for building;~~	None	10'	None

							~~residential area~~			~~25' for parking~~			
Minimum rear yard (feet)	None	~~None~~	None	None	~~25'~~10'	None	~~25'~~	~~50~~	None	~~100' for building; 25' for parking area~~	None	10'	None
Lot Coverage													
Lot coverage (percentage)	85%	~~None~~	None	None	~~1 story (60%) 2 stories or more (50%)~~ 65%	None	~~70%~~	~~50%~~	None	~~1 story (30%) 2 stories (40%) 3 stories (45%)~~	None	65%	None
Minimum Usable Open Space[5]	N/A	~~N/A~~	N/A	N/A	~~N/A~~ 50 sf/du	5% (net acreage)	~~N/A~~	~~N/A~~	N/A	~~N/A~~	5% (net acreage)	100 sf/du	5% (net acreage)
Building Height													
Maximum building height (feet)	2.5 stories; or 35	~~None~~	None	None	Vertical mixed use 60; Horizonal mixed use 45	100 [6]	~~acre or less: 35'; 1 to 2 acres: 45'; 2 acres or more: 60'~~	~~None~~	None	~~60~~	100[6]	100[6]	100[6, 8]

Notes:

1. If along a flanking street of corner lot.
2. The densities and dimensions in the LI/BP zone may be reduced under a planned industrial development. See Chapter 18.21 Light Industrial/Business Park.
3. Maximum setback at front building line is ten feet.
4. Residential dwelling units shall satisfy the front setbacks of CMC Section 18.09.040 Table 2, based on comparable lot size.

5. Areas that provide opportunities for active and passive uses and encourage community interaction. These spaces are accessible to the general public or to residents, employees, or customers and can include, but are not limited to plazas, courtyards, sports courts, and viewpoints (see 18.03.040 "Definitions for development terms").
6. Building heights shall "step-down" and provide compatible scale and privacy between developments. See the North Shore Design Manual.
7. If buildings are rear loaded from an alley, the rear yard setback shall be twenty feet.
8. Does not apply to cottage-style development.
9. Passive pedestrian space, as identified in the North Shore Design Manual and including elements such as seating and building overhangs, is allowed within the fifteen foot front yard setback.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § V(Exh. E), 5-18-2009; Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2672, § III(Exh. C), 1-22-2013; Ord. No. 17-013, § I(Exh. A), 10-2-2017; Ord. No. 23-010, Exh. A, 8-7-2023)

18.09.040 Density and dimensions—~~Single-family residential~~ Residential zones.

Table 1—Density and Dimensions for ~~Single-family~~ Residential Zones[1]

	R-6	R-7.5	R-10	R-12	R-15	LD-NS
A. Standard New Lots						
Maximum density (~~dwelling units~~lots/net acre)	7.2	5.8	4.3	3.6	2.9	5.8[7]
Minimum density (~~dwelling units~~lots/net acre)	X	X	X	X	X	4
Average lot area (square feet)[4]	6,000	7,500	10,000	12,000	15,000	7,500
Minimum lot size (square feet)	4,800	6,000	8,000	9,600	12,000	5,400[8]
Maximum lot size (square feet)[3]	9,000	12,000	14,000	18,000	24,000	12,000
Minimum lot width (feet)	60	70	80	90	100	40[9]
Minimum lot depth (feet)	80	90	100	100	100	90[10]
Maximum building lot coverage[5]	40%	40%	35%	30%	30%	N/A
Average building lot coverage[6]	N/A	N/A	N/A	N/A	N/A	45%
Maximum building height (feet)[2]	35	35	35	35	35	35[11]
B. Density Transfer Lots[1]						
Maximum density (~~dwelling units~~lots/net acre)	7.2	5.8	4.3	3.6	2.9	5.8
Minimum lot size (square feet)	4,200	5,250	7,000	8,400	10,500	5,250
Maximum lot size (square feet)[3]	7,200	9,000	12,000	14,400	18,000	9,000
Minimum lot width (feet)[1]	50	60	60	70	80	40
Minimum lot depth (feet)[1]	80	80	90	90	100	80
Maximum building lot coverage	40%	40%	40%	35%	35%	60%
Maximum building height (feet)[2]	35	35	35	35	35	35

Notes:

1. For additional density and dimension provisions, see CMC Sections 18.09.060 through 18.09.180.
2. Maximum building height: three stories and a basement, not to exceed height listed.
3. For parcels with an existing dwelling, a one-time exception may be allowed to partition from the parent parcel a lot that exceeds the maximum lot size permitted in the underlying zone. Any further partitioning of the parent parcel or the oversized lot must comply with the lot size requirements of the underlying zone.
4. The minimum front yard setback may be reduced by up to five feet for the non-garage portions of a dwelling when any garage is set back the full minimum front yard distance required in the underlying zone. This allowance is intended to promote varied building facades and reduce the visual prominence of garages along the street.
5. The maximum building lot coverage for single-story homes may be up to forty-five percent in R-6, R-7.5, and LD-NS zones, and forty percent in R-10 and R-12 zones. To qualify for increased lot coverage, a single-story home cannot include a basement or additional levels.
6. Average building lot coverage is based on the square footage of all lots within the development or plat with an LD-NS zoning designation. The average building lot coverage may increase to fifty-five for single-story development and/or lots below five thousand square feet.
7. Does not apply to cottage-style development.
8. Minimum lot size for cottage-style development shall be two thousand four hundred square feet and rowhouse developments shall be one thousand eight hundred square feet.
9. Minimum lot width for cottage-style development shall be thirty feet and rowhouse developments shall be twenty feet.

10. Minimum lot depth for cottage-style and rowhouse development shall be fifty feet.

11. Maximum building height for cottage-style development shall be twenty-five feet.

Table 2—Building Setbacks for ~~Single-Family~~ Residential Zones[1]

Lot Area	Up to 4,999 sq. ft.	5,000 to 11,999 sq. ft.	12,000 to 14,999 sq. ft.	15,000 or more sq. ft.	LD-NS
Minimum front yard (feet)	20[2]	20[2]	25[2]	30[2]	10-25[3]
Minimum side yard (feet)	5	5	10	15	5
Minimum side yard flanking a street and corner lot rear yard (feet)	10	10	15	15	10
Minimum rear yard (feet)	20	25	30	35	10-20[4]
Minimum lot frontage on a cul-de-sac or curve (feet)	25	30	35	40	25

Notes:

1. Setbacks may be reduced to be consistent with the lot sizes of the development in which it is located. Notwithstanding the setbacks requirements of this chapter, setbacks and/or building envelopes clearly established on an approved plat or development shall be applicable. In the LD-NS zone, cottage-style development setbacks are identified in the North Shore Design Manual.

2. The minimum front yard setback may be reduced by up to five feet for the non-garage portions of a dwelling when any garage is set back the full minimum front yard distance required in the underlying zone. This allowance is intended to promote varied building facades and reduce the visual prominence of garages along the street.

3. LD-NS subarea developments are encouraged to vary the front yard building setbacks to provide visual interest along a residential block. Garage faces shall maintain a minimum setback of twenty feet. Lots with alley-access garages may have a minimum front yard building setback of ten feet.

4. LD-NS subarea developments with street-access garages may have a minimum rear yard setback of ten feet. LD-NS developments with alley-access garages must maintain a twenty foot rear-yard building setback from the alley.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 15-010, § I, 8-17-2015; Ord. No. 17-013, § I(Exh. A), 10-2-2017; Ord. No. 19-012, § II(Exh. A), 11-4-2019; Ord. No. 21-005, § I(Exh. A), 3-15-2021; Ord. No. 23-010, Exh. A, 8-7-2023; Ord. No. 25-025, § I (Exh. A), 12-15-2025)

18.09.050 Density and dimensions—Multifamily residential zones.

Table 1—Density and Dimensions for Multifamily Residential Zones

	MF-10	MF-18	MF-24	MF-C Overlay	HD-NS
Density					
Maximum density (dwelling units per net acre)	10	18[Note 10]	24 [Note 11]	24	18[Notes 6, 10]
Minimum density (dwelling units per net acre)	6.0	6.0	8	6.0	10
Standard lots					

Minimum lot area (square feet)	3,000	2,100	1,800	None	1800
Minimum lot width (feet)	36	26	20	None	20
Minimum lot depth (feet)	70	60	60	None	60
Maximum gross floor area (GFA) per dwelling unit (square feet)	No max	No max	No max	1,000[Note 4]	No max
Setbacks					
Minimum front yard/at garage front (feet)	15/20	10/20	10/20	0/20	10/20
Minimum side yard (feet)	3[Note 1]	3[Note 1]	3 [Note 1]	0 / If abutting R-zone than setback is 10'	3[Note 1]
Minimum side yard, flanking a street (feet)	15 [Note 8]	15 [Note 8]	15 [Note 8]	15	15[Note 8]
Minimum rear yard	10	10	10	0 / If abutting R-zone than setback is 10'	10
Standard lots coverage					
Maximum building lot coverage	55%	65%	65%	Building coverage is limited by a minimum of 200 sq. ft. of useable yard adjacent to each dwelling unit.	65%
Building Height					
Maximum building height (feet)	35[Note 2]	50[Note 5]	50 [Note 5]	18[Note 3]	50[Notes 5, 9]

Table Notes:

1. The non-attached side of a dwelling unit shall be three feet, otherwise a zero-lot line is assumed.
2. Maximum three stories and a basement but not to exceed height listed.
3. Maximum one story and a basement but not to exceed height listed.
4. Gross floor area (GFA) in this instance does not include covered porches or accessory structures as defined per CMC 18.17.040.
5. Maximum four stories but not to exceed height listed.
6. Does not apply to cottage-style development.
7. In the HD-NS zone, cottage-style development setbacks are identified in the North Shore Design Manual.
8. Minimum side yard flanking street shall be ten feet for cottage-style and rowhouse developments.
9. Building heights shall "step-down" and provide compatible scale and privacy between developments. Building height transitions shall be applied to new and vertically expanded buildings in the HD-NS zone within twenty feet (measured horizontally) of an existing single detached residential building thirty feet or less in height. The building-height-transition standard is met when the height of the taller building does not exceed one foot of height for every one foot separating the new building from the existing single detached residential structure.
10. To encourage apartment development on larger sites, properties that are five acres or larger and developed exclusively with apartment buildings may be developed at up to double the maximum allowed density for the zone.

11. To encourage apartment development on larger sites, properties that are five acres or larger and developed exclusively with apartment buildings may be developed at up to a 50% increase of the maximum allowed density for the zone.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2694, § III, 2-3-2014; Ord. No. 17-013, § I(Exh. A), 10-2-2017; Ord. No. 23-010, Exh. A, 8-7-2023; Ord. No. 25-025, § I (Exh. A), 12-15-2025)

18.09.055 Density and dimensions—Downtown zones.

Development in the Downtown Subarea and zones shall comply with the general standards and development standards found in section 3.0 of the Downtown Design Manual.

Table 1—Density and Dimensions for Downtown Zones

DT – HMSC	DT – MXM	DT – MXL	DT – R
See General and Development Standards in Section 3.1 of the Downtown Design Manual	See General and Development Standards in Section 3.2 of the Downtown Design Manual	See General and Development Standards in Section 3.3 of the Downtown Design Manual	See General and Development Standards in Section 3.4 of the Downtown Design Manual

18.09.060 Density transfers.

A. Purpose. To achieve the density goals of the comprehensive plan with respect to the urban area, while preserving environmentally sensitive lands and the livability of the single-family residential neighborhoods, while also maintaining compatibility with existing residences.

B. Scope. This section shall apply to new development in all residential (R) zoning districts.

C. Where a land division proposes to set aside a tract for the protection of a critical area, natural open space network, or network connector (identified in the city of Camas parks plan), or approved as a recreational area, lots proposed within the development may utilize the density transfer standards under CMC Section 18.09.040~~.B Table 1~~ Table 1, Section B.

D. Where a tract under "C" above, includes one-half acre or more of contiguous area, the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC Section 18.09.040 Table 1 and 2. In no case shall the maximum density of the overall site be exceeded. A letter explaining the request for negotiated flexibility shall be submitted to the director for consideration. The city may also provide the landowner with:

   1. A credit against park and open space impact fees per Chapter 3.88; or

   2. Cash from the parks and open space impact fee fund or other public fund.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 18-014, § XII, 9-4-2018; Ord. No. 19-001, § I(Att. A), 1-22-2019; Ord. No. 21-005, § I(Exh. A), 3-15-2021)

18.09.080 Lot sizes.

A. In planned residential developments with sensitive lands and the required recreational open space set aside, a twenty per-cent density bonus on a unit count basis is permitted. Density may be transferred for sensitive areas but the total lot count shall never exceed the number of lots established in the density standards established in CMC Section 18.23.040 "Density Standards."

B. When creating new lots via short plats or subdivisions that are adjacent to a different residential zone designation, the new lots along that common boundary shall be the maximum lot size allowed for the zone

designation of the new development (if a lower density adjacent zone), or the minimum lot size allowed for the zone designation of the new development (if a greater density adjacent zone), as based on CMC 18.09.040 Table ~~2~~1, Section A. In applying this section, where a land division is required to increase the size of lots, the land division may utilize the density transfer provisions provided for in CMC Section 18.09.060.

C. For residentially zoned parcels owned or controlled by a religious organization, a twenty percent density bonus to the dwelling unit maximum (Refer to Sections 18.09.040 and 18.09.050) is permitted for the development of affordable housing, when the following criteria are met:

1. Affordable housing is for low-income households. "Low-income household" means a single person, family, or unrelated persons living together whose adjusted income is less than eighty percent of the median family income, adjusted for household size for Clark County;

2. A lease or other binding obligation shall require development to be used exclusively for affordable housing purposes for at least fifty years, even if the religious organization no longer owns the property; and

3. Does not discriminate against any person who qualifies as a member of a low-income household.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 21-004, § II(Exh. A), 3-15-2021)

18.09.090 Reduction prohibited.

No lot area, yard, open space, off-street parking area, or loading area existing after the effective date of the ordinance codified in this chapter shall be reduced below the minimum standards required by the ordinance codified in this chapter, nor used as another use, except as provided in Chapter 18.41 "Nonconforming Lots, Structures, Uses."

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.09.100 Lot exception.

If at the time of passage of the code, a lot has an area or dimension which does not conform with the density provisions of the zoning district in which it is located, the lot may be occupied by any use permitted outright in the district, subject to the other requirements of the district. The person claiming benefits under this section shall submit documentary proof of the fact that the lot existed by title at the time of passage of the code. See Section 18.41.040 "Buildable lot of record."

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.09.110 Height—Exception.

A. The following type of structures or structural parts are not subject to the building height limitations of the code: tanks, church spires, belfries, domes, monuments, fire and hose towers, observation towers, transmission towers, wind turbines, chimneys, flag poles (see setbacks at CMC Section 18.09130(G)), radio and television towers, masts, aerials, cooling towers, and other similar structures or facilities.

B. The heights of telecommunication facilities are addressed in CMC Chapter 18.35 Telecommunication Ordinance.

C. Building heights may exceed the maximum allowable height by eight inches to accommodate additional insulation.

D. Building heights may exceed the maximum allowable height by 48 inches to accommodate roof-mounted solar energy panels.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.09.120 Roof overhang permitted.

The maximum a roof overhang may intrude into yard setbacks shall be as follows:

Yard Setback	Maximum Roof Overhang[1]
5 feet	2 feet
10 feet	3.5 feet
15 feet	5 feet
15 feet or greater	5 feet

1. In the C-NS zone, roof overhangs may intrude up to fifteen feet in the front yard setback.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006; Ord. No. 23-010, Exh. A, 8-7-2023)

18.09.130 Setback—Exception.

A. Cornices, eaves, chimneys, belt courses, leaders, sills, pilasters, or other similar architectural or ornamental features (not including bay windows or vertical projections) may extend or project into a required yard not more than two feet.

B. Open balconies, unenclosed fire escapes, or stairways, not covered by a roof or canopy, may extend or project into a required front yard, or a required rear yard along a flanking street of a corner lot, or into a required side yard not more than three feet.

C. Open, unenclosed patios, terraces, roadways, courtyards, or similar surfaced areas, not covered by a roof or canopy, and not more than thirty inches from the finished ground surface, may occupy, extend, or project into a required yard.

D. Cantilevered floors, bay windows, or similar architectural projections, not wider than twelve feet, may extend or project into the required side yard along a flanking street of a corner lot not more than two feet. The total of all projections for each building elevation shall not exceed fifty percent of each building elevation.

E. Detached accessory buildings or structures may be established in a side or rear yard, provided such structure maintains a minimum setback of five feet from side and rear lot lines, and a minimum six feet setback from any building. In no event shall an accessory building(s) occupy more than thirty percent of a rear yard requirement. For accessory dwelling units, see Chapter 18.27.

F. On sloping lots greater than fifty percent, only uncovered stairways and wheelchair ramps that lead to the front door of a building may extend or project into the required front yard setback no more than five feet in any R or MF zone.

G. Flag poles may be placed within any required yard but shall maintain a five-foot setback from any lot line.

H. The portion of exterior wall assemblies that includes insulation may to project up to an additional eight inches into setbacks on all sides.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.09.140 Front yard—Exception.

A. Commercial , Mixed Employment, Mixed Employment, and Industrial Districts. For a lot in a NC, CC, RC, ~~LI~~, MX, ME or HI districts proposed for commercial, mixed use, mixed employment, or industrial development, which is across a street from a residential (R) zone, the yard setback from the street shall be fifteen feet.

B. Sloping Lot in Any Zone. If the natural gradient of a lot from front to rear along the lot depth line exceeds an average of twenty percent, the front yard may be reduced by one foot for each two percent gradient over twenty percent. In no case under the provisions of this subsection shall the setback be less than ten feet. The front of a garage shall not be closer than eighteen feet from the back of the sidewalk.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 17-013, § I(Exh. A), 10-2-2017)

18.09.150 Side yard—Exception.

For a lot in a NC, CC, MX, ME, or RC district containing a use other than a dwelling structure, and adjoining a residential zoning district, minimum side yard along a side lot line adjoining a lot in a residential zoning district shall be fifteen feet. In the case of a lot in ~~a LI or~~ an HI district the side yard setbacks shall be twenty feet. If the adjoining residential district is within an area shown in the comprehensive plan for future commercial or industrial use or expansion, no minimum side yard shall be required.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.09.160 Side yard—Flanking street.

For a corner lot in a NC, CC, RC, ~~LI~~ ME, MX, or HI district proposed for commercial or industrial development, which is across a street from a residential (R) zone, the yard setback from the street shall be fifteen feet.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.09.170 Rear yard—Exception.

For a lot in a NC, CC ME, MX, or RC district containing a use other than a dwelling structure and adjoining a residential zoning district, minimum rear yard along a rear lot line adjoining a side or rear yard of a lot in a residential zoning district shall be fifteen feet. In the case of a lot in a ~~LI or~~ an HI district, the rear yard setback shall be twenty feet. If the adjoining residential district is within an area shown in the comprehensive plan for future commercial or industrial use or expansion, no minimum rear yard shall be required.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.09.180 Elevated decks.

Rear Yard Setback. The rear yard setback for an elevated deck shall be fifteen feet. As used herein, an elevated deck shall mean a deck thirty inches or more aboveground level that is physically attached to a residential structure. The areas covered by an elevated deck shall be counted when calculating the maximum lot coverage permitted under the applicable density provisions.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

EXHIBIT F

Chapter 18.11 PARKING

18.11.010 Parking policy designated.

Except as hereafter provided for the ~~MX District and DC District~~Downtown and Mixed-Use zoning districts, in all Districts there shall be provided minimum off street parking spaces in accordance with the requirements of ~~Section 18.11.020~~this chapter. Such off street parking spaces shall be provided at the time of erecting new structures, or at the time of enlarging, moving, or increasing the capacity of existing structures by creating or adding dwelling units, commercial or industrial floor space, or seating facilities. Under no circumstances shall off street parking be permitted in the vision clearance area of any intersection. Off street parking will only qualify if located entirely on the parcel in question, and not on City owned right-of-way or privately owned streets less than twenty feet in width. Covered parking structures shall not be permitted within the front yard set back or side yard set back along a flanking street.

~~For projects one-half block or less in size in the DC District and MX District, the Community Development Director may waive the off street parking requirements if the City Engineer finds that the anticipated parking needs of the project can be adequately met by existing off street parking on site, if any, and on street parking adjacent to the project. The Community Development Director may, as a condition of waiving the off street parking requirements of Section 18.11.020, require that on street parking be converted at the expense of the applicant to angle parking or another parking configuration approved by the City Engineer.~~

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § VI, 5-18-2009)

18.11.020 Design.

The design of off-street parking shall be as follows:

A. Ingress and Egress. The location of all points of ingress and egress to parking areas shall be subject to the review and approval of the city.

B. Backout Prohibited. In all commercial and industrial developments and in all residential buildings containing five or more dwelling units, parking areas shall be so arranged as to make it unnecessary for a vehicle to back out into any street or public right-of-way.

C. Parking Spaces—Access and Dimensions. Adequate provisions shall be made for individual ingress and egress by vehicles to all parking stalls at all times by means of unobstructed maneuvering aisles.

1. Off-street parking space dimensions shall be as follows or as otherwise approved by the director:

    a. Standard spaces shall be a minimum of nine feet in width;

    b. Standard spaces shall be a minimum of eighteen feet in length.

2. Aisle width dimensions shall be as follows or as otherwise approved by the director:

    a. One-way aisle width shall be fifteen feet;

    b. Two-way aisle width shall be twenty-four feet.

D. Small Car Parking Spaces. A maximum of thirty percent of the total required parking spaces may be reduced in size for the use of small cars, provided these spaces shall be clearly identified with a sign permanently affixed immediately in front of each space containing the notation "compacts only." Spaces designed for small cars may be reduced in size to a minimum of eight feet in width and fifteen feet in length. Where feasible, all small car spaces shall be located in one or more contiguous areas and/or adjacent to ingress/egress points within parking facilities. Location of compact car parking spaces shall not create traffic congestion or impede traffic flows.

E. Wheel stops. Wheel stops shall be installed where parking spaces are oriented toward sidewalks, walkways, or landscape areas and vehicle overhang may obstruct pedestrian access, interfere with maintenance, or damage trees, shrubs, groundcover, flowers, or other plantings. Wheel stops may be omitted where sidewalks are wide enough to maintain required pedestrian clearance despite vehicle overhang, or where plantings are set back sufficiently to avoid damage or maintenance conflicts.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 17-013, § I(Exh. A), 10-2-2017)

18.11.030 Location.

Off-street facilities shall be located as hereafter specified. Such distance shall be the maximum walking distance measured from the nearest point of the parking facility to the nearest point of the building that such facility is required to serve:

A. For single-family or two-family dwelling and motels: on the same lot with the structure they are required to serve.

B. For multiple dwelling, rooming or lodging house: two hundred feet.

C. For hospital, sanitarium, home for the aged, or building containing a club: three hundred feet.

D. For uses other than those specified above: four hundred feet.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

~~18.11.040 Units of measurement.~~

~~A. In a stadium, sports arena, church, or other place of assembly, each twenty inches of bench seating shall be counted as one seat for the purpose of determining requirements for off-street parking facilities.~~

~~B. For purposes of determining off-street parking as related to floor space of multilevel structures and building, the following formula shall be used to compute gross floor area for parking determination:~~

~~Main floor~~	~~100%~~
~~Basement and second floor~~	~~50%~~
~~Additional stories~~	~~25%~~

~~(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)~~

18.11.~~050~~040 Change or expansion.

Except in a ~~DC District or MX District~~Downtown or Mixed Use zoning district, whenever a building is enlarged or altered, or whenever the use of a building or property is changed, off street parking shall be provided for such expansion or change of use.

A. The number of off street parking spaces required shall be determined for only the square footage of expansion and not the total square footage of the building or use; however, no additional off street parking space need be provided where the number of parking spaces required for such expansion, enlargement, or change in use since the effective date of this Code is less than ten percent of the parking spaces specified in the Code.

B. No additional off-street parking spaces shall be required for the addition of dwelling units added within an existing building.

C. Nothing in this provision shall be construed to require off-street parking spaces for the portion and/or use of such building existing at the time of passage of the Code.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § VII, 5-18-2009)

~~18.11.060 Unspecified use.~~

~~In case of a use not specifically mentioned in Section 18.11.130 of this chapter, the requirements for off-street parking facilities shall be determined by the city in accordance with a conditional use permit. Such determination shall be based upon the requirements for the most comparable use listed.~~

~~(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)~~

18.11.~~070~~050 Joint use.

Cumulative parking requirements for mixed-use occupancies or shared facilities may be reduced where it can be shown that the peak parking requirements of the various uses occur at different times of the day, week or year. Methods for calculating parking reduction and submission requirements are outlined in this section. Two methods for determining parking reduction are as follows:

A. Parking Occupancy Rates. When a parking reduction is requested based on parking demand calculations from Table 18-11-1, the applicant shall submit a parking demand summary showing the calculations outlined in this section. To determine the number of parking stalls required:
    1. Determine the minimum required minimum number of parking stalls for each use.
    2. Multiply the minimum required number of stalls by the “occupancy rate” for the corresponding use in Table 18-11-1 (or as determined by a parking study) to produce an adjusted minimum requirement for each use for weekday day, evening and night periods, and for weekend day, evening and night periods.
    3. Sum the adjusted minimum number of stalls for each use for each time period to produce an aggregate adjusted minimum number of stalls for each period.
    4. The greatest of the aggregate adjusted minimum number of stalls for each period shall be the minimum number of shared parking stalls required.

5. Parking reserved for specified individual persons, positions, businesses, or offices, hotel or residential units do not count toward shared parking.

Table 18-11-1. Parking Occupancy Rates

Use[a]	Weekdays[a]			Weekends[a]		
	Day (7:00 a.m. – 6:00 p.m.)	Evening (6:00 p.m. – 11:00 p.m.)	Night (11:00 p.m. – 7:00 a.m.)	Day (8:00 a.m. – 5:00 p.m.)	Evening (5:00 p.m. – 12:00 a.m.)	Night (12:00 a.m. – 8:00 a.m.)
Residential	60%	100%	100%	80%	100%	100%
Office/Industrial/Warehouse	100%	20%	5%	5%	5%	5%
Retail/Commercial	90%	80%	5%	100%	79%	5%
Hotel	70%	100%	100%	70%	100%	100%
Restaurant	70%[b]	100%	10%	70%[b]	100%	20%
Theater (Movie or Live)	40%	80%	10%	80%	100%	10%
Entertainment/Recreation	40%	100%	10%	80%	100%	10%
Convention/Conference	100%	100%	5%	100%	100%	5%
Place of Worship	10%	5%	5%	100%	50%	5%

(a) Weekends are the period from 6:00 p.m. on Friday to 6:00 p.m. on Sunday.

(b) Fast food and breakfast/lunch oriented facilities = 100%

B. Parking Study.

1. A parking study may substitute for a parking occupancy rates summary for uses not found in the table above; for parking reductions based on seasonal variation or other time frames not found in the table; or for a parking reduction greater than provided for in the table.
2. The parking study shall meet the requirements of Section 18.11.110.

~~The city may authorize the joint use of parking facilities for the following uses or activities under conditions specified:~~

~~A. Up to fifty percent of the parking facilities required by the code for a theater, bowling alley, tavern, or restaurant may be supplied by the off-street parking facilities provided by certain types of buildings or uses herein referred to as "daytime" uses in subsection D of this section.~~

~~B. Up to fifty percent of the off-street parking facilities required for any building or use specified in subsection D of this section, "daytime" uses, may be supplied by the parking facilities provided by uses herein referred to as "nighttime or Sunday" uses in subsection E of this section.~~

~~C. Up to one hundred percent of the parking facilities required for a church or for an auditorium incidental to a public or parochial school may be supplied by the off-street parking facilities provided by uses herein referred to as "daytime" uses in subsection D of this section.~~

~~D. For the purpose of this section, the following and similar uses are considered as primary daytime uses: banks, offices, retail, personal service shops, household equipment or furniture stores, clothing or shoe repair shops, manufacturing or wholesale buildings, and similar uses.~~

~~E. For the purpose of this section, the following and similar uses are considered as primary nighttime or Sunday uses: auditorium incidental to a public or parochial school, churches, bowling alleys, theaters, taverns or restaurants.~~

~~F. Owners of two or more buildings or lots may agree to utilize jointly the same parking space, subject to such conditions as may be imposed by the city. Satisfactory legal evidence shall be presented to the city in the form of deeds, leases, or contracts to establish the joint use. Evidence shall be required that there is no substantial conflict in the principal operating hours of the buildings or uses for which joint off-street parking is proposed.~~

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.11.~~080~~060 Plan submittal.

Every tract or lot hereafter used as public or private parking area, having a capacity of five or more vehicles, shall be developed and maintained in accordance with the requirements and standards of this chapter.

The plan of the proposed parking area shall be submitted to the city at the time of the application for the building for which the parking area is required. The plan shall clearly indicate the proposed development, including location, size, shape, design, curb cuts, lighting, landscaping, and other features and appurtenances required. The parking facility shall be developed and completed to the required standards before an occupancy permit for the building may be issued.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.11.~~090~~070 Landscaping.

Landscaping requirements for parking areas shall be provided under Chapter 18.13 "Landscaping."

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.11.~~100~~080 Residential parking.

~~A. Residential off-street parking space shall consist of a parking strip, driveway, garage, or a combination thereof, and shall be located on the lot they are intended to serve.~~

A. For single-family and middle housing, driveways and parking areas shall lead to a garage, attached carport, or a parking area in a side yard or rear yard.

B. All residential off-street parking shall be graded and surfaced with asphalt, concrete, hard pavers, or grass block pavers. Gravel is prohibited for parking lot surfacing except in an existing nonconforming parking area under RCW 36.70A.622.

C. The minimum dimensions for any residential off-street parking space shall be 8 feet wide by 20 feet long. Alternatively, the City shall allow the length of an individual space to be reduced to no less than 18 feet long, provided the width of any space under 20 feet in length is at least 9 feet. For any space under a carport or

within a garage, encroachments are prohibited, including structural columns, posts, fixed appliances or objects like heat pumps, water heaters, and the swing areas of doors.

D. Parking spaces in tandem shall count towards meeting minimum parking requirements at a rate of one space for every 20 linear feet with any necessary provisions for turning radius. For purposes of this subsection, "tandem" is defined as having two or more vehicles, one in front of or behind the others with a single means of ingress and egress.

E. Existing parking spaces that do not conform to the requirements of this section by June 6, 2024, are not required to be modified or resized, except for compliance with the Americans with disabilities act. Existing paved parking lots are not required to change the size of existing parking spaces during resurfacing if doing so will be more costly or require significant reconfiguration of the parking space locations.

F. Minimum parking spaces are not required if compliance with tree retention would otherwise make a residential development infeasible as determined by a parking study. In addition to the requirements of 18.11.110, the parking study shall include a narrative demonstrating site conditions and applicable off-street parking and tree retention standards that impact feasibility and any other evidence and supporting information the applicant wishes to provide to support the request to remove parking requirements.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.11.~~110~~090 Parking for the handicapped.

Off-street parking and access for the physically handicapped persons shall be provided in accordance with the international building code.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.11.~~120~~100 Additional requirements.

In addition to the basic standards and requirements established by other sections of this chapter, the city may make such other requirements or restrictions as shall be deemed necessary in the interests of safety, health and general welfare of the city, including, but not limited to, lighting, jointly development of parking facilities, entrances and exits, accessory uses, and conditional exceptions. Further, performance bonds may be required in such cases where the city determines that such shall be necessary to guarantee proper completion of improvements within time periods specified.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.11.110 Parking study.

A. A parking study is required when:
   1. An applicant proposes fewer parking spaces than allowed under the alternative minimum standards in Section 18.11.120;
   2. A multifamily development containing more than twenty dwelling units requests use of the alternative minimum standards;
   3. No reasonably comparable parking standard exists for an unspecified use; or
   4. The Community Development Director determines that the scale, mix of uses, operating characteristics, or phasing of a development warrants additional parking analysis.

   Approval under this section is an alternative method of compliance and is not a variance under Chapter 18.45.

B. The parking study shall determine the anticipated parking demand of the proposed development, justify any difference between the parking requirements of this chapter and the proposed parking supply, demonstrate that adequate parking will be provided for each phase and the ultimate development scenario, if applicable, and evaluate alternative methods of meeting parking demand, including shared parking, off-site parking, on-street parking, and transportation demand management.

C. A parking study shall use accepted engineering and planning principles and shall include:
1. The project name, property address, purpose of the study, site location, and a brief description of the proposed development, including the type of development, development statistics such as the number of dwelling units and site area, proposed parking areas, access points, amenity areas, and proposed phasing, if applicable.
2. For nonresidential uses, the gross floor area, in square feet, by use and the anticipated hours of operation, if known.
3. A description of existing on-site conditions and the surrounding area, including streets, natural areas, buildings, and parking areas.
4. A concept plan showing proposed building locations, parking areas, vehicular, bicycle, and pedestrian access and circulation, amenity areas, landscaping, grading, natural features, and known natural hazards.
5. The parking requirements applicable to the proposed development under this chapter.
6. Any previously approved parking reductions or modifications applicable to the property or development.
7. An outline of the proposed parking supply, broken down by land use and development phase, if applicable.
8. Identification of the applicable accessible parking requirements and the number of accessible parking spaces proposed.
9. A description of existing parking and any shared or off-site parking proposed or relied upon, including applicable parking agreements.
10. For existing vacant or unoccupied tenant spaces, identification of anticipated tenants or uses, if known. If future tenants or uses are unknown, the analysis shall assume a reasonably foreseeable use with parking demand at the higher end of the range of uses likely to occupy the space.
11. The location of nearby transit facilities and a description of any proposed transportation demand management measures.
12. A summary of the parking analysis, findings, and conclusions, including any reductions or adjustments to the standards of this chapter relied upon in the analysis.
13. A recommendation for the parking supply necessary to meet the anticipated parking demand of the proposed development.
14. Any other special considerations, conditions, or circumstances supporting the recommended parking supply.
15. Other information reasonably required by the Community Development Director to evaluate the proposed parking supply.

D. The parking study shall be submitted with the applicable development application. The Community Development Director will review the study to determine whether the proposed recommended off-street parking supply, outlined in the parking study, will accommodate the needs generated by the proposed development project.

E. The Community Development Director may impose conditions necessary to ensure continued compliance, including shared or off-site parking agreements, transportation demand management measures, parking management or monitoring, or additional review if the use or operating characteristics change materially from those assumed in the approved study.

18.11.120 Alternative minimum standards

As provided by RCW 35A.21.445, the following minimum alternative off-street parking standards may be allowed with an approved parking assessment:

A. No more than 0.5 parking space per multifamily dwelling unit.
B. No more than one space per single-family home.
C. No more than two parking spaces per 1,000 square feet of commercial space.
D. No minimum parking spaces for:
    1. Residences under 1,200 square feet;
    2. Commercial spaces under 3,000 square feet;
    3. Affordable housing;
    4. Senior housing;
    5. Child care centers defined in RCW 43.216.010;
    6. Ground level nonresidential space in mixed use buildings; and
    7. A building undergoing a change of use from a nonresidential to a residential use or a change of use for a commercial use.
E. Parking assessment. A parking assessment shall include:
    1. A site plan and brief description of the proposed development, including the proposed uses and parking supply;
    2. The parking requirement under Section 18.11.130 and the alternative minimum requested;
    3. A brief explanation of the anticipated parking needs of the development based on its size, use, and operating characteristics;
    4. A description of existing on-site and abutting on-street parking, including applicable restrictions;
    5. A description of available transit, pedestrian and bicycle facilities, shared or off-site parking, and proposed transportation demand management measures, as applicable; and
    6. A description of any site constraints affecting the ability to provide the otherwise required parking.
D. The Director may approve the alternative minimum upon finding that the proposed parking supply is reasonably expected to serve the development, considering the information provided in the parking assessment and the availability of other parking and transportation options.
E. Multifamily residential projects with more than twenty units are required to conduct a parking study under Section 18.11.110 in place of a parking assessment in order to utilize the alternative minimum standards.

18.11.130 Standards.

A. The minimum number of off-street parking spaces for the listed uses shall be shown in Table 18.11-~~1~~2, Off-Street Parking Standards. The city shall have the authority to request a parking study when deemed necessary.

B. Unspecified uses. For a use not specifically listed in Section 18.11.130, the required number of off-street parking spaces shall be determined by the Director based on the listed use with the most similar parking demand and operating characteristics. The Director may require a parking study under Section 18.11.065 when no reasonably comparable use exists.

C. Downtown and mixed-use zones. Commercial uses and ground-floor nonresidential space in a mixed-use building have no minimum parking requirements. For other uses in projects one-half block or less in size, the Community Development Director may reduce the off-street parking requirements if the City Engineer finds that the anticipated parking needs of the project can be adequately met by existing off-street parking on site, if any, and on-street parking adjacent to the project. The Community Development Director may, as a condition of this section, require that on-street parking adjacent to the project be

converted at the expense of the applicant to angle parking or another parking configuration approved by the City Engineer.

Table 18.11-2 Off-Street Parking Standards

Use	Required Number of Off-Street Parking Spaces
Residential	
Single-family dwelling, ~~duplex, rowhouse~~ middle housing	2 per unit on lots greater than 6,000 square feet 1 per unit on lots smaller than 6,000 square feet
Studio apartment	1 per unit
Apartment 1 bedroom/ 2+ bedrooms	1.5/2
Housing for elderly (apartment/unassisted)	.33 per unit
Retirement dwellings	2 per unit
Residential care facility/assisted living	1 per 2 beds + 1 per day shift employee
Affordable housing	No minimum
Residential new construction or retrofit of existing buildings meeting passive house requirements	No minimum
Residential modular construction	No minimum
Residential mass timber construction	No minimum
Lodging	
Hotel or motel	1 space per unit plus additional for bars, restaurants, assembly rooms
Bed and breakfast	1 space per room
Recreation	
Marina	1 space per 2 slips
Miniature golf	1 per hole
Golf course	6 spaces per hole and 1 per employee
Golf driving range	1 space per 15 feet of driving line
Theater, auditorium	1 space per 4 seats maximum occupancy
Stadium, sports arena	1 space per 4 seats, or 1 for each 8 feet of benches, plus 1 space per 2 employees
Tennis, racquetball, handball, courts/club	3 spaces per court or lane, 1 space per 260 square feet of gross floor area (GFA) of related uses, and 1 space per employee
Basketball, volleyball court	9 spaces per court
Bowling, bocce ball center, billiard hall	5 spaces per alley/lane, and/or table
Dance hall, bingo hall, electronic game rooms, and assembly halls without fixed seats	1 space per 75 square feet of gross floor area (GFA)
Sports club, health, spa, karate club	1 space per 260 square feet of gross floor area, plus 1 space per employee
Roller rink, ice-skating rink	1 space per 100 square feet of gross floor area
Swimming club	1 space per 40 square feet of gross floor area
Private club, lodge hall	1 space per 75 square feet of gross floor area
Institutional	
Church/chapel/ synagogue/temple	1 space per 3 seats or 6 feet of pews
Elementary/middle/ junior high school	1 space per employee, teacher, staff, and 1 space per 15 students
Senior high school	1 space per employee, teacher, staff, and 1 space per 10 students

Technical college, trade school, business school	1 space per every 2 employees, staff, and 1 space per every full-time student, or 3 part-time students
University, college, seminary	1 per every 2 employees and staff members, and either 1 per every 3 full-time students not on campus, or 1 for every 3 part-time students, whichever is greater
Multi-use community centers	1 per 4 seats maximum occupancy
Museum, art gallery	1 space per 500 square feet of gross floor area
Library	1 per employee and 1 per 500 square feet of gross floor area
Post office	1 per 500 square feet of gross floor area, plus 1 space per each 2 employees
Medical care facilities	
Hospitals	1 per 2 beds
Veterinary clinic/hospital	1 space per 250 square feet of gross floor area
Medical/dental clinic/office	1 per employee plus 1 per 300 square feet of gross floor area
Office	
General offices	1 per employee, plus 1 per 400 square feet of gross floor area
General office (no customer service)	1 per 250 square feet of gross floor area
Office park	1 space per 400 square feet of gross floor area
Meeting rooms	1 per 4 person occupancy load, and 1 per 2 employees
Commercial/service	
Automobile sales new/used	1 per 400 square feet of gross floor area
Auto repair accessory to auto sales	2 spaces per auto service stall
Automobile repair shop, automobile service station, automobile specialty store, automobile body shop	4 per bay
Gas station	1 per 2 fuel pumps
Gas station with mini-market	1 per nozzle plus 1 per 250 square feet of gross floor area
Car wash or quick service lubrication facilities	2 spaces per stall, and 1 space per 2 employees
Beauty parlor, barber shop	1 per 300 square feet of gross floor area
Massage parlor	1 per 300 square feet of gross floor area
Exhibition halls, showrooms, contractor's shop	1 space per 900 square feet of gross floor area
Photographic studio	1 space per 800 square feet of gross floor area
Convenience market, supermarket	1 space per 250 square feet of gross floor area
Multi-use retail center	1 per 250 square feet of gross floor area
Finance, insurance, real estate office	1 per employee plus 1 per 400 square feet of gross floor area
Bank	1 per employee, plus 1 per 400 square feet of gross floor area
Drug store	First 5,000 square feet = 17 spaces plus 1 per additional 1,500 square feet
Furniture/appliance store	1 per 500 square feet of gross floor area
Clothing store	1 per 400 square feet of gross floor area
Lumber yard, building material center	1 space per 275 square feet of indoor sales area, plus 1 space per 5,000 square feet of warehouse/storage

Hardware/paint store	1 per 400 square feet of gross floor area
Restaurant	1 per 100 square feet of gross floor area
Restaurant, carry-out	1 space per 225 square feet of gross floor area
Fast food restaurant/coffee kiosk	1 space per 110 square feet of gross floor area, plus 6 stacking spaces for drive-through lane
Repair shop	1 per 400 square feet of gross floor area
Laundromats, coin-operated dry cleaners	1 space per every 3 washing or cleaning machines
Mortuary	1 space per 150 square feet of gross floor area
Express delivery service	1 space per 500 square feet of gross floor area, plus 1 space per employee
Retail stores in general	Less than 5,000 square feet: 1 per 300 square feet. Greater than 5,000 square feet: 17 plus 1 per 1,500 square feet
Industrial	
Industrial, manufacturing	1 per 500 square feet of gross floor area
Warehousing, storage	1 per 1,000 square feet of gross floor area
Public or private utility building	1 per 1,000 square feet of gross floor area
Wholesaling	2 plus 1 per 1,000 square feet of gross floor area
Research and development	1 per 500 square feet of gross floor area
LI/BP general office	1 per employee peak plus 15%
LI/BP research	1 per employee peak + 10%

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.11.140 Loading standards.

In all districts except the DC districts, buildings or structures to be built or substantially altered which receive and distribute material and merchandise by trucks shall provide and maintain off-street loading berths in sufficient numbers and size to adequately handle the needs of the particular case.

The following standards in Tables 18.11-~~2~~3 and 18.11-~~3~~4, shall be used in establishing the minimum number of berths required:

Table 18.11-~~2~~3 Berth Standards for Commercial and Industrial Buildings

Number of Berths	Gross Floor Area of the Building in Square Feet
1	Up to 20,000
2	20,000—50,000
3	50,000—100,000
* One additional berth is required for each 50,000 in excess of 100,000	

Table 18.11-~~3~~4 Berth Standards for Office Buildings, Hotels, Hospitals and Other Institutions

Number of Berths	Gross Floor Area of the Building in Square Feet
1	Up to 100,000
2	100,000 to 300,000

3	300,000 to 600,000
* One additional berth is required for each 300,000 in excess of 600,000	

No loading berth shall be located closer than fifty feet to a lot in any residential zoning district unless wholly within a completely enclosed building, or unless screened from such lot in the residential district by a wall, fence, or sight-obscuring evergreen hedge not less than six feet in height.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.11.150 Bicycle parking.

Bicycle parking shall be provided for new development unless otherwise exempt under this section. Single-family dwellings, middle housing, accessory dwelling units, home occupations, and temporary uses are exempt.

A. **Minimum spaces required.** Bicycle parking shall be provided as shown in Table 18.11-5. When a calculation results in a fraction, the number of spaces shall be rounded up to the nearest whole number.

Table 18.11-5 Bicycle Parking Standards

Use	Short-term bicycle parking	Long-term bicycle parking
Multifamily dwellings, 5 or more units	2 spaces, or 1 per 20 dwelling units, whichever is greater	1 per 5 dwelling units
Nonresidential and mixed-use buildings, 10,000 gross square feet or more	2 spaces, or 1 per 10,000 gross square feet, whichever is greater	2 spaces, or 1 per 20,000 gross square feet, whichever is greater
Hotels and lodging	2 spaces	1 per 20 guest rooms

B. **Short-term bicycle parking.** Short-term bicycle parking shall be located outside the building, within 50 feet of a primary entrance, and visible from the entrance or public right-of-way, and shall not obstruct sidewalks, walkways, drive aisles, fire lanes, or required accessible routes. Short-term bicycle parking spaces shall use racks or lockers securely anchored to the ground or structure and allow the bicycle frame and at least one wheel to be locked to the rack.

C. **Long-term bicycle parking.** Long-term bicycle parking shall be covered and secured within a building, bicycle room, locked enclosure, individual locker, garage, or other area accessible only to residents, employees, or other authorized users. Long-term bicycle parking for residential uses may be provided in private garages or storage areas assigned to individual dwelling units or inside individual dwelling units.

D. **Electric bicycle charging.** Electric bicycle charging facilities are encouraged near short-term and long-term parking areas. Where provided, charging equipment shall be located or managed so they do not create tripping hazards or obstruct required access.

18.11.160 Electric vehicle charging.

New developments shall provide electric vehicle charging infrastructure in compliance with WAC 51-50-0429.

EXHIBIT G

Chapter 18.13 LANDSCAPING

. . .

18.13.051 Minimum tree density requirement.

A. Tree Density. A minimum tree density per net acre is required and must be incorporated within the overall landscape plan. The tree density may consist of existing trees, replacement trees or a combination of existing and replacement trees, pursuant to the priority established in Section 18.13.052. At least fifty percent of minimum tree density shall be achieved through retention of existing trees where the existing tree coverage on the site would allow for this standard to be met. If this standard cannot be met, an arborist report is required to demonstrate that it cannot be met. Replacement trees must be native and/or coniferous species.

18.13.051 Table 1: Required Tree Density

Proposed Activity	Required Minimum Tree Density per Net Acre	Required Tree Replacement	~~North Shore Subarea Required Minimum Tree Density per Net Acre~~[1]
New Development	~~20~~ 30 Tree Units	~~20~~ 30 Tree Units per acre	~~30 Tree Units~~
Residential	~~20~~ 30 Tree Units	~~20~~ 30 Tree Units per acre	~~30 Tree Units~~
Developed commercial and industrial properties	~~20~~ 30 Tree Units	3 Tree Units for every 1 tree unit removed up to the minimum tree density per acre.	~~30 Tree Units~~

[1] At least fifty percent of minimum tree density shall be achieved through retention of existing trees where the existing tree coverage on the site would allow for this standard to be met. If this standard cannot be met, an arborist report is required to demonstrate that it cannot be met. Replacement trees must be native and/or coniferous species. More information is included in the North Shore Design Manual.

B. Tree Density Calculation. Specific instructions on how to perform tree density calculations are provided in the Design Standards Manual. "Tree Unit" is a unit of measurement based upon the size of the diameter of the tree measured at the breast height ("dbh"). New trees are given a value of one (1) Tree Unit, as they must be a minimum of 2" dbh when planted. Tree Unit values are summarized in the following Table:

18.13.051 Table 2: Tree Units for Existing Trees

Diameter at Breast Height "dbh"	Tree Units	Diameter at Breast Height "dbh"	Tree Units
1" to 5"	1	31" to 32"	12
6" to 12"	2	33" to 34"	13
13" to 14"	3	35" to 36"	14
15" to 16"	4	37" to 38"	15
17" to 18"	5	39" to 40"	16
19" to 20"	6	41" to 42"	17
21" to 22"	7	43" to 44"	18
23" to 24"	8	45" to 46"	19
25" to 26"	9	47" to 48"	20
27" to 28"	10	49" to 50"	21

29" to 30"	11	For larger trees, allow a ½ tree unit for every additional inch of dbh.

(Ord. No. 18-014, § XIV, 9-4-2018; Ord. No. 23-010, Exh. A, 8-7-2023)

18.13.052 Tree and native vegetation preservation.

A. When determining where to retain or plant trees, locations with healthy soils, native understory vegetation, and mature trees shall have priority when there are feasible alternative locations on site for proposed buildings and site improvements to achieve the minimum tree unit density per acre. This may require site redesign. Provided, where necessary, density transfer areas may be used to ensure protection and retention of trees. Residential and mixed-use developments may use density transfer standards when setting aside area outside of critical or natural areas to protect existing trees.

B. In designing a development project and in meeting the required tree density, the applicant must provide a Landscape, Tree and Vegetation plan that retains healthy, wind firm trees in the following priority:

1. Trees located within critical area buffers. Trees must be identified within a protected tract.
2. Significant wildlife habitat, or areas adjacent and buffering habitat.
3. Significant trees that are greater than 36 inch dbh.
4. Groves of trees, or other individual healthy trees with the intent to retain must be located in separate tract if part of a land division, or other protective mechanism if other development type,

. . .

18.13.060 Parking areas.

A. Parking areas are to be landscaped at all perimeters.

B. All parking areas shall provide interior landscaping for shade and visual relief.

C. Parking lots shall include a minimum ratio of one tree per six parking spaces.

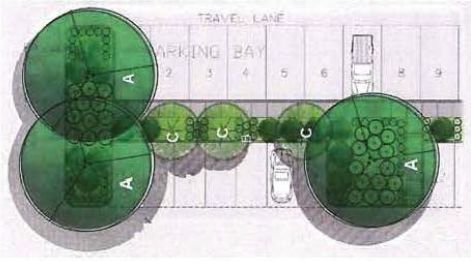

Figure 18.13.060-1 Example of Parking Lot Planter Areas.

In this example, there are three medium-sized trees ("A") for eighteen parking spaces, with ground cover ("B") and shrubs ("C").

D. Planter strips (medians) and tree wells shall be used within parking areas and around the perimeter to accommodate trees, shrubs and groundcover.

E. Planter areas for trees must provide a minimum of five hundred cubic feet of soil, and shall provide eight-foot by eight -foot minimum of clear planting space. For other vegetative buffer areas a minimum of a five foot clear width must be provided.

F. Wheel stops ~~should be used adjacent to tree wells and planter areas to protect landscaping from car overhangs.~~ shall be installed where parking spaces are oriented toward sidewalks, walkways, or landscape areas and vehicle overhang may obstruct pedestrian access, interfere with maintenance, or damage trees, shrubs, groundcover, flowers, or other plantings. Wheel stops may be omitted where sidewalks are wide enough to maintain required pedestrian clearance despite vehicle overhang, or where plantings are set back sufficiently to avoid damage or maintenance conflicts.

G. Curbed planting areas shall be provided at the end of each parking aisle to protect parked vehicles.

H. No more than fifteen parking spaces shall be located in a row without a landscaped divider strip (See Figure 18.13.060-1).

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006; Ord. No. 18-014, § XIII, 9-4-2018; Ord. No. 19-012, § II(Exh. A), 11-4-2019)

EXHIBIT H

Chapter 18.15 SIGNS[1]

. . .

18.15.040 General definitions and regulations.

A. Regulated. In the event that a definition is not listed in this section and is necessary in the interpretation of this chapter, the director shall primarily rely upon the general definitions established for this title, and secondarily on the definition found in a standard English dictionary. For the purpose of this chapter the following definitions and regulations shall apply:

1. "Abandoned" means a sign which no longer identifies or advertises a bona fide business, service, owner, product, or activity, and/or for which no legal owner can be found.
2. "Awning" is a structure that may support a sign. An awning is a shelter projecting from, and supported by, the exterior wall of a building, constructed of non-rigid materials on a supporting framework. [Refer to "awning signs."]
3. "Commercial" means the purpose of the sign is to engage in commerce, or to advertise for one's work that is intended for sale.
4. "Date of adoption" means the date the ordinance codified in this chapter was originally adopted or the effective date of an amendment to it, if the amendment makes a sign nonconforming.
5. "Height" is defined at "Dimensions of Signs" within this chapter.
6. "Internally illuminated" means signs where the source of the illumination is inside the sign and light emanates through the message of the sign, rather than being reflected off the surface of the sign from an external source. Neon signs are considered internally illuminated signs.
7. "Multiple building complex" means a group of structures housing at least one retail business, office, commercial venture, or independent or separate part of a business which shares the same lot.
8. "Nit" means a luminance unit equal to one candela per square meter measured perpendicular to the rays from the source.
9. "Off-premises sign" means a sign that advertises products, services, or facilities, or directs person to premises different than where the sign is placed.
10. "On-premises sign" means a sign that advertises products or services related to the building or structure where it is located.
11. "Permanent sign" means a sign that is intended to remain for the life of the project or business without fundamental or marked changes and is attached to a building or structure by means of a rigid wall, frame, or structure.

[1]Editor's note(s)—Ord. No. 2600, § I, adopted November 1, 2010, repealed former Ch. 18.15, §§ 18.15.010—18.15.240. Section II of said ordinance enacted provisions designated as a new Ch. 18.15 to read as herein set out. See also the Code Comparative Table and Disposition List.

12. "Public right-of-way." There are two distinctions of right-of-way. "Privately maintained right-of-way" means that portion of the public right-of-way maintained by the abutting property owner. "Publicly maintained right-of-way" means that portion of the public right-of-way maintained by the City of Camas or other public agency. Signs placed in the public right-of-way must be located outside vision clearance areas and may not pose a traffic hazard or other threat to human safety.
13. "Sign" means any device, structure, or placard using graphics, logos, symbols, and/or written copy designed specifically for the purpose of advertising or identifying any establishment, product, goods, or services.
14. "Sign area" is defined at "Dimensions of Signs" within this chapter.
15. "Sign schedule" means a listing of multiple signs proposed within an application or development project, which consists of dimensions and descriptions; normally this is in a tabular format (e.g., spreadsheet).
16. "Site plan" means a drawing of the location of a sign or multiple signs within the city limits.

B. Sign Types—Regulations and Limitations. In the event that a sign type as provided in this section is in conflict with provisions elsewhere in this chapter, the more restrictive criteria shall apply.

1. "Animated sign." [Refer to "electronic message board" sign.]
2. "Awning signs." Signage on awnings shall not exceed thirty percent of the awning and shall be included in the combined sign calculation for particular business or storefront.
3. "Banner" is a sign constructed of fabric, vinyl or other non-rigid, durable material that can withstand the typical weather in this area, and does not exceed sixty square feet in size. Banners primarily announce a special occasion, such as a grand opening or special event. National, state or municipal flags are not considered banners.
4. "Bulletin board" is often installed to provide a central location for people to gather information about events or classes that are happening within the building or community in which it is installed. Bulletin boards are included in the overall signage calculation for the site. They are not electronic, LED or otherwise programmable for messaging.
5. "Cabinet sign" is generally a wall sign. This type of sign is usually internally illuminated with a removable face and is enclosed on all edges with a metal cabinet, and does not extend more than ten inches from the wall face on which it is mounted.
6. "Construction sign" means a temporary sign identifying an architect, contractor, subcontractor, and/or material supplier participating in construction on the property on which the sign is located.
7. "Directory sign" identifies two or more establishments and/or the complex as a whole. If a tenant in a multi-building complex has a sign on the freestanding directory sign, then the tenant shall not have an individual freestanding sign. Directory sign area may not exceed one-hundred square feet.
8. "Electronic message board sign," "animated sign," and "LED sign" are considered to be similar sign types for purposes of this chapter. These signs use changing lights to form a message, or messages in sequence, uses movement or change of lighting to depict action or create a special effect or scene. This element of a sign may not exceed thirty percent of total sign area or thirty-six square feet, whichever is less. This calculation does not include post or mounting framework. The electronic board must avoid using flashing, rotating or blinking lights or videos.
9. "Entrance structure." Refer to "monument sign."

10. "Freestanding sign" is attached to, erected on, or supported by some structure (such as a pole, mast, frame, or other structure) that is not itself an integral part of or attached to a building or other structure whose principal function is something other than the support of a sign.

    a. Height limit. Freestanding sign height shall not exceed twenty-five feet from the ground to the top of sign in any zone.

    b. Construction. Rigid, fire-proof material that can withstand wind pressure of thirty mph per square foot.

    c. Combination. A freestanding sign is permitted in combination with wall signs; however, the size of all permitted signs cannot exceed the overall size permitted per building face per zone. A freestanding sign is not permitted in combination with a projecting or monument sign.

11. "Incidental sign" means a small sign, two square feet or less in surface area. Included are decals informing the public of goods, facilities, or services available on the premises, e.g., designating restrooms, a credit card sign, hours of operation, or "help wanted." May also contain the name or logo of an establishment, e.g., parking, or exit and entrance signs. Incidental signs if placed in windows may not cover more than twenty-five percent of window area in combination with any other permitted signs.

12. "Monument sign" is a sign not attached to a building, not more than five feet in height or twenty feet in length, which is attached to the ground by means of a wide base of solid appearance. Monument signs must be designed so as to be compatible with adjacent architecture and landscaping, and must be constructed with materials conductive to abutting structures and the surrounding area. They may not be constructed from fabric or banner material.

13. "Pennant" is a small, double-faced sign that is intended to be viewed by pedestrians and is hung above the sidewalk or street, with the bottom edge conforming to sign height regulations. Pennants may not exceed four square feet, may not be placed closer than twenty feet apart, and are constructed of fabric or other durable materials with a message, logo or artistic rendering on the sign face.

14. "Portable sign" means any sign designed to be moved easily, and not permanently affixed to the ground, or other permanent structure, to include such other descriptive names such as "A-frame," "sandwich board," and "poster panels."

    a. Size. The sign shall not exceed forty-two inches above ground, and six square feet in sign area per side.

    b. Construction. Portable signs shall be firmly and solidly constructed so as to be able to bear a wind pressure of at least thirty pounds per square foot of area.

    c. Location. It is unlawful to erect or maintain any portable sign in such a position as to obstruct any fire escape or any window or door leading thereto, or within vision clearance at intersections; and must allow for a pedestrian clearance of five feet on sidewalks.

    d. Portable signs may only be displayed during business hours. If business hours continue past daylight hours, precautions should be taken to place the sign in a location that is visible after dark.

    e. One sign per business entity and located on same lot as business entity.

15. "Poster" is a piece of sales literature that presents information through words and graphic images. It has text and symbols or pictures to convey an idea or concept. Usually, it is designed vertically and displayed on a wall or window. Posters, where allowed, may not exceed six square feet.

16. "Projecting sign" is a sign affixed to a building or wall in such a manner that its leading edge extends more than ten inches beyond the surface of such building or wall.

17. "Real estate sign" means a temporary sign advertising that real estate is for rent, lease, or sale.

18. "Roof sign" means any sign erected over or on the roof of a building. The roof sign may not exceed the maximum building height allowed in the zoning district in which it is located. If the zoning district has no limitation to building height, then the height from base of sign shall not exceed that of a freestanding sign, which is limited to twenty-five-feet tall.

19. "Sandwich board sign." [Refer to definition of "Portable Sign."]

20. "Temporary sign" means a sign that is used in connection with a circumstance, situation, or event that is designed, intended or expected to take place or to be completed within a reasonably short or definite period after erection of such sign; or is intended to remain on the location where it is erected or placed for a short period of time [refer to additional requirements in Section 18.15.100 CMC]. "Temporary signs" include, but are not limited to, the following examples:

    a. Political signs advocating political candidates or political issues;

    b. Real estate signs advertising property for sale or lease;

    c. Construction signs identifying the builder of a structure or the developer of a residential, commercial or industrial development;

    d. Special event signs or banners advertising grand openings, fairs, carnivals, circuses, festivals; or

    e. Community events, garage and yard sale signs, and any other sign of a similar purpose.

21. "Vehicular sign" means a sign adhered to or mounted to the vehicle body that is parked along a vehicular right-of-way for the principle purpose of displaying advertising.

22. "Wall sign" is any permanent sign that is attached parallel to and extending not more than ten inches from the wall of a building. This includes painted, individual letter, cabinet signs and signs attached to a mansard roof (if constructed at an angle of seventy-five degrees or more from horizontal). No more than two wall signs are permitted per building face, and in combination with all other permitted signs shall not exceed ten percent of wall area.

C. Determination of number of signs.

1. For the purpose of determining the number of signs permitted, a sign shall be considered to be a single display surface or display device containing elements organized, related, and composed to form a unit. Where matter is displayed in a random manner without organized relationship of elements, each element shall be considered a single sign. A two-sided or multi-sided sign shall be regarded as one sign if the sign faces are identical.

2. Only one projecting or monument sign is permitted per street frontage (either one or the other) and neither is permitted in combination with a freestanding sign, per lot.

3. Only one permanent sign per lot in residential zones.

4. Combination. Only one freestanding sign may be allowed per street frontage for each commercial and industrial zoned lot on which the business is located in combination with a maximum of two wall signs (if the lot does not contain a monument or projecting sign). The combined square footage of signs may not exceed size allowance per building face per zone. If a lot contains a multi-building complex a directory sign is permitted in combination with a freestanding sign and wall signs. For a multi-building complex with property frontage that exceeds three-hundred feet, an additional freestanding sign may be allowed for each three hundred feet and set apart no less than one-hundred feet.

5. Refer to "Temporary Sign" section of this chapter for limitation on number of temporary signs.

D. Dimensions of signs.

1. Sign Area. The sign area is defined as the area of the surface, or surfaces, which displays letters or symbols identifying the business or businesses occupying the parcel, together with any allowable electronic message board. In calculating the sign area, the following apply:
   a. The sign area shall not include the base or pedestal to which the sign is mounted.
   b. The sign surface area of a double-faced (back-to-back) sign shall be calculated by using the area of only one side of such sign and shall be considered one sign structure.
   c. The sign surface area of double-faced signs constructed in a "V" shall be calculated by using the area of only one side of such sign and shall be considered one sign structure.
   d. The sign surface area of three dimensional signs shall be computed by including the total of all sides designed to attract attention or communicate information that can be seen at any one time by a person from one vantage point.
2. Sign Height. Height is measured from the finished grade at the point of support to the topmost point of a sign. Height limitations are determined by type of sign as defined in this chapter.
3. Placement. All signs, unless attached to a building, must be set back from the property line by a minimum of five feet, unless otherwise stated in this chapter. Setbacks may be increased or decreased during plan review if there are concerns for vision clearance or other public safety concerns. Signs must provide a minimum clearance of fourteen feet over any vehicular use area, and ten feet over any pedestrian area. Where a sign is affixed to an awning over a pedestrian area, the minimum pedestrian clearance may be reduced to 7 feet six inches.

(Ord. No. 2600, § II, 11-1-2010; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 19-012, § II(Exh. A), 11-4-2019)

18.15.050 Signs controlled by zoning district.

The following table identifies signs by zoning district as permitted (P), prohibited (X), or only allowed with a Conditional Use Permit (C). All permitted signs are subject to the requirements of this chapter, and any other applicable sections of CMC. If dimensions of a sign vary by zone, then it is noted in this table.

Table 1 - Signs controlled by Zoning District

Sign Types as defined in this chapter	Residential and Multi-family Zones	Commercial, Industrial, and Park Zones	~~LI/BP~~
Animated/electronic message board signs	C	P	~~P~~
Awning signs	X	P	~~P~~
Bulletin board	P Note 4	P Note 2	~~P Note 2~~
Cabinet	X	P Note 2	~~P Note 2~~
Directory sign	X	P	~~P~~
Freestanding sign	X	P Note 2	~~P Note 2, 3~~
Incidental sign	P	P	~~P~~
Monument sign	P	P	~~P~~
Portable sign	X	P Note 2	~~P Note 2~~
Projecting sign	X	P Note 2	~~P Note 2~~
Roof sign	X	P Note 2	~~P~~
Temporary sign (e.g., construction signs, real estate, banners, and other sign types as defined in this chapter)	P Note 1	P Note 2, 3	~~P Note 2, 3~~

Vehicular signs	P	P	~~P~~
Wall signs	P[Note 1]	P[Note 2]	~~P~~[~~Note 2~~]

Notes:

[1] Sign may not exceed six square feet in area per lot unless approved with a Master Sign Permit.

[2] Sign may not exceed ten percent of the size of the wall area in combination with all other permitted signs on the same plane and visible from public view unless approved with a Master Sign Permit.

[3] If lot is vacant, then sign is limited to ninety-six square feet.

[4] Only allowed if approved in combination with a Type III development permit.

(Ord. No. 2600, § II, 11-1-2010)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014)

. . .

18.15.070 Master sign permit requirements.

A. Purpose. The purpose of this section is to establish a binding Master Sign Permit that will allow for placement of both permanent and temporary signs on a group of lots or within a business complex, in order to encourage comprehensive sign design, and reward proper placement and prompt removal of temporary signs, which combined will benefit the city by reducing municipal costs for code enforcement. This section allows the size of signs on a lot or within a zoning district to be exceeded and other bonuses as set forth. Individual signs may be permitted by the building department without additional General Sign Permits after a Master Sign Permit has been approved.

B. Application Requirements. Applications for a Master Sign Permit shall contain the following materials in addition to the requirements for a General Sign Permit:

1. Application form and payment of current fee as determined by resolution.
2. Site Plan. Site plan shall include the proposed placement of all signs, both on-premises and off-premises.
3. Consent of property owner for placement of signs within privately-maintained right-of-way or on private lots. The provisions of this section shall not apply to allow placement of any signs within the public right-of-way.
4. Sign Schedule - existing conditions. The schedule will include a calculation of the combined maximum sign area permitted and the number of signs allowed on the proposed lot(s).
5. Sign Schedule - proposed. The schedule will include a calculation of the combined total proposed sign area included in the plan, sign types, number, and short description.
6. Construction Plans. Detailed construction plans shall be provided at a reasonable scale to include type of material and method of installation.
7. Time frame for installation of each sign indicated on plan.
8. Narrative that supports how this application meets or exceeds the criteria for approval for a Master Sign Permit and other regulations in this chapter.

C. Maximum total area of all signs. The combined sign area of all proposed signs on a lot or lots under consideration for a Master Sign Permit shall not exceed ten (10) percent of the total ground floor area (GFA) of the building(s) or in the case of a vacant lot then ten (10) percent of the area of building lot coverage.

D. Bonus. If the owners of two or more contiguous (disregarding intervening streets and alleys) lots or the owner of a single lot with more than one building (not including any accessory building) file with the Director for such lots a Master Signage Plan conforming with the provisions of this section, a thirty percent (30%) increase in the maximum total sign area of that zone shall be allowed for each included lot. This bonus shall be allocated within each lot as the owner(s) elects. Or if a subdivision, then the applicant may combine potential sign area from multiple lots for a single sign to be no greater than thirty-two (32) square feet in lieu of the residential zone size limitation of six square feet.

E. Criteria of Approval for Master Sign Permit.

1. Provisions have been made to have a consistent design with regard to: color scheme; lettering or graphic style; lighting; location of each sign on the buildings or on the lots or elsewhere; material; and sign proportions.

2. Provisions have been made to install signs that will not detract from the natural beauty of the city or contribute to urban blight.

3. The locations of off-premises signs do not exceed one sign per radius of 300-feet.

4. The application and plans shall be consistent with the applicable regulations of the adopted development codes, comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.

F. Approval and Modification. The designated official shall approve a master sign permit and subsequent modifications. Any deviation from the approved master sign permit such as additional signs, relocating signs, and any other changes (excluding tenant name changes and maintenance) shall require a modification to the master sign permit on file with the city.

G. Expiration. Master Sign Permits expire in two years from date of issuance unless at least one sign of the Master Sign Permit has been installed prior to that date.

(Ord. No. 2600, § II, 11-1-2010; Ord. No. 2691, § I(Exh. A), 1-21-2014)

. . .

18.15.100 Temporary signs.

A. Temporary signs are exempt from permit requirements as described in this section. Although no permits will be issued, compliance with this chapter is required. Temporary signs may be permitted with a Master Sign Permit as described in this chapter.

1. Number. One sign per lot, per candidate, issue or event.

2. Size. Refer to "Table 1" of this chapter for sign dimensions per zoning district and bonuses as allowed with a Master Sign Permit.

3. Consent. If displayed on private property, the responsible party must obtain consent of property owner.

4. Location. Temporary signs are prohibited from being placed within the center island of roundabouts, any splitter islands adjacent to any roundabout, and within ten feet of the outer curb of all circulatory

travel lanes that are within the public right-of-way of any roundabout, and within the center median of any public right-of-way.

B. Temporary signs may not be illuminated.

C. Removal. Temporary signs shall be removed by sign owner within ten days after occurrence of the event. For example, political signs should therefore be removed within ten days following an election, real estate signs should be removed within ten days following sale or lease of the property, construction signs should be removed within ten days following issuance of the certificate of occupancy for the building, special event signs should be removed within ten days after occurrence of the special event, and yard and garage sale signs should be removed within ten days following the sale.

D. Confiscation. The city or property owner may confiscate signs installed in violation of this chapter and dispose of it. The property owner is not responsible for notifying owners of confiscation of the illegal sign.

(Ord. No. 2600, § II, 11-1-2010; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 22-008, § I, 5-16-2022)

. . .

EXHIBIT I

Chapter 18.18 SITE PLAN REVIEW

18.18.010 Intent.

This chapter is intended to provide procedures for the review of site plan applications. Site plan review is intended to ensure that development projects carried out in given zoning districts are executed in a manner consistent with existing ordinances concerning public utilities, traffic, facilities, and services, and provide unified site design, access, landscaping, screening, building placement and parking lot layout. The site plan review process is not intended to review and determine the appropriateness of a given use on a given site. It is intended to ~~insure~~ ensure that development of a site will provide the features necessary to protect the health, safety, and general welfare of the citizens of the city.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.18.020 Applicability.

A. Site plan review and approval shall be required for the following development activities prior to issuance of a building permit:

1. All new nonresidential uses for the location of any building(s);
2. Any multifamily development in which more than two dwelling units would be contained, not including any middle housing or accessory dwelling unit development on a single residential lot;
3. The expansion of any building or development as defined in CMC Section 18.18.020(A) exceeding twenty percent of the existing floor or site area, or any one thousand square foot addition, or increase in impervious coverage thereto, whichever is lesser.

B. Exemptions. The following developments and land use categories shall be exempt from site plan review:

1. Planned unit developments, land divisions, binding site plans and boundary line adjustments pursuant to CMC Titles 17 and 18;
2. ~~Light industrial/business park development applications pursuant to CMC Chapters 18.20 North Dwyer Creek Residential Overlay and 18.21 Light Industrial/Business Park;~~
2~~3~~. Normal or emergency repair or maintenance of public or private buildings, structures, landscaping, or utilities;
3~~4~~. Interior remodeling and tenant improvements to buildings previously reviewed and approved; and
4~~5~~. Unless otherwise required, proposals that are subject to Type I procedures under CMC Chapter 18.55 Administration and Procedures.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2481 § 1 (Exh. A (part)), 2007: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.18.030 Site plans and review procedures.

A. Any use that is subject to the requirements for a site plan review shall be processed in accordance with the procedures established under CMC Chapter 18.55 Administration and Procedures for Type II project permit applications.

B. Site plan review and approval shall be required prior to issuance of grading or other building permits.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2481 § 1 (Exh. A (part)), 2007: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.18.040 Submittal and contents of a complete application.

In addition to the submittal requirements under CMC Chapter 18.55 Administration and Procedures, each application for site plan review shall contain the following information. Items may be waived if, in the judgment of the community development department, the items are not applicable to the particular proposal.

A. A written description addressing the scope of the project, the nature and size in gross floor area of each use, and the total amount of square feet to be covered by impervious surfaces;

B. A vicinity map showing site boundaries, and existing roads and accesses within and bounding the site;

C. A topographic map based upon a site survey delineating contours, existing and proposed, at no less than five-foot intervals, and which locates existing streams, marshes, and other natural features;

D. Site plans drawn to a scale no smaller than one inch equals fifty feet showing location and size of uses, buffer areas, proposed areas of disturbance or construction outside of the building footprint, yards, open spaces and landscaped areas, and any existing structures, easements and utilities;

E. A circulation plan drawn to a scale acceptable to the community development director illustrating all access points for the site, the size and location of all driveways, streets, and roads, with proposed width and outside turning radius, the location, size, and design of parking and loading areas, and existing and proposed pedestrian circulation system. If a project would generate more than one hundred average daily trips either based on the latest edition of the International Transportation Engineer's (ITE) Trip Generation Manual or evidence substantiated by a professional engineer licensed in the state of Washington with expertise in traffic engineering, a traffic impact study shall be submitted;

F. A preliminary stormwater technical information report (TIR) supporting the preliminary stormwater drainage and runoff plan. The preliminary stormwater TIR is to be prepared in accordance with Ecology's latest edition Stormwater Management Manual for Western Washington (SWMMWW);

G. A utility plan;

H. A plot plan of all proposed landscaping including the treatment and materials used for open spaces, and the types of plants and screening to be used; and

I. Typical building elevation and architectural style.~~; and~~

~~J. Reserved.~~

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2481 § 1 (Exh. A (part)), 2007: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 19-012, § II(Exh. A), 11-4-2019; Ord. No. 21-005, § I(Exh. A), 3-15-2021)

18.18.050 Reserved.

Editor's note(s)—Ord. No. 2612, § I(Exh. A), adopted February 7, 2011, repealed § 18.18.050, which pertained to application open for public inspection. See also the Code Comparative Table and Disposition List.

18.18.060 Criteria for approval.

The city shall consider approval of the site plans with specific attention to the following:

A. Compatibility with the city's comprehensive plan;

B. Compliance with all applicable design and development standards contained in this title and other applicable regulations;

C. Availability and accessibility of adequate public services such as roads, sanitary and storm sewer, and water to serve the site at the time development is to occur, unless otherwise provided for by the applicable regulations;

D. Adequate provisions are made for other public and private services and utilities, parks and trails (e.g., provide copies of private covenant documents);

E. Adequate provisions are made for maintenance of public utilities; and

F. All relevant statutory codes, regulations, ordinances and compliance with the same. The review and decision of the city shall be in accordance with the provisions of CMC Chapter 18.55 Administration and Procedures.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2481 (Exh. A (part)), 2007: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.18.070 Improvements for residential development.

A. Public. Prior to the issuance of a building permit for residential construction, all public improvements required to adequately service that portion of the plat for which the building permit will be issued shall be installed, or the developer shall provide financial surety acceptable to the city pursuant to CMC Section 17.21.050 Bonds and Other Financial Agreements.

B. Private. Prior to issuance of final occupancy permits all public and private improvements shall be completed in accordance with CMC Section 17.21.070 Final Acceptance.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2481 § 2 (Exh. A (part)), 2007)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.18.080 Duration of approval.

Construction on the project must commence within twenty-four months from the date of final action by the city; otherwise, the approval of the project becomes null and void.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2481 (Exh. A (part)), 2007: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.18.090 Amendments to a site plan.

A. Minor site plan adjustments may be made and approved when a building permit is issued. Any such alteration must be approved by the community development director. Minor adjustments are those which may affect the precise dimensions or siting of building (i.e., lot coverage, height, setbacks) but which do not affect the basic character or arrangement and number of buildings approved in the plan, nor the density of the development or the amount and quality of open space and landscaping. Such dimensional adjustments shall not vary more than ten percent from the original, but shall not exceed the standards of the applicable district.

B. Major amendments are Type II permit applications and are processed in accordance with CMC Chapter 18.55 Administration and Procedures. Major amendments are those that substantially change the character, basic design, density, open space or other requirements and conditions of the site plan. When a change constitutes a major amendment, no building or other permit shall be issued without prior review and approval by the city.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2481 (Exh. A (part)), 2007: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

EXHIBIT J

Chapter 18.19 DESIGN REVIEW[1]

18.19.010 Purpose.

This chapter is intended to provide for orderly and quality development consistent with the design principles of the "Camas Design Review Manual: Gateways, Commercial, Mixed-Use and Multifamily Uses," hereafter referred to as the Design Review Manual (DRM), the "Downtown design manual," and the "North Shore design manual." The design review process is not intended to determine the appropriateness of a given use on a given parcel. The design review process is intended to produce a meaningful integration of building, landscaping and natural environment. This will protect the general health, safety, and welfare of the community by making efficient use of the land, which is consistent with the visual character and heritage of the community.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

(Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 23-010, Exh. A, 8-7-2023)

18.19.020 Scope.

A. Design review is required for all new developments within commercial, mixed-use, mixed employment~~business park,~~ or multifamily zones, redevelopment (including change in use, e.g., residential to commercial), or major rehabilitation (exterior changes requiring a building permit or other development permit). Commercial uses in the context of design review include both traditional uses listed as commercial under the zoning code, including those listed as active or passive retail uses in the Downtown design manual, as well as recreational, religious, cultural, educational, and governmental buildings and associated properties. Additionally, design review is applicable to all new developments or redevelopments within a design overlay~~gateway area~~ as defined in Chapter 18.20 Design Overlays~~the design review manual~~. Design review is also required for all development within the North Shore subarea, consistent with the North Shore design manual.

B. Consistency with this chapter shall be reviewed by the approval authority during the development review process.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

(Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 23-010, Exh. A, 8-7-2023)

18.19.025 Applicability and scope of the downtown design manual (DDM).

The provisions of this manual shall be applied to public and private parcels located within the downtown subarea~~commercial zone~~. Development of parcels within the downtown subarea shall comply with the standards found in the DDM. ~~The standards within the DDM supersede the general requirements of the DRM for parcels located within the downtown commercial zone.~~

(Ord. 2518 § 1 (Exh. A (part)), 2008)

[1]Prior ordinance history: Ords. 2443 and 2515.

18.19.030 Design review manual adopted.

The city's design standards are primarily contained in the design review manual, which was adopted by the city.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

18.19.035 Downtown design manual adopted.

The city's design standards for the downtown subarea~~commercial zone~~ are contained in the manual, which is adopted by the city.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

~~18.19.040 Design review committee.~~

~~A. The city council shall establish a seven-person design review committee (DRC) for the purposes of reviewing specific proposals, and recommending conditions and/or other actions necessary for consistency with the principles of the DRM. The DRC members serve at the pleasure of the city council. The DRC shall consist of six members appointed by the city council, including two from the development community, one council member, one planning commissioner, and two citizens at large. A seventh member shall be a neighborhood representative of the surrounding neighborhood to a specific proposal, or a United Camas Association of Neighborhoods member.~~

~~B. The DRC will hold a public meeting to consider a design review application when:~~

~~1. The city planner determines that the issues related to a specific proposal are complex enough to warrant a review by the DRC;~~

~~2. The proposal varies from the guidelines of the DRM; or~~

~~3. When an administrative decision on a design review application is appealed with no prior review by the DRC.~~

~~C. The DRC shall not issue a decision, but shall prepare a written recommendation, together with findings to support the recommendation, to the approval authority within ten days of a public meeting held for that purpose (RCW 36.70.020(5)).~~

(Ord. 2518 § 1 (Exh. A (part)), 2008)

18.19.050 Design principles.

The principles as provided in the DDM or DRM are mandatory and must be demonstrated to have been satisfied in overall intent in order for approval of a design review application to be granted. Standard principles listed below shall apply to all commercial, mixed use, or multifamily uses outside of Downtown. Specific principles are used in addition to the standard principles outside of Downtown for design overlaysgateways and corridors, commercial~~,~~ and mixed uses, ~~and~~ multifamily (e.g. ~~apartments~~stacked housing~~,~~ ~~townhouses, duplexes~~), and the North Shore subarea. Design principles for Downtown are included in the DDM.

A. Standard Principles.

1. Landscaping shall be done with a purpose. It shall be used as a tool to integrate the proposed development into the surrounding environment.

2. All attempts shall be made at minimizing the removal of significant natural features. Significant natural features shall be integrated into the overall site plan.

3. Buildings shall have a "finished" look. Any use of panelized materials shall be integrated into the development in a manner that achieves a seamless appearance.

4. A proposed development shall attempt to incorporate or enhance historic/heritage elements related to the specific site or surrounding area.

B. Specific Principles.

1. All new development and redevelopment within design overlays shall meet the minimum requirements in Chapter 18.20 Design Overlays~~Gateways~~, which supersede the specific principles for Commercial and Mixed Uses and Multifamily as described in 18.19.050.B.2 and B.3 below.

~~a. Gateways shall be devoid of freestanding signs. Preexisting freestanding signs will be subject to removal at the time of any new development, redevelopment, or major rehabilitation on the site. Exemptions include approved directional or community information signage as approved by the city.~~

~~b. Business signage not placed on buildings shall be integrated into the landscaping/streetscaping of the subject property.~~

~~c. Permanent signage within a gateway shall be standardized in a manner that creates a consistent look within the gateway in question.~~

~~d. The surface of pedestrian walkways within intersections shall be accentuated with a unique character.~~

~~e. A consistent streetscape lighting scheme shall be used.~~

2. Commercial and Mixed Uses.

a. On-site parking areas shall be placed to the interior of the development unless site development proves prohibitive. All on-site parking areas along adjacent roadways shall be screened with landscaping. ~~Downtown commercial and mixed-use areas shall not be required to provide on-site parking.~~

b. Buildings shall be used to define the streetscape unless site conditions prove prohibitive.

c. Structures abutting, located in, or located near less intensive uses or zoned areas (such as commercial developments next to residential areas) shall be designed to mitigate size and scale differences.

d. Developments containing ~~a~~ multiple ~~of~~ uses/activities shall integrate each use/activity in a manner that achieves a seamless appearance, or creates a cohesive development.

e. Mixed-use developments that place uses throughout the site (horizontal development) shall organize elements in a manner that minimizes their impact on adjacent lower intensity uses.

f. Walls shall be broken up to avoid a blank look and to provide a sense of scale.

g. Outdoor lighting shall not be directed off-site.

3. Multifamily

a. Stacked Housing.

i. All on-site parking areas shall be screened with landscaping. Parking spaces shall be clustered in small groups of no more than six to ten spaces.

ii. Stacked houses abutting or located in single-family residentially zoned areas shall be designed to mitigate size and scale differences.

iii. Walls shall be articulated in order to avoid a blank look and to provide a sense of scale. Consistent with RCW 36.70A.815, this standard does not apply to affordable housing, new construction meeting passive house requirements, retrofit of existing buildings meeting passive house requirements, the conversion of existing buildings to housing, modular construction, mass timber construction.

iv. Detached garages shall be located to the rear of stacked unit(s) so as not to be directly viewable from a public street.

v. Attached garages shall account for less than fifty percent of the front face of the structure. Garages visible from the street shall be articulated by architectural features, such as windows, to avoid a blank look except as not allowed per RCW 36.70A.815, as noted in 18.19.050.B3.iii above.

b. ~~Townhomes and Rowhouses.~~

~~i. All on-site parking areas (excluding driveways and garages) shall be screened with landscaping.~~

~~ii. Buildings shall be used to define the streetscape unless site conditions prove prohibitive.~~

~~iii. When appropriate, structures abutting or located in single-family residentially zoned areas shall be designed to mitigate size and scale differences.~~

~~iv. Walls shall be articulated in order to avoid a blank look and to provide a sense of scale.~~

~~v. Detached garages shall be located to the rear of the townhouse or rowhouse unit(s) so as not to be directly viewable from a public street.~~

~~vi. Attached garages shall account for less than fifty percent of the front face of the structure. Garages visible from the street shall be articulated by architectural features, such as windows, to avoid a blank look.~~

~~c. Duplex, Triplex and Four-Plex.~~

~~i. Garages shall account for less than fifty percent of the front face of the structure. Garages visible from the street shall be articulated by architectural features, such as windows, to avoid a blank look.~~

4. North Shore Subarea. All development within the North Shore subarea shall meet the minimum requirements determined in North Shore Design Manual.

a. Use a stepped-transition in building height and mass to move from higher density to lower density and from more intense mix-of-uses to single uses to provide compatible scale and privacy between developments. Building height transitions shall be applied to new and vertically expanded buildings in the HD-NS, C-NS, MX-NS, and ME-NS zones within twenty feet (measured horizontally) of an existing single detached residential building thirty feet or less in height. The building height transition standard is met when the height of the taller building does not exceed one foot of height for every one foot separating the new building from the existing single detached residential structure.

b. Vary lot sizes, front yard setbacks, and building product type for residential uses to avoid predictable suburban development patterns (also known as "cookie cutter" development) and better reflect the natural geography.

c. Minimize the visibility of off-street surface parking where feasible by instead integrating structured and tuck-under parking in buildings or locating surface parking behind buildings.

d. Provide public-facing facades and building entries-regardless of land use-that provide weather protection from wind, rain, sun, and the occasional snow.

e. Include multiple entries and windows on ground floor commercial uses facilitate business access, create visual interest, and promote safety.

f. Encourage an aesthetic that complements the surroundings (such as the Pacific Northwest style) through site design, exterior building materials, landscaping, and other features. Exterior building materials may include: concrete, wood, standing-seam sheet metal, glass, board-and-batten, wood siding, corrugated sheet metal, board-formed concrete, board-and-batten siding, commercial/industrial terra-cotta, stone siding, spaced wood sun screens, ply-formed concrete, horizontal wood siding, brick, sheet metal panels, standing-seam metal roofing, stucco, and/or heavy-timber.

g. Use dark-sky friendly lighting for outdoor areas, such as full cutoff fixtures, or limiting light trespass from buildings into the street.

h. Design the development to maximize potential for passive solar and solar-ready construction.

5. Downtown Subarea. All development within the Downtown Subarea shall meet the minimum requirements in the Downtown Design Manual.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

(Ord. No. 16-006, § I, 5-2-2016; Ord. No. 23-010, Exh. A, 8-7-2023)

18.19.060 Guidelines.

A. The guidelines include five major categories:

1. Landscaping and screening;

2. Architecture;

3. Massing and setbacks;

4. Historic and heritage preservation; and

5. Circulation and connections.

B. Each of the major guidelines include subcategories. Compliance with the guideline categories and subcategories demonstrate compliance with the principles. However, not every guideline may be deemed applicable, and therefore required, by the approval authority. Additionally, there may be circumstances where an alternative design solution is proposed that meets the guidelines and intent of the established principles, but is not in strict compliance. Development proposals with alternative design solutions are subject to review by the approval authority, and the approval authority may approve a ~~variance~~ deviation from one or more guidelines, provided the overall intent of the principles is satisfied.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

(Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.19.070 Application requirements.

Application for design review shall be submitted on the most current forms provided by, and in a manner set forth by the ~~community development director or designee~~Community Development Director (Director). The application shall include such drawings, sketches, and narrative as to allow the approval authority review of the specific project on the merits of the city's design review manual and other applicable city codes. An application shall not be deemed complete unless all information requested is provided.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.19.090 Deviations to design review guidelines.

A design review application that includes a deviation from any of the five major guidelines of the DRM shall be subject to review ~~and recommendations~~ from the approval authority~~design review committee~~. The approval authority~~DRC~~ shall base ~~its~~their ~~recommendation~~decision upon findings setting forth and showing that all of the following circumstances exist:

A. Special conditions or circumstances exist which render a specific requirement of the DRM unreasonable, given the location and intended use of the proposed development;

B. The special conditions and circumstances are characteristic of the proposed general use of the site, and not of a specific tenant;

C. The specific conditions and circumstances are not representative of typical development which may be allowed within the zoning district;

D. The requested deviation is based upon functional consideration rather than economic hardship, personal convenience or personal design preferences;

E. Variation from a guideline(s) has sufficiently been compensated by other site amenities; and

F. The requested deviation will not result in a project that is inconsistent with the intent and general scope of the DRM principles.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

18.19.100 Enforcement.

Failure to comply with the requirements of this chapter, or a decision resulting from this chapter are enforceable under Article VIII of CMC Chapter 18.55 Administration and Procedures.

(Ord. 2518 § 1 (Exh. A (part)), 2008)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

EXHIBIT K

Chapter 18.20 Gateway Design Overlays

18.20.010 Purpose and Applicability.
18.20.020 Permitted Uses.
18.20.030 Downtown Design Overlays
18.20.040 General Design Overlay Standards.
18.20.050 Tier 1 and Tier 2 Corridors Design Overlays
18.20.060 Incentives.

18.20.010 Purpose and Applicability.

A. Purpose and Intent

1. To encourage new development and business opportunities along identified corridors throughout the city;
2. To elevate the design standards beyond the base zoning requirements along the identified corridors that result in developments that are arranged, scaled, and designed to create a unique sense of place that is complementary with surrounding land uses; and
3. To promote a mix of uses with a compact growth pattern to efficiently use the remaining developable land and to help support community and neighborhood businesses and residents.

B. Applicability.

1. Unless provided elsewhere in this title or in adopted manuals, this chapter applies to all new development and redevelopment not including ordinary maintenance, interior tenant improvements, or changes of use that do not involve substantial exterior building or site modifications) within the identified overlays, which are shown on the City's Gateway Design Overlays map as Tier 1 and Tier 2 corridors. The overlay applies to properties within 200 feet of the frontage on these corridors. The underlying zoning standards still apply along with the overlay requirements. New development and redevelopment shall submit a site plan review application in accordance with Camas Municipal Code (CMC) Chapter 18.18 Site Plan Review, unless otherwise exempted in this title.
2. For developments consisting of single-family attached or detached dwellings, the design overlay standards shall apply to the development as a whole rather than individual dwelling units or lots. Applicable standards shall be limited to improvements along the designated corridor frontage, including landscaping, screening, pedestrian improvements, and gateway features.
3. All new developments and redevelopment shall be required to submit a design review application in accordance with CMC Chapter 18.19 Design Review of this title prior to applying for a building permit.
4. Unless noted elsewhere in this title or in adopted manuals, landscaping requirements shall be the same as landscaping standards in the underlying base zones.
5. Development and redevelopment of public and private properties that have frontage along corridors in the Downtown Subarea shall comply with the standards found in the Downtown Design Manual.
6. To demonstrate arrival into the community, entry points along Tier 1 corridors shall feature public and private amenities in the form of public art and entry signage.

18.20.020 Permitted Uses.

The uses permitted in a Gateway Design Overlay shall be governed by *Chapter 18.07 Use Authorization*.

18.20.030 Downtown Design Overlays

All development and redevelopment within the Downtown Subarea shall meet the minimum design standards in the Downtown Design Manual.

18.20.040 General Design Overlay Standards.

Before any approval of a design review application is granted, all new development and redevelopment (including change in use, e.g., residential to commercial) within each design overlay shall comply with the general overlay design standards.

General standards are developed with the intent of being applied throughout each design overlay regardless of the underlying land use. Public improvements applied within design overlays that transition between the street segments of the Downtown Subarea and adjacent areas shall be consistent. Development/redevelopment within a design overlay must adhere to the applicable Gateway Design Overlay goals and policies in the Land Use element of the Comprehensive Plan. Development/redevelopment must also adhere to the applicable goals and policies in the Community Character, Land Use, Housing, Transportation, and Economic Development elements, as well as applicable development regulations and other design review standards.

1. Freestanding signs shall be permitted in accordance with Chapter 18.15, provided they are monument-style signs designed to complement the architecture and landscaping of the associated development. Freestanding signs shall be limited in number and consolidated where feasible to minimize visual clutter. Multi-tenant developments shall utilize coordinated signage identifying multiple businesses on a single sign or sign structure.
2. Placement, size, and type of signs will be controlled by the zoning district and Chapter 18.15 Signs.
3. Permanent wayfinding, historic, and/or interpretive signage within a Design Overlay shall be standardized in a manner that creates a consistent look within the Design Overlay area. Permanent signage within entry points shall be standardized in terms of size, color, and materials.
4. The surface of pedestrian walkways within intersections shall be accentuated, consistent with ADA standards, with a unique character, such as stamped or colored concrete or pavers.
5. Bike lanes shall be incorporated into the public right of way where feasible, as determined by the City Engineer and approval authority.
6. A consistent iconic streetscape lighting scheme shall be used that portrays the primary development period, architecture characteristics, or predetermined theme as identified in a concept plan, sub-area plan, or master plan recognized by the City.
7. Layered landscaping must be provided as a transition to properties adjacent to the public right of way, including a mix of trees, shrubs, rockeries, and ground cover.
8. Sidewalks shall be separated from the roadway through the use of planter strips (minimum 4-feet wide), 6-foot diameter tree wells, or if feasible, raingardens/bioswales.
9. Street trees of no less than two inches in diameter shall be planted within planter strips or tree wells at a spacing that creates the appearance of a continuous canopy at tree maturation. Street trees must be replaced with an appropriate species as defined by the City's Plant Materials document if they are removed due to a hazardous condition or other reasons that are first verified by a certified arborist.

18.20.050 Tier 1 and Tier 2 Corridors Design Overlays

As shown on the Gateway Design Overlays map, Tier 1 and Tier 2 corridors extend along intersections and identified routes throughout the city. Tier 1 corridors are located along arterial roadway functional classifications. Tier 2 corridors primarily extend from Tier 1 corridors and include arterial and collector roadway functional classifications. Specific overlay design standards apply to Tier 1 and Tier 2 corridors. All development and redevelopment within the corridors shall comply with the special design standards outlined below.

A. The following list of streets and street segments are referred to as Tier 1 corridors to which other standards below apply.
   a. NE Ingle Road Corridor: Just north of N 92nd Avenue to NE Goodwin Road.
   b. NE Goodwin Road Corridor: NW Camas Meadows Drive to N Boxwood Street.
   c. North Shore Boulevard Corridor: SR-500 to NE 232nd Ave
   d. NE Everett Street Corridor: NE 15th Avenue to the northern Urban Growth Boundary and from SR-14 to E 1st Avenue.
   e. NW Lake Road Corridor: NW Friberg-Strunk Street to NW Leadbetter Drive.
   f. NW Brady Road/NW Parker Street Corridor: City Limits to NW Lake Road.
   g. NW 38th Avenue Corridor: City Limits to NW Parker Street.
   h. NW Pacific Rim Blvd Corridor: City Limits to NW Parker Street.
   i. NW 6th Avenue Corridor: NW 6th Ave/Hwy 14 roundabout to NW Drake Street.
   j. NE 3rd Avenue Corridor: 6th Street/Lechner to NE Joy Street.

B. The following list of streets and street segments are referred to as Tier 2 corridors to which other standards below apply.
   a. NE Ingle Road Corridor: The northern Urban Growth Boundary to N 92nd Avenue.
   b. Green Mountain Corridor: NE 92 Avenue to N Boxwood Street.
   c. NW Camas Meadows Drive Corridor: NE Goodwin Road to NW Lake Road.
   d. NW Friberg-Strunk Street Corridor: NE Goodwin Road to and NW Lake Road.
   e. NW Lake Road Corridor: NW Leadbetter Drive to NE Everett Street.
   f. NW 38th Avenue Corridor: NW 38th Avenue to NW Lake Road.
   g. NW Sierra Street Corridor: NW Brady Road to NW 43rd Avenue.
   h. NW McIntosh Road Corridor: NW Brady Road to NW 18th Avenue.
   i. Division Street Corridor: NE 6th Avenue to NW Sierra Street.
   j. NE Dallas Street Segment: NE 13th Avenue and NE 15th Avenue.
   k. NE Garfield Street Segment: NE Ione Street and NE 15th Avenue.
   l. SE Crown Road Corridor: NE 3rd Avenue to SE 15th Street.
   m. NE 43rd Avenue/SE 15th Street Corridor: NE Everett Street and SE 283rd Avenue.

Table 18.20-1. Gateway Design Overlay Specific Standards

Design Standards	Tier 1 Design Overlay	Tier 2 Design Overlay
18.20-010 Landscaping and Screening Standards		

Design Standards	Tier 1 Design Overlay	Tier 2 Design Overlay
A. Landscaping adjacent to the public right-of-way shall provide multiple layers of plantings, including canopy trees, understory trees, shrubs and groundcover.	S	S
B. Buildings frontages adjacent to pedestrian areas shall incorporate pedestrian-oriented architectural amenities such as flower baskets, window planters, decorative wall-mounted lighting, awnings, or similar features.	S	N/A
C. Median planting design/plant selection shall create a unique and cohesive streetscape design.	S	S
18.20-020 Use Standards		
A. If allowed in the underlying zone, drive-throughs are allowed in a Tier 1 Design Overlay and shall be screened with landscaping or architectural features that integrate them into the building. Freestanding drive-throughs are not allowed.	S/C (if allowed in underlying zone, see Chapter 18.07 Use Authorization)	N/A
B. Those Neighborhood Commercial uses listed as permitted (P) are allowed within residential zones on corner lots at intersections with collector or arterial streets. The neighborhood commercial use must be pedestrian oriented with access to a public sidewalk or walkway and may have a maximum building footprint of 2,500 square feet and no more than five (5) off-street parking spaces, which can be satisfied by on-street parking provided they are along the frontage of the subject parcel.	S	S
18.20-030 Architecture Standards		
A. Permanent signage within Design Overlays shall be standardized in terms of size, color, and materials.	S	N/A
18.20-040 Massing and Setback Standards		
A. New construction shall include a maximum setback of 20 feet. Developments containing multiple principal buildings or a principal building exceeding 20,000 square feet may exceed this setback, provided that the development includes enhanced frontage landscaping and direct pedestrian connections between principal building entrances and the public sidewalk. Main entrances to the buildings must be oriented to the street or to an internal pedestrian circulation system connected to the public sidewalk.	S	N/A
B. On-site parking areas shall be located to the rear or the side of a building except that parking may be located between a building and the public right-of-way when screened by landscaping and connected to the public sidewalk by a designated pedestrian walkway.	S	N/A
C. Setbacks shall include landscaping, hardscaping, and public art to enhance the pedestrian experience.	S	N/A

Design Standards	Tier 1 Design Overlay	Tier 2 Design Overlay
18.20-050 Historic and Heritage Preservation Standards		
A. The use of historic markers, information kiosks, project names, architectural features, or other elements of the project shall promote the historic heritage of the site or surrounding area, where appropriate.	S	N/A
18.20-060 Circulation and Connections Standards		
A. Orient the main public entrance toward the public right-of-way or toward an internal pedestrian circulation system connected to the public sidewalk. Pedestrian walkways shall connect each building's front entry with the sidewalk, without conflicting with accessways on the site.	S	S
B. New developments shall include plans for alternative transportation, such as providing attractive and convenient bus stop shelters, bicycle parking, etc.	S	S
C. Trees and planting strips or raingardens/bioswales shall be used for separating vehicles and pedestrian movements, as well as provide a secure and pedestrian friendly environment.	S	S
18.20-070 Public Realm Standards		
A. Where applicable (as determined by the City), and when corridors intersect with an existing street, provide modular, movable, and durable seating in public spaces and ensure seating areas are shaded and accessible.	S/C (see *Chapter 18.07 Use Authorization)*	S/C (*see Chapter 18.07 Use Authorization*)

NA – Not Applicable

S – Standard

S/C – Standard with certain conditions

C. Gateway Design Overlay Features

Specific design standards in Table 18.20-1 apply to Tier 1 and Tier 2 corridors. Additional design shall be included where Tier 1 and Tier 2 corridors intersect and for properties located within 200 ft. of city limits enhance the character and style desired for a particular design overlay area. Development/redevelopment proposals within Tier 1 and Tier 2 Design Overlays should include public and private design features listed in Table 20-2 to demonstrate arrival into the community.

a. Tier 1 Design Overlay areas shall include two additional design features from Table 20- 2.

b. Tier 2 Design Overlay areas shall include one additional design feature from Table 20- 2.

c. Required design features shall be provided on the development site or within the adjoining public right-of-way, subject to City approval. Features located within the public right-of-way shall be consistent with adopted City standards.

d. Design features used to satisfy this section shall be in addition to improvements otherwise required by applicable development standards.

Table 20-2. List of unique design overlay features.

Sidewalks	• Wide sidewalk (minimum of 8 feet) • Bus stop improvements (shelter, lighting, bench) – develop consistent bus stop standards to be implemented throughout the city • Public seating areas, benches, or other pedestrian amenities adjacent to sidewalks, plazas, or pedestrian gathering areas
Roadway Right-of-way	• Roundabouts at entry point intersections • Public art in center of roundabout • Protected or buffered bike lanes to provide a horizontal separation of 1 to 3 feet between the bike lane and motor vehicle lane • Community entry or neighborhood identification signage welcoming visitors to Camas or identifying a neighborhood or district
Other Public Realm amenities and features	• Install posts/poles for community pride/event banners (less than 16 square feet), such as school pendants and community events • Identify and develop locations for public green spaces and pedestrian access through campus style development • Decorative fencing, railings, or guardrails that complement the character of the corridor • Public art, including murals, sculptures, decorative installations, or other publicly visible artwork • Enhanced landscaping, including ornamental plantings, flowering trees, or landscaped entry features beyond minimum requirements • Decorative pedestrian-scale lighting along sidewalks or pedestrian gathering areas • Publicly accessible plazas, courtyards, or outdoor gathering areas • Limit lighting to allow for views of the night sky (motion sensors, or other technology to limit excessive light) • Enhanced frontage landscaping that complements adjacent natural areas and incorporates native trees, shrubs, and other vegetation to create a natural transition between the development and surrounding properties.

18.20.060 Incentives.

A. Public Art. A five percent increase in lot coverage area may be granted upon staff approval for providing public art, equal in value to 1% of a project's construction cost, within a proposed project.

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § I(Exh. A), 5-18-2009)

EXHIBIT L

Chapter 18.22 Mixed Employment (ME)

18.22.010 Purpose

18.22.020 Site development standards

18.22.030 Building design guidelines

18.22.040 Warehousing

18.22.050 Mixed use

18.22.010 Purpose

A. Purpose and Intent. The Mixed Employment District provides a variety of employment focused activities located in strategic areas of the community. These areas are important to the local and regional economy, contributing to the overall economic sustainability of the City of Camas by enhancing service variety and job diversity through a range of employment opportunities closer to residents with access to good transportation options. Mixed Employment Districts are characterized by higher employment density such as advanced manufacturing, research and development, service commercial, offices, and limited retail uses. These districts encourage innovation and a business environment that is flexible and resilient to changing economic conditions and customary business cyclical conditions.

   The ME district standards encourage and accommodate the adaptive reuse of existing development and emphasize multimodal accessibility and connectivity. It also provides a zoning designation for uses which will create local higher wage employment opportunities and offer a wide range of uses that are compatible with one another as well as adjoining residential and commercial areas. The ME districts can be located on small or large sites and present a sustainable alternative to solely commercial or industrially designated areas while retaining legacy light industrial and business park uses. Primary uses include a broad mix of light industrial, research and development, advanced technology production, artisan/craft industrial, commercial, office, and personal service uses, within a more amenity-rich environment.

B. Flexibility of Property Development Regulations. The ME district provides for flexibility of certain property development regulations, placement and clustering of buildings, and provisions for site design intended to promote innovative approaches to planning, including:
   1. The encouragement of employment expansion to the city's economic base through emerging business types and new capital investment;

2. The preservation of natural features, open space areas and native vegetation;
3. The provision of on-site essential services for industries, employees, and customers;
4. The protection of adjacent properties from adverse impacts; nearby existing and future non-employment land uses and activities; and
5. The arrangement of buildings and land use intensities, as they relate to surrounding land uses to minimize and mitigate adverse impacts.

C. Anticipated Benefits. Development within the ME district is of direct and indirect economic benefit to the city in the form of high-wages, innovative and resilient employers, local employment with a diverse work force, desirable creative designs for projects, and tax revenue for the city to fund urban services at appropriate levels. Development within this district will also diversify the economy by realizing diverse employers and uses.

18.22.020 Site development standards

Site improvements shall be designed to result in a complementary appearance that will blend with surroundings and be compatible with neighboring developments.

A. Dimensional Standards are established in Section 18.09.030.

B. Grading and Drainage. Site grading and drainage shall be designed by a Washington licensed civil engineer. Grading and slopes are to be compatible with landscaping materials, shall not permit erosion, and shall minimize use of retaining walls to control slopes. Plans submitted for building permits shall include a construction phase mitigating procedure to control temporary runoff, erosion, sedimentation, or other objectionable effects.

C. Parking and Loading.

1. Shared parking is encouraged between adjacent uses.

2. Parking areas available to the general public should be clearly identified.

3. Parking areas between the primary street and the front of the building should be limited to visitor and accessible spaces. Employee parking should be located behind the front of the building screened from the public right of way.

4. Parking areas between the primary street and front of building should have a minimum landscape area of 20 feet from right of way to the paved area.

5. All new developments should provide multimodal connections throughout the development, as well as to adjacent developments.

6. All loading areas within parking areas shall be located to minimize viewing from adjacent properties and roadways. They shall be screened from horizontal view with the use of dense landscaping, mounds, view screen fencing, or other approved means.

7. Truck docks and loading areas are not permitted on the front elevation of the property and are to be screened from the front view if located within the side yards.

D. Refuse/Storage. Refuse areas and service/storage areas are to be located under cover. Refuse areas should be located behind the building screened from the right of way.

E. Utilities. All utility service lines are to be located underground. All pad-mounted equipment and other visible utility and service equipment are to be carefully located to minimize appearance and shall be appropriately screened consistent with required access and safety requirements.

F. Fencing. Perimeter fencing shall be so constructed as to minimize visual impacts. Walls or fences separating adjoining parcels may be located at the property line. No wall or fence taller than three feet shall be placed within the landscape setbacks along rear or side lot lines, and no wall or fence exceeding three feet in height shall be located on the property, except for security fencing. Security fencing shall blend into and be compatible with landscaping. Fencing shall have earth tone colors of brown, tan, gray, or green. Walls shall be constructed of materials compatible with the building architecture.

G. Lighting. Site and building lighting shall be designed to minimize glare to the adjacent properties. Site-lighting poles shall not exceed twenty feet in height and shall direct the light downward. Lighting sources viewed from above or below on adjacent property shall be shielded. Building lighting is to be concealed and indirect. Lighting in service areas is to be contained to conceal visibility of light sources from street and adjacent property. Site lighting is to be designed to provide uniform distribution, and the light levels shall be adequate for reasonable security and safety on the premises.

18.22.030 Building design guidelines

A. All structures should be designed to complement the local setting and with neighboring developments, while contributing to the overall architectural character of the area. The building design should appear as an integrated part of the design concept. All facilities

should be designed by a Washington licensed architect and reflect a high standard of architectural design. Buildings should be either reinforced concrete and steel, masonry, or wood frame construction. Prefabricated metal buildings or sheet metal-sided structures are not permitted, unless an exception is made by staff review, based upon a design that meets or exceeds the overall architectural character of the area.

B. Building design should consider the orientation toward major streets and thoroughfares; vehicular and pedestrian flow patterns; the character of neighboring development; expression of the facilities functional organization and individual character; and the satisfaction of the physical and functional needs of facility users.

C. Design features that can contribute to the design character of a project include entrance drives, enhanced visitor parking areas, highlighted visitor entrances and entry plazas, decorative pedestrian plazas and walkways, focal landscape treatments and site sculptures, employee lunch areas (with amenities such as outdoor seating, garden areas, etc.), atriums and interior courts, dynamic building and roof forms, distinctive window patterns, shade and shadow patterns, surface treatments, and accent lighting and landscaping.

D. Long, blank, straight building facades are generally discouraged as they are uninviting and visually uninteresting. Building setbacks shall be varied, and all facades articulated to add visual variety, distinctiveness, and human scale. Space created by the varied setbacks of the building facades can accommodate landscaping and pedestrian/employee areas that contribute to visual interest. Buildings should orient along the length of the primary street frontage in order to avoid visual exposure of loading areas to the public right of way.

E. Exterior building colors shall be compatible with the surrounding man-made and natural environments, and not in competition with surrounding elements for attention (i.e., building color should not, in any way, become signing for the site). Generally, muted colors are encouraged with primary colors or other bright colors used only as accents to enliven the architecture. Repetition and overuse of a single approach to the use of color, such as horizontal stripes/bands, can result in this treatment losing its effectiveness.

F. Roof-mounted equipment that is visible from adjacent, elevated property should be painted a compatible color with the roof screen.

G. All rooftop or outdoor mechanical equipment shall be fully screened from public view in a manner which is architecturally integrated with the structure. Screening shall be constructed to a finished standard using materials and finishes consistent with the rest

of the building. Building designs should consider potential visibility of equipment from elevated rights-of-way or adjoining property.

H. All vents, flues, or other protrusions through the roof, less than sixteen inches in diameter need not be screened from view but must be painted or treated to blend with the color of the background. All such vents, flues, or other protrusions through the roof, more than sixteen inches in diameter shall be considered mechanical equipment and shall be screened from view.

18.22.040 Warehousing

A. Warehousing, indoor storage, and distribution activity may be allowed only as an accessory use when directly associated with and subordinate to a permitted principal use located on the same site. Accessory warehousing may include storage of raw materials, equipment, inventory, finished goods, tools, vehicles, or supplies used in connection with the principal use, but shall not function as a stand-alone warehouse, distribution center, fulfillment center, freight terminal, mini-storage facility, self-service storage facility, or outdoor storage yard.

B. Accessory warehousing, indoor storage, and distribution areas shall not exceed fifty percent of the gross floor area of the building or tenant space unless a greater percentage is approved by the approval authority upon finding that the storage area is necessary to support the principal permitted use, the principal use remains the dominant use of the site or tenant space, and the use will not generate traffic, truck trips, loading activity, outdoor storage, noise, or other operational impacts inconsistent with the purpose of the zone.

18.22.050 Mixed use

The primary purpose of the Mixed Employment (ME) district is to promote employment opportunities and job creation. As an economic development incentive, on sites of 25 acres or greater, mixed-use development incorporating residential uses may be authorized through a City Council-approved development agreement when associated with substantial office, manufacturing, or industrial development that advances the City's economic development objectives and facilitates significant employment investment and job creation. Employment uses shall remain the predominant component of the development. The agreement shall establish the permitted mix of uses, development phasing, and enforceable employment commitments. Building permits for the qualifying employment development shall be issued, and construction commenced, prior to or concurrently with residential development.

EXHIBIT M

Chapter 18.23 PLANNED RESIDENTIAL DEVELOPMENT (PRD)

18.23.010 Purpose.

The purpose of this chapter is to promote the public health, safety and general welfare of the citizens of the City of Camas in accordance with state law and the city's comprehensive plan; to facilitate the innovative development of land; and to provide for greater flexibility in the development of residential lots in ~~medium and high-density~~ residential districts.

A further purpose of this chapter is to allow for the modification of certain regulations when it can be demonstrated that such modification would result in a development which would not increase the density and intensity of land use (except as provided for in Section 18.23.040 of this chapter); would preserve or create features or facilities of benefit to the community such as, but not limited to, open space or active recreational facilities; would be compatible with surrounding development; and would conform to the goals and policies of the City of Camas' comprehensive plan.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.23.020 Definitions.

In addition to those definitions listed in CMC Chapter 18.03, the following definitions shall also apply:

"Density bonus" means a percentage of units allowed in a PRD over and above the number of units provided for in the zoning district absent a PRD proposal.

"Density transfer" means a transfer of dwelling units located on a site identified as sensitive lands or open space to the developable portion of land on the site. (Refer to Section 18.09.060 Density transfers)

"Development agreement" means a legal contract between the city and the developer relative to a specific project and piece of property. The agreement may specify and further delineate, and may include but is not limited to, findings of council, actions, requirements of the developer and city, benefits to the parties involved, conditions of approval, time frames, etc. A development agreement shall become binding upon the land.

"Master plan" means a planned proposal for development that includes and illustrates the division of land into lots, the location and sizes of streets, roads and accessways, pedestrian circulation, landscaping, parking areas and the location of and types and densities of uses. A master plan further identifies the dimensions, height, location, and setbacks of all such buildings to the extent necessary to comply with the purpose and intent set forth in this chapter.

"Open space" means land that is set aside and maintained in a natural state, providing air, light, and habitat for wildlife, and/or containing significant trees and vegetation. Open space may also contain environmentally sensitive lands, which include but are not limited to steep slopes and areas with unstable soils, wetlands, and streams and watercourses. Open space may also provide for active and passive recreation use. There are two general categories of open space:

1. Natural open space is land that is devoted to protecting environmentally sensitive lands as defined in this code. Natural open space generally has no developed areas, with the exception of trails as identified in the comprehensive parks, recreation, and open space plan, or by a condition of development approval.

2. Recreational open space is land that is set aside and shall include development for recreational opportunities such as trails, sports fields, playgrounds, swimming pools, tennis courts, and picnic areas. Recreational open space is generally limited in size and intensity, proportionate to the development, and is intended for the enjoyment of the residents of the development.

"Peripheral yard" means those areas which form the boundary between a planned unit or planned residential development district and any other zoning district, planned unit, or planned residential development.

"Planned residential development" (hereinafter referred to as a PRD) means a development constructed on land of at least ~~ten~~ five acres in size, designed and consistent with an approved master plan. A PRD is comprised of two primary components: detached single-family and middle housing or multifamily units. ~~The single-family component shall contain only single-family detached residences on lots equal to or greater than four thousand square feet~~. The middle housing or multifamily component may contain duplexes, triplexes, fourplexes, townhouses, stacked flats, courtyard apartments, and cottage housing or apartments~~either attached or detached single-family residences on lots smaller than four thousand square feet, or it may contain, but may not be limited to, duplexes, rowhouses, apartments, and designated manufactures homes~~, all developed in accordance with Section 18.23.030(A) of this chapter. Secondary components include park and recreational amenities, accessory uses, and limited commercial uses as provided in this chapter.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006; Ord. No. 15-008, § I, 3-16-2015)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.23.030 Scope.

Planned residential developments (PRDs) are optional. If proposed, it shall be established under the following criteria:

A. A PRD may be allowed in all ~~R and MF~~ residential zoning districts. Where residentially zoned land is contiguous to lands zoned for commercial uses, the city may, subject to a development agreement, provide for the inclusion of the commercial area into the PRD for the purposes of establishing continuity community design, pedestrian and commercial circulation, streetscape standards and design, and effective transitions between commercial and residential uses.

B. The minimum land area necessary to apply for a PRD shall be ~~ten~~ five acres of contiguous land.

C. All land in which a PRD is to be developed shall be held and maintained in a single ownership, including but not limited to an individual, partnership, corporation, or homeowner's association. Evidence of such ownership shall be provided to the ~~planning commission and city council~~ Hearings Examiner before PRD approval.

D. Permissible uses within a PRD include any use listed as a permitted use or condition use in the applicable zones, as per CMC Chapter 18.07, when approved as part of a master plan. Notwithstanding an approved master plan, incidental accessory buildings, incidental accessory structures, and home occupations may be authorized on a case by case basis.

E. A minimum of fifty percent to a maximum of seventy percent of the overall permitted residential density of the PRD must be single-family homes.

F. The middle housing or multifamily component ~~(two or more attached dwelling units)~~ of a PRD shall ideally be developed toward the interior of the tract, rather than the periphery, to ensure compatibility with existing single-family residences that border the surrounding properties. Alternatively, when the tract borders a non-residential use or a collector or arterial street, the middle housing or multifamily components can be located on the periphery to act as a transition or buffer. Deviation from this

requirement shall be requested during the preliminary master plan review, and specifically approved by the ~~planning commission and city council~~Hearings Examiner.

G. Density standards and bonuses for the residential portion of a PRD shall be in accordance with CMC Sections 18.23.040 and 18.23.050.

H. ~~An equivalent amount of up to twenty~~ At least fifteen percent of the ~~developable~~ gross land area shall be set aside ~~and developed~~ as ~~recreational~~ open space in a PRD, and shall include the following:

1. Passive or active recreation concentrated in large usable areas;

2. Existing groves of matures trees or other individual healthy mature trees to be retained;

~~2~~3. Provide trails and open space for connection and extension with the city's open space and trail plan, if feasible; and

~~3~~4. Be held under one ownership, and maintained by the ownership; or be held in common ownership by means of homeowners' association, and maintained by the homeowners' association. The open space and recreation areas shall be dedicated for public use and be maintained by the ownership or homeowners' association.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 15-008, § II, 3-16-2015)

18.23.040 Density standards.

A. Density standards for a PRD shall be based on the gross area of the parcel being considered. Open space, greenways, sensitive areas, parks, and recreation areas set aside within the tract shall be used in the computation of the gross development area. The maximum number of dwelling units in the PRD shall be determined as follows:

Divide the gross land area (in square feet) by the minimum lot size (in square feet) of the underlying zoning district.

B. The minimum lot size for a single-family dwelling within the single-family component of the PRD shall be four thousand square feet. The minimum lot width, depth and setback requirements, and maximum lot coverage requirement shall be established for each PRD as part of the approval process. The minimum lot size for the dwellings within the middle housing or multifamily component of the PRD shall be established as part of the master plan approval.

C. If more than one zoning district is included within the PRD area, the number of dwelling units allowed in each zoning district shall be computed, and then combined to determine the total number of dwelling units within the entire development.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.23.050 Density bonus.

A density bonus of ~~no more than twenty~~ fifteen percent ~~may~~shall be granted ~~by the city council~~ for a PRD~~, as demonstrated by site design and layout~~. For example: ten acres in an R~~1~~-10 zone yields four hundred thirty-five thousand six hundred square feet. This is then divided by ten thousand square feet. Using this example, the maximum number of units equals forty-three and one-half units, and with a ~~twenty~~fifteen percent density bonus the maximum number of units allowed would be fifty~~-two~~. The hearing examiner may grant an additional density

bonus of up to twenty percent for any PRD that sets aside twenty percent or more open space under Section 18.23.030(H).

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.23.060 Permitted uses.

Permitted or conditional uses currently listed in the applicable zoning classification shall be considered permitted within a PRD. All proposed uses shall be reviewed in conjunction with the preliminary master plan review.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.23.070 ~~Preliminary m~~Master plan—Requirements.

A. Initial Conference. Schedule a pre-application conference to discuss and resolve conceptual problems prior to submission of the ~~preliminary~~ master plan related to such application.

B. Contents. The ~~preliminary~~ master plan shall include the following information:

1. The legal description of the total site proposed for development;
2. The existing and proposed land uses within the development, and the existing and proposed location of all structures;
3. The proposed residential density for the development, which shall include the number and types of dwelling units;
4. The proposed lot sizes and building envelopes. Approved building envelopes will establish the setbacks for each lot or parcel in which development may occur;
5. A site plan drawn to scale and depicting the following:
    a. The location of all areas to be conveyed, dedicated, or maintained as public or private streets; access and egress to the development showing proposed traffic circulation, parking areas, and pedestrian walks,
    b. The proposed location of any residential buildings, and any other structures, including identification of all buildings as single-family, duplex, townhouse, apartment, condominium, designated manufactured home, or otherwise,
    c. The location of areas to be maintained as common open space, and a description of the proposed use of those areas,
    d. The location of areas to be maintained as open space network, if applicable,
    e. Proposed lot or boundary lines for residential, open space, parks, and recreational areas, management or allocation purposes;
6. An accurate survey of the property showing the topography in five-foot contours, identifying slopes above fifteen percent, all existing, isolated trees six inches or more in diameter, all wooded areas, all existing streets, utility easements, drainage patterns, structures, and other improvements, the location of all easements and rights-of-way for utilities, including, but not limited to water, sanitary sewers, storm sewer, electricity, gas, telephone, and cable TV lines;
7. A document containing agreements, provisions, and covenants regarding the establishment of a homeowner's association, which provides for the permanent ownership, maintenance, protection, and

use of the planned development, including streets (if privately owned), storm drain facilities, utilities, common areas (e.g., storage areas, parking areas, and landscaping) open spaces, greenways, parks, and recreational areas;

8. A landscaping plan drawn to scale and demonstrating compliance with CMC Chapter 18.13 Landscaping of this title. Additionally, the landscape plan shall indicate the landscaping features such as screening, fences, lighting, and signage;

9. A development schedule outlining the expected schedule and phases of development;

~~10. The calculation of all applicable impact fees. This shall be coordinated with the city prior to submission of the preliminary master plan.~~

C. Effect of Approval. Approval by the ~~city council~~ Hearings Examiner of a ~~preliminary~~ master plan shall constitute provisional approval of the PRD. This approval is contingent upon the applicant submitting a final development plan ~~and development agreement, if required,~~ that complies with the provisions of this chapter.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.23.080 Professional preparation.

A. The applicant for a proposed PRD shall certify that one or more of the following have been involved with the preparation of the ~~preliminary~~ master plan:

1. An architect licensed in the state of Washington;

2. A landscape architect licensed in the state of Washington;

3. A registered civil engineer or a registered land surveyor licensed in the state of Washington; and/or

4. A certified landscape architect, certified arborist, or a qualified biologist, if a vegetation management plan is required.

B. All plans and specifications required for the development shall be prepared and designed by engineers and/or architects licensed in the state of Washington.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.23.100 Approval standards.

Approval for a PRD shall be based on the following standards:

A. The proposed PRD conforms to:

1. The City of Camas' comprehensive plan;

2. All provisions of the Camas Zoning Code which are not proposed for modification;

3. All engineering design standards; and

4. Any other applicable city, state, federal regulations, policies, or plans, except those standards proposed for modification.

B. Utilities and other public services necessary to serve the needs of the proposed development shall be made available, including open spaces, drainageways, streets, alleys, other public ways, potable water,

transit facilities, sanitary sewers, parks, playgrounds, schools, sidewalks, and other improvements that assure safe walking conditions for students who walk to and from school.

C. The probable adverse environmental impacts of the proposed development, together with any practical means of mitigating adverse impacts, have been considered such that the proposal shall not have ~~an unacceptable~~ a significant adverse effect upon the quality of the environment, in accordance with CMC Title 16 and 43.21C RCW.

D. Approving the proposed development shall serve the public use and interest, and adequate provision has been made for the public health, safety, and general welfare.

E. The proposed development satisfies the standards and criteria as set forth in this chapter.

F. The proposed development shall be superior to, or more innovative than conventional development, and shall provide greater public benefit without additional probable adverse impacts to public health, safety, or the environment, than available through the use of conventional zoning and/or development standards.

G. The proposed development shall provide at least two access points (where a PRD does not have access to a primary or secondary arterial) that distribute the traffic impacts to adjacent streets in an acceptable manner.

H. ~~Preliminary~~Master plan approval alone does not constitute approval to obtain any building permits or begin construction of the project.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.23.110 Relationship to adjacent areas.

The design and layout of a planned development shall take into account the integration and compatibility of the site to the surrounding areas. The perimeter of the planned development shall be so designed as to minimize any undesirable impact on adjacent properties. Setbacks from the property lines of the planned development shall be comparable to, or compatible with, those of any existing development on adjacent properties. Or, if adjacent properties are undeveloped, then setbacks shall conform to the type of development that may be permitted on adjacent properties.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.23.120 Amendments.

A. Minor Amendments. In issuing building permits for construction of a PRD, the city may approve minor adjustments provided that such adjustments shall not:

1. Increase the number of dwelling units;
2. Decrease the amount of parking spaces, loading spaces, or open space;
3. Permit structures to be located closer to any property line;
4. Change any points of ingress or egress to the development as set forth in the final development plan;
5. Conflict with any conditions or statements within a development agreement;
6. Increase the height of buildings beyond the limits of the underlying zone.

B. Amendment of Final Development Plan. Any change in the final development plan, other than those minor adjustments specifically authorized in writing by the city at the time building permits are issued, must be

reviewed by the ~~planning commission~~ Hearings Examiner ~~and recorded in the minutes thereof. The recommendation of the planning commission regarding any change in the final development plan, together with its reasons therefore, shall be submitted to the city council for its approval~~. Upon approval of such changes by the ~~city council~~ Hearings Examiner, the final development plan shall be considered amended to that extent.

C. Unauthorized Changes. Unauthorized changes or substantial deviations from the final development plan shall be subject to a stop work order by the city. If not corrected, no occupancy permits shall be issued until the development is brought into compliance with the approved final development plan.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.23.130 Procedure.

An application for a PRD shall be processed as a Type III procedure pursuant to CMC Chapter 18.55 Administration and Procedures of this title. A public hearing before the ~~planning commission and review by the city council~~ Hearings Examiner is required for ~~preliminary~~ master plan approval. ~~Final master plan approval is subject to review and acceptance by the city council at a public meeting. Final approval shall be in accordance with the provisions of this chapter.~~

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2451 § 3, 2006: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

EXHIBIT N

Chapter 18.24 MIXED USE[1]

18.24.010 Purpose.

A. To encourage new development and business opportunities;

B. To foster the development of mixed use areas that are arranged, scaled, and designed to be compatible with surrounding land uses;

C. To promote a compact growth pattern to efficiently use the remaining developable land and to help sustain neighborhood businesses; and

D. To promote new construction of multi-story structures with commercial uses on the ground floor and residential uses on the upper stories.

E. To require design integration if the mixed use project is proposed and constructed in a horizontal, rather than vertical regime.

F. To encourage vibrant, walkable neighborhoods that integrate a variety of land uses and foster economic vitality.

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § I(Exh. A), 5-18-2009)

18.24.020 Applicability.

A. All new development within the Mixed Use (MX) zone shall submit a site plan review application in accordance with CMC Chapter 18.18 Site Plan Review of this title unless otherwise exempt per this title.

B. All new developments and uses shall be required to submit a design review application in accordance with CMC Chapter 18.19 Design Review of this title prior to applying for a building permit.

C. Landscaping requirements shall be the same as landscaping standards in community commercial zones.

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § I(Exh. A), 5-18-2009)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.24.030 Mix of Uses

A. To ensure projects within the Mixed Use zone have a mix of commercial and residential uses, and no one use predominates the other, development proposals shall include a mix of nonresidential and residential uses through either vertical mixed use, horizontal mixed use, or a combination of both. The mix of uses shall be demonstrated through approval of a site plan.

B. Vertical Mixed Use. Residential uses may be located above ground-floor commercial or nonresidential uses. A building with ground-floor commercial or nonresidential uses and residential uses above shall be considered consistent with the mixed-use intent of this chapter.

[1]Editor's note(s)—Ord. No. 2547, § I, adopted May 18, 2009, amended Ch. 18.24, in its entirety, to read as herein set out. See also the Code Comparative Table and Disposition List.

C. Horizontal Mixed Use. Where commercial or nonresidential uses and residential uses are provided in separate buildings, separate portions of a site, or otherwise in a horizontal development pattern, the development shall consist of a maximum of fifty percent residential uses and a minimum of fifty percent commercial or nonresidential uses.

1. The required use mix may be measured using either site acreage, based on the portion of the site devoted primarily to each use; or gross floor area, based on the total floor area devoted to each use.

2. When the use mix is measured by site acreage, the area devoted to each use shall include buildings, outdoor use areas, service areas, loading areas, and parking areas primarily associated with that use. Shared parking areas, drive aisles, internal circulation, stormwater facilities, landscaping, open space, and other common improvements may be allocated proportionally between uses based on floor area, parking demand, or another reasonable method approved by the approval authority.

3. The development shall be designed as a cohesive mixed-use project. The site plan shall demonstrate integration of uses through building orientation, shared or coordinated parking, pedestrian connections, landscaping, open space, architectural compatibility, signage, lighting, and other design features that connect the commercial or nonresidential and residential components.

D. Commercial Frontages. Where a development site has frontage on an arterial, collector, or design overlay corridor, commercial or nonresidential uses shall be located and oriented towards the street frontage so as to maximize visibility and accessibility of these uses to the street.

E. Smaller lots. On lots smaller than 20,000 square feet, a development proposal may be allowed to be either 100% commercial or 100% residential.

F. Residential Flexibility. The approval authority may allow residential uses to exceed fifty percent of the site acreage, up to a maximum of seventy percent residential acreage, when the applicant demonstrates that the proposal will provide a superior mixed-use outcome by ensuring timely delivery of the commercial or nonresidential component. Approval of residential acreage above fifty percent may be conditioned on:

1. Concurrent construction of the commercial or nonresidential component with the residential component where building permits for the commercial or nonresidential components are issued and construction is started before or at the same time as the residential components; or

2. Execution of a development agreement with a phasing plan.

G. Property Previously Zoned Residential. Any property that was zoned for residential use immediately prior to being rezoned to Mixed Use as part of the 2026 Comprehensive Plan Update may be developed with up to one hundred percent residential uses.

18.24.040 General Standards

A. Building height: Buildings shall be limited to four stories and 60 feet in height for vertical mixed use and 45 feet in height for horizontal mixed use.

B. Ground floor design standards: In vertical mixed-use developments, ground floors shall be designed to support adaptable uses and meet the following requirements:

1. A minimum floor-to-ceiling height of fifteen feet, unless the approval authority determines that a lesser height is appropriate due to building design or other site-specific conditions; and

2. A minimum façade transparency of sixty percent.

3. To support small business and flexible tenant occupancy, ground floors shall be designed to be capable of subdivision into a variety of tenant spaces, demonstrated by location of walls, entrances, and mechanical

systems. This requirement does not apply where the applicant demonstrates that a larger tenant space is needed for a specific tenant, anchor tenant, build-to-lease arrangement.

C. Shared parking requirements: Mixed-use developments are encouraged to make efficient use of parking through shared parking, reduced parking demand, pedestrian and bicycle access, and connections between complementary uses. Required parking may be reduced pursuant to Section 18.11.050 when the mix of uses on a site have different peak parking demand periods or when parking can be effectively shared among uses, buildings, parcels, or phases of development.

18.24.~~030~~050 Incentives.

A. Traffic Impact Fee (TIF) Reduction. A reduction of the TIF may be granted pursuant to § 18.22.100 CMC.

B. Public Art. A five percent increase in lot coverage area may be granted ~~upon design review committee approval~~ for providing public art within proposed project.

C. Sustainability. Up to a ten percent reduction in building and/or engineering review fees may be authorized at the discretion of the director in proportion to a proposed low-impact development method.

D. To encourage affordable housing development, regulated affordable units may be exempted from the residential portion of the use percentage and counted towards the non-residential percentage minimum.

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § I(Exh. A), 5-18-2009)

18.24.~~040~~060 Exemptions.

Newly created lots, via short plats or subdivisions or combined lots, that are adjacent to existing single-family lots shall not be required to bevel to existing platted lots (Refer to §18.09.080-B).

(Ord. No. 2545, § III, 5-4-2009; Ord. No. 2547, § I(Exh. A), 5-18-2009)

EXHIBIT O

Chapter 18.26 FLEXIBLE DEVELOPMENT

18.26.010 Purpose and intent.

This chapter is optional in all zoning districts ~~except the LI/BP zone~~. The purpose and intent of this chapter is to promote the public health, safety and general welfare of the citizens of the City of Camas in accordance with state law and the City's Comprehensive Plan; and

A. To provide for greater flexibility in the development of properties;

B. To foster the development of land that is arranged, scaled, and designed to be compatible with existing and potential densities;

C. To promote a growth pattern to efficiently use land;

D. To promote construction and redevelopment that implements ~~the most current~~ sustainable features;

E. Retain historical building or other structures to the greatest extent possible; and

F. To allow for the modification of certain regulations when it can be demonstrated that such modification meets the minimum points for development under this chapter.

G. To encourage site and building design that supports renewable energy, electric vehicle charging infrastructure, low-impact development, tree retention and planting, and other features that advance Comprehensive Plan climate and resiliency goals and policies.

G. To provide for an alternative to CMC Chapter 18.23 - Planned Residential Development (PRD). The city shall review a proposal for either a PRD or a flexible development, not a combination.

(Ord. No. 2628, § I(Exh. A), 10-17-2011)

18.26.030 Permitted uses.

Only permitted land uses within the underlying zoning classification shall be considered permitted within a flexible development. A use listed as conditional use within the underlying zoning classification may be proposed in combination with a flexible development if submitted concurrently with an application for such use.

(Ord. No. 2628, § I(Exh. A), 10-17-2011)

18.26.040 Definitions of terms.

For the purposes of this chapter, the flexible development score sheet, the following definitions shall apply in addition to those definitions within Chapter 18.03:

A. "Building envelope" means the exterior dimensions of a structure. For detached multi-family housing, a suitable size and configuration includes a building envelope capable of siting a twenty-foot by fifty-foot dwelling within the building envelope.

B. "Double-frontage lot" means a lot, other than a corner lot, having street frontage on two sides. If proposed on streets other than arterials, then both sides of the lot must provide pedestrian access to the sidewalk, and the more intensely traveled street must be the front of the structure. This could

require that each frontage provide a gate if fencing is proposed or the installation of stairs if there is a slope.

C. "Green roof" means a landscaped area on the roof of a structure that provides stormwater benefits. Green roofs may serve dual purposes of stormwater management and as an aesthetic enhancement.

D. "GFA" means the gross floor area of a structure as measured from the outside surface of the outer building wall for all levels.

E. "Permeable paving" means that the method and material of paving will allow the movement of water and air through the paving material.

F. "Energy star/LEED (Leadership in Energy and Environmental Design)" are nationally recognized programs for measuring the amount of overall environmental benefit that is provided in a building versus conventional methods.

G. "LED lighting" means "light-emitting diode." These lights consume less energy, have a longer useable life, and are smaller in size than other lights with the same amount of lighting output.

H. "Meandering sidewalks" means that the course of the walkway is winding or curving rather than straight. This design may cost more to develop given that more land may be required for curvature and landscaping.

I. "Rain gardens" are landscaped areas planted with wild flowers and other native vegetation to soak up rain water, mainly from the roof of a house or other building. The rain garden fills with a few inches of water after a storm and the water slowly filters into the ground rather than running off to a storm drain. Compared to a conventional patch of lawn, a rain garden allows about thirty percent more water to soak into the ground.

J. "Recreational open space" means lands that are developed for active recreation such as for park and trail use. These lands may contain critical features such as streams, steep slopes or wetlands, however only the unencumbered area of land is used in the score sheet calculations.

K. "Repurpose structure" means to alter or renovate a building for a different purpose, on a long-term basis in lieu of demolition (e.g., renovating a barn into a restaurant, or a warehouse into a performing arts theatre).

L. "Solar lighting" is any use of sunlight or sky light for illuminating the interior of a building, or may be defined as the conversion of sunlight to power a fixture.

M. "Vegetated wall" means a vertical surface designed and planted to be covered at maturity by plants.

N. "White roof" means a roof with reflective shingles that exceed a 0.15 reflectivity, as established by the Department of Ecology. White roofs increase energy efficiency and lower the heat island effects of new development.

(Ord. No. 2628, § I(Exh. A), 10-17-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.26.050 Score sheet adopted.

The city's "Flexible Development Score Sheet" (score sheet) is a required form for this chapter and is adopted by the city by resolution (RES1223, or as amended).

(Ord. No. 2628, § I(Exh. A), 10-17-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.26.060 Application requirements for flexible development proposals.

In addition to those items listed in CMC 18.55.110, the following items are required for a complete application for a flexible development. Items may be waived if, in the judgment of the director or designee, the items are not applicable to the particular proposal:

A. Flexible development score sheet;

B. Complete and signed SEPA checklist;

C. A transportation impact study to determine the adequacy of the transportation system to serve the proposed development and to mitigate impacts of the proposal on the surrounding transportation system;

D. Preliminary stormwater plan and preliminary stormwater technical information report (TIR). The preliminary stormwater TIR is to be prepared in accordance with Ecology's latest edition Stormwater Management Manual for Western Washington (SWMMWW);). If proposed, rain gardens-shall meet the standards of CMC Section 17.19.030.F.6 Storm Drainage Facilities;

E. Preliminary grading plan;

F. Site plan drawn to scale and depicting the following:

1. The existing land uses within the development, and the existing location of all structures (indicate if any structures are to be repurposed);

2. A list of owners of land adjacent to the proposed development;

3. The proposed location of all buildings, if commercial or industrial project;

4. The proposed lot sizes and building envelopes, if subdivision project;

5. Location of any critical areas, critical area buffers, and significant trees in compliance with CMC Chapter 18.31 and CMC Title 16 Environment;

6. Location of sidewalks, driveways, street lighting and street trees;

7. The location of all areas to be conveyed, dedicated, or maintained as public or private streets/tracts;

8. Provide a plan with the ingress/egress to the development with the proposed traffic circulation, parking areas, pedestrian walkways;

9. A draft document containing agreements, provisions, and covenants regarding the permanent ownership, maintenance, protection, and use of the development;

G. A preliminary landscape plan;

H. Building elevations for each unique type of structure; and

I. Narrative to describe how the proposed project complies with this chapter in balance with proposed flexible elements, relevant requirements of Camas Land Development and Zoning Codes, and the requirements of Chapter 58.17 RCW, if applicable. The city shall not consider variances to the minimum provisions of this chapter.

(Ord. No. 2628, § I(Exh. A), 10-17-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 21-005, § I(Exh. A), 3-15-2021)

18.26.070 Professional preparation

The applicant for a proposed flexible development shall certify that one or more of the following have been involved with the preparation of the preliminary plan:

A. An architect or engineer licensed in the State of Washington.

B. A landscape architect licensed in the State of Washington.

C. A registered civil engineer or a registered land surveyor licensed in the State of Washington.

(Ord. No. 2628, § I(Exh. A), 10-17-2011)

18.26.080 Criteria for approval.

A preliminary flexible development plan approval may be authorized by the decision maker if findings are made that the following criteria is satisfied:

A. The proposal shall meet the purpose and intent of a flexible development as stated in this chapter in balance with development bonuses.

B. The proposal ~~meets the minimum~~ scores at least 0.30 ~~per the~~according to the "flexible development score sheet"~~ based on the particular land use zone~~.

~~Residential zones0.3~~

~~Commercial zones0.3~~

~~Industrial zones0.3~~

~~LI/BP ZonesNot applicable~~

C. The proposal is in conformance with the Camas Comprehensive Plan.

(Ord. No. 2628, § I(Exh. A), 10-17-2011)

18.26.090 Development bonuses.

Upon meeting the minimum standards of a flexible development per the score sheet, the project may be eligible for the following additional flexibility in land development standards:

A. If proposed to meet the standards of this chapter, then rain gardens are exempt from the thirty-foot setback standard of CMC Section 17.19.030.F.6 Storm Drainage Facilities.

B. Residential development:

1. May increase density of residential development in accordance with the Density Transfer Standards of CMC Section 18.09.040 ~~of the underlying zone, or, if a multifamily zone, then standards may reflect those of the MF-18 zone of CMC Section~~or 18.09.050, if landscaping is not sacrificed.

2. If project scores higher than minimum score, then for standard lots, building setbacks may be reduced to five feet on all sides of the structure with eighteen feet from garages (if driveways are accessed at the front of the lot). Refer to Figure 1.

3. On corner lots, vision clearance setbacks must be maintained in accordance with CMC Section 17.19.030.D.7 Corner Lots.

4. Height of buildings may exceed the maximum building height of the zoning district by one story or ten feet, whichever is less.

C. Commercial/industrial projects.

1. If project scores higher than a minimum score, then the applicant may reduce the required off-street parking for the GFA by twenty-five percent ~~and participate in the city's Commute Trip Reduction Program~~, provided that the project provide bicycle parking equal to the number of parking spaces reduced.

2. If a green roof is proposed, then the applicant may reduce up to fifty percent of the required off-street parking spaces (calculated on the first level ~~if~~ of a multi-story building) for the equivalent square footage of a green roof, provided that the project provide bicycle parking equal to the number of parking spaces reduced. Refer to Figure 2 for formula.

(Ord. No. 2628, § I(Exh. A), 10-17-2011; Ord. No. 2691, § I(Exh. A), 1-21-2014; Ord. No. 17-013, § I(Exh. A), 10-2-2017)

18.26.100 Development assurances.

A. To assure full performance of the proposed flexible development, the developer shall provide certification from the qualified professional of record that the project element has been built as approved in the decision, prior to receiving an occupancy permit from the Building Department.

B. Perpetual maintenance covenant.

1. The applicant shall be required to perform maintenance functions on the flexible development aspects of their approved project in perpetuity to maintain functionality at the current industry standards (e.g. roof gardens or solar panels).

2. The maintenance covenant in a form acceptable to the city shall be recorded with the Clark County Auditor for each applicable lot or parcel. A copy of the recorded document must be provided to the Building Department prior to receiving an occupancy permit.

3. The maintenance covenant as described herein shall run with the land and be binding upon the heirs, successors, and assigns of the applicant or owner.

C. Amount of financial security. The director may require financial security to be provided for certain elements of the project that are not otherwise required to be secured pursuant to CMC Chapter 17.21-Procedures for Public Improvements. The financial security shall be based on one hundred five percent of the cost estimates. Cost estimates of the following shall be submitted to and approved by the director:

1. Estimated construction cost for green roofs, white roofs, and solar lighting.

2. Estimated installation costs for landscaping and maintenance for a period of three years post-construction.

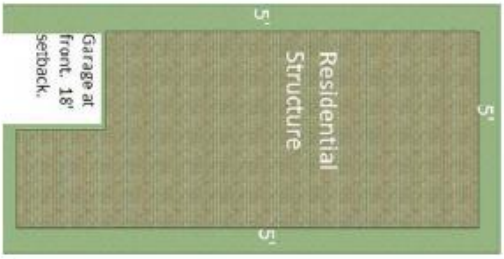

Figure 1: Potential reduced building setbacks.

Figure 2: Formula for parking calculation.

Answer 1 is [(SF of green roof) ÷ (parking # per use [note])] ÷ 2 = ____

Answer 2 is (SF of standard roof) ÷ (parking # per use [note]) = ____

Answer 1 + Answer 2 = parking spaces required

Example: 1,750 SF Office Building with 500 SF of green roof.

Answer 1: (500 SF ÷250) ÷ 2 = 1

Answer 2: 1,250 SF ÷ 250 = 5

1 + 5 = 6 parking spaces are required

Notes: *The amount of parking spaces for the equation is determined from* ***CMC 18.11.130*** *Parking Standards Table.* "SF" = Square Feet

(Ord. No. 2628, § I(Exh. A), 10-17-2011)

EXHIBIT P

Chapter 18.28 Co-living Housing

18.28.010 Purpose.

The purpose in providing for co-living is to authorize the development of rental homes affordable to people with moderate to low incomes that do not require any public funding, and to be consistent with RCW 36.70A.535.

18.28.020 Applicability.

Co-living housing is a permitted use on any lot that allows at least six multifamily residential units, including on a lot zoned for mixed-use development, excluding lots where six units are permitted only through an affordable housing density bonus, such as under RCW 36.70A.635(1)(b)(iii).

18.28.030 General Standards.

Room dimensional standards shall minimally meet the Washington State building code, including dwelling unit size, sleeping unit size, room area, and habitable space;

A. Co-living units may be provided in a mix of sizes and number of rooms;
B. Co-living developments are not required to include other types of land uses;
C. For purposes of calculating dwelling unit density, a sleeping unit in co-living housing is no more than one-quarter of a dwelling unit.
D. Sleeping units may include kitchenettes, but shall not include kitchens;
E. Where open space standards are applied based on the number of dwelling units, one half of the open space requirement will be required for sleeping units that is required of dwelling units.

18.28.040 Parking.

A. Off-street parking shall be provided at a rate of 0.25 off-street parking spaces per sleeping unit.
B. No off-street parking is required for co-living units within one-half mile walking distance of a major transit stop as defined in RCW 36.70A.030.

18.28.050 Processing and Administration.

A. The review, notice, or public meeting requirements for co-living housing shall be the same as those required for other types of residential uses in the same location, unless otherwise required by state law.
B. Co-living housing development may be included in an affordable housing incentive program, such as RCW 36.70A.540.
C. For purposes of calculating sewer connection fees, a sleeping unit in co-living housing is no more than one-half of a dwelling unit, unless a finding, based on facts, is made that the connection fees should exceed the one-half threshold.

18.28.060 Definitions.

A. "Co-living housing" means a residential development with sleeping units that are independently rented and lockable and provide living and sleeping space, and residents share kitchen facilities, and may share bathroom facilities, with other sleeping units in the building.
B. “Major transit stop” means:
    a. A stop on a high capacity transportation system funded or expanded under the provisions of chapter 81.104 RCW;
    b. Commuter rail stops;

c. Stops on rail or fixed guideway systems, including transitways;
d. Stops on bus rapid transit routes or routes that run on high occupancy vehicle lanes; or
e. Stops for a bus or other transit mode providing actual fixed route service at intervals of at least 15 minutes for at least five hours during the peak hours of operation on weekdays.

C. "Sleeping unit" means an independently rented or owned and lockable unit that provides living and sleeping space.
D. "Kitchenette" means a room or part of a room which is used, intended, or designed to be used for basic food preparation, with a sink and at least one 120v electrical outlet.
E. "Kitchen" means a room or part of a room which is used, intended, or designed to be used for preparing food. The kitchen includes facilities, or utility hookups for facilities, sufficient to prepare, cook, and store food, and wash dishes, including, at a minimum, countertops, a kitchen-style sink, space and utilities sufficient for a gas or 220/240v electric stove and oven, and a refrigerator.
F. "Shared kitchen" means a kitchen that is used, intended, or designed to be used by residents of multiple dwelling or sleeping units for preparing food simultaneously.

18.28.070 Conflicting code.

If any section this ordinance conflicts with another section of code, these regulations will take precedence over any conflicting standards elsewhere in code.

EXHIBIT Q

Chapter 18.32 PARKS AND OPEN SPACE ZONE~~ZONING~~[1]

18.32.010 ~~Applicability~~ Purpose.

The regulations of this chapter apply only to land held in public trust.

(Ord. No. 2667, § IV, 12-17-2012; Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.32.020 Permitted uses.

Uses shall be allowed in accordance with Table 18.07.050 - Park and open space land uses. Park use is also subject to the requirements and limitations of Chapter 12.32 Park Rules and Regulations.

(Ord. No. 2667, § IV, 12-17-2012; Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.32.030 Development standards.

A. Lot Area. There is no minimum or maximum lot size in the Park zoning districts.

B. Setbacks. The minimum setbacks are twenty feet.

C. Building lot coverage. The maximum building lot coverage shall not exceed thirty-five percent of lot area, with the exception of community or recreation centers, where lot coverage shall not exceed sixty percent.

D. Landscaping. All required yard setbacks shall be landscaped. Any storage areas visible to the right-of-way shall be screened. Parking area landscaping shall be consistent with CMC Chapter 18.13 Landscaping.

E. Parking. The number and location of off-street parking shall be consistent with CMC Chapter 18.11 Parking.

F. Signs. Signs shall be permitted according to the provisions of Chapter 18.15 Signs, under the commercial zoning standards.

(Ord. No. 2667, § IV, 12-17-2012)

18.32.040 Site plan review ~~and design review~~.

A. Before a clearing, grading or building permit will be issued; Site Plan approval per Chapter 18.18 Site Plan Review is required. A phased site plan may be allowed in order to guide a new park development as funds and resources become available.

~~B. When Design Review is applicable; the Parks & Recreation Commission shall conduct design review and find that the development is generally consistent with the design standards of CMC Chapter 18.19 Design Review, guidelines and principles for commercial and mixed uses.~~

(Ord. No. 2667, § IV, 12-17-2012)

[1]Ord. No. 2691, § I(Exh. A), adopted Jan. 21, 2014, amended the code by retitling Ch. 18.32 to read as herein set out. Ch. 18.32 was formerly titled Park Zoning.

EXHIBIT R

Chapter 18.43 CONDITIONAL USE PERMITS

18.43.010 Purpose.

It is the purpose of this chapter to establish review and permit approval procedures for unusual or unique types of land uses which, due to their nature, require special consideration of the impact on the neighborhood and land uses in the vicinity.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.43.020 Scope.

This chapter shall apply for each application for a conditional use permit (CUP). Only those uses indicated by a "C" in the use tables contained in CMC Chapter 18.07 Use Authorization of this title will be considered for a conditional use permit.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.43.030 Application.

Application for a conditional use permit shall be filed with the community development department on forms provided by the city. The application shall be accompanied by a filing fee as may be set from time to time by resolution of the city council. The application and review process shall be subject to a Type III procedure, pursuant to CMC Chapter 18.55 Administration and Procedures of this title.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.43.050 Criteria.

The hearings examiner shall be guided by all of the following criteria in granting or denying a conditional use permit:

A. The proposed use will not be materially detrimental to the public welfare, or injurious to the property or improvements in the vicinity of the proposed use, or in the district in which the subject property is situated;

B. The proposed use shall meet or exceed the development standards that are required in the zoning district in which the subject property is situated;

C. The proposed use shall be compatible with the surrounding land uses in terms of traffic and pedestrian circulation, density, building, and site design;

D. Appropriate measures have been taken to minimize the possible adverse impacts that the proposed use may have on the area in which it is located;

E. The proposed use is consistent with the goals and policies expressed in the comprehensive plan;

F. Any special conditions and criteria established for the proposed use have been satisfied. In granting a conditional use permit the hearings examiner may stipulate additional requirements to carry out the intent of the Camas Municipal Code and comprehensive plan.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.43.070 Expiration and renewal.

Expiration, renewals or extensions of any conditional use permit shall be governed by the terms of CMC Section 18.55.260.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 22-007, § I, 5-16-2022)

18.43.090 Performance bond or security.

A performance bond or other adequate and appropriate security may be required by the hearing examiner for any elements of the proposed project which the ~~city council~~ hearing examiner determines are crucial to the protection of the public welfare. Such bond shall be in an amount equal to one hundred fifty percent of the cost of the installation or construction of the applicable improvements.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.43.100 Resubmittal of application.

An application for a conditional use permit that has been denied may not be resubmitted within one year from the date of the disapproval.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

18.43.115 Reserved.

Editor's note(s)—Ord. No. 2655, § I, adopted July 16, 2012, repealed § 18.43.115, which pertained to special conditions and criteria for licensed liquor establishments in the downtown commercial zone. See also the Code Comparative Table and Disposition List.

EXHIBIT S

Chapter 18.45 VARIANCES

18.45.010 Purpose.

A variance to any development standard contained in this title, other than density and lot area, may be granted when practical difficulties, unnecessary hardship, or results inconsistent with the general purposes of CMC Title 16, Environment, and CMC Title 18, Zoning, would result from the literal enforcements of its requirements. The sole purpose of any variance shall be to prevent such difficulties, hardship, or results and no variance shall be granted that would have the effect of granting a special privilege not shared by another property in the same vicinity and zone, except when necessary to avoid such difficulties, hardship, or results.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011; Ord. No. 2649, § I, 5-21-2012)

18.45.020 Approval process.

A. Minor Variance. A minor variance is one that results in the modification of up to ten percent of a numerical development standard (other than lot area or density) or up to one foot of setback that shall be subject to Type I procedure, pursuant to CMC Chapter 18.55 Administration and Procedures, and subject to the approval criteria contained in CMC Section 18.45.030(A).

B. Major Variance. A major variance is one that results in the modification of a numerical development standard by more than ten percent but less than forty percent. ~~The board of adjustment is generally the decision maker regarding major variances. Where a variance is consolidated with an application for a Type III decision, the decision maker shall be the same as that for the Type III application.~~ A major variance is subject to a Type III procedure with a final decision issued by the hearing examiner. A major variance shall not be approved unless findings are made by the approval authority that all of the approval criteria under CMC Section 18.45.030 are satisfied.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2612, § I(Exh. A), 2-7-2011)

18.45.030 Minor variance.

The community development director may grant a minor variance upon demonstration by the applicant of compliance with all of the following approval criteria:

A. Unusual circumstances or conditions apply to the property and/or the intended use that do not apply generally to other property in the same vicinity or district;

B. The variance requested is the minimum necessary to relieve the unusual circumstances or conditions identified in subsection (A) of this section;

C. The granting of such variance will not be materially detrimental to the public welfare or injurious to property in the vicinity or district in which property is located;

D. The proposed variance does not exceed ten percent of the requested dimensional standard in which the variance is requested or one foot of setback, whichever is greater.

E. The unusual circumstances and conditions associated with the variance are not a result of the actions of the applicant or property owner.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.45.040 Major variance.

A. The hearing examiner ~~board of adjustment (or hearing examiner, or planning commission, in accordance with Section 18.45.020(B))~~ shall consider all requests for major variances from the zoning code.

B. Approval of a major variance must demonstrate with findings of compliance with all of the following criteria:

1. The variance shall not constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity and zone in which the subject property is located;

2. That such variance is necessary, because of special circumstances or conditions relating to the size, shape, topography, location, or surroundings of the subject property, to provide it with use, rights, and privileges permitted to other properties in the vicinity and in the zone in which the subject property is located;

3. The granting of such variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and in the zone in which the subject property is located.

(Ord. No. 2691, § I(Exh. A), 1-21-2014)

18.45.050 Conditions for granting—Extension.

In authorizing the variance, the hearing examiner~~approval authority~~ may attach thereto such conditions that it deems to be necessary or desirable in order to carry out the intent and purpose of this chapter and the public interest. A variance so authorized shall become void after the expiration of one year, or a longer period as specified at the time of the approval authority action, if no building permit has been issued in accordance with the plans for which such variance was authorized, except that the community development director~~approval authority~~ may extend the period of variance authorization, without a public hearing, for a period not to exceed twelve months upon a finding that there has been no basic change in pertinent conditions surrounding the property since the time of the original approval.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2691, § I(Exh. A), 1-21-2014)

Ord. No. 2691, § I(Exh. A), adopted Jan. 21, 2014, repealed § 18.45.050, which pertained to application requirements, and renumbered § 18.45.040 as § 18.45.050. See also the Code Comparative Table and Disposition List.

18.45.060 Prohibited variance.

Under no circumstances shall the approval authority grant a variance to permit a use not outright or conditionally permitted in the zone involved, or any use expressly or by implication prohibited by the terms of this title.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 2691, § I(Exh. A), 1-21-2014)

EXHIBIT T

Chapter 18.51 COMPREHENSIVE PLAN AND ZONING AMENDMENTS[1]

18.51.010 Application for amendments to comprehensive plan.

Any interested person, including applicants, citizens, planning commission, city council, city staff, and other agencies, may submit an application in the month of January each year for a comprehensive plan amendment. The application shall specify:

A. A detailed statement of what is proposed and why;

B. A statement of the anticipated impacts of the change, including the geographic area affected, and issues presented by the proposed change;

C. An explanation of why the current comprehensive plan is deficient or should not continue in effect;

D. A statement of how the proposed amendment complies with and promotes the goals and specific requirements of the growth management act;

E. A statement of what changes, if any, would be required in functional plans (i.e., the city's water, sewer, stormwater or shoreline plans) if the proposed amendment is adopted;

F. A statement of what capital improvements, if any, would be needed to support the proposed change which will affect the capital facilities plans of the city;

G. A statement of what other changes, if any, are required in other city or county codes, plans, or regulations to implement the proposed change; and

H. The application shall include an environmental checklist in accordance with the State Environment Policy Act (SEPA).

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 17-013, § IV, 10-2-2017)

Ord. No. 17-013, § IV, adopted Oct. 2, 2017, amended the catchline of § 18.51.010 from "Application and criteria therein" to read as herein set out.

18.51.020 Application review process for comprehensive plan.

The comprehensive plan shall be reviewed once a year as a Type IV legislative process, and in accordance with RCW 35A.63.070—073, unless there is an emergency, with the following procedure:

A. In the months of November and December, city staff and applicants shall complete preapplication meetings;

B. In the month of January of each year, applicants shall submit an application form containing all of the information required by Section 18.51.010 of this chapter;

[1]Ord. No. 17-013, § IV, adopted Oct. 2, 2017, retitled Ch. 18.51 from "Comprehensive Plan Amendments" to read as herein set out.

C. The city may take as much as sixty days from the closing of the application period (January 31) to complete the initial review of proposals. Environmental determination requirements associated with an application may lengthen this period. If no amendments are received, the chairman of the planning commission shall so report to the mayor and city council, and the annual review of the comprehensive plan shall be considered completed.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 17-013, §§ I(Exh. A), IV, 10-2-2017)

Ord. No. 17-013, § IV, adopted Oct. 2, 2017, amended the catchline of § 18.51.020 from "Application review" to read as herein set out.

18.51.025 Zoning text and map amendments.

A. Amendments to the zoning code text or other development regulations shall follow procedures for a Type IV legislative process. Requests amending the zoning code text or development regulation shall include the following information with an application:

1. Narrative that addresses the following:

a. The specific code text or the development regulation and the rationale for the amendment;

b. A statement of how the amendment is warranted due to changed circumstances, error, or because of a demonstrated need for the change in the zoning text or regulation;

c. A statement of how the public safety and welfare is improved by the amendment; and

d. A statement of what the effect would be if the amendment is not granted.

B. Requests for zoning map amendments shall follow procedures for a Type III decision, and include the following information with an application:

1. An application form indicating the applicant(s), application date, property information (including address, size, zoning, and current use), specific map amendment request, and other pertinent information.

2. Narrative that addresses the following criteria:

a. The map amendment shall be consistent with the policies and provisions of the comprehensive plan including the comprehensive plan map;

b. The amendment shall be compatible with the uses and zoning of the adjacent properties and surrounding areas;

c. The amendment is warranted due to changed circumstances, error, or because of a demonstrated need for additional property in the proposed zoning district;

d. The subject property is suitable for development in conformance with zoning standards under the proposed zoning district;

e. Adequate public facilities and services are likely to be available to serve the development allowed by the proposed zone;

f. Specific information about the intended use and development of the property.

C. An applicant may propose a concomitant rezone in conjunction with a zoning map amendment and shall be subject to a Type IV legislative process. Where a concomitant rezone is proposed by an applicant, the application shall also include the materials identified in Section 18.51.040.

(Ord. No. 17-013, § I(Exh. A), 10-2-2017)

18.51.030 Evaluation criteria.

For consideration of any proposed amendment to either the comprehensive plan, zoning code text, or development regulations, the planning department shall prepare and submit to the planning commission a staff report which evaluates the following:

A. Impact upon the city of Camas comprehensive plan and zoning code;

B. Impact upon surrounding properties, if applicable;

C. Alternatives to the proposed amendment; and

D. Relevant code citations and other adopted documents that may be affected by the proposed change.

The report shall include a copy of the application for each proposed amendment, any written comments on the proposals received by the department, and shall contain the department's recommendation on adoption, rejection or deferral of each proposed change; and the SEPA checklist with the determination.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 17-013, § I(Exh. A), 10-2-2017)

Ord. No. 17-013, § IV, adopted Oct. 2, 2017, amended the catchline of § 18.51.030 from "Staff report" to read as herein set out.

18.51.040 ~~Reserved~~ Concomitant Rezone.

A concomitant rezone may be required by the City or proposed by an applicant in conjunction with a zoning map amendment. Concomitant rezones are appropriate where additional limitations or requirements are necessary to ensure consistency with the comprehensive plan; the proposed zoning could allow a range of uses or intensities not appropriate for the specific site; or the City desires to secure specific land uses, development outcomes, or public benefits.

A. The City Council may approve a zoning map amendment subject to a concomitant agreement or ordinance.

   1. The concomitant rezone shall be implemented through a development agreement, recorded covenant, or ordinance.

   2. The provisions of the concomitant rezone shall run with the land and be binding on successors and assigns.

   3. The agreement or ordinance shall be recorded prior to issuance of development permits.

B. Conditions imposed through a concomitant rezone may include, but are not limited to:

   1. Limitations on permitted or conditional uses, including the prohibition of specific uses or the requirement to include specific uses or a mix of uses (e.g., minimum percentages of residential, commercial, or mixed-use development, or required active ground floor uses);

   2. Additional development standards, including but not limited to minimum or maximum densities, floor area ratios, building height, setbacks, lot coverage, site layout, and design requirements;

3. Phasing or timing of development, including sequencing of uses or required improvements;
4. Infrastructure or public facility improvements, including transportation, utilities, open space, or other public amenities;
5. Environmental protection measures, including enhanced critical area protections, tree retention, or low impact development requirements; and
6. Other requirements necessary to ensure consistency with the Comprehensive Plan and compatibility with surrounding development.

C. In addition to the requirements for a zoning map amendment in Section 18.51.025(B), an applicant requesting a concomitant rezone shall provide:

1. A proposed concomitant agreement or a detailed description of proposed conditions;
2. A site concept plan illustrating intended development, including land use distribution, building locations, access, and open space; AND
3. Any supporting studies necessary to demonstrate feasibility and impacts.

D. Development of the property shall comply with the approved concomitant conditions. Where there is a conflict between the underlying zoning and the concomitant conditions, the concomitant conditions shall control.

E. Modification or Removal

1. A concomitant rezone may be modified or removed only through the same procedure required for a zoning map amendment, unless otherwise specified.
2. The applicant shall demonstrate that the modification remains consistent with the comprehensive plan and continues to address site-specific impacts.

F. Enforcement
Failure to comply with the terms of a concomitant rezone shall constitute a violation of this Code and may result in denial, withholding, or revocation of permits or approvals.

18.51.050 Council consideration and decision.

Subsequent to planning commission review and recommendation, the city council shall consider each request for an amendment to the comprehensive plan or zoning code at a public meeting, at which time the applicant will be allowed to make a presentation. Any person submitting a written comment on the proposed change shall also be allowed an opportunity to make a responsive oral presentation. Such opportunities for oral presentation shall be subject to reasonable time limitations established by the council.

A. At minimum, the criteria the city council shall use to make a decision on a proposed amendment are as follows:

1. The application and criteria established therein;
2. The staff report and recommendation;
3. The planning commission recommendation;
4. The public interest.

B. The city council shall make a decision by motion, resolution, or ordinance as appropriate. The city council decision on a planning commission recommendation following a public hearing shall include one of the following actions:

1. Approve as recommended;

2. Approve with additional conditions;
3. Modify, with or without the applicant's concurrence;
4. Deny (resubmittal is not allowed until the next year for comprehensive plan amendments);
5. Remand the proposal back to the planning commission for further proceedings.

(Ord. 2515 § 1 (Exh. A (part)), 2008: Ord. 2443 § 3 (Exh. A (part)), 2006)

(Ord. No. 17-013, § I(Exh. A), 10-2-2017)

EXHIBIT U



DOWNTOWN
DESIGN MANUAL

City of Camas, WA

November 2026

Acknowledgments.

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John Nohr
Ward 1

Martin Elzingre
Ward 2

Tim Hein
Ward 2

Masha Eshghi
Ward 3

Jennifer Senescu
Ward 3

John Svilarich
At-Large (All Wards)

PLANNING COMMISSION

Troy Hull
Chair

Geoerl Niles
Vice Chair

Joe Walsh

Shawn High

Joe Keller

Paul Anderson

DOWNTOWN ADVISORY COUNCIL

Alicia Brazington
Community Member/Parks and Recreation Commission

Samantha Horner
Community Member / Library Board of Trustees

Jason Irving
Community Member / Parks and Recreation Commission

Brian Kuhta
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Rick Melching
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PREAMBLE



Figure 1. Downtown Camas, Washington

1.1 Overview of the Manual.

This design manual, prepared as part of the Our Downtown Camas 2045 Downtown Subarea Plan, serves as a practical tool for implementing updated zoning regulations and design standards in Downtown Camas. Fully aligned with the City's adopted code, the zoning sections and design standards are supported by clear illustrations and visual aids, enabling applicants to interpret and apply requirements with confidence.

The design manual integrates key zoning standards that collectively shape the downtown's built environment. Zoning components include the regulating plan, base zoning districts, detailed provisions for land use and parking, and street types, creating a clear framework to guide future growth. These standards ensure predictability while supporting flexibility for high-quality development.

Complementing the zoning standards, the design standards offer frontage type definitions, public realm expectations, and recommended best practices to inform project design and review. Together, these elements foster cohesive, attractive, and pedestrian-friendly development that reflects the community's vision for a vibrant, well-designed downtown.

	DESIGN MANUAL SECTION	1.0 *Preamble*	2.0 *The Regulating Plan*	3.0 *Base Zoning Districts*	4.0 *Use and Parking*	5.0 *The Street Network*	6.0 *Frontage Standards*	7.0 *Public Realm Standards*	8.0 *General Standards*	0.0 *Definitions & Measures*
PROJECT TYPE	**OCCUPANCY** A change of occupancy to an existing building or structure.	✓	✓	✗	✓	✗	✗	✗	✗	✓
	MINOR ALTERATION Little or no exterior changes to buildings or structures; and no structural work.	✓	✓	✗	✗	✓	✗	✓	✓	✓
	MINOR ALTERATION WITH USE / OCCUPANCY CHANGE Minor alteration (per this table) with change in use or occupancy.	✓	✓	✗	✓	✓	✗	✓	✓	✓
	ADDITION OR MAJOR EXTERIOR CHANGE Changes to exterior or square footage addition of less than fifty (50%) percent with or without a change in use or occupancy.	✓	✓	✓	✓	✓	✓	✓	✓	✓
	NEW CONSTRUCTION All new buildings and changes to exterior or square footage addition of 50% or more.	✓	✓	✓	✓	✓	✓	✓	✓	✓
	OTHER	*See **Chapter 18.55 Administration and Procedures***								

Figure 2. Applicability of Project Type by Manual Section

1.2 Applicability of Sections.

✓ SECTION IS APPLICABLE

✗ SECTION IS NOT APPLICABLE

Because this document combines zoning regulations with a range of design standards for future development, it is important to clearly identify which sections apply to each type of project within Downtown Camas. Distinguishing levels of project impact ensures that each development or modification is reviewed by the appropriate portion of the design manual proportional to its scale and potential influence on the area. Minor alterations with little or no exterior change, or a simple change in use, generally pose minimal impacts on urban design, public space, and community character, and therefore do not require the same level of review as larger projects. In contrast, substantial exterior modifications, additions, and new construction can significantly shape the public realm and architectural identity. The table on this page identifies which sections apply. In the event of a conflict between this manual and other regulations, the more stringent shall be applicable.



Figure 3. Chart Vibrant Frontage Along 4th Avenue

1.3 How to Use this Manual.

The following diagram illustrates the overall process and core components for using this guide during permitting to ensure all applicable requirements are met. The planning official may modify or adapt this process as needed to address site-specific conditions, ensure compliance, and coordinate with other relevant sections of the zoning code.

After completing the review in **Section 1.2** to confirm which provisions of this document apply, the steps that follow provide a clear, sequential overview of how to use this manual.

STEP #1
IDENTIFY PROJECT LOT OR LOTS ON THE REGULATING PLAN.

STEP #2
REVIEW STANDARDS IN THE BASE ZONING DISTRICTS.

STEP #3
VERIFY ADHERENCE TO USE AND PARKING STANDARDS.

STEP #4
CONFIRM APPLICABILITY OF DESIGN STANDARDS.

STEP #5
SELECT FRONTAGE TYPE AND VERIFY ADHERENCE TO STANDARDS.

STEP #6
VERIFY ADHERENCE TO PUBLIC REALM STANDARDS FOR STREET TYPE AND GENERAL STANDARDS FOR ALL IMPROVEMENTS.

Figure 4. How to Use this Document Flow

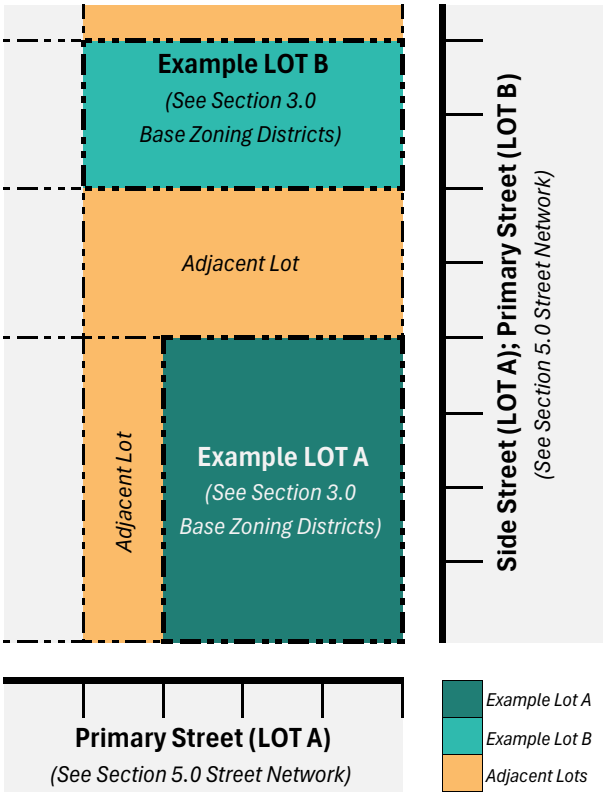


Figure 5. Typical Lot and Street Type Diagram

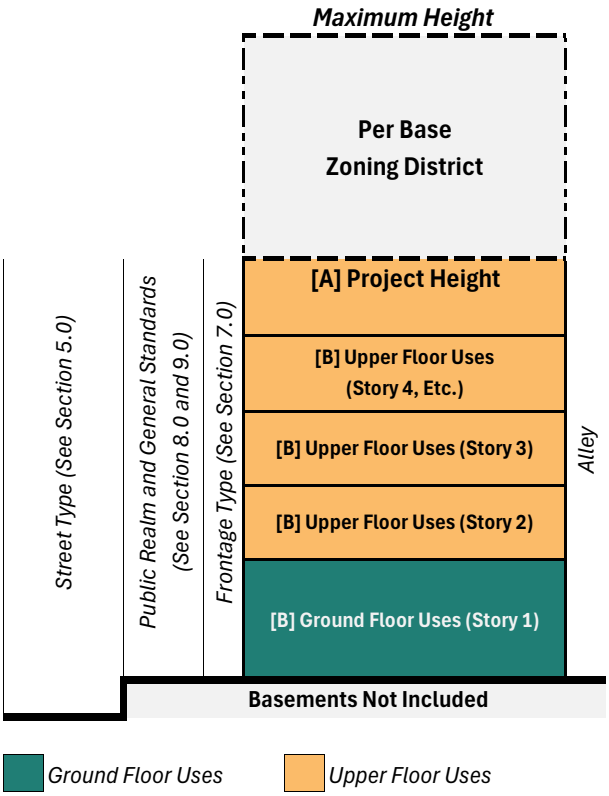


Figure 6. Typical General Standards: Height and Use

STEP 1: IDENTIFY PROJECT LOT OR LOTS ON THE REGULATING PLAN.

Begin by referencing the regulating plan **(Section 2.0)** and documenting the lot to determine:

- Which of the four (4) base zoning districts **(Section 3.0)** or existing zoning districts the lot or lots are located in; and
- Which of the five (5) street types **(Section 5.0)** are applicable to the lot or lots for all frontages onto public rights-of-way.

NOTE: Projects may contain lots with more than one (1) base zoning district or street type. Projects that fall within the Heavy Industrial district, open space district, or districts not listed in this manual must refer to the zoning code.

STEP 2: REVIEW STANDARDS IN THE BASE ZONING DISTRICTS.

Each base zoning district defines unique goals, building form parameters, height limits, and other requirements suited to its intended form and function (e.g., Historic Main Street, Downtown Mixed-Use, etc.). Refer to the specific base zoning district **(Section 3.0)** identified in Step 1 for specific requirements and review each for adherence to the purpose and intent, applicability, and standards. The general standards for each district include:

- **[A] Building height:** Measurement in feet (FT) and above-grade number (#) of stories.
- **[B] Building uses:** Primary use types **(See Section 4.0)** for percentage allowable on ground floor areas, ground floor frontages, and upper floor areas.

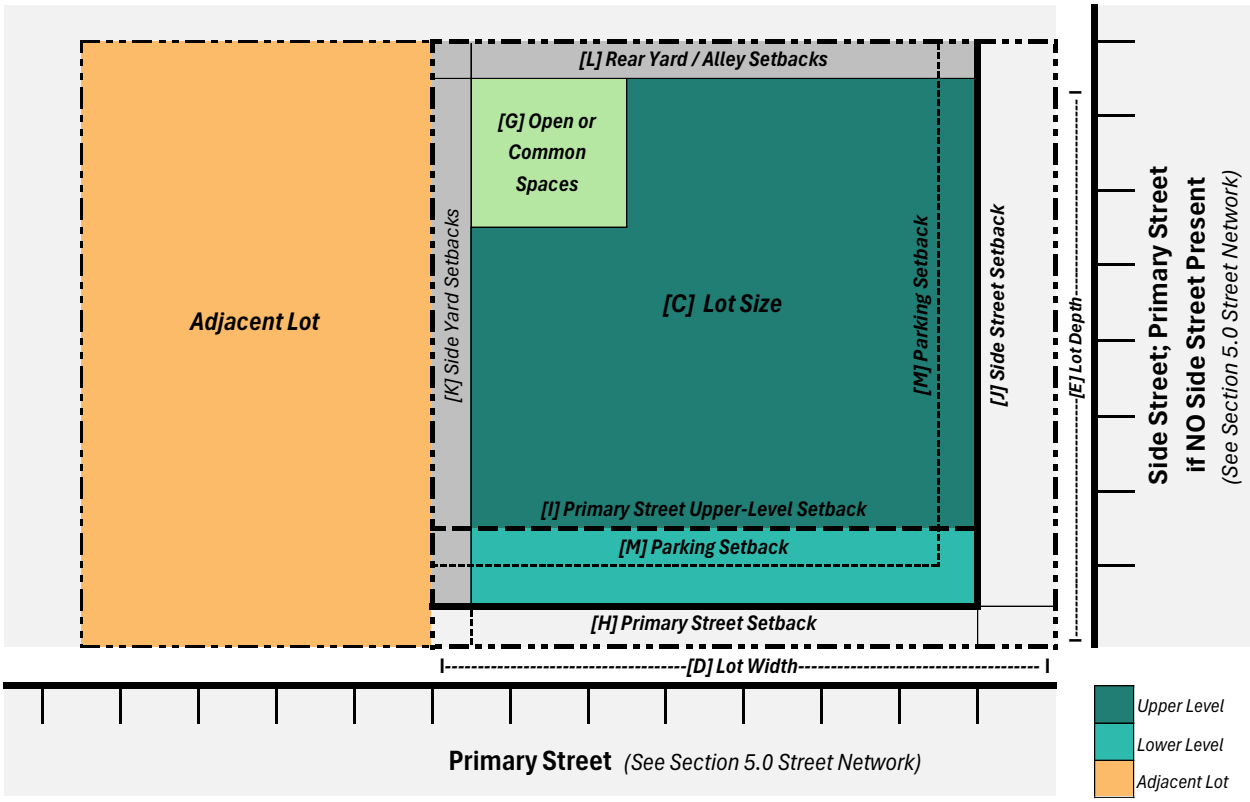


Figure 7. Typical Development Standards: Lot and Setback Requirements

In addition to the general standards that apply to all lots, each lot is also subject to specific development standards governing lot dimensions and setbacks. The development standards for each district include:

- **[C] Lot size:** Maximum lot size in square feet (SF) or the proportion of a typical downtown block (i.e. 1/8, 1/2, Etc.).
- **[D] Lot width:** Minimum dimension in linear feet (LF) of the lot from the primary street.
- **[E] Lot depth:** Minimum dimension in linear feet (LF) of the lot from the property line on the primary street.
- **[F] Lot coverage:** Minimum percentage (%) of the new building footprint (SF) respective to the lot (SF).
- **[G] Open or common spaces:** Required square footage (SF) of space on the lot for each dwelling unit provided on the lot.
- **[H] Primary street setbacks:** Maximum distance in linear feet (LF) of the placement of the building facade on the ground floor from the property line on the primary street.
- **[I] Primary street upper-level setbacks:** Minimum distance in linear feet (LF) of the placement of building facades on a designated upper-level from the ground floor building facade on the primary street.
- **[J] Side street setbacks:** Maximum distance in linear feet (LF) of the placement of the building facade from the property line on the side street.
- **[K] Side yard setbacks:** Maximum distance in linear feet (LF) of any building facades from property lines on adjacent lots.
- **[L] Rear yard / alley setbacks:** Minimum distance in linear feet (LF) of any building facades from property lines at the rear of the yard or onto an existing or proposed alley.
- **[M] Parking setbacks:** Minimum distance in linear feet (LF) of the placement of any structured or surface parking facilities or storage of vehicles on the site from the primary street or side street.

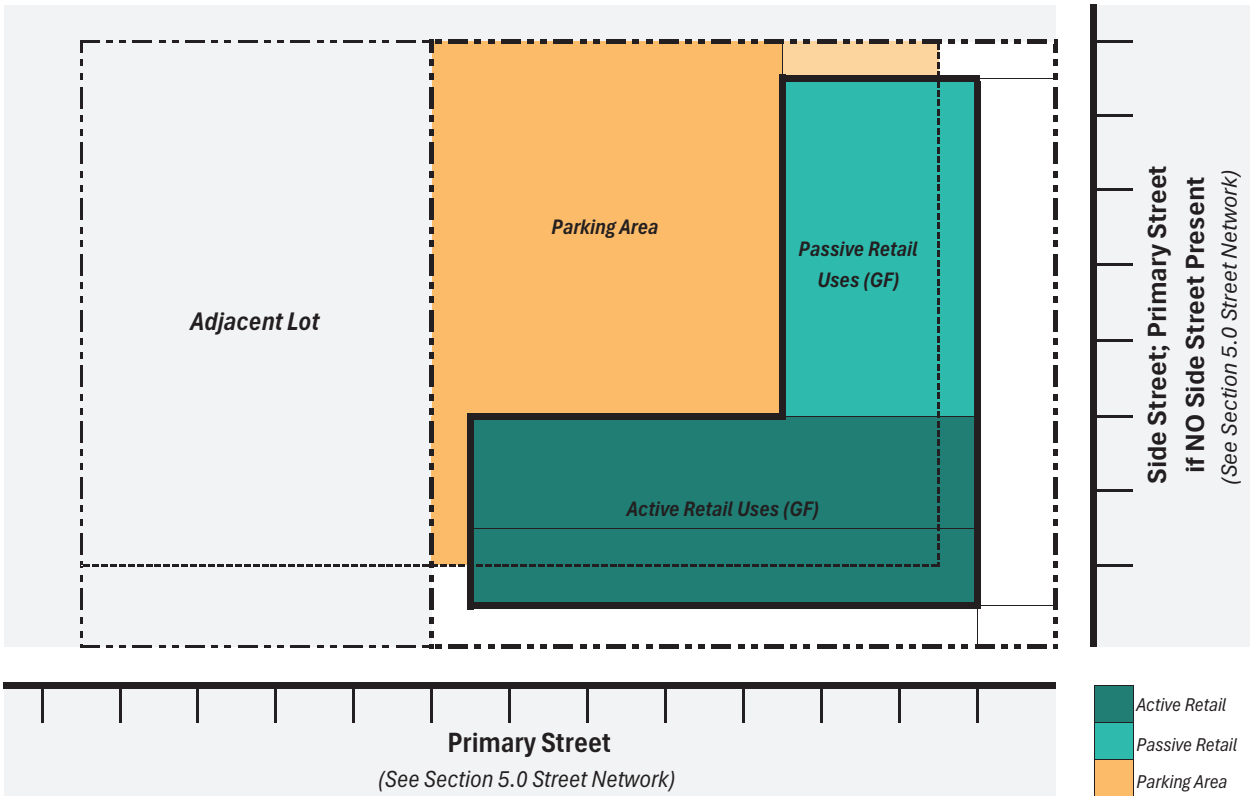


Figure 8. Typical Lot and Street Type Diagram

STEP 3: VERIFY ADHERENCE TO USES AND PARKING STANDARDS.

Based on the intended uses, consult the applicable use tables (**Section 4.0**) to determine which uses are permitted, conditional, or prohibited on the ground floor and upper floors. After confirmation, refer to the zoning code and review the corresponding parking requirements to ensure compliance with parking ratios. Primary use categories include the following:

- Active commercial uses.
- Communication, utilities, and facilities uses.
- Educational uses.
- Incidental uses.
- Industrial uses.
- Manufacturing and/or processing uses.
- Passive commercial uses.
- Recreational, religious, and cultural uses.
- Residential uses.
- Temporary uses.

Active Commercial Uses VS Passive Commercial Uses

Commercial uses are organized into two (2) categories per Section 4.2: Active Commercial Uses and Passive Commercial Uses. This distinction differentiates uses that generate high levels of foot traffic and pedestrian activity from those that contribute at a more limited scale. The purpose of this classification is to ensure that ground-floor spaces in designated downtown areas support vibrant, active streetscapes. Active Commercial is intended to be concentrated along primary streets where pedestrian activity is most critical, while Passive Commercial is better suited to side streets. Verify active commercial uses and passive commercial uses are appropriate per the table.

Figure 9. Overview of Active and Passive Commercial Uses

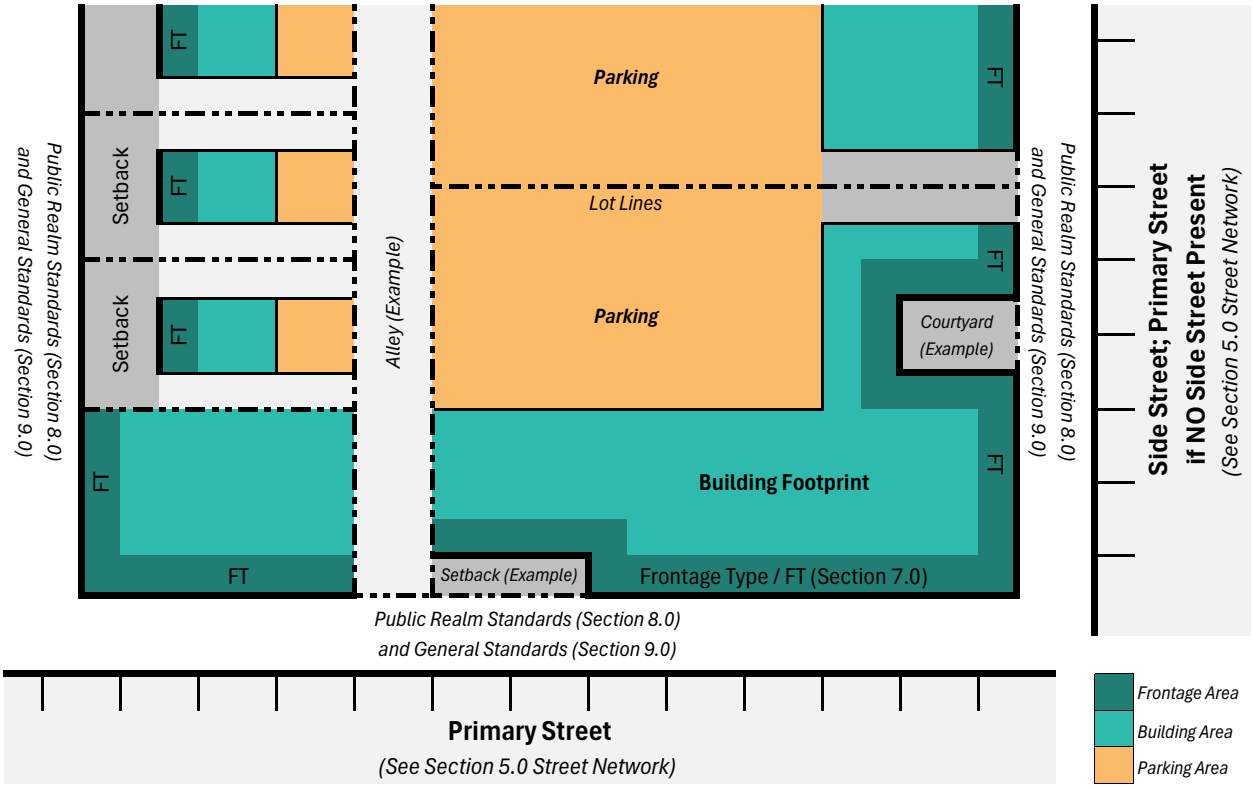


Figure 10. Typical Public Realm Diagram

STEP 4: CONFIRM APPLICABILITY OF DESIGN STANDARDS.

Confirm applicability **(Section 1.2)** of the design standards based on permit application, including applicability of frontage standards **(Section 6.0)**, public realm standards **(Section 7.0)**, and general Standards **(Section 8.0)**.

STEP 5: SELECT FRONTAGE TYPE AND VERIFY ADHERENCE TO STANDARDS.

If applicable to the lot, review the allowable frontage types **(Section 6.0)** for each street type. This includes adherence to any specific standards or dimensions for the frontage type. And although these standards are fairly minimal, frontage has a critical role in shaping public space and making sure the space between the public right of way and the building facade are lively, engaging, and conducive to walkability and pedestrian activity.

STEP 6: VERIFY ADHERENCE TO PUBLIC REALM STANDARDS FOR STREET TYPES AND GENERAL STANDARDS FOR ALL IMPROVEMENTS.

Where applicable, verify that each street type complies with the public realm standards **(Section 7.0)** and that all public realm improvements meet the general standards **(Section 8.0)**. While requirements vary by street type, general standards apply universally. Confirm with the planning official whether additional zoning code provisions apply. Supplemental public realm guidance is provided on the opposite page.

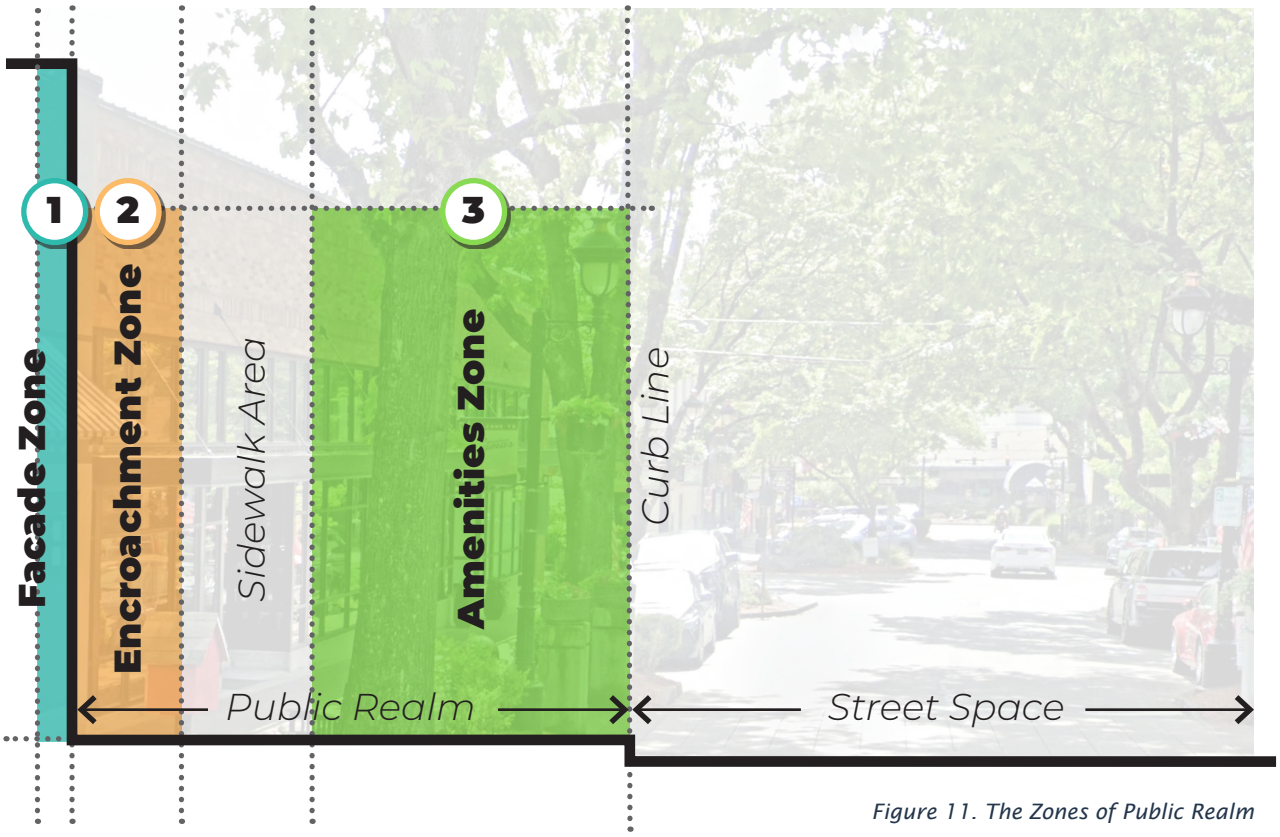


Figure 11. The Zones of Public Realm

The Zones of the Public Realm

For this design manual, the public realm is described through three (3) zones that extend from the curb edge to the building façade. These zones provide a framework for organizing streetscape elements and building frontage.

[1] Facade Zone: This zone is the vertical plane of the building face adjoining the sidewalk or setback, regulated to maintain cohesive street character through controls on blank walls, horizontal articulation, entrances, and other facade elements.

[2] Encroachment Zone: A flexible area between the building façade (including any setback) and the sidewalk circulation zone, accommodating elements such as signage, awnings, displays, seating, and weather protection that activate and support building uses.

[3] Amenity Zone: A flexible area between the sidewalk and curb, with a wide range of dimensions, accommodating trees, landscaping, lighting, furnishings, transit stops, bicycle parking, and related amenities enhancing safety, comfort, and character.

Note on the Sidewalk Area: *The primary clear path for pedestrian circulation, free of any obstructions, ensuring accessibility, safety, and comfort while connecting building entrances, transit stops, and public spaces along a streetscape.*

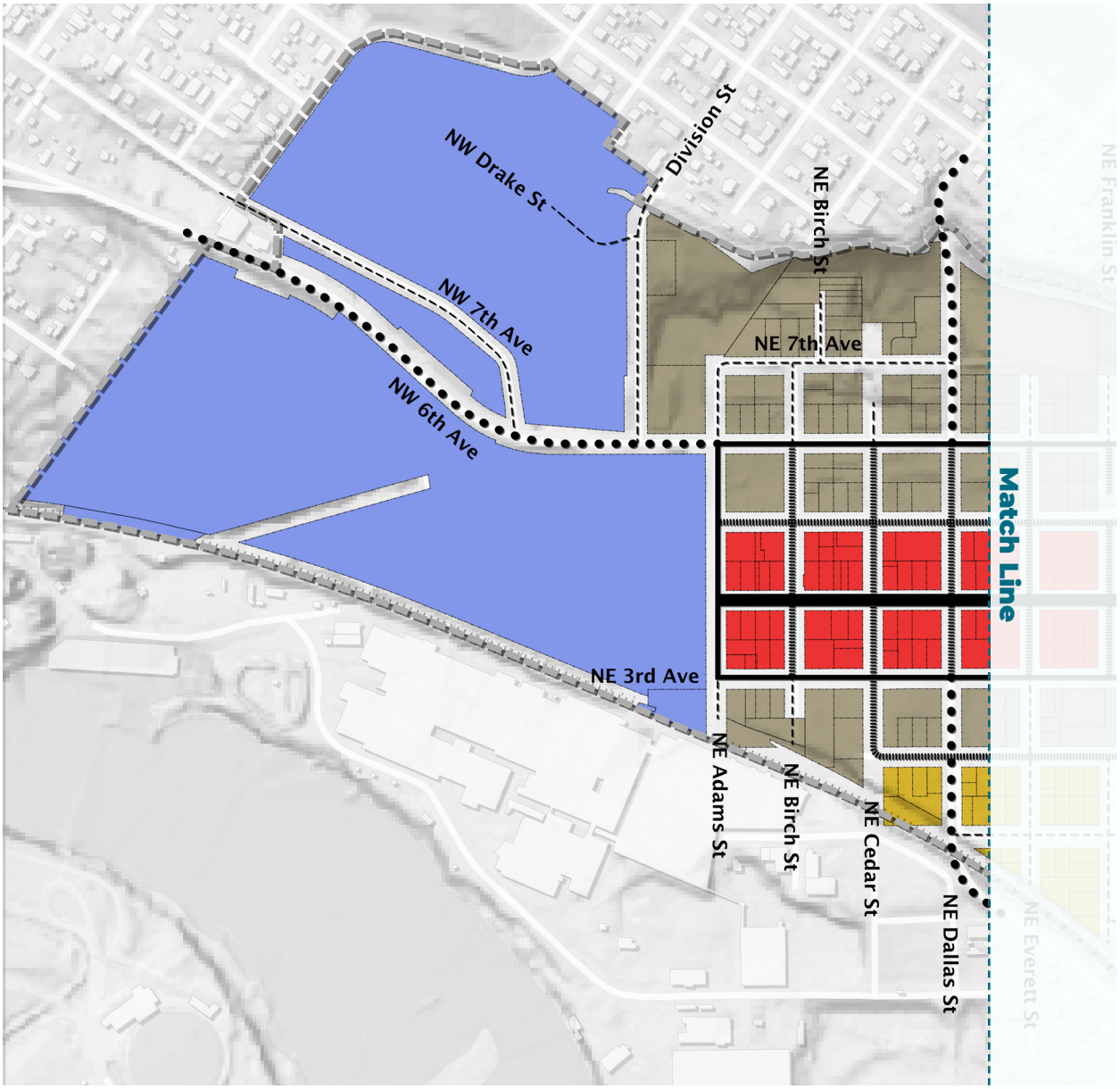
Figure 12. Overview of the Zones of the Public Realm


334
AUTUMN LEAF
BOOKS
CHURCH



ZONING CODE

SECTION 2.0 REGULATING PLAN
SECTION 3.0 BASE ZONING DISTRICTS
SECTION 4.0 USE AND PARKING
SECTION 5.0 THE STREET NETWORK



2.0 The Regulating Plan.

The purpose of the regulating plan is to provide applicants with a clear, parcel-specific map of which base zoning districts and street types apply to each property within Downtown Camas. The base zoning districts guide applicants to the applicable general and development standards, while the street types direct them to the corresponding frontage and public realm requirements. Although the regulating plan functions as a visual navigation tool, each parcel is also formally codified with its assigned districts and street types to ensure clarity and regulatory certainty throughout the development process.

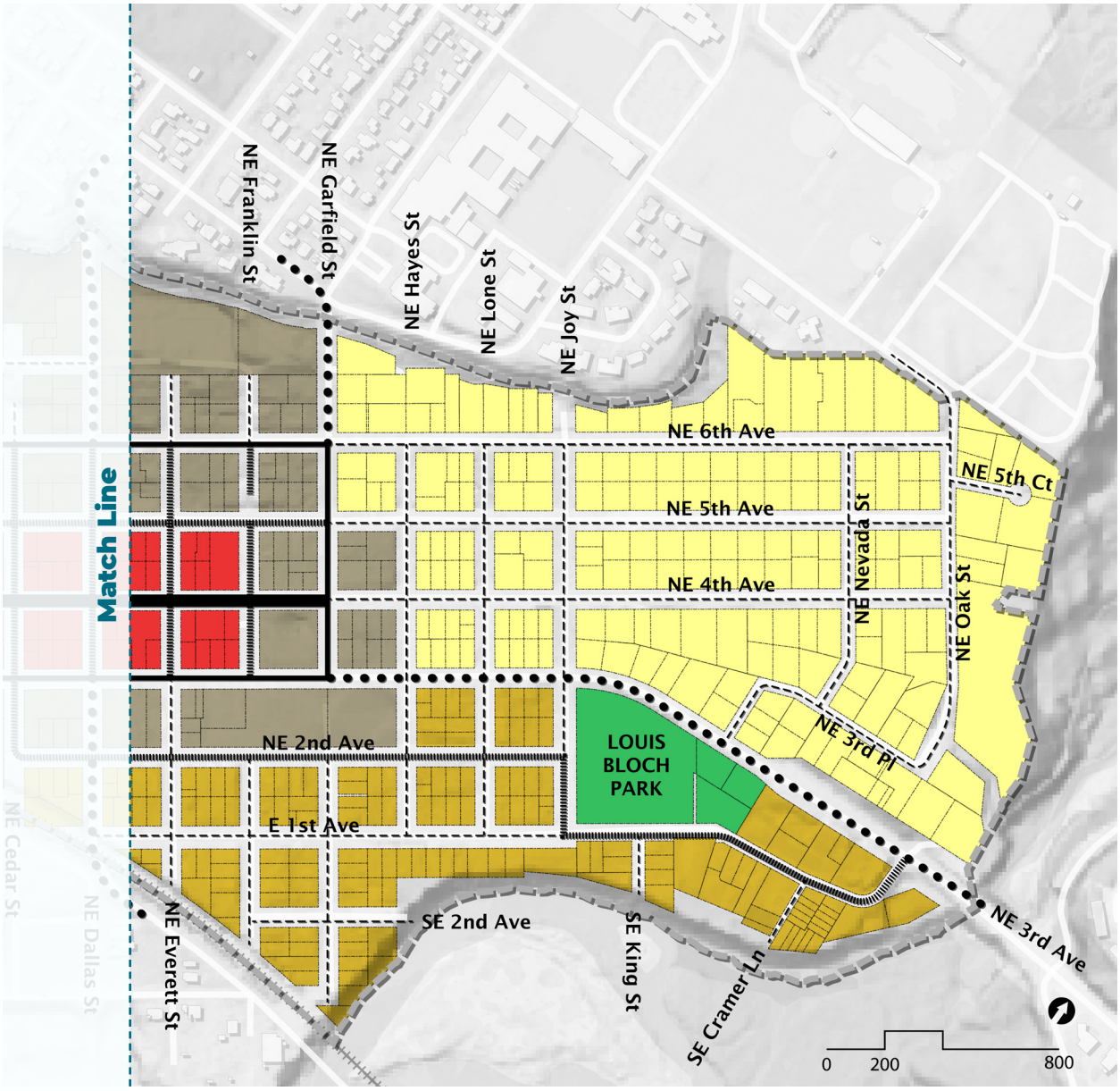


Figure 13. Map of the Regulating Plan

BASE ZONING DISTRICTS.

*See **Section 3.0** for further details.*

- 3.1 Historic Main Street Core
- 3.2 Downtown Mixed-Use: Mid Rise
- 3.3 Downtown Mixed-Use: Low Rise
- 3.4 Downtown Residential
- 3.5 Heavy Industrial (HI)
- 3.5 Neighborhood Park (NP)

STREET TYPES.

*See **Section 5.0** for further details.*

- 5.1 Main Streets (MNS)
- 5.2 Connector Streets (CNS)
- 5.3 Mobility Streets (MBS)
- 5.4 Gateway Streets (GWS)
- 5.5 Neighborhood Streets (NHS)

3.0 Base Zoning Districts

The Downtown Camas Transect Framework guides growth across four (4) base zoning districts, transitioning from the walkable Historic Main Street Core to surrounding residential and employment areas. Each district reflects context-appropriate building types, scale, and uses. Mid- and low-rise mixed-use zones provide housing and commerce near the core, while the Downtown Residential district preserves neighborhood character with gentle infill—balancing preservation, growth, and walkability for a cohesive downtown.



3.1
Historic Main Street Core.

The most compact and walkable district, featuring continuous street-facing buildings with minimal setbacks and active ground floors. Uses include retail, dining, civic, and upper-story office or residential. Architecture emphasizes preservation, human scale, and a fine-grain frontage pattern.



3.2
Downtown Mixed-Use: Mid Rise.

A vibrant, higher-density urban zone with buildings ranging in heights. Supports a mix of residential, commercial, and civic uses with structured parking and active ground-floor frontages. Streets are multimodal, with wide sidewalks, trees, and transit access.

PURPOSE OF THE BASE ZONING DISTRICTS.
The purpose of the base zoning districts is to provide the appropriate general and development standards for each district that will regulate the built form, including: building heights, building uses, lot sizes, lot widths, lot depths, lot coverage, open or common spaces, primary street setbacks, side street setbacks, side yard setbacks, rear yard/alley setbacks, and parking setbacks. See **Chapter 18.05 Zoning Map and Districts** of the Camas Municipal Code for codified base zoning districts.

Figure 14. Base zoning district Transect Diagrams



3.3
Downtown Mixed-Use: Low Rise.

A transitional zone with a range of building types and a mix of neighborhood-serving retail, offices, and housing, including a range of missing middle housing. Slightly deeper setbacks and increased landscaping support a softer urban edge while maintaining pedestrian orientation and urban form.



3.4
Downtown Residential.

A primarily residential area defined by smaller-scale housing types—such as cottages, duplexes, triplexes, fourplexes, and accessory dwelling units—often on existing single-family lots. The district maintains a lower-density character while allowing incremental infill that respects existing neighborhood patterns and historic scale.



Figure 15. Sample Historic Main Street Character

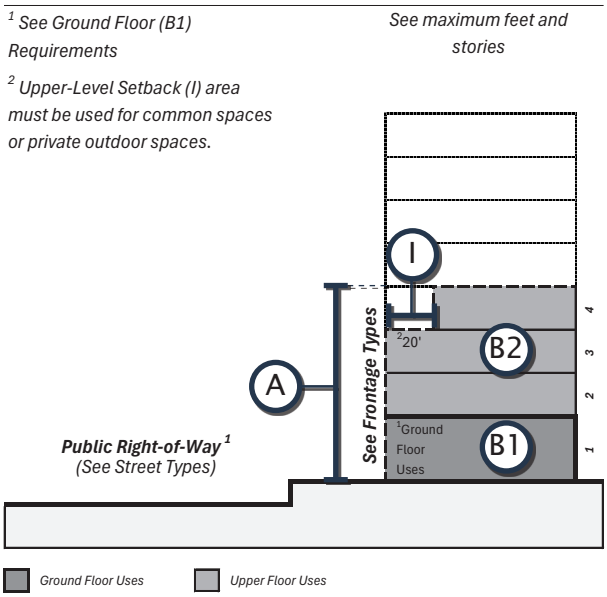


Figure 16. Height and Use Diagram (A-B)

3.1 Historic Main Street Core.

PURPOSE AND INTENT.

1. To continue the historic pedestrian-oriented characteristic along NE 4th Avenue, between NE Adams and NE Garfield Streets and enhance that same character throughout the district;
2. To recognize and accommodate primary retailers along 3rd, 4th, and 5th Avenue between Adams Street and Garfield Street within the Downtown Camas boundary;
3. To preserve the existing historic architectural character with design standards;
4. To preserve the historic character of primary uses, include a limited mix of small and local retail shops, restaurants, bars, and cafes;
5. To encourage and accommodate the adaptive reuse of existing development and emphasize multimodal accessibility and connectivity; and
6. Mixed use within this district refers to vertical mixed use where active primary uses are on the ground floor and secondary uses are above.

APPLICABILITY.

See **Chapter 18.05: Zoning Map and Districts** for further details.

GENERAL STANDARDS.

[A] Building Height.

- Maximum Fifty (50') feet and four (4) stories.
- An upper-level setback (See [I]) of twenty (20') feet along Main Streets would ensure that new development along 4th Avenue is setback for the fourth level as part of a development.

[B] Building Uses.

See **Section 4.0 Use and Parking** for further details.

- **[B1] Ground Floor Uses:** At least seventy (70%) percent of the ground floor area and frontages on Main Streets must be occupied by active commercial uses. On all other street types, at least seventy (70%) percent of the ground floor area and frontages must be occupied by active commercial uses or passive commercial uses.
- **[B2] Upper Floor Uses:** The upper floor area may occupy up to one hundred (100%) percent on any street type with other uses permitted within this zone.

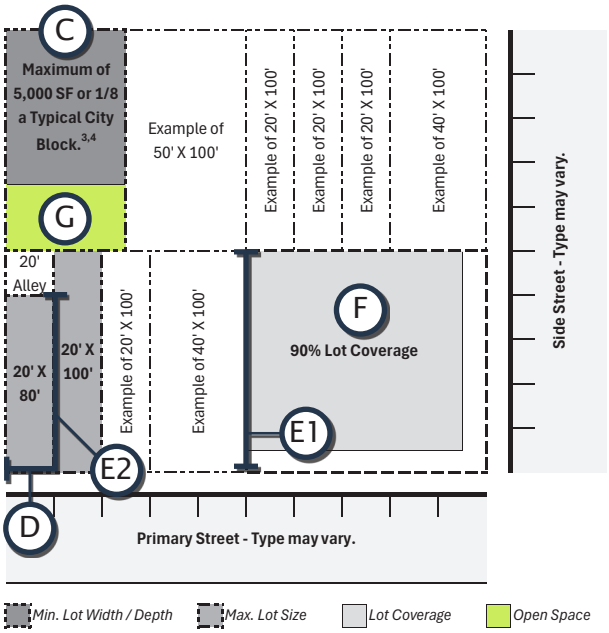


Figure 17. Lot Requirements Diagram (C-G)

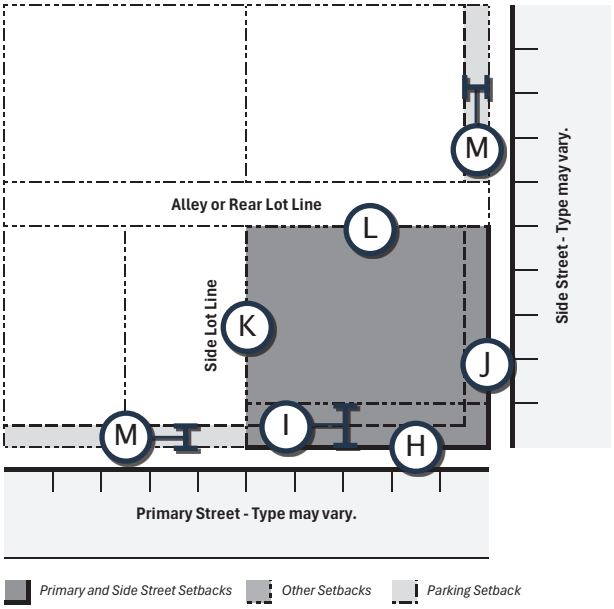


Figure 18. Setback Requirements Diagram (H-M)

DEVELOPMENT STANDARDS.

LOT REQUIREMENTS

[C] Lot Size.

- Maximum five thousand (5,000 SF) square feet or one-eighth (1/8) of a typical city block when located west of NE Dallas St.
- Maximum ten thousand (10,000 SF) square feet or one-quarter (1/4) of a typical city block when located east of NE Dallas St.
- Lot sizes are not applicable to any public agency uses.

[D] Lot Width.

- Minimum twenty (20') feet.

[E] Lot Depth.

- **[E1]** Minimum one hundred (100') feet.
- **[E2]** Minimum eighty (80') feet with provision of alley.

[F] Lot Coverage.

- Minimum ninety (90%) percent.
- Coverage may be decreased for public agency uses.

[G] Open or Common Spaces.

- Minimum square feet of usable, shared open or common space per dwelling unit: Ten (10 SF) square feet per dwelling unit.

SETBACK REQUIREMENTS

[H] Primary Street Setback

- Maximum distance of Ground Floor Facade from public ROW on Primary Street: Zero (0') lot line.
- Setback may be increased for public agency uses.

[I] Primary Street Upper-Level Setback

- Minimum distance from Ground Floor Facade for upper-levels in building: Minimum twenty (20') feet for stories four (4) or more. Upper-Level Setback area must be used for common spaces or private outdoor spaces.

[J] Side Street Setback

- Zero (0') feet maximum (Zero Lot Line).

[K] Side Yard Setback

- Zero (0') feet maximum (Zero Lot Line).

[L] Rear Yard / Alley Setback

- Not applicable.

[M] Parking Setback

- Minimum five (5') feet from primary street lot line; and never in front of the primary street or side street facade line.
- See **Section 4.0 Use and Parking** for parking ratios.



Figure 19. Sample Downtown Mixed-Use: Mid Rise Character

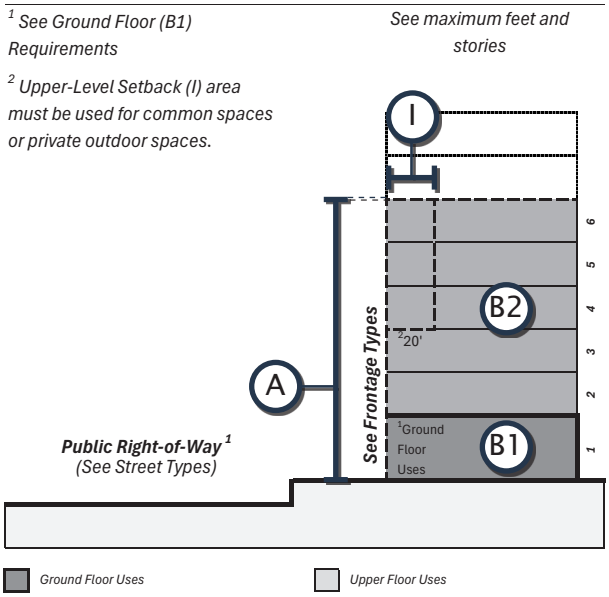


Figure 20. Height and Use Diagram (A-B)

3.2 Downtown Mixed-Use: Mid Rise.

PURPOSE AND INTENT.

1. To recognize and accommodate a mix of uses including retail and residential, within the downtown mixed use – low rise zone within the Downtown Camas boundary;
2. To promote the development of low-rise apartments with active ground floor, live/work units, duplexes, townhomes, triplexes, and quadplexes; and
3. To encourage and accommodate higher density middle housing.

APPLICABILITY.

See **Chapter 18.05: Zoning Map and Districts** for further details.

GENERAL STANDARDS.

[A] Building Height.

- Maximum seventy-five (75') feet and six (6) stories.
- An upper-level setback (See [I]) of twenty (20') feet when located on 5th Avenue directly across from Historic Main Street Core district would ensure that new development near the historic downtown is sensitive to historic buildings.

[B] Building Uses.

See **Section 4.0 Use and Parking** for further details.

- **[B1] Ground Floor Uses:** At least seventy (70%) percent of the ground floor area and frontages on Main Streets must be occupied by active commercial uses. On Mobility Streets and Gateway Streets, at least seventy (70%) percent of the ground floor area and frontages must be occupied by active commercial uses or passive commercial uses. On all other street types, residential uses may not occupy more than seventy (70%) percent of the ground floor area and frontages.

- **[B2] Upper Floor Uses:** The upper floor area may occupy up to one hundred (100%) percent on any street type with other uses permitted within this zone.

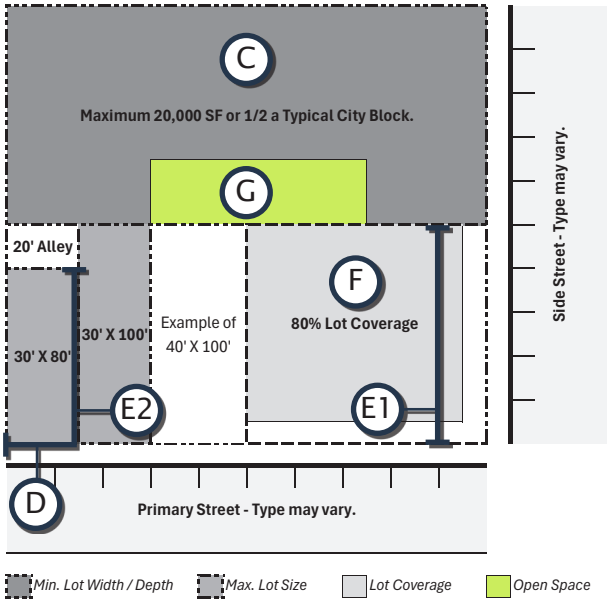


Figure 21. Lot Requirements Diagram (C-G)

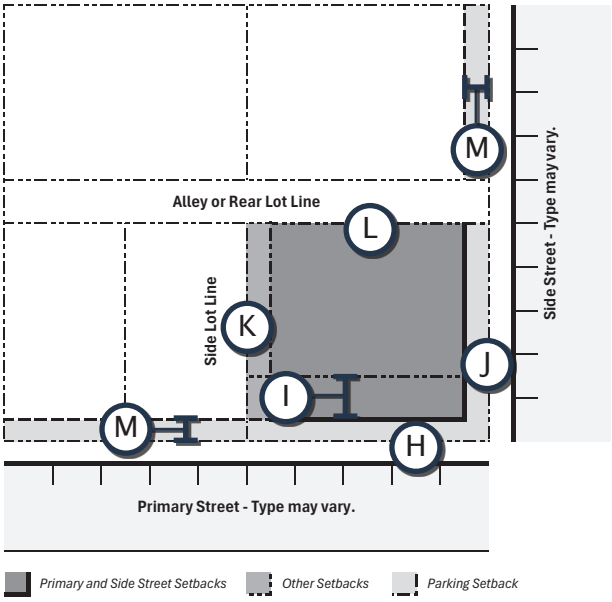


Figure 22. Setback Requirements Diagram (H-M)

DEVELOPMENT STANDARDS.

LOT REQUIREMENTS

[C] Lot Size.

– Maximum twenty thousand (20,000 SF) square feet or one-half (1/2) of a typical city block.

[D] Lot Width.

– Minimum thirty (30') feet.

[E] Lot Depth.

– **[E1]** Minimum one hundred (100') feet.
– **[E2]** Minimum eighty (80') feet with provision of alley.

[F] Lot Coverage.

– Minimum eighty (80%) percent.

[G] Open or Common Spaces.

– Minimum square feet of usable, shared open or common space per dwelling unit: Fifty (50 SF) square feet per dwelling unit.

SETBACK REQUIREMENTS

[H] Primary Street Setback

– Maximum distance of Ground Floor Facade from public ROW on Primary Street: Ten (10') feet.

[I] Primary Street Upper-Level Setback

– Minimum distance from Ground Floor Facade for upper-levels in building located on 5th Avenue directly across from Historic Main Street Core: Minimum twenty (20') feet for stories four (4) or more. Upper-Level Setback area must be used for common spaces or private outdoor spaces.

[J] Side Street Setback

– Maximum distance of Ground Floor Facade from public ROW on side street: Ten (10') feet.

[K] Side Yard Setback

– Maximum five (5') feet.

[L] Rear Yard / Alley Setback

– Not applicable.

[M] Parking Setback

– Minimum five (5') feet from primary street lot line; and never in front of the primary street or side street facade line.
– See **Section 4.0 Use and Parking** for parking ratios.



Figure 23. Sample Downtown Mixed-Use: Low Rise Character

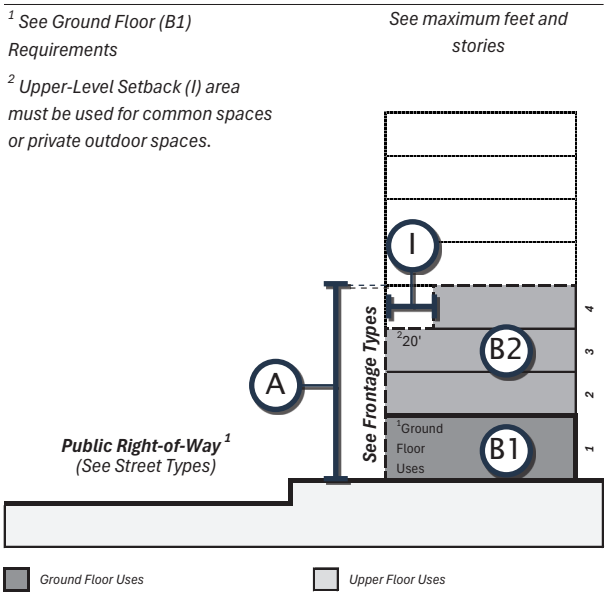


Figure 24. Height and Use Diagram (A-B)

3.3 Downtown Mixed-Use: Low Rise.

PURPOSE AND INTENT.

1. To recognize and accommodate a mix of uses including retail and residential, within the downtown mixed use – low rise zone within the Downtown Camas boundary;
2. To promote the development of low-rise apartments with active ground floor, live/work units, duplexes, townhomes, triplexes, and quadplexes; and
3. To encourage and accommodate the adaptive reuse of existing development and emphasize multimodal accessibility and connectivity.

APPLICABILITY.

See **Chapter 18.05: Zoning Map and Districts** for further details.

GENERAL STANDARDS.

[A] Building Height.

- Maximum (50') feet and four (4) stories.
- An upper-level setback (See [I]) of twenty (20') feet along all street types will ensure that new development is sensitive to existing residential areas.

[B] Building Uses.

See **Section 4.0 Use and Parking** for further details.

- **[B1] Ground Floor Uses:** At least seventy (70%) percent of the ground floor area and frontages must be occupied by active commercial uses or passive commercial uses or residential uses on Mobility Streets and Gateway Streets. Residential uses may occupy up to one hundred (100%) percent of the ground floor area and frontages on any street type, including Mobility Streets and Gateway Streets.

- **[B2] Upper Floor Uses:** The upper floor area may occupy up to one hundred (100%) percent on any street type with other uses permitted within this zone.

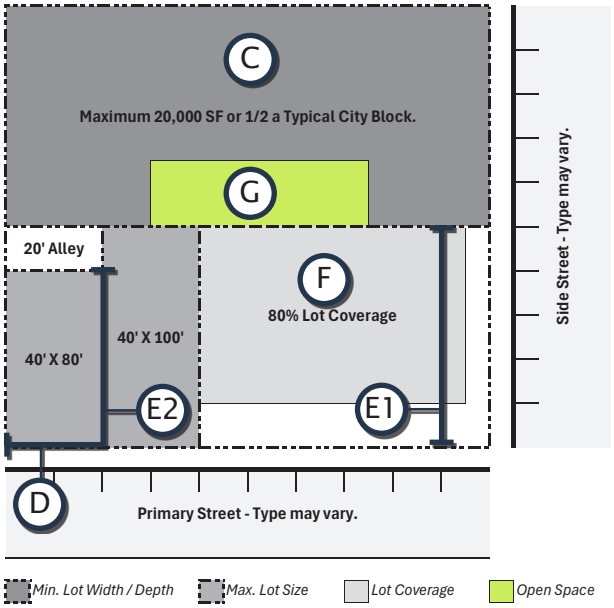


Figure 25. Lot Requirements Diagram (C-G)

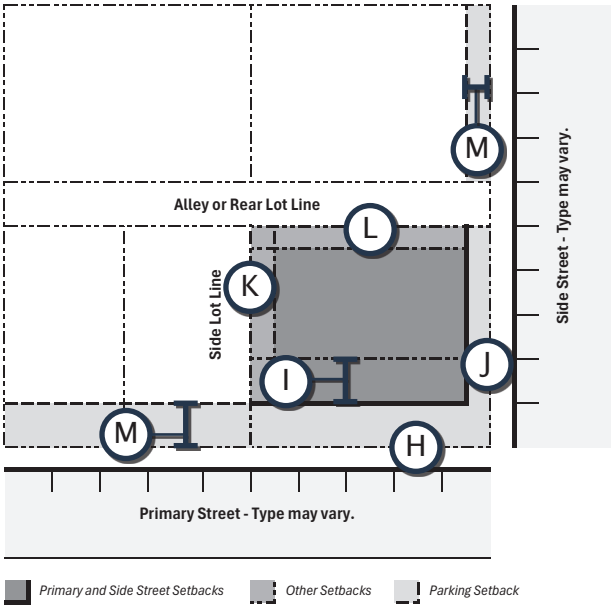


Figure 26. Setback Requirements Diagram (H-M)

DEVELOPMENT STANDARDS.

LOT REQUIREMENTS

[C] Lot Size.

– Maximum twenty thousand (20,000 SF) square feet or one-half (1/2) of a typical city block.

[D] Lot Width.

– Minimum forty (40') feet.

[E] Lot Depth.

– **[E1]** Minimum one hundred (100') feet.
– **[E2]** Minimum eighty (80') feet with provision of alley.

[F] Lot Coverage.

– Minimum eighty (80%) percent.

[G] Open or Common Spaces.

– Minimum square feet of usable, shared open or common space per dwelling unit: Fifty (50 SF) square feet per dwelling unit. This provision is not required for single-family residential (attached or detached).
– Requirement does not apply to single-family residential projects.

SETBACK REQUIREMENTS

[H] Primary Street Setback

– Maximum distance of Ground Floor Facade from public ROW on Primary Street: Fifteen (15') feet.

[I] Primary Street Upper-Level Setback

– Minimum distance from Ground Floor Facade for upper-levels in building: Minimum twenty (20') feet for stories four (4) or more. Upper-Level Setback area must be used for common spaces or private outdoor spaces.

[J] Side Street Setback

– Minimum distance of Ground Floor Facade from public ROW on Primary Street: Five (5') feet.
– Maximum distance of Ground Floor Facade from public ROW on Primary Street: Ten (10') feet.

[K] Side Yard Setback

– Maximum five (5') feet.

[L] Rear Yard / Alley Setback

– Minimum five (5') feet.

[M] Parking Setback

– Minimum five (5') feet from primary street lot line; and never in front of the primary street or side street facade line.
– See **Section 4.0 Use and Parking** for parking ratios.



Figure 27. Sample Downtown Residential Character

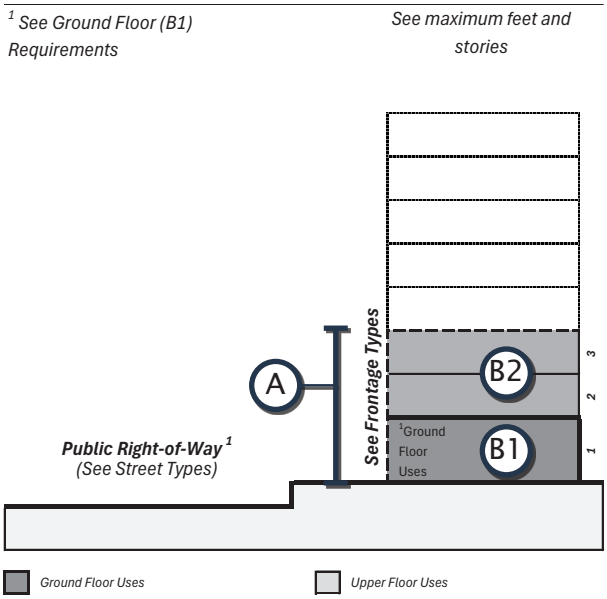


Figure 28. Height and Use Diagram (A-B)

3.4 Downtown Residential.

PURPOSE AND INTENT.

1. To recognize and preserve existing single-family housing stock within the Downtown Camas boundary while supporting gradual redevelopment and the addition of middle housing consisted with the neighborhood's established character;
2. To encourage and accommodate the transitional permeability of existing residential development with downtown commercial activity and emphasize the neighborhood's character and walkability.

APPLICABILITY.

See **Chapter 18.05: Zoning Map and Districts** for further details.

GENERAL STANDARDS.

[A] Building Height.

- Maximum twenty-five (25') feet and two (2) stories on Neighborhood Streets; and
- Maximum thirty-five (35') feet and three (3) stories on all other street types.

[B] Building Uses.

See **Section 4.0 Use and Parking** for further details.

- **[B1] Ground Floor Uses:** Active commercial uses or passive commercial uses may occupy up to seventy (70%) percent of the ground floor area and frontages on Gateway Streets and Connector Streets. Residential uses may occupy up to one hundred (100%) percent of ground floor area and frontages on any street type.
- **[B2] Upper Floor Uses:** The upper floor area may occupy up to one hundred (100%) percent on any street type with other uses permitted within this zone.

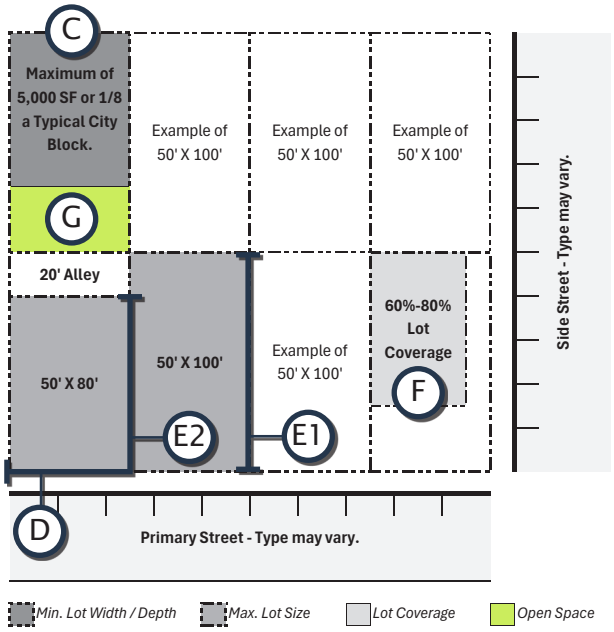


Figure 29. Lot Requirements Diagram (C-G)

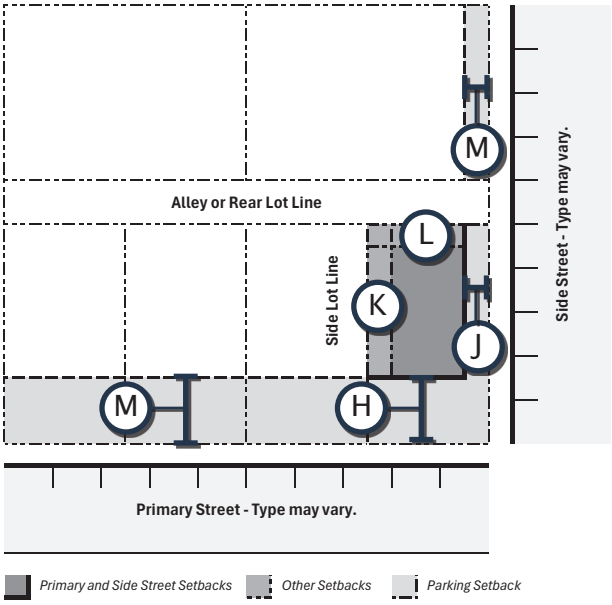


Figure 30. Setback Requirements Diagram (H-M)

DEVELOPMENT STANDARDS.

LOT REQUIREMENTS

[C] Lot Size.

– Maximum five thousand (5,000 SF) square feet or one-eighth (1/8) of a typical city block.

[D] Lot Width.

– Minimum fifty (50') feet.

[E] Lot Depth.

– **[E1]** Minimum one hundred (100') feet.
– **[E2]** Minimum eighty (80') feet with provision of alley.

[F] Lot Coverage.

– Minimum sixty (60%) percent.
– Maximum eighty (80%) percent.

[G] Open or Common Spaces.

– Not applicable.

SETBACK REQUIREMENTS

[H] Primary Street Setback

– Minimum distance of Ground Floor Facade from public ROW on Primary Street: Fifteen (15') feet.
– Maximum distance of Ground Floor Facade from public ROW on Primary Street: Twenty-five (25') feet.

[I] Primary Street Upper-Level Setback

– Not applicable.

[J] Side Street Setback

– Minimum distance of Ground Floor Facade from public ROW on Primary Street: Ten (10') feet.

[K] Side Yard Setback

– Minimum five (5') feet; Maximum ten (10') feet.

[L] Rear Yard / Alley Setback

– Minimum five (5') feet.

[M] Parking Setback

– Minimum twenty (20') feet from primary street lot line; and never in front of the primary street or side street facade line.
– See **Section 4.0 Use and Parking** for parking ratios.

4.0 Use and Parking.

PRIMARY USE TYPES[1]	UF/GF	Historic Main Street	Downtown Mixed-Use (Mid Rise)	Downtown Mixed-Use (Low Rise)	Downtown Residential
Active Commercial Uses	UF	P[2]	X	X	X
	GF		P	P[1]	P[3]
Communication, Utilities, and Facilities Uses	UF	X[4]	X[4]	X[4]	X[4]
	GF				
Educational Uses	UF	P	P	P	X
	GF	X			
Incidental Uses	UF	*Varies widely, see CMC Chapter 18.07.060.*			
	GF				
Industrial Uses	UF	X	X	X	X
	GF				
Manufacturing and/ or Processing Uses	UF	X	X	X	X
	GF				
Passive Commercial Uses	UF	P[1]	P[1]	P[1]	X
	GF	X[1]			P[3]
Recreational, Religious, and Cultural Uses	UF	*Varies widely, see CMC Chapter 18.07.060.*			
	GF				
Residential Uses	UF	P[1]	P	P	P
	GF	X			
Temporary Uses	UF	T	T	T	T
	GF				

P PERMITTED X PROHIBITED T TEMPORARY

Figure 31. Allowable Use by Floor for all Base Zoning Districts

4.1 Use Table.

The following use table provides use authorization for the ground floor (GF) and upper floors (UF) for each base zoning district. Please see **CMC Chapter 18.07.060 Downtown Zoning Districts** for all individual land uses. Please see **CMC 18.11 Parking** for all parking requirements. In the event of a conflict, the zoning code shall supersede this manual.

NOTES:

(1) Verify all individual land uses per CMC Chapter 18.07.060 Downtown Zoning Districts. Verify all percentages allowable per district in Section 3.0 Base Zoning Districts.

(2) Active Commercial Uses are required on Ground Floor (GF) of Main Streets.

(3) Active Commercial and Passive Commercial Uses only permitted on Ground Floor (GF) when located on Gateway Streets or Connector Streets.

(4) Refer to CMC Chapter 18.35 for Wireless Communication Facilities.

4.2 Active and Passive Commercial Uses.

To support enforcement of the zoning code provisions in this design manual, commercial uses are classified as either active commercial uses or passive commercial uses per **CMC Chapter 18.07.060 Downtown Zoning Districts**. These uses are as follows:

[A] Active Commercial Uses.

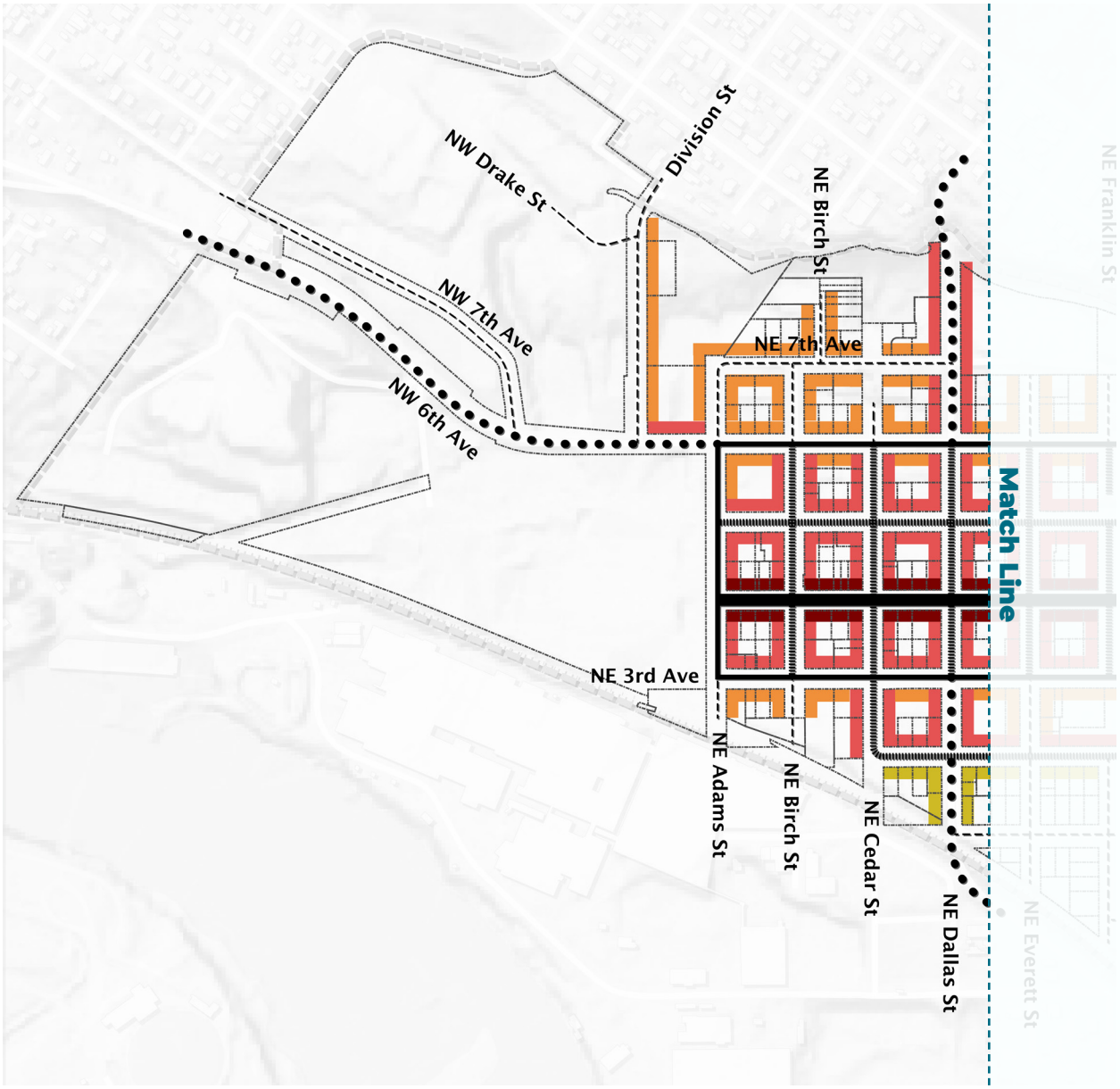
Active commercial refers to street-facing, ground-floor uses that encourage walkability and activate sidewalks, such as shops, cafés, restaurants, and other active, customer-oriented businesses. Active commercial uses include:

- Antique shop
- Appliance sales and service
- Artisanal/craft/makers
- Bakery (retail)
- Banks, savings and loan
- Barber and beauty shops
- Book store
- Bowling alley/billiards
- Building, hardware and garden supply store
- Candy; confectionery store
- Clothing store
- Coffee shop, cafe or kiosk
- Day care, mini-center
- Delicatessen (deli)
- Department store
- Event center
- Feed store
- Fitness center/sports club
- Florist shop
- Food cart/food truck/ food delivery business
- Furniture store
- Grocery, neighborhood scale
- Grocery, small scale
- Hotel, motel
- Laundry/dry cleaning (retail)
- Liquor store
- Medical or dental clinics (outpatient)
- Nursery, plant
- Office supply store
- Pet shops
- Pharmacy
- Photographic/ electronics store
- Professional office(s)
- Public agency
- Real estate office
- Restaurant
- Restaurant, fast food
- Second-hand/ consignment store
- Specialty goods production (e.g. brew pub)
- Taverns
- Theater, except drive-in

[B] Passive Commercial Uses.

Passive commercial refers to commercial activities that primarily serve building occupants or a smaller customer base—such as boutique offices, lobby kiosks, or specialty shops—which typically generate less foot traffic and require less window visibility. Passive commercial uses include:

- Animal kennel, commercial boarding
- Animal shelter
- Automobile repair (garage)
- Automobile sales, new or used
- Automobile service station
- Automobile wrecking
- Bakery (wholesale)
- Boat building
- Boat repair and sales
- Bus station
- Cabinet and carpentry shop
- Convention center
- Day care center
- Day care, adult
- Day care, family home
- Equipment rental
- Funeral home
- Furniture repair; upholstery
- Gas/fuel station
- Gas/fuel station with mini market
- Grocery, large scale
- Hospital, emergency care
- Household appliance repair
- Industrial supplies store
- Laundry (self-serve)
- Laundry/dry cleaning (industrial)
- Machine shop
- Manufactured home sales lot
- Mini-storage/vehicular storage
- Newspaper printing plant
- Nursing, rest, convalescent, retirement home
- Parcel freight depots
- Pawnshop
- Permanent supportive housing
- Plumbing, or mechanical service
- Printing, binding, blue printing
- Recycling center
- Recycling collection point
- Recycling plant
- Research facility
- Roadside produce stand
- Sand, soil, gravel sales and storage
- Sexually oriented business
- Shoe repair and sales
- Smoke shop
- Stock broker, brokerage firm
- Truck terminals
- Veterinary clinic
- Warehousing, wholesale and trade
- Warehousing, bulk retail



4.3 Ground Floor Uses Map.

The following map illustrates the applicable provisions of **Section B1: Ground Floor Uses** (as further established in the **Section 4.1: Use Table**) for all lots within the area according to the appropriate Street Type and Base Zoning District. In the event of a conflict, the zoning code shall supersede this manual.

STREET TYPES.

*See **Section 5.0** for further details.*

- 5.1 Main Streets (MNS)
- 5.2 Connector Streets (CNS)
- 5.3 Mobility Streets (MBS)
- 5.4 Gateway Streets (GWS)
- 5.5 Neighborhood Streets (NHS)

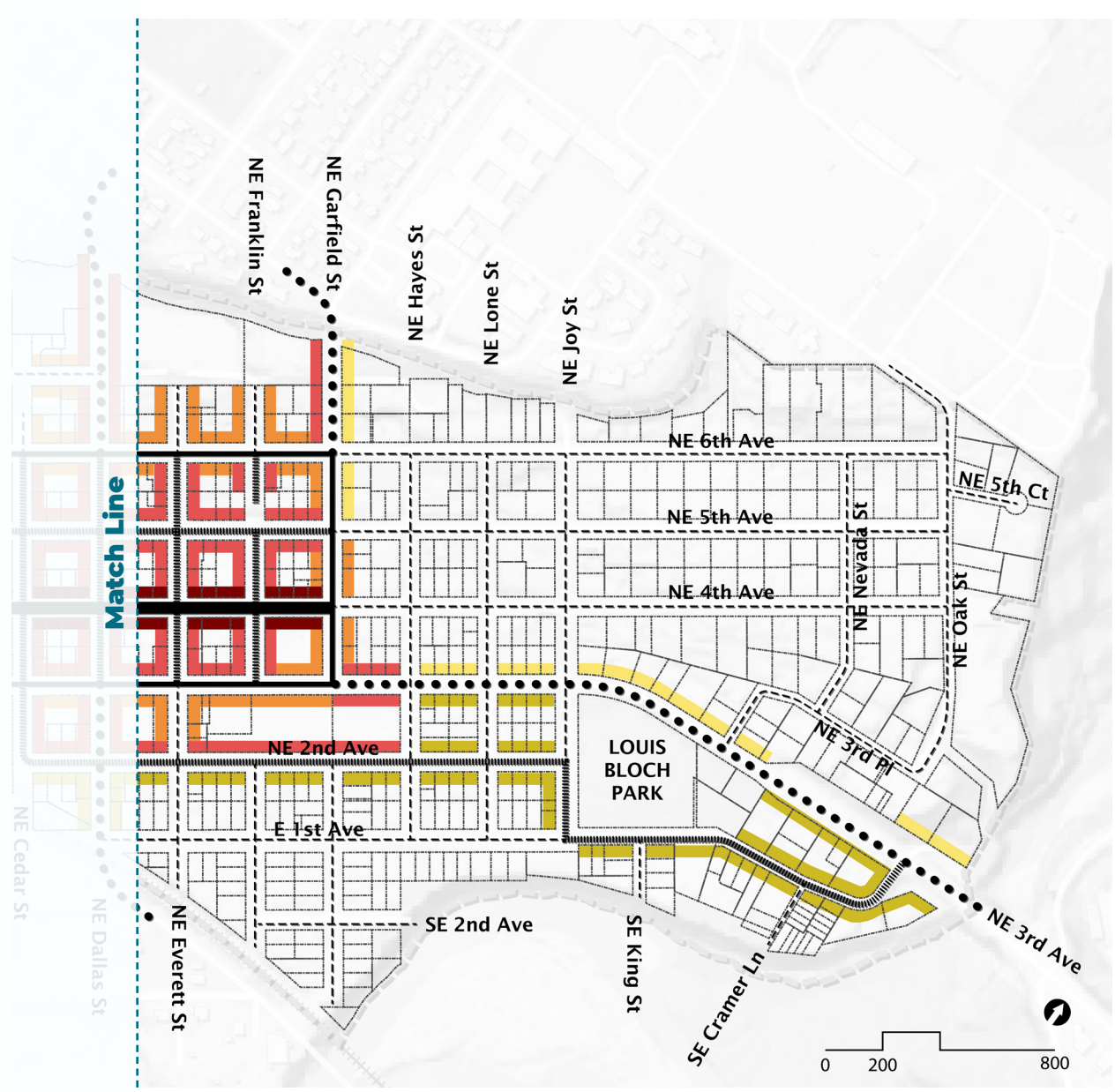


Figure 32. Map of Ground Floor Use Requirements

GROUND FLOOR USES REQUIREMENTS.

*See **Section 3.1-3.4 [B1]** Ground Floor Uses of the applicable Base Zoning District for further details.*

1) Must occupy at least seventy (70%) percent Active Commercial Uses.

2) Must occupy at least seventy (70%) percent Active or Passive Commercial Uses.

3) Must not occupy more than seventy (70%) percent with Residential Uses.

4) Must occupy at least seventy (70%) percent Active / Passive Commercial or Residential Uses.

5) May occupy up to seventy (70%) percent Active or Passive Commercial Uses.

All lots not highlighted and (5) and (6) may occupy up to one hundred (100%) percent residential uses.



Figure 33. Map of the Street Network In the Downtown Core

5.0 The Street Network.

The street network weaves together and unifies the base zoning districts throughout downtown. The street network plan illustrated above identifies the five (5) street types assigned to all streets within the Downtown area, as also shown in the regulating plan in Section 2.0: The Regulating Plan.

For the purposes of this design manual, these street types assign standards for frontage types, general improvements, and specific street-type standards. They also define activities and standards for the façade zone, encroachment zone, sidewalk zone, and amenities zone, with variations that help shape the distinct character of each street.

STREET TYPES.

- 5.1 Main Streets (MNS)
- 5.2 Connector Streets (CNS)
- 5.3 Mobility Streets (MBS)
- 5.4 Gateway Streets (GWS)
- 5.5 Neighborhood Streets (NHS)

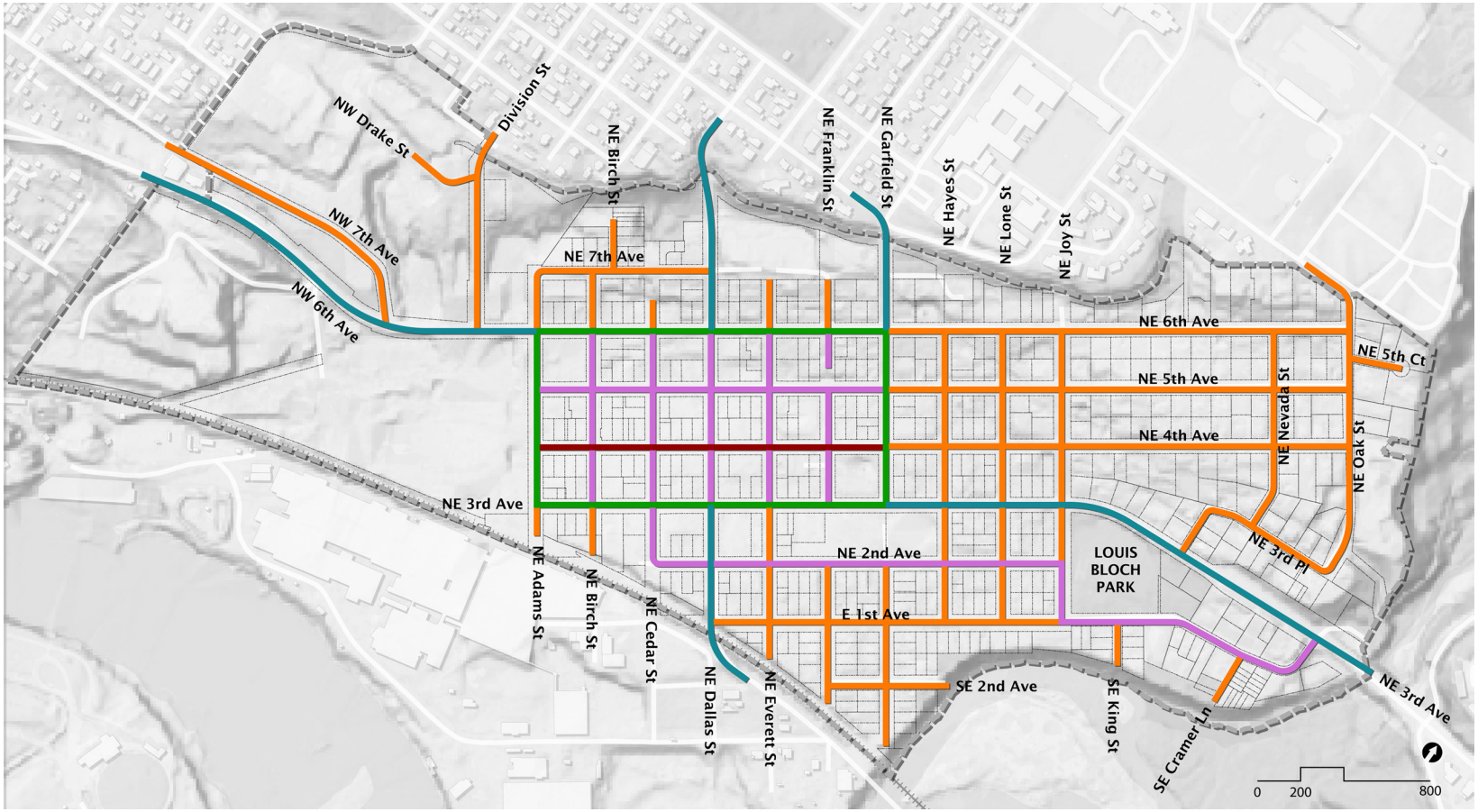


Figure 34. Map of the Street Network

STREET TYPES.

- 5.1 Main Streets (MNS)
- 5.2 Connector Streets (CNS)
- 5.3 Mobility Streets (MBS)
- 5.4 Gateway Streets (GWS)
- 5.5 Neighborhood Streets (NHS)


SNOW WHITE
NOVOCAINE
NTL IMPORTANCE EARNEST



DESIGN STANDARDS

SECTION 6.0 FRONTAGE STANDARDS
SECTION 7.0 PUBLIC REALM STANDARDS
SECTION 8.0 GENERAL STANDARDS



Figure 35. A Range of Frontage Types along Historic 4th Avenue

6.0 Frontage Standards.

Frontage is defined as the area between a building and its lot line (or setback area), including façades, porches, stoops, shopfronts, and yards. In some cases, frontage may extend into the public right-of-way through elements such as awnings, seating, or landscaping. Frontage defines how buildings engage the street, supports walkability, and enhances the public realm. Frontage standards are allowed based on the street type or types adjacent to a lot, and a single building may incorporate more than one applicable frontage type. When frontage standards conflict with other requirements of this manual, the planning official will determine which applies. See general standards **(Section 8.0)** for other improvements related to frontage.

✓ ALLOWED ON THE STREET TYPE.

✗ NOT ALLOWED ON THE STREET TYPE.

FRONTAGE TYPE	Main Street	Connector Street	Mobility Street	Gateway Street	Neighborhood Street
6.1 Alcove Frontage	✗	✓	✓	✓	✗
6.2 Café Frontage	✓	✓	✓	✓	✗
6.3 Civic Frontage	✓	✓	✓	✗	✗
6.4 Forecourt Frontage	✗	✗	✓	✓	✓
6.5 Porch Frontage	✗	✗	✗	✓	✓
6.6 Shop Frontage	✓	✓	✓	✓	✗
6.7 Stoop Frontage	✗	✓	✓	✓	✓
6.8 Walkup Frontage	✗	✓	✓	✓	✓
6.9 Yard Frontage	✗	✗	✗	✗	✓

Figure 36. Allowable Frontage Type by Street Type



Figure 37. Example of Alcove Frontage

6.1 Alcove Frontage.

Alcove frontage can be described as typical passive commercial frontage with awnings or recessed spaces and doors with limited glass and less outdoor-focused spaces; often used for passive commercial (such as personal services, medical offices, or other less-active uses). Must meet the following standards:

- Maximum coverage of fifty (50%) percent of primary building façade.
- Minimum width of eight (8') feet and maximum depth of six (6') feet.
- Entry point must be located within the covered alcove area.
- Columns supporting the alcove and other elements such as awnings must not be located within the public right-of-way.

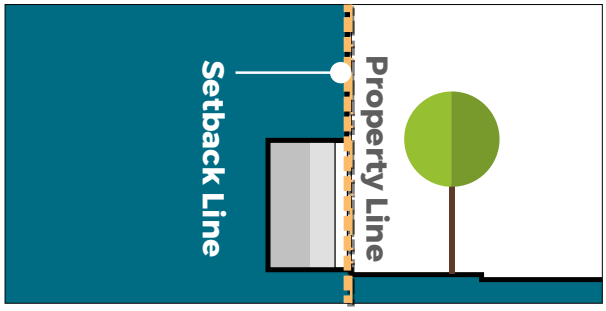


Figure 38. Typical Cross Section

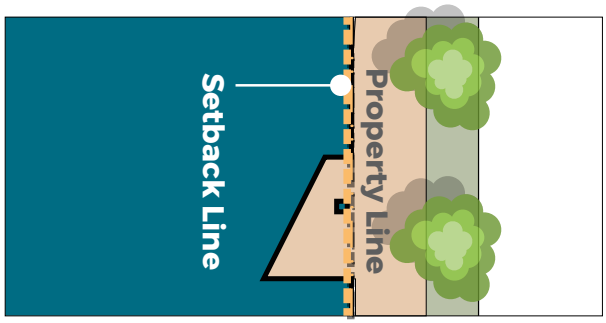


Figure 39. Typical Plan Diagram

STREET TYPE	ALLOWANCE
Main Street	✗
Connector Street	✓
Mobility Street	✓
Gateway Street	✓
Neighborhood Street	✗

Figure 40. Street Type Allowance



Figure 41. Example of Café Frontage

6.2 Café Frontage.

Café frontage can be described as typical active commercial frontage with awnings, windows, entry points, and fixed walls or railings around exterior spaces for outdoor dining; often used for active commercial uses (such as bars, dining, and other entertainment purposes). Must meet the following standards:

- Minimum of eighty (80%) percent facade transparency on all street types.
- Maximum depth of four (4') feet in the window zone and minimum depth of six (6') feet in the amenities zone.
- Must retain minimum of six (6') feet sidewalk zone through the café area; and limit any "pinch points" at four (4') feet in width for maximum of ten (10') feet distance.
- Medallions or markings on the ground may be used to delineate café area.
- Vertical barriers are allowed as required by the LCB for any business serving alcohol; and minimum café entry points in vertical barrier required every eight (8') feet.
- When included, a vertical barrier must be a maximum of forty-two (42") tall and minimum two (2") inch wide separating cafe from other spaces.

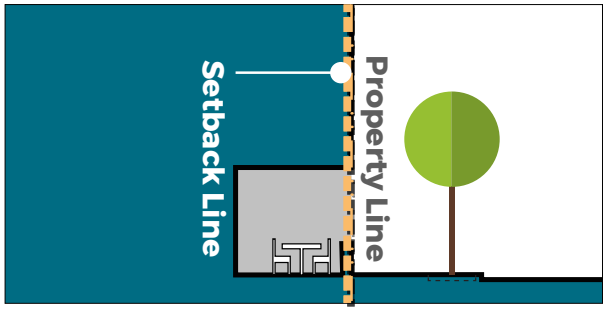


Figure 42. Typical Cross Section

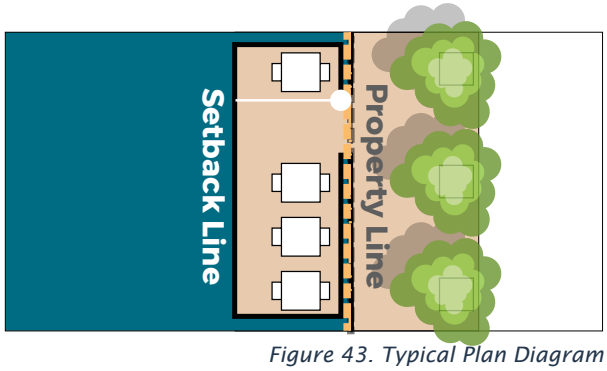


Figure 43. Typical Plan Diagram

STREET TYPE	ALLOWANCE
Main Street	✓
Connector Street	✓
Mobility Street	✓
Gateway Street	✓
Neighborhood Street	✗

Figure 44. Street Type Allowance



Figure 45. Example of Civic Frontage

6.3 Civic Frontage.

Civic frontage can be described as typical frontages for civic uses—such as libraries, city halls, schools, and places of worship—often include a single point of entry and adjacent exterior public spaces, but have limited requirements to let them reflect their civic importance, distinctive character, or public-serving functions. Must meet the following standards:

- Primary entry point must be clear, visible, and covered and accessed by accessible pedestrian walkways linking with the primary street.
- No surface parking is allowed in any of the frontage between the building facade and the primary street.
- Public spaces must be hardscaped, landscaped, and provide amenities (such as benches, trash cans, public art, etc.).

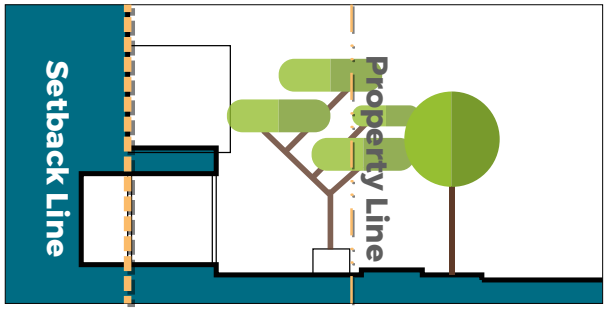


Figure 46. Typical Cross Section

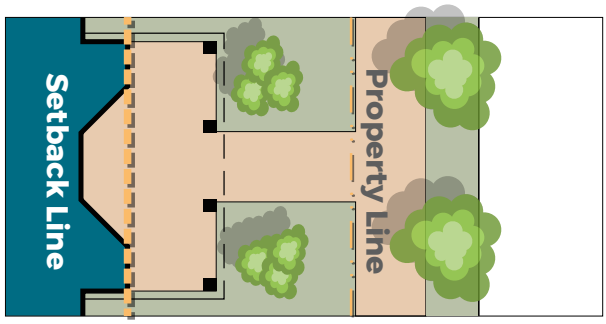


Figure 47. Typical Plan Diagram

STREET TYPE	ALLOWANCE
Main Street	✓
Connector Street	✓
Mobility Street	✗
Gateway Street	✗
Neighborhood Street	✗

Figure 48. Street Type Allowance



Figure 49. Example of Forecourt Frontage

6.4 Forecourt Frontage.

Forecourt frontage can be described as typical active commercial frontage with awnings, windows, entry points, and fixed walls or railings around exterior spaces for outdoor dining; often used for active commercial uses (such as bars, dining, and other entertainment purposes). Must meet the following standards:

- Maximum coverage of fifty (50%) and thirty (30') feet of primary building façade.
- Maximum depth of thirty (30') feet.
- Must be accessed by accessible pedestrian walkways.
- Walls or fences enclosing forecourts must be no less than forty-two (42") and no greater than seven (7') feet tall; and no less than two (2") inches thick.
- Gates must be at least thirty-six (36") inches wide.
- Must not be located within the public right-of-way.

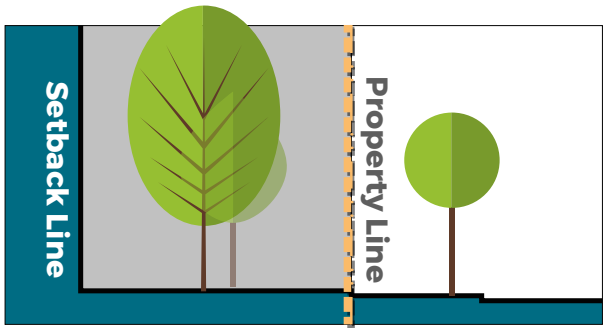


Figure 50. Typical Cross Section

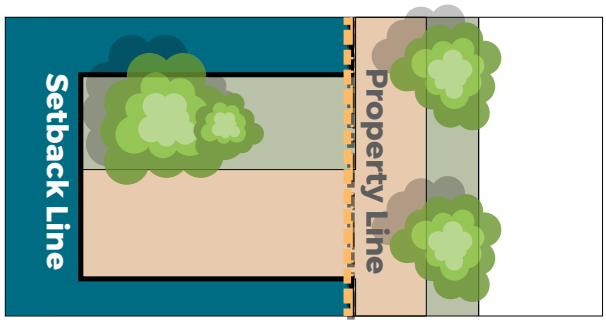


Figure 51. Typical Plan Diagram

STREET TYPE	ALLOWANCE
Main Street	✗
Connector Street	✗
Mobility Street	✓
Gateway Street	✓
Neighborhood Street	✓

Figure 52. Street Type Allowance



Figure 53. Example of Porch Frontage

6.5 Porch Frontage.

Porch frontage can be described as typical single family (1 unit) or small, multifamily (2-4 unit) frontage which consists of a wide, large space with seating area, covering, small run of stairs, landscaping, and fencing to blend with a variety of housing types. Must meet the following standards:

- Minimum coverage of seventy-five (75%) of primary building façade.
- Minimum clear depth of six (6') feet and maximum clear depth of ten (10') feet on primary building façade.
- Minimum height of eight (8') feet above the finished first floor grade.
- Landscaping such as trees, shrubs, and other ground cover must be provided in front yard setbacks.
- May not be located within the public right-of-way.

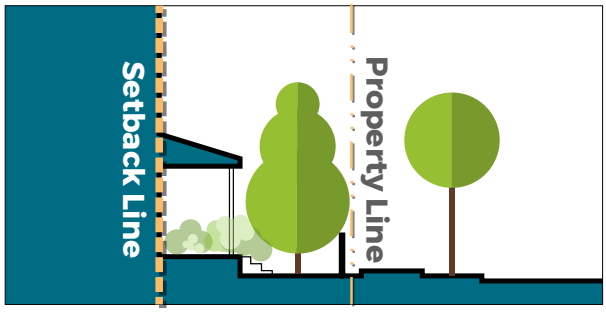


Figure 54. Typical Cross Section

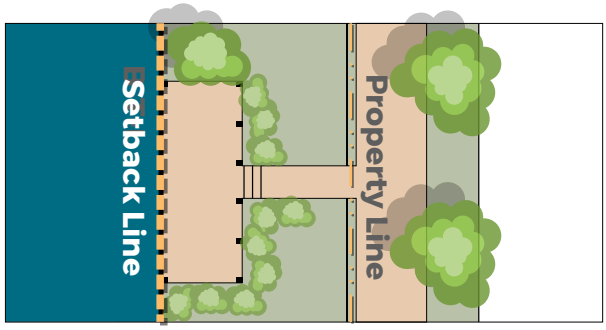


Figure 55. Typical Plan Diagram

STREET TYPE	ALLOWANCE
Main Street	✗
Connector Street	✗
Mobility Street	✗
Gateway Street	✓
Neighborhood Street	✓

Figure 56. Street Type Allowance



Figure 57. Example of Shop Frontage

6.6 Shop Frontage.

Shop frontage can be described as typical active commercial frontage with awnings, windows, entry points, and storefront displays; often used for active commercial uses (such as shopping or sales or dining with no fixed outdoor seating). Must meet the following standards:

- Minimum of eighty (80%) percent facade transparency on all street types.
- Minimum linear awning coverage of seventy-five (75%) percent of primary building façade, and must cover all windows and points of entry.
- Minimum four (4') foot awning covering depth and maximum six (6') foot awning covering depth (over the window zone).
- Minimum awning height of eight (8') feet above the adjacent sidewalk.
- Must include planters, public art, movable seating, or other amenities in the window zone where feasible.
- May be used to meet Weather Protection requirements for the street type.

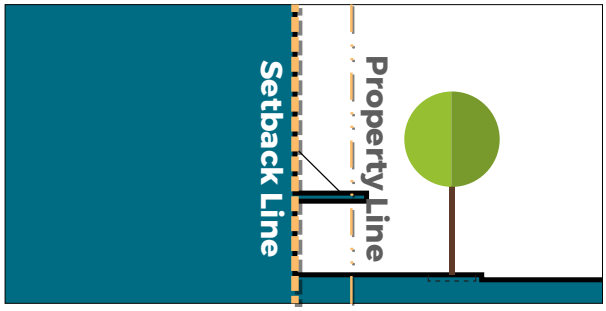


Figure 58. Typical Cross Section

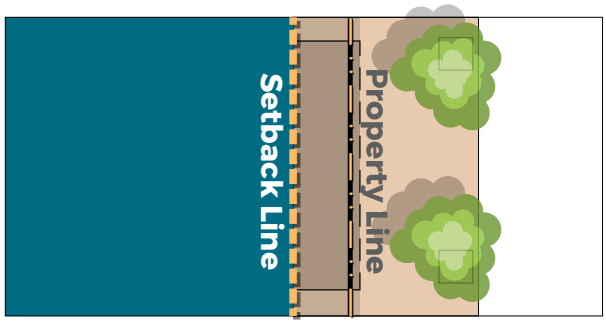


Figure 59. Typical Plan Diagram

STREET TYPE	ALLOWANCE
Main Street	✓
Connector Street	✓
Mobility Street	✓
Gateway Street	✓
Neighborhood Street	✗

Figure 60. Street Type Allowance



Figure 61. Example of Stoop Frontage

6.7 Stoop Frontage.

Stoop frontage can be described as typical single family (1 unit) or small, multifamily (2-4 unit) frontage which consists of a small porch area with covering, small run of stairs, landscaping, and fencing to blend with a variety of housing types. Must meet the following standards:

- Maximum coverage of twenty-five (25%) of primary building façade.
- Minimum clear depth of four (4') feet and maximum clear depth of six (6') feet on primary building façade.
- Must not be elevated greater than six (6') feet above the adjacent sidewalk.
- Landscaping such as trees, shrubs, and other ground cover must be provided in front yard setbacks.
- Steps or stairs associated with a stoop that extend into the public right-of-way must not impeded ADA accessibility.

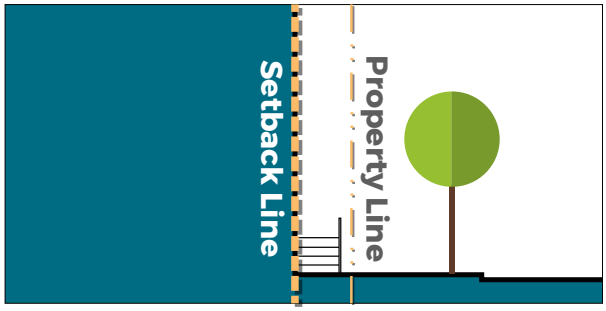


Figure 62. Typical Cross Section

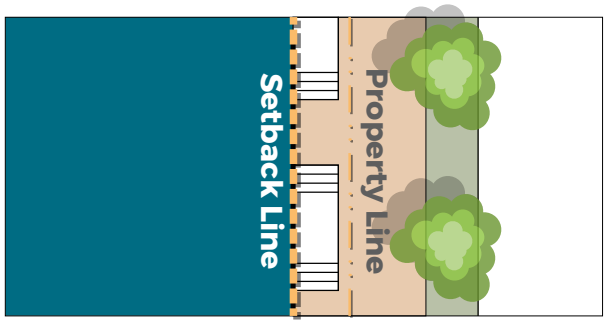


Figure 63. Typical Plan Diagram

STREET TYPE	ALLOWANCE
Main Street	✗
Connector Street	✓
Mobility Street	✓
Gateway Street	✓
Neighborhood Street	✓

Figure 64. Street Type Allowance



Figure 65. Example of Walkup Frontage

6.8 Walkup Frontage.

Walkup frontage can be described as typical urban residential frontage with covered entry point, glass, and some public realm improvements to reinforce the building wall, match more commercial context, and maintain an urban street context. Must meet the following standards:

- Minimum three (3') foot deep and five (5') foot wide covering (in the window zone) over all entry points.
- Finished ground floor must not be elevated greater than six (6") inches above the adjacent sidewalk.
- Must provide built-in planters and landscaping in setback area when not zero lot line to maintain the urban wall.
- Only rain coverings may extend over property line and into public right-of-way.

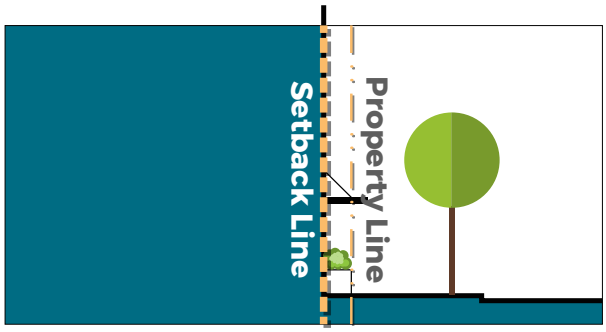


Figure 66. Typical Cross Section

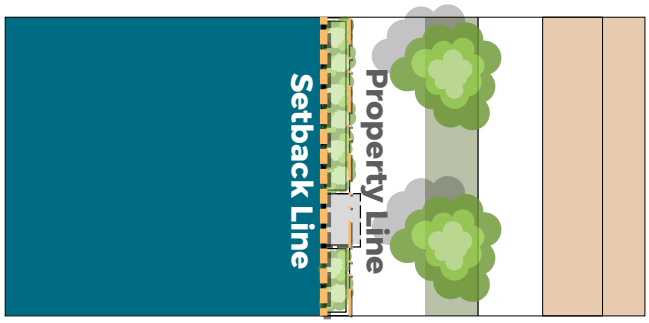


Figure 67. Typical Plan Diagram

STREET TYPE	ALLOWANCE
Main Street	✗
Connector Street	✓
Mobility Street	✓
Gateway Street	✓
Neighborhood Street	✓

Figure 68. Street Type Allowance



Figure 69. Example of Yard Frontage

6.9 Yard Frontage.

Yard frontage can be described as typical single family (1 unit) or small, multifamily (2-4 unit) frontage which is mostly limited to covered entryway with grassy area, landscaping, and fencing to blend with a variety of housing types. Must meet the following standards:

- Retaining walls or terracing required for yards elevated greater than three (3') feet above the grade of the adjacent sidewalk.
- Fencing required for adjacent side lots, minimum of four (4') feet tall.
- In lieu of fencing, a landscape buffer (that when full maturity) is no less than two (2') feet wide and no less than four (4') feet tall must be provided.
- Landscaping such as trees, shrubs, and other ground cover must be provided in front yard setbacks.
- May not be located within the public right-of-way.

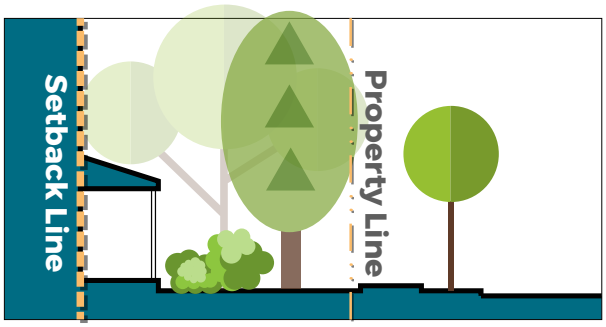


Figure 70. Typical Cross Section for a Yard

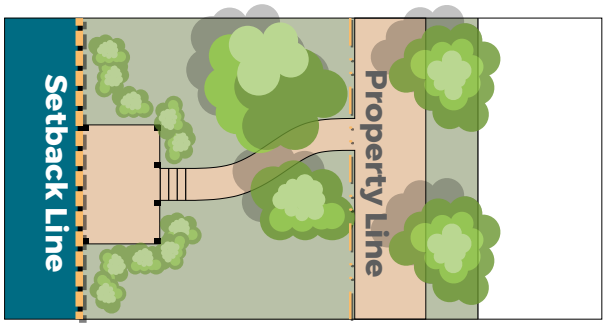


Figure 71. Yard Typical Plan Diagram for a Yard

STREET TYPE	ALLOWANCE
Main Street	✗
Connector Street	✗
Mobility Street	✗
Gateway Street	✗
Neighborhood Street	✓

Figure 72. Street Type Allowance



Figure 73. Example of a Blank Wall in Downtown Camas

7.0 Public Realm Standards.

To support implementation of the street network (**Section 5.0**) throughout Downtown Camas, each street type includes a set of standards for the zones of the public realm. These public realm standards establish expectations for the design, function, and character of spaces between the building façade and the curb lines, including sidewalks, planting areas, amenity zones, lighting, and furnishings. They provide the essential regulations for how these elements must enhance walkability, safety, comfort, and visual quality while supporting adjacent land uses.

PUBLIC REALM	SECTION
Main Street Public Realm Standards	7.1
Connector Street Public Realm Standards	7.2
Mobility Street Public Realm Standards	7.3
Gateway Street Public Realm Standards	7.4
Neighborhood Street Public Realm Standards	7.5

Figure 74. Chapter Index for Public Realm Standards

7.1 Main Streets (MNS) Public Realm



Figure 75. Map of Main Streets in Downtown Camas

The purpose of the public realm standards for the main street public realm is to reinforce 4th Avenue as the community's central activity area by establishing a cohesive, walkable streetscape. The standards regulate elements within the facade zone, encroachment zone, and amenities zone; while maintaining a clear sidewalk zone.

NAME	TYPICAL CHARACTERISTICS
Public Realm Space	*Ten (10') feet minimum (both sides), eighteen (18') feet maximum (one side) > Includes larger extended curb areas due to "chicane" street and parking configuration.*
Sidewalk Width	*Unobstructed clear width of six (6') feet is preferred; may be reduced to four (4') feet at "pinch points" for no more than ten (10') feet in distance.*

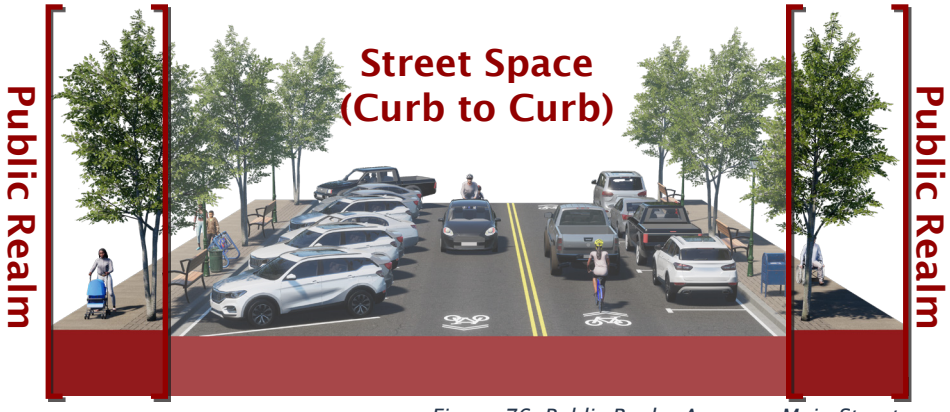


Figure 76. Public Realm Areas on Main Streets

7.1 Main Streets (MNS) Public Realm

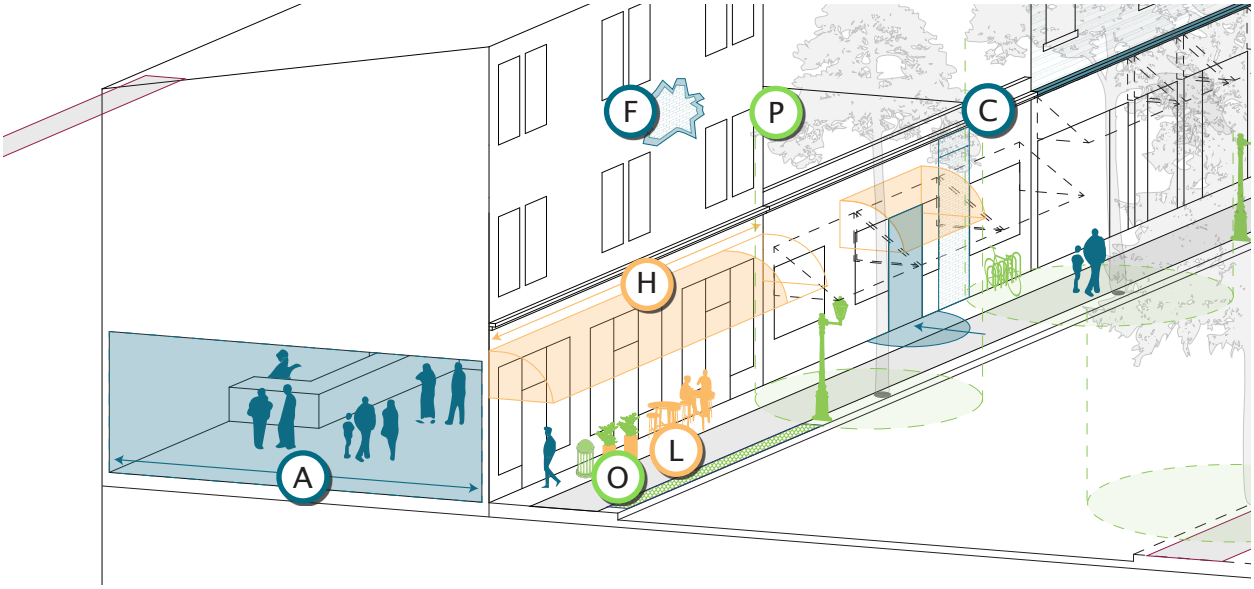


Figure 77. Typical Main Street Segment Diagram

7.1.1 Facade Zone.

[A] Retailing Depth
- Minimum thirty (30') feet depth for ground-floor retail to support viable commercial activity.

[B] Ground Floor Transparency
- Minimum sixty (60%) percent transparency between two (2') feet and ten (10)' feet above sidewalk grade using clear, non-reflective glass.
- Transparency must be maintained on existing buildings when renovated, restored, or modified.

[C] Blank Wall Limitations
- No length of wall greater than ten (10') feet without architectural articulation including transparency, plane breaks, or entrances.

[D] Horizontal Banding
- The ground floor shall be emphasized through banding with material or color differentiation or projection of two (2") inches to six (6") inches at a height between twelve (12') feet and fourteen (14') feet above the sidewalk.

[E] Pedestrian Entrances
- Entrances must be clearly visible from the street and directly accessible from the sidewalk.
- Minimum fifty (50%) transparent for visual connection.
- Multi-tenant buildings must have entrances for each tenant.

[F] Materiality and Colors
- Materials and finishes shall be durable, low-maintenance, weather-resistant, and drawn from a muted, coordinated palette consistent with the established downtown character; highly reflective, unfinished, or overly bright colors are prohibited.

[G] Setback Buffering
- Not applicable and not identified on diagram.

7.1.2 Encroachment Zone.

[H] Weather Protection
- Eighty (80%) percent of linear front facades must have rain protection or awnings with minimum four (4') feet covering depth and must include all entrances, exits, and windows.

[I] Vertical Barriers
- Use transparent or semi-transparent materials for outdoor dining enclosures.
- Ensure dining walls do not obstruct pedestrian flow.
- Dining enclosure must not exceed forty-two (42") inches in height.
- Barriers shall be constructed of durable, weather-resistant materials, securely anchored or weighted for stability, capable of withstanding wind and pedestrian contact, and shall not include temporary, flimsy, or unfinished materials.



[J] Outdoor Seating
- Provide modular, movable, and durable seating in public spaces. Ensure seating areas are shaded and accessible.

[K] Building Signage
- Signs shall be pedestrian-scaled, architecturally integrated, legible, durable, and not internally illuminated.
- See **Chapter 18.15 Signs** for standards.

[L] Movable Elements
- Provide movable seating, planters, and furnishings to support active use and seasonal programming.

7.1.3 Amenities Zone.

[M] Multimodal Features
- Provide bike racks, scooter parking, and information kiosks adjacent to the intersection or mid-block crossing.
- See **Chapter 8.3 Hardscaping** for standards.

[N] Pervious Surfaces
- Use permeable pavers where possible to contribute to a minimum twenty (20%) percent permeability within each block.

[O] Planters
- Planter are required.
- See **Chapter 8.2 Landscaping** for standards.

[P] Street Tree Canopy
- Maintain a continuous canopy achieving thirty (30%) percent to sixty (60%) percent street tree canopy over the total sidewalk area at maturity to reinforce pedestrian comfort and street character.
- Tree grates are required.
- See **Chapter 8.2 Landscaping** for standards.

[Q] Hardscaping
- See **Chapter 8.3 Hardscaping** for standards.

[R] Lighting
- Building, window, and decorative overhead lighting required.
- See **Chapter 8.4 Lighting** for standards.
- Must incorporate a minimum of three (3) of the lighting types identified in **8.4.1 Lighting Types**.

[S] Screening
- See **Chapter 8.5 Screening** for standards.

[T] Public Art
- See **Chapter 8.6 Public Art** for standards.

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7.2 Connector Streets (CNS) Public Realm

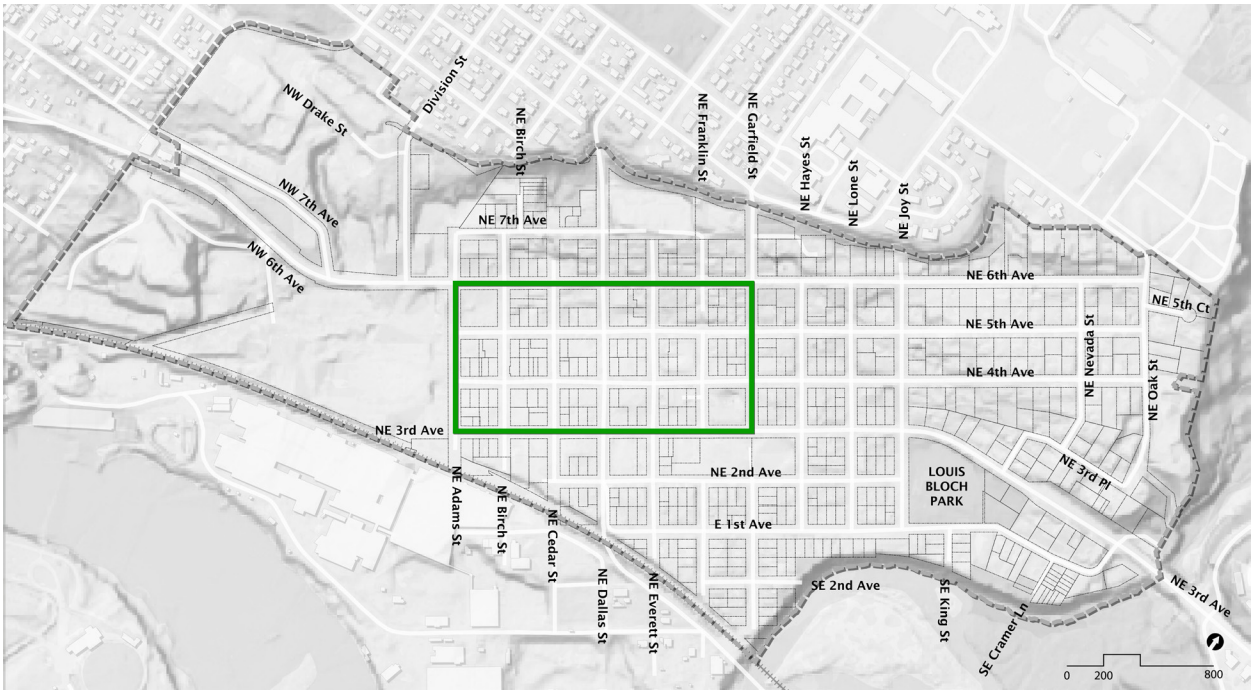


Figure 78. Map of Connector Streets in Downtown Camas

The purpose of the public realm standards for the connector street public realm is to reinforce the edges of the downtown core area and better link walkability to new downtown areas. The standards regulate elements within the facade zone, encroachment zone, and amenities zone; while maintaining a clear sidewalk zone.

NAME	TYPICAL CHARACTERISTICS
Public Realm Space	*Up to fourteen (14') feet maximum (both sides) > May include larger extended curb areas at intersections or mid-blocks.*
Sidewalk Width	*Unobstructed clear width of six (6') feet is preferred; may be reduced to four (4') at "pinch points" for no more than ten (10') feet in distance.*



Figure 79. Public Realm Areas on Connector Streets

7.2 Connector Streets (CNS) Public Realm

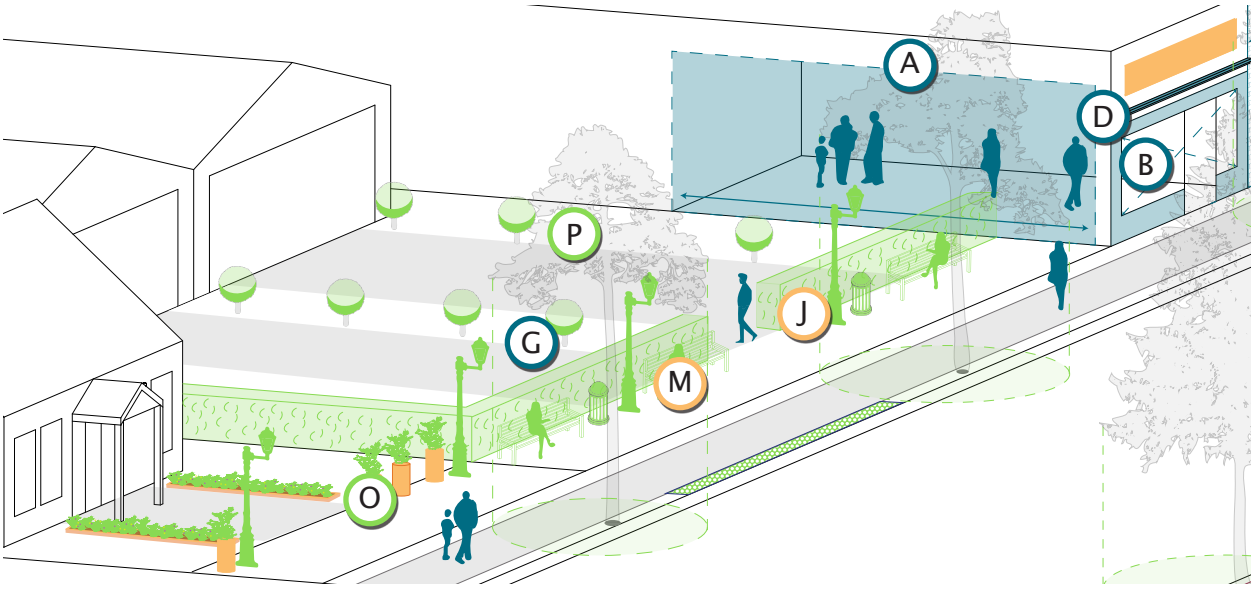


Figure 80. Typical Connector Street Segment Diagram

7.2.1 Facade Zone.

[A] Retailing Depth.

– Minimum twenty five (25') feet depth for ground-floor retail to support viable commercial activity, when applicable.

[B] Ground Floor Transparency.

– Minimum forty (40%) percent transparency between two (2') feet and ten (10') feet above sidewalk level using clear, non-reflective glass.

[C] Blank Wall Limitations.

– No length of wall greater than fifteen (15') feet without architectural articulation including transparency, plane breaks, or entrances.

[D] Horizontal Banding.

– The ground floor shall be emphasized through banding with material differentiation or projection of two (2") to six (6") inches at a height between twelve (12') feet and fourteen (14') feet above the sidewalk.

[E] Pedestrian Entrances.

– Entrances must be clearly visible from the street and directly accessible from the sidewalk.
– Minimum fifty (50%) transparent for visual connection.
– Multi-tenant buildings must have entrances for each tenant.

[F] Materiality and Colors.

– Materials and finishes shall be durable, low-maintenance, weather-resistant, and drawn from a muted, coordinated palette consistent with the established downtown character; highly reflective, unfinished, or overly bright colors are prohibited.

[G] Setback Buffering.

– Use landscaped buffers with seating, lighting, walls, screening, planters and public art to create a sense of enclosure. Ensure that at least forty (40%) percent of the setback frontage area includes seating, lighting, and hardscaping.

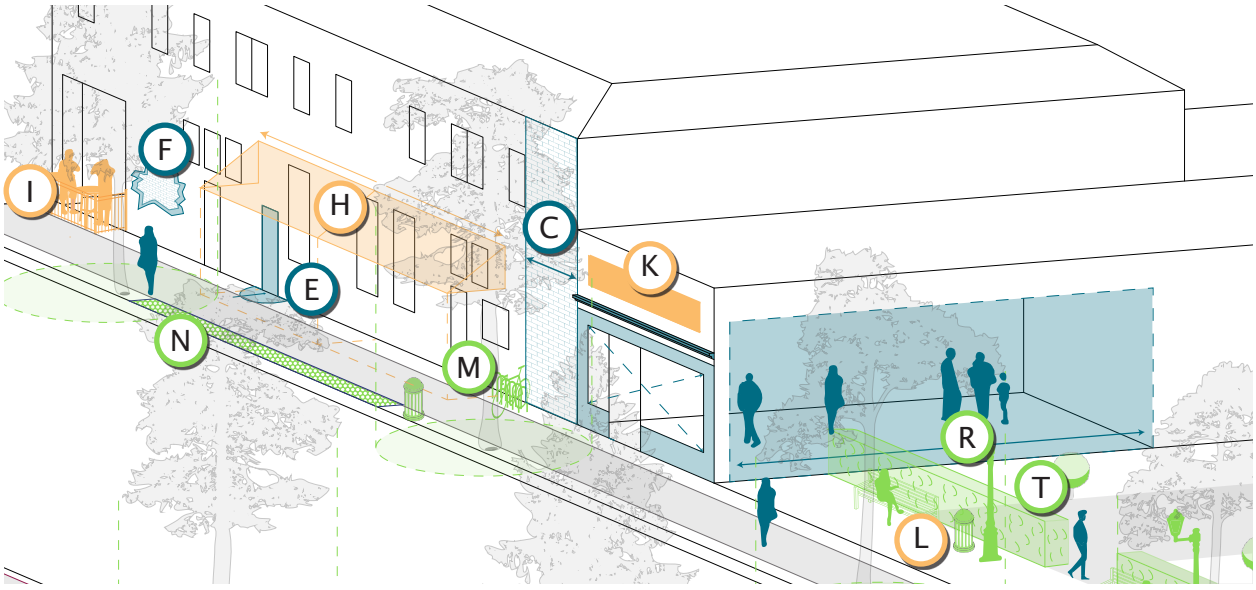
7.2.2 Encroachment Zone.

[H] Weather Protection.

– Sixty (60%) percent of linear front facades must have rain protection or awnings with minimum four (4') feet covering depth and must include all entrances, exits, and windows.

[I] Vertical Barriers.

– Use transparent or semi-transparent materials for outdoor dining enclosures. Ensure dining walls do not obstruct pedestrian flow.
– Dining enclosure must not exceed forty-two (42") inches in height.



– Barriers shall be constructed of durable, weather-resistant materials, securely anchored or weighted for stability, capable of withstanding wind and pedestrian contact, and shall not include temporary, flimsy, or unfinished materials.

[J] Outdoor Seating.
– Provide modular, movable, and durable seating in public spaces. Ensure seating areas are shaded and accessible.

[K] Building Signage.
– Signs shall be pedestrian-scaled, architecturally integrated, legible, durable, and not internally illuminated.
– See **Chapter 18.15 Signs** for standards.

[L] Movable Elements
– Provide movable seating, planters, and furnishings to support active use and seasonal programming.

7.2.3 Amenities Zone.

[M] Multimodal Features.
– Provide bike racks, scooter parking, and information kiosks at regular intervals.
– See **Chapter 8.3 Hardscaping** for standards.

[N] Pervious Surfaces.
– Use permeable pavers where possible to contribute to a minimum twenty-five (25%) percent permeability within each block.

[O] Planters.
– Planter are recommended.
– See **Chapter 8.2 Landscaping** for standards.

[P] Street Tree Canopy.
– Maintain a continuous canopy achieving thirty (30%) percent to sixty (60%) percent street tree canopy over the total sidewalk area at maturity to reinforce pedestrian comfort and street character.
– Tree grates are required.
– See **Chapter 8.2 Landscaping** for standards.

[Q] Hardscaping.
– See Chapter 8.3 Hardscaping for standards.

[R] Lighting.
– Building and window lighting required
– See **Chapter 8.4 Lighting** for standards.
– Must incorporate a minimum of three (3) of the lighting types identified in **8.4.1 Lighting Types**.

[S] Screening.
– See **Chapter 8.5 Screening** for standards.

[T] Public Art.
– See **Chapter 8.6 Public Art** for standards.

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7.3 Mobility Streets (MBS) Public Realm

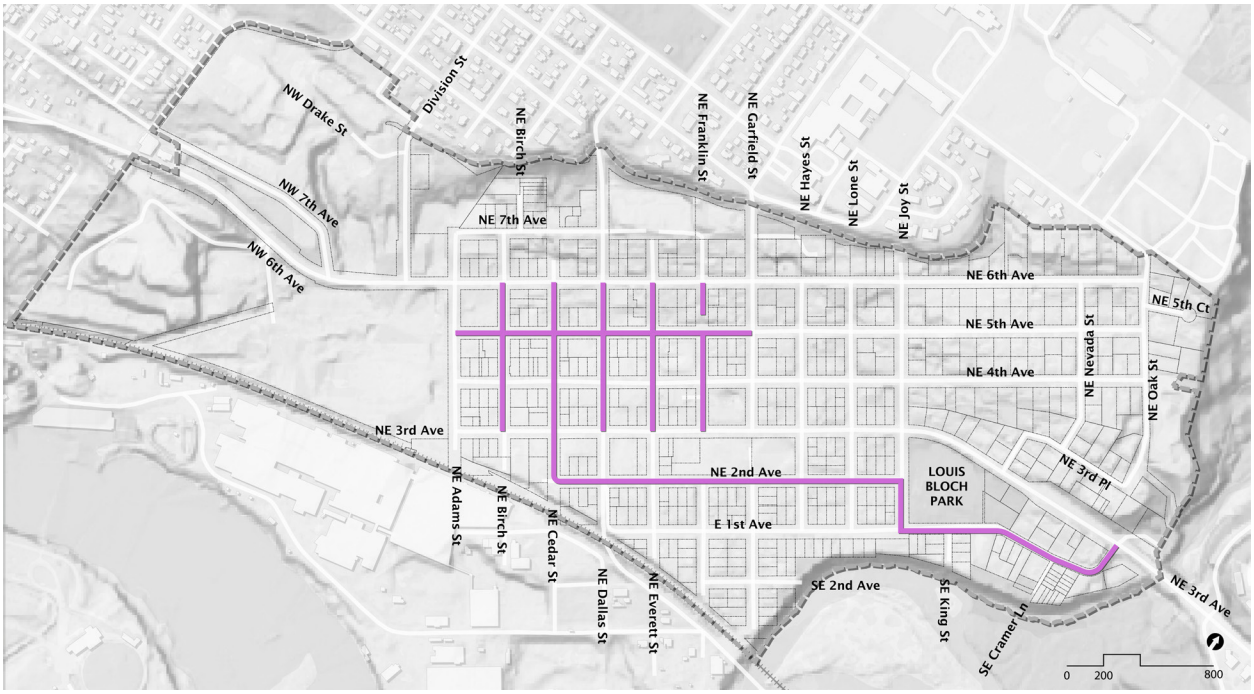


Figure 81. Map of Mobility Streets in Downtown Camas

The purpose of the public realm standards for the mobility street public realm is to balance efficient movement through downtown with a safe and comfortable multi-modal environment. The standards regulate elements within the facade zone, encroachment zone, and amenities zone; while maintaining a clear sidewalk zone.

NAME	TYPICAL CHARACTERISTICS
Public Realm Space	*Eleven (11') feet minimum to fourteen (14') feet maximum (both sides) > May include larger extended curb areas at intersections or mid-blocks.*
Sidewalk Width	*Unobstructed clear width of six (6') feet is preferred; may be reduced to four (4') at "pinch points" for no more than ten (10') feet in distance.*



Figure 82. Public Realm Areas on Mobility Streets

7.3 Mobility Streets (MBS) Public Realm

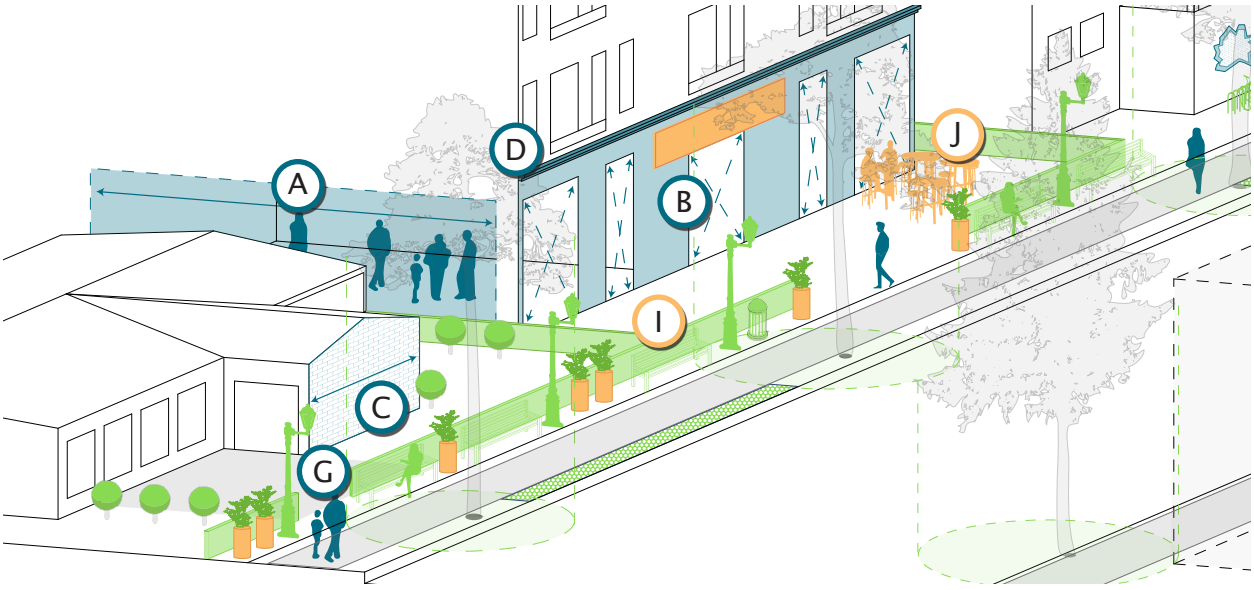


Figure 83. Typical Mobility Street Segment Diagram

7.3.1 Facade Zone.

[A] Retailing Depth.

– Minimum twenty (20') feet depth for ground-floor retail to support viable commercial activity, when applicable.

[B] Ground Floor Transparency.

– Minimum forty (40%) percent transparency between two (2') feet and ten (10') feet above sidewalk level using clear, non-reflective glass.

[C] Blank Wall Limitations.

– No length of wall greater than fifteen (15') feet without architectural articulation including transparency, plane breaks, or entrances.

[D] Horizontal Banding.

– The ground floor shall be emphasized through banding with material differentiation or projection of two (2") to six (6") inches at a height between twelve (12') feet and fourteen (14') feet above the sidewalk.

[E] Pedestrian Entrances.

– Entrances must be clearly visible from the street and directly accessible from the sidewalk.
– Minimum fifty (50%) transparent for visual connection.
– Multi-tenant buildings must have entrances for each tenant.

[F] Materiality and Colors.

– Materials and finishes shall be durable, low-maintenance, weather-resistant, and drawn from a muted, coordinated palette consistent with the established downtown character; highly reflective, unfinished, or overly bright colors are prohibited.

[G] Setback Buffering.

– Use landscaped buffers with seating, lighting, walls, screening, planters and public art to create a sense of enclosure. Ensure that at least sixty (60%) percent of the setback frontage area includes seating, lighting, and hardscaping.

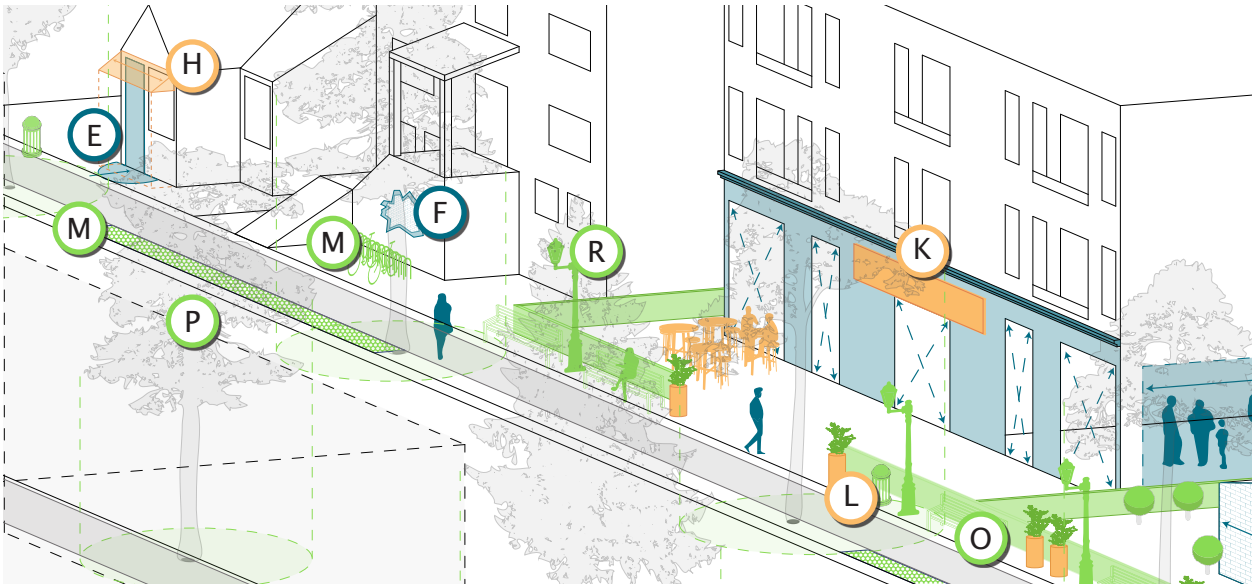
7.3.2 Encroachment Zone.

[H] Weather Protection.

– Sixty (60%) percent of linear front facades must have rain protection or awnings with minimum four (4') feet covering depth and must include all entrances, exits, and windows.

[I] Vertical Barriers.

– Use transparent or semi-transparent materials for outdoor dining enclosures. Ensure dining walls do not obstruct pedestrian flow.
– Dining enclosure must not exceed forty-two (42") inches in height.



– Barriers shall be constructed of durable, weather-resistant materials, securely anchored or weighted for stability, capable of withstanding wind and pedestrian contact, and shall not include temporary, flimsy, or unfinished materials.

[J] Outdoor Seating.
– Provide modular, movable, and durable seating in public spaces. Ensure seating areas are shaded and accessible.

[K] Building Signage.
– Signs shall be pedestrian-scaled, architecturally integrated, legible, durable, and not internally illuminated.
– See **Chapter 18.15 Signs** for standards.

[L] Movable Elements.
– Provide movable seating, planters, and furnishings to support active use and seasonal programming.

7.3.3 Amenities Zone.

[M] Multimodal Features.
– Provide bike racks, scooter parking, and information kiosks at regular intervals.
– See **Chapter 8.3 Hardscaping** for additional standards.

[N] Pervious Surfaces.
– Use permeable pavers where possible to contribute to a minimum twenty (20%) percent permeability within each block.

[O] Planters.
– Planter are recommended.
– See **Chapter 8.2 Landscaping** for standards.

[P] Street Tree Canopy.
– Maintain a continuous canopy achieving thirty (30%) percent to sixty (60%) percent street tree canopy over the total sidewalk area at maturity to reinforce pedestrian comfort and street character.
– Tree grates are required.
– See **Chapter 8.2 Landscaping** for standards.

[Q] Hardscaping.
– See **Chapter 8.3 Hardscaping** for standards.

[R] Lighting.
– Building and window lighting required
– See **Chapter 8.4 Lighting** for standards.
– Must incorporate a minimum of three (3) of the lighting types identified in **8.4.1 Lighting Types**. Not required on 1st Avenue and 2nd Avenue.

[S] Screening .
– See **Chapter 8.5 Screening** for standards.

[T] Public Art.
– See **Chapter 8.6 Public Art** for standards.

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7.4 Gateway Streets (GWS) Public Realm

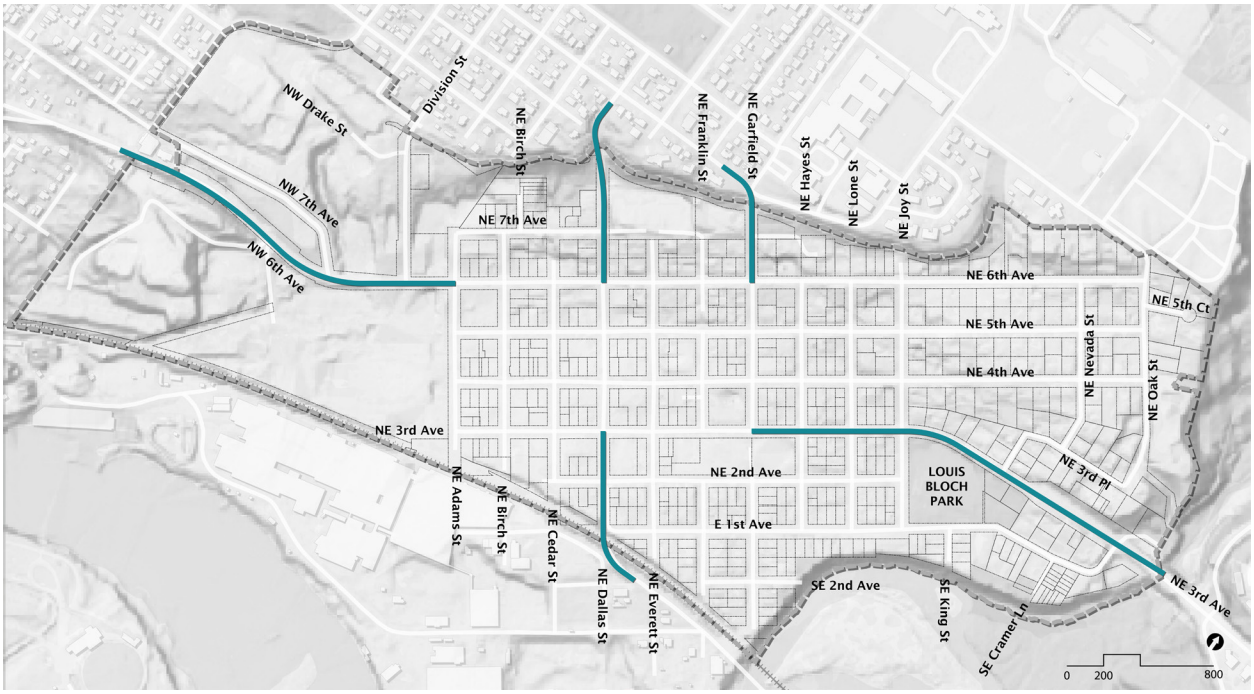


Figure 84. Map of Gateway Streets in Downtown Camas

The purpose of the public realm standards for the gateway street public realm is to establish a welcoming streetscape that signals entry into the downtown core while maintaining a safe, legible pedestrian environment. The standards regulate elements within the facade zone, encroachment zone, and amenities zone; while maintaining a clear sidewalk zone.

NAME	TYPICAL CHARACTERISTICS
Public Realm Space	*Up to eleven (11') feet maximum (both sides) > May include larger extended curb areas at intersections.*
Sidewalk Width	*Unobstructed clear width of six (6') feet is preferred; may be reduced to four (4') at "pinch points" for no more than ten (10') feet in distance.*

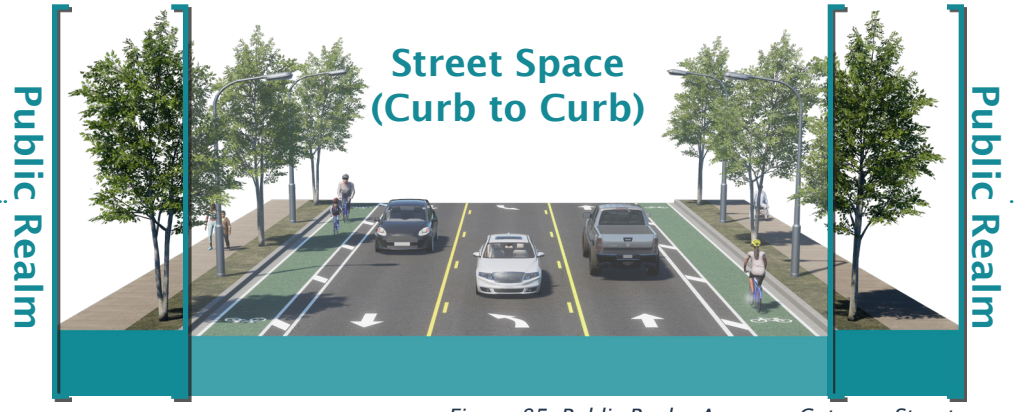


Figure 85. Public Realm Areas on Gateway Streets

7.4 Gateway Streets (GWS) Public Realm

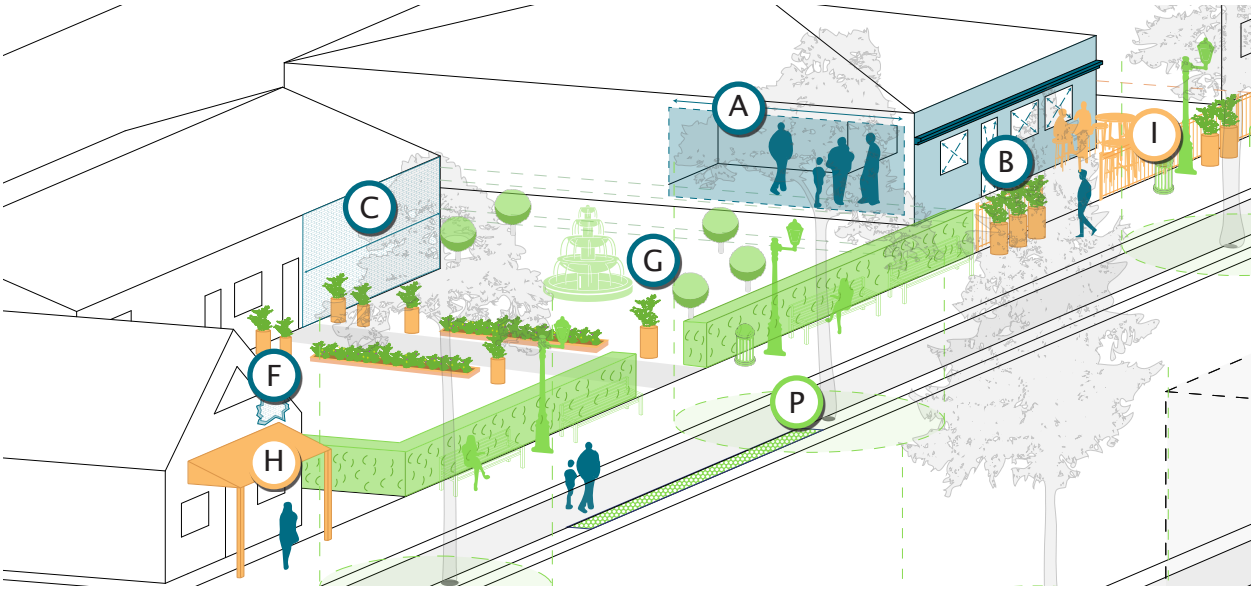


Figure 86. Typical Gateway Street Segment Diagram

7.4.1 Facade Zone.

[A] Retailing Depth.

– Minimum twenty (20') feet depth for ground-floor retail to support viable commercial activity, when applicable.

[B] Ground Floor Transparency.

– Minimum twenty (20%) percent transparency between two (2') feet and ten (10') feet above sidewalk level using clear, non-reflective glass.

[C] Blank Wall Limitations.

– No length of wall greater than twenty-five (25') feet without architectural articulation including transparency, plane breaks, or entrances.

[D] Horizontal Banding.

– Not applicable and not identified on diagram.

[E] Pedestrian Entrances.

– Not applicable and not identified on diagram.

[F] Materiality and Colors.

– Use materials and colors that are durable, low-maintenance, and environmentally friendly that complement the existing downtown character at present and over time as they age.
– Avoid reflective or unfinished materials and overly bright colors.

[G] Setback Buffering.

– Use landscaped buffers with seating, lighting, walls, screening, planters and public art to create a sense of enclosure. Ensure that at least thirty (30%) percent of the setback frontage area includes seating, lighting, and hardscaping.

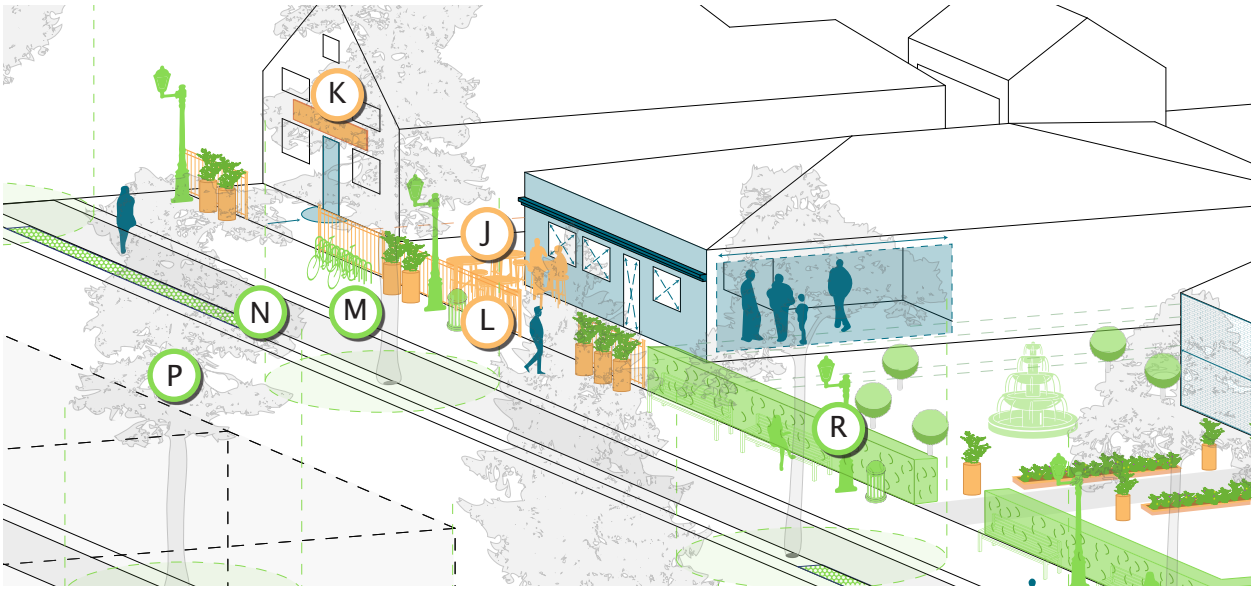
7.4.2 Encroachment Zone.

[H] Weather Protection.

– Provide continuous rain protection or awnings at all building entrances and exits, with covering depth extending no less than four (4') feet.

[I] Vertical Barriers.

– Use transparent or semi-transparent materials for outdoor dining enclosures. Ensure dining walls do not obstruct pedestrian flow.
– Dining enclosure must not exceed forty-two (42") inches in height.



– Barriers shall be constructed of durable, weather-resistant materials, securely anchored or weighted for stability, capable of withstanding wind and pedestrian contact, and shall not include temporary, flimsy, or unfinished materials.

[J] Outdoor Seating.
– Provide shaded seating at key locations.

[K] Building Signage.
– Signs shall be pedestrian-scaled, architecturally integrated, legible, and durable.
– See **Chapter 18.15 Signs** for standards.

[L] Movable Elements.
– Allow movable elements that enhance the entry experience and do not obstruct visibility.

7.4.3 Amenities Zone.

[M] Multimodal Features.
– Include bike parking and transit shelters near intersections.
– See **Chapter 8.3 Hardscaping** for standards.

[N] Pervious Surfaces.
– Use permeable pavers where possible to contribute to a minimum thirty five (35%) percent permeability within each block.

[O] Planters.
– Not applicable and not identified on diagram.

[P] Street Tree Canopy.
– Maintain a continuous canopy achieving thirty (30%) percent to fifty (50%) percent street tree canopy over the total sidewalk area at maturity to reinforce pedestrian comfort and street character.
– See **Chapter 8.2 Landscaping** for standards.

[Q] Hardscaping.
– See **Chapter 8.3 Hardscaping** for standards.

[R] Lighting.
– Building and window lighting is recommended.
– See **Chapter 8.4 Lighting** for standards.

[S] Screening .
– See **Chapter 8.5 Screening** for standards.

[T] Public Art.
– See **Chapter 8.6 Public Art** for standards.

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7.5 Neighborhood Streets (NHS) Public Realm

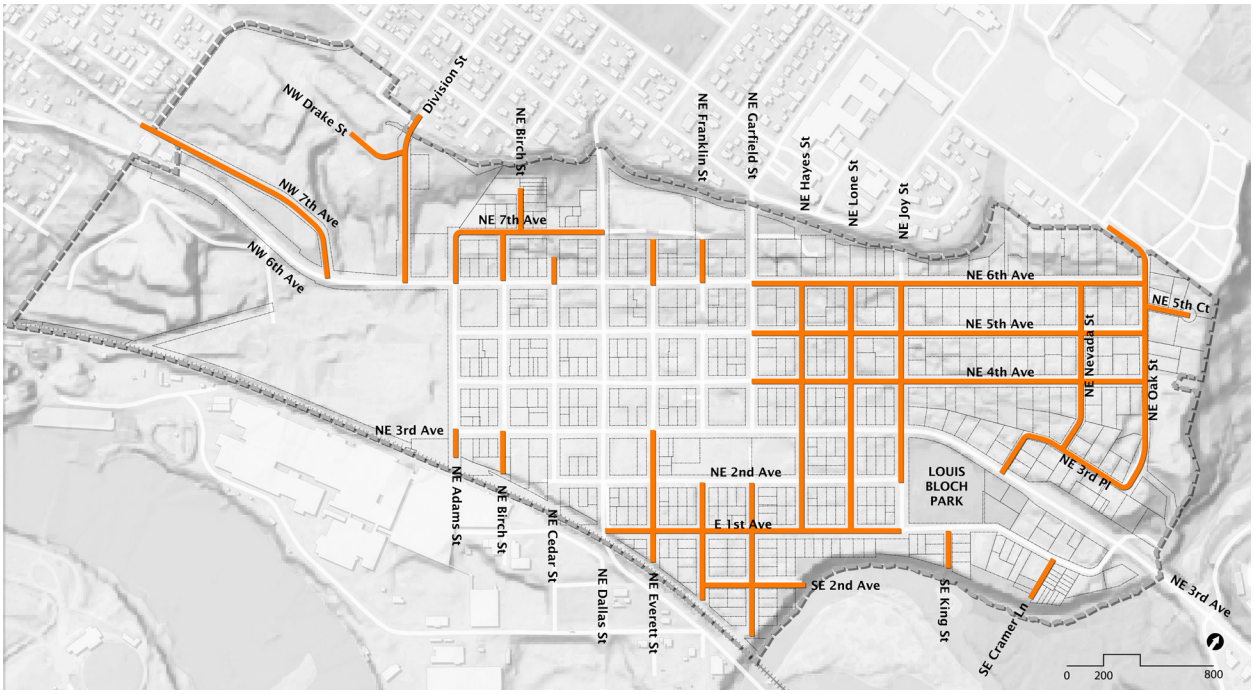


Figure 87. Map of Neighborhood Streets in Downtown Camas

The purpose of the public realm standards for the neighborhood street public realm is to support a calm, comfortable streetscape that prioritizes residential character and local activity. The standards regulate elements within the facade zone, encroachment zone, and amenities zone; while maintaining a clear sidewalk zone.

NAME	TYPICAL CHARACTERISTICS
Public Realm Space	*Eleven (11') feet minimum to fourteen (14') feet maximum (both sides) > May include larger extended curb areas at intersections or mid-blocks.*
Sidewalk Width	*Unobstructed clear width of six (6') feet is preferred; may be reduced to four (4') at "pinch points" for no more than ten (10') feet in distance.*



Figure 88. Public Realm Areas on Neighborhood Streets

7.5 Neighborhood Streets (NHS) Public Realm

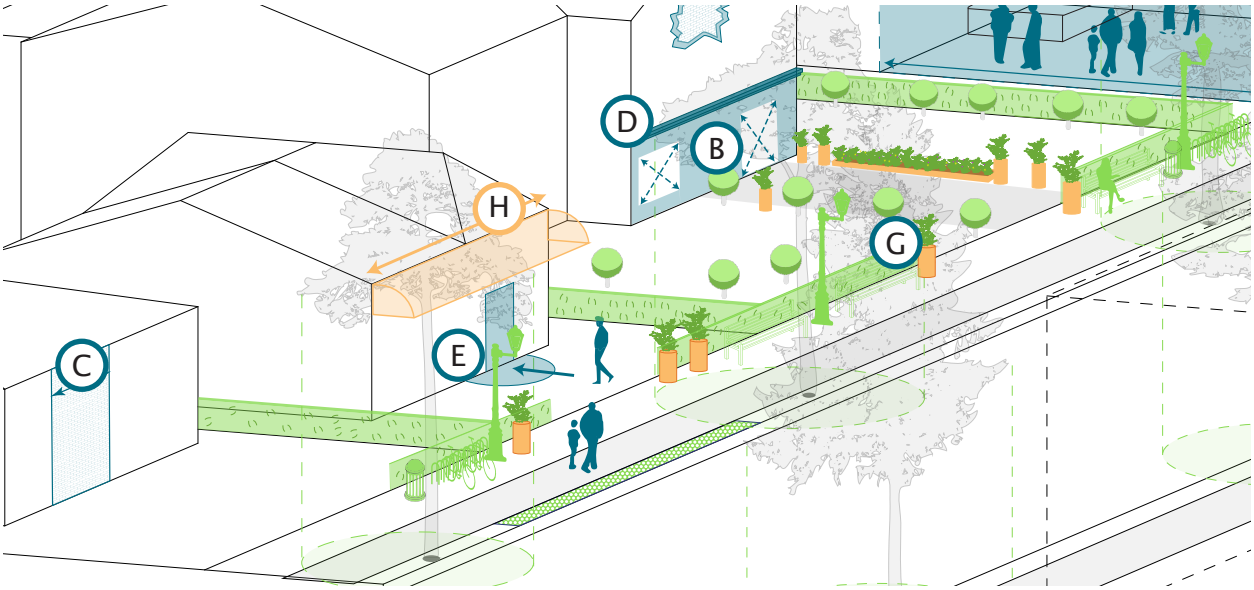


Figure 89. Typical Neighborhood Street Segment Diagram

7.5.1 Facade Zone.

[A] Retailing Depth.

– Retail depth not required unless part of mixed-use development. If part of a mixed use development, provide a minimum of twenty (20') feet.

[B] Ground Floor Transparency.

– Minimum ten (10%) percent transparency between two (2') feet and ten (10') feet above sidewalk level using clear, non-reflective glass.

[C] Blank Wall Limitations.

– No length of wall greater than thirty (30') feet without architectural articulation including transparency, plane breaks, or entrances.

[D] Horizontal Banding.

– Not applicable and not identified on diagram.

[E] Pedestrian Entrances.

– Not applicable and not identified on diagram.

[F] Materiality and Colors.

– Use materials and colors that are durable, low-maintenance, and environmentally friendly that complement the existing downtown character at present and over time as they age.
– Avoid reflective or unfinished materials and overly bright colors.

[G] Setback Buffering.

– Use landscaped buffers with seating, lighting, walls, screening, planters and public art to create a sense of enclosure. Ensure that at least forty (40%) percent of the setback frontage area includes seating, lighting, and hardscaping.

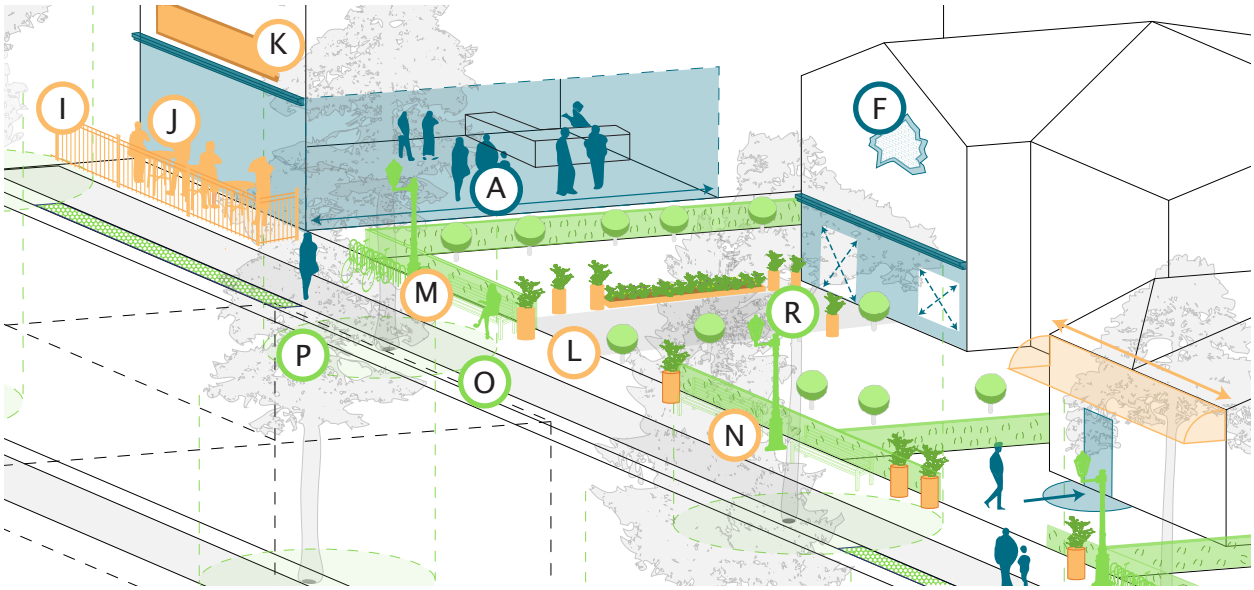
7.5.2 Encroachment Zone.

[H] Weather Protection.

– Provide continuous rain protection or awnings at all building entrances and exits, with covering depth extending no less than four (4') feet.

[I] Vertical Barriers.

– Not applicable and not identified on diagram.



[J] Outdoor Seating.
- Provide shaded seating at key locations.

[K] Building Signage.
- Signs shall be pedestrian-scaled, architecturally integrated, legible, and durable.
- See **Chapter 18.15 Signs** for standards.

[L] Movable Elements.
- Allow movable elements that enhance the entry experience and do not obstruct visibility.

7.5.3 Amenities Zone.

[M] Multimodal Features.
- Not applicable and not identified on diagram.

[N] Pervious Surfaces.
- Use permeable pavers where possible to contribute to a minimum thirty (30%) percent permeability within each block.

[O] Planters.
- Not applicable and not identified on diagram.

[P] Street Tree Canopy.
- Maintain a continuous canopy achieving thirty (30%) percent to fifty (50%) percent street tree canopy over the total sidewalk area at maturity to reinforce pedestrian comfort and street character.
- See **Chapter 8.2 Landscaping** for standards.

[Q] Hardscaping.
- See **Chapter 8.3 Hardscaping** for standards.

[R] Lighting.
- Building and window lighting is recommended.
- See **Chapter 8.4 Lighting** for standards.

[S] Screening.
- See **Chapter 8.5 Screening** for standards.

[T] Public Art.
- See **Chapter 8.6 Public Art** for standards.



Figure 90. Image of Downtown Camas Streetscape

8.0 General Standards.

Unless otherwise noted in this section, the general standards provide a range of standards for any street or frontage within the downtown area, including landscaping, hardscaping, lighting, screening, and public art. In the event of a conflict between the Public Realm Standards **(Section 7.0)** and these General Standards, the Public Realm Standards for the specified Street Type or Street Types shall supersede.

8.1 General Principles.

The general standards are intended to aspire to the following principles for elements within the public realm in Downtown Camas:

- **Implement Adopted Plans.** Advance the goals and policies of the City of Camas Comprehensive Plan and Capital Facilities Plan.
- **Strengthen Downtown Vitality.** Enhance livability, environmental quality, and economic vitality through a diverse and complementary mix of downtown uses.
- **Use Public Resources Efficiently.** Promote the efficient and coordinated use of public facilities, infrastructure, and services.
- **Create a Complete and Safe Downtown Environment.** Foster a safe, attractive, and convenient setting that supports living, working, shopping, and recreation, with active ground-floor uses and residential or office uses above.
- **Support Economic Development.** Encourage economic growth by creating an inviting downtown environment that attracts a broad and diverse consumer base.
- **Attract and Retain Businesses.** Establish a stable and economically viable downtown that supports existing businesses and attracts new investment.
- **Promote Sustainable Development.** Encourage development practices that support long-term environmental, social, and economic sustainability.



Figure 91. Character Image of Landscaping



Figure 92. Landscape Located within Curb Extension Area

8.2 Landscaping.

Vegetation and green infrastructure are essential components of a healthy, attractive urban environment. They manage stormwater, reduce urban heat island effect, and improve air quality while enhancing the pedestrian experience. Thoughtfully integrated, they soften the built form, support biodiversity, and create a more comfortable, visually engaging streetscape. The following applies to all street types:

8.2.1 LANDSCAPING STANDARDS

1. **Location:** Landscaping and trees shall be selected and located to dampen sound, filter air contaminants, curtail erosion, minimize stormwater run-off, contribute to living privacy, reduce the visual impacts of large buildings and paved areas, screen, and emphasize or separate outdoor spaces of different uses or character.
2. **Variety:** Must include a combination and multiple layers of canopy trees, under-story trees, shrubs, and ground cover to achieve the goal of this section.
3. **Parking Areas:** Must be landscaped in accordance with this section.



Figure 93. Typical Street Tree and Tree Well



Figure 94. Example of Landscape Planters

4. **Setback Buffering Area:** Landscape must be utilized in setback buffering areas per this section.
5. **Tree Density:** Minimum forty (40) tree units per acre of land.
6. **Tree Caliper:** Minimum of two (2") inch caliper, fully branched, and staked at the time of planting.
7. **Tree Undercanopy:** Must be maintained to a minimum of eight (8') feet clearance above any sidewalk and ten (10') feet above any street.
8. **Tree Spacing:** Install deciduous trees at intervals of thirty (30') feet along sidewalks.
9. **Tree Placement:** Minimum of thirty (30") inches from the center of the caliper to the back of any curb or not within twenty-five (25') feet of a light pole.
10. **Tree Wells and Grates:** Provide a minimum planting area of four (4') by four (4') feet for tree grates, or four (4') by six (6') feet for open planters. Tree grates must be ADA accessible and have removable expansion rings to accommodate tree growth.
11. **Soil Volume:** Ensure each tree has access to at least two (2 CF) cubic feet of soil for every one (1') foot of crown at maturity. Ideally loose soil which will allow for root penetration.
12. **Planter Dimensions:** Raised planters must be at least four (4') feet wide; at-grade planting strips must be no less than five (5') feet wide. Must include root barriers and cannot impede ADA accessibility.
13. **Stormwater Features:** Incorporate bioswales or rain gardens with a minimum width of four (4') feet and ponding depth of six (6") to twelve (12") inches where possible.
14. **Pervious Surface.** Must meet the pervious surface requirements for the associated street type.
15. **Plant Selection:** Use sixty (60%) percent native or northwest climate-adapted species such as ornamental grasses, flowering perennials, small shrubs, or drought-tolerant vegetation; and fifty (50%) percent evergreen species. All plant materials shall be suitable for the climatic conditions.

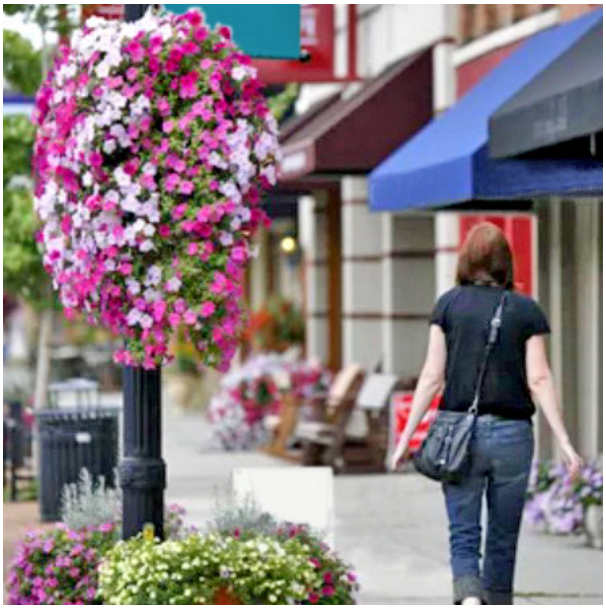


Figure 95. Example of Hanging Baskets



Figure 96. Example of Raingardens

16. **Height:** Landscape materials must not exceed thirty (30") inches in height on corners or impede sight lines for vehicles and cyclists.
17. **Hanging Baskets:** The bottom of any hanging basket must be at least eighty (80") inches above the grade of the sidewalk; except when an effective barrier - such as a planter box, potted plant, or other physical barrier is located in the ground in such a way to effectively mitigate any hazard created by the hanging item.
18. **Maintenance:** Require irrigation for the first three (3) years and establish a quarterly maintenance schedule for pruning and weeding.
19. **Damage:** The property owner shall be responsible for any future damage to a street, curb, or sidewalk caused by landscaping.
20. **Raingardens:** Raingardens are allowed as long as ADA accessibility is preserved.
21. **Irrigation:** All landscape planting shall be irrigated with an automatic, underground irrigation system design with water conservation in mind. Utilization of techniques such as separate water zones based on soil type, sun exposure, and plant water requirements are encouraged. Hanging baskets and individual planter pots may be hand watered. All irrigation materials located within the public right-of-way shall utilize the materials and construction techniques as required by the City.
22. **Existing Tree Retention:** Retain existing trees that are not already protected as "significant trees" under the Camas Municipal Code. In the event retention is not possible, require the project to provide two (2) new trees in replacement of one (1) existing tree.



Figure 97. Example of Specialty Brick Pavers at Mid-Block Crossing



Figure 98. Example of a Curb Extension with Paving, Landsdcaping, and other Amenities

8.3 Hardscaping.

Hardscape elements establish the physical framework of the public realm and must be designed for long-term durability, universal accessibility, and visual cohesion. Materials and site furnishings must support pedestrian comfort, encourage gathering, and reflect local character while accommodating a broad range of activities, from informal seating and daily use to larger, organized events. The following applies to all street types:

8.3.1 HARDSCAPING STANDARDS

1. **Elements:** Hardscape elements such as natural stone, water features, drinking fountains, decorative sidewalks, enhanced paving, and other site furnishings are strongly encouraged.
2. **Sidewalk Width:** Provide a minimum width of six (6') feet in commercial areas and ten (10') feet where possible in high-traffic zones and right-of-way is available.
3. **Paving Materials:** Use scored concrete or other materials with a compressive strength of at least four thousand (4,000 psi) pounds per square inch.
4. **Curb Extensions:** Design curb extensions to be at least six (6') feet deep and eighteen (18') feet wide, with ADA-compliant ramps. Typical curb extension must be eight (8') feet wide and coordinated with on-street, parallel parking.



Figure 99. Example of Existing Bench along 4th Avenue in Downtown Camas



Figure 100. Example of Existing Water Feature in Downtown Camas

5. **Furnishings:** Allocate a two (2') foot to four (4') foot wide zone between the curb and pedestrian path for benches, drinking fountains, trash receptacles, and bike racks. Placement of any furnishings must not impede or constrict pedestrian movement or ADA accessibility.
6. **Drinking Fountains:** All drinking fountains shall be ADA accessible.
7. **Benches:** Install one six (6') foot bench with armrests and backrests every two hundred and seventy (270') linear feet on average, unless already provided by others.
8. **Bike Racks:** Provide one (1) bike rack per ten (10) vehicle parking spaces associated with the primary use or every two hundred (200') linear feet of frontage, unless already provided by others. Shall be placed within the public sidewalk, pocket plazas, and parks to encourage multimodal access. Uses that generate a high potential for bike parking such as arcades or movie theaters are strongly encouraged to locate a bike rack within their frontage. Preferred near public entrances or shared entrances to buildings. Must also be accessible from the street to discourage biking on the sidewalk.
9. **Trash Receptacles:** Shall be placed with the public sidewalk, pocket plazas, and parks to encourage public sanitation and a litter free environment. Uses that generate a high potential for immediately disposable trash such as takeout restaurants are strongly encouraged to locate a receptacle within their frontage.
10. **Water Features:** May be provided in lieu of some of these requirements based on review by the planning official.
11. **Subsurface Access Points:** Any improved hardscapes must not interfere with existing subsurface access point for businesses.



Figure 101. Example of Downtown Ripon which incorporates numerous types of lighting to make visitors feel welcome. [Photo credit: Craig Tebon]



Figure 102. Example of wrapped trees that clearly define the edges of the Broadway district in Green Bay, WI.

8.4 Lighting.

Lighting is a critical element of the streetscape, enhancing safety, extending activity into evening hours, and reinforcing the area's character. It must provide clear, comfortable illumination for pedestrians, cyclists, and drivers, minimize glare and light pollution, and thoughtfully highlight architectural features and public spaces without dominating the environment.

Because a significant share of consumer activity occurs during evening hours, particularly in winter months with limited daylight, adequate downtown lighting is essential to economic vitality and public safety. Lighting shall support safe and comfortable pedestrian movement, encourage exploration throughout the district, and reinforce active ground-floor uses. Light emitted from storefronts and building frontages must contribute to a welcoming streetscape and signal downtown activity after dark.

Evaluation of existing nighttime conditions shall consider the coordinated use of multiple "layers of light" that support wayfinding, visibility, and a positive pedestrian experience, including the following:

- District Edge and Ridgeline Lighting,
- Facade and Architectural Feature Lighting,
- Signage and Business Lighting,
- Pathway and Pedestrian Lighting,
- Entryway and Building Entrance Lighting,and
- Window Display and Interior Visibility Lighting.

When coordinated, these lighting layers contribute to a safe, comfortable, and engaging nighttime environment. Improvements may be implemented incrementally and are not required to occur simultaneously. Priority must be given to lighting interventions that provide the greatest public benefit, including integration with planned capital projects or the use of incentive programs to encourage enhanced façade, window, and signage lighting by private property owners.



Figure 103. Example of ridgeline and building edge lighting from Country Club Plaza, Kansas City, MO



Figure 104. Example of architectural lighting that draws attention to unique architecture, in this case the simple columns of the building, making it stand out even at night. Apartment building, Duluth, MN. [Photo credit: Seanette Corkill]

8.4.1 LIGHTING TYPES

District Edge and Ridgeline Lighting

District edge and skyline lighting elements may be used to visually define the boundaries and perceived extent of the business district during evening hours. Similar to daytime gateway features, lighting that is introduced at district edges and continues within the district can signal arrival, reinforce identity, and communicate district scale when visibility is limited.

This lighting may include continuous or regularly spaced lighting along building rooflines where such features exist. In areas without consistent rooflines, or where gaps between buildings occur, comparable visual continuity may be achieved through illumination of tree trunks or canopies, or by integrating lighting on streetlights or other vertical streetscape elements, provided such lighting is coordinated and avoids glare or light spill onto adjacent properties.

Facade and Architectural Feature Lighting

Façade and architectural feature lighting may be used to highlight distinctive architectural elements, landmark buildings, or historically significant features in order to reinforce district identity and aid nighttime orientation. Emphasis must be placed on buildings with notable architectural character or cultural significance to create visual focal points and support interpretation of the district's architectural context.

This lighting may include ground-mounted floodlights, wall-mounted sconces, or focused spotlights directed at towers, cornices, entries, or other defining features. Lighting shall be designed to avoid glare, excessive brightness, and light spill onto adjacent properties or the public right-of-way.

Signage and Business Lighting

Signage and business lighting shall be illuminated to support nighttime visibility, orientation, and wayfinding within the district. Sign lighting must allow signs to remain legible after business hours in order to help visitors navigate the district and understand the range of available businesses, including those not open during evening hours. This lighting shall be directed toward the sign face and shielded to prevent glare or light spill onto adjacent buildings, sidewalks, or residential areas. Gooseneck fixtures, angled shades, or similar focused luminaires may be used. Fixtures must be spaced and aimed to provide uniform illumination across the entire sign face, with overlapping light coverage to minimize shadows and ensure legibility. See **Chapter 18.15 Signs** for standards.

Pathway and Pedestrian Lighting

Pathway and pedestrian lighting shall be provided to illuminate pedestrian routes and spaces, supporting safe, comfortable, and intuitive nighttime movement throughout the district. Pedestrian lighting must reinforce key connections between destinations such as parking areas, transit stops, hotels, residential neighborhoods, and primary downtown streets. This lighting shall provide a continuous and even wash of light focused on walking surfaces and pedestrian-scale spaces. Wall-pack fixtures, unshielded ceiling lights, or security-style luminaires are discouraged due to glare and negative impacts on pedestrian comfort. Acceptable lighting strategies may include wall-mounted sconces, gooseneck fixtures with shields, lighting integrated under awnings, or illuminated streetscape elements, provided lighting is directed toward pedestrian areas and avoids excessive brightness or spillover.



Figure 105. Example of facade fixture where a linear wash of light illuminates a sign in Walla Walla, WA [Photo credit: Seanette Corkill]



Figure 106. Example of facade fixture where a sign holder with lights on arms integrated into the bracket hold bulbs exactly the right distance from the sign face in Camas, WA [Photo credit: Seanette Corkill]

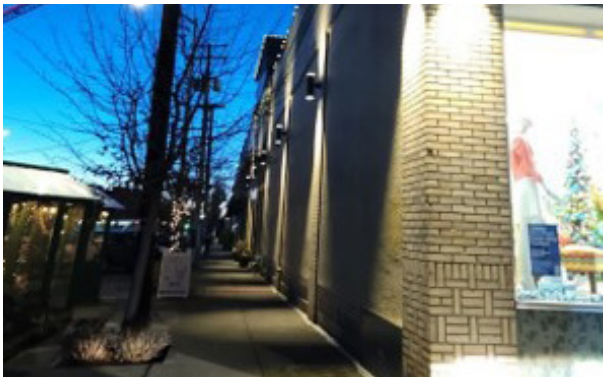


Figure 107. Example of shielded light located at a human scale height and that falls directly on the sidewalk supports comfortable navigation to and from destinations in Vancouver, WA [Photo credit: Seanette Corkill]

Entryway and Building Entrance Lighting

Entryway and building entrance lighting shall be provided at business and building entrances to clearly define entry locations, improve visibility, and support safe access during evening hours. Entryway lighting must illuminate doors, thresholds, and posted information such as business hours and contact details, and contribute to a secure environment for employees and patrons when entering or exiting a building. This lighting shall be designed for pedestrian-scale use and located to avoid direct glare due to close proximity to users. Light sources must be shielded within fixtures and not directly visible from the public right-of-way. Where bulbs are visible, low-output lamps or glare-reducing bulb types, such as chrome-dipped or similarly treated bulbs, may be used to limit direct light exposure.

Window Display and Interior Visibility Lighting

Window display and interior visibility lighting must activate storefronts and enhance nighttime visual interest along sidewalks. Illuminating interior spaces visible from the public right-of-way supports pedestrian wayfinding, reinforces district vitality after business hours, and allows visitors to understand available goods and services when businesses are closed. Fixtures must be located near glazing and spaced to provide even coverage. Lighting shall be directed inward toward displays and merchandise and shielded to minimize glare for pedestrians. For service-oriented uses, interior lighting may highlight reception areas, feature walls, or business identification elements visible from the sidewalk.

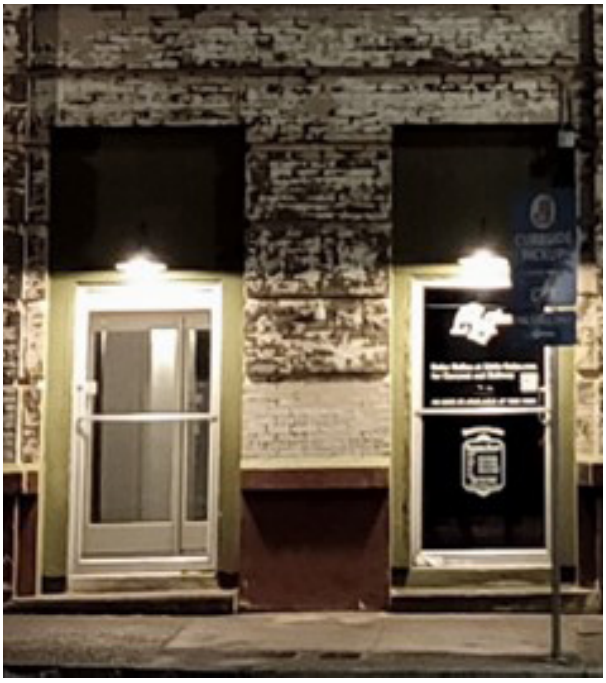


Figure 108. Example of entrance lights over doorways (front or back) that are pedestrian scale and shield the viewer from light bulb in Vancouver, WA [Photo credit: Seanette Corkill]



Figure 109. Example of entrance lights with some personality or unique flare that can delight visitors by communicating a business's vibe in Portland, OR [Photo credit: Seanette Corkill]



Figure 110. Example of wrapped light poles that clearly define the edges of Uptown's Main Street in Vancouver, WA. [Photo credit: Seanette Corkill]

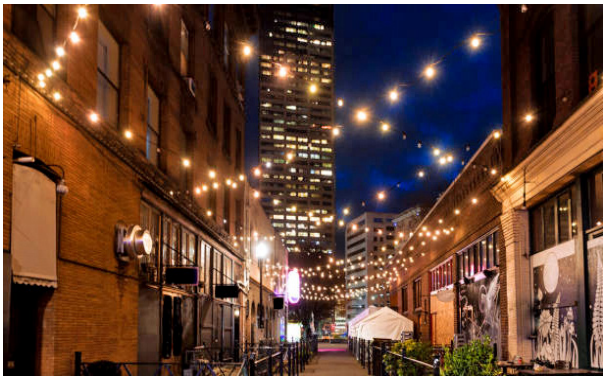


Figure 111. Example of decorative overhead lighting in an alley in Portland, OR.

8.4.2 LIGHTING STANDARDS

The following applies to all street types:

1. **Light Pole Height:** Use pedestrian-scale poles between twelve (12') and fourteen (14') feet tall; vehicular corridor poles may be up to twenty (20') feet tall.
2. **Light Fixture Type:** Install full cutoff LED fixtures with a color temperature between two thousand seven hundred (2,700 K) and three thousand (3,000 K) Kelvin. LED should utilize screw-base bulbs.
3. **Light Pole Spacing:** Space pedestrian lights sixty (60') feet to eighty (80') feet apart, adjusted for tree canopy and building height.
4. **Light Pole Location:** Shall not be placed within thirty (30") inches of the curb line or within twenty-five (25') feet of an existing tree.
5. **Illumination Levels:** Maintain one (1 FC) to two (2 FC) foot-candles on sidewalks at the back of curb and five (5 FC) foot-candles at crosswalks. See definitions for footcandle.
6. **Building Lighting (on buildings):** Allow architectural lighting up to a combined maximum of three (3 FC) foot-candles to highlight building features or public art.
7. **Decorative Overhead Lighting:** Permit string lights in plazas and alleys, mounted at heights between ten (10') and fourteen (14') feet.
8. **Window Lighting:** Must be located near glazing on primary facades to provide flexible and even coverage at intervals of eighteen (18") inches to twenty-four (24") inches; and must be directed inward toward displays and merchandise and shielded to prevent glare toward pedestrians and vehicles.



Figure 112. Example of Commercial or Residential Dumpster Screening

8.5 Screening.

Screening helps preserve the visual quality of the streetscape by concealing service areas, utilities, and parking from public view. It must be designed to complement surrounding architecture and landscape, using durable materials that maintain accessibility, ensure safety, and reinforce the overall character of the public realm. The following applies to all street types:

8.5.1 SCREENING STANDARDS

1. **General:** Screening must reduce visibility from public streets, sidewalks, alleys, and adjacent residential uses.
2. **Materials:** Materials must be durable, compatible with building architecture, and maintain a cohesive urban design character
3. **Accessibility:** Screening elements must not obstruct sight lines, pedestrian paths, or ADA access.
4. **Landscaping:** Landscaping used for screening must be maintained and replaced if dead or damaged.
5. **Trash Enclosures:** Construct six (6') foot high walls with opaque gates; set back at least five (5') feet from sidewalks.
6. **Utility Screening:** Use two (2') wide by three (3') foot tall shrubs at maturity, decorative fencing, or public art to screen all utility boxes.
7. **Mechanical Equipment (on rooftops):** Must be screened by parapets, penthouses, or integrated architectural forms. Screening must be equal to or greater than the height of the equipment. Equipment must be grouped and set back from roof edges to minimize views from the street.
8. **Mechanical Equipment (on the ground):** Must be fully screened by a combination of architectural enclosures, landscaping, or fencing at least three (3') feet to six (6') feet high. Preferred solutions include low walls that match building materials, dense evergreen shrubs, or integrated cabinets. Equipment must be oriented away from primary streets when possible.
9. **Service Areas:** Locate loading docks and dumpsters at the rear or side of buildings; screen with materials that match the primary building.
10. **Parking Lot Screening:** All parking lots shall provide a continuous perimeter treatment along any lot lines adjacent to a street. The treatment may consist of ornamental fencing, masonry walls, or dense hedges and shall be between three (3') feet and five (5') feet tall with at least fifty (50%) percent opacity. Pedestrian connections must remain open, visible, and safe.
11. **Structured Parking Buffers:** Ground floors facing streets must include windows, art, or architectural treatments to avoid blank walls. Openings must be screened with decorative grilles, louvers, or architectural panels.
12. **Blank Walls:** Blank walls longer than twenty (20') feet must be treated with murals or public art, vines or green screens, or landscaping beds to reduce scale and enhance the pedestrian experience.



Figure 113. Example of Existing Sculpture along 4th Avenue in Downtown Camas



Figure 114. Example of Existing Mural Art along 4th Avenue in Downtown Camas

8.6 Public Art.

Public art enriches the streetscape by adding cultural value, visual interest, and a distinct sense of identity. It can function as a landmark, convey local stories, or introduce playful, interactive elements. Art must be thoughtfully integrated into the built environment, ensuring accessibility, durability, and a meaningful reflection of the community's character and values. The following applies to all street types:

8.6.1 PUBLIC ART STANDARDS

1. **Funding:** All projects within a Downtown Zoning District must allocate at least one (1%) percent of construction cost to public art.
2. **Placement (in public spaces):** Must include art in an exterior, publicly visible area such as at major intersections, plazas, amenities zones (along a street), mid-block crossings, building entry points, park spaces, and gateways. Upon approval by the planning official, placement of a permanent public art display may be in lieu of some (or all) of the required elements for a particular project.
3. **Placement (in private spaces):** For sites with new public space, must be integrated into site or building design where possible and treated similarly to placement in public spaces.



Figure 115. Example of Mural



Figure 116. Example of Plaza Sculpture

4. **Access:** Public art must avoid any conflicts with pedestrian circulation, ADA access, sight-distance (for vehicles or cyclists), utilities, or emergency egress.
5. **Design:** Avoid materials that create hazards such as glare, sharp edges, or climbable surfaces near traffic.
6. **Materials:** Must use durable, weather-resistant materials suitable for the climate (e.g., treated metal, stone, laminated glass, ceramic, etc.)
7. **Maintenance:** Consider long-term maintenance and safety requirements.
8. **Lighting:** Must be integrated and fully shielded following state energy code and dark sky guidelines, nor can it create glare into sidewalks, streets, or adjacent properties.
9. **Murals:** Allow murals to cover up to seventy-five (75%) percent of a wall surface; apply anti-graffiti coatings.
10. **Sculpture Pads:** Must provide a minimum two (2') foot by two (2') foot concrete bases with optional electrical conduit for lighting.
11. **Community Engagement:** Encourage participation from local artists, schools, and community groups in creating public art.
12. **Themes:** Must avoid imagery or content that may be discriminatory, culturally inappropriate, or inconsistent with community values.





OTHER

SECTION 9.0 DEFINITIONS & MEASURES

9.0 Definitions & Measures.

The following section provides general definitions for all new terms and terminology included in this design manual, as well as guidance on measuring for specified terms.

Alcove Frontage: A frontage type characterized by recessed building entries or display areas partially sheltered by the building mass, intended to provide transition space between the public sidewalk and interior uses.

Alley Setback: Minimum distance in linear feet (LF) of any building facades from property lines onto an existing or proposed alley.

Amenity Zone: The portion of the public realm located between the sidewalk zone and curb, intended to accommodate trees, lighting, furnishings, transit amenities, and other streetscape elements.

Active Commercial Use: Active commercial refers to street-facing, ground-floor uses that encourage walkability and activate sidewalks, such as shops, cafés, restaurants, and other active, customer-oriented businesses. See **Section 4.0 Use and Parking** for further detail.

Base Zoning District: The mapped zoning classification that establishes permitted uses, building form, height, and development standards applicable to lots within Downtown Camas. See **Section 3.0 Base Zoning Districts** for further details.

Blank Wall: A building façade segment lacking transparency, articulation, or pedestrian-oriented features for a continuous length exceeding the maximum permitted by this manual.

Building Footprint: For the purposes of this manual, the building footprint is the total square footage (SF) of any habitable structures or accessory buildings on a lot or lots as determined by the perimeter of those buildings on a site plan.

Building Frontage: The portion of a building façade that directly abuts or faces a public right-of-way, setback area, or frontage zone and is subject to frontage standards.

Building Height: A general standard for each base zoning district, building height measures the vertical dimension of a building in feet and stories.

HOW TO MEASURE: Building height is measured in linear feet and stories (#) by measuring the distance from the adjacent grade of the sidewalk on the primary street to the bottom of the eaves or parapet. Building height does not include any levels below-grade.

Building Uses: A general standard for each base zoning district, building uses are the primary uses of the main building on a site, not including any accessory or temporary uses. See **Section 4.0 Use and Parking** for further details.

Encroachment Zone: The area between the building façade or setback line and the sidewalk zone where limited projections, seating, signage, or weather protection elements may be permitted.

Facade Zone: The vertical plane of the building face adjoining the public realm, regulated to ensure transparency, entrances, articulation, and compatibility with street character.

Footcandle: A unit of illuminance used to measure the intensity of light on a surface. One footcandle is equal to the amount of light produced by one lumen uniformly distributed over one square foot. Footcandles are measured using a light meter, which is placed at the location being evaluated, such as on the ground for a sidewalk or parking lot. The sensor is typically pointed upward to capture the amount of light falling on that surface, and the device displays the result in footcandles.

Frontage Type (or Standards): A classified method as part of this manual by which a building interfaces with the public realm, including but not limited to shop, café, porch, stoop, forecourt, civic, or yard frontage. See **Section 6.0 Frontage Standards** for further details.

General Standards (for Public Realm): A set of standards as part of this manual which regulates common elements of the public realm on all street types within the street network. See **Section 8.0 General** for further details.

Ground Floor (Uses): The lowest occupied story of a building above finished grade, intended to accommodate uses and design features that directly engage the public realm. See **Section 4.0 Use and Parking** for further details.

Lot Coverage: The percentage (%) of a lot area occupied by the building footprint, calculated in accordance with the measurement standards of this manual.

HOW TO MEASURE: Lot coverage is calculated by dividing the footprint (in square feet) of the building or buildings on the lot or lots by the total lot size (in square feet) to derive a percentage.

Lot Depth: Lot depth is the dimension in feet of a lot or lots perpendicular to the primary street frontage along the public right-of-way.

Lot Size: Lot depth is the dimension in feet of a lot is the area, typically a maximum area, in square feet (FT) and determined by its length and width.

HOW TO MEASURE: Lot size can be measured easily by multiplying the lots width (in feet) by depth (in feet) for standard lots, and calculating the area based on GIS or other public sources for irregular shaped lots such as flag lots or triangular lots.

Lot Width: Lot width is the dimension of a lot or lots along the primary street frontage parallel with the public right-of-way.

Mixed Use: A development pattern in which multiple primary uses, such as residential and commercial, are integrated within a single building or site, typically in a vertical configuration.

Open or Common Spaces: For the purposes of this manual, open or common spaces are considered usable outdoor spaces or exterior spaces in square feet (SF) on a building that are accessible by all inhabitants of a building or open to the public.

Parking Setback: Minimum distance in linear feet (LF) of the placement of any structured or surface parking facilities or storage of vehicles on the site from the primary street or side street.

Passive Commercial Use: Passive commercial refers to commercial activities that primarily serve building occupants or a smaller customer base—such as boutique offices, lobby kiosks, or specialty shops—which typically generate less foot traffic and require less window visibility. See **Section 4.0 Use and Parking** for further detail.

Primary Street: The primary street is the dominant street for a lot as determined by the address on the parcel of land.

Primary Street Setback: Maximum distance in linear feet (LF) of the placement of the building facade on the ground floor from the property line on the primary street.

Primary Street / Upper-Level Setback: Minimum distance in linear feet (LF) of the placement of building facades on a designated upper-level from the ground floor building facade on the primary street.

Primary Uses: The primary use on the lot in the main building as identified in this manual per **Section 4.0 Use and Parking** for further details.

Public Realm (Standards): All publicly accessible spaces between the building façade and curb line, including sidewalks, planting areas, amenity zones, and related streetscape elements, regulated as part of this manual. See **Section 7.0 Public Realm Standards** for further details.

Rear Yard Setback: Minimum distance in linear feet (LF) of any building facades from property lines at the rear of the yard.

Regulating Plan: The official map that assigns base zoning districts and street types to individual parcels, establishing the framework for applicable zoning and design standards. See **Section 2.0 Regulating Plan** for further details.

Setback: The required minimum or maximum distance between a building façade and a property line (or public right-of-way line), measured horizontally and regulated by base zoning district.

Street Network: The mapped network of streets based on intended character within Downtown Camas which assigns frontage standards, public realm standards for the purposes of this manual. See **Section 5.0 The Street Network** for further details.

Sidewalk Zone: The unobstructed portion of the public realm reserved primarily for pedestrian circulation, required to meet minimum width and accessibility standards.

Side Street: The side street is the less-dominant street for a lot which is often a street perpendicular and secondary to the primary street. If no primary street is present, the side street shall serve as the primary street for the purposes of this manual.

Side Street Setback: Maximum distance in linear feet (LF) of the placement of the building facade from the property line on the side street.

Side Yard Setback: Maximum distance in linear feet (LF) of any building facades from property lines on adjacent lots.

Street Type: A functional and design classification assigned to a public street that determines applicable frontage standards, public realm dimensions, and streetscape requirements.

Transparency: The percentage of a building façade composed of clear, non-reflective glazing that allows visual connection between interior spaces and the public realm.

Upper Floor (Uses): Any occupied building story located above the ground floor, subject to distinct use, setback, and design standards. See **Section 4.0 Use and Parking** for further details.

Zero Lot Line: The condition when the facade of a building on a primary street or side street is built on or very near the public right-of-way, resulting in a zero (0') foot or very near zero foot setback.

For all other definitions or measurements, see **Chapter 18.03 Definitions** of the Camas Municipal Code.

WSP

FOR MORE INFORMATION PLEASE CONTACT

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EXHIBIT V

The Zoning Map of the City of Camas, Washington

Adopted by Ordinance 26-010
November 16, 2026

Zoning Designation
- R-6
- R-7.5
- R-10
- R-12
- R-15
- LD-NS
- MF-10
- MF-18
- MF-24
- HD-NS
- DT-R
- DT-MXL
- DT-MXM
- DT-HMSC
- MX
- MX-NS
- CC
- NC
- RC
- C-NS
- ME
- ME-NS
- HI
- POS
- Water

Zoning Overlay
- Airport Overlay - Zone A
- Airport Overlay - Zone B
- Airport Overlay - Zone C
- Cottage Overlay

Gateway Design Overlay
- Tier 1
- Tier 2

- City Limits
- 2045 UGA
- State Route
- Primary Arterial
- Arterial

N W E S

0 0.25 0.5 Miles

Note: Features shown on this map were collected from multiple sources and are presented as-is. The City of Camas does not guarantee accuracy or completeness and assumes no liability for errors, omissions, or inaccuracies in the information.

City of Camas WASHINGTON

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